

## Uttarakhand landslides - 2013: Satellite based Study

### A Preliminary Report

#### Summary

The area in and around Kedarnath, Uttarakhand, witnessed a large scale occurrence of flood and landslides between the 16<sup>th</sup> and 17<sup>th</sup> of June, 2013 due to incessant rainfalls upstream of Mandakini river and its tributaries. A landslide inventory is being carried out for the affected area using pre and post IRS data. The data used for the study is listed as follows.

#### Data Sources

Satellite	Date of Acquisition	Sensor type (resolution)	Source
Resourcesat-2 LISS-IV Mx (Post-event data)	21st June, 2013	Multispectral (5.8 m)	ISRO
Resourcesat-2 LISS-IV Mx (Pre-event data)	18 <sup>th</sup> November, 2011	Multispectral (5.8 m)	ISRO

Semi-automatic detection of landslides using standard algorithms was used in order to detect the landslides and generate the outputs. The detected landslides shown here include existing landslides of which some are reactivated.

In the preliminary assessment, a total of **2395** landslides have been identified along the river valleys of Mandakini, Basuki Ganga, Mandani, Kali, Madhyamaheshwar, Bhillangana, parts of Alaknanda (including upper Saraswati valley) and its tributaries like Kalpa Ganga, Kalapani Gad, Khirao Ganga and Rishi Ganga from Srinagar to Chamoli (also around Jakhpur, Kalpeshwar, Khiraogarh and Mana) and parts of Bhagirathi around Gangotri. The major towns included in this area are Kedarnath, Sonprayag, Gaurikund, Okhimath, Guptkashi, Mansuna, Phata, Agastmuni, Rudraprayag, Srinagar, Gauchar, Karnaprayag, Nandprayag, Chamoli, Jakhpur, Kalpeshwar, Khiraogarh, Mana, Gangotri, etc.

*Note: Currently the sections along the river valleys of Mandakini, Basuki Ganga, Mandani, Kali, Madhyamaheshwar, Bhillangana, parts of Alaknanda (including upper Saraswati valley) and its tributaries like Kalpa Ganga, Kalapani Gad, Khirao Ganga and Rishi Ganga from Srinagar to Chamoli (also around Jakhpur, Kalpeshwar, Khiraogarh and Mana) and parts of Bhagirathi around Gangotri are completed and uploaded for visualization in Bhuvan. Other sectors will be continuously uploaded upon completion.*

#### Disclaimer:

- i) Areas under snow, cloud cover and shadow could not be mapped.