Khaled Hasan
Professor
Department of Disaster Science and Management, University of Dhaka
Tel: 01716353330
Date of Birth – 31/12/1956
Email: **kdmhasans@gmail.com**

EDUCATION

- **PhD in Geology**, Texas A&M University, College Station, Texas, USA, 1995
- **MSc in Geology**, 1st Class 2nd, University of Dhaka, Bangladesh, 1984
- **BSc in Geology**, 1st Class 1st, University of Dhaka, Bangladesh, 1981
- **HSC and SSC**, 1st Division, Faujderhat Cadet College, Chittagong, Bangladesh, 1975 and 1973

WORK EXPERIENCES

a. Academic Appointments.

2019 - present	**Professor, Disaster Science and Management, University of Dhaka**
2014-2019	Adjunct Professor, Austin Community College, Austin, Texas
2015-2016	Adjunct Faculty, Northeast Lakeview College, Universal City, Texas
2013-2014	Research Scientist, Mississippi Mineral Resources Institute
2010-2013	Visiting Professor, Mississippi State University
2010-2012	Professor, Department of Geology, University of Dhaka, Bangladesh
2004-2010	Associate Professor, Department of Geology, University of Dhaka
2001-2004	Visiting Assistant Research Professor, University of Mississippi
1995-2004	Assistant Professor, Department of Geology, University of Dhaka,
1985-1995	**Lecturer, Department of Geology, University of Dhaka, Dhaka**

b. Consulting Appointments

- 2016-2017 – **Team leader** of the study to delineate potential areas for developing a greenbelt along Bangladesh coastal region to provide protection against the impacts of climate induced coastal hazards. The study is funded by World Bank to support Bangladesh Forest Department and executed by CEGIS.
- 2005-2006 – USAID funded **consultant** in Agricultural Reconstruction and Development in Iraq (ARDI) project, Erbil, Iraq. Training Iraqi govt. officials RS and GIS concepts and application in preparing landuse and Agro Ecological Zones (AEZ) maps for Iraq
- 1999 – 2000: **Coordinator,** Spatial Analysis Cluster, Environment and GIS Support Project (EGIS II), a project of the Ministry of Water Resources of Bangladesh, funded by The Netherlands. This organization has now become CEGIS (Center for Environment and GIS), a public trust think tank under the Ministry of Water Resources of Bangladesh.
- 1995-1999: Remote Sensing **Expert consultant** for EGIS II before taking over as the Cluster Coordinator responsibilities
- July 1997: Resource person of **European Space Agency (ESA)** at week-long training given to government officials of Vietnam on use of Synthetic Aperture Radar (SAR) in mitigating risks from flooding.

RESEARCH EXPERIENCE HIGHLIGHTS

- 2016-17: At CEGIS led a team of 20+ specialists including, ecologist, economist, botanist and geospatial analyst to define the hazard from cyclone and tidal surges along Bangladesh coast at union level. The work concluded with recommendation for location and width of coastal green belt, species selection and plantation plan, economic and social cost/benefit calculation and a phase wise implementation plan over 15 years.
- 2014: At Mississippi Mineral Resources Institute worked on landuse-landcover change along Mississippi Gulf Coast from 1940s to 2014 using aerial photographs and Landsat imagery.

Wrote proposals for research grants to NASA. NSF, USDoT to conduct research using RS and GIS.

- 2013: At Mississippi State University worked in a research project funded by NSF titled "Local to Global Scale Monitoring for a Sustainable Earth Dam and Levee System". It is a collaborative project led by Colorado School of Mines with partnership between Mississippi State University, University of Mississippi, and Technical University Delft (Netherlands). I was partly responsible to develop the RS-GIS component of the study. One of the component also was looking at the impact of climate change on the dam and levees.
- 2010-2012: At Mississippi State University completed research work to develop algorithm to screen vulnerable levee segments along Mississippi River using Radar imagery from both air and satellite borne platforms
- 2009: Site selection for Managed Artificial Recharge in saline aquifers of Southern Bangladesh using RS and GIS tools, funded by UNICEF
- 2009: Site selection for refugee camp in Southeast Bangladesh using RS/GIS funded by UNICEF and MSF (Medicines Sans Frontieres)
- 2008: Inventorying and mapping of Arsenic contaminated aquifers in Bangladesh using GIS, funded by JICA
- 2007: Prepared landuse map from IRS and ASTER imagery for UNOCAL Bangladesh to support their geophysical surveying plan in south Bangladesh
- 2006: Prepared a landuse map of Iraq using MODIS time series data of 2002-03 for the ARDI project funded by USAID
- 1995-2001: Work at EGIS II included
  - flood mapping using satellite borne radar data for Bangladesh and UNDP
  - Landuse-landcover mapping to support IEE and EIA studies of 3 major and several minor water resource management project funded and executed by donoragencies
  - Landuse zoning and developing SDSS to select the optimum use from competing land uses in the southwest Bangladesh; funded by UNDP
  - Mangrove species mapping using ASTER imagery
  - River planform and geomorphological studies using TM and ETM imagery
  - Crop map using MODIS imagery
- 1993-95: PhD research on mapping the extent and depth of floodwaters and damages caused by the December 1993 flood in Brazos River, Texas RS/GIS and hydrologic models.
- 1995-2004: Guiding several MS student research at Dhaka University and University of Mississippi using RS/GIS to study Geomorphology, Flood Mapping, Landslides, Lithologic Mapping, Arsenic Contamination of Groundwater, etc.

RS/GIS SOFTWARE

Expert user of ERDAS Imagine
Proficient user of ARCGIS Desktop and other ESRI products
Have limited experience with ENVI

AWARD

NASA funded Course Creation Fellow, Institute for Advanced Education in Geospatial Sciences, 2002: Selected via a nationwide open competition, developed short course on Spatial Decision Support System for online delivery.

PROJECT MANAGEMENT SKILLS

- **Team Leader** Greenbelt study; 2016-17, Led the 5 month study to design the greenbelt physical extent, plant selection and cost-benefit ratio. This is the first study of this nature in the world.
- **Coordinator, Spatial Analysis Cluster**, EGIS II, 1999-2000: All remote sensing and GIS work of EGIS II was dealt within this cluster. 13 personnel scientists and engineers worked under my supervision. The job description entailed overall project management responsibilities including:

Marketing and Developing new proposals, communication with clients, quality control of all projects, report writing, advising younger colleagues on methodology.

COURSES TAUGHT

- At University of Dhaka

Undergraduate - Historical Geology, Physical Geology, Invertebrate Paleontology (theory & lab), Remote sensing and GIS (theory & lab); Graduate- Advanced remote sensing, Geologic Hazards

- At University of Mississippi

Undergraduate – Introductory Remote sensing, Introductory GIS.; Graduate- Radar Remote Sensing, Hyperspectral Remote sensing, Spatial Decision Support System

- At Mississippi State University

Undergraduate – Survey of Earth Sciences, Maps and Remote Sensing, Survey of Geospatial techniques, Remote sensing of Physical Environments

- At Austin Community College and Northeast Lakeview College

Undergraduate –Physical Geology, Natural Hazards and Disasters, Introduction to Raster based GIS

PUBLICATIONS, PRESENTATION AND REPORTS

In Peer Reviewed Journals:

1. Haque, M. and Hasan, K., 1987, *Matamuhuri Delta and its Environmental Aspects,* **The Journal of NOAMI** (National Oceanographic And Maritime Institute), Vol. 4, No. 1, Dhaka, Bangladesh.
2. Hasan, K., 1995, *Overburden characterization as topsoil replacement at Jewett and other Texas lignite mines-texture and pH indicators*, **Environmental & Engineering Geosciences**, Vol. 1, No. 3, Fall 1995, pp. 327-340.
3. Hossain, A and Hasan, K., 1998: *Changing Trends in the Planform of the Jamuna River based on Width Analysis using the Digital Image Processing, GIS and Field Data*, **The Journal of NOAMI** Vol. 15, No.1.
4. Hossain, A. K. M. A., and Hasan, K., 1998, *Influence of bank materials on the planform evolution of the Jamuna river along the bridge site*, **The Journal of NOAMI**, Vol. 15., No. 2., pp 19-28.
5. Werle, Dirk, Martin, T. C. and Hasan, K., 2000, *Flood and Coastal Zone Monitoring in Bangladesh with RADARSAT ScanSAR -Technical Experience and Institutional Challenges*, **Johns Hopkins APL Technical Digest**, January-March 2000, Vol. 21, No. 1 The Johns Hopkins University Applied Physics Laboratory, Laurel. MD, USA.
6. Ali, K. M. and Hasan, K., 2002, *Rock Mass Characterization to Indicate Slope Instability at Bandarban, Bangladesh – A Rock Engineering Systems Approach.* **Environmental & Engineering Geosciences,** Vol. VIII, No. 8, May 2002, pp. 105-119.7.
7. Ingram, S. L., Easson, G., and Hasan, K., 2003, *Remote sensing techniques augments surface mapping in North Mississippi*, **Journal of the Mississippi Academy of Sciences,** Jan 1, 2003.
8. Hossain, A., Easson, G., and Hasan, K., 2006, *Detection of Levee Slides Using Commercially Available Remotely Sensed Data*, **Environmental and Engineering Geosciences**, Vol. 12, No. 3, August 2006, pp. 235-246.
9. Mia, B. M. and Hasan, K., (2008), *Monitoring Changes of Surface Water Distribution using Satellite imageries within the South-Central Bengal Delta, Bangladesh*, **The Journal of NOAMI**.
10. Bodruddoza Mia, M; Hasan, K. and Akhter, S.H**.**, 2010: *Landuse-Landcover Mapping using satellite image within gas exploration blocks 7, Bangladesh.* **The Dhaka University Journal of Earth and Environmental Sciences**, Faculty of Earth and Environmental Sciences, University of Dhaka, Vol. 1.
11. Jung, H.C., Hamski, J., Durand, M., Alsdorf, D., Hossain, F., Lee, H., Hossain, A.K.M.A., Hasan, K., Khan, A.S., and Hoque, A.K.M.Z., 2010, *Characterization of complex fluvial systems using remote sensing of spatial and temporal water level variations in the Amazon, Congo and Brahmaputra Rivers.* **Earth surface processes and landforms**, John Wiley and Sons.
12. Hasan, K., Aanstoos, J., and Mahrooghy, M., 2013, Stressed vegetation identification by SAR time-series as an indicator of slope instability Mississippi River levee segments, **Proc. 42th IEEE Applied**

Imagery Pattern Recognition Workshop. Washington, DC: IEEE 2013

13. Sehat, S., Vahedifard, R., Aanstoos, J.,Dabbiru, L., and Hasan, K., 2014, _Using in situ soil measurements for analysis of a polarimetric SAR-based classification of levee slump slides in the Lower Mississippi River_, **Engineering Geology**, Elsevier, Vol 181, pp a57-168.

14. Mahrooghy, M., Aanstoos, J., Nobrega, R. A., Hasan, K., and Younan, N. H., 2016, _A neural network approach to soil electrical conductivity estimation on earthen levationees using spaceborne X-band SAR imagery_, **Photogrammetric Engineering & Remote Sensing**, ASPRS, Vol 82, no. 7, pp 507-519.

15. Mahmood, T. H., Hasan, K., and Akhter, S. H., 2018, _Lithologic mapping of a forested montane terrain from Landsat 5 TM image_, **Geocarto International**, DOI: 10.1080/10106049.2018.1434688, 11 Feb 2018

16. Paul, S. S., Akhter, S. H., Hasan, K., and Rahman, M. Z., 2019, _Geospatial analysis of the depletion of surface water body and floodplains in Dhaka City (1967 to 2008) and its implications for earthquake vulnerability_, **Springer Nature Applied Sciences**, https://doi.org/10.1007/s42452-019-0582-5, 14 May 2019.,(2019)1:565.

In Conference Proceedings:

1. Hasan, K., 1989, _Effects of Rice Cultivation on Soils of Tropical South and Southeast Asia_, Presented and Published in Proceedings of **23rd annual meeting of South-Central section of the Geological Society of America**, Arlington, TX, Abstracts with Programs, Vol. 21, N0. 1.

2. Hasan, K., 1990, _On Antecedent Origin of Matamuhuri River, SE Bangladesh_, Presented and Published in Proceedings of **24th annual meeting of South-Central section of the Geological Society of America**, Stillwater, OK, Abstracts with Programs, Vol. 22, N0. 1.

3. White, K. L.; Sharp, R.; and Hasan, K., 1994, _TM imagery and Mapping of Floodplain Soils_, published in Conference proceedings of the **17th annual Applied Geography Conference**, Kent- Akron, OH.

4. Martin, T. C., Hasan, K., Shireen, S. A., and Werle, D., 1997, _RADARSAT Data for monitoring flood conditions in Bangladesh - An assessment of early results_, In proceedings "**Geomatics in the Era of RADARSAT/GER '97, Ottawa, Canada**, May 25-30, 1997.

5. Hasan, K., Martin, T. C., Shireen, S. A., and Choudhury, A. M., 1998**,** _Dynamics of monsoonal flooding in Bangladesh using RADARSAT imagery_, In Proceeding **"ADRO Final Symposium" Montreal**, October 13 – 15, 1998.

6. Martin, T. C., Hasan, K., Werle, D., and Rahman, M. A., 1998, _Potential of satellite-based SAR for land and water resources application in Bangladesh_, In Proceeding "**ADRO Final Symposium" Montreal**, October 13 – 15, 1998.

7. Sarker, M. M., Kamal, M. M., and Hasan, K., 1999, _Identifying the Morphological changes of a distributary of the Ganges in response to the declining flow using Remote Sensing_**,** In proceeding " **20**[th] **Asian Conference on Remote Sensing**", Vol 2., Hong Kong, China, November 22-25, 1999.

8. Hassan, Q. K., Martin, T. C., Hasan, K., Hassan, A. and Ali, S., 1999, _Evaluation of filtering and classification techniques for floodplain landuse/cover mapping using RADARSAT SAR data_**,** In proceeding "**20**[th] **Asian Conference on Remote Sensing**", Vol 2., Hong Kong, China, November 22-25, 1999.

9. Ingram, S. L., Easson, G. L., and Hasan, K., 2002, _Application of Remote Sensing for Mapping Surface Geology in Heavily Vegetated Cover in North Mississippi_, **ACSM-ASPRS Annual Conference Proceedings**, Washington, DC, April 21-26, 2002 (CD-ROM).

10. Hasan, K., Hassan, Q. K., and Huque, I., 2003, Mapping the Monsoon Landuse/Landcover in Bangladesh using Radarsat-1 and ERS-2 Images: A comparative study, **ASPRS Annual Conference,** Anchorage, AK, May 5-9, 2003

11. Hasan, K and Easson, G. L., 2003, Flood management in Bangladesh using remote sensing tools; A discussion on technical and institutional issues, **30**[th] **International Symposium on Remote Sensing of the Environment**, Honolulu, HI, Nov. 10-14, 2003

12. Hossain, A., Easson, G. L., and Hasan, K., 2004, Inventory of levee slides with potential of prediction using the commercially available remotely sensed data, **ASPRS Annual Conference**, Denver, CO, May 23-28, 2004

13. Hasan, K., 2007, <u>Using MODIS vegetation data to map winter crops in Bangladesh; an</u> <u>efficient</u> <u>alternative to support field derived information</u>, Conference on **Current Trends in Remote Sensing and GIS Application**, IIT Kharagpur, India, February 15-17, 2007.

14. <u>Hamski</u>, J. P., Azad Hossain, A. K., Hasan, K. , Alsdorf, D. E., Hossain, F. , Pavelsky, T. , Khan, A. S., Hoque, A. Z., 2008, <u>Estimation of hydraulic parameters and discharge of the Ganges and</u> <u>Brahmaputra</u> <u>Rivers from Shuttle Radar Topography Mission Digital Elevation Models</u>., Conference on **2008 Ocean Sciences Meeting**, 2-7 March 2008 · Orlando, Florida, USA

15. Aanstoos, J.V., Hasan, K., Mahrooghy, M., Dabbiru, L., Nobrega, R. A. A., & Prasad, S. (2011). *Screening of Earthen Levees Using TerraSAR-X Radar Imagery*. **4th TerraSAR-X Science Team Meeting**. Oberpfaffenhofen, Germany: DLR (German Aerospace Center).

16. Hasan, K., Aanstoos, J.V., Mahrooghy, M., Dabbiru, L., & Dunbar, J. (2011*). Characterizing* <u>*Mississippi*</u> <u>*River levee segments using soils and geologic data*</u>. **Symposium on applications of geophysics to engineering and environmental problems (SAGEEP)**, Charleston, SC.

17. Mahrooghy, M., Aanstoos, J.V., Hasan, K.,& Younan, N. H. (2011), <u>*Levee Soil Moisture*</u> <u>*Assessment*</u> <u>*Based On a Backpropagation Neural Network Using Synthetic Aperture Radar Data*</u>, *proceeding 2011,* **34th International Symposium on Remote Sensing of Environment,** Sydney, Australia,

18. Mahrooghy, M., Aanstoos, J.V., Hasan, K., Prasad, S., & Younan, N. H. (2011), <u>*Effect of*</u> <u>*vegetation*</u> <u>*height and volume scattering on soil moisture classification using Synthetic Aperture*</u> <u>*Radar (SAR) images*</u>. **Proc. 2011 40th IEEE Applied Imagery Pattern Recognition Workshop**. Washington, DC: IEEE.,

19. Mahrooghy, M., Aanstoos, J.V., Hasan, K., Nobrega, R. A. A., & Younan, N. H. (2011), <u>*Classification of*</u> <u>*soil moisture on vegetated earther levee using X and L band Synthetic Aperture*</u> <u>*Radar (SAR)*</u>, **Proc. AGU Fall meeting2011,** San Francisco, CA.

20. Paul, S. S., Hasan, K., Akhter, S. H., and Li, J., (2012), <u>*Application of remote sensing and GIS*</u> <u>*analysis*</u> <u>*for investigating urbanization induced surface water body change in and around Dhaka*</u> <u>*city, Bangladesh*</u>,

12th International Environmental Specialty Conference, Edmonton, Alberta, Canada

21. Huq, M.R., Matin, K., Hasan, K.,Uddin, A., 2012, <u>*Relationship between the geomorphic*</u> <u>*features and*</u> <u>*spatial Arsenic distribution patterns in part of the Meghna floodplain, Bangladesh*</u>**,**

61st Annual Meeting of Southeastern Section, Geological Society of America, Abstract with Programs, Vol 44, No. 4, p.71, April 2012, Asheville, NC.

22. Ahmed, R, Hasan, K., and Haque, I., 2012 , <u>*Monitoring the changes in the distribution of the*</u> <u>*mangrove*</u> <u>*species of Sunderbans using satellite images: A consequence of sea level rise*</u>, **IUFRO landscape Ecology Conference**, November, 2012, Concepcion, Chile.

As Authored Reports and Technical Notes:

1. 1997, EGIS Report, TR-EGS-07. **Mapping and monitoring floods with RADARSAT images**, (lead author) 67 pp.
2. 1999, EGIS Report, TR-EGS-12. **Microwave remote sensing applications for flood monitoring**, (co-author)
3. 1999, EGIS Technical Note, TN-EGS-13. **Mosaic of TM images of Bangladesh**, (single author), 23 pp.
4. 1999, EGIS Technical Note, TN-EGS-14. **Mapping the 1998 floods,** (co-author). 58 pp.
5. 2001, EGIS and SPARRSO Report 01, **Application of ERS-2 images in Monitoring Water and Land uses**. (lead author), 46 pp.
6. 2001, EGIS, Synoptics and Resource Analysis, **Market access in Bangladesh for sustainable data services for rice and flood applications using SAR data**, (Co-author), 33 pp.
7. 2017, CEGIS, **Technical study for mapping of potential Greenbelt zone in the coastal regions of Bangladesh,** (Lead author), 170 pp.