



**GOVERNMENT OF KARNATAKA**  
**VISION GROUP ON SCIENCE AND TECHNOLOGY**  
Karnataka Science and Technology Promotion Society  
Department of Electronics, Information Technology, Biotechnology and  
Science & Technology

Application No. **VRN/000479/22-23**

**A. GENERAL INFORMATION**

1	Scheme Applied (GRE, K-FIST L1 & L2 and ECRA)	GRE : Grants for Research Excellence
2	About the project	
a)	Title of the project	Slope Vulnerability Assessment and Landslide Mitigation of Kodagu District
b)	Subject area as per instruction (Please refer serial No.26 under Annexure-II)	Civil Engineering
	Subject category area	GIS/GPS

3	Details of Principal Investigator	
a)	Name	Dr. AREKAL VIJAY
b)	Date of Birth & Gender (Age as on 55 )	23/03/1968 ( Male )
c)	Highest Qualified Degree	Ph.D. degree in Science, Mathematics and Engineering
d)	Designation	Professor
e)	Department	Civil Engineering
f)	Years of teaching/research experience	Teaching : 14.00 ; Research : 10.00
g)	Email ID	arekalvijay@gmail.com
h)	Alternate Email ID	arekal.vijay@kssem.edu.in
i)	Cell Number / Alternate Cell Number	9663590628 /
j)	Residential Address	115, 4th Mian, 3rd Cross, JHBCS Layout, Gubbalala, Bengaluru 560061
k)	Ph.D Degree holder	Yes

4	Details of Co-Principal Investigator	
a)	Name	Mr. Shashi Prasad N
b)	Date of Birth & Gender (Age as on 30/10/2019)	25/05/1991 , Male
c)	Highest Qualified Degree	M.Tech. in Engineering with at least 5 years of Experience
d)	Designation	Assistant Professor
e)	Department	Civil Engineering
f)	Institution Name	K S School of Engineering and Management
g)	Years of teaching/research experience	Teaching : 5.00 ; Research : 3.00
h)	Email ID	shashiprasad@kssem.edu.in
i)	Alternate Email ID	shashiprasad700@gmail.com
j)	Cell Number / Alternate Cell No	9632081005 / 8618697237
k)	Residential Address	302, Sai Nilayam, 3rd Floor, Sri Krishna Residency, 14th Main, JP Nagar 7th Phase, Bengaluru 560078

5	Details of the Head of the Department	
a)	Name of the Head of the Department	Dr Vijayalakshmi Akella
b)	Email ID	hod.civil@kssem.edu.in
c)	Cell Number	9845399062

6	Details of the Institution of PI	
a)	Name of the College/Institution with address	K.S. SCHOOL OF ENGINEERING AND MANAGEMENT Address : #15/1, MALLASANDRA, OFF KANAKAPURA ROAD , BENGALURU , Bangalore North , Bangalore - 560063
b)	Type of the Institution (as per the instruction in SI.No.29)	Private Institution
c)	Accredited year by NAAC/NBA	1
d)	Name of the Head of the Institution	Dr K Rama Narasimha
e)	Designation of the Head of the Institution	Principal
f)	Phone Number (Landline) and college website	080-28425012 Website : www.kssem.edu.in
g)	Cell Number	9900633688
h)	Email ID	principal@kssem.edu.in

i)	Student strength		
Sno.	Department	UG	PG
1	Civil Engineering	126	10
2	Computer Science and Engineering	501	0
3	Electronics and Communication Engineering	350	0
4	Mechanical Engineering	100	0
5	Electrical and Electronics Engineering	30	0
6	Artificial Intelligence and Data Sciences	61	0
7	MBA	0	98
Total		1168	108

	Whether the project involves collaboration with research institution / industry? If yes , please enclose a letter to this effect	No
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7	If your proposal is selected,	
a)	Cheque/DD to be written in favour of	K S School of Engineering and Management

8	If, amount to be credited to your bank	
a)	Name of the Account holder	K S School of Engineering and Management
b)	Name of the Bank	Axis Bank
c)	IFS Code	UTIB0001513
d)	SB A/c Number	911010055761116
e)	Address of the Bank	75/A,, 100 Feet Ring Road, 6th Phase, J P Nagar, Bengaluru 560078

9	Details of VGST/ Other Grants	
a)	Received by Department in last 5 Years	
i)	Project Sanctioned to the Dept. from VGST in the last 5 years	Dynamic Analysis and Retrofitting of Heritage Buildings in South India, Sanctioned Amount Rs8.47 Lakhs, VGST KFist L1
ii)	Project Sanctioned to the Dept. from Other Agencies in the last 5 years	Analysis of Ground Water Potential Zones Using Electrical RESistivity Remote Sensing and GIS Techniques in Bidadi Industrial Area, Ramanagar Taluk, Karnataka, Sanction by VTU, Amount Rs 1.5 Lakhs,
b)	Received by PI in last 5 years	
i)	Project Sanctioned to the PI from VGST in the last 5 years	
ii)	Project Sanctioned to the PI from Other Agencies in the last 5 years	
c)	Received by Co-PI in last 5 Years	
i)	Project Sanctioned to the Co-PI from VGST in the last 5 years	
ii)	Project Sanctioned to the Co-PI from Other Agencies in the last 5 years	



- a) We are aware of all instructions and directions indicated in Guidelines, Terms and Conditions (GTC) present in GRD – Book of VGST.
- b) We undertake to utilize the VGST grant by strictly adhering to the GTC of VGST.
- c) We undertake the responsibility of purchasing/procuring the equipment only within the VGST approved cost/price.
- d) If we purchase the equipment more than the VGST approved cost the college management will meet the extra cost.
- e) In case of transfer/ retirement/ deputation/ termination/ change of work place from this Grantee Institution, we shall obtain NOC from VGST office by suggesting another responsible & suitable faculty member as PI who belongs to the grantee Dept. of this College/ Institution.
- f) We will procure the equipment within the allowed cost as approved by VGST in the Budget Estimate (PART - A of GRD).
- g) We will not procure any equipment which is not approved by VGST. If such procurement of Equipment/Item is made without the VGST's approval, the College Management/ Grantee Institution will bear the cost of the equipment/Item.
- h) While procuring the equipment, Purchase Committee will follow the procurement procedure as per the KTPP Act 1999 & 2000.
- i) We will obtain the VGST approval of the Budget Estimate (both Non-recurring & Recurring) indicated in PART-A of GRD only once in a Financial Year (FY) & we will not submit for the revised Budget Estimate. We will submit to VGST all the necessary Purchase documents (PART-B) within the 4 months period from the date of issue of grant. We will submit the quarterly progress report and consolidated report at the end of the project.
- j) We hereby declare that the details furnished above are true to the best of our knowledge
- k) We understand that any misinformation furnished by us will lead to the rejection of the application.



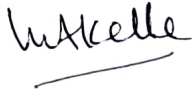
( Dr. AREKAL VIJAY )

  
Signature of the  
Principal Investigator



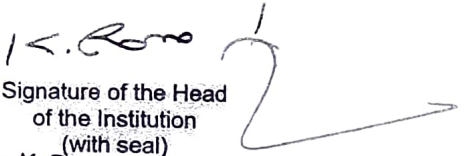
( Mr. Shashi Prasad N )

  
Signature of Co-  
Principal Investigator



Signature of Head of  
the Department  
(with seal)  
Professor & Head

Dept. of Civil Engineering  
K.S. Group of Institutions  
K.S. School of Engineering & Management  
Bangalore-560 062.



Signature of the Head  
of the Institution  
(with seal)  
**Dr. K. RAMA NARASIMHA**  
Principal/Director  
K S School of Engineering and Management  
Bengaluru - 560 109

**Attached documents**

S No.	Document Name	File Name	Document Description
1	Experience Certificate (For MTech)	Experience Certificate.pdf	Experience Certificate
2	Others	List of Publications Arekal Vijay.pdf	List of Publications of PI
3	PAN Card Copy	PAN.pdf	PAN copy of Institution
4	Highest Qualified Degree Certificate	PhD.pdf	PhD Certificate
5	Others	Resume Arekal Vijay.pdf	Resume of PI

## B. DETAILS OF THE PROJECT PROPOSAL

1. Title of the Project Proposal	Landslide Vulnerability Assessment and Mitigation Measures for Kodagu District, Karnataka
2. Project Keywords	disaster, landslide, mitigation,
3. Objectives of the proposal (Not more than six points)	<ol style="list-style-type: none"> <li>1. To study the topographical conditions of the study area</li> <li>2. To collect historical data on landslide and rainfall of the study area</li> <li>3. To assess the landslide vulnerability by GIS method.</li> <li>4. To investigate the geotechnical properties of the area</li> <li>5. To validate the GIS assessment by geotechnical analysis</li> <li>6. Recommend suitable measures to prevent landslides</li> </ol>
4. Background of the project	<p>During year the 2018, Kodagu district was hit by landslides at various locations after heavy rainfall. Such massive landslides were unprecedented. Although, the Kodagu district have been identified as landslide prone area, risk assessment was not carried out after these landslides. Risk pattern will change with time. Also policy makers and regulatory agencies are required reassess the situation and revise the existing regulations.</p>
5. Methodology (Graphs, designs, charts, may be attached as a separate file in the list of attachments by selecting Document Type 'Others')	<p>Objective 1: Topo sheets will be obtained to get the information regarding terrain details.</p> <p>Objective 2: Historical data on landslide and rainfall data will also be obtained and correlated</p> <p>Objective 3: Weighted linear combination (WLC) method will be used to assess landslide vulnerability. The parameters required for WLC method are slope angle, elevation, rainfall, vegetation cover, land use/land cover, proximity to roads, proximity to rivers and proximity to lineaments. WLC method can be adopted from the following procedures:</p> <p>i. the weight of each parameter considered is added by means of overlay as in the following equation</p> $S = \sum W_i X_i$ <p>where S is the susceptibility, W<sub>i</sub> denotes weight of factor and X<sub>i</sub> is the criterion score of factor.</p> <p>The different factors are combined by adding their weight to obtain the final output.</p> <p>Objective 4: Site visit/Lab tests to obtain Geotechnical properties of the soil</p> <p>Objective 5: Geotechnical analysis will be carried to assess slope vulnerability. For this, limit equilibrium method will be adopted</p> <p>Objective 6: After the satisfactory validation process, suitable recommendations will be made to prevent/mitigate landslide. (Retaining walls, vegetation, drainages, stone pitching, etc).</p>
6. Milestones with time schedule & work plan	<ol style="list-style-type: none"> <li>1) Data collection (topo sheets, landslide, rainfall) - 3 months</li> <li>2) GIS analysis - 3 months</li> <li>3) Geotechnical investigation - 3 months</li> <li>4) Geotechnical analysis - 3 months</li> <li>5) Recommend measures to mitigate landslide - 6 months</li> </ol> <p>Total 24 months</p>
7. List of equipment available in your Institute/College for the project implementation	<ol style="list-style-type: none"> <li>1) Consistency limit apparatus</li> <li>2) Permeability apparatus</li> <li>3) UCC test apparatus</li> <li>4) Direct shear test apparatus</li> <li>5) Triaxial shear test apparatus</li> </ol>
8. List of equipment required for 1st instalment & 2nd instalment for Project Implementation	<ol style="list-style-type: none"> <li>1) ArcGIS software: Rs 9,97,899</li> <li>2) GPS instruments: Rs 64,510</li> </ol>



	<p>1) Landslides are becoming frequent incidents in Kodagu district particularly during rainy season. It is high time that the reassessment of the slope stability is carried out to mitigate the loss.</p> <p>2) Landslide hazard zonation maps have been developed by National Remote sensing centre in association with other government agencies and universities. However, vulnerable areas should be critically assessed by experts at local level.</p> <p>3) Recently Landslides have occurred even when there were no construction activities in hilly areas. It is critical to carryout vulnerability assessment of the slope stability and recommend mitigation measures.</p> <p>4) Being a relatively new act, Disaster Management Act (2005) is yet to sink in at the district and local bodies level. The need of the hour is to sensitize administrators at gross root levels particularly, civil servants and engineers.</p> <p>5) The existing regulations on stability of slopes are general in nature. This study may assist in framing the new regulations/guidelines and also assist in approval process for development works on hill slopes.</p>
10. Novelty/Uniqueness of the project	The study is focused on area specific of Kodagu District and Landslide risk specific. Post landslides studies have not been carried out in this area which are critical for policy making and framing regulations.
11. Whether this project leads to innovations and patents, if yes explain	At this point of time there is no foreseeable patent. The focus of this study is on landslide mitigation.
12. Whether this project leads to a Startup, if yes explain	No
13. Whether this project leads to cost effective Technology, if yes explain	No
14. Highlight reasons in FIVE sentences or less, what is special, unique or novel in your project that makes it an attractive proposition	<p>1) Unlike, earthquake induced landslides in Northern India, landslides in Karnataka are water induced. Landslides have occurred even when there were no construction activities in the proposed study area.</p> <p>2) Recently no such studies have been carried out in this area. Landslide risks may vary with time. Risk assessment on slope stability needs to be carried out by experts particularly at vulnerable areas.</p> <p>3) Running streams, ponding of water, soil erosion, steep slopes have to be identified and corrective measures like proper drainage facility, reforestation etc have to be implemented.</p> <p>4) Piping or internal erosion of soil due to drainage is one of the critical factors that contribute to the initiation of landslide. Hence proper drainage could prevent most of the landslides.</p> <p>5) The proposed study includes risk landslide risk assessment, its validation and mitigation measures.</p>
15. Deliverables of the project (Precise and in bullet form)	<p>1) This study provides a logical approach for landside mitigation and slope stabilization based on GIS and geotechnical analysis.</p> <p>2) The major users of this research and final deliverables are local municipal and other engineers</p>
16. Please state willingness of your Institute to give partial financial support to this proposal. If yes, state percentage of the total cost that will be supported by your Institute. Include a signed letter from the head of the institute assuring the said support	The institute will provide infrastructure facilities like, testing facility, computing facility and library facilities.
Information about Principal Investigator, Research track record, Innovation in the proposed work	
a) List of Publications (For the last 5 years with DoI Numbers) i) Journal Publications listed @ SCImago Journal Rank. (Rating - Q1 OR Q2 OR Q3 OR Q4). Specify rating by referring the website: <a href="https://www.scimagojr.com/journalsearch.php">https://www.scimagojr.com/journalsearch.php</a>	
ii) Journal publications -Not listed in SCImago Journal rating rank	
	<p>1. Arekal Vijay, Vijayalakshmi Akella, P R Bhanu Murthy (2021) "Numerical Validation of Experimental Results for Bearing Capacity of Internal Inclined Skirted Footings on c-f Soil". Journal of Construction Management, Vol. XXXVI, No II, ISSN 0970-3675, pp 5-12.</p>

	2.
ii) Conference Presentations	
	1. Arekal Vijay, Gunasheela P, Vijayalakshmi Akella, Raghuprasad B K "Disaster Risk Reduction Policies and its implementation in India - A Review" Two Day International Conference on Sustainable Infrastructure: Innovation, Opportunities and Challenges, NITK, Surathal Apr 20, 2023
	2. Arekal Vijay, Vijayalakshmi Akella, Bhanu Murthy P R "Experimental Studies on Bearing Capacity of Inclined Skirted Footing on c-F soil" Seventh International Joint Conference on Advances in Engineering and Technology - AET 2016, New Delhi, 16-17 Dec 2016, 1-7.
	3. Arekal Vijay, Vijayalakshmi Akella, Bhanu Murthy P R, "Experimental Studies on Bearing Capacity of Skirted Footings On C-F Soils" . Second International Conference on Recent Advances in Engineering Sciences, MS Ramaiah Institute of Technology, Bangalore, 8-9 Sept 2016, 5-9.
iv) Google Impact factor of journal	
b) Patent (s) filed/granted with details	
c) Give details of commercialization status for the granted patents	
d) Books published/chapter contributed with details	Arekal Vijay, Vijayalakshmi Akella, B K Raghu Prasad (2020) "Experimental Studies and Numerical Validation on Bearing Capacity of Skirted Footings on c-F Soils", "Advances in Structures, Systems and Materials. Springer, Singapore, ISBN 978-981-15-3254-2, pp 85-98.
e) Industrial consultation (given/undertaken) provide details (past 5 years)	
f) Other details if any You may state willingness of your institute to financially support this proposal. If yes, what percentage of the cost will be supported by your institute. Include a signed letter from the head of the institute reflecting the same.	
g) Highlight reasons in FIVE sentences, why your project must be chosen over many other proposals received by VGST?	<input type="checkbox"/> The existing regulations on stability of slopes are general in nature. Experts needs to be involved in framing the new regulations/guidelines and also in approval process for development works on hill slopes <input type="checkbox"/> Risk assessment on slope stability needs to be carried out by experts particularly at vulnerable areas. <input type="checkbox"/> Currently, most part of the hilly region comes under the jurisdiction of State Forest Departments. Forest officials are trained for forest development. Recently Landslides have occurred even when there were no construction activities in these areas. <input type="checkbox"/> Landslide hazard zonation maps have been developed by National Remote sensing centre in association with other government agencies and universities. However, vulnerable areas should be critically assessed by experts at local level
h) Have you tested your concept/innovation? If yes indicate supporting results that makes you to believe in the succusses of the proposal	There are established Geotechnical methods to analyse slope stability, of hills. GIS methods can be adopted to support/validate other methods
Information about Co-Principal Investigator, Research track record, Innovation in the proposed work	
a) List of Publications (For the last 5 years with DoI Numbers) i) Journal Publications listed @ SCImago Journal Rank (Rating . Q1 OR Q2 OR Q3 OR Q4). Specify rating by referring the website: <a href="https://www.scimagojr.com/journalsearch.php">https://www.scimagojr.com/journalsearch.php</a>	
ii) Journal publications -Not listed in SCImago Journal rating rank	
	Naveen J, Shashi Prasad N, Vijayalakshmi Akella, " Seismic Analysis of Multi-Storied Building with Shear Walls at different locations " Journal for Recent Advances in Built Environment, Vol 3, Jan 2023

iii) Conference Presentations	
iv) Google Impact factor of journal	
b) Patent (s) filed/granted with details	
c) Give details of commercialization status for the granted patents	
d) Books published/chapter contributed with details	
e) Industrial consultation (given/undertaken) provide details (past 5 years)	
Details Of Industrial Collaboration	

**Signature of PI and Co-PI**

**Signature from Industry/Collaborative Institute**

1)

2)



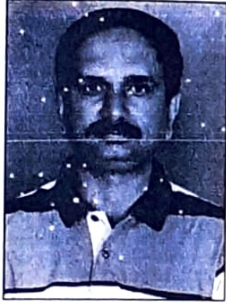
### C. UNDERTAKING FROM THE PRINCIPAL INVESTIGATOR AND CO-PRINCIPAL INVESTIGATOR

Project Title: Slope Vulnerability Assessment and Landslide Mitigation of Kodagu District  
VGST Name: GRE : Grants for Research Excellence

- 1) We have carefully read the terms and conditions of VGST Scheme and we agree to abide by them and complete the project by fulfilling all the formalities.
- 2) We have not submitted or obtained any financial support for this or a similar project proposal.
- 3) We shall ensure that the equipment shown in the project proposal which will be procured under this project are not available in our institution/college.
- 4) The equipment procured under VGST Scheme will be made available to other faculty and students, as needed by them.

#### Declaration

- 1) We hereby declare that the details furnished above are true to the best of our knowledge
- 2) We understand that any misinformation furnished by us will lead to the rejection of the application



( Dr. AREKAL VIJAY )

Name and Signature of  
the Principal  
Investigator



( Mr. Shashi Prasad N )

Name and Signature of  
Co-Principal  
Investigator

Date 08.05.2023

**PART-A Proforma**  
***(FIRST INSTALMENT)***

**GRANT RELATED DOCUMENT (GRD)**

(To be submitted by Principal Investigator to VGST for an Approval)

Name of VGST Scheme: <b>GRANT FOR RESEARCH EXCELLENCE (GRE)</b>		
GRD No:		
Title of the Project	Landslide Vulnerability Assessment and Mitigation Measures for Kodagu District, Karnataka	
	PI Details	Co-PI Details
Name	Dr Arekal Vijay	Shashi Prasad N
Phone Number	080-28425012	080-28425012
Mobile Number	9663590628	9632081005
Alternate Mobile number		8618697237
Email ID	arekalvijay@gmail.com	shashiprasad700@gmail.com
Alternate Email ID	arekal.vijay@kssem.edu.in	shashiprasad@kssem.edu.in
Department	Civil Engineering	Civil Engineering
Name and Address of the Head of the Institution (including Phone Nos. & Email)	Dr K Rama Narasimha Principal KS School of Engineering and Management 15, Mallasandra, off Kanakapura Road Bengaluru 560109 Phone: 080-28425012 Email: principal@kssem.edu.in	

GRANT FOR RESEARCH EXCELLENCE (GRE) Scheme

GRD No:

Phase/Year

Summary of Part-A

1 <sup>st</sup> year/phase (for GRE Scheme)			
List of Non-recurring Expenditure		Total Qty	Total Amount (Rs. in lakhs)
NRE1	ArcGIS software	1	9.98
NRE2	GPS instrument	1	0.65
NRE3			
Total Non-recurring (NRE)			10.63
List of Recurring Expenditure			Total Amount (Rs. in lakhs)
RE1	Human Resources/Manpower/Project Assistant Salary(25k/month)	12 months	3
RE2	Chemicals		
RE3	Glassware		
RE 4	Plasteware		
RE 5	Biological Specimen		
RE 6	Electrical & Electronics spare parts		
RE 7	Mechanical Spare parts		
RE 8	Contingency		0.4
RE 9	Books & Journals		0.1
Total Recurring (RE)			3.5
1 <sup>st</sup> PHASE TOTAL NON-RECURRING AND RECURRING			14.13



# TECHNICAL SPECIFICATION OF EQUIPMENT

(For Non-Recurring Expenditure only)

PROPOSED FOR 1<sup>st</sup> YEAR ONLY

Sl. No.	Name of Equipment & Accessories	Quantity	Details of Technical Specification as indicated/proposed in the e-procurement document
NRE 1	GIS Software, Indo Esri India GIS Academy Program (EIGAP) -	1	<p>ArcGIS Desktop Advanced (ArcGIS Pro and ArcMap) with 10 extensions 3D Analyst, Data Interoperability, Data Reviewer, Geostatistical Analyst, Network Analyst, Publisher, Schematics, Spatial Analyst, Tracking Analyst, Workflow Manager, ArcGIS Enterprise Advanced (ArcGIS Server &amp; Portal for ArcGIS) and extensions, Esri City Engine Advanced,</p> <p>Apps: ArcGIS Earth: Explorer for ArcGIS, Web Mapping Apps, Collector for ArcGIS, Survey123 for ArcGIS, Operations Dashboard for ArcGIS, Workforce for ArcGIS, ArcGIS Maps for Adobe Creative Cloud, ArcGIS Maps for Office, Esri Maps for SharePoint, Web AppBuilder for ArcGIS, Story Maps and Web App Templates, AppStudio for ArcGIS Basic, Business Analyst web and mobile apps, Community Analyst, GeoPlanner for ArcGIS, Insights for ArcGIS</p>
NRE 2	Garmin Handheld Gps Receiver	1	<p>Display : Color TFT touch Screen, dual orientation                      Inbuilt Memory : 3 GB                      External Memory: Yes                      Waypoints: 4000                      Routes: 200                      Tracks: 10,000 points, 200 saved tracks                      Electronic Compass: yes                      Barometric Altimeter: yes                      Camera : yes (5 megapixel with autofocus; digital zoom)                      Area Calculation : Yes                      High –Sensitivity Receiver : Yes</p>

## JUSTIFICATION FOR THE PURCHASE

(Applicable only for Non-Recurring Expenditure/ Equipment etc.)

Sl. No.	List of the Equipment/ Item (relevant to carry out the proposed project)	Justification for the Purchase (in brief)
NRE 1	GIS Software, Indo Esri India GIS Academy Program (EIGAP) -	<p>GIS software is required for slope stability analysis. Also it can be used for future projects to carry out studies on disaster risk management. The institute (KSSEM) is planning to establish itself as a disaster risk management centre and establish collaboration with National Institute of Disaster Management. (NIDM). This software is a proprietary product and it is an essential tool for GIS analysis.</p>
NRE 2	Garmin Handheld Gps Receiver	<p>This instrument is essential for obtaining field data such as location coordinates, altitude, area calculation etc.</p>

Institution/ Principal Investigator and Co-Principal Investigator shall abide by the following VGST Terms & Conditions:

- ❖ Procurement for items Rs. 1.00 lakh and above shall be made strictly through E-tendering process using GoK E-portal as per KTPP Act.
- ❖ To facilitate hassle free procurement of equipment by the Grantee Institution, VGST desires to be flexible by permitting "Package Approval" instead of "Item-wise Approval" in procurement procedure under non-Recurring grants. Yet, the total Non-Recurring Expenditure shall not exceed approved amount.
- ❖ Further change in the Budget Estimate (Both Non-Recurring & Recurring) will not be entertained.
- ❖ For purchase of Items less than Rs.1.00 lakh, minimum 3 quotations have to be taken and to be purchased from the lowest quote.
- ❖ The proposal/PART-A proforma shall include Technical Specification of the Equipment (TSE) and Justification of the Purchase (JPE). This supportive information is most essential for Non-Recurring Budget Estimate.
- ❖ Procurement procedure has to be initiated as per KTPP act only after obtaining VGST's approval for PART-A proforma.
- ❖ It is mandatory to submit the equipment list in this VGST format only. If it is submitted in any other format, it is not acceptable to the VGST.

1<sup>st</sup> INSTALMENT GRANT ALLOCATION FOR GRE SCHEME ONLY:

Sl.No.	Details	Total Amount (Rs.in lakhs)
1	Grant allocated for Non-recurring head	12.00
2	<b>Grant allocated for Recurring head</b>	
a)	Human resource @ Rs. 25,000 per month (25000 x 12months)	3.00
b)	Consumables, Chemicals, Contingency, Others	10.00
	<b>GRAND TOTAL FOR 1<sup>st</sup> INSTALMENT</b>	<b>25.00</b>

<p><i>K. Rama</i></p> <p>Signature of Principal/Head of Institution (With Seal)</p> <p><b>Dr. K. RAMA NARASIMHA</b> Principal/Director K S School of Engineering and Management Bengaluru - 560 109</p>	<p><i>CM</i></p> <p>Signature of Principal Investigator</p> <p><i>Shal P. N</i></p> <p>Signature of Co-PI</p>
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Date: 8/5/2023

Place: BENGALURU

**PART-A Proforma**  
**(SECOND INSTALMENT)**

**GRANT RELATED DOCUMENT (GRD)**

(To be submitted by Principal Investigator to VGST for an Approval)

Name of VGST Scheme: **GRANT FOR RESEARCH EXCELLENCE (GRE)**

GRD No:

Title of the Project

Landslide Vulnerability Assessment and Mitigation Measures for Kodagu District. Karnataka

PI Details

Co-PI Details

Name

Dr Arekal Vijay

Shashi Prasad N

Phone Number

080-28425012

080-28425012

Mobile Number

9663590628

9632081005

Alternate Mobile number

8618697237

Email ID

arekalvijay@gmail.com

shashiprasad700@gmail.com

Alternate Email ID

arekal.vijay@kssem.edu.in

shashiprasad@kssem.edu.in

Department

Civil Engineering

Civil Engineering

Name and Address of the Head of the Institution (including Phone Nos. & Email)

Dr K Rama Narasimha  
Principal  
KS School of Engineering and Management  
15, Mallasandra, off Kanakapura Road  
Bengaluru 560109  
Phone: 080-28425012  
Email: principal@kssem.edu.in



GRANT FOR RESEARCH EXCELLENCE (GRE) Scheme

GRD No:

Phase/Year

Summary of Part-A

2 <sup>nd</sup> year/phase ((for GRE Scheme)			
Sl. No.	List of Recurring Expenditure	Total Qty	Total Amount (Rs. in lakhs)
RE 1	Human Resources/Manpower/Project Assistant Salary(25k/month)	12 months	3
RE 2	Chemicals		
RE 3	Glassware		
RE 4	Plasticware		
RE 5	Biological Specimen		
RE 6	Electrical & Electronics spare parts		
RE 7	Mechanical Spare parts		
RE 8	Contingency		0.4
RE 9	Books & Journals		0.1
		Total Recurring (RE)	3.5
		2 <sup>nd</sup> PHASE TOTAL RECURRING	3.5

# TECHNICAL SPECIFICATION OF EQUIPMENT/ITEMS

(For Recurring Expenditure only)

PROPOSED FOR 2<sup>nd</sup> YEAR ONLY

Sl. No.	Name of Items & Accessories	Quantity	Details of Technical Specification
NRE 1			
NRE 2			
NRE 3			

## JUSTIFICATION FOR THE PURCHASE

(Recurring Expenditure)

Sl. No.	List of the Equipment/ Item (relevant to carry out the proposed project)	Justification for the Purchase (in brief)
NRE 1		
NRE 2		
NRE 3		

Institution/ Principal Investigator and Co- Principal Investigator shall abide by the following VGST Terms & Conditions:

- ❖ Procurement for items Rs. 1.00 lakh and above shall be made strictly through E-tendering process using GoK E-portal as per KTPP Act.
- ❖ To facilitate hassle free procurement of equipment by the Grantee Institution, VGST desires to be flexible by permitting "Package Approval" instead of "Item-wise Approval" in procurement procedure under non-Recurring grants. Yet, the total Non-Recurring Expenditure shall not exceed approved amount.
- ❖ Further change in the Budget Estimate (Both Non-Recurring & Recurring) will not be entertained.
- ❖ For purchase of Items less than Rs.1.00 lakh, minimum 3 quotations have to be taken and to be purchased from the lowest quote.
- ❖ The proposal/PART-A proforma shall include Technical Specification of the Equipment (TSE) and Justification of the Purchase (JPE). This supportive information is most essential for Non-Recurring Budget Estimate.
- ❖ Procurement procedure has to be initiated as per KTPP act only after obtaining VGST's approval for PART-A proforma.
- ❖ It is mandatory to submit the equipment list in this VGST format only. If it is submitted in any other format, it is not acceptable to the VGST.

**2<sup>nd</sup> INSTALMENT GRANT ALLOCATION FOR GRE SCHEME ONLY:**

Sl.No	Details	Amount (Rs.in lakhs)
1	<b>Grant allocated for Recurring head</b>	
a)	Human resource @ Rs. 25,000 per month	3.00
b	Consumables, Chemicals, Contingency, Others	12.00
	<b>GRAND TOTAL FOR 2<sup>nd</sup> INSTALMENT</b>	<b>15.00</b>

<p><i>K. Rama</i></p> <hr/> <p>Signature of Principal/Head of Institution (With Seal) <b>Dr. K. RAMA NARASIMHA</b> Principal/Director K S School of Engineering and Management Bengaluru - 560 109</p>	<p><i>[Signature]</i></p> <hr/> <p>Signature of Principal Investigator</p> <p><i>[Signature]</i></p> <hr/> <p>Signature of Co-PI</p>
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Date: 8/8/2023

Place: BENHALURU



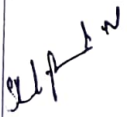
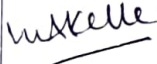



GRD No:

Scheme:

## PURCHASE COMMITTEE

(APPLICABLE FOR PROCURING ITEMS INDICATED UNDER NON-RECURRING & RECURRING EXPENDITURES OF VGST APPROVED BUDGET ESTIMATE)

Sl. No.	Designation	Name	Signature
1	Principal/Registrar/Dean/Director/Comptroller	Dr K Rama Narasimha	
2	Principal Investigator	Dr Arekal Vijay	
3	Co- Principal Investigator	Shashi Prasad N	
4	<b>Head of the Department(of the applied project)</b> (In case, if the PI is also functioning as HOD, HOD of any other Dept. can be the Member of Purchase Committee)	Dr Vijayalakshmi Akella	
5	<b>Manager/ Finance Officer/ Accounts Officer</b>	E Babu Naidu	
6	<b>Head of the Department</b> (Any other than grantee Dept.)		

- ❖ The Constitution/Structure of the Purchase Committee shall be as indicated above.
- ❖ The purchase committee undertakes the responsibility of procuring only those Equipment/ Items indicated in the "VGST approved Budget Estimate" (both Non-Recurring & Recurring) by strictly adhering to the Guidelines, Terms & Conditions of VGST(VGST-GTC).
- ❖ The decision, methodology in procurement of the items shall be recorded in the "Proceedings of the Purchase Committee" & shall obtain the signatures of all the members of the purchase committee.
- ❖ The Purchase Committee takes the complete responsibility in case of any anomaly/ violation is found in the procurement procedure.
- ❖ Any audit query regarding purchase procedure will be responded by the Purchase Committee.
- ❖ Change in the members in the Purchase Committee is allowed only if there are any changes in the person holding the respective designations. In such cases, grantee institution should take necessary action to revise the committee as soon as there is any such change, and shall intimate to VGST immediately.



KAMMAVARI SANGHAM (R), 1952  
**K.S. School of Engineering and Management**

Approved by AICTE-1-5279601, Affiliated to VTU, Belagavi

ACCREDITED BY NAAC

# 15, Near Vajarahalli, Mallasandra, off Kanakapura Road,  
Bengaluru - 560 109, www.kssem.edu.in

Fax : +91 80 28425164, Mob : 8884444408 / 9606055906

REF/KSSEM/CIV/041/2022-23

**ENDORSEMENT FROM HEAD OF THE COLLEGE/INSTITUTION**

**Project Title: Landslide Vulnerability Assessment and Mitigation Measures for Kodagu District, Karnataka**  
**VGST Scheme: GRE**

1. Certify that Dr. Arekal Viajy is the Principal Investigator and Mr. Shashi Prasad N is the Co-Principal Investigator for the project. In an unforeseen and legitimate event of discontinuation by the Principal Investigator, the Co-Principal Investigator will accept/take full responsibility for completion of the project. Any change in this effect will be endorsed by me and the same will be promptly communicated to the VGST.
2. Certify that the laboratory and administrative facility will be made available to the Investigators throughout the duration for the successful completion of the project.
3. The College/Institution will take the responsibility of all the financial and purchase procedures as per the prevailing Government norms within the allocated and approved budget.
4. The College/Institution shall provide timely statements of expenditure and utilization certificates of the funds received under this project/scheme in the prescribed format.

Date: 8/5/2023

  
Signature of the Head of the  
Institution

**Dr. K. RAMA NARASIMHA**  
Principal/Director  
K S School of Engineering and Management  
Bengaluru - 560 109



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REF/KSSEM/CIV/042/2022-23

**INSTITUTIONAL SUPPORT FROM PRIVATE INSTITUTIONS**

1	Name of the Scheme	GRE
2	Title of the project	Landslide Vulnerability Assessment and Mitigation Measures for Kodagu District, Karnataka
3	Name of the Principal Investigator	Dr Arekal Vijay
4	Name of the Co-Principal Investigator	Shashi Prasad N
5	Sponsorship amount from the institution (In Rs.)	Nil (The institute will provide infrastructure facilities like, testing facility, computing facility and library facilities.)
6	Percentage of sponsorship amount against total VGST grant by the institution	-

Signature of PI

Signature of Co-PI

Signature of the Head  
of the Institution

Date: 8/5/2023

**Dr. K. RAMA NARASIMHA**  
Principal/Director  
K S School of Engineering and Management  
Bengaluru - 560 109