Department of Geology

Faculty of Science / University of Peradeniya



Dr. Jagath K. Gunatilake

B.Sc. (Perad.), M.Sc. (AIT, Thailand), Ph.D. (Saga, Japan)

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About Me

I have obtained a First class BSc honours degree in Geology from the University of Peradeniya, and the MSc degree in Engineering Geology from the Asian Institute of Technology (AIT), Bangkok, Thailand. I received my PhD degree from the Saga University, in Japan in Geotechnical Engineering. I joined the University of Peradeniya, Sri Lanka in 1993 as a Lecturer (probationary) and promoted as a senior Lecturer in 2001 attached to the Department of Geology, University of Peradeniya. I served as the Head of the Department for 3 years (2013-2016) and have served as the chairman of the Board of Study in Earth Sciences of the Postgraduate Institute of Science (PGIS). I am the Coordinator of the MSc programme in GIS & Remote Sensing as well as MSc programme in Engineering Geology & Hydrogeology attached to the PGIS. I have supervised over 250 Postgraduate MSc thesis, 5 MPhil thesis, 1 MD thesis and 3 PhD thesis during the last 20 years. I have served in several University Committees and presently serving as the director of the Sri Lanka Japan Study Centre (SLJSC) and the Deputy Director of the Centre for Environmental Studies (CES).

Higher Education Qualifications

PhD	MSc	BSc
Saga University Japan (2001)	Asian Institute of Technology (AIT) Thailand (1995)	University of Peradeniya Sri Lanka (1987)

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Awards, Scholarships, Memberships & Fellowships

- Presidential Awards for Scientific publications in the year – 2014/2015
- NSF SUSRED Awards for promoting postgraduate studies - 2015
- NRC Merit Award for Scientific publications - 2014
- Japanese Government MONBUSHO Scholarship
- AIT Alumni Association Annual research Grant for studying the Reservoir Leakage Problem of the Samanalawewa Hydropower Project, Sri Lanka

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Positions Held

- Director of the Sri Lanka Japan Study Centre, University of Peradeniya- (2021-2024)
- President – University of Peradeniya Science Teachers Association (UPSTA)- (2021)
- Chairman – Education Committee of the Institute of Geology, Sri Lanka (IGSL)- (2020 – 2023)
- Head – Department of Geology, Faculty of Sciences, University of Peradeniya- (July 2013 to July 2016)
- Deputy Director/Consultancy– Center for Environmental Studies (CES), University of Peradeniya- (2018 todate)
- Deputy Director/Training– Center for Environmental Studies (CES), University of Peradeniya- (2015-2017)
- Deputy Coordinator– Center for Environmental Studies (CES), University of Peradeniya- (2006-2015)
- Coordinator - MSc Program on Engineering Geology & Hydrogeology – PGIS,- (2011 todate)
- Coordinator - MSc Program on GIS and Remote Sensing – PGIS- (2004 todate)
- Coordinator - 120 Short Courses on GIS and Applications conducted at the PGIS- (2014 todate)
- Coordinator - Short Courses on ISO14000 conducted by the Center for Environmental Studies, University of Peradeniya- (2015 – 2018)
- Coordinator – Disaster Resilience Leadership Program conducted by Asian Disaster Preparedness Centre (ADPC) in collaboration with the PGIS, University of Peradeniya- (2010, 2011, 2012 and 2013.)
- National Consultant – Coconut Research Institute (CRI, Lunuwila)- (2012 – 2015)
- President of the Geoinformatics Society of Sri Lanka (GISSL)- (2008/2009)
- President Geological Society of Sri Lanka GSSL- (2005/2006)
- Secretary, Peradeniya University Science Teachers Association USTA-P- (2004-2005)
- Acting Proctor – University of Peradeniya- (2010 -2012)
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My Teachings

- GL217: Soil & Rock Mechanics
- GL327: Remote Sensing & GIS
- GL332: Engineering Geology
- GL334: Field Geology
- GL418: Advanced Engineering Geology
- GL435: Seminar on Special Topics in Geology
- GL446: Research Project
- GL447: Industrial Training

Research Interests (Research Fields/ Projects)

Engineering Geology - Foundation investigations for Dams, Tunnels & Highways
GIS & Remote Sensing - Spatial data Analysis, Spatial data Infrastructure, Drone Surveys, GNSS
Geological and structural Mapping
Geochemical Investigations
Investigations for Renewable Energy - Solar, Wind, Geothermal
Geotechnical Investigations
Geophysical Investigations

Ongoing Research and Projects

High Resolution RTK Drone Survey for Siyambalanduwa Solar Park and transmission line (26 km) from Siyambalanduwa to Moneragala Grid Station

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 1 cm, creating Digital Surface Model (3D model), Baseline video footage along the area under study. Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area of the proposed transmission line and the solar park, Locating the angle tower points up to 1 cm accuracy on ground by pegging.

High Resolution RTK Drone Survey for identifying suitable sites for wind power turbines in Mannar Island

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the accuracy of 1 cm, creating Digital Surface Model (3D model), Baseline video footage along the area under study. Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area.

High Resolution RTK Drone Survey for identifying suitable sites for wind power turbines from Silawatura to Mullikulam (Modaragam Aru) 23 km stretch along the western coast of Sri Lanka

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Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the accuracy of 1 cm, creating Digital Surface Model (3D model), Baseline video footage along the area under study. Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

High Resolution RTK Drone Survey; A Sample survey for identifying suitable sites for wind power turbines in Mannar Island

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the accuracy of 5 cm, creating Digital Surface Model (3D model), Baseline video footage along the area under study. Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

High Resolution RTK Drone Survey to identify and quantify Bamboo plants for the use of Industry Year: 2021 (Commenced and in progress)

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 2 cm or less, creating Digital Surface Model (3D model), Baseline video footage along the (along the axis of the Mahaweli River), Digitize features in the orthomosaic to get the information of count of bamboo trees and to identify suitable areas for bamboo plantation

High Resolution RTK Drone Survey along proposed Kandy Highway Tunnel trace (Suduhumpola to Thennekumbura)

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 5 cm or less, creating Digital Surface Model (3D model), Baseline video footage along the proposed tunnel trace (along the axis of the trace), Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

High Resolution RTK Drone survey along the entire Kaluganga Flood plain for the Hydrological study of the proposed deviated road trace of Ruwanpura Expressway from Kiriella to Ratnapura and compiling 3-D models

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the accuracy of 1 cm, creating Digital Surface Model (3D model), Baseline video footage along the proposed expressway trace (along the axis of the trace), Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

RTK Drone survey along the proposed canal route (27 km) from Muruthawela Reservior to Chandrika wewa, Embilipitiya for Gin-Nilwala Diversion Project

Carrying out RTK Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the accuracy of 1 cm, creating Digital Surface Model (3D model), Baseline video footage along the area under study. Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

High Resolution RTK Drone survey along the proposed deviated road trace of Ruwanpura Expressway from Kiriella to Ratnapura and compiling 3-D models for proposed 2 Intersections at Kiriella

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model), Baseline video footage along the proposed expressway trace (along the axis of the trace), Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

Sample RTK Drone survey for a part of the 100 MW Solar Park in Siyambalanduwa and a section of 26 km long transmission line from Siyambalanduwa to Moneragala and to compose a knowledge product

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model), Baseline video footage of the proposed land, Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

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Composing a promotional video clip using Drone survey for a part of the 100 MW Solar Park in Siyambalanduwa, Solar park in Hambantota and a section of 26 km long transmission line

Carrying out Drone Survey and obtain video clips using drones with the resolution of 10 cm or less, creating a promotional video indicating different landuse types and topography.

RTK Drone survey for Lanka Mineral Sands Corporation to estimate the volume of mineral sands

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) for creating Digital Surface Model (3D model), along the stockpiles of mineral sands and create Contour dataset with 1 m interval derived from the 3D model and precisely estimate the volume of mineral sands including Ilmenite, Rutile, zircon etc.

RTK Drone survey along the proposed road trace of Central Expressway (Potuhera to Galagedera)

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model), Baseline video footage along the proposed expressway trace (along the axis of the trace) and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

RTK Drone survey along the proposed road trace of Ruwanpura Expressway

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model), Baseline video footage along the proposed expressway trace (along the axis of the trace), Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area

RTK Drone survey to identify the most suitable lands for Solar Power Projects in Kilinochchi District

Carrying out Drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model), Baseline video footage of the proposed land, Digitize features in the orthomosaic to get the information of count of buildings, existing roads and areas of the different landuse types in the buffer zone, and create Contour dataset with 1 m interval derived from the 3D model in the buffer area. Three land plots each with 500 acres were selected as suitable lands for 10 MW solar parks

Compilation of a Spatial Database (for proposed roads, bridges and registered contractors) for Road Development Authority (RDA)

Coordination and supervision of Developing a spatial database for proposed roads and bridges, to show the progress of the construction of proposed 100,000 km roads, and the spatial database of the RDA-registered contractors

Geological and Geotechnical investigations for the EIA study for the proposed Kandy Highway Tunnel from Heeressagala to Thannekumbura for Road Development Authority (RDA)

Review all available geological and structural data of the previous studies, carryout additional study and Interpretation of aerial photos and satellite imagery etc. together with information to be obtained from high resolution drone survey, Reviewing the landslide hazard map of NBRO (1;50,000 and 1:10,000), Review geotechnical properties of rock (and soil); General characteristics of the rock mass along the tunnel route and its surroundings, core drilling investigations on groundwater levels and correlate with geological profiles. Establish the potential locations for water ingresses, to the tunnel to enable evaluation of the effectiveness of remedial and mitigation measures etc

Geological and Geotechnical Investigations for Gin-Nilwala Diversion Project

Core drilling, geotechnical investigations for construction of 32 km long tunnel sections and dam foundations

High Resolution drone Survey and Engineering geological, hydrogeological, and geotechnical investigations Gin-Nilwala Diversion Project

Carryout High Resolution drone Survey (using survey level accurate RTK drone) and obtain Orthomosaics using the survey grade drones (RTK) with the resolution of 10 cm or less, creating Digital Surface Model (3D model). Engineering geological, hydrogeological, and geotechnical investigations for construction of 32 km long tunnel sections and dam foundations

GIS Mapping of Water Sources in Matale, Nuwara Eliya & Moneragala Districts

GIS mapping of drinking water sources in Matale, Nuwara Eliya & Monaragala Districts conducted as a phase of the

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'Assisting Communities in Creating Environment and Nutritional Development' (ACCEND) project, which is funded by European Union (EU).

Geotechnical Investigation and Designing Mitigation Measures for the Landslide at Victoria Power Station

Slope Stability investigation and design of remedial measures and monitoring

Geological, Engineering Geological, Hydrogeological and Structural Mapping for Main Dam Foundation, Saddle Dam Foundation, Reservoir and Geotechnical investigations of 6 km long proposed tunnel trace, Quarry site, 7 km long proposed canal trace of Kaluganga Moragahakanda Multipurpose development Project

Carryout Geological, engineering geological and structural mapping for entire reservoir area, main dam and saddle dam foundations, 6 km long proposed tunnel trace, 7 km long cannel trace, quarry site and compiling maps and profiles, Compilation of Report.

Engineering Geological, Geological, Hydrogeological and Structural Mapping for alternative 9 km long proposed tunnel trace of Kaluganga Moragahakanda Multipurpose development Project and geophysical investigations (electrical resistivity) for shallow sections tunnel trace.

Carryout Geological, engineering geological and structural mapping for 9 km long proposed alternative tunnel trace, 2-D and 1-D electrical resistivity survey along shallow sections of the tunnel and compiling maps and profiles, Compilation of Report

Engineering Geological, Geological, Hydrogeological and Structural Mapping along proposed 1 km long tunnel trace of North Western Province Canal Project and geophysical investigations (electrical resistivity) for shallow sections tunnel trace.

Carryout Geological, engineering geological and structural mapping for 1 km long proposed tunnel trace, 2-D and 1-D electrical resistivity survey along shallow sections of the tunnel and compiling maps and profiles, Compilation of Report.

EIA of Rwimi Hydropower Project, Kasese, Uganda

30 m high concrete gravity dam, 3 km long cannel and penstock line and power house Position: Team Leader/ Engineering geological and Hydrogeological Consultant Role: Preliminary geotechnical investigation for dam foundation, grout curtain, power house and canal trace of Rwimi Hydropower Project, Kasese, Uganda

Geotechnical study for Rwimi Hydropower Project, Kasese, Uganda

Geological and geotechnical aspects for dam foundation, power house and canal trace of Rwimi Hydropower Project, Kasese, Uganda

Geological investigations for Thalpitigala (Lower Uma Oya) Hydropower – Irrigation Project

Engineering Geological, Hydrogeological, and Geotechnical investigations for construction of Thalpitigala (Lower Uma Oya) Hydropower – Irrigation Project 1 km long tunnel section.

Engineering Geological Study and Drone survey along Upper Elahera Canal (Tunnel) Project

Reviewing hydrogeological, geological and geotechnical aspects of the proposed 26 km long tunnel sections (Tunnels 3 & 4) of the Upper Elahera Canal Project, drone survey along critical sections of the proposed tunnel trace, field investigation to identify potential environmental problems, writing review report

Engineering geological, hydrogeological, and geotechnical investigations for major water ingress problem of Uma Oya Multipurpose Development Project

Engineering geological, hydrogeological, and geotechnical investigations for major water ingress problem in the construction of 15.2 km long headrace tunnel and 3.5 km ling Link tunnels of Uma Oya Multipurpose Development Project, drone survey along critical sections of the tunnel trace, Monitoring groundwater level variation and proposing mitigation measures to control the tunnel water leakage problem, predicting the subsurface geological and hydrogeological conditions.

Comprehensive Geological and Geotechnical study of Uma Oya Multipurpose Development

Carry out Engineering geological, hydrogeological, and geotechnical investigations for major water ingress problem in the construction of 15.2 km long headrace tunnel and recommending most suitable mitigation measures

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Greater Kandy Strategic City Development Project using drone survey

Building survey for Kandy city including a high resolution drone survey and compilation of building database for Kandy CBD using drone survey

Greater Kandy Strategic City Development Project

Drone survey for Kandy city obtaining high resolution drone images and compilation of streetscapes for entire road sections within Kandy CBD.

Geological and Engineering geological study for the EIA of Kurunegala - Habarana Proposed new Railway Line Extension Project

Conducting geological and hydrogeological study for EIA of Kurunegala - Habarana proposed new railway line extension project including three tunnel sections

Geological and Engineering geological study for the EIA of Horana Rathnapura Pelmadulla Proposed Expressway project

Conducting geological and hydrogeological study for EIA of Horana Rathnapura Pelmadulla Proposed Expressway project.

Geological and Engineering geological study for NWCP Cannel Project

Geological, engineering geological, hydrogeological and structural mapping of 1 km tunnel trace

Feasibility Study on Environmental and Social Conditions of 11 Sites for Pumped Storage Power Plants (Environmental Studies 1 and 2)

Study geological and hydrogeological feasibility for constructions of reservoirs, tunnel routes and power houses at 11 proposed locations and select the best 2 alternative sites and the detailed study

Engineering geological study for landslides within Upper Kothmale Hydro Power Project

Slope stability investigations, Field mapping for landslide prone areas in the reservoir periphery and along the proposed tunnel trace, Compilation of landslide hazard zonation map, propose mitigation measures for potential slope instabilities

Investigation of leakage problems of Norton Bridge reservoir

investigation of the water leakage at the Right Bank downstream of Nortonbridge Dam, identification of the source and proposing mitigation measures to control the leakage

Investigation of leakage problems of New Laxapana tunnel

Investigation of the tunnel for possible leakage locations, carry out dye tests and propose suitable mitigation measures

Investigation of leakage problems of Maussakele reservoir

Investigation of the dam sections for possible leakage locations and propose suitable mitigation measures

Environmental study at Koladeniya Mini hydro power project

Investigation of environmental conditions and proposing mitigation measures to control environmental impacts of the total project area and the surrounding

Environmental study at Ross Mini hydro power project

Investigation of environmental conditions and proposing mitigation measures to control environmental impacts of the total project area and the surrounding

Development of Metadata Web Portal

Leading the Design Team of the web Portal, Training staff of the stakeholder Institutions, Collection and formulation of database

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Compilation of digital maps and drone images for proposed elephant corridors between existing wildlife sanctuaries and other Protected Wildlife Regions

Drone imaging, design and compilation of elephant corridors and formulation of database of the landuse including buildings and roads

Feasibility study of the proposed highway from Badulla to Kandy (Geological Hydrogeological and Geotechnical study)

Design the road trace using maps and satellite images, carryout feasibility study for construction of 2-lane road through existing plantation areas, settlement areas, and forest areas. Compilation of geological and geomorphological maps and profiles to identify the most suitable trace for a highway.

EIA of the proposed highway from Badulla to Kandy

Leading the EIA team, writing reports, carry out geological and engineering geological study, and making presentations to CEA

Additional Geotechnical study on Quarry sites, campsites and other utility sites for the EIA Report on Moragolla Hydropower Project

Leading the EIA team, writing reports, carry out geological and engineering geological study

Geological and Geotechnical Investigations for the WindPark Areas in Mannar Island

Supervise field and laboratory investigations, Writing and editing report

Investigation for the locations and depths of the buried Gas pipe lines at Kerawalapitiya

Carryout GPR survey to identify the locations of existing buried pipeline to avoid damages by newly constructed offshore pipeline to unload diesel for Kerawalapitiya Diesel Thermal Power Plant

Geotechnical Investigation for Major Water Supply Project at Nuwara Eliya – Talawakele

Carryout engineering geological study to identify the foundation conditions of the proposed weir sites, storage tanks and pipelines

Geotechnical Investigation for Dam, Reservoir and Treatment plant at Mul Oya for Major water Supply Project for Rikillagaskada - Hanguranketha

Carryout engineering geological study to identify the foundation conditions of the proposed Dam site, Design of grout curtain for the dam, investigation of the foundations for Treatment plant, storage tanks and pipelines.

Geological Hydrogeolocal and Geotechnical Investigation for Reservoir Leakage Problem of Samanalawewa Hydro Power Project

Engineering geological investigations to identify the source of leakage, right bank ground conditions and identify the most suitable mitigation measures.

Geotechnical Site Investigation of the Sports Complex at Digana, Kandy

Engineering geological investigations to identify the foundation conditions for the construction sites

Remote sensing study on the spreading patterns of coconut leaf wilt disease in southern area of Sri Lanka

Consulting the CRI staff of the investigation of the coconut leaf wilt disease, Remote Sensing investigations to identify the affected coconut cultivations and interpret the affected areas by satellite images.

User Satisfaction Survey – Dambulla to Trincomalee Highway, Sri Lanka

Consulting the Enumerator teams and coordination the questionnaire survey

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Key Publications

Nothing to show under this subheading !!!

Conferences

Disaster Resilience Leadership (DRL) Forum - Sri Lanka; for Disaster Resilient Leadership Development

HELD AT : University of Peradeniya, Bangkok, Thailand - (13th July, 2013, 13 – 17 May 2013,)
TOPIC : *Disaster Resilience Leadership*

124 six-day residential Short Courses in "GIS and Applications"

HELD AT : conducted at PGIS, University of Peradeniya - (2004 - 2021)
TOPIC : *GIS and Applications*

UNDP Training Program on "Data Management"

HELD AT : University of Peradeniya - (2017 , 2017 , 2018)
TOPIC : *Data Management*

SAARC Training Program in "Urban Risk Management

HELD AT : at the PGIS, University of Peradeniya. - (October 30 – November 3, 2012)
TOPIC : *Urban Risk Management*

Workshop on "Incorporating Community Voices Into Research-Led Policy Making For Disaster, Disaster Preparedness, Climate Change And Development"

HELD AT : The Post-Graduate Institute of Science (PGIS) - (February 27, 2017)
TOPIC : *Incorporating Community Voices Into Research-Led Policy Making For Disaster, Disaster Preparedness, Climate Change And Development*

My Publications

Please goto the website.

https://sci.pdn.ac.lk/geology/staff/Jagath-Gunatilake

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