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ABSTRACT VOLUME



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5th ANNUAL INTERNATIONAL CONFERENCE

on

"Challenges & Solutions for a Sustainable Environment"





Presents

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on

“Challenges & Solutions for a Sustainable Environment”

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Venue: Suresh Gyan Vihar University, Jaipur, (Raj.), India



His expertise, unbiased advice and ability to create a relaxed working atmosphere while still upholding demanding standards make him a much most admired mentor among the employees. His thought provoking speeches have influenced thousands of minds. He holds amazing knowledge in every sphere. He is a man of great substance, integrity, social values and vision. Being a disciplinarian, he also possesses great human resource skills essential to lead an organization.

Perspective

The uniqueness of Gyan Vihar will be apparent as you go through these pages. The feedback of our alumni and students will provide insight into their experiences. These experiences comprise of all our programs which include education in a broad spectrum of career building. I invite you to review this information and learn about our approach to achieve the highest quality in higher education.

At the core of this approach is our commitment to values which have characterized Gyan Vihar since its inception in 1994. We believe that success in career is important, but so is success in life. In addition to providing superior knowledge, skill development and opportunities to gain hand-on experience, education at Gyan Vihar is permeated by values. Operating ethically and with a passion for high principles is a powerful career strategy.

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aspects of our community. Another competitive advantage is our state-of-the-art infrastructure. Our facilities enhance our global reach and our ability to teach without limits. Additionally, working in a serene, spacious place truly fosters the ability to focus, dig deep and strive to do one's best. We are an undisputed leader in bringing global perspectives to our classrooms and will continue to expand our presence. This publication is about the worth of Gyan Vihar degree and the special and unique experience you'll have as one of our students. I believe strongly in the University and its ability to create and inspire tomorrow's leaders. Once you are here, you will too.

Sunil Sharma

Chancellor, Suresh Gyan Vihar University Chairman,
Gyan Vihar University



Perspective

From our selection process to the classroom and beyond, we focus on working with people who are dedicated to be holistic professionals with well developed leadership abilities. Among very bright, ambitious applicants, we Select those who know the value of balanced preparedness and then we devote ourselves unconditionally to their Success.

Gyan Vihar has a well-earned reputation as a curricular innovator. We understand the difference between concepts whose relevance may not endure and the lasting ability to think and solve problems logically as well as analytically, and maintain high ethical standards.

Our students are involved in every aspect of our programs as leaders and as sources of constructive review. Their input helps us assure that we understand their needs and truly fulfill their objectives. Through their involvement, they shape our program while they chisel their leadership skills, complementing what we teach.

As diverse as they are exceptional, our students come from across Rajasthan and around India. Likewise, our focus is global, we have been helping our students compete in a global environment from their beginning.

Our placement cell is one of our integral strengths. Once our students graduate, they want to put their skills, talents, and leadership abilities to work. It is staffed by extraordinarily devoted people who help our students make vital connections to careers and internships, and provide a host of other opportunities for professional growth.

Our commitment to our students doesn't stop at the classroom door, nor does it end when they graduate. Our culture is collegial because our students are partners in the learning process. This culture also underlines our students' interactions with each other and with our alumni, who gladly make themselves available as guest speakers, networking contacts, and sources of inspiration and guidance.

As Chief Mentor, I'm committed to uphold Gyan Vihar traditions while keeping our program focused on building well-rounded, mature and thoughtful, poised career leaders who can compete and succeed wherever they choose to apply themselves.



Dr. Sudhanshu, the co-founder of Suresh Gyan Vihar University was born on 19 February, 1969. An Indian educationist and polymath: geologist, writer, thinker, photographer, and environmentalist; his invaluable contribution to transforming Gyan Vihar University into a world class institution goes beyond words. Besides being a great academician, Dr. Sudhanshu is a think-tank in himself who is resolute in his efforts to making the world greener and a better place to live in. With over 25 years of experience in successfully administering various educational organizations, his persona mirrors honesty, empathy, consistency, direction and conviction; the making of a visionary and a great leader.

Dr. Sudhanshu

Chief Mentor, Suresh Gyan Vihar University
Suresh Gyan Vihar University



President's Message

Welcome to Suresh Gyan Vihar University!

21st century is going to focus on ultra technology, which would be efficient, fast and change the style & quality of life. India has highest population of youth in the world and is going to be a big resource for the economic growth of India and globe. However, it is widely accepted fact that our graduates and post-graduates have poor employable skills due to isolation of academia and industries and it is further widened by the poor industrial exposure of the faculty. Therefore, Suresh Gyan Vihar University is having a strong interface with various industries, corporate houses & research laboratories for tapping faculty of high repute and regular interaction to pace our students with latest requirements of the industry. A few to list are Google, Bosch Rexroth, Amazon, UR Energy, Sun Group BSE etc. We focus on building a career, not a job seeker, by providing essentials career skills in project management and communication to enhance employability and satisfaction.

A professional infrastructure combined with ergonomically designed transaction theater, industrial required laboratories with innovative pedagogy like problem based learning, interactive seminars, brain storms, pre-practicum formulation etc. provide an academic learning environment to the students. To ensure the best academic environment, industrial exposure and to meet your dreams and expectations, SGVU has designed a Mission 20 Points to succeed. To facilitate international exposure the university has collaborations with universities across the globe. It is very important to mention that within a span of less than 10 years, in the year 2017, the university has been awarded 'A' grade by National Assessment and Accreditation Council (NAAC), an autonomous institute of the University Grants Commission and became first private university in the state of Rajasthan, which proves our dedication towards academic excellence. I can assure that my more than a quarter century exposure in academics & industry at national and international level would be able to meet your dream, expectations and shape your career. I welcome you as a part of Gyan Vihar Family and wishing a grand success in your life.



Prof. (Dr.) Dharam Buddhi

President, Suresh Gyan Vihar University
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Crop Residue Burning: Impacts on Air quality, Health and Climate Change Modelling using Geospatial Technology: A Review

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ABSTRACT

Crop residue is a common source of air smog and poor air quality, which has adverse impacts with immediate short-term and long-term effects on human health at local, regional and global levels. Recently, crop exercises use mechanical harvesting machines in Indian rice and wheat farming systems. In the field of these methods, leave a large amount of plant residues. Burning the remains of the crop, there is a general view of destroying garbage after harvesting around the world. Crop Residue burning (CRB) is an important air pollution cause, with local, regional and global effects on air quality, public health and climate. Globally a broad range of studies has been conducted on almost all the aspects of CRB, including its particular types, on quantification of emissions and on calculating its numerous impacts. Hence, the object of this research is to studies published on related topic, articles, including literature relating to field measurements, laboratory studies and the impacts of CRB. Further, this review provides visions into the role of CRB and wildfire on air quality and health worldwide. The MODIS on-board the Terra (EOS AM-1) and Aqua (EOS PM-1) satellites is important tool for identification of the CRB activities over the globe. The MODIS (Terra +Aqua) retrievals provide daily global aerosol optical depth (AOD), fine mode fraction (FMF) and Angstrom exponent (AE) over land. Based on comparative study between AOD vs FMF and AOD vs AE, several researchers have examined the aerosol types for example urban/industrial, CRB, dust, urban mixed etc. This review emphasis on literature findings concerning CRB emissions, the impacts on air quality, health and climate change. In addition, its threats to atmospheric environment and climate change.

Keywords: CRB, Geospatial Technology, Crop Residue, MODIS, Air Smog, Air Quality;



Spatial Dynamic Change Of Forest Cover Of Bageshwar District (2000-2016) Using Google Earth Engine (Gee)

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ABSTRACT

Forests are subjected to gradual change due to anthropogenic as well as natural activities so monitoring of forest cover change on continuous basis has been of paramount importance as it affects the global environment, but now monitoring of forest cover change has been greatly aided by the use of remote sensing technology. For the present study mapping of forest cover in Bageshwar district of Uttarakhand for the period of over 16 years have been done using Google Earth Engine (GEE), ArcGIS and R statistical language. Satellite images from landsat 5 and 8 were used for supervised classification using GEE. The change detection map was produced by differencing classified images of 2000 and 2016, respectively. The result from the change detection has shown that forest area has increased by 4.5 % within the above mentioned time period. Analysis through GEE has been a great asset in the emerging field of Remote sensing as the major advantage of using GEE is that it facilitates free access to archive of satellites imageries with temporal resolution for the analysis at global level. The demonstration of forest cover change through supervised classification for the Bageshwar district using GEE has shown a satisfactory results but because of some exceptionality regarding the accuracy assessment and other mapping purposes software's like ArcGIS for visualization and mapping and R statistics were used for accuracy assessment.

Keywords: Google Earth Engine (GEE), supervised classification, R statistical language, Change detection.



Urban Flood Management Using of Remote Sensing & GIS techniques –A Literature Review

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ABSTRACT

Flooding is a common natural hazard and causes major disruptions in cities & lead to noticeable damages on human lives, properties, and the environment. These damages may be aggravated by socio-economic and climate changes. Nowadays urban flooding is a much-known event in the world and in India. Due to the uneven distribution of rainfall together with the uncontrolled growth of urban areas, lack of proper drainage system, encroachments on storm drains, decreasing of wetlands etc. Using Remote Sensing & GIS for flood management, damage can be reduced. In the recent years Remote sensing technology coupled with geographic information system (GIS) has become the key tool for flood monitoring & management. GIS in flood management helps to map flood hazards of vulnerable areas and delineates flood zones are core attention areas. Advancement in this field has grown from optical to Microwave remote sensing, which has provided flood mapping capability in all weather conditions. In flood hazard mapping and management, most crucial parameter is flood depth and to estimate flood depth from remotely sensed or hydrological data, digital elevation model (DEM) is considered as a most effective means and the accuracy of flood estimation depends on the better resolution of Digital elevation model. This paper highlights the review of remote sensing & GIS techniques, methodologies and models use for urban flood management in various cities. These techniques have provided a scientific approach for city planners and decision makers to manage flood risks more efficiently.

Keywords: Remote Sensing, GIS, Digital elevation Model, urban flood management etc.



Mapping The Social Landscape Through Social Media

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ABSTRACT

Being a habitat of the global village, every place has established connections through the strength and power of social media, piercing through the political boundaries. Social media is a digital platform, where people across the world can interact. This has a number of advantages of being universal, anonymous, easy accessibility, indirect interaction, gathering and sharing information as compared to direct interaction. The easy access to social networking sites such as facebook, twitter and blogs brought about unprecedented opportunities for citizens to voice their thoughts and opinions loaded with emotions. Furthermore, social media can influence human thoughts where social media relatively more active. A recent incident of public importance had presented an opportunity to map these emotions, involved around it. Emotions were extracted through tweets for a week. These emotions were classified as positive, negative and neutral, and were mapped in GIS environment. It was found that the number of tweets had diminished by 91 % from 25/08/2017 (beginning of observation) to 31/08/2017 (end of observation). A boom of sentiments emerged near the origin of the case, i.e., Haryana and nearby areas i.e. Delhi, Punjab which came as a spill over effect. The trend of sentiments was prevailing more as neutral (45.37%), negative (28.6%) and positive (21.6%) after calculating the sentiment scores of the tweets. Interestingly, the tweets were also were coming from unexpected places such as USA, UK, West Asia. The result can also be used to assess the spatial distribution of digital penetration in India. Highest concentration was found to be in and around big metropolitan cities i.e. Mumbai, Delhi and lowest in North East India and the state of Jammu & Kashmir.

Keywords: Sentiment mapping; Digital Literacy; GIS; Spillover effect; spatio-temporal analysis



Climate Change and its Impact on Temperature and Rainfall of India: An Overview

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ABSTRACT

Climate change is perhaps the biggest challenge faced by the world today and the very existence of human depends on how effectively this challenge is tackled. There are explicit evidences that atmospheric temperature has been gradually increasing since the beginning of the industrial revolution in 1850's. The Intergovernmental Panel on Climate Change (IPCC) concludes that most of the observed temperature increases since the middle of the 20th century is caused by increasing concentrations of greenhouse gases in the atmosphere resulting from human activity such as fossil fuel burning and deforestation. It also mentioned that the impact of emissions caused by anthropogenic activities on climate is unequivocal. The world community especially developing nations like India is at high risk due to climate change. Present paper gives an overview on the global climate change, the reasons behind climate change, the relationship between CO₂ emission and temperature rise and its immediate effect on Indian climatic factors (temperature and rainfall). Temperature and rainfall both play an important role in shaping the economy of an agricultural based country. The variation of these factors from normal has been discussed in this study. The role of climate change in this variation has also been tried to figure out.

Keywords: Climate Change, CO₂ Emission, Temperature and Rainfall



Analysis Of Stability Of Cohesionless Soil Under Varying Slope And Moisture Content

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ABSTRACT

Slope stability analysis deals with the analysis for the safe design of human made or natural slopes for example river levee, road, open pit mining, excavations, landfills etc. and the equilibrium conditions. The failure of any kind of slope has huge effect on human life and nature. The main objectives of slope stability analysis are finding endangered areas, investigation of potential failure mechanisms and determination of the slope sensitivity to different triggering mechanisms, designing of optimal slopes with regard to safety, reliability and economics, designing possible remedial measures like protection or stabilization by any suitable techniques. The stability analysis of the model bank for two initial moisture content 13%, 3% and for two slopes of 1V:1.8H and 1V:1.5H have been carried out by both experimental and classical analysis by limit equilibrium method (LEM). In this work the experimental model study has been carried out to have an inside of the actual effect of water level drawdown or stability has been observed and the FOS to measure the stability has been evaluated by using strength reduction method (SRM) and for the validation purpose of the result the same model bank has been analyzed using LEM.

Keywords: Slope, Natural slope, SRM, LEM, FOS



Geospatial Approach for Delineation of Artificial Recharge Sites in Gandheswari Watershed, West Bengal (India)

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ABSTRACT

Artificial groundwater recharge plays a vital role in sustainable management of groundwater resources. The present study was carried out to identify the artificial groundwater recharge zones in Gandheswari watershed using remote sensing and geographical information system (GIS) for augmenting groundwater resources. The study area has been facing severe water scarcity due to intensive agriculture for the past few years. Morphometric parameters are analyzed to understand the watershed characteristics and its influence on the water resources for instance bifurcation ratio indicates high surface runoff and low recharge. Low drainage density showing permeable strata, dense vegetation and low relief. Whereas, slope, geology and geomorphological mapping is done to demarcate groundwater potential zones for future exploration in the study area. Slope is inversely proportional to infiltration. Based on AHP various ground water potential zones are found like excellent, very good, good, poor and very poor zones are delineated. At the end, final delineation of artificial recharge sited selection is based on the soil type, slope, drainage order etc. The integrated study helps in designing suitable sites for constructing water harvesting structures. Check dams, percolation tanks and Nala bund are proposed at 1st, 2nd or 3rd drainage orders at Micro Basins with pediment. Nala bund and check dam are proposed at MB-2 and MB-4 whereas, at MB-3 check dams and percolation tanks are proposed so as to conserve the natural resources present in the watershed. Finally, the best feasible water harvesting structures have been proposed within the watershed area using remote sensing and GIS techniques.

Keywords: AHP, Artificial Recharge, Geospatial, GIS, MCDM, Remote Sensing



Site Suitability Analysis for Solid Waste Dumping Using Remote Sensing & GIS Techniques To Reduce And Manage The Urban Environment Pollution Of Ranchi City, Jharkhand

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ABSTRACT

The industrial, municipal and house hold solid waste produce lots of environmental issues in urban and rural areas, being one of the major sources of environmental pollution on the Earth's surface. Due to rapid urbanization coupled with increasing industrial, commercial and economic development, have given rise to an increased generation of various types of waste. This work demarcates the suitable sites for solid waste disposal using Remote Sensing & GIS of an urban environment of Ranchi City. Several factors have been considered in site selection for solid waste disposal. Using different parameters in weighted overlay analysis tool in Arc GIS software a final solid waste dumping site map has been prepared. The parameters being road network, railways, drainage, urban, vegetation, soil, geology, slope, and land use/land cover have been analyzed for suitable site selection. The final result indicates three classes in the study area (Restricted, Suitable and Highly Suitable). The restricted area covers 205 sq.km (66.97%), suitable area covers 52 sq.km (19.77%) and highly suitable area covers 40.08 sq.km (13.26%) of the total study area. These potential sites are economically and environmentally suitable for solid waste dumping to reduce the environmental problem in Ranchi city.

Keywords: Geographic Information System (GIS), Remote Sensing (RS), Site Suitability, Solid Waste Management, Multi-Criteria, MSWM, SMCDA, Weightage Overlay Analysis.



Multi Criteria Analysis For Flood Risk Assessment Using Remote Sensing & GIS Technique-A Case Study of Damodar River Basin

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ABSTRACT

Flood is a natural hazard occurring on the Earth's surface when water overflows the bank and spreads over the flood plain causing harm to the residents, crops and vegetation. GIS, Remote Sensing and Modelling technology are used in formulating models for flood hazard monitoring, risk analysis and identification of flood risk zones for the planning and management of this natural hazard. The flood risk assessment of Damodar River Basin lying in districts of Jharkhand, Bihar and West Bengal in India, was prepared using multi-criteria analysis involving the weighted overlay of LU/LC, drainage density, soil, rainfall, slope and geological parameters. The total area of 23,370.98 sq.km is divided into four flood risk zone, namely no flood risk, low flood risk, moderate flood risk and high flood risk zone. According to the final output flood risk map no risk zone covers 6,472.19 sq.km (27.69%), low risk zone covers 3,341.02 sq.km (14.30%), moderate risk zone covers 12,647.48 sq.km (54.12%) and high risk zone covers 910.29 sq.km (3.89%) of area. According to the evaluated statistics 40% of the total area of Bihar in the study area comes under no risk zone. A major area of low flood risk zone is present in Jharkhand which is 15.80% of the total area of Jharkhand in the study area whereas in Bihar it comprises 6.23% of its total area in the study area and in West Bengal it covers 11.02% of its total area in the study area. In West Bengal 68.63% and 20.35% of the total area of West Bengal in the study area comes under moderate flood risk and high flood risk zone respectively.

Keywords: Remote Sensing, GIS, Multi-Criteria Analysis, Weighted Overlay, Flood Risk Modelling, Flood Risk Zone.



Groundwater Potential Zone Identification and Water Quality Assessment using Geospatial and Multi-Criteria Decision Analysis Techniques in Guna District, Madhya-Pradesh: A Review

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ABSTRACT

In 21st century, water quality problem is one of the most serious questions that affected human health and social development. In this context, it is necessary to evaluate water quality for drinking purposes. Safe drinking water is one of the basic human rights. This is undoubtedly having a great significance to human health and social stability. Groundwater is an important source of freshwater. Freshwater scarcity, caused by overexploitation, pollution and climate change is one of the primary challenges of human society. While scarcity of freshwater resources already constrains development and societal well-being in many countries. It is very important to reasonably develop and utilize groundwater resources in an area because groundwater resource is linked mainly with drinking purpose and different sectors. This paper has discussed about the review of literatures in the field of groundwater studies using Remote Sensing & GIS and other Multi-Criteria decision analysis techniques, groundwater recharge, aquifer parameter studies, quantitative assessment of groundwater, statistical modeling of groundwater fluctuation, groundwater management and groundwater quality. The literature review indicates that most of the techniques/logics/models/methods used in the past years for exploring the groundwater potential zone like Geospatial techniques, Analytic Hierarchy Process (AHP), Analytical Network Process (ANP), Fuzzy Logic techniques, Weighed Index Overlay Analysis (WIOA) etc. The Purity of water or drinking water quality can be identify by using some standard water quality testing parameters viz. Physical, Chemical and Microbial. From the review of research papers it is evident that lot of research has been carried out in the above fields. Their analysis could be used for our study area to assess the groundwater both quantitatively and qualitatively as it requires exploring the groundwater potential to overcome water scarcity or overexploitation in the study area.

Keywords: Remote Sensing, GIS, Ground Water Potential Zone, Water Quality, AHP, ANP, Fuzzy Logic, WIOA etc.



Water Balance Assessment using Geospatial techniques in Shivpuri district of Madhya-Pradesh: A Review

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ABSTRACT

Water is a precious natural resource and at the same time complex to manage. Due to the ever-increasing demand on water resources, the pressure on its judicious utilization is also increasing. Besides being precious, this resource is also complex to manage on account of its dynamic behaviour. Water balance analysis for estimation of the supply/demand scenario, integrated geospatial approach plays very important role in worldwide research. Water balance is based on the law of conservation of mass which states that any change in the water content of a given soil volume during a specified period must equal to the difference between the amount of water added to the soil volume and the amount of water withdrawn from it. It helps to quantify the relationships between precipitation, surface and groundwater runoff, evaporation, evapotranspiration and aquifer drafts, and provide a framework for future planning of sustainable exploitation of the available water resources. This paper has discussed about the review of literatures in the field of water balance assessment. The water balance of a place, an agricultural field, watershed, or a continent can be determined by calculating the input, output, and storage changes of water at the Earth's surface. From the review of research papers it is evident that lot of research has been carried out and lot of models such as SWAT, TM, GRACE, MIKE SHE etc. have been developed for the evaluation of water balance assessment. Their analysis could be used for our study area to assess the water balance analysis for estimation of the supply/demand scenario viz. evaporation, evapotranspiration, surface runoff, crop water requirement, inflow, outflow and change in water storage as it requires exploring water balance components to overcome over exploitation or water scarcity in the study area.

Keywords: Water Balance, Remote Sensing, GIS, Evaporation, Evapotranspiration, Surface Runoff etc.



Accounting Forest Carbon Sequestration using Integrated Geospatial Techniques

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ABSTRACT

Forest aboveground biomass (AGB) serves as a vital ingredient for global climate change policy making. It serves as an indicator of climate change in term of carbon sequestered in forests and act as a key constituent in the carbon cycle that moderates the global climate. Hence, monitoring the carbon dynamics becomes extremely important in terms of ecological services. Remote Sensing is an advanced tool for suitable and accurate measurements of forest AGB on a regional scale. The study targets in the assessment of forest AGB over the mixed deciduous tropical forests of Bhimbandh Wildlife Sanctuary in Bihar (India) using forest-based inventory and integrated geospatial approaches to develop a regression model based on the statistical correlation between AGB measured at plot level and the associated spectral parameters derived from IRS P-6 LISS III sensor. AGB map is generated from the best-fit model in GIS platform following the top-down and bottom-up inventory approach, which is further converted to carbon map using standard carbon conversion factor. The methodology adopted helped in developing a robust yet simple approach in proper accounting of forest sequestered carbon in terms of AGB using integrated geospatial techniques. Hence, the study recommends the combined use of information generated from both the field-based forest inventory and geospatial approaches for better assessment of stand biomass with significant contribution towards operational forestry and climate change studies, in context to REDD (Reduced Emissions from Deforestation and forest Degradation)/REDD+ regimes for measuring and monitoring the current state and dynamics of forest carbon stocks.

Keywords: Carbon, Biomass, Forest, Multiple Linear Regression, Remote Sensing, GIS



Urbanization vis-à-vis Groundwater Prospects in Coastal Environment of Visakhapatnam Township (India) Using Geo-informatics

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ABSTRACT

Growing urbanization in coastal area is causing major threat to rich biodiversity of such region. Increasing urbanization may change groundwater hydraulics in coastal area due to interaction of fresh & saline water. Climate change may trigger some impact in coastal urban environment due to coastal flood or cyclone which also need assessment of town planners. Ground water is highly valuable source of water because of its unique properties which may not be possessed by surface water. Most of the water is being utilized by man for domestic and industrial purpose. Water can be obtained from various sources among which are the streams, lakes, rivers, ponds, rain, spring and wells. Ground Water a part of the rain water reaches the earth surface and percolates into the earth. The studies has focused on the utility of remote sensing and GIS in the identification of ground water potential zones and build up area expansion over four decades (1975-2015). Satellite imagery proved to be highly useful characterization for delineation of urban build up area from 1975 to 2015 with Landsat series (1-5) data, and high resolution google imagery. Satellite imagery proved to be highly useful in terrain characterization, i.e. in mapping of different groundwater controlling parameters for the occurrence and movement of groundwater such as geology, geomorphology, land use/cover drainage, etc. The groundwater prospects map has been prepared by integrating the Geology, Geomorphology, land use and depth to water table maps using Index Overlay Model in the GIS domain.

Keywords: Urbanization, Climate change, Coastal Environment, Remote Sensing, GIS, Geomorphology



Water, Water Everywhere, But not a drop to Drink-Negotiating Access to Clean Water, and Sanitation as an SDG Agenda in LMICs

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ABSTRACT

Access to Safe and clean drinking water has been realized as a deeply felt need across communities in different parts of the world. Especially, in developing economies which are historically resource-constrained, access to clean water is an ignored need. This is complicated especially due to rapacious demand of material development (e.g. rapid urbanization, greedy industrialization, and material accumulation of wealth and resources), creating wider disparities and divide in developing economies, and LMICs in particular. Although UN and such other development agencies boast of their achievement related to Water and Sanitation, reality is quite strikingly different. However, it is also recognizable that a context which does not offer adequate space for co-habitation may be further limited by different limitations as far resource allocation, and equity in access to resources are considered. In order to set the context for a need assessment, we conducted a pilot study on clean water and sanitation and how do young students relate to this deeply entrenched issue in Indian society. A mixed method research with 4 FGDs and a focused 'Attitudes towards Sustainability Scale' with α .90 were conducted on 325 students in 2 Universities of East India-Odisha. Quantitative and Qualitative data were analysed for, collated, complemented and integrated to come out with core thematic insights. A detailed analysis suggests that: i) 92% of the youth feel that Access to Clean and Safe Drinking water is a Human Right, and must be included and addressed as an SDG agenda; ii) However, they do feel dissatisfied with how Governments and ULBs are providing water, especially related to water quality, etc.; iii) They also expressed grave concerns related to inequity which persists related to access of clean water to all, especially those living in poorly resource constrained contexts such as slums, rural areas, small towns, and remote locations like areas with heavy ST concentration, etc.; iv) When explored on the role of students, they did point out on a multi-sectoral and multi-stakeholder integration and partnership for realization of this chronically neglected need, but were little uncomfortable to identify strategies for doing so, especially in increasing equity(e.g. access, and inclusion). Water and Sanitation was a deeply felt need in this pilot. Increased concentrated and judicious effort need to be made in order to achieve goals by the Governments and ULBs, with joint stake-holdership with the local community for increased participation.

Keywords: ULB, SDG, LMIC, Clean Water, Sanitation



An Experimental And Numerical Investigation of Uplift Capacity Of Single Piles And Group Piles in Cohesion-Less Soil

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ABSTRACT

A number of analytical, numerical and physical research works on uplift capacity of pile have been reviewed prior to undertake this experimental programme. It has been realized that still there is numerous scope of research to find out optimum design criterion of pile under uplift load. In the present analysis vertical single and group model piles made of steel have been used to carry out investigation of uplift capacity by varying the number of piles in group, depth of embedment to diameter ratio (L/d), and relative density of foundation soil. From the experimental results it was found that the net uplift capacity of single piles increased significantly with an increase in both the L/d ratio and relative density of soil. Whereas, the efficiency of the pile group under uplift loading decreases with the increase in L/d ratio and also with the increase in the number of piles in the group. The efficiency increases with an increase in the relative density of the soil for both single and group piles. A numerical analysis of the model piles with the same parametric variation has been carried out using PLAXIS-3D software. The results obtained from the numerical analysis meets the same trends as obtained from the experimental results.

Keywords: *Embedment ratio, group efficiency, Plaxis-3D, relative density, uplift capacity*



Perception Of People Towards “Delhi's Smart City” A Case Study

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ABSTRACT

In 2014 Modi government came in power with 31% vote share. Mr. Narendra Modi is still most popular politician in India. Smart cities mission is one of the dream projects of current central government or Modi government. Targeting to develop 100 smart cities across country which could suit or sustainable for citizens. Modi government's urban development ministry is also thinking and optimistic that will reduce load on big cities of India. For this mission, ministry has started working on it and many proposals are being invited. As we know New Delhi is capital of India and it has many facilities like Hospitals, Schools/Colleges, Airports etc...It would be very interesting to see what is the perception and expectations of public of Delhi towards DELHI- SMART CITY?

Keywords: Smart City, Government, Survey and Questionnaire



Land Subsidence Monitoring In Raniganj Coal Mines Area Using DInSAR Technique

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ABSTRACT

For monitoring land subsidence in mining area DInSAR (Differential Synthetic Aperture Radar Interferometry) technique is used. The study area is selected in the Raniganj coal mine area located in Bardhaman District, West Bengal, India, and Sentinel-1 data were used to carry out DInSAR technique. Since Raniganj coal mines is the oldest one in India and many areas are affected in this region due to land subsidence that's why this area is selected for this study. We analysed the interferometric results by Sentinel-1 data from December 2014 to November 2017. We using SNAP (Sentinel Application Platform) software for data processing. The condition of the mine subsidence monitoring results is mainly constrained by the noise due to the spatial and temporal decorrelation between the interferometric pair and the phase discontinuities in the interferogram. The procedure is an advanced technique (DInSAR) that generates deformation maps and time series of deformation from multiple SAR images acquired over the same site. Through the comparison of the pictorial results of DInSAR technique and the location of the mine on the optical images, it can be concluded that DInSAR technique can be used in effectively monitoring of land subsidence caused by underground mines, and it may act as an effective tool for law enforcement of over-mining.

Keywords: DInSAR, Sentinel-1, SNAP, Remote Sensing



The Multi Aspects Of The Stone Industry In India: A Critical Review

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ABSTRACT

The impact of the industrial revolution can evidently be realized in India through its several flourishing industries that have ever since drawn the researchers and scientists associated with several fields. The stone industry is one of the most flourishing industries in India that adds a lot to the economic development of the country through the export of the stone inland and all over the world. It has raised several issues that need to be analysed, reanalysed, answered and solved for the sake of the public welfare. Obviously, like the other industries, it too has its own merits and demerits. Positively speaking, it adds to the revenue of the government, generates employment in both the private and the public sector, and provides opportunities of investment to the capitalists and industrialists. Negatively speaking, it is horribly polluting the environment, causing adverse effects on the health associated with it, and forcing the male and female workers to work under unhygienic and adverse conditions. Despite all this, it is the demand of time to promote the stone industry in India. Rajasthan in India is incredibly rich in its mineral resources. There are several places which are known for the manufacturing and export of stone. Some of them are Makrana, Jodhpur, Kishangarh, Dholpur etc. Several types of stone are manufactured in Rajasthan, such as, the sand stone, marble, kota stone, red stone etc. The research paper aims at presenting a critical review of the literature associated with the multi aspects of the stone industry in India.

Key Words: Crushing units, Economic development, Natural Resources, Pollutants, Revenue, Hub of stone business, Economic factor



Water Resource Management As The Basis Of Conflicts In The Indus Basin

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ABSTRACT

During the course of history various developments took place in the Indus Basin in order to increase its utility for the prosperity of the region and then came the era known as the British Raj where water resource management in the Indus Basin was carried out not for the welfare of the region but to benefit their own markets. The aim of this paper is to map the various techniques that were engaged during the British rule that in one way enabled to increase the utility of Indus Basin manifold but eventually becomes the basis of water conflicts between different geographical regions of the subcontinent. This paper enables to have an overview of various cunning efforts put by our colonial masters which had become the cause of various water related conflicts in the Indus basin.

Keywords: British Raj, Indian Subcontinent, Indus Basin, Water Conflict, Water Resource Management



Hawker's Rehabilitation Planning In The Metropolitan City (Ludhiana) ¹Harcharan Singh

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ABSTRACT

According to a general definition, “Metro city is a huge size of urban area with population above 1 million within city limits and which have all major facilities like as Railways, Bus terminals, large roads network with other cities, rural areas and towns”. E.g. Ludhiana with its population 1,611,932 as census 2011. Street Hawkers or Street vendors are the most visible section of the informal economy. Street hawking as a profession, which has been existing in India since immemorial years ago or time. Street hawkers are the people who are mainly unemployed, under BPL, lack the level of education and lack of the skills required for better paid jobs. For these people, hawking/street vending is one of the means of earning a livelihood, as it requires minor financial input and the skills involved are low and also no age entry level barriers in this job (**Chandigarh Street Vending Report, 2016**). More than 90% of the workforce in our country is involved in the informal sector, which contributes about 63% to the country's Gross Domestic Product. According to the Ministry of Housing and Urban Poverty Alleviation, “there are 10 million street vendors in India, roughly 2% of urban population”. A hawker also has prominent place in the urban areas like as pavements and provides inexpensive and convenient access to goods and services to all phases of the population. The study is basically concerned with the broad understanding concept of the socio-economic profile of hawkers or street vendors and the process that how to integrate them in the process of urban development and various issues created by the hawkers related to their informal/vending activities at various places in Metropolitan city. The understanding of the existing situation of hawkers is expected to give detailed practical solutions of the whole process of integrating of hawkers in a fast growing town like as Ludhiana. The many well-known locations of hawkers (vending sites) were identified through transect walks and by using geospatial technology, due to which many problems are taking birth in the Metropolitan cities by affecting the traffic and transportation. Few case studies are taken for an in depth understanding of certain complex issues like a case study of Chandigarh and Jalandhar etc. Solid Waste management is a very important part of hawking activity. It's the responsibility of hawker to pay attention to the public health and maintain the hygiene environment in the vending zones and vendors market in the concerned adjoining area. For this Hawker shall keep a waste collection basket in the place of vending. Further hawkers contribute to promote the collective disposal of the waste in the vending zones. The availability of the public toilets should be the priority for Vendors (Especially in the theme based market) and public near vending zones to make the vending zone and its adjoining area clean and hygienic fit for the vending activities.

Keywords: Geospatial Planning technology, Google earth, QGIS, AutoCAD.



Vanishing water sources and rural water security in the face of climate change: Experiences from Sikkim Himalaya

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ABSTRACT

Springs are the major source of domestic and agricultural water for rural mountainous communities' in the Himalayan region. In recent years their flow rates have diminished which is attributed to improper watershed management and natural stress like Climate change. Today, Climate change is termed as the wicked problem gripping the entire world and its resources. Small streams and springs from various part of Sikkim Himalaya are showing signs of decreasing discharge. The paper will attempt to access the status of springs in Upper rangit basin in the face of climate change for rural water security. Field visit along with extensive springs and household survey was conducted in 2016-17 accompanied by Focussed Group Discussions (with farming community). It was found that local farmers perceive climate change as a real phenomenon which is affecting local water supply and agriculture adversely. About 50% of springs reported decreased water discharge and 30%-40% had dried up over the past 30-35 years (1980-85). Also the small tributaries (known as kholcha's) have started drying up post monsoon with average discharge reduced up to 60%. Combination of bio-physical attributes like climatic variability and land use and socio-economic factors like improper maintenance has led to drying up of springs. Such water sources play a pivotal role in local water and food security, which is under stress. Therefore, drying springs and water scarcity issues necessitates the need to increase the understanding of spring hydrology, with special reference to Sikkim Himalaya. In response to increasing stress initiatives like artificial water tanks at water sources, lying proper plastic pipes for transporting portable drinking water, diverting water from other springs (during excess rainfall) and ground water recharge are being taken up. In addition to enhance drinking water supplies, ensure agricultural and water security initiatives such as comprehensive research on springs and groundwater hydrology has to be undertaken. Site specific spring rejuvenation program and community capacity building for water sustainability and climate change adaptation would be suggested for successful adaptation.

Keywords: Springs, climate change, hydrology, water security, agriculture, capacity building, Sikkim Himalaya.



Remote Sensing Based Approach On Recent Changes in Platform of River Ganga from Mirzapur to Jalangi

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ABSTRACT

Geo-informatics technology has a dynamic role in river monitoring and river path change detection. River path change is a complex phenomenon which has been seen in the recent times which depends on various natural as well as anthropogenic factors. The present research work deals with revealing the change in platform dynamics of river Ganga from Mirzapur (Uttar Pradesh) to Jalangi. The study is based on sequential river platform maps generated from the time series multi-spectral datasets revealed a periodic pattern of evolution of the river system over the study area which began by means of meandering indices and braiding index. The characteristics and dynamics of meandering rivers have been the subject of extensive research. Presently, availability of archival satellite sensor data at regular and frequent intervals for almost four decades presents a great potential for increasing the understanding of the natural processes of the platform change, meander growth and braid bars. The present work deals with Meandering indices and Braiding index which determines the sinuosity, tortuosity and braiding of the river Ganga. The study depends upon using Landsat sensors that are TM, MSS and ETM+ acquired through 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010 and 2015 years. Geographical System Information (GIS) analysis, sinuosity index and braiding index were used in this study to investigate and classify the river into straight, sinuous and meander category. The analysis of the Landsat imagery revealed the migration of the river course with time and space. The study reveals that the natural as well as anthropogenic factors are responsible for the shifting nature of river Ganga in some areas and it also signifies that Landsat images/remote sensed images can be successfully used to identify the meandering indices, braiding index and platform change.

Keywords: Meandering Indices, Braiding Index, Landsat data, GIS.



Flood risk assessment and mapping in Gumti River Basin, Tripura using GIS, Remote Sensing and multi-influencing factor (MIF) techniques

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ABSTRACT

Flooding is a Natural Phenomenon which is very common in a Riverine Watershed. Gumti River Basin area experiences heavy rainfall during monsoon season (June to September). The heavy monsoon rains cause the Gumti River and its tributaries to distend their banks, often flooding surrounding areas. The present study attempts to identify the flood risk areas in Gumti river basin, Tripura State, having an area of 2492.9 Sq.km using Remote sensing and Geographical Information System (GIS) techniques. Various thematic layers such as rainfall distribution map, slope angle, distance from river, elevation, drainage density, size of sub watershed, land use /land cover, lithology and population density map were integrated into GIS platform, using the Spatial Analyst Tool in Arc GIS 10.1 to identify the flood risk areas in Gumti river basin. Multi Influence Factor (MIF) technique has been used to calculate the weighted values for each individual parameter of each thematic layer, based on their relative importance of causative factors for flood. The final Flood risk vulnerability zonation map of the study area was categorized into five classes namely; very low, low, moderate, high and very high risk zones. The major findings of the study revealed that most of the areas in the downstream part of the Gumti River basin were within high to very high flood risk level zone. The western part of the basin, particularly in Kakraban, Photamati, Horijala, Rani, Salgarah and Hadra region have been identified as high flood risk areas of the basin. The resulted flood risk assessment mapping will help the concerned authorities and decision makers to formulate their development strategies for future flood occurrences.

Keywords: Flood, Risk, Multi-Influencing Factor, GIS, Remote sensing, Gumti River



Landslide Susceptibility Mapping Through Weightages Derived From Statistical Information Value Model

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ABSTRACT

Landslides poses great risk to the life and property, therefore landslide susceptibility assessment is of vital importance in the hilly terrain. The key objective of this study is to generate a landslide susceptibility map through integrating weightages of different categories of the landslide causative factors derived from statistical information value model under GIS environment. Several causative factors such as slope, slope aspect, lithology, drainage proximity, structural feature proximity, land use land cover, NDVI, topographic wetness index, stream power index, road proximity and relative relief were identified in our study area resulting in slope failures to a great extent. The existing landslides were mapped using remotely sensed data and field survey which were then divided into 70% (model training) and 30% (model testing) data sets. Finally, the Landslide susceptibility map derived from Statistical information value model and has been divided into five classes such as Very Low, Low, Moderate, High and Very High. The accuracy of the model was evaluated using Receiver Operation Characteristic curve which resulted in 0.8629 area under curve. The Area under curve figure reflects that the prediction accuracy of model is 86.29% and results obtained will be useful for the policy makers in the study area for the generation of key plans and decision making tasks.

Keywords: Susceptibility, NDVI, Landslide, Statistical Information



POLLUTION AND CLIMATE CHANGE

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ABSTRACT

Global Climate is changing and this is apparent loss across the world. Humans have been contributing to occurring climate change. The global warming of the past 50 years is primarily due to human activities, predominately the burning of fossil fuels. Earth's climate is sensitive to human emission of various heat trapping gases and serious consequences of warming can be seen in specific region of the world and future changes in oceans and clouds will affect in climate change. Impacts from climate change are already occurring and are expected to become increasingly disruptive in many sectors. Snow and rainfall patterns are shifting and more extreme weather events like heat wave and heavy rainstorms are already taking place. The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. The sum total of these and other indicators are evidence that our world is getting warmer. All post risk to human health, critical infrastructure, agriculture and the ecosystem that supports us. The carbon dioxide from anthropogenic activities not part of the earth's natural carbon cycle. The global warming that has been observed in recent decades was caused by elevated levels of carbon dioxide and other greenhouse gases in the atmosphere, due primarily to human activities. It is not too late to have a significant impact on future climate change and its effects on us. With appropriate actions by governments, communities, individuals and businesses, we can reduce the amount of greenhouse gas pollution we release and lower the risk of much greater warming and severe consequences. Many of the actions that we can change will have other benefits, such as cleaner, healthier air. In addition, communities can take action to prepare for the changes we know are coming.

Keywords: Global warming, Anthropogenic activities, Atmosphere, Climate change



Mapping Of Utilities Using GIS Based Approach: A Case Study Of Parts Of Ranchi Municipal Corporation, Jharkhand

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ABSTRACT

The availability of remote sensing satellite data at various spatial, temporal and spectral resolutions provides enormous opportunity to map the urban sprawl. When coupled with Geographic Information System (GIS) it is possible to evaluate, analyse and integrate large data. We need to understand and quantify the urban sprawl on spatial and temporal scales which forms a basis for better planning and sustainable management of cities and towns. The city of Ranchi has witnessed unprecedented urban growth after assuming the status of a capital of Jharkhand state, India in 2000. The increasing population has put pressure on the natural resources of the city. The urban growth has been in a haphazard manner at the cost of agricultural lands, forest land and open green spaces such as park, garden and recreational forestry. The Ranchi district is divided in 55 wards, and google earth images were used to collect the geospatial features present in the provided ward. There are various RS/GIS techniques used to collect the location of features one of them was to take the points in QGIS software using web mapping platforms. While the other method was to collect points from GPS enabled software's by field verification. In QGIS software, the open layer plugins was installed and through that plugins various maps were overlaid on the ward shapefile and location of the features were taken in degree decimal. They were further classified upon the type of facilities taken from the map such as market places (eg. shops, malls, vegetable markets etc.), financial sector (eg. bank, ATMs, insurance companies etc.), sports and youth facilities (for stadiums, sports club, sports coaching centre etc.), commercials (for automobile showrooms, business, industries, workshops, NGO's etc.), public facilities (eg. post offices, public toilets, gym centre, rainbasera, community halls etc.), Health Services (for hospitals, medical shops, vaccination centre etc.), Education (for college, schools, universities, institutes etc.), Government Offices (for civil court, high court, state government offices etc.), Tourism and Recreation (for hotels, parks, restaurants, clubs etc), residential (for apartments, lodge, hostels etc.), Religious places (for temples, masjids, church, gurudwara etc.). Thus, spatial analyses of urban sprawl are a prerequisite for curbing the unplanned urban growth and ensure sustainable living.

Keywords: Remote Sensing, GIS, urbanization, QGIS, Overlay analysis.



Effective use of Fish Scale for removal of fluoride, lead and chromium from aqueous solution

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ABSTRACT

Fluoride in concentration of 0.3 to 1.5 mg/l is beneficial for humans but cause hazardous effect like dental fluorosis if intake in high concentration over a period of times. The objective of this study is for removal of fluoride and Pb(II) and Cr(VI) from aqueous solution by using the fish scales powder. This adsorption test was done at different adsorption dose, initial concentration, at different contact time, pH and at different agitation speed (rpm). The fish scale is characterizing by XRD, SEM, TEM analysis etc. The fish scale gives high de-fluoridation capacity from aqueous solution at different contact time, initial concentration, pH and agitation speed. Langmuir isotherm model, pseudo second order represent better the adsorption data in comparison to the Freundlich isotherm models, pseudo first order model. Column experiments using fluoride solution were carried out under a constant absorbate concentration and bed depth, and varying flow rates. The removal capacity of fluoride decrease with increase of flow rates. The maximum adsorption capacity of fish scale is 9.3 mg/g, 1.782 mg/g, 1.898 mg/g for fluoride, Cr(VI), Pb(VI) respectively. It gives maximum adsorption capacity of fluoride at the pH of 6.5 and at the agitation speed of 150 rpm for 3 hours of contact period i.e. 9.3 mg/g. This result shows that by using this bio-waste (fish scale) we can remove fluoride from drinking water.

Keywords: fish scales powder, De-fluoridation, Column experiments, Langmuir isotherm model.



Performance Evaluation Of Bitumen Using Phenol Formaldehyde

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ABSTRACT

This paper deals with the influence of Phenol Formaldehyde resin on the rheological properties of petroleum bitumen. Different amounts of phenol formaldehyde were doped into the bitumen of 60/70 penetration grade and variation in the rheological properties were observed. The effects of phenol formaldehyde were determined by conventional test methods. Adhesion and stability of bitumen aggregate mixtures prepared using pure and modified bitumen was tested using Marshall Test method. The tests that were conducted on the sample were softening point test, penetration test and ductility test. The bitumen sample was obtained from CESC Limited. Phenol Formaldehyde was collected in powdered form from Allied Resins and Chemicals Limited or ARCL Organics limited. The appropriate dosage of the phenol formaldehyde yielding the best rheological and performance properties in hot climates was found to be 1.5% (W/W). Appreciable decrease in the formation of rutting, bleeding, stripping, and cracking in bitumen may be obtained by the addition of phenol formaldehyde resin which was also found out to be 1.5% (W/W).

Keywords: Phenol Formaldehyde, petroleum, bitumen, Marshall Test method



Dynamic Changes in Mangrove Forest and LU/LC Variation Analysis over Indian Sundarban Delta in West Bengal (India) Using Multi-Temporal Satellite Data

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ABSTRACT

Sundarban ecological unit is a well-known world's major mangrove ecosystem, prolonged over Bangladesh and India across the deltaic formation of Ganga, Brahmaputra and Meghna rivers. Indian Sundarban Delta (ISD) is located over Ganges and Brahmaputra rivers delta in West Bengal part of India. In the existing epoch, sundarbans delta is prone to ecological pressure caused by various natural as well as anthropogenic activities. The mangroves ecosystems of ISD has been critically disturbing via Climate change, Sea Level Rise (SLR), gales, flood, shoreline erosion, salinity intrusion, population pressure etc. Aforesaid issues are apprehension for the mangroves forest and can create more socio-economic complications for local mankind and wildlife of the ISD. Present study has essentially focused on the analysis and assessment of temporal deviation in the spatial pattern of Indian sundarbans delta using chronological satellite imagery since 1972-2017. Digital image processing of multi-temporal Landsat-series satellite data of 1972s, 1987s, 2002s and 2017s were carefully performed in GIS environment. Loss of Mangroves cover and Land Use / Land Cover (LU/LC) transformation were accomplished using two image processing technique; supervised classification (Random Forest Classification) and Soil Adjusted Vegetation Index (SAVI). And accuracy assessment of the derived LU/LC map was done by preparing a confusion matrix. The impact of climate change on ISD and socio-economic impact of mangrove ecosystem on shelters has also discussed.

Keywords: Mangrove, ISD, Climate Change, Satellite data, Random Forest Classification, SAVI, Socio-economic Impact.



Impacts of Hydro Power Projects on Ambient Air Quality in the Alaknanda basin, north-western Himalaya, India

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ABSTRACT

Hydropower is one of the important sources of energy in the Indian Himalayan Region (IHR). The IHR is characterized with steep topography, glacier fed perennial rivers with potential scope of economic development in terms of hill agriculture, tourism and hydropower development. But studies pertaining to environmental impact assessment of hydropower projects reveal that increasing number of projects within a limited geographic entity has multiplied environmental impacts. Ambient air pollution, in particular, is not only limited to the Himalayan urban towns of Uttarakhand rather it is also significant in the construction sites of the hydropower projects. Particulate pollutants such as particulate matter below 10 micron (PM₁₀) and gaseous pollutants such as sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and ammonia (NH₃) are the important parameters to be monitored. In and around a commissioned hydroelectric project Srinagar, PM₁₀ concentration was found as low as 81.5±5.2 µg m⁻³ ranging from 56.8 to 104.3 µg m⁻³. On the other hand, Tapovan-Vishnugad hydroelectric project (HEP) under construction has relatively higher PM₁₀ pollution with a mean value of 104.1±3.4 µg m⁻³ ranging from 84.4 µg m⁻³ to 126.3 µg m⁻³. It is found that particulate pollution is higher in the surrounding of Tapovan-Vishnugad HEP which is under construction as compared to Srinagar HEP- a commissioned project. Because the Tapovan-Vishnugad project under construction phase is also lying relatively in a larger area. The two other projects-Vishnupryag and Vishnugad-Pipalkoti overlapped each other's ecological boundaries. At contrary, gaseous pollutants in ambient environment were found higher in Srinagar HEP as compared to Tapovan-Vishnugad HEP. It is noted that Tapovan-Vishnugad HEP and its surrounding affected area, the particulate pollutants have crossed its permissible limit (100 µg m⁻³) as set by National Ambient Air Quality Standards (NAAQS), India. However, gaseous pollutants except particulate pollutants at every study site were under permissible limit.

Keywords: Hydroelectric projects; commissioned project; under-construction project; particulate matter <10 µ; nitrogen dioxide; sulphur dioxide; ammonia; northwestern Indian Himalaya.



Analysis of Trend in Low Flow Using Non Parametric Statistical Methods

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ABSTRACT

Identification of trend in the low flow series is essential for decision-making in water resources planning and management. This paper exemplifies a study involving non-parametric statistical method of Mann-Kendall test for identification of existence of trends in different low flow indices (7-day min flow, 30-day min flow, 90-day min flow) in the Mahanadi river basin, India. Long term daily discharge data of 18 representative stations in the study basin were used for low flow trend analysis. Sen's estimator of slope method was used to compute the change per unit time in a time series having linear trend. The results show the downward trend in the low flows in most of the stations of the river basin covered under study. It is hoped that this study can provide support for water resources planning, for coping with low flow situation in the river basin.

Keywords: Low Flows, Non Parametric, River basin, Sen's estimator, Trend analysis



Index for Cost Effective Centralised or Decentralised Solid Waste Management Facility – A Case Study

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ABSTRACT

Municipal solid waste management is an issue of worldwide concern. The problem is especially severe in cities of most developing countries due to increased urbanization, poor planning, and lack of adequate resources. The ongoing SWM facility in Durgapur was shut down in 2013 because waste collection & supply was less than benchmark level and poor planning of waste collection system & increased cost of operation. In this regard an attempt has been made to evolve proper management strategies based on multi-criteria decision analysis and geographic information system based (GIS) overlay analysis in Durgapur municipality boundary with 154 square kilometres as per the SWM rule 2016 by Govt. Of India. At first the Population and Waste Generation is forecasted for 2025. Study Area is taken by calculating the trend of growth. Then suitable sites are chosen by making restriction and suitability model with the help of Arc GIS software. Unit processes (*Composting, Land filling*) are selected for the construction of centralized and decentralized facility. Waste collection and transportation system is designed for the study area. Then the route of collection vehicles were optimized using *Network Analysis* Technique as 70-75% budget of the project is spent for transportation. Then an index is created including the criteria like *Population density, Available area, Transportation cost* etc. By creating a proper Index for the both facilities, we can easily decide whether to choose a centralized or decentralized facility for constructing a solid waste management facility for a city.

Keywords: Forecasting, Restriction and Suitability model, Unit processes, Network Analysis, Index.



Rainfall Fluctuations and Depleting Water Levels in Alwar City

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ABSTRACT

Water is the key to life. It is one of the basic needs for us to survive. Alwar had water resources in abundance but in recent years, it experienced a huge depletion in water levels that it even reaches to dark zone. Rainfall fluctuation is one of the major causes of it. In the last decade, the average rainfall of alwar decreased at a sharp rate, that in 2010-2011 it was about 64cm but in 2016-2017 it has reached to 55cm(approx) on an average. Such a decrease results in rapid ground water depletion in alwar. Previously, the rate of ground water depletion was about 0.30 m per anum but now it has reached to approximately 1m per anum. The adversely affected areas of alwar are Behror and Neemrana blocks where the water level has reached to the depth of more than 40m. The major cause of rainfall fluctuation in recent year is seasonal shift due to increasing global warming worldwide. Now its high time to take this problem seriously. In all, we could recover water depletion to an extent by rainwater harvesting and other management techniques, so that the levels will improve to a bit.

Keywords: Rainfall fluctuation, Dark zone, Seasonal shift, Global warming, Rainfall harvesting



Water Harvesting through Inter-Basin Transfer Technique for part of Visakhapatnam Urban Area using Geo-Spatial Technology

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ABSTRACT

The increasing demand of the water resources in urban environment requires the formulation of scientific methods to augment them. In this paper a methodology has been demonstrated for the development of these valuable water resources in the urban watershed of Visakhapatnam, the second largest metropolitan city in Andhra Pradesh using geospatial technology. This methodology is based on a detailed examination of the existing tanks in the study area using both spatial technology and ground based observations. Total Station survey for the existing surface tanks in the study area along with Geophysical investigations are carried out to identify the thicknesses of top soil, weathered rock, fractured rock and hard rock formations, to assess the volume of the groundwater that can be stored in the aquifer system and accordingly rainwater harvesting structures are suggested, which collects the runoff and recharges the aquifer zone. Inter-basin transfer technique is suggested to recharge the tank catchments having high aquifer storage capacity and low surface area from neighbouring tank catchments having more surface area and rainfall runoff.

Key words: Visakhapatnam, rain water harvesting, inter-basin transfer technique



Late Miocene Records of Monsoon Variability In The Indian Region: Evidences From Multi-Proxy Records

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ABSTRACT

The evidence of the Indian monsoon rainfall is registered in variety of proxies both over terrestrial and marine region, arguably the most reliable continuous record of the monsoonal variability comes from the sediments deposited on the ocean floor, from the Arabian Sea. The present day climate parameters like temperature and humidity are measured with instrumental record, but we cannot directly observe the climates of the geological past. The indirect mean to retrieve such information from sedimentary archives is through analyses of physical and chemical parameter in the sedimentary deposits and these includes physical proxies like clay mineralogy, grain size distribution, heavy minerals, organic bio markers, Chemical and isotopic proxies like isotopes in ice core, alkenones, sedimentary organic fraction, inorganic carbonates and organic deposits. Isotopic compositions provide direct relationship allowing understanding of temperature, atmospheric composition and seawater salinity respectively. Along with this multi parameter approach, the importance of distribution of microfossil assemblages and abundances of particular species from marine platform provide direct measure on the response of physical and chemical factors on the biota. Various research work supported to Indian monsoon evolution has been closely related to the uplift of the Himalaya and Tibetan plateau which is believed to have intensified the monsoon during ~10 Ma. During the Quaternary time the Indian monsoon system also underwent parallel changes like glacial and interglacial mode and the summer monsoon weakens during glacial periods as compared to interglacial periods. The cold spell intervals in the North Atlantic have been found to be associated with intervals of weak summer monsoon, the winter monsoon strengthened during the same time. The glacial terminations are marked by weak monsoon activity. The summer monsoon weakened during the Middle Holocene after the Early Holocene optimum. The published data from land and oceanic region indicate a major changes land vegetation and oceanic productivity during period of intense monsoon. The high southern latitude cooling and increased volume of ice act as important factors responsible for lowering the strength of monsoonal circulation. The signature for strengthening of the upwelling, presumably from strengthening of seasonal winds over the Indian Ocean was noted as a proxy for monsoon intensification.

Keywords: Monsoon, Rainfall, Monsoonal Circulation



Water Resources Utilization and Their Sustainable Management: A Case Study of District Raebareli

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ABSTRACT

Water is the primary resource affecting growth of crop Production. Rae Bareli District located in the Gomti-Ganges doab, is endowed with an abundant supply of this vital resource. The average annual rainfall of Rae Bareli district is about 950 mm of which nearly 98% occurs during the period of June to October. Thus the district falls in the medium rain fall region of the country. The deep alluvial plains in the district offer ample opportunity for soil moisture storage and ground water recharge. There is abundant availability of ground water which can be harnessed through deep tube wells, shallow tube wells and open wells. In addition, the district is served by a number of branch canals and distributaries of Sharda canal system, the Sharda Sahyak irrigation system and Dalmau pump canal system. More than 85% of irrigation in the district is done by both canal systems and remaining proportion of irrigation is fulfilled by tube wells and other traditional means of irrigation.

The cropping pattern in the district has been changing from year to year leading to varying demands on the irrigation system. The causes of the underutilization of irrigation potential in the canal irrigated areas need to be understood based on a comparative study of the changing pattern of irrigation water supplies and demands. The latter are governed by the dynamics of the cropping systems and Irrigation application efficiency of water distribution systems. The imbalances in the supply demand situation may be corrected through judicious conjunctive use of surface and ground water, or increased efficiency of operation at the irrigation system level and at the field level or at both.

Keywords: Water Resource, Agro-climatic, Sustainable Irrigation, Cropping pattern, etc.



Dynamics of urban land use change in Jalandhar city of Punjab, India: A Spatio-Temporal Analysis.

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ABSTRACT

Analyzing spatio-temporal characteristics of land use change is essential for understanding and assessing the ecological consequence of urbanization. Monitoring of land use/Land Cover changes has also become important to arrive at a better decision-making process. Anthropogenic activities are mainly responsible for Land use/land cover changes in an area. Remote Sensing and Geographical Information Systems (GIS) is being widely used for monitoring and mapping of these changes and to assess the urbanization trend. The main objective of this study is to analyze the spatio-temporal characteristics of urban land use change in the Jalandhar City and its surroundings using Remote sensing data. A comprehensive study was carried using Landsat TM satellite images of 1989 and IRS LISS-III images of 2006 and 2016 to assess the urban growth over the last 3 decades. The results indicated a significant change in the urban area of Jalandhar city with a boom in urban population in and around the city. The increase in the built-up area has been mostly at the expanse of agricultural land. Increase in population, Industrialization, rapid urbanization and higher income returns have been the major driving forces for the increase in urban land use.

Keywords: Change detection, Land use Land cover, GIS, RS, Urbanization.



Use of Geospatial Techniques for Natural Resource Management in Urban areas

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ABSTRACT

Climate change is a global axiom phenomena and terrestrial resource management is becoming very challenging task to ensure our future. Remote Sensing and Geographical Information System (GIS) Techniques are such invented powerful tools that can be used to demonstrate and elaborate methods for decision making system related to resource management. Nowadays, Geospatial technique act as a major loop for land resource monitoring and management. This research aims on providing a strategic technique for the management of land resources by integrating geo-spatial techniques. With the integration of this technology, it would enable us to execute proper plans for suitable drainage system and water supply in any geographical region. GIS techniques integrated planning support system encompasses subjects like 3D visualization of buildings of cities by incorporating various tools, hence provide a platform for urban management also which includes multi-disciplinary factors. These factors are used to understand the phenomenon, retrieves information from aerial photography and local urban planning system database as well as it allows efficient planning by providing accurate data about different aspects and predicting urban growth of a city. This research comprises of satellite images like LANDSAT, LISS3 and SRTM data which are freely available and help in broader aspects of urban planning. Planning for a sustainable urban development must aim towards impactful long-term goals and utilize knowledge about the environmental consequences of different solutions, but should not be based solely on means-ends rationality. Hence geospatial tools integrated with RS and GIS techniques are most reliable and efficient for this planning and management. This research aims to provide an overview look for better planning of water resource management in different urban areas. Case study has been taken on Delhi, Manali, Dabhkhera, Ranchi, Vijaywada to show the different aspects of utilization of RS & GIS.

Keywords: SRTM, RS, GIS, LISS



RS schemes mingled with ICTs for flood disaster management

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ABSTRACT

The paper emphasizes on mingling ICTs with Remote Sensing schemes for disaster management not only for the relief and rescue operations but also for preparedness prior the disaster and recovery beyond the disaster. Remote Sensing and ICTs upon prudent mobilization, can counter the probable loss due to natural disasters. ICTs can be used to real time tracking of incidents prior to disaster with the aid of sensors and the stakeholders are in unceasing communication with the situation. In case of flood, this can help by providing flood level data continuously to the stakeholders so that they can be alert of the anticipated flood. These data along with the Remote Sensing images before and after disasters are processed by the proficient to extract information which can be disseminated via graphs and visualized via maps. The concerned authorities like governing agencies and humanitarian organizations henceforth can use these products for rescue and relief operations. Mass media and SMS technologies can be efficacious tool both in search and rescue planning along with disaster preparedness and recovery approach. The Remote Sensing images when blended with GPS data collected on the field can be used in numerical quantification and appraisal of losses for ecological recovery tactic and recuperation. Hence, Remote Sensing coupled with ICTs is one of the modest technology, which can play substantial role in disaster management and planning aftermath. They can be blended wisely for emergency warning and quick response for diminution of the disastrous effects, if not nullify. Mass media and SMS technologies are other important tools aiding disaster regulation and management.

Key words: Remote Sensing, Web GIS, GNSS, ICTs, disaster, SMS, mass media



Drought Mapping and Monitoring Using Geo-informatics

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ABSTRACT

The Purulia region is under the dry spell inclined zone, the majority of the year, the Purulia locale is influenced by the dry season. For the event of dry season there are some reason which influence the zone and they are less water content, high temperature, less vegetation cover, high surface strain (regardless of whether through the weight of air or material present on the earth surface) weight. This examination is on the dry spell checking appraisal of Purulia region with the assistance of multi criteria investigation by utilizing RS (remote detecting) and GIS (geographic data framework) systems. The geological sheet (arranged by armed force delineate, NF 45-2, Scale-1:25000), LANDSAT-8 OLI, LANDSAT-5TM satellite symbolisms, precipitation and insurance information are utilized to plan different topical maps, for example, arrive utilize arrive cover, soil, waste, lineament, street systems, topography, precipitation dissemination. The last dry spell delineates utilizing distinctive parameters with appointing the weightage esteem for each class with the assistance of ARC GIS weighted overlay investigation instrument. The weightage esteem for each class has been produced by their significance. The SPI (institutionalized precipitation record) is likewise used to investigation the consequence of precipitation in a specific range to screen dry spell appearance. The last outcome produced utilizing four parameters to be specific (LST, NDVI, precipitation information and LU/LC), the last outcome demonstrates in four classes specifically: no dry spell, gentle wet, low dry spell, direct dry spell. The no dry spell zone demonstrates 355.7189 sq. km about 6% on the south and south-western part secured with the backwoods arrive, the mellow wet region demonstrates 1086.23 sq. km around 17% on the south-western, south-eastern and eastern part secured with horticulture, vegetation and fruitless land, the low dry season region shows 2363.987 sq. km around 38% on the center part and north-eastern part secured with farming, scattered vegetation, settlement and agribusiness neglected land, the direct dry spell region shows 2453.064 sq. km around 39% on the north-eastern part secured with desolate land, settlement and rural place where there is the examination region. Then again SPI esteem run differs between - 0.03 to - 0.26 it demonstrates that the Purulia locale goes under the gentle wet area. Urbanization isn't simply a cutting edge process, however a fast change of human social roots on a worldwide scale, where town culture is in effect quickly supplanted by the urban culture. In India, the many-sided quality of urban improvement is rapid to the point that it requests snappy reaction and viewpoint physical arranging of the urban areas and towns. In this way, it is vital and major for approach producers to join remote detecting into urban arranging and administration.

Keywords: Geospatial, drought, satellite imageries, SPI



Geo-Spatial Approach for Flood Management in Ganga Flood Plains: A Case of Varuna River Basin, Uttar Pradesh, India

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ABSTRACT

Floods are the recurring, widespread, disastrous and frequent one kind (Fluvial) of the natural as well as anthropogenic hazard. India is one of the worst flood affected country, accounts of 1/5th of global death counts due to flood and 40 million hectare or nearly 1/8th of India's geographical area is flood prone. Specially Ganga flood plains regularly suffering from water-logging and floods during rainy seasons. Geo-spatial approach is powerful tool in 21st century to map, measure, monitor and manage floods. Varuna is a plain-fed, flood plain tributary of river Ganga situated in south-east part of Uttar Pradesh within Middle Ganga Plain (MGP), India. Present study through a combination of on screen digitization at large magnification from high resolution remote sensing Data-Google Earth Imagine, SRTM dem data and field observations settles the question of flood management in flood plains of Ganga river by taking case of Varuna river system. Flood management required an integrated holistic approaches such as real time satellite based monitoring, river management, multi-criteria decision support system. Numerous numbers of scientists, academia, and planners suggested long list of measures to manage floods within Ganga flood-plains in three categories-strategic approach, structural approach, non-structural Approach. Understanding of past and flood mapping with an integrated approach is required for sustainable solution of flooding. This paper is describing probable solutions of flood control, flood management, identification of water harvesting sites and surface waterlogged areas within Varuna catchment. Present study also suggests nature based solution to manage floods by “river management” approach, by dredging of Ponds/tanks, depressions/lakes/tals and interlinking of water bodies.

Keywords: Varuna, Floodplains, Flood Management, Geo-spatial Approach



Impact on water quality deterioration due to climate change in coastal region of Karnataka, India

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ABSTRACT

Costal Karnataka of India faces severe water crisis in post monsoon period, though this region receives 3600mm of average annual rainfall. The several house located along the shores of the costal Karnataka depend on ground water as a drinking water source. Due to the change in climate the salt water intrusion to the ground water has become more; this caused deterioration in ground water quality. This study mainly focuses on the impact of climate change on ground water quality along the shore of the coastal Karnataka. The study conducted involves the collection of water sample from the open well located along the shore line of the study area in the range of 100 metres. The collected water samples were subjected to laboratory analysis for predicting the change in water quality. From the analysis it was found that over a period of two years percentage of salt content was gradually increasing. The main reason for this increase in salt content is due to variation in annual average rainfall and depleting ground water level. By analysing annual rainfall data fluctuations were observed in the monsoon period. This caused variation in infiltration rate which caused problems in ground water recharge. Hence the concentration of dissolved salt content was found to be high. So the study concludes that the main cause for deterioration in ground water quality is due to varying rainfall caused by climate change.

Keywords: Climate change, groundwater, salt content, water quality analysis.



An analysis on the vulnerable effect of climate change on children and adaptation in changing situation in Rajshahi District

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ABSTRACT

At this present decade, with limited resources and high standard of poverty, Bangladesh is one of the most effected country for climate change in the world. Frequent disaster events, and devastating result of these events effect children, men, and women, in Bangladesh every day. Climate change threatens the positive development process and people try to cope up with the changing situation in the sectors of crop production, housing, education, safe water, and communication etc, Children are the poorest and easiest sufferer after any disaster first, hardest, and longest. Various climate risks envisage the children are diverse, ranging from direct physical impact, long term mental impact, and nutrition challenge due to storm, cyclone, and extreme temperature in almost every district in Bangladesh. The goal of the study is to find out the impacts of climate change and its consequences on children and find out the development priorities shored up against climate change impacts. The study survey was conducted by 12th June to 16th June applying questionnaire survey with 150 respondents, and collection of secondary information based on different parameter like health effect, mental health effect, school dropping, pure water crisis etc. The study carries out in recent extreme weathering condition prone sites located in Rajshahi Sadar, PABA, of Rajshahi Sadar Upazila. Expert opinion is inflicted for ensuring the justification of the recommended solution and strategies. This obtainment has concluded with the measurement of the adverse effect to climate change on children and some admissible strategies for the changing situation as there is no longer distinction between normal periods and disaster periods.

Keywords: Climate change, PABA, storm, children



Satellite Image Based Land Use Land Cover Change Analysis of Ranchi District, Jharkhand

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ABSTRACT

The high rate of urbanization coupled with population growth has caused changes in land use and land cover in Ranchi, Jharkhand. Therefore, understanding and quantifying the spatio-temporal dynamics of land use and land cover changes and its driving factors is essential to put forward the right policies and monitoring mechanisms on urban growth for decision making. Thus, the objective of this study was to analyse land use and land cover changes in Ranchi area, Jharkhand by applying geospatial technology and land use change modelling. In order to achieve this, satellite data of Landsat-5, TM of 1992 and Landsat-8, OLI of 2017 have been obtained and pre-processed using ArcGIS. The Maximum Likelihood Algorithm of Supervised Classification has been used to generate land use and land cover maps. For the accuracy of classified land use and land cover maps, a confusion matrix was used to derive overall accuracy and results were above the minimum and acceptable threshold level. The generated land cover maps have been run with Land Change Modeller for quantifying land use and land cover changes, to examine land use transitions between land cover classes, to identify gain and losses of built up areas in relation to other land cover classes and to assess spatial trend of built up areas. Finally, Land Change Modeller has been run to model land use and land cover changes in Ranchi area and to predict land use changes. Generally, the results of Ranchi district of Jharkhand study have shown that there was an increased expansion of built up areas in the last 25 years from 9.69% in 1992 to 21.00% in 2017. The spatial trend of built up areas also showed that there was a growing trend in the center part relative to other directions and also increase in agriculture land from 1992 to 2017 that is 28% to 37%, Forest in 1992 was about 16.01% and in 2017 about 10.00% decrease in the forest areas, Barren land in 1992 was about 10.04% and the year 2017 about 8.34%, Vegetation was about 24.26 % in 1992 and in the year 2017 about 16.74 % ,Water bodies was also lit decreased in the year 1992 to 2017 there was 11.06 % to 10.02 %. Growing population pressure and its associated problems, such as the increasing demand for land and trees, poor institutional and socio-economic settings, and also unfavourable government policies, such as lack of land tenure security and poor infrastructure development, have been the major driving forces behind the LULC changes.

Keywords: Landsat-5 TM, Landsat-8 OLI, Geospatial Technology, Land Use Change Modelling and Supervised Classification



Geospatial Modelling for Delineation of Groundwater Potential Zone: A part of Gomati Basin (U.P.)

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ABSTRACT

Groundwater is an important resource contributing significantly in total annual supply. However, overexploitation has depleted groundwater availability considerably and also led to land subsidence at some places. Assessing the potential zone of groundwater recharge is extremely important for the protection of water quality and the management of groundwater systems. The present study attempts to delineate groundwater potential zones for the assessment of groundwater availability in the Kundu Nala, Gomti basin (U.P) using remote sensing and GIS technique. Integration of remote sensing data and the geographical information system (GIS) for the exploration of groundwater resources has become a breakthrough in the field of groundwater research, which assists in assessing, monitoring, and conserving groundwater resources. Groundwater potential zones are demarcated by integrating the highly impacting thematic layers such as land use, slope, drainage density, and geomorphology. Landsat 8 OLI and ASTER (30m) data have been used in the present study to prepare various thematic maps such as geomorphology, drainage, drainage density, land use / land cover and slope. On the basis of their characteristic and interrelationship with groundwater, the weight is assigned to each thematic layer. Further, within each thematic map ranking has been made for each of the features. All the thematic maps have been integrated step by step using the Weighted Index Overlay (WIO) analyses method in spatial analysis tool in Arc GIS. On the basis of this final weight and ranking, the ground water potential zones have been delineated. Thus from the present study it is observed that an integrated approach involving remote sensing and GIS technique can be successfully used in identifying potential groundwater zones in the study area. Five categories of groundwater potential zones, viz., very good, good, moderate poor and very poor have been demarcated. Major portions of the study area has “Very good” as well as “good” prospect while a few scattered areas have very poor prospect. The result depicts the groundwater potential zones in the study area and found to be helpful in better planning and management of groundwater re-sources.

Keywords: ASTER, WIO, GIS, Groundwater, Delineation



Estimation of Temporal Land Surface Temperature using Thermal Remote Sensing of Landsat-8 (OLI) and Landsat-7 (ETM+): A study in Sainj river basin, Himachal Pradesh, India

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ABSTRACT

Land Surface Temperature (LST), a key geophysical parameter, has an essential role in studies related to hydrological cycle, climate change, land use/land cover change, soil moisture, vegetation water stress etc. It is governing parameter that control water and energy nexus between land and atmosphere. The estimation of LST plays important role in numerical modeling especially in physical based hydrological models where water balance/budgeting of the catchment is an important component. LST varies with complexity of the land cover that changes naturally as well as due to anthropogenic activities. Application of Thermal Remote Sensing technique provides opportunity to retrieve LST of different land cover at local scale, which was very cumbersome and uneconomic in conventional way. Present study was conducted in downstream part of Sainj river basin in Himachal Pradesh of Indian Himalayan Region (IHR), wherein we analyze the change in LST over different land use/land cover of the area over the period of time where developmental activities alters the natural ecosystem in relation to water and land use. LST was derived using Landsat-7 Enhanced Thematic Mapper Plus (ETM+) for October 2001 using Single-Window algorithm and Landsat-8 OLI (Operational Land Imager) for October 2016 using Split-Window (SW) algorithm. NDVI threshold was used for estimating land surface emissivity. The spatial distribution of LST of Landsat-7 of 18th October 2001 ranged from minimum 5.15°C to maximum 36.10°C with a mean of 19.98°C and standard deviation of 6.09; whereas, for Landsat-8 (OLI), of 22nd October 2016 ranged from minimum 7.16°C to maximum 33.31°C with a mean of 19.62 °C and standard deviation of 4.95. For validation, the standard daily LST product of MODIS has been used for both algorithms. Further the corresponding land use/land cover change was also analyzed to understand the effect of land use changes on the behavior of land surface temperature.

Keywords: Land Surface Temperature, IHR, Thermal Remote Sensing, Split-Window, NDVI, Land use/land cover, MODIS



Urban Growth Modeling Using Logistic Regression and Geo-informatics: A Case Of Jaipur, India

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ABSTRACT

The study comprises of the logistic regression based urban growth modeling of Jaipur, Rajasthan, India to demarcate the places having higher probabilities of growth in future and also to understand the dependency of urban growth of different driving parameters. Various physical and socio-economic parameters prepared using remotely sensed spatial data were taken into consideration which showed varying level of contribution in the growth process. The built-up data for two different time periods (2008 and 2017) and other geospatial datasets were taken to perform the logistic regression modeling and obtain the future urban growth probability map as well as the ranking of driving forces. Despite of its inability to deal with the temporal dynamics, logistic regression comes up as a formula based robust model for developing countries like India where the growth is unplanned.

Keywords: Geo-informatics, modelling, urban growth



Inventory & Retreat of Glaciers of Garhwal Himalayan Area Using Remote Sensing Data

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ABSTRACT

Change in spatial and temporal distribution of the cryosphere influences the water flow in the world's major rivers. Glacial retreat monitoring plays an important role in glacio-hydrological and climate change studies. The monitoring of glaciers is necessary as they are the sensitive indicators of the environmental and climate change. Himalayas has the largest resources of snow and ice which act as huge reservoirs of fresh water, so monitoring their health is very important with the current climatic scenario. In the present study, 16 selected glaciers including Gangotri and surrounding covering an area of 2982.14 sq.km., Garhwal Himalaya (Utrakhnad) India were mapped and their boundaries were delineated using the Landsat MSS (3rd November, 1976), TM (16th October, 1990), ETM+ (18th October, 1999 and) and OLI-TIRS (29th Oct., 2013) and ASTER images. In this study a total of 101 glacial lakes are identified in 2013 while the number of identified glacial lakes was 69 and 128 in 1990 and 1999. The valley of Gangotri glacier and Satopanth glacier show huge increase in number and area of glacial lakes especially supraglacial lakes. Several morphometric parameters like length, width, total area, perimeter, accumulation area, ablation area, area accumulation ratio (AAR), thickness etc. were estimated for detailed morphometric analysis among the mapped glaciers. The mapping of selected 16 glaciers during the period 1972–2013 reveals that the glacier covered area reduced from 409.08 to 377.83 sq.km. observing approx. 7.63% deglaciation in the Gangotri and surrounding area. Gangotri glacier shown a net loss of 4.68% area during 1972 to 2013 while it shows a net gain of 1.32% area during 1999 to 2013. Advancement in the total glacier area was also recorded during 1979 to 1999. The average elevation of the ablation zone of Gangotri glacier show an upward shift from 3944 m (1972) to 4033 m (2013) which may be a consequence of a shift in equilibrium line altitude (ELA) reflecting imbalance. In this study, it is estimated that the Gangotri glacier was retreated 1.60 km. between 1972 to 2013.

Keywords: Glacier retreat, ablation area, accumulation area, Gangotri glacier, Garhwal Himalaya



A Critical Analysis & Interpretation Of The Reviews On LSRW Skill Development In The Students Of English Language

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ABSTRACT

Every human being on the earth has a code of language to express himself. A learner of a language is said to be perfect in communication when he knows what and how to listen; what and how to speak; what and how to read and what and how to write. In fact, the four skills of learning, that is, listening, speaking, reading and writing make one proficient in a language. Each of the skills has a pivot role in the life of every one, but they play a very important role in the life of the learners of a language. In order to train the students in all the four skills, the teachers need to be well qualified and experienced, as the learners have a serious concern for what is taught to them by the teachers. Every learner of a language requires an individual focus while learning a language. The teachers need to have a strategic plan for his lessons. It is only then, that each of the specified skills of communication can be developed in the students properly and successfully. While developing the learning, speaking, reading and writing skills in the students, the teachers should adopt such methods and techniques of teaching that can help the students be comfortable with the language they are learning. In India, English has the status of second language, and the students because of being from the rural space, face much difficulty while learning English language. The problem becomes worse when the teachers are not fit to teach English. In such a situation, the teachers fail to develop the communication skills in the students properly which later results into the students' incapability to make an effective communication. Indeed, a learner of English language is required to develop in him all the four skills in order to be competent to use English in his practical life. Similarly, the teachers of English are required to be trained enough to develop all the four skills of learning English in the students. The research paper prepared through the secondary data collected from the selected reviews on the theme, is an analytical interpretation of the reviews on the LSRW skills in the students. The paper covers the various aspects of these skills from the various angles.

Keywords: Skill Development, English Language, LSRW



Integration Of GPS And GIS Technique for Mobile Mapping

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ABSTRACT

Mobile mapping systems are becoming increasingly popular as they can build 3D models of the environment rapidly by using a laser scanner that is integrated with a navigation system. 3D mobile mapping has been widely used for applications such as 3D city modelling and mapping of the scanned environments. However, accurate mapping relies on not only the scanner's performance but also on the quality of the navigation results (accuracy and robustness). The patterns of urban sprawl over a period presented in the study indicate unplanned development in the urban agglomerations of Ranchi city. The saturation of urban areas within municipal limits, along with pressure from the growing population, resulted in the densification of the core urban areas within Ranchi City. Ranchi city exhibits a very high rate of built-up growth with a reducing population density, indicating a low density of built-up development. The development of built-up land at the expense of agricultural land in Ranchi Urban Agglomeration indicates poor land-transformation practices. Any future built-up development of these agglomerations should involve the use of the government city development plan. This paper discusses the potentials of mobile mapping systems for landscape evaluation that is traditionally carried out by terrestrial laser scanners that can be accurately geo-referenced at a static location to produce highly accurate dense point clouds. Yet compared to conventional surveying, a large area can be monitored in a relatively short period, which enables high repeat frequency monitoring without having to set-up dedicated stations. However, current mobile mapping applications are limited by the quality of navigation results, especially in different environments. This paper presents some data collected for the purpose of monitoring from a mobile platform. The datasets are analysed to address current potentials and difficulties. The change detection results are also presented based on the collected dataset. Results indicate the potentials of change detection using a mobile mapping system and suggestions to enhance quality and robustness.

Keywords: GPS, GIS, Geodatabase, Urban areas, Accuracy



Use of Geospatial Techniques to Manage the Tourists & Administration: A Case Study of Mount Abu, Rajasthan.

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ABSTRACT

Tourism is extremely acknowledged as a crucial supply of economic gain to any country. The success of any tourism business can be easily determined by its tourism planning, development and marketing. The best site selection for tourism development and the best way to facilitate the tourists is to exchange information using GIS tool and this help in economic development and information needs for the whole society. In this study GIS, being used as a tool for data mapping and analysis to serve as an efficient and effective tool for the tourists. GIS technology used to integrate various data sets both qualitative and quantitative in a single system. Similarly, the success of the tourism industry is also determined by the effective planning and information exchange. The main aim of this exploration is to locate the capability of geospatial procedures and to encourage the tourism and administration in the Mount Abu city of Rajasthan. Geospatial innovation offers a scope of chances for the improvement of current tourism applications utilizing digital maps. The use of spatial and non-spatial database information is to facilitate in visualizing, analyzing and to querying through digital maps to the present and upcoming tourists. The GIS Data set has been created by extensive survey and analysis. On the other hand, Global Position System (GPS) is used to collect the spatial information. The base map used for this study is IRS Cartosat 1 Satellite data taken from Bhuvan. Thematic layers have been used for providing basic tourist facilities such as hotel, home stay, guest house, transportation, food hubs, heritage sites, bank, ATM, post office, police help, health facilities and all the tourist attraction sites etc., has been developed. Present study deals with how to facilitate the tourists in Mount Abu city as well as to develop a GIS based information system for the administrators of government officials or planners which will also help in management and the department of tourism for enhancement and beautification of site.

Keywords Geospatial Technology; Tourism; GPS Survey; Spatial Planning



Electricity Load Forecasting in Smart Grid using Web based Geographic Information Systems (Web GIS)

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ABSTRACT

India is a developing nation and due to emerging of new infrastructure in various sectors the demand of electricity is always higher than generation. Smart Grid is an automated system which includes automation of existing electrical infrastructure into modern and controlled system with the help of IT control, IoT systems that enables real-time monitoring and control of bi-directional power flows and information flows from generation to consumption. Electricity demand is a major issue in India and with the help of these technologies the demand of electricity can be managed in reliable and economic mode. Consumers can monitor real-time energy consumption of their energy use which reflects in supply, demand and generation of energy. State Utilities send their billing data to Electricity Regulatory Commission every year where billing data analysis is carried and new tariff of electricity is decided by the Regulatory Commission to all Consumers of Electricity in the State. Web based Geographical Information System (GIS) can help by mapping all electrical infrastructures on a digital map including their complete details and all consumers can be mapped. Web Based GIS can help to state utilities as a tool for plan and manage their all assets by logging into the system from anywhere. Web based GIS can help to manage area wise Load Scheduling by integrating Road, Buildings, Lands, Transmission Stations, Transmission Lines, Generation Stations and consumers detail. This system can help for Load Forecasting, Decision Making and Electricity Demand Management for State Utilities, Regulatory Body and Policy Makers towards making effective approach in Energy Conservation and Efficiency.

Keywords- Smart Grid, Web GIS, IoT, Electricity Demand Management.



Mobile Mapping Using Geospatial Technology for Spatial Data Acquisition

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ABSTRACT

Remote Sensing techniques are extremely useful for selection of sites for specific facilities such as hospitals, restaurants, solid waste disposal and industry. Urban planning requires a large volume of data both at the time of planning and at the time of implementation of the plan to determine the status of the available facilities. Thus remote sensing techniques provide accurate, orderly and reliable information for planning and management of a town or a city. Remote Sensing techniques are extremely useful for change detection analysis and selection of sites for specific facilities such as hospitals, restaurants, solid waste disposal and industry. Mobile mapping has been the subject of significant research and development by several research teams over the past decade. A mobile mapping system consists mainly of a moving platform, navigation sensors, and mapping sensors. The mobile platform may be a land vehicle, a vessel, or an aircraft. Generally, the navigation sensors, such as GPS (Global Positioning System) receivers, and INS (Inertial Navigation System), provide both the track of the vehicle and positional and orientation information of the mapping sensors. Spatial information of the objects is extracted directly from the georeferenced mapping sensor data by integrating navigation sensor data. Mobile mapping technology has evolved to a stage which allows mapping and GIS industries to apply it in order to obtain high flexibility in data acquisition, more information with less time and effort, and high productivity. In addition, a successful extension of this technology to helicopter - borne and airborne systems will provide a powerful tool for large scale and medium scale spatial data acquisition and database updating. This paper provides a systematic introduction to the use of mobile mapping technology for spatial data acquisition. Issues related to the basic principle, data processing, automation, achievable accuracies and a breakdown of errors are given. Application considerations and application examples of the technology in highway and utility mapping are described. Finally, the perspective of the mobile mapping technology is discussed. More efficient image processing and sequential estimation algorithms should be researched and developed in order to make a good use of the large amount of high resolution data and characteristics of sequential images. Enhancement of the automation of object recognition and attribute extraction would improve the efficiency of GIS database generation from the georeferenced image sequences. This would also contribute to the reduction of the significant difference between the speed of mobile mapping data acquisition and that of the subsequent data processing.

Keywords: GIS, accuracy, Resolution, Satellites, GPS



Climate Smart Cities – The Need of the Future

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ABSTRACT

Most of the world's population now lives in the cities leading to increased energy consumption, carbon emissions, and enormous amounts of waste generation. With ever increasing number of people moving in the cities, there is an increased burden on the existing natural resources and therefore, people living in the cities are particularly vulnerable and exposed to the risks and to the impacts of climate change. One of the main challenges is that these fast growing cities are not well equipped for a changing climate. In order to be climate resilient and sustainable, urban development of the cities has to take into account the future climatic changes and uncertainties associated with it. Urban centers and cities have a very important role to play in both adapting and mitigating climate change. It is now imperative that efforts are made to shift towards a more climate resilient path. 'Climate smart cities' can be an important part of the solution by minimization of required inputs of natural resources such as energy and water, and waste output of heat, air pollution - CO₂, methane, and water pollution. This article reviews and presents valuable examples of sustainability initiatives from various cities all over the world like Curitiba, Singapore, Auroville, Copenhagen, Reykjavik, etc. The various key descriptors include waste reduction, water conservation, renewable energy production, sustainable transport, creating green public spaces, and improving urban planning and management and policy initiatives that encourage sustainability. Therefore, a climate smart city includes various adaptation and mitigation measures like intelligent architecture, promotion of mass transit, lifestyle changes like use of bicycles and walking, use of clean energy sources, improved water and waste treatment, and rainwater management and harvesting measures to increase ground water recharge and pollution control measures to ensure good public health.

Keywords: Climate Smart City, sustainable city



Variability and Trends in Rainfall in Northeast India Based On Rainfall Data Form 1901 To 2016

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ABSTRACT

Understanding of rainfall from a spatial point view is of great importance in a country like India where more than half of the population is directly dependent on agriculture. And agriculture in India is largely dependent on rainfall. The availability of water in India is also highly reliant on the monsoon rainfall. In this study, the inter-annual, inter-seasonal variability and trends of rainfall in Northeast India are estimated for the years 1901 to 2016. This region receives the highest amount of annual rainfall than any other area. It is based on the data computed by the Indian Institute of Tropical Meteorology (IITM), Pune. IITM has prepared the data from almost 306 meteorological stations all over India. IITM has divided India into five regions and further sub-divisions of these regions. IITM provides the monthly rainfall data for the regions and their sub-divisions. The Northeast region consists of states of Northeast India (excluding Arunachal Pradesh) and West Bengal (as per IITM classification). The whole time span is divided into four periods of 30 years' span assuming the minimum climatic cycle to be of 30 years. Variability in annual and seasonal rainfall for each of periods are calculated. Departure of rainfall from normal (long time average) are computed for each year and based on this normal, excess and deficient rainfall years are identified. Trends in rainfall are also tried to be estimated in the study.

Keywords: Rainfall variability, Rainfall trends, Northeast India, Rainfall deficiency



Climate Change and Agricultural Vulnerability: Adaptive Strategies for Climate Compatible Agriculture in Gorakhpur City Peri- Urban Area.

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ABSTRACT

Climate is changing naturally at its own pace, since the beginning of the evolution of earth, but presently, it has gained momentum due to inadvertent anthropogenic disturbances. These changes may culminate in adverse impact on the biosphere on which we depend for our food, fiber and shelter. The multi-faceted human interventions have started reflecting an increase in the concentration of greenhouse gases (GHGs) causing globe warming along with other cascading consequences in the form of shift in rainfall and temperature pattern, melting of ice, rise in sea level etc. which has a wide impact on livelihood specially agriculture and other primary activities and need to be scrutinized to sought the probable solutions to these undesirable changes and their adverse impacts. Vulnerability is the degree to which a system is susceptible to, or unable to cope with adverse effects of climate change, including climate variability and climate extremes. Vulnerability to climate change varies across regions, sectors, and social groups. Understanding the regional and local dimensions of vulnerability is essential to develop appropriate and targeted adaptation efforts. Research on the impact of climate change and vulnerability on agriculture is a high priority in India as the impact is expected to be widespread and severe. Developing the ability to confidently estimate the impacts of climate change on agriculture is critically important. It could provide the information needed to help farmers to develop their own long-range response to climate change. Changes in the atmospheric chemistry have increased during last few decades due to the heightened anthropogenic activities even in and around Gorakhpur city in form of variability of rainfall and temperature which is causing the intensity of water logging, flooding, drought in summer and frost and hail in winter that adversely impacting the agricultural activities, their productivity and net production. The past records of weather conditions in Gorakhpur city show a rapid alteration and unexpected change in the climate. Since last two decades there has been a continual change in annual maximum and minimum temperature, annual amount of rainfall and rainy days and it is expected that in future these weather abnormalities are likely to increase in number and scale which have an adverse effects and will severely impact the livestock, Land use, crop productivity, farm profitability and whole ecosystem of this transitional zone of peri-urban area. The magnitude and geographical distribution of such climate induced changes is affecting our ability to expand the food production area as required to feed the burgeoning population

Keywords: Agricultural Vulnerability, GHGs, Climate compatible, Gorakhpur city



Quality Control of Meteorological Data and Relation Between Rainfall and SST in A Semi-Arid Region

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ABSTRACT

Studies related to climate variability and change, hydrological designs, crop planning etc., require long-term homogeneous datasets. Since homogeneous climate data is not available for climate analysis in countries like India, the present study emphasizes on quality control of meteorological data. Ten rain gauge stations were selected for the study in Vaippar basin. This study concludes that precipitation daily time series are fairly homogeneous. Meteorological data filling was done using normal ratio method. The homogeneity and consistency check of data was carried out using visual interpretation and double mass curve analysis. Results show no suspicious values and no break in double mass curves which shows homogeneity and consistency. The relationship between monsoon rainfall and SST also suggest that not all the ENSO events were associated with drought.

Keywords: Metrological data, ENSO events, Double mass curves



Climate Variability and Flood Hazards In Lower Ganga Plain Of West Bengal, India: A Geospatial Approach

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ABSTRACT

Climate change is expected to manifest quite significantly in India. India is considered highly vulnerable to climate change, not only because of high physical exposure to climate-related disasters, but also because of the dependency of its economy and majority of population on climate-sensitive sectors (e.g. agriculture, forests, tourism, animal husbandry and fisheries). West Bengal, a part of Bengal Delta, has a long recorded history of flood. At present 42.3% of total area of the State is susceptible to flood. Reason is the landmass of the State was formed by the Ganga-Padma system of rivers through the delta building process of which flood being the main carrier of sediments, the bulk of fluvial deposit, in huge volumes. The highest affected area as recorded in 1978 is about 30,607 sq. km and in 2000 is about 23,971 sq. km.

Keywords: Climate variability, Disaster, Flood hazard, Flood Vulnerability, Ganga- Padma system



Remote Sensing and GIS Based Groundwater Prospects & Quality Assessment in Fatehabad District, Haryana

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ABSTRACT

In modern period of urbanization, industrialization, agriculture and increasing population and increasing population have great effect on quantity and quality of groundwater. Haryana is an agriculture dominated state so water is major requirement for irrigation. Fatehabad district is also agriculture dominates district which lies between 28°48'15” to 29°17'10” N and 76°28'40” to 77°12'45” E covering an area of 2538 km². In this present study, remote sensing satellite IRS-P6-LISS-III 2006 has been used to assess the groundwater prospects and quality by preparing various thematic layers in Arc Map Arc Info 9.3 GIS software. Field visit have been done for collect GPS point to verify delineated unit and inventory data. Post field correction has been made in prospects and quality map. In the district, Older Alluvial Plain, Aeolian plain, Sand Dune, Sand Dune Complex, Palaeochannel and Older Flood Plain have been demarcated. Older Alluvial covers the largest area of 1498.94 sq. km² (59.09%) having good to very good groundwater prospects which is 59.09% of total area. After that Aeolian plain covers 411.8 km² (16.22%) having moderate to good, sand dune and dune complex covers 30.86 km² (1.21) and 70.04 km² (2.77%) having poor groundwater prospects. Older flood plain covers 368.84 km² (14.53%) having good to very good groundwater prospects. Palaeochannel covers 86.68 km² (3.41%) having very good to excellent groundwater prospects. For ground water quality, data has been collected from Groundwater Cell, Hisar. The major constituents such as TDS, Cl, Ca+Mg, EC (µmho/cm), pH, TH are used for assess the groundwater quality from pre monsoon and post monsoon data. Based on Indian Drinking Water Standards (BIS Guideline-IS: 10500:1991), ground water quality has been categorized into desirable and permissible limit and non-potable limit. In the integrated groundwater quality map only two categories permissible and non-potable limit. Permissible limit covers an area of 1703.67 sq. km (67.13%) and non-potable area covers an area of 834.33sq. km. (32.87%). The study present is highly useful for giving a glance view of prospects and quality in the district which will be helpful in further development and management.

Keywords: Remote Sensing, GIS, GPS, Prospect, Quality, Groundwater



Estimation of SWAT model output uncertainty

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ABSTRACT

The problem of soil erosion exists in Chotki-Bherghi watershed in Eastern India and requires immediate attention. The watershed includes mostly agricultural land and rainfall is the major source of irrigation in the region. The objective of the study is to priorities the parameters and simulates the stream flow by using SWAT model and analysing the output uncertainty with SUFI-2 algorithm. The SWAT model was simulated for the period of 2004-2006 and validated for 2007-2008. R^2 and NSE values were found to be 0.88 and 0.82 for calibration, and 0.80 and 0.78 during validation period, respectfully. P-factor of 0.70 during calibration indicates that 70% of observed data were captured very well. The calibrated model can be used for further analysis of the effect of climate and land use change as well as other different management scenarios on stream flow and soil erosion.

Keywords: SWAT, SWAT-CUP, SUFI-2, Hydrological Modelling, Stream flow



Abundance and mode of occurrence of environmentally hazardous trace elements in Rajpardi lignite mine, Cambay Basin, Gujarat

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ABSTRACT

Lignite is mainly used in power generation. A large amount of pollutants and ash residues are produced during this process. So, for environmental protection, concentration of hazardous trace elements, modes of occurrence and distribution are important issues. The distribution of trace elements in the Rajpardi lignite mine from the Cambay Basin was investigated in relation to ash content and maceral composition. The lignite seam of Rajpardi mine is mainly composed of Huminite group of maceral. Huminite is the chief maceral group and varies in concentration from 67.86 to 80.04% while liptinite (8.70 to 16.30%) and inertinite (2.77 to 9.31%) are the subordinate maceral groups. Mineral matter varies from 6.94 to 14.88%. For this hazardous study, composite samples of coals from Rajpardi open cast mines were prepared for Atomic Absorption Spectrometer of Co, Cu, Cr, Cd, Zn, Ni, Pb, and As. The concentrations of these elements range from 12.0-40.04 ppm, 7.88-123.6 ppm, 9.6-45.6 ppm, 0.04-1.4 ppm, 1.88-20.96 ppm, 3.0-18.28 ppm, 2.12-18.2 ppm, and 0.001-0.547 ppm respectively. These elements are mobile and reached at soils and affect the quality of ground and surface waters, and finally, human health. In developing countries, where people are more exposed to their geochemical environment and suffer many health problems. These investigations find out the occurrence, variability and a degree of affinity to organic and inorganic constituents of coal and its effect on environment and human being.

Keywords: Trace elements; Environment; Water; Maceral; Human health



Climate Change Impacts on Crop Evapotranspiration in Varanasi (U.P.)

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ABSTRACT

Warming of earth's climate leading towards a less precipitation high-temperature scenario. Much of the worldwide debates are going on the spatiotemporal impacts of global warming on climatic variables across the world. The regional differences in climate change impacts and warming trends in continental interiors are strongest in Asia. The warming trend is strongest in winter over China and in autumn and spring over eastern and northern Asia since 1979. Climatic variables of the regional scale are in continuous change due to the global systems variation. Evapotranspiration rate could be driven by changing land use and climate parameters. Under the current study, mean monthly rainfall and air temperature from seven meteorological stations located in the Varanasi district were analyzed together with the land cover data to accomplish the spatial distributions of crop evapotranspiration (ET_c) from 1971 – 2000. The future predictions of ET_c refer to the 2040-2059 period is also estimated with projected temperature. Based on climate data and on specific crop coefficients during the main stages of the vegetation growth (initial, mid-season, end season, cold season), the seasonal and annual ET_c were calculated. The crop evapotranspiration registered highest values during the mid-season stage when the values reached 1099 mm, 1045 mm, and 1146 mm in 1941-1970, 1971-2000 respective 2040-2059 periods. For the last century, the annual ET_c varied from 2352 mm to 2265 mm between the analyzed periods, while during 2040-2059, the study area will face a significant increase up to 2595 mm year⁻¹ of the crop evapotranspiration. These values overlap mostly in the crop area, whereas in the urban area the ET_c fall below 600 mm. This finding shows how have been the evapotranspiration get affected by the ever-changing climatic variables in the last century, especially in the northern, western, and central sides of the study area.

Keywords: Crop evapotranspiration, Climate change, Potential evapotranspiration, Land cover, Crop coefficient, Precipitation.



Watershed Delineation through Automated Extraction techniques using CartoDEM data of Hoshangabad District

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ABSTRACT

Digital Elevation Model(DEM)is considered as an important driver to Delineate Watershed and its sub parts which provide the foundation for better understanding of relationships and interactions between human and natural phenomena and better management of resources. Geographical Information System and Remote Sensing provide a platform to perform these tasks. The present study was carried out for Hoshangabad District located in Madhya Pradesh State, India. The aims of this study are to detect automated drainage, watershed using CartoDEM version-3 with 30 m. resolution (2014). The objective is extended to examine the effectiveness of the technique for Automatic Watershed extraction and drainage delineation, and also their relationship between topography, slope, and stream networks, and watershed characterization by Spatial Analyst Hydrology Tools in ArcGIS. Results include watershed, subwatershed and basins, drainage network and maps that help in identifying the nature and extent of watersheds in the study area and other related phenomenon.

Keywords: Carto Digital Elevation Model(CartoDEM), Spatial Analyst- Hydrology Tools, GIS and Remote Sensing, Watershed.



Role of Biotechnology in Mitigating Climate Changes in Agriculture

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ABSTRACT

There has been a drastic change in agriculture due to the changing climatic scenario over last decade. Heat stress due to high ambient temperatures is a serious threat to crop production worldwide and negatively affects plant growth, development and crop yield. With the decrease in crop yield, the need of agricultural innovation has become even more apparent. Development of new crop cultivars tolerant to high temperature is a major challenge for plant scientists and keeping in view the elevated temperatures resulting in global warming it has become the need of hour to study the plant responses and adaptation mechanisms underlying it to develop heat-tolerant varieties. Research and development of new technologies like biotechnology and other advanced agricultural practices have become important to increase the agricultural production. Various biotechnological approaches such as biotechnology based bio-fertilizers, use of GM crops which lower down the fertilizer input needs, development of resistant and tolerant plants to various abiotic and biotic stresses using modern genomics approaches may lead to increase in the production and can contribute to climate change adaptation and mitigation initiatives. Genetically modified (GM) canola developed by Arcadia Biosciences can use nitrogen more efficiently, resulting in reduced fertilizer needs. Additionally, they can reduce greenhouse gas emissions through reduced fertilizer application. Further, tissue culture and breeding are also being used to generate stress-tolerant high/yielding hybrids. Recent widely studied molecular approaches have included omics techniques and the development of transgenic plants through manipulation of target genes. Investigation of these underlying molecular processes may provide ways to develop stress tolerant varieties and to grow agriculturally important crop plants under high temperature. Thus, an integrated approach combining both the conventional and modern agricultural biotechnology approaches will not only contribute to increased yield and food security, but also significantly contribute to climate change adaptation and mitigation initiatives.

Keywords: Climate change, biotechnology, transgenic, abiotic and biotic stress



Impact of Urban Land use & Environment on Crime in Jalandhar City

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ABSTRACT

The highly improvement of the cities along with their expansion of size and denseness conjoined with the hasty speed of civilization and is combined with increased crime and assault. The poor planning of the urban areas, urban design and the management of urban areas plays a vital role in the framing of urban environments that put civilians along with their wealth at risk. Various designs and the built up structures of cities influence on the nature of perpetrators movements and victims and on eventualities for crime. In Jalandhar city (8,62,886 Population as Census 2011) the crime is a serious problem, which affect poorly to the community of different areas. Crime possesses the community economically as well as intellectually by creating fear of danger in the peoples. Peoples always want life that is free from danger. Now these days in Jalandhar city, Crime is growing day by day and it is an asocial and malicious component in the society. The criminals are those dirty insects of society, which contaminate the society. Its seem to be very difficult to handle the responsibility of the public security as efficient need of the society by the police with this poor infrastructure and incompetent technologies. Crime eradication is the big need to maintain the serenity and sustainability of Social life. The prevention of crime in the region/city has the multidimensional approach.

This study of crime hotspot analysis identifies the crime hotspot areas (Police station Wise) and provides consideration on the effect of Urban Land use & environment on crime rate of the city. Land use planning plays a vital role in creating a balance between the needs of society along with its physical environment. However, most often poor planning and dislocation of land uses particularly in urban areas contribute to social conflicts such as murder, attempt to murder, theft and other kinds of illegal activities. This research explains the impact of land use and surrounding physical environmental things on the crime of the city. This study enlightens the Computer Geospatial technologists on the subject of crime hotspot analysis of the city and the realization of safety. Further research on crime hotspot analysis and prevention is, to actual improvements of public safety is encouraged. This research also includes the various basic parameters like as Crime rate and Crime density to identify the hot crime areas. The Geospatial Computer technology is used in this research the criminal activities tend to concentrate in various land use areas of the study area.

Keywords: Google Earth, QGIS (Open Source), Crime data from Jalandhar Commissioner ate and MS Office.



A study of Climate Impacts on Coastal Areas of Karnataka

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ABSTRACT

The coastline of the Karnataka is densely populated; approximately 4.63 million people live in an area vulnerable to relative sea level change, historical shoreline change, coastal slope etc. Global warming and Climate Change is projected to increase the sea level, the two important causes of global sea level rise are thermal expansion because of warming of the sea (since water expands because it warms) and extended melting of land-primarily based ice, which include glaciers and ice sheets. If sea rises unexpectedly for a small extent could have devastating outcomes on coastal habitats. As seawater reaches farther inland, it could cause damaging erosion, wetland flooding, aquifer and agricultural soil infection, and misplaced habitat for fish, birds, and plant life. In order to avoid these damages and to identify the most critical area this study was carried out. The present study has been carried out with a view to calculate the coastal vulnerability index (CVI) to know the high and low vulnerable areas and area of inundation due to future sea level change, historical shoreline change etc. Both conventional and remotely sensed data were used and analyzed through the modeling technique and by using ERDAS Imagine and geographical information system software. In this study total 295.05 km was identified and it is observed that about 63.42 km of the shoreline is under very high CVI category and 69.68 km of shoreline is under high CVI category and remaining shoreline, 63.82km and 98.13km are of moderate and low vulnerable categories, respectively.

Keywords: Geo-informatics, Climate change, Global warming, coastal vulnerability index (CVI), ERDAS Imagine. Geographical information system



GIS Based Modelling of The Routes of The Allahabad City (U.P.) by Using ArcGIS

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ABSTRACT

The current Geographic Information System (GIS) modelling work is to analysis the shortest and fastest route among the city of Allahabad's routes. These alternative routes save time, fuel and money and are the best for driving, which is especially important for emergency case. Allahabad city is the seventh most populaces place in the state of Uttar Pradesh and has recognized the fastest growing cities. Although, a number of roads connect almost the all stoppages and stations and the vast population leads the city very busy and vibrant, as a result chaos occurs very often on roads, where one can easily get confused to find the best and convenient way to reach the destination. The inconvenience is even worst when the roads are very long time taken and passed through much traffic hold areas, however at the same time some short roads are available to reach a station from a stoppage and these alternative routes may free from the traffic noise. Purpose of present research work is to extract these alternative routes with the help of ARC GIS software. There are 23 stations and 69 stoppages selected in the city of Allahabad. In present work station is hospital and stoppage is an accident spot.

Keywords: Geographic Information system, ARC GIS, fastest route, shortest route



Effect of Various Concentrations of Plant Growth Regulators and Different Growing Media On Rooting of Bitter Gourd (*Momordica Charantia* L.) Cuttings Under Mist Condition

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ABSTRACT

A field experiment was conducted during winter season of 2015-16 to study “**Effect of various concentrations of plant growth regulators and different growing media on rooting of bitter gourd (*Momordica charantia* L.) cuttings under mist condition**” having 16 treatment combinations of two growth regulators main factor IBA and NAA with concentration 300 ppm, 250 ppm and 200 ppm (C₁- NAA 300 ppm, C₂ NAA 250 ppm, C₃ NAA 200 ppm, C₄ IBA 300 ppm, C₅ IBA 250 ppm, C₆ IBA 200 ppm, C₇ IBA 300 ppm + NAA 300 ppm, C₈ IBA 300 ppm + NAA 250 ppm, C₉ IBA 300 ppm + NAA 200 ppm, C₁₀ IBA 250 ppm + NAA 300 ppm, C₁₁ IBA 250 ppm + NAA 250 ppm, C₁₂ IBA 250 ppm + NAA 200 ppm, C₁₃ IBA 200 ppm + NAA 300 ppm, C₁₄ IBA 200 ppm + NAA 250 ppm, C₁₅ IBA 200 ppm + NAA 200 ppm, C₀ Control) and two growing media (M₁- Vermiculite and M₂- Perlite). The treatment C₇M₁ (IBA 300 ppm + NAA 300 ppm + Vermiculite) recorded the maximum percentage of rooted cuttings (66.67), number of primary roots / cutting (15.33), number of secondary roots / cutting (59.33), length of longest root (5.55 cm), diameter of thickest root (0.87 mm) and treatment C₀M₂ (control with perlite) recorded the maximum percentage of unrooted cuttings (58.33%) The root was found superior in compare to other growth regulator concentration and growing media.

Keywords: Cutting, Growth regulators and growing media



Automated Spatial Delineation of Watershed and Drainage Network from Aster Digital Elevation Model – A Case Study Of Sind River Basin

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ABSTRACT

Watershed is one of the important essential content for many multidisciplinary researches such as water harvesting, watershed management, morphometric analyses, land use and land cover change analyses, soil types, geology, geomorphological analyses, river flows studies etc. The delineation of watershed can be done either manually from topographic sheets or derived from Digital Elevation Model (DEM) data using computational methods. In the last few decades, Geographic Information Systems (GIS) are proving valuable tools in many hydrological as well as natural resources environments. In the present study automated spatial delineation of watersheds have been done using ASTER DEM data with the help of ARC SWAT (Soil and Water Assessment Tool) model. This methodology is executed on a geo-spatial software such as ARC GIS in which ARC SWAT performed as a tool of ARC GIS. The Sind River basin has been taken as the study area which covers about 27,905 km² and seventeen watersheds have been delineated using ARC SWAT. Some of the major watersheds are that of Pahuj, Parbati, Kunwari, Morar, and Upper Sind catchment. The drainage network has been extracted and the patterns of the drainage have been studied. It was concluded that this methodology is also suitable for low spatial resolution of DEM (30 m.). Further for the delineation of several watersheds from a large area the technique not only saves time but also provides splendid results. The study demonstrates the importance and reliability of ARC SWAT tool for automated delineation of watersheds and drainage network from ASTER data.

Keywords: Watershed, GIS, ARC SWAT, ASTER DEM, Geo-Spatial.



Assessing The Influence of Glass Powder as A Pozzolanic Material on The Flexural Members

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ABSTRACT

The focus of this work is to assess the feasibility of using glass powder as a partial replacement of cement in concrete on the flexural members. A huge emission of carbon dioxide (CO₂) a potentially hazardous greenhouse gas to the atmosphere is released during the manufacturing of cement, which is the number one responsible factor of nowadays scourge "Global Warming". Beams were casted to check the Flexure strength of beams made of concrete by partially replacing cement by glass powder. Flexural members incorporating glass powder as a partial replacement of cement proved to have more strength than flexural members made of normal concrete (without any replacement). This work has proved that we can reduce pollution caused by cement during its production by partially replacing it by glass powder.

Keywords: Glass powder, Pozzolanic activity, Flexural Strength.



Effect of Planting Dates and Varieties on Growth and Corm Yield on Gladiolus (*Gladiolus hybridus* Hort.) Under Sub-Humid Zone of Rajasthan

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ABSTRACT

A field experiment was conducted during winter season of 2015-16 to study “Effect of Planting Dates and Varieties on Growth and Corm Yield on Gladiolus (*Gladiolus hybridus* Hort.) under sub-humid zone of Rajasthan” having 15 treatment combinations of five Varieties (V₁- African Star, V₂- Hunting Song, V₃- Legend, V₄- Pusa Srijana and V₅- Snow Princess) and three planting dates (D₁- 10th October, D₂- 25th October and D₃- 9th November). The treatment V₂D₁ (Hunting Song + 10th October planting) recorded the maximum plant height (116.10 cm), highest number of leaves per plant (8.77), main stem diameter (1.50 cm), number of corms per plant (3.66), number of corms per plot (31.66), number of cormels per plant (57.66), number of cormels per plot (350.66), diameter of corm (7.13 cm) and maximum weight of corms (86.03 g). While the maximum leaf length (64.20 cm) and leaf width (4.96 cm) was found in (V₅D₃). It concluded that 10th October planting date along with variety Hunting Song was found to be the best treatment combination for growth and yield parameters.

Keywords: varieties, planting dates, gladiolus, spike



Studies on Effect of Planting Dates and Varieties on Growth and Quality in Gladiolus (*Gladiolus hybridus* Hort.) Under Sub-Humid Zone of Rajasthan

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ABSTRACT

A field experiment was conducted during winter season of 2015-16 to study “Studies Effect of Planting Dates and Varieties on Growth and Quality on Gladiolus (*Gladiolus hybridus* Hort.) under sub-humid zone of Rajasthan” having 15 treatment combinations of five Varieties (V₁- African Star, V₂- Hunting Song, V₃- Legend, V₄- Pusa Srijana and V₅- Snow Princess) and three planting dates (D₁- 10th October, D₂- 25th October and D₃- 9th November). The treatment V₂D₁ (Hunting Song + 10th October planting) recorded the maximum plant height (116.10 cm), highest number of leaves per plant (8.77), main stem diameter (1.50 cm), number of florets per spike (15.8), spike length (91.80 cm), rachis length (57.90 cm), floret diameter (10.04 cm), vase life of spike (13 days), While the maximum leaf length (64.20 cm), leaf width (4.96 cm) in (V₅D₃) and maximum spike girth (0.91 cm) was found in (V₁D₂). The growth and flowering quality was found superior in compare to other planting dates.

Keywords: varieties, planting dates, gladiolus, spike



Effects of Voltage Crest Factor in Rapid Start Fluorescent Lamps with HPF

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ABSTRACT

The aspect of lamp expectancy for compact fluorescent lamps (CFL) has already been explored by many lighting engineers. It is also well understood that there several parameters that are always influencing the life and performance of CFLs. The parameter such as lamp current crest factor happens to be a pivotal piece of information in connection with lamp life. It has been observed experimentally that the range of lamp current crest factor should be 1.9 to 2.1 for CFLs. Thus implying a reliable heating of the lamp electrodes without any damage. In most of the high power factor (HPF) lamps it has been observed that the lamp current crest factor is within the prescribed limit. But however if the electrode heating is not sufficient it will result in sputtering of the electrode coating and if it more than sufficient evaporation will occur. In both the cases the lamp electrodes are prone to damage. It has been observed that the lamp starting voltage is an important parameter that governs the necessary and sufficient heating of the lamp electrodes. In this paper explores the impact of high power factor (HPF) circuit on the life of self-ballasted lamps by analyzing the lamp voltage crest factor. The experiment carried out on different types of 18W lamps data for lamp voltage crest factor has been collected. The research work done in this paper provides information about the lamp voltage crest factor with corresponding change in electrode temperature. The lamps used in this paper are put to accelerated test with 5 minutes on and 5 minutes off cycle. The lamps with improved circuit is compared with the other types. The lamp voltage responsible for preheating is finally considered while regulating voltage crest factor using IR215X IC for the lamp ballast. The degradation of lamp life is observed physically. The data is plotted in MATLAB and analyzed. An empirical relation has been derived from the curve fitting tool with the set of results obtained. This work serves an important aspect of HPF circuitry as it explores an ingenious parameter influencing the life of CFLs.

Keywords: high power factor; lamp current; lamp voltage crest factor; lifetime



Comparative Analysis of Classification Techniques of Fused Remotely Sensed Data

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ABSTRACT

Mapping land use/land cover through remotely sensed images involves various considerations, processes and techniques. Increasing availability of remotely sensed images due to the rapid advancement of remote sensing technology expands the horizon of our choices for imagery sources. Various techniques have been developed to map the land use /land cover classes with varying and cost. Various classification techniques have been designed and have better than other, they are not only help to identify land use/land cover classes but also help to monitor the change due to natural disaster. The present study discusses various classification techniques i.e. supervised, unsupervised, knowledge base classification on fused image data(i.e. taking the image fusion of CARTOSAT-1 and LISS-IV) and provides a detailed comparative study of classification techniques based on their accuracy assessment using fused data of Bhopal area .In this study ,we analyzed the different classification techniques which give different results on the basis of land use /Land cover classes(finally we got the four classes that is water body, vegetation, waste/fallow land and settlements), for example knowledge classifier gives better result in case of class water however supervised classification gives best result for all classes.

Keywords: Image processing, Remote Sensing, Geographic Information System, classification, accuracy assessment, supervised classification, unsupervised classification, knowledge base classification, decision tree, Principal component, image fusion, land use/land cover.



A hungrier world- blame it on climate change

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ABSTRACT

In coming years about 140 million human beings will be born and some 55 million of us will die. That amounts to a net population gain of 85 million – more than 230,000 additional residents of the earth every day of the year. Many of these newcomers will suckle their meals from a mother's breast for a year or so, but after that it will be up to Mother Earth to provide them food and drink. Our fragile, over extended planet and its hard working human population will have to feed those 230,000 hungry people day after day for the next 66 years. A growing global food shortage has caused prices to double in recent years, and a growing consensus of scientists now blames climate change as one factor in an equation that includes a burgeoning population and increasingly scarce water supplies. More people around the planet are going hungry as a result. One in seven people go to bed hungry every night, according to the United Nations World Food Program. Hunger kills more people than AIDS, malaria and tuberculosis combined. The problem is worst in developing countries. Two hot spots has been identified —South Asia and southern Africa—where higher temperatures and drops in rainfall could cut yields of the main crops people grow there. A variable agriculture needs a stable climate. If we cannot anticipate from one year to the next what and when to sow and what sort of harvest to expect because the climate is going through all sorts of unpredictable convulsions, then we are in serious trouble. According to current general circulation models, the worst impact on agriculture will be in Africa, the Middle East and the Indian sub-continent.

Keywords: Climate Change, Hunger World, Food Program



Soil Health Mapping for Micro Level Planning

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ABSTRACT

The main objective of the study is micro level natural resources development using remote sensing, GIS and java applets. In this I did prepare the Hydro geomorphology, land use/land cover, Soil and Slope maps of the Chityala Mandal on 1: 10,000 scale using high resolution satellite data LISS IV using remote sensing and GIS techniques. All the thematic mapping data integrate and preparing of action plan map of Chityala Mandal, and all the themes promises to bring the benefits of green revolution hitherto untouched by adopting a farming system approach on watershed management principle, in order to conserve precious rain water and equally precious soil.

Keywords: Planning, Soil Health, LISS IV, GIS



Effect of Quarry Dust on Different Properties of Soil

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ABSTRACT

Quarry dust is a type of solid waste material obtained from aggregate crushing industries. Disposal of such waste materials creates lots of problems to the environment and public. To utilize the quarry dust in order to lessen the burden on environment and health, an experimental study was conducted on locally available soil by mixing it with quarry dust. This paper presents the variation of index and engineering properties of clayey soil such as liquid limit, plastic limit, plasticity index, compaction characteristics, California Bearing Ratio (CBR) and Cohesion and Angle of Internal Friction when it is mixed with different percentages of quarry dust.

Keywords: Stabilization, Quarry Dust, Soil Improvement, Index Properties, Engineering Properties



Effects of Micronutrients (Zn, Fe & Mn) On Growth & Yield of Onion (*Allium Cepa* L.) Cv. Pusa Red

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ABSTRACT

Investigation on entitled “Effects of Micronutrients (Zn, Fe & Mn) on the Growth, Yield, Quality of Onion (*Allium cepa* L.) cv. Pusa Red” was carried out during Rabi 2015-2016 at Horticulture Research from, R. B. (PG) College Agra (UP). The data taken a various character were analyzed statistically. The effect of micronutrients application on plant height of onion was found to be significant. The maximum plant height (63.65 cm) was recorded in the treatment T5 ZnSO₄ @ 10 kg/ha + FeSO₄ 10 kg/ha while it was lowest (53.15 cm) in the untreated control (T1) at 75 DAT. Maximum number leaves per plant (7.66) were recorded in the treatment T8 (ZnSO₄@ 10 kg/ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/h and lowest (5.94) in the control (T1) at 75 DAT. The maximum bulb diameter (6.65 cm) was recorded in the treatment T8 (ZnSO₄ @ 10 kg/ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/ha) while it was lowest (4. 57 cm) in the untreated control (T1). The treatment T8 (ZnSO₄ @ 10 k. ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/ha) recorded maximum weight of onion bulb (160.86 g) and lowest (39.00 g) in the treatment T4 (MnSO₄ @ 10 kg/ha) and the untreated control (T1) was (45.81 g) which were at par with each other. There was a signify effect of micronutrients application on yield of onion bulb per hectare. It can be concluded that soil application micronutrients ZnSO₄@ 10 kg/ha + FeSO₄@10 kg/ha + MnSO₄ @ 10 kg/ha in combination before transplanting along with a recommended dose of FYM and NPK to the onion crop is the most beneficial treatment for obtaining higher vegetative growth, yield and quality of onion bulbs. However, for low input technology soil application of ZnSO₄ @ 10 kg/ha can be followed for better growth and yield of onion bulbs.

Keywords: Micronutrient, FYM, NPK and Onion (cv. Pusa Red)



Influence of Micronutrients (Zn, Fe & Mn) On Growth & Qyality of Onion (*Allium Cepa L.*) Cv. Pusa Red

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ABSTRACT

Investigation on entitled “Influence of Micronutrients (Zn, Fe & Mn) on the Growth, Quality, of Onion (*Allium cepa L.*) cv. Pusa Red” was carried out during Rabi 2015-2016 at Horticulture Research from, R. B. (PG) College Agra (UP). The data taken a various character were analyzed statistically. The effect of micronutrients application on plant height of onion was found to be significant. The maximum plant height (63.65 cm) was recorded in the treatment T5 ZnSO₄ @ 10 kg/ha + FeSO₄ 10 kg/ha while it was lowest (53.15 cm) in the untreated control (T1) at 75 DAT. Maximum number leaves per plant (7.66) were recorded in the treatment T8 (ZnSO₄@ 10 kg/ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/h and lowest (5.94) in the control (T1) at 75 DAT. The maximum total soluble solid 'TSS' (16.73%) was recorded in T8 (ZnSO₄@ 10 kg/ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/h and lowest (5.94) in the control (T1) at 75 DAT. The maximum bulb diameter (6.65 cm) was recorded in the treatment T8 (ZnSO₄ @ 10 kg/ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/ha) while it was lowest (4. 57 cm) in the untreated control (T1). The treatment T8 (ZnSO₄ @ 10 k. ha + FeSO₄ @ 10 kg/ha + MnSO₄ @ 10 kg/ha) recorded maximum weight of onion bulb (160.86 g) and lowest (39.00 g) in the treatment T4 (MnSO₄ @ 10 kg/ha) and the untreated control (T1) was (45.81 g) which were at par with each other. There was a signify effect of micronutrients application on yield of onion bulb per hectare. It can be concluded that soil application micronutrients ZnSO₄@ 10 kg/ha + FeSO₄@10 kg/ha + MnSO₄ @ 10 kg/ha in combination before transplanting along with a recommended dose of FYM and NPK to the onion crop is the most beneficial treatment for obtaining higher vegetative growth, yield and quality of onion bulbs. However, for low input technology soil application of ZnSO₄ @ 10 kg/ha can be followed for better growth and yield of onion bulbs.

Keywords: Micronutrient, FYM, NPK and Onion (cv. Pusa Red)



Correlation Analysis for flowering parameters in Chrysanthemum

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ABSTRACT

Correlation was carried out for 15 varieties of chrysanthemum for different flowering attributing traits. Correlation studies showed significantly and positive association with stalk length at phenotypic and genotypic levels with plant height, plant spread, number of leaves per plant, fresh flower weight, flower diameter, stalk diameter and vase life. Flower diameter is significantly positively correlated with stalk length, fresh flower weight, flower yield per plant, flower yield per plot and stalk diameter indicating that these characters can be chosen for further improvement in the breeding programme.

Keywords: Correlation and Chrysanthemum.



GIS AND REMOTE SENSING

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1

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ABSTRACT

This poster defines about the GIS and Remote Sensing technology. Firstly, we will know about this both technology. **Remote sensing** is the art and science of making measurements of the earth using **sensors** on airplanes or satellites. These **sensors** collect data in the form of images and provide specialized capabilities for manipulating, analysing, and visualizing those images. **Remote** sensed imagery is integrated within a **GIS**. A geographic information system (**GIS**) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. After this we will know about importance of these technology and its applications. Mapping can play an **important role** in both areas as it is an excellent means of communication. ... It is interesting to study and analyze the domain knowledge of **remote sensing (RS)**, geographic information system (**GIS**) and bioinformatics and integrate them with the medical sciences to understand the advances and gaps. In the other point we will know about, the process of remote sensing and GIS. This is done by **sensing** and recording reflected or emitted energy and **processing**, analyzing, and applying that information." In much of **remote sensing**, the **process** involves an interaction between incident radiation and the targets of interest. A geographic information system (**GIS**) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. **Advantages of remote sensing** technology: ...**Remote sensing** is unconstructive especially if the **sensor** is passively recording the electromagnetic energy reflected from or emitted by the phenomena of interest. This means that passive **remote sensing** does not disturb the object or the area of interest. The **advantages** of using a geographic information system include: Improved decision making – decisions are made easier because specific and detailed information is presented about one or more locations. ... Easy recordkeeping – geographical changes are easily recorded by **GIS** for those responsible of recording the changes.

Keywords: Remote Sensing, GIS, Sensor, Electromagnetic Energy



Climate Change Effects on Agriculture

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ABSTRACT

Agriculture is the backbone of Indian economy which in turn relies on the monsoon seasons. Rising global temperature is not only causing climate change but also contributes to rainfall. Climate change and agriculture are interrelated processes both of which take place on a global scale. Climate change affects agriculture through changes in temperature, rainfall and climate extremes (example heat and waves). Indian agriculture is very sensitive to climate change. Rising temperature with lower rainfall at the end of season have caused a significant loss in Indian's rice production. High levels of NO_x can have a negative effect on vegetation, including leaf damage and reduced growth. Due to global warming the temperature of environment increases continuously also in winter season due to which the winter crops yielding affected. If climate factors such as precipitation and temperature change in region beyond the phenotypic plasticity *a/c* to law of tolerance. The plants species are shifting their ranges in altitude to latitude as a response to changing regional climates. If temperature exceeds a crop optimal level, sufficient water and nutrients are not available, yields increase may be reducing or reversed. Elevated CO₂ has been associated with reduced protein and nitrogen content in alfalfa and Soyabean plants, resulting in loss of quality. Agriculture significantly suffers from climate change such as adverse effects on rearing of animals and growing of food crops in water scarce region and exposure to heat stress and soil erosion from stronger winds. In poster presentation depict various changes in agriculture due to climate change.

Keywords: Climate Change, Agriculture, Monsoon Seasons, Rainfall



Solid Waste Management

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ABSTRACT

With the aim of preserving the environment in rapidly developing nations, I will introduce Waste management and recycling technologies, which are effectively turning waste into resources or appropriately dispose of it. Due to economic development, industrialization and increasing population, problems related to the expanded consumption and depletion of resources, and the increased output of wide ranging types of waste are becoming more serious than ever. This resulted in a relatively large quantity of solid waste remaining poorly managed and challenged to the society, today society is more concerned about the environment and is much more aware about its activities and the impact resulting from the activities on the environmental society demands that waste management must be sustainable. The proper management of solid waste needs appropriate technology, which is economically affordable, socially accepted and environmentally friendly.

Keywords: Solid Waste, Waste Management, environment



Hazards: Natural and Anthropogenic

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ABSTRACT

A hazards is an agent which has the potential to cause harm to a vulnerable target and transmitted by natural and built environment. There are two types of hazards first one is natural hazards and second one is anthropogenic hazards. Natural hazards are a natural phenomenon that might have a negative effect on human and environment such as earthquake, volcanic eruption, wildlife fires, cyclonic storms, floods, droughts and landslides as well as risk assessment. Anthropogenic or man-made disasters are hazards that caused by human action and inaction. Man-made disasters may adversely affect humans, other than organism, biomes and ecosystem. The man-made hazardous material are organochlorides, DDT, Freon, toxic metals, radioactive materials etc. Hazards affecting the health of exposed person, usually having an acute or chronic illness as the consequences. The primary effect of hazards is caused by directly example crushed by falling buildings, drowning in tsunami. The secondary effect caused by subsequent problem triggered by original hazards examples radiation sickness from nuclear power plant explosion in Japan. The monitoring and control of environmental hazards to health entails a wide range of action, each tailored to the particular hazards or form of public health concern. The control of environmental hazards depends on defining acceptable levels of exposures and health risk and returning the levels of control needed to keep exposure below specified threshold. Monitoring activity using biomarkers that focus on environmental exposures, diseases and disorders. In poster presentation I depicts about the natural and anthropogenic hazards that affect the environment.

Keywords: Hazards, Volcanic eruption, Vulnerable target, Man-made disaster, Specified thresholds, Biomarkers, Exposures



Disaster Risk Re-Evaluation: A Need for New Techniques

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ABSTRACT

A Disaster is a sudden, calamitous event that seriously disturbs the functioning of a community or society and causes human, material, and environmental losses that exceed the community's or society's ability to cope with using its own resources. Disaster is a mishap which is not in the control of human beings and thus termed as natural disasters. Disaster can be anthropogenic which can't be stopped or tackled immediately. Disaster risk re-evaluation deals with the reassessment of the natural and man-made disasters so as to determine the various causative agents along with its mitigation methods. Climate change has been seen as the major factor that has a direct impact on the prevalence and seriousness of the disaster, as well as causing them to be more frequent in the future. There are growing efforts to closely link Disaster risk reduction and climate change adaptation, both in policy and practice. Disaster cannot be stopped, yet it can be controlled. The poster deals with the various trending techniques that helps in reducing the risk factor of these disasters and also highlights the various factors that enhance the effects of the disaster.

Keywords: Disaster Risk, Climate Change, Mitigation, Technique



Climate Change Effect on Agriculture

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ABSTRACT

Agriculture Production is sensitive to weather and thus directly affected by climate change. Possible change in Temperature, Precipitation and Carbon Dioxide Concentration are significantly impact crop growth and Agriculture affected in several ways such as quantity and quality of crop in term of productivity, growth rates, photosynthesis and transpiration rates moisture availability etc. Climate change has affected the environment of areas which has ultimately affected the agriculture pattern. The poster explains the causes behind the change in the agricultural pattern. It is also emphasizing on the comparative study of the past & present activities that has leads to the disruption in the Pattern of agriculture.

Keywords: Agriculture, Climate change, comparative study, Photosynthesis, Transpiration, Productivity



Flood Flow Modelling and Embankment Protection of Mahanadi River Using HEC-RAS

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ABSTRACT

India has such a diverse geographical area that there are floods in some parts and droughts in other parts of country and same time they co-exist. Large numbers of severe and devastating floods are endangering life and properties. In the state of Odisha flooding is caused primarily due to Mahanadi River. The flow of water and its level in the river Mahanadi having a catchment area 141000 km² is controlled by Hirakud dam. The entire deltaic region of Mahanadi River intercepting a catchment of 48700 km² gets affected by medium to severe flood almost every year causing immense loss to life and property. Study was done to find out reduced level of flood water in different locations of Mahanadi river reach between Hirakud dam and Naraj for 10, 25, 50, 100 and 500 years return period using HEC-RAS model. The study has been accomplished by preparing the basin map of for Mahanadi river in HEC-RAS readable format and computing the peak flood for 10 years, 25 years, 50 years, 100 years and 500 years return period using Gumbel's distribution. Improvements for the channel cross-section, bank embankment modification, height of flood protection structure such as dikes, levees in the flooded zone were suggested. The peak flood discharge of Mahanadi river at 10 years, 25 years, 50 years, 100 years and 500 years return have been calculated as 37535.026 m³/s 45067.19 m³/s, 50656.19 m³/s, 56203.24 m³/s and 69021.61 m³/s respectively. Flood flow hydrograph has been prepared for the year 2008 by unsteady flood flow simulation. Around 10 numbers of river stations are prone flood under 20 year return period. Where the flood height above cross-section is varying from 1 m to 10 m at different period cross-section stations no 299, 295, 290, 234, 173, 165, 140 and 130 in the main channel of the river. The findings of present study suggest the height of dikes, levees to provide protection from flood at different locations of the river reach under different return periods. So the structure of dikes, levees should height between 2m to 10.5m respectively in the 10 to 500 years return flood.

Keywords: HEC-RAS, Droughts, Flood, Flow Modelling, Dikes



Temporal and Spatial Variation of Water Quality of Ganga River In Varanasi Stretch

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ABSTRACT

Large scale emigration from rural to urban areas and immense population growth have been uninterrupted and accelerating phenomena in parts of Ganga basin, where urbanization is creating an anomalous change. The main source of pollution in Varanasi are small industries, domestic sewage, cremation, migration from remote areas. Urban agglomeration is responsible for comprehensive change in surface water quality. Increasing pollution need to better understand the spatial and temporal variability of pollutants with in aquatic ecosystem through physicochemical parameter includes ph, temperature, turbidity, salinity, alkalinity, phosphate, nitrate and heavy metals in list chromium, cadmium, zinc, copper as the most important characteristics of the river water quality. Due to unprecedented growth of population needs food so wastewater use in irrigation which promotes chlorinated organic pesticides. They are lipid soluble toxic chemical and cumulative accumulation of low concentration of these pesticides in the body fat and enter into the food chain which might pose potential hazards in the long run. Ultimately change in water quality leads climate change which became a havoc for society.

Keywords: Urban agglomeration, spatial and temporal variability, heavy metals, water pollution, climate change



Assessment of The Drought Conditions During Kharif 2016 for Koppala District, Karnataka - A Case Study

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ABSTRACT

Drought is a harmful hazard in the nature and it is also considered to be one among the most complex natural hazards but it the least understood one. Drought is an impermanent instability, not like aridity or even periodic aridity, which is an enduring feature of the climate. Enormous number of historic data's and the present data's are essential to learn about the drought which includes difficult inter-relationship between the hydrological, agricultural and meteorological data. The drought description is area specific, marking the variance in climatic features along with the diverse physical, chemical, biological and socio-economic influences. The assessment of drought condition was made using GIS and remote sensing. The indicator such as Rainfall deviation, Dry Spell, SPI, NDVI deviation, Moisture Adequacy Index and Reservoir storage index was considered and all the indicators/indices vary across one region to another region depending on the geographical locations. Karnataka State stands second after Rajasthan in terms of total area under arid/ semi-arid conditions. 17 taluks in Karnataka have drought vulnerability for 6 or more consecutive years. The drought determination was done on Koppala district, Karnataka, India situated between 15.09'00" to 16.03'30" North Latitude and 75.47'30" to 76.48'10" East Longitude. Koppala District is one among the districts that has observed drought for 11 to 12 years. In 2005, 2007 and 2010 drought was not observed. The result puts forward a conclusion that the methodologies are feasible to estimate the drought condition for any given region.

Keywords: Drought, Rainfall deviation, Dry Spell, SPI, NDVI deviation, Moisture Adequacy Index.



Estimating the Soil Moisture Index using Normalized Difference Vegetation Index (NDVI) And Land Surface Temperature (LST) for Bidar and Kalaburagi District, Karnataka

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ABSTRACT

The soil moisture is a significant analysis of understanding the moisture content in soil that are most, The Soil Moisture Index measures the moisture condition at different levels in the soil. It is mostly determined by the rainfall via the method of penetration. To bring out the geospatial data that allows to generate of suitable information relating to Soil Moisture content, we used the remote sensing method and GIS software's that depend on the use of soil moisture index (SMI) such as Normalized Difference Vegetation Index (NDVI) and Land Surface Temperature (LST). Landsat 8 satellite images that are provided with visible (red band) and infrared bands (near infrared bands) are important for the calculating NDVI and the Band 10, Band 11 along with NDVI is provided as the input for LST analysis. The Soil moisture index (SMI) is based on the observed parameters and the relationship between Land Surface Temperature (LST) and Normalized Difference Vegetation Index (NDVI). The SMI condition is done for Bidar and Kalaburgi districts, Karnataka, India for the April month in 2017. Soil moisture data are collected from under the surface from a long period as well as at higher spatio-temporal resolutions data that are very important in assessing the severity and level of drought relatively accurate.

Keywords: NDVI, LST, SMI, Landsat 8.



GIS Based Site Suitability Modelling for Locating Solar Power Park in Thiruvannamalai District, Tamil Nadu

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ABSTRACT

Owing to the demand of the electricity consumption across the world, an important trait has been brought to the context by including the solar energy as an alternate source of power generation. The solar energy is termed as the best renewable resource that meets all the needs because of its tremendous benefit. Renewable energy generation can assist countries encounter their sustainable development that aims through delivery of spotless, safe, reliable and inexpensive energy and this paper gives the idea of using the on multiple criteria's decisions and methodology to find optimum sites for planting the Solar power park concentrating on numerous other factors. Determining an opposite location that is favourable to all the circumstances such as the economy, environmental and social issues is a tedious task. Hence, considering the problem in account the best solution can be given as using the Geographical information system (GIS) based model for this analysis. Here, the GIS-based model works with the multi-criteria-analysis for solar site assessment for Thiruvannamalai District, Tamil Nadu. The criteria such as distance from road, Availability of barren lands, Distance from waterbodies, slope, direction of sun radiation and existing built-up area etc. have been taken into consideration as analysis criteria. The study area extends between 78.20 to 79.50 eastern longitude and 11.55 to 13.15 northern latitude, and covers area of 622059 ha. At last number of maps was prepared to show the selected criteria's and a final output of the selected area which is very much suitable, moderately suitable and less suitable area to plant the solar power park.

Keywords: GIS, Suitability, Solar Power Park, Renewable Energy, Multi Criteria Analysis



Study of The Physiochemical Parameters and Spatial Variability of Available Nutrients in Mango Growing Areas using GIS

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ABSTRACT

The present study highlights the physiochemical properties and a methodology developed for mapping spatial variability of available macro nutrients of soils of mango (*Mangifera indica*) orchard, GKVK University of Agricultural science, Bengaluru. The soil samples were collected from the six different sites of the mango orchard (shaded, unshaded, moist, un-moist, aged, new sapling) covering an area of 16.7 ha. This study of soil is based on the various parameters like pH, total organic carbon, Macronutrients (Phosphorous, Potassium, Boron, Calcium, Magnesium, Sulphur, Sulphate and Phosphate). This study revealed the spatial variability of nutrients at different levels, which indicates the quantity of nutrients levels were low, medium and high content to study the effect of nutrients to increase the percentage of yield crops.

Keywords: Geographic Information System (GIS), Global Positioning System (GPS), macro nutrients, spatial distribution.



Clustering Technique to Threshold Vegetation Indices and Gap Detection in Hazaribagh Wildlife Sanctuary, Jharkhand (India)

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ABSTRACT

The K means clustering was processed for retrieving the vegetation index value that represents forestland cover, percentage vegetation coverage and canopy density. The method was further used for finding the probability distribution of forest canopy gaps in the forest. The result was tested in the Hazaribagh Wildlife Sanctuary, Jharkhand, India. The percentage vegetation cover was calculated in the new SNAP software. The canopy density was mapped through FCD model. From the analysis, it was estimated that the dense forest has greater than 70% of canopy density comprises 64-100% of vegetation cover; moderately dense forest having 40-70% canopy density includes 21-64% of vegetation cover and open forest having less than 40% canopy density have 7-21% of vegetation cover. The NDVI and TVI considered being more efficient and DVI was less efficient for forest vegetation cover and density measurement. Inversely, it was observed that DVI was more efficient in finding gaps in the forest. The method was also functional for finding the probability distribution of canopy gaps in the forest. This clustering technique can be applied in other means for forest landscape level assessment.

Keywords: K-Means Clustering, Vegetation Indices, Forest Cover, Canopy Density, Threshold and Canopy Gaps



The Impacts of Climate Change on Water Resources in Hilly Areas of Nepal

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ABSTRACT

The paper briefly analyses "The impacts of climate change on water resources in hilly areas of Nepal". The study sites for this study area were carried out on three water supply systems from every two districts at different places. The tool used was focus group discussion with the community dependent on the water supply system. Their experience in relation to climate variability or change over time were collected and analyzed. Secondary data obtained of precipitation and temperatures were also analyzed. Drying and depletion of spring water sources and frequent climate-induced hazards are caused due to changing rainfall patterns and temperature regime which may be the result of climate change. Water scarcities have multiple impacts on living condition to the people and adaptive capacity of local people in this area is very low which increase the vulnerability. Finally, it was explored; there is a need for future planning and management of water resources resilient to the climate change.

Keywords: vulnerability, Adaption, climate change, impact, Water Supply Project



Production of Next Generation Biofuel from Lignocellulosic Wastes

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ABSTRACT

The present communication highlights the evolution of biofuels while giving priority attention to next generation biofuel from lignocellulosic waste. Both biochemical (chemicals, enzymes, and fermentative microorganisms) and thermo-chemical (heat and chemical) processes, are addressed. For biochemical processes, topics related to the pretreatment, hydrolysis, and fermentation steps as well as process integration, are also discussed. For the thermo-chemical processes, research topic such like process development and process analysis, will be dealt with. Important R&D technical aspects, economic assessment of available technologies, limitations of certain technological approaches, etc. will also be discussed in the present communication.

Keywords: Biofuel, Lignocellulosic waste, Biochemical



Assessment of Indoor and Outdoor Carbon Dioxide Concentration Using NDIR Sensor Method in a Technical Institute

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ABSTRACT

Carbon dioxide (CO₂) is the most important greenhouse gas (GHG) in the atmosphere and is the greatest contributor of the global warming. Carbon accounting is often called as carbon footprint. The amount of CO₂ released into the atmosphere as a result of the activities of an individual, organization, or community. It is not just about carbon concentration but about identifying the sources of emission, carbon sinks, and its control. The carbon footprint measures the total GHG emissions that caused directly and indirectly by an individual, organization or product. Due to a wide range of natural and anthropogenic activities, a very large number of contaminants are released into the environment. That is the cause of climate change. This is evident from observations of increment in the global average air and ocean temperatures, melting of snow and ice, and the rising global average sea level. To achieve the objectives in the project work, the study was carried out in two phases: The first phase the sampled sites were indoor areas in BIT campus; and the second phase sampled sites were outdoor areas in BIT campus. The study is conducted so it can be measured that how much CO₂ is emitted in the institutional organisation. The study aims to analyse the concentration of CO₂, temperature and relative humidity in indoor and outdoor area. Based on the study, it was accepted that the concentration of CO₂, temperature and relative humidity are varying in different places. The research is based on Carbon accounting by digital Lutron Handheld CO₂ Meter- non-dispersive infrared sensor (or **NDIR** sensor) methodologies.

Keywords: CO₂, NDIR, Concentration, GHG



Detecting, Mapping and Analysing of Flood Water Propagation of Using SAR Satellite Data and GIS: A Case Study of Kosi River Basin (Bihar)

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ABSTRACT

Floods are probably the most recurring, widespread, disastrous and frequent natural hazard of the world. In India Himalayan rivers account for maximum flood damage in country. The problem of flood state of Bihar (Kosi river basin). In this paper synthetic aperture radar (SAR) remote sensing data is used to accurately delineate the distribution of open water inundation during the flood of 2017 in Kosi river basin (Bihar). Due to the penetration capacity of SAR data through clouds and hazy atmospheric circumstances like fog, smog, light rain, mist etc. it has ability to continuous observation of flood events for producing accurate, rapid and cost effective flood mapping. A study using pre and during SAR images in flood water detection, monitoring of spatial extent described in this paper. The SAR images were first calibrated, geometrically and filtered, afterward threshold method was applied to extract the inundation areas from the SAR images. In threshold method, density slicing technique was used to separate the open water and non-water (land) areas from the images. Later, to delineate the actual flooded area, permanent water bodies (e.g. river, lake, ponds etc.) were subtracted from the open water. Flood maps were superimposed and analysed to find out the nature of spatial extend. This study illustrates that the SAR data along with GIS can be used effectively for flood water mapping, monitoring and analysing the propagation of flood water in flood prone area.

Therefore, the finding of this study will help to take initiative to reduce the flood hazard impact and increase the flexibility in the process of flood management.

Keywords: SAR Image, Kosi River, GIS, Flood Mapping, Detecting



Above Ground Biomass Estimation Of Bhajji Forest Range Of Shimla Forest Of Himachal Pradesh, India Using Polarimetric SAR Interferometry

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ABSTRACT

If we are talking about the parameters for the global carbon stock modelling and monitoring as well as the assessment of forest health then one among the forest biophysical parameter, Forest biomass is having major and important role. Estimation of the biomass can only be possible with uncertainties because of certain available challenges with satellite-based dataset. Traditional field methods take much time to monitor the status of forest landscape in the comparison to RS & GIS methods but unfortunately, the available conventional remote sensing techniques are not quite satisfying and able to estimate. Globally, forests provide very critical ecosystem service to regulate the carbon cycle. To assess the forest biophysical parameters at regular interval some sort of robust technique should be available. In areas where forest structure is very complex with various kind of species and covers with multi layers of vegetation only SAR data can be the option because of some limitations with optical dataset. According to some of the recent studies, Interferometric Water Cloud Model(IWCM) can be used to estimate above ground biomass, here input parameters to the model may be extracted from decomposition modelling of microwave data. To estimate the height of tree Coherence amplitude could be used. Into previous research studied that shift in polarization orientation angle that results volume scattering is overestimated but here it is compensated. The accuracy assessment is must be done with the help of ground data. Results shows that cross polarized (HV) image is more sensitive to dense vegetation in comparison to like polarized (HH) image.

Keywords: Radar, IWCM, Polarization, SAR, Above Ground Biomass, Coherence, RS &GIS



RS & GIS Based Urban Planning for Sustainable Environment

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ABSTRACT

The analysis during work on this project includes the finding and results for sustainable environment development in urban areas, which was done in Dhanbad Block in Jharkhand. The priority of this present study is to aim in finding suitable site for sustainable environment and planning in Dhanbad block. Such growth can be facilitated by rapid development in natural resources management and new economic opportunities mostly found in the forest and metrological department. This kind of growth later on takes different shapes in different directions. By using satellite image of Landsat 5, ASTER DEM image, Toposheet, Ancillary data & other data of Dhanbad block which help in monitoring the land use/land cover pattern for sustainable Environmental development planning and identify suitable Environment development site with various utility services of Dhanbad block. It facilitated to understand the complexities of a dynamic phenomenon such as suitability site for Environmental development planning in urban, land use/land cover benefits, Environment development planning pattern. Includes the digitization of various layers, preparation of maps, field work and other RS / GIS technique i.e., Geo-referencing, Digitization, Attribution, Data attachment, proximity of features, overlay analysis, unsupervised classification, were analyzed. A major component of this, survey and analysis. Review of modern techniques and methodology adopted for the study can also be discussed. This comprises the profile of the study area that gives a detailed account of location of study area, extent and aerial coverage of the study area at the Dhanbad District, Jharkhand, India. Thus including weighted value to the features as per there requirement for the suitable site selection for the sustainable Environmental development planning in Dhanbad Block. In this study Ganshadih, Jatudih, Jharma, Sabaldih, Kustuk, Brlihahi, Kusunda, Phutha, Dhabanil, Basuria, Ekra, Goreria, and also other some part of Nawadih, Dhansar, Bera, Narayanpur Dhariojoba, Godhar, Chirudih and Samshikhary are the suitable site for future Environment development

Keywords: Geo-rectification, Digitization, RS, GIS, Unsupervised, Proximity, Weighted, Overlay



Use of High Resolution Remote Sensing Data and GIS Techniques for Monitoring of 'U' Shaped Wetland at G.B. Nagar District, Uttar Pradesh

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ABSTRACT

In developing countries of the world, the ever increasing population and to fulfil its need for housing and other economic activities almost urban fringe are getting encroached and our surrounding environment and natural wetlands, water bodies and other biological cycles are depleting. In recent years high resolution satellite imageries and Geographical Information System (GIS) coupled with Global Positioning System (GPS) is vital tool for mapping and monitoring of our natural resources and provide us lucid and effective means of information on present and past status due to synoptic coverage of satellites. This paper present results on monitoring of 'U' shaped wetland at Gautambuddha Nagar district of Uttar Pradesh using Survey of India Topographical Map surveyed in 1971, Cartosat-1 (2.5m Res.) plus IRS-P6 LISS-IV Mx (5.8 m multispectral) fused data product acquired in 2008 and Cadastral Map Sheets on 1: 4,000. The result shows that in 1971 the wetland total geographical area based on Survey of India Topographical Map (SOI) was 61.12 hectare, whereas based on interpretation of Cartosat-1 (2.5m Res.) plus IRS-P6 LISS-IV Mx (5.8 m) satellite imagery of 2008, it was calculated as 40.52 hectare in GIS domain. This has been decreased to -20.60 hectare in a span of 37 years.

Keywords: Wetland, CARTOSAT plus IRS-P6 Merged Satellite Imagery, GIS, GPS Techniques.



Role of Society in Environment Conservation

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ABSTRACT

The role of society in environment saving and how individual can participate in this movement of cleaning and purring the environment. What steps should we have to be taken to prevent our environment polluted. Pollution is growing day by day with every second passes. It's a like bad dream not only destroying our environment but also ruining our ecosystem and life cycle, every single living as well as non-living creature is effected by pollution. We should also learn from martyrdom of Amrita Devi of Rajasthan to save environment who scarify her life along with her two daughters. On that day total 363 Bishnois became martyrs to save the trees of their region in 1730 A.D.

Keywords: Environment, Ecosystem, Pollution, Chipko



Accounting Forest Carbon Sequestration Using Integrated Geospatial Techniques

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ABSTRACT

Forest aboveground biomass (AGB) serves as a vital ingredient for global climate change policy making. It serves as an indicator of climate change in term of carbon sequestered in forests and act as a key constituent in the carbon cycle that moderates the global climate. Hence, monitoring the carbon dynamics becomes extremely important in terms of ecological services. Remote Sensing is an advanced tool for suitable and accurate measurements of forest AGB on a regional scale. The study targets in the assessment of forest AGB over the mixed deciduous tropical forests of Bhimbandh Wildlife Sanctuary in Bihar (India) using forest-based inventory and integrated geospatial approaches to develop a regression model based on the statistical correlation between AGB measured at plot level and the associated spectral parameters derived from IRS P-6 LISS III sensor. AGB map is generated from the best-fit model in GIS platform following the top-down and bottom-up inventory approach, which is further converted to carbon map using standard carbon conversion factor. The methodology adopted helped in developing a robust yet simple approach in proper accounting of forest sequestered carbon in terms of AGB using integrated geospatial techniques. Hence, the study recommends the combined use of information generated from both the field-based forest inventory and geospatial approaches for better assessment of stand biomass with significant contribution towards operational forestry and climate change studies, in context to REDD (Reduced Emissions from Deforestation and forest Degradation)/REDD+ regimes for measuring and monitoring the current state and dynamics of forest carbon stocks.

Keywords: Carbon, Biomass, Forest, Multiple Linear Regression, Remote Sensing, GIS



The Role of Vegetation Indices to Alleviate the Land Surface Temperature in Almora

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ABSTRACT

Urban heat island (UHI) is a terminology of metrology relates to the higher temperature than surrounding rural or suburban area. The land surface temperature is directly proportional to urban heat factor. UHI is a metropolitan area that's a lot warmer than the surrounding rural areas. Heat is created by energy from all the people, cars, buses, and trains in big cities. Land surface temperature is an important factor for estimating the radiation budget in heat balance studies and as a control for climate models. In this study an attempt has been made to estimate surface temperature over Almora city area using Landsat-5 and Landsat-8 satellite data. The variability of these land surface temperature (L.S.T.) has been investigated with respect to different land use / land cover type determined from the Landsat visible and Near Infrared (N.I.R) channels. The emissivity per pixel is retrieved directly from satellite data and has been estimated as narrow band emissivity at satellite sensor channel in order to have least error in the surface temperature estimation. The result suggests that the methodology is feasible to estimate Normalized Difference Vegetation Index (N.D.V.I.) surface temperature and emissivity with reasonable accuracy over heterogeneous urban areas.

Keywords: - Urban Heat Island, LST, NDVI, Landsat, NIR channels



Water Supply and Demand Analysis for Ranchi City Under Climate Change Using Weap Model

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ABSTRACT

There are different water user sectors such as rural, urban, mining, subsistence and commercial irrigated agriculture, commercial forestry, industry, power generation which are present in the catchment in Subarnarekha River Basin and Ranchi city. There is an inequity issue in the access to water. The development of the rural area, construction of new power generation plants, along with the population growth, the requirement of unmet water demand and the consideration of environmental flows, the revitalization of small-scale irrigation schemes is going to increase the water demands in almost all the water-stressed catchment. The WEAP Model was developed by the Stockholm Environment Institute (SEI) to enable evaluation of planning and management issues associated with water resources development. The WEAP model can be used for both urban and rural areas and can address a wide range of issues including sectoral demand analyses, water conservation, water rights and allocation priorities, river flow simulation, reservoir operation, ecosystem requirements and project cost-benefit analyses. This model is a tool for integrated water resource management and planning like, forecasting water demand, supply, inflows, outflows, water use, reuse, water quality, priority areas and Hydropower generation, In the present study, efforts have been made to access the utility of the WEAP model for water supply and demand analysis for Ranchi city. A detailed works haven carried out and it was tried to ascertain that the WEAP model used for generate different scenario of water requirement which could help for the feature planning of water. The water supplied to Ranchi city was mostly contributed by our study river, Hatiya reservoir and ground water. Data was collected from various agencies like PHE Ranchi, census data of 2011, Doranda reservoir and meteorology department etc. this collected and generated data was given as input to the WEAP model. The model generated the trends for discharge of our study river up to next 2050 and same time also generated scenarios calculating our demand and supplies for feature. The results generated from the model outputs predicting the water require 12 million litter. The results will help in drafting policies for future regarding water supplies and demands under changing climatic scenarios.

Keywords: WEAP MODEL, Water Demand Analysis, Ranchi, Scenarios



Targeting Groundwater Potential Sites Using Geo-informatics

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ABSTRACT

Remote sensing and GIS technique shows an efficient tool for analyzing groundwater potential zones parameter. Availability of fresh water determine the development of any region. The existence of groundwater takes place where water infiltrates beneath the soil surface, soils and rocks beneath the surface are porous and permeable in nature. Groundwater is a subsurface phenomenon and remote sensing gives the visual information of the Earth surface. The detection of various surface parameter of the earth surface which effect the occurrence and movement of groundwater can easily retrieve. The rate of infiltration depends on various parameter such as regional geology, geomorphology, hydrology, soils, land use/land cover, natural vegetation and groundwater quality. Temporal analysis of satellite imagery of Landsat having 30m resolution used to be done for the dynamic analysis of land use change over the time series. The satellite image is classified into several classes named as settlement, agriculture fallow, agriculture, dry fallow, wasteland, dense forest and water bodies. Shuttle Radar Topography Mission (SRTM) of 30m resolution used to find the slope of the study area. With the increase in urbanization and industrialization due to which the soil strata changes which reduces the rate of infiltration.

Keywords: Groundwater, Industrialization, Remote Sensing, Urbanization.



Habitat Suitability Modelling of Elephant for Punalur District of Tamilnadu

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ABSTRACT

Animals have a tremendous importance to the humans. They constitute important components of our environment. Animals are important helpful natural resource. Forest ecosystem is dominated by trees, the species varying in different parts of the world. Forests are intimately linked with our domestic use. They also contribute significantly to the economic development of our country. In various fields of farming, woolen material, travelling source animals like camel, elephant, horse and so on. Even after thousands of years this bond is still strong but humans cannot extract its resources as easily. The governments have made several restrictions to preserve many species and provide them safe and good environments. Using GIS Applications, buffer zone around settlement, rivers, lakes, biodiversity hotspots around which no forest harvesting is permitted. The Punalur Paper Mills, established in 1850's, was the first industry in Kerala and a pioneer in the industrial revolution of Kerala. Punalur become an important trading / transport centre between Kollam and Shenkottai(Tamilnadu) during the administration of Travancore Kingdom. Punalur Panchayat administration upgraded to Municipality status by 1972. Although enjoying the status of Municipality since 1972, Punalur is waiting to develop basic infrastructure to the ever growing population, tourists and pilgrims.

Keywords: Remote Sensing, GIS, Habitat, Forest



Bioelectricity Generation and Wastewater Treatment Using a Two Chambered Microbial Fuel Cell with Four Different Anolytes

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ABSTRACT

As the global demand of energy is increasing day after day, we need a sustainable and environment friendly source of energy. Microbial Fuel Cell (MFC) can be an alternate to fulfill such demand. This work highlight the development of effective small scale Microbial Fuel Cells and simultaneously bioenergy generation from wastewater using four different anolytes. The bacteria used for this study is *Bacillus stratosphericus* NITDID2 (Accession number-KY784656), which was isolated from mangrove soil. Four dual chambered Microbial fuel cells were constructed which consist Nafion®perfluorinated membrane as cationic exchange membrane having thickness 0.005 inch, Flexible graphite carbon foil 4cm*4cm is used as electrode. Both the electrodes were affixed with current collector with the help of Air rubber tube pierced with t wires projecting outside connecting to an external electrical circuit. Phosphate buffer along with potassium ferricyanide $K_3[Fe(CN)_6]$ was used as catholyte while wastewater+bacteria+glucose, wastewater, wastewater+glucose and wastewater+bacteria were used as anolyte for this study. This experiment revealed that the MFC in which wastewater+bacteria+glucose is used as anolyte is having more potential 362mV compared to other MFC having potential 192mV, 262mV and 305mV simultaneously after 3 days. While the COD removal efficiency of 1st MFC in which anolyte is wastewater+bacteria+glucose is 51% also high compared to others MFCs.

Keywords: MFC, Wastewater, Bioelectricity, COD removal efficiency



Behavior Of Concrete with Organic Wastes Used As A Partial Replacement In Concrete

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ABSTRACT

With the increase of demand of concrete structure in our society, the source of concrete material like cement, sand, stone is continuously decreasing. That's why we should think about the alternative material of these. And probably the best alternative is organic wastes. In this project saw dust, paper pulp and coconut shell has been used as a partial replacement of sand, cement and coarse aggregate respectively for M-20 concrete. The use of sand (river sand) plays a major role in all type of construction, especially in cement concrete & cement mortar. The ultimate aim of the saw dust concrete is to recycle the waste material from saw mill & utilizing in concrete ingredients in the state of partial replacement. This project reports on the results of an investigation of utilization of paper waste as partial replacement of cement in concrete mixes to be used for housing projects, for which it must be assured that the resulting concrete has the proper mechanical strength. Concrete mixes containing various contents of the waste by replacing the ingredients were prepared and basic characteristics such as compressive strength has been determined and compared with a conventional mix. The use of coconut shell could be a valuable substitute of coarse aggregate that can be used as a housing construction, such as concrete. In this project sand, cement and coarse aggregate was replaced by saw dust, paper pulp and coconut shell respectively as various percentage (%), by weight for M-20 nominal mix. The concrete cubes were tested for compressive strength at the age of 7 days and 28 days. The results obtained were compared with normal concrete of M-20 nominal mix. For all the cases up to 10% replacement the compressive strength remains approximately same compared to normal mix and beyond 10% the compressive strength decreased as we increase the percentage of replacement.

Keywords: Saw dust, Concrete, Ordinary Portland cement, Compressive Strength, coconut shell.



Experimental Study On Foam Concrete Using Polypropylene Fiber (Recron 3s)

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ABSTRACT

The Researcher and Industrialists interest in foamed concrete to be used in structural applications is steadily increasing. Foamed concrete is type of concrete with cementitious paste, fine aggregates (sand), water and foaming agent. The work represents experimental study on foamed concrete using PPF (Recron 3S fiber), use of recron 3s fiber in concrete increasing rapidly nowadays as Recron 3s fiber improves the quality of concrete. The main objective of the study is to investigate the mechanical and structural properties of foamed concrete with and without PPF (Recron 3S fiber). These properties are: Density, Compressive strength and split tensile strength. The Recron 3s fiber has been mixed as 2.5 gm/kg cement in foamed concrete and the properties of foamed concrete with recron 3s fiber has been investigated. (150×150×150) mm size cube samples has been used for the determination of the compressive strength and calculating dry density and (150×300) mm cylinders' samples has been used to test split tensile strength of the foamed concrete in UTM. Almost 40 cubes and 40 cylinders casted and tested for different mixes (M1, M2, M3 and M4) and density, compressive strength as well as split tensile strength investigated. The results have shown that strength gain for foamed concrete with the use of PPF (Recron 3s Fiber) has increased as compared to the plain foamed concrete.

Keywords: Foam Concrete, PPF (Recron 3S Fiber), Compressive Strength, Split Tensile Strength.



Waste Heat Recovery Through Ejector Refrigeration Cycles Exploring Feasible Size of Heat Recovery Unit

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ABSTRACT

Global demand for electricity is increasing day by day. Substantial part of global electricity production is consumed in producing refrigeration effects. As a substantial part of industrial energy consumption by combustion of fuel is finally rejected as waste heat, refrigeration cycle driven by waste heat can reduce global electricity demand and associated greenhouse gas production. In the present study, the suitability of dry refrigerants as working fluids of waste heat driven ejector based refrigeration are explored. It is observed that from economical point of view R600 and R245ca are probable options due to the smaller HRU size requirement for producing a specified refrigeration effect.

Keywords: Sustainable, Energy, Global, Combustion, Heat, HRU



GIS as a Tool for Property Tax enhancement- A Literature Review

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ABSTRACT

Property tax is a levy on property that the owner is required to pay to the governing authority of the area where property exist. It reflects the relation between the types of services financed at the local level vs the benefit to property values. It's been considered by the economist that property tax is appropriate as it is used to fund various type of local level services that are visible to the citizen such as school, maintenance of transportation, garbage management, drainage management, neighbourhood parks etc. The major reason it is considered as a good tax for the local government because the property is immovable. Still there is huge gap in tax demand and assessment. It has been identified that storage of information of the properties are totally based on manual efforts, which lead to failure to appropriate tax collection. It can be improved if the database will be designed on GIS platform and segregated as spatial and non-spatial classes using any CAD or ESRI platform software. This paper focus that GIS platform is best way to store in one spatial database as feature dataset enable with access through the structured query based language, both geographic as well as its attribute. Having an IT enabled GIS platform not only correct current slip-ups regarding tax assessment but also be beneficial to add new properties under tax net in future.

Keywords: GIS, Property Tax, CAD, ESRI platform



Torsional Behavior Of Different Types Of Multi Storeyed Buildings

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ABSTRACT

At present scenario many buildings are asymmetric in plain view on the distribution of mass and stiffness along each storey throughout the height of the building. The objective of this work aimed a better understanding of the torsional behavior of building systems. In this analysis both symmetric and asymmetric structures with plan irregularities are compared. Symmetric structures have center of mass coinciding with the center of rigidity and the torsion effect in such structures occurs out of accidental eccentricity whereas in asymmetric structures have irregular distribution of mass and stiffness and its center of mass and center of rigidity do not coincide and hence causes the torsional effect on the structures which is one of the most important factor influencing the seismic damage of the structure. In the present study 9 types of structures having same height, number of storeies, material and section properties are considered. A simple static and dynamic comparison based on eccentricity, shear forces and drift is also carried out for G+19 structures which are constructed on medium soil in seismic zone III of India (as per IS:1893-2002). It has been observed that more stiffness on irregular shape causes more spectrum accelerations. The irregular profiles of buildings have got larger forces and displacement and drift ratios as compared to regular one. The analysis of the structural models has been carried out using SAP 2000 software.

Keywords: Stiffness, torsion, eccentricity, SAP 2000



Blueprints of the tectonic and climatic signatures on the head-streams of The Ganga River

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ABSTRACT

The present landscapes serve as a tool for interpreting the geologically past climatic and tectonic perturbations. And the longitudinal profiles of the rivers provide indispensable information 'The blueprints' regarding the processes through which the rivers have passed during the geologic past and the Himalayan Rivers are not an exception to it. The master streams - the Bhagirathi and Alaknanda River join each other at Devprayag to give rise to Holy Ganga River. The anatomisation of the longitudinal profiles and the associated knickpoints and/or knickzones of the two headstreams are carried out in a GIS environment and subsequent ground checks. The positive anomalies are overlain and matched with the lithotectonic map of the area and the climatic regime to deduce the correlation between the operating factors and the evolution of the profile. The results show that in such a structurally dynamic region, the river is mainly influenced by the activity of the thrusts and faults which appear to hinder the rivers to achieve topographic steady-state. The convex reaches in the Bhagirathi River near the downstream reaches i.e. Devprayag can be accounted to the local base-level changes by the other confluencing master stream in the Alaknanda River Basin. However, the role of climatic factors cannot be ruled out. Thus, the present study is an attempt to investigate and document the relative impact of the tectonic and climatic setting of the area on the evolution of the rivers.

Keywords: *Ganga River, longitudinal profiles, knickpoints, tectonic and climate*



Prediction of The Disaster “*In Making*”

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ABSTRACT

Now-a-days, the river basin transpire as the most erratic region of the globe. The flow to the lower reaches of the river basin is severely wrecked as “The River” sanctifying the sewage of our cities and seems to be turning into an ailing river, a bit away to be called as a *sewage drain*. But in the youth age, the river is still capable to clean and preserve its existence by frequent flood and/or flash flood events. These efforts of the river to survive against the human interferences and be incessant leads to loss of lives and properties in the invaded region, the Kedarnath Disaster (2013) can be quoted as the most devastating and recent example, the bitter memories of which are not yet healed. In the present study, an endeavour is made to correlate the discharge and the disasters (or the extreme events) occurred in the Ganga River Basin, which is fed by Gangotri glacier which allows it to flow perennially and the flow is accentuated by precipitation due to orographic barrier (i.e. Main Central Thrust Zone). The available data from stations Karnaprayag, Rudraprayag (Alaknanda), Rudraprayag (Mandakini), Chandrapuri, Tehri and Devprayag, indicate that the periods have anomalously high discharge values also experienced a number of reported extreme events. This communication summarises that the anomalously high discharge value is replica (in majority of cases) of an extreme event in the region, hence, it can be treated as the forecast signatures of upcoming chaos. The intimation can serve as an alert, so that management and mitigation can be planned in advance to save as many lives as possible.

Keywords: Ganga, extreme event, water discharge.



Solar Energy Modeling using Artificial Neural Network & Geospatial Technology - A Literature Review

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ABSTRACT

Solar energy is one of the most important renewable energy available since the historical time and alternative sources of the energy. The present research proposes to assess the solar energy potential on the basics of solar radiation and climatologically data. Solar radiation is form of electro-magnetic waves which traveled with the speed of light from the sun to the earth and the wave is related to Wavelength and frequency which is calculated by Geospatial techniques and modeling to identify optimal place to estimate solar energy potential. The solar irradiation data, land-use data and Digital Elevation Model (DEM) were used in GIS environment while employing land-use criteria and topography to exclude unsuitable sites for harnessing solar energy. A GIS based model, Solar Flux, Horizon shading, solar angle, surface orientation, atmospheric conditions and solar flux data is used in this software, to estimate solar energy potential of a specific area. Artificial neural networks model with meteorological, geographical data and digital elevation model (DEM) is used to classified monthly solar irradiance map.

Keywords: Renewable energy, Solar Energy, solar irradiation, GIS, Artificial Neural Network



Assessment of Reservoir Sedimentation Using Remote Sensing for Patratu Reservoir, Ranchi, Jharkhand

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ABSTRACT

This study describes the assessment of reservoir sedimentation of the Patratu Reservoir using Satellite Remote Sensing (SRS). The sedimentation assessment was carried out using satellite data and reservoir water level data from 2006 to 2012. Water spread area was analyzed from satellite data. The Normalized Difference Water Index (NDWI) and The Normalized Difference Vegetation Index (NDVI) has been used to delineate open water features and to enhance the presence of water surface in satellite imagery of the Patratu Reservoir at Ranchi, Jharkhand, India. Water spread area of the reservoir at a particular elevation on the date of pass of the satellite was used to develop elevation-area curve. For the present case fluctuation of water level was found to vary from 387.096 m to 406.152 m. The linear interpolation / extrapolation technique has been employed to assess water spread area of Patratu Reservoir at different elevation. Further, these areas were used to compute live storage capacity of reservoir between two elevations by Prismoidal formula. From the study, it was found that due to sedimentation, the live storage capacity of Patratu Reservoir has reduced from 101.95 ha-m to 89.96 ha-m, thus showing capacity loss of 11.76 % in span of 44 years. To increase the live storage capacity of the reservoir it is proposed to adopt manual and mechanical digging combined with flushing for desilting of the deposited sediment.

Keywords: GIS, NDVI, NDWI, Prismoidal Formulae, Remote Sensing



Geospatial Modelling to Assess Human Elephant Conflict and Corridor Mapping in Palamau Tiger Reserve, Jharkhand (India)

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ABSTRACT

Asian Elephant (*Elephas maximus*) is the basically jeopardized biggest earthbound creature. In the course of recent decades, the quantity of Asian Elephants has dwindled because of human infringement and spontaneous settlements and development along the development courses and halls of this lofty creature. Along these lines, legitimate preservation activities require a point by point spatial database on the courses and passages of Asian Elephant. Human-natural life clashes happen inside the setting of dynamic socio-environmental frameworks. Understanding these contentions at generally more extensive spatial and transient scales gives a knowledge into the contention situations crosswise over bigger territory and changes in their spread and power over a wide timeframe. This information would give be able to vigorous contributions to arrangement making for the locale on the issue. Then again, understanding these contentions at generally littler spatio-fleeting scale may demonstrate helpful in moderation of contentions for neighbourhood administration organizations, for example, Forest Department. This locale is much of the time gone by elephants from the neighbouring environments of Orissa and Jharkhand looking for better natural surroundings and regularly enter human residences and farming fields bringing about clashes with people. Satellite images and ground data were utilized for Land use/land cover mapping and identification of contention zones. In the present study data was utilized to dole out weights to the three elements, viz., types of vegetation cover, nearness to water body and vicinity to human home. In light of the investigation a passageway for elephant development and movement has been recognized which could be told and overseen by the state government with a specific end goal to limit human - elephant clashes in the locale.

Keywords: Human Elephant Conflict; Geospatial Modeling; Corridor Mapping; Remote Sensing; Elephant Suitability; Settlement; Satellite Images; Accessibility



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