



UNIVERSITY OF KERALA
(Reaccredited with A++ by NAAC)



**LANDSCAPE ECOLOGY APPROACH FOR THE
SUSTAINABLE MANAGEMENT OF
NATURAL AND BIORESOURCES**

NATIONAL SEMINAR

INTERNATIONAL AND INTER UNIVERSITY CENTRE FOR
NATURAL RESOURCES MANAGEMENT

&

DEPARTMENT OF GEOLOGY

9-10 February 2023

Rajesh Reghunath & Ajayakumar A (Eds.)



UNIVERSITY OF KERALA

**INTERNATIONAL AND INTER UNIVERSITY CENTRE FOR
NATURAL RESOURCES MANAGEMENT**

&

DEPARTMENT OF GEOLOGY

Proceedings of the National Seminar

on

**LANDSCAPE ECOLOGY APPROACH FOR THE SUSTAINABLE
MANAGEMENT OF NATURAL AND BIORESOURCES**

9-10 February, 2023

Funded by

University of Kerala

Rajesh Reghunath and Ajayakumar A (Eds.)

Organizing Committee

Patron : Hon'ble Vice Chancellor
University of Kerala

Co-Patron : Pro Vice chancellor
University of Kerala

Convenor : Dr.E.Shaji, Head, Department of Geology, University of Kerala

Organizing Secretary : Prof (Dr.) Rajesh Reghunath, IIUCNRM, University of Kerala

Members : Prof.(Dr.) G.Prasad, Department of Zoology, University of Kerala
Prof.(Dr.) A. Gangaprasad, Department of Botany , University of Kerala
Dr.Suresh Francis, Scientist, KSREC, Govt. of Kerala, Trivandrum
Dr.Gireesh Gopinath, Department of Remote Sensing and GIS KUFOS, Cochin
Dr. A. Krishna Kumar, NCESS, Thiruvananthapuram
Dr.Smitha Asok V, All Saints College, Thiruvananthapuram
Dr. Manoharan A.N., Government College, Kasargod
Mrs.Vineetha P, IUCGIST, University of Kerala

CONTENTS

SL.NO.	PAPER NO.	TITLE AND AUTHORS	PAGE NUMBER
SESSION I: LANDSCAPE ECOLOGY OF WETLANDS, GRASS LANDS, FOREST ECOSYSTEMS, AGRICULTURAL LANDS, ETC			
1	KN1	WETLAND MANAGEMENT <i>DR. RENJITH K.R.</i>	1
2	PP1	MANGROVE DISTRIBUTION MAPPING IN KANNUR DISTRICT OF KERALA, USING GEE AND GIS TECHNIQUES. <i>MAHA MADHU, ROHINI P AND AYONA JAYADEV</i>	2
SESSION II: LAND AND WATER RESOURCES MANAGEMENT			
3	KN2	GEOSPATIAL TECHNOLOGY IN LANDSCAPE AND NATURAL RESOURCES MANAGEMENT <i>GIRISH GOPINATH</i>	3
4	KN3	GEOSPATIAL DECISION SUPPORT SYSTEM FOR MICRO LEVEL LAND AND WATER RESOURCE MANAGEMENT <i>SURESH FRANCIS</i>	4
5	PP2	A STUDY OF LANDSCAPE MODIFICATIONS DUE TO ANTHROPOGENIC ACTIVITIES <i>AKHIL S</i>	6
6	PP3	ESTIMATION OF SOIL EROSION USING RUSLE MODELLING AND GEOSPATIAL TOOLS IN VAMANAPURAM WATERSHED OF SOUTHERN PENINSULAR INDIA. <i>SREEVISAL G, ARYA R, ABHILASH SREEKUMAR, SURESH S</i>	7
7	PP4	DELINEATION OF GROUNDWATER POTENTIAL ZONES FOR SUSTAINABLE DEVELOPMENT AND PLANNING USING WEIGHTED OVERLAY METHOD (WOM) : A CASE STUDY FROM SOUTHERN WESTERN GHATS, INDIA <i>ARUNKUMAR K. S</i>	8
SESSION III: BIODIVERSITY ASSESSMENT OF WETLANDS, GRASS LANDS, FOREST ECOSYSTEM, AGRICULTURAL LANDS, ETC			
8	KN4	THE STATUS OF FAUNA OF KERALA FORESTS AND THE POSSIBILITY OF LANDSCAPE ECOLOGICAL STUDIES FOR THE BETTER FOREST MANAGEMENT IN THE STATE. <i>G. PRASAD</i>	9
9	KN 5	TREE DIVERSITY OF MUNNAR DIVISION THE WESTERN GHATS OF KERALA INDIA <i>BHEEMALINGAPPA, M., VB. SREEKUMAR, KA. SREEJITH AND G. PRASAD</i>	11
10	PP5	A COMPARATIVE ASSESSMENT OF SEASONAL AND SPATIAL FLUCTUATIONS OF PLANKTON ABUNDANCE IN THREE FRESHWATER LAKES OF KERALA <i>ADITYA S.K, REVATHY DAS, A. KRISHNAKUMAR, AND K. ANOOP KRISHNAN</i>	13

SESSION IV: LANDSCAPE ECOLOGY AND CHARACTERISATION OF LANDSCAPES			
11	KN6	LANDSCAPE ECOLOGY APPROACHES TO BIODIVERSITY CONSERVATION USING GEOSPATIAL TECHNIQUES <i>VINEETHA.P</i>	14
SESSION V: REPLICABLE LANDSCAPE ECOLOGY MODELS OF BIODIVERSITY MODELS			
12	KN7	GEOSPATIAL TECHNOLOGY AND GEO-AI FOR ECOLOGICAL STUDIES <i>ACHU A L</i>	16
13	PP6	GEO-SPATIAL TECHNOLOGIES BASED WILDLIFE HABITAT SUSTAINABILITY MODEL IN THIRUNELLI GRAMA PANCHAYAT <i>KRISHNAPRIYA V S, DEVIKA MOHAN, KARTHIKA M J</i>	17
SESSION VI: INTERACTIONS OF BIOSPHERE, LITHOSPHERE AND HYDROSPHERE			
14	KN8	GLOBAL ENVIRONMENTAL CHANGES AND EMERGING CONCERNS IN LAND AND WATER MANAGEMENT <i>DR. A. KRISHNAKUMAR</i>	18
15	PP7	THE EFFECTS OF LAND USE PATTERN ON THE SURFACE WATER QUALITY OF KABINI RIVER BASIN, KERALA- KARNATAKA STATES, INDIA <i>HIMANSHI GUPTA, APPUKUTTAN PILLAI KRISHNAKUMAR AND KRISHNAN ANOOP KRISHNAN</i>	24
16	PP8	RECENT LANDSLIDES IN KERALA: SOME INSIGHTS FROM THE FILED INVESTIGATIONS <i>AMAL GEORGE K, P.S. SUNIL, A. L. ACHU, A.U. ANISH AND GIRISH GOPINATH</i>	25
SESSION VII : APPLICATIONS OF REMOTE SENSING AND GIS IN LANDSCAPE STUDIES			
17	KN9	UNDERSTANDING THE LANDSCAPE EVOLUTION AND CHANGING LAND USE TOWARDS DISASTER RISK REDUCTION, INFERRED FROM REMOTE SENSING AND SEDIMENT PROXIES <i>DR. K.CH. V NAGA KUMAR</i>	26
18	PP9	IMPACT OF LAND SURFACE TEMPERATURE ON MANGALORE CITY ENVIRONS' –A STUDY BASED ON RS AND GIS TECHNIQUES <i>ABHISHEK R, H GANGADHARA BHAT AND K.R. SHIVAPRASAD</i>	27
19	PP10	IMPACT OF URBANISATION ON URBAN HEAT ISLAND INTENSITY IN KOCHICORPORATION – USING REMOTE SENSING AND GEOSPATIAL TOOLS <i>DEVIKA MOHAN, FEBA S PAUL, AFREENA S AND ASSUMPTA MARIA</i>	28
20	PP11	EVALUATING THE SURFACE URBAN HEAT ISLAND EFFECT OVER COCHIN, KERALA, BY USING THERMAL REMOTE SENSING TECHNIQUE. <i>SETHULAKSHMI MJ</i>	29
21	PP12	A TEMPORAL ANALYSIS OF LAND SURFACE TEMPERATURE AND NORMALIZED DIFFERENCE VEGETATION INDEX RELATIONSHIP: A STUDY ON VADAKARA MUNICIPALITY IN KOZHIKODE DISTRICT. <i>AAVANI P VAS, SREEHARSH K AND INDULEKHA C</i>	30
22	PP13	ANALYSIS OF PM10 CONCENTRATION WITH GEOSPATIAL TECHNOLOGIES: A CASE STUDY IN KOCHI CORPORATION <i>KARTHIKA M J, AAVANI P VAS AND KRISHNAPRIYA M S</i>	31

23	PP14	LANDSLIDE HAZARD ZONATION USING GIS & REMOTE SENSING TECHNOLOGY AND MULTI-CRITERION DECISION MAKING: A STUDY OF CHALAKKUDY TALUK, THRISSUR DISTRICT <i>ABHILASH SREEKUMAR, SREEVISAL G, ARYA R AND SURESH S</i>	32
SESSION VIII: LANDSCAPES AND ITS EVOLUTIONARY PROCESSES			
24	KN10	LANDSCAPE DEVELOPMENT AND EARTH'S SURFACE PROCESSES <i>C.P. PRIJU</i>	33
25	KN11	GEOMORPHIC ANALYSIS: IMPLICATION FOR IDENTIFYING ACTIVE TECTONISM <i>BIJU JOHN</i>	34
26	KN12	GEOMORPHIC INDICES: TOOLS FOR ASSESSING NEO TECTONIC ACTIVITIES <i>AJU C D</i>	36
27	PP15	GEOMORPHIC DEVELOPMENT OF WEST FLOWING TROPICAL RIVERS OF SOUTH- WESTERN PENINSULAR INDIA <i>ARYA R, SREEVISAL G, ABHILASH SREEKUMAR, SURESH S</i>	38
28	PP16	TECTONICS ASSESSMENT OF BHARATHAPUZHA RIVER BASIN, PARTS OF WESTERN GHATS, INDIA <i>DEVIKA. P, ARYA R, SREEVISAL G AND SURESH S</i>	39
29	PP17	GEOMORPHIC ANALYSIS OF ITHIKKARA RIVER BASIN, SOUTHERN KERALA, INDIA USING REMOTE SENSING AND GIS TECHNIQUES <i>AJAYAKUMAR A, DR. RAJESH REGHUNATH</i>	40
30	PP18	EVOLUTION OF COASTAL FLOODPLAINS IN SOUTH KERALA: A STUDY BASED ON GEOCHEMICAL AND PALEONTOLOGICAL PROXY ANALYSIS <i>DIVYA MURALI, RAJESH REGHUNATH, RAVI BHUSHAN, DR. A.K SUDHEER AND ANOOP KRISHNAN</i>	41
31	PP19	MORPHOMETRIC ANALYSIS OF THE THIRD ORDER SUB BASINS OF PALLIMAN WATERSHED, KOLLAM DISTRICT, KERALA <i>SREEJA I S, AJU C D, RAJESH REGHUNATH AND BINOJ KUMAR R B</i>	42
SESSION IX: QUALITY STATUS OF SURFACE AND SUBSURFACE WATER RESOURCES			
32	KN13	MANAGEMENT OF GROUND WATER RESOURCES OF VERY SMALL TROPICAL CARBONATE ISLAND OF AGATTI IN THE ARABIAN SEA <i>JOJI, VS</i>	43
33	KN14	SURFACE AND SUBSURFACE WATER QUALITY OF INDIA <i>DR. DIPU SUKUMARAN</i>	44
34	PP20	COVID-19 LOCKDOWN IMPACTS ON HEAVY METALS IN SURFACE WATER OF KARAMANA RIVER BASIN, SOUTHWEST INDIA: HEAVY METAL POLLUTION INDEX AND GEOSTATISTICAL PERSPECTIVE <i>S.P. PRASOOD, M.V. MUKESH, K.S. SAJIN KUMAR, REJI SRINIVAS, R. LAKSHMI, N.R. CHRIPS AND THRIVIKRAMJI, K. P</i>	46
35	PP21	GROUNDWATER RESPONSES TO INDUCED RECHARGE FROM ARTIFICIAL CANALS. <i>DR. RAICY M C AND DR. R D DESHPANDE</i>	48

36	PP22	GROUNDWATER QUALITY ASSESSMENT OF URBAN AND PERI URBAN WATER REGIMES OF ERNAKULAM DISTRICT USING VARIOUS WATER QUALITY INDEX MODELS <i>SABITHA, A. R AND GIRISH GOPINATH</i>	49
37	PP23	HYDROCHEMISTRY AND GROUNDWATER QUALITY ANALYSIS IN THE TUNGABHADRA RIVER BASIN, INDIA <i>ANJU LAL, T.M. VISHNU MAYA, R. RAJALEKSHMI, G. RIJULAL, V. ARUN, A. KRISHNAKUMAR AND K. ANOOPKRISHNAN</i>	50
SESSION X: URBAN LANDSCAPES			
38	PP24	URBAN SEWAGE CANALS AS POTENTIAL BIORESOURCE OF TUBIFEX WORMS FOR AQUARICULTURE: A CASE STUDY OF AAMAYIZHANCHAN THODU OF THIRUVANANTHAPURAM CITY, KERALA <i>KURIAN MATHEW ABRAHAM</i>	51
39	PP25	URBAN HEAT ISLAND WITH SPECIAL REFERNCE TO KOLKATA: A GENERAL OVERVIEW <i>SK MOCKBUL ALAM</i>	52

MANGROVE DISTRIBUTION MAPPING IN KANNUR DISTRICT OF KERALA, USING GEE AND GIS TECHNIQUES.

Maha Madhu, Rohini P and Ayona Jayadev

*Department of Environmental Sciences, All Saints College, Thiruvananthapuram, Kerala, India.
mahalegend@gmail.com*

Mangrove forests play a pivotal role in the protection and maintenance of coastal shorelines of tropical and subtropical regions. Mangroves are well reputed for their ecological and economic contributions in the form of protection from coastal attrition, enacting as the breeding and feeding grounds of aquatic beings and execution of water and air purification functions. Being such a valuable biological resource and its highly sensitive nature, the need for implementation of its conservation measures has become an ineluctable task. As per the existing studies and reports, it is evident that the mangrove spread in the Kannur district of Kerala is facing heavy threats from the extensive and fast-developing shrimp farming and Kaipad (paddy) cultivation in the region. As an initial step towards conservation and threat analysis, it is important to develop a better understanding of the landscape distribution of the mangrove ecosystem, which can be achieved by employing periodic mapping and monitoring in the most cost-effective and time-conserving manner. This study aims to opt for a low-cost remote sensing perspective using Google Earth Engine and QGIS platform for the spatiotemporal mapping and monitoring of mangrove spread in the Kannur district of Kerala. The approach mostly relied on Random Forest Classifier, Spectral Indices (NDVI, GCVI, NDDWI) and Band Ratios. Landsat 7 and 8 images for 2009 and 2022 respectively, were taken for analysis and comparison study. The accuracy assessment for the study was performed using ArcGIS platform with the aid of field-derived data. The results of the overall analysis shall provide insights into the current mangrove extent of the study area, thus facilitating the research and environmental communities to take appropriate and prompt actions for the conservation procedure.

Keywords: Mangrove ecosystem, Landsat images, Google Earth Engine, ArcGIS, Mangrove extend mapping, Coastal Attrition, Remote Sensing, Change detection, Spatio-temporal Analysis, Random Forest Classification, Spectral Indices, Band Ratios, Accuracy assessment.



INTERNATIONAL AND INTER UNIVERSITY CENTRE FOR NATURAL RESOURCES MANAGEMENT
&
DEPARTMENT OF GEOLOGY
UNIVERSITY OF KERALA

