

**GEOLOGICAL SURVEY OF INDIA
TRAINING INSTITUTE, HYDERABAD**

PHOTOGEOLOGY AND REMOTE SENSING DIVISION

**COURSE REPORT ON THE FIFTH COURSE ON APPLICATION OF GEOINFORMATICS
FOR DISASTER MANAGEMENT**

(GSI TI-ISRO COLLABORATIVE PROGRAMME UNDER NNRMS)

(15th April 2009 to 16th May , 2009)

Introduction: The natural disasters taking the toll of life and property have become matter of concern all over the world. There is a need to collect, collate, analyse and disseminate the geoinformatics data to evolve decision support system for effective disaster management. Considering the expertise of GSI in the area of Disaster management a pre cursor training programme on Geoinformatics for Disaster Management has been conducted during December 15, 2004 to January 13 ,2005 at GSITI, Hyderabad. Subsequently an agreement has been made between NNRMS-ISRO and GSI for conducting five training courses for the period of five years and the present course being the 5th in the cycle.

The current 5th Course under this programme was conducted from 15th April 2009 to 16th may 2009 (32 days).A total of seventeen candidates from different universities from different parts of the country participated in the training program.

Sl. No.	Name	Designation	University/Institution
1	Ms.Lakshmi Poornima.S.	Res. Scholar	Govt Arts College, Kumbakonam Tamil Nadu
2	Ms. Mamta Chauhan	Res. Scholar	Jai Narain Vyas University, Jodhpur, Rajasthan
3	Mr. Kaliraj.S.	Lecturer	Gandhigram Rural university, Dindigul Tamil Nadu
4	Mr.Rupesh S.Mankar	Res. Scholar	SGB Amravathi University, Maharashtra
5	Mr.Bijay Tripathy	Res. Scholar	Ranchi University, Jharkhand
6	Ms.Rashmi Gairola	Res. Scholar	Wadia Institute of Himalayan Geology, Dehradun, Uttrakhand

7	Ms.Priyanka Tripathi	Res. Scholar	NGRI, Hyderabad
8	Mr. G.Ramesh	Lecturer	Annamalai University, Chidambaram, Tamil Nadu
9	Dr. N.Muthukrishnan.	Lecturer	SASTRA University, Tanjavur, Tamil Nadu
10	Mr. P.Venkateshwara Rao	Res. Scholar	Andhra University, Vizag, Andhra Pradesh
11	Mr Sanjay Kumar Pandey	Res. Scholar	University of Delhi, Delhi
12	Ms. Parmita Bose	Lecturer	Jiwaji University, Gwalior, Madhya Pradesh
13	Ms. Kirankumari Singh	Lecturer	Govt PG College Hamirpur, Uttar Pradesh
14	Poongodi.S.	Guest Lecturer	Madurai Kamaraj University, Madurai ,Tamil Nadu
15	Vishnu.B.	Asst Professor	Kerala Agriculture University, Kasargod dist, Kerala
16	Ms.Bhavana N Umrikar	Lecturer	University of Pune, Maharashtra
17	Mr. M. Kannan	Research Scholar	SASTRA University, Tanjavur, Tamil Nadu

The core faculty associated with the programme included:

D.K. Choudhury, Geologist (Sr), PGRS Division, GSI, SR, Hyderabad

N.S.Gadagkar, Gologist (Sr), PGRS Division, GSI, SR, Hyderabad

S.Ananda Murthy, Gologist (Sr), PGRS Division, GSI, SR, Hyderabad

R.M.Sundaram, Gologist (Sr), PGRS Division, GSI, SR, Hyderabad

B.K. Sahu, Geologist (Sr), CGMT, GSITI, Hyderabad

P.V.Krishna Rao, Geologist (Sr), CGMT, GSITI, Hyderabad

Apart from the above core faculty, a number of eminent geoscientists from GSI and other organizations delivered guest lectures on specific specialized topics including case studies on Disaster management.

The course was inaugurated by Dr.Y.V.N.K Murthy , Director RRSSC,ISRO Bangalore on 15th April 2009.After a brief self introduction by the participants, Sri V.Hanumantah Rao, Director PGRS Divn gave a brief account of the course curriculum. Sri, R.K.Khorana Dy Diretcor General

,GSITI and Chairman of the session advised the participants to interact with the faculty and guest faculty to extract maximum benefit during the training programme.

The course was conducted in 4 modules.

1. Aerial Remote sensing and Photogrammetry – 3 days
 2. Digital Image Processing including Digital Photogrammetry - 9 days
 3. Project work in Aerial Photo and satellite imagery Interpretation -3 days
 4. Geographic Information System (GIS) – 6 days
- These were supplemented by
5. Case studies and application- 4 days
 6. Visit to national laboratories (NRSC and INCOIS) 1 day

Module – 1: Photo geology and Remote Sensing

The basis for interpretation of any Remotely sensed data product for Geology is based on the principles aerial photo interpretation. Therefore, under this module after introducing the participants to the fundamental aspects like aerial photography and its planning, principles of photogrammetry, physics of remote sensing, data acquisition systems and platforms and principles of photo interpretation, the participants will be introduced to interpretation of lithology and structure of sedimentary, igneous and metamorphic terrains. Besides Remote Sensing in Thermal Infra-red and Microwave regions of Electromagnetic Spectrum will also be dealt with.

Module – II: Digital Image Processing

The participants will be introduced to Digital Image Processing involving geometric rectification of raw data, various image enhancement and classification techniques, image mosaicing and map composition, using ERDAS Imagine software (9.1 version). The various aspects will be covered through a series of lectures, demo and hands on practice followed by a project work where the participants will apply all these techniques to the data product of a selected block and appreciate the results.

Besides, the participants will be introduced to Digital Photogrammetry through lectures and demo for three days comprising topics like digital image orientation, aero and space triangulation, generation of DEM, Orthophoto, 3D feature extraction followed by a project work for 3 days using both Aerial Photos and Cartosat –1 data.. For the first time CARTOSAT-1 stereodata of Sikkim Himalayas was used for delineating landslide hazard zones. **This is an improvement over the previous courses.**

Module – III: Case studies and applications

- A) Spatial inputs for disaster mitigation,management with special reference to flood.
- B) Remote sensing and GIS for Disaster management.

- C) Neotectonics and active fault mapping
- D) Dam safety aspects
- E) Landslides, causes, susceptibility zonation and control
- F) Earthquake hazards in India a case study from Bhuj earthquake.
- G) Application of RS and GIS for coastal zone management.
- H) Applications of geoinformatics for Tsunami mitigation and management
- I) Application of RS in Draught management

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Module – IV: Geographic Information System

This module to be conducted at the CGMT laboratory will encompass General concepts of spatial data models, Spatial data capture techniques, Geo-referencing and on screen digitization, Automatic and semi-automatic vectorisation using Arc Scan, Spatial data editing, Concepts of GPS and Mobile mapping, Spatial adjustments, GIS analysis and Modeling techniques, Cartographic principles and Map layouts.

As a part of practical exercise classification of landslides and preparation of landslide hazard zone map was dealt with

The participants were taken to Satellite Earth Receiving Station at Shadnagar and NRSA Laboratories at Balanagar, where they received a first hand experience on the process of real time data collection as the satellites pass over the country and the various stages of processing done before the data are disseminated to the users. For the first time the the participants were taken to the Indian National Ocean Information System (INCOIS) Kukkatpally, Hyderabad for first hand information on tsunami warning and hazard mitigation.

The trainees took active part in the group discussion and delivered their presentations on various topics. An evaluation test was conducted where in all the trainees performed very well.

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