

Abdulla -Al Kafy

Remote Sensing and Earth Observation Enthusiastic

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RESEARCH INTEREST AND MOTIVATION

My research interests include **land cover change and urbanization impacts** on thermal environment, air quality, carbon emission and natural resources using **remote sensing, machine learning and spatial statistics**. Particular focus on remote sensing database development in urban environmental analysis and landscape change studies.

Working with Geospatial, remote sensing and earth observation related topics for more than five years and have experience in both research and industry. Highly passionate about research and published more than **20 peer-reviewed journal articles** using machine learning algorithms, geospatial and remote sensing techniques. My published articles received **more than 400 citations**, inspiring me to explore remote sensing applications further by pursuing a graduate degree to identify effective ways for ensuring sustainable urban development.

PROFESSIONAL EXPERIENCE

Urban planner & Project officer, ICLEI – Local Government for Sustainability, Rajshahi, Bangladesh. **November 2019 – Present**

Key Responsibilities

- Mapping land cover, natural assets, and urbanization pattern.
- Mapping fragile urban system, climate risk and vulnerable hotspots.
- Remote sensing database creation, monitor, and ensure the quality of datasets.
- City profile, vulnerability assessment and Greenhouse Gas emission report preparation.
- Develop detailed project reports and Terms of Reference (ToR).
- Identify potential climate change and environmental protection-related projects.

Geographic Information Systems Analyst, Rajshahi Development Authority, Rajshahi, Bangladesh. **October 2018 - October 2019**

Key Responsibilities

- Land use map preparation using commercial and freely available satellite images.
- Suitability analysis and risk assessment
- Remote sensing database preparation, error checking, and digitization
- Provide methodological and technical support in data acquisition
- Monitor and ensure the quality of the fieldwork and data management
- Working report preparation

GIS and Solid Waste Management Specialist, B & F Company Ltd., Dhaka, Bangladesh. **May 2018 – Sept. 2018**

Key Responsibilities

- Land use map preparation using RapidEye and Landsat images.
- Land suitability analysis.
- Data acquisition from satellite and ground-based platforms.
- Preparation of layout plan and 3D visualization.
- Project completion report preparation.

Research Consultant, Center for Environmental and Geographic Information Services (CEGIS), Dhaka, Bangladesh. **November 2017 - April 2018**

Key Responsibilities

- Land use map preparation using RapidEye, Sentinel, and Landsat images.
- Remote sensing database creation and error checking
- DEM creation, Digitizing, topology, and error correction

PROJECT/RESEARCH WORK EXPERIENCE

Publication Associate (Consultant), University of Liberal Arts Bangladesh (ULAB), Dhaka, Bangladesh.

**October 2020-
Continue**

Project

Building Resilient Universities: Promotion Of Democratic Citizenship And Media Literacy.

Key Responsibilities

- Refining and Publishing COVID-19, social science, and business management-related reports in Scopus indexed journals by strengthening the methodology, result, discussion, and language structure corrections.

GIS Consultant, Eusuf and Associates – Dhaka, Bangladesh.

Project

Urban Primary Health Care Services Delivery Project (UPHCSDP)

**Feb. 2018 -
April 2018**

Key Responsibilities

- Mapping the Slum catchment area using GPS, GIS and Remote sensing data.
- Ground Truthing using GIS & GPS
- Topographical survey
- Project report preparation

Research Assistant, Bangladesh Institute of Planners (BIP), Bangladesh.

**March 2017–
Sept. 2017**

Project

Developing Active Transportation Indicators for Rajshahi, Bangladesh.

Key Responsibilities

- Travel behaviour questionnaire survey
- Data entry and analysis
- Travel behaviour variables mapping
- Documentation of survey outputs as a report.

Research Consultant, Caritas Bangladesh, Rajshahi, Bangladesh.

**April 2016–
October 2016**

Project

Integrated Community Development Project (ICDP)

Key Responsibilities

- Mapping the Slum catchment area using GPS, GIS, and Remote sensing data.
- Ground Truthing using GIS & GPS
- Topographical survey

EDUCATION

Bachelor of Urban & Regional Planning.

Rajshahi University of Engineering & Technology – Rajshahi, Bangladesh
CGPA: 3.42 (1st Class 7th)

**March 2013 -
October 2017**

AWARDS

Local Pathways Fellowship

UN Sustainable Development Solutions Network (SDSN).

<http://localpathways.org/blog/2020/10/11/success-story-abdulla-al-kafy-2019-local-pathways-fellow>

Final Project:

Effective Land Use Management for Ensuring Inclusive and Sustainable Urbanization in Rajshahi City, Bangladesh (SDG Goal 11)

**Sept. 2018 –
Dec. 2019**

PUBLICATIONS

Peer-Reviewed Journal Publications

21. The operational role of remote sensing in assessing and predicting land use/land cover and seasonal land surface temperature using machine learning algorithms in Rajshahi, Bangladesh APPLIED GEOMATICS (SPRINGER); DOI: <https://doi.org/10.1007/s12518-021-00390-3> **2021**
Kafy AA, Faisal AA, Al Rakib A, Akter KS, Rahaman ZA, Jahir DMA, Subramanyam G, Michel OO, Bhatt A
20. Prediction of seasonal urban thermal field variance index using machine learning algorithms in Cumilla, Bangladesh SUSTAINABLE CITIES AND SOCIETY (ELSEVIER) ; <https://doi.org/10.1016/j.scs.2020.102542> **2021**
Kafy AA, Rahman MS, Islam M, Al Rakib A, Islam MA, Khan MH, Sikdar MS, Sarker MH, Sattar GS
19. Monitoring the effects of vegetation cover losses on land surface temperature dynamics using geospatial approach in Rajshahi city, Bangladesh ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100187> **2021**
Kafy AA, Al Rakib A, Akter KS, Rahaman ZA, Faisal AA, Mallik S, Nasher NR, Hossain MI, Ali MY
18. Cellular Automata approach in dynamic modelling of land cover changes using RapidEye images in Dhaka, Bangladesh ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100084> **2021**
Kafy AA, Naim MN, Subramanyam G, Ahmed NU, Al Rakib A, Kona MA, Sattar GS.
17. Predicting changes in land use/land cover and seasonal land surface temperature using multi-temporal landsat images in the northwest region of Bangladesh HELIYON (ELSEVIER); <https://doi.org/10.1016/j.heliyon.2021.e07623> **2021**
Kafy AA, Faisal AA, Al Rakib A, Roy S, Ferdousi J, Raikwar V, Kona MA, Fatin SMAA
16. Geospatial approach for developing an integrated water resource management plan in Rajshahi, Bangladesh. ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100139> **2021**
Kafy AA, Faisal AA, Raikwar V, Al Rakib A, Kona MA, Ferdousi J.
15. Modelling the relationship between land use/land cover and land surface temperature in Dhaka, Bangladesh using CA-ANN algorithm. ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100190> **2021**
Kafy AA, Dey NN, Al Rakib A, Rahaman ZA, Nasher NR, Bhatt A.
14. Assessment and prediction of seasonal land surface temperature change using multi-temporal Landsat images and their impacts on agricultural yields in Rajshahi, Bangladesh. ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100147> **2021**
Faisal AA, **Kafy AA**, Rahman AF, Al Rakib A, Akter KS, Raikwar V, Jahir DM, Ferdousi J, Kona MA.
13. Assessing and predicting land use/land cover, land surface temperature, and urban thermal field variance index using Landsat imagery for Dhaka Metropolitan area. ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100192> **2021**
Faisal AA, **Kafy AA**, Al Rakib A, Akter KS, Jahir DM, Sikdar MS, Ashrafi TJ, Mallik S, Rahman MM.
12. Assessment of urban thermal field variance index and defining the relationship between land cover and surface temperature in Chattogram city: A remote sensing and statistical approach. ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100107> **2021**
Naim MN, **Kafy AA**.

11. Remote Sensing-Based Urban Sprawl Modeling Using Multilayer Perceptron Neural Network Markov Chain in Baghdad, Iraq.
Remote Sensing (MDPI) ; <https://doi.org/10.3390/rs13204034>
Al-Hameedi, W. M. M., Chen, J., Faichia, C., Al-Shaibah, B., Nath, B., **Kafy, AA**, & Al-Aizari, A. (2021). **2021**
10. Geospatial modelling of changes in land use/land cover dynamics using Multi-layer perception Markov chain model in Rajshahi City, Bangladesh.
ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100148>
Dey NN, Al Rakib A, **Kafy AA**, Raikwar V. **2021**
9. A perception-based study to explore COVID-19 pandemic stress and its factors in Bangladesh.
DIABETES & METABOLIC SYNDROME: CLINICAL RESEARCH & REVIEWS (ELSEVIER) ;
<https://doi.org/10.1016/j.dsx.2021.05.002>
Amit S, Barua L, **Kafy AA**. **2021**
8. Assessment on controlling factors of urbanization possibility in a newly developing city of the Vietnamese Mekong delta using logistic regression analysis.
PHYSICS AND CHEMISTRY OF THE EARTH PARTS A/B/C ; <https://doi.org/10.1016/j.pce.2021.103065>
Diep NT, Nguyen CT, Diem PK, Hoang NX, **Kafy AA**. **2021**
7. Application of modified managed aquifer recharge model for groundwater management in drought-prone water-stressed Barind Tract, Bangladesh.
ENVIRONMENTAL CHALLENGES (ELSEVIER); <https://doi.org/10.1016/j.envc.2021.100173>
Hossain MI, Bari MN, Miah SU, **Kafy AA**, Nasher NR. **2021**
6. Countering violent extremism using social media and preventing implementable strategies for Bangladesh.
HELIYON (ELSEVIER); <https://doi.org/10.1016/j.heliyon.2021.e07121>
Amit S, Barua L, **Kafy AA**. **2021**
5. Remote sensing approach to simulate the land use/land cover and seasonal land surface temperature change using machine learning algorithms in a fastest-growing megacity of Bangladesh.
REMOTE SENSING APPLICATIONS: SOCIETY AND ENVIRONMENT (ELSEVIER) ;
<https://doi.org/10.1016/j.rsase.2020.100463>
Kafy AA, Shuvo RM, Naim MN, Sikdar MS, Chowdhury RR, Islam MA, Sarker MH, Khan MH, Kona MA. **2020**
4. Modelling future land use land cover changes and their impacts on land surface temperatures in Rajshahi, Bangladesh.
REMOTE SENSING APPLICATIONS: SOCIETY AND ENVIRONMENT (ELSEVIER);
<https://doi.org/10.1016/j.rsase.2020.100314>
Kafy AA, Faisal AA, Rahman MS, Hasan MM, Islam M. **2020**
3. Classification of cities in Bangladesh based on remote sensing derived spatial characteristics.
JOURNAL OF URBAN MANAGEMENT (ELSEVIER); <https://doi.org/10.1016/j.jum.2018.12.001>
Rahman MS, Mohiuddin H, **Kafy AA**, Sheel PK, Di L. **2019**
2. Impact of LULC changes on LST in Rajshahi district of Bangladesh: a remote sensing approach.
JOURNAL OF GEOGRAPHICAL STUDIES. <https://doi.org/10.21523/gcj5.19030102>
Kafy AA, Faisal AA, Sikdar S, Hasan M, Rahman M, Khan MH, Islam R. **2019**
1. Identifying most influential land-use parameters contributing reduction of surface water bodies in Rajshahi City, Bangladesh: A remote sensing approach.
REMOTE SENSING OF LAND. <https://doi.org/10.21523/gcj1.18020202>
Kafy AA, Islam M, Khan A, Hossain M. **2019**

Book Chapter Publications

2. Prediction of urban expansion and identifying its impacts on the degradation of agricultural land: a machine learning-based remote-sensing approach in Rajshahi, Bangladesh. **2020**
RE-ENVISIONING REMOTE SENSING APPLICATIONS 2021, TAYLOR & FRANCIS (CRC PRESS).
<http://dx.doi.org/10.1201/9781003049210-6>
Kafy AA, Naim NH, Khan MH, Islam MA, Al Rakib A, Faisal AA, Sarker MH
1. Remote Sensing-Based Approach to Identify the Influence of Land Use/Land Cover Change on the Urban Thermal Environment: A Case Study in Chattogram City, Bangladesh. **2020**
RE-ENVISIONING REMOTE SENSING APPLICATIONS 2021, TAYLOR & FRANCIS (CRC PRESS).
<http://dx.doi.org/10.1201/9781003049210-16>
Kafy AA, Islam M, Sikdar S, Ashrafi TJ, Al-Faisal A, Islam MA, Al Rakib A, Khan MH, Sarker MH, Ali MY.

Conference Proceedings

10. Simulation of Future Development Pattern and Identify Its Impact on The Degradation of Agricultural Land: A Machine Learning-Based Remote Sensing Approach In Rajshahi District **2020**
1ST INTERNATIONAL STUDENT RESEARCH CONFERENCE-2020, UNIVERSITY OF DHAKA, BANGLADESH
Kafy, AA; MHH, Khan; Islam, MA; Sarker, MHS
9. Prediction of Future Land Surface Temperature And Its Impact On Climate Change: A Remote Sensing Based Approach In Chattogram City. **2020**
1ST INTERNATIONAL STUDENT RESEARCH CONFERENCE-2020, UNIVERSITY OF DHAKA, BANGLADESH
Kafy AA, MA I, Khan MH, Sarker MH, Rahman MW.
8. Using Geographic Information System and Remote Sensing Techniques in Environmental Management: A case study in Cumilla City Corporation. **2019**
1ST INTERNATIONAL CONFERENCE ON URBAN AND REGIONAL PLANNING, DHAKA, BANGLADESH
Kafy AA, Faisal AA, Sikdar S, Hasan M, Ahmmmed R.
7. Estimation of Urban Heat Islands Effect and Its Impact on Climate Change: A Remote Sensing and GIS-Based Approach in Rajshahi District. **2019**
1ST INTERNATIONAL CONFERENCE ON URBAN AND REGIONAL PLANNING, DHAKA, BANGLADESH
Kafy, AA, Hasan, M, Faisal, AA, Nipun, WH, Noman, AA.
6. Application of artificial hierarchy process for landslide susceptibility modelling in Rangamati Municipality Area, Bangladesh. **2019**
INTERNATIONAL CONFERENCE ON DISASTER RISK MANAGEMENT, DHAKA, BANGLADESH
Kafy AA, Hasan MM, Ali MR, Uddin MS.
5. Exploring The Association of Surface Water Body Change and Rapid Urbanization in Rajshahi City Corporation (RCC) Area Using RS and GIS. **2018**
1ST NATIONAL CONFERENCE ON WATER RESOURCES ENGINEERING, CUET, CHITTAGONG, BANGLADESH
Kafy AA, Faisal AA, Khan HA, Sheel PK.
4. Pond Filling Locations Identification Using Landsat-8 Images In Comilla District, Bangladesh. **2018**
1ST NATIONAL CONFERENCE ON WATER RESOURCES ENGINEERING, CUET, CHITTAGONG, BANGLADESH
Kafy AA.

3. Economic Value Determination Of A Wetland Using Contingent Valuation Method: A Case Study On Chalan Beel In Natore District, Bangladesh. **2018**
1ST NATIONAL CONFERENCE ON WATER RESOURCES ENGINEERING, CUET, CHITTAGONG, BANGLADESH
Kafy AA, Sheel PK, Ali S.
2. Exploring the association of land cover change and landslides in the Chittagong hill tracts (CHT): A remote sensing perspective. **2017**
INTERNATIONAL CONFERENCE ON DISASTER RISK MANAGEMENT, DHAKA, BANGLADESH
Kafy AA, Rahman MS.
1. An analysis of Causes, Impacts and Vulnerability Assessment for Landslides Risk in Rangamati District, Bangladesh. **2017**
INTERNATIONAL CONFERENCE ON DISASTER RISK MANAGEMENT, DHAKA, BANGLADESH
Ferdous L, **Kafy AA**, Roy S, Chakma R.

Under Review papers

5. Assessment of temporal shifting of particulate matter 2.5, lockdown effect and influences of seasonal meteorological factors over fastest-growing megacity, Dhaka **2021**
URBAN CLIMATE (ELSEVIER)
Faisal AA, **Kafy AA**, Jahir DMA, Al Rakib A, Mallik S
4. Impact of vegetation cover loss on surface temperature in a fast-growing city, Cumilla, Bangladesh **2021**
BUILDING & ENVIRONMENT (ELSEVIER)
Kafy AA, Faisal AA, Al Rakib A, Fattah MA
3. Predicting index-based agricultural drought vulnerability using CA-ANN algorithms in Barind region, Bangladesh. **2021**
THEORETICAL AND APPLIED CLIMATOLOGY (SPRINGER)
Kafy AA, Sikdar MS, Ashrafi TJ, Faisal AA, Al Rakib A
2. Dasymeric population exposure estimation in the largest city corporations of Bangladesh: An analytical tool for identifying city development **2021**
ARABIAN JOURNAL OF GEOSCIENCE (SPRINGER)
Faisal AA, **Kafy AA**, Jahir DMA, Al Rakib A, Mallik S
1. Impact of land use/land cover change on the urban thermal environment using machine learning algorithms in Nanjing city, China **2021**
Wang A, **Kafy AA**, Zhang M
SUSTAINABLE CITIES AND SOCIETY (ELSEVIER)

Ongoing Research

1. Machine learning algorithms for predicting the impacts of land cover fluctuations on seasonal urban thermal environment in Sylhet city, Bangladesh
2. Modelling the impact of urban expansion on seasonal urban heat island effect using remote sensing data in Sylhet city
3. Investigating spatial differentiation and determinants of the vegetation carbon sequestration capacity: a case of 127 cities along the Yangtze River in China
4. Monitoring urban heat island effects using remote Sensing and GIS-based approach in Rajshahi, Bangladesh

SERVICE AND ACTIVITIES

Journal Review

- Sustainable Cities and Society (Elsevier)
- Remote Sensing Applications: Society and Environment (Elsevier)
- Transport Research Interdisciplinary Perspectives (Elsevier)
- Journal of Urban Management (Elsevier)
- Heliyon (Elsevier)
- GeoJournal (Springer)
- Theoretical and Applied Climatology (Springer)
- Natural Hazard (Springer)
- Geocarto International (Taylor and Francis)
- Applied Artificial Intelligence (Taylor and Francis)
- Geo-Spatial Information Research (Taylor and Francis)
- International Journal of Digital Earth (Taylor and Francis)

Workshops/Seminars attended

1. Build back better: **Harnessing South-South cooperation and risk reduction planning for resilient and healthy cities in the post-COVID-19 era-** An introductory training for local authorities and urban development practitioners **June 8th - 29th, 2021**
2. **Geoinformatics Summer School, 2020**, Organized by Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS), Wuhan University, China **August 24th – Sep. 2nd, 2020**
3. **21 Days Online GIS Training Programme using QGIS, 2020**, Organized by Central University of Karnataka, India Jointly with State Institute of Urban Development, Karnataka, India **July 13th – Aug. 2nd, 2020**
4. **Geoinformatics Summer School, 2018**, Organized by Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS), Wuhan University, China. **July 9th – 11th, 2018**
5. Workshop on **GIS Programming & Algorithm, 2017**, organized by Bangladesh Institute of Planners (BIP)., Dhaka, Bangladesh **Dec. 23rd - 24th, 2017**
6. Workshop on **Principles of Geographic Information System (GIS) and Remote Sensing** organized by Department of Urban and Regional Planning, Rajshahi University of Engineering & Technology – Rajshahi, Bangladesh **May 28th - 29th, 2015**
7. Workshop on **Multidisciplinary Application of Geographic Information System (GIS)** organized by Department of Urban and Regional Planning, Rajshahi University of Engineering & Technology – Rajshahi, Bangladesh **Dec 03rd -04th, 2015**

PROFESSIONAL AFFILIATION

Member (ID – 1428), **Bangladesh Institute of Planners**

References

Dr. Golam Sabbir Sattar

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Professor, Geology & Mining
Director, Institute of Environmental Science
University of Rajshahi
Rajshahi, Bangladesh
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