

IPL Project (IPL - 227) Annual Report Form 2019

1 January 2018 to 31 December 2018

1. Project Number (approved year) and Title,

(IPL-227 (2017), Title: Development of a web based landslide information system for the landslides in Sri Lanka

2. Main Project Fields: Technology Development (database and hazard assessment)

3. Name of Project leader:

Eng. K. M. Weerasinghe, B.Sc. (Civil Engineering), M.Sc. (Geotechnical Engineering)

Affiliation: Civil Engineer, Centre for Research & Development (CRD), Central Engineering Consultancy Bureau (CECB))

Contact: No. 11, Jawatta Road, Colombo 05, Sri Lanka

Fax: +94 112 598215; Tel: +94 112 505688; e-mail: kmweera@yahoo.com

Core members of the Project: Names/Affiliations: (4 individuals maximum)

Ms. J. M. K. Herath; B.Sc. (Geology Special), M.Sc. (Water Resources Management)/Engineering Geologist (CECB)

Mr. K. B. Attapattu – B.Sc (Town and Country Planning)/Planner (CECB)

Mr. A. A. Virajh Dias – B.Sc(Civil Eng); CEng, PG.Dip; MASCE,MIESL/ AGM (CECB)

4. Objectives: The objective of this research is to develop a web based database on landslides for Sri Lanka by collecting information through online tools such as ‘Google alert’ (<https://www.google.com/alerts>), other available databases (www.desinventar.lk) and field verification, and organizing the data in an user friendly manner.

5. Study Area: Mountainous area of Sri Lanka covering the Central, Sabaragamuwa, Uva, Western and Southern administrative provinces.

6. Project Duration: Three years (September 2017 –August 2020)

7. Report

7.1 Progress in the Project

Data collection: Data on past landslides have been successfully collected through online tools such as Google alert. Additionally, digital and printed media, technical reports, and field verifications have been utilized for data collection. Harnessing the Des Inventar database (www.desinventar.lk) for collecting information on past landslides have been completed.

Designing backend database architecture on a Mysql server:

Considering those requirements of the potential users, both the back and front ends of the LIS was designed as per the following use case diagrams.

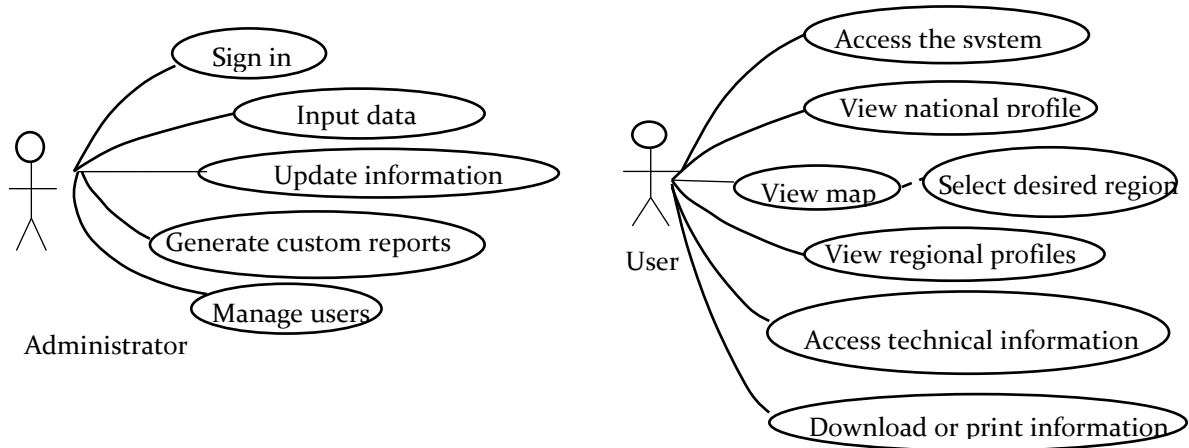


Figure 1: Use case diagrams for expressing the design of proposed LIS

A color coding system has been established (Table 1) to indicate the accuracy levels of data stored in the databases.

Table 1: Color codes used for establishing the accuracy levels of the information in LIS

Code	Color	Accuracy level
1	Green	Data were collected from one or several media source(s), and verified with a technical report and/or field investigation.
2	Blue	Data were collected from one or several media source(s).
3	Orange	Data were collected from one media source.

Data are stored in relational tables avoiding redundancies. Each landslide is assigned a unique identification number (ID), and a calling name for minimizing ambiguities about the information retrieved on landslides occurred in the same village and/or very close to each other.

Where available, the location information of landslides have been stored in the form of Latitude and Longitude or Cartesian coordinates. Information on Sri Lankan administrative units where the landslide is located have also been input and linked with the landslide.

Similarly, the date and time of occurrence, the damage and loss information and technical information have been input into the database using appropriate relational tables. Photographs,

video clips, sketches, newspaper articles, and layout maps are also stored and linked to the landslide information for users' retrieval.

Designing front end (user interface) of the Information System:

The users can access information by clicking on a desired landslide prone district on the map shown on the home page. The country profile and district profiles of past landslides are also shown on that first page for a quick glance. Once a district is selected, users are prompted to a second page, through which, the information at district, divisional, and GN division level can be accessed.

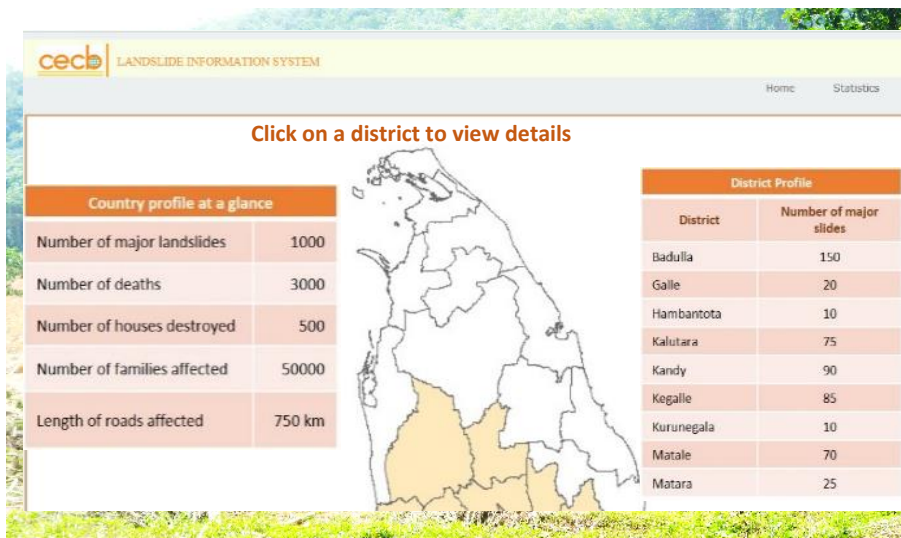


Figure 2: Preliminarily designed user interface

7.2 Planned future activities or Statement of completion of the Project

January 2019- December 2019:

- Continuing collection of landslide information,
- Field data verification on past landslides, where possible,
- Continuing designing of front end architecture using PHP, Java etc.,
- Development of tools for data analyses at the users' end.

January 2020- August 2020:

- Continuing collection of data, if new landslides occur.
- Continuing development of tools for data analyses at the users' end.
- Performing unit testing, sub system testing and integration testing.
- Launching the Beta version of the comprehensive landslide information system.
- Performing performance testing and acceptance testing.

7.3 Beneficiaries of Project for Science, Education and/or Society

The landslide professionals, academics, researchers, planners and people residing in landslide prone areas in Sri Lanka are the beneficiaries of this project.

8. Results: (15 line maximum, e.g. publications)

- a. Mysql database on landslide information available at CECB
- b. Preliminary user interface for retrieving landslide information

Publication:

“A Landslide Information System for Sri Lanka: A tool for Decision Making”, Kumari M. Weerasinghe , A.A.V. Dias , H.M.J.M.K. Herath , A.M.K.B. Atapattu, Proceedings of the CECB Symposium – 2018, Colombo, November 2018, PP 219-223,

References:

Devoli G., Strauch W., Chávez G., Høeg K., (2007), A landslide database for Nicaragua: a tool for landslide-hazard management, Journal on Landslides (Springer).

Des Inventar Disaster Information System, <https://www.desinventar.lk>.

Innocenzi, E., Greggio, L., Frattini P and Amicis M.de.,(2017), A Web-based Inventory of Landslides Occurred in Italy in the Period of 2012-2015, In: Advancing Culture of Living with Landslides, Vol 2, 1127 -1133.

Weerasinghe, K.M., (2014),Utilization of Inferred Landslide Hazard Information as a Web Based Decision Making Tool for Landslide Disaster Risk Reduction and Early Warning, In: Landslide Science for a Safer Environment, Vol. 3, 319 - 332.