A Note on the visit of CNR scientists to GSI, CHQ under LANDSLIP project

A team of scientists comprising Dr. Alessandro Cesare Mondini, Dr. Mauro Rossi and Dr. Massimo Melillo from National Research Council (CNR)-IRPI, Italy visited Geohazards Research and Management (GHRM) Centre, GSI, CHQ, Kolkata between 3rd and 11th October, 2018 to jointly carryout of landslide modelling and to provide training to six GSI officers from CHQ, SR and ER engaged in LANDSLIP project. The CNR is a reputed research institute of the Italian Consiglio Nazionale delle Ricerche engaged in landslide studies and is also one of the consortium partners of LANDSLIP project.

LANDSLIP is a multi-disciplinary project aims to integrate meteorological, landscape and social dynamics information in developing landslide early warning system (EWS) at catchment and regional scales. It contains seven interlinked work packages (WP1 to WP7) in which GSI co-lead with British Geological Survey (BGS), UK and CNR-IRPI, Italy in WP4 and partly in WP5. The responsibility includes mapping and modeling of landscape dynamics for generation of landslide hazard susceptibility models and analysis of landslide and rainfall data for the development of rainfall threshold models. To accomplish the above work, GSI is collaborating through memorandum of understanding (MoU).

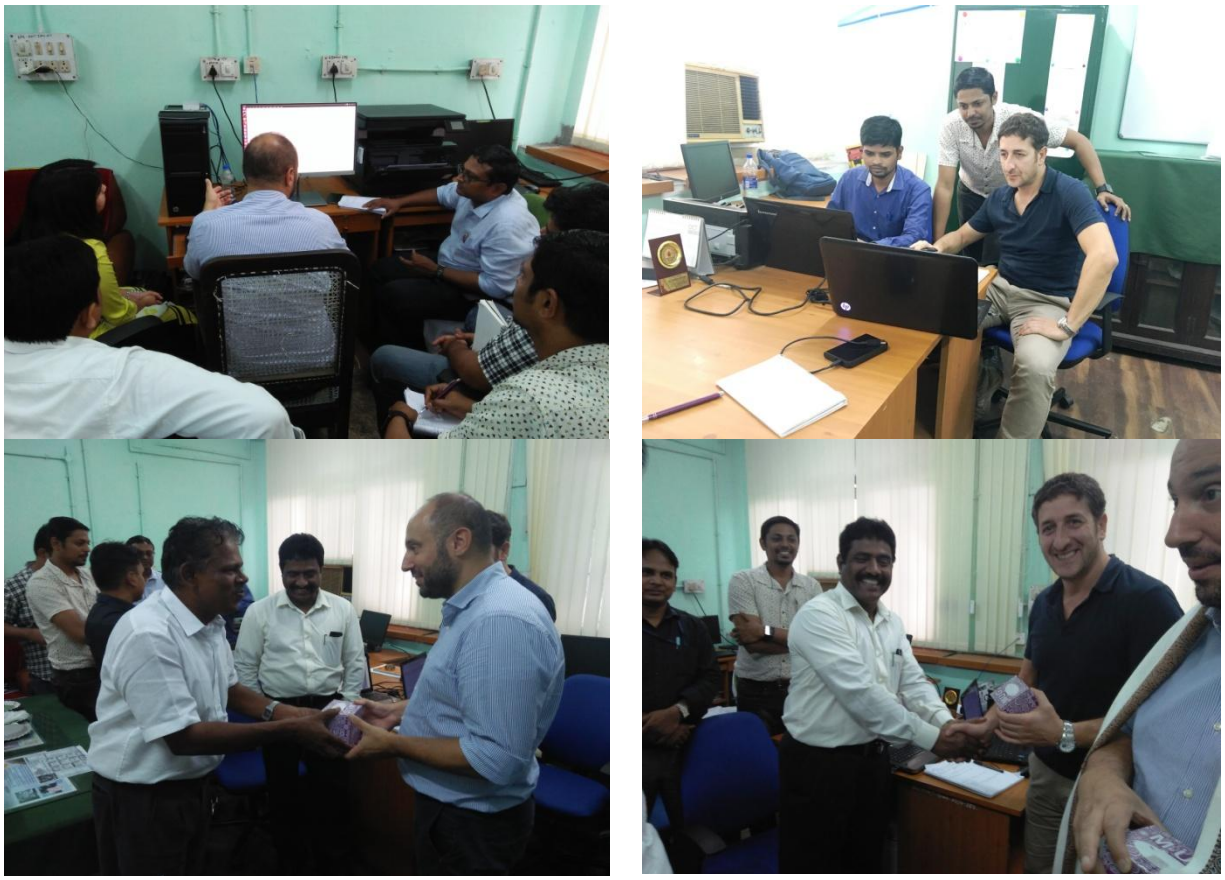
Dr. Alessandro Cesare Mondini visited Landslide Studies Division (LnSD), GHRM Centre between 3rd and 4th October, 2018 and guided the GSI officers in carrying out automatic change detection using SNAP, an open source common architecture for ESA Toolboxes, for identification of landslide locations in the Nilgiri area. Two same path temporal Synthetic Aperture Radar (SAR) imageries were processed in SNAP and co-registered using SRTM DEM and used for the change detection algorithm to detect landslide locations. He also imparted basic knowledge on remote sensing in landslide studies.

Dr. Mauro Rossi and Dr. Massimo Melillo visited LnSD between 4th and 11th October, 2018 and guided the GSI officers in carrying out rainfall threshold modeling using CTRL-T (Calculation of Thresholds for Rainfall-induced Landslides Tool) developed by Massimo Melillo and landslide susceptibility modelling using LAND-SUITE. CTRL-T is R based (open-source software for advanced statistical computing and graphics) algorithms that automatically and objectively reconstructs rainfall events and the triggering conditions responsible for the failure and calculates rainfall thresholds at different exceedance probabilities. During training, three set of algorithms were run in Rstudio, a free and open-source Integrated Development Environment (IDE) for R, to get the i) rainfall events, ii) rainfall conditions responsible for the landslide and iii) rainfall thresholds. Rainfall events were reconstructed and rainfall threshold was developed for the Darjeeling area using the daily rainfall data of 37 rain gauges and 94 landslide events.

For Landslide susceptibility modeling software LAND-SUITE (LANDslide - SUsceptibility Inferential Tool Evaluator) was introduced for the Nilgiri area. LAND-SUITE is a suite of R tools designed to support the landslide susceptibility inference process and is composed of

LAND-SE (LANDslide-Susceptibility Evaluation), LAND-SIP (LANDslide-Susceptibility Input Preparation) and LAND-SVA (LANDslide-Susceptibility Variable Analysis). LAND-SUITE works on R code and is able to perform different training and validation dataset partition, explorative analysis of the variables, and susceptibility map preparation using ensemble model based on Linear Discriminant, Quadratic Discriminant and Logistic Regression analysis. The data preparation and processing were carried out in the recently procured high end Work Station using GRASS and Q GIS. Several new DEM derivates such as geovariance, geomorphon, geointensity, georange etc were generated and introduced in the susceptibility modelling.

The training ended with a valediction ceremony attended by Dr. S. Raju, ADG and NMH-IV and Dr. K. Jayabalan, DDG, M-IVA.



A glimpse of the training at LnSD, GHRM centre