

## Impact Of Pre-monsoon Cyclonic Storm Fani Along The Coastal Tract Of Odisha : A Geospatial Assessment

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The coastal tract of Odisha along the Indian east coast witnessed a rare pre-monsoon severe cyclonic storm Fani on 3rd May 2019. The storm was unique with respect to its timing, strength and trajectory wherein contrary to normal observations, it intensified to a category - 4 cyclones from a tropical depression as it approached the Indian subcontinent. Current research findings portray the impact being catastrophic taking away 64 lives and opening up 4 new mouths along the largest lagoon of Asia, the Chilika. The study indicates noteworthy erosional and accretion activity along the shoreline. These changes are going to affect the sensitive coastal ecosystem of Chilika lagoon due to saline water transgression. Hence, it is suggested that better preparedness, adequate beefed-up infrastructure as well as eco-sensitive measures, such as cyclone-resistant plantations should be given a thrust for sustainable management of this susceptible coastal tract.

### KEYWORDS

Cyclone, Fani, Odisha, Chilika, Shoreline, Pre-monsoon

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## Hydrochemical Facies Of Groundwater Of Panchaganga River Basin, Kolhapur

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Groundwaters undergo changes in their chemistry and quality as they pass through rocks, soils and human settlement areas. The modification is manifested in variations in their cation and anion constituents. Attempt has been made to classify groundwater on the basis of their chemistry, the sources of the major ions and to categorize quality of groundwater for irrigation purposes. The physical parameters, such as pH (7.5 average 8.5), EC (400-3268  $\mu\text{mhos/cm}$ ) and TDS (1166-2451.25 mg/L) found to be higher in groundwater samples near the sugar factories. Average values of cations and anions were in the order of Ca (107.04 mg/L), Na (67.46 mg/L), Mg (61.31 mg/L), K (11.44 mg/L) and Cl (245.38 mg/L),  $\text{HCO}_3$  (192.50 mg/L),  $\text{SO}_4$  (59.51 mg/L), respectively. Average sodium adsorption ratio (SAR) was 1.35. Calcium - magnesium, cation hydrochemical facies is most dominant with 92% followed by 8% of sodium - calcium facies. Anion hydrochemical facies is dominated by chloride - sulphate - bicarbonate facies (65.39%), bicarbonate - chloride - sulphate facies (19.23%) and chloride - sulphate facies (15.38%). The dominance of calcium - sodium facies can be attributed to the leaching or ion-exchange reactions. Because of medium to high salinity hazard ground water is by and large suitable to moderate to high salt tolerant crops demanding for reclamation of soil for better agriculture yield.

### KEYWORDS

Groundwater, Physico-chemical parameters, Hydrochemical facies, Hydrolysis, Salinity hazard

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## Determining, Mapping And Prediction Of Noise Pollution

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Noise pollution is recognized as an emerged environmental hazard in urban areas. The primary aim of this study was to determine, map and predict noise levels in the urban part of the city of Banja Luka (Bosnia and Herzegovina). The aim of this research is also to compare the measured noise levels in the street with legislation. All measured values of  $L_{eq}$  (day and night) are exceeded regardless of the highest level of external noise allowed for zones I, III and IV.  $L_{eq}$  for the day range from 62.2 to 66.2 dB(A).  $L_{eq}$  for the night range from 57.3 - 58.6 dB(A). Values of peak levels  $L_1$  and  $L_{10}$  are slightly lower than the limit values or have been exceeded and that the noise level values in this area are alarming. A noise map was generated for a day, evening and night period and prediction sound level at receptor locations.

### KEYWORDS

Road traffic, Noise pollution, Hospital, Mapping, Prediction

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## COVID-19 Lockdown : A Blessing Or Blight For Wildlife?

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This research aims to show the positive and negative impacts of COVID-19 lockdown on wildlife. The study shows that since the lockdown came into effect, there have been improvements in environmental conditions, the resurgence of marine life in coastal waters and privacy for wildlife. On the other hand, the lockdown has also brought some negative impacts, such as increasing in poaching activities, human-wildlife conflicts, hunger issues for urban wildlife and the reopening of wet markets. The study also provides solutions to keep the wildlife safe during and after the lockdown period, such as the use of technology to monitor unauthorized human movements in wildlife parks, providing economic assistance to keep villagers away from wildlife poaching and use of carbon credits to ensure the continued flow of revenue during a time like these. There is a chance that once the lockdown is lifted, all global activities will return and people will go back to their old ways and all the positive impacts of the lockdown will disappear. Hopefully, the current situation will facilitate us to reconsider our way of life and our relationship with nature and encourage us to make the necessary changes that are long pending.

### KEYWORDS

COVID-19, Lockdown, Wildlife protection, Environmental conservation, Impacts of COVID-19

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## Study Of Physico-Chemical Quality Of Groundwater In Tykomiye Region Of Community Of Talssint (Eastern Morocco), By Application Of Principal Component Analysis

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For the purpose of the management and conservation of the aquatic environment of spring waters in the Tykomyine-Talssint region of eastern Morocco, principal component analysis (PCA) of physico-chemical parameters and major elements were studied during the low-water period (May of the year 2011). The visualization of the results allowed us to show that the pH, T<sup>o</sup>, SO<sub>4</sub><sup>2-</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Na<sup>+</sup> and conductivity are positively correlated with the F1 axis, contrary to the ions: NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup> which is associated negatively on the two main axes F1 and F2. Thus the application of the principal component analysis on these results shows that we have two groups of stations: the first group of stations in the positive part of the F1 axis, characterized by waters with high concentrations in pH, T<sup>o</sup>, SO<sub>4</sub><sup>2-</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Na<sup>+</sup> and conductivity at the S1 and S5 stations. The second group of stations in the negative part of the F1 axis, characterized by waters with a high concentration of Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup> at the station S2. This enrichment in major elements is to be related to the geological context of the studied region.

### KEYWORDS

Spring waters, Talssint, Principal component analysis, Major elements of pollution

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## Status Of Municipal Solid Waste Management And Potential Of Waste To Energy In Alwar, Rajasthan

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The municipal solid waste generated in urban areas is creating a severe environmental problem in absence of its proper handling and management. This paper is based on a study related to municipal solid waste management, seasonal variation in waste generation from residential households, total waste generated per day, constituents of solid waste and the potential of waste to energy in Alwar city of Rajasthan. The study has been conducted for more than one year period from May 2018 to May 2019 so as to study the effect of seasonal variation in waste generation including all the seasons of a year. The study area consisted of the whole urban area of Alwar city comprising municipal corporation boundary and it was divided into four zones for the ease of investigation. Each zone of the study area comprised of residential areas. From each zone, 30 samples were collected in a period of three months. The samples were analyzed for their composition and seasonal variation. During the study, the calorific values of the waste material have also been calculated after segregation of reusable and recyclable material and on the same way, analysis of the potential of waste to energy has been carried out. The study indicates that there is an immediate need for proper monitoring at the level of the government to take steps towards segregation, collection, transportation, treatment and disposal of solid waste as per the latest Municipal Solid Waste (Management and Handling) Rules, 2016. Alwar city has a good potential of waste to energy as much as 2.27 Mw and the electricity generated can be utilized either for revenue realization or for electrification in the city by the local body administration of the city.

### KEYWORDS

Municipal solid waste, Seasonal variation, Calorific value, Waste to energy

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## Effect Of Anthropogenic Activities On The Water Quality Of Community Pond In Keshpur Block Of Paschim Medinipur - A Survey Report

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During the survey of potability of water (2017-2019) in Keshpur block, Paschim Medinipur, West Bengal, it has been noted that the local inhabitants of the area regularly use pond as source of water for bathing of human and domestic animals, washing clothes, utensils, vegetables and other materials; watering livestock, also used in some cases for domestic and worship purposes too. The present work deals with the study of water quality standards by analyzing the viable coliform alongwith other water borne bacteria present in water samples collected from ten randomly chosen major community ponds of Keshpur block in Paschim Medinipur district, West Bengal. This preliminary study may provide some important information about potential public health risks associated with the use of ponds water in the highly populated area, possible source of contamination, like cow dung, vermicompost and poultry litter. In this paper, we review the bacterial composition of cattle manure, poultry litter as well as methods engaged in the control of pathogenic microbes present in manure and recommendations that need to be respected and implemented in order to prevent microbial contamination of the environment, animals and humans.

### KEYWORDS

Potability, Community pond water, Keshpur block, Paschim Medinipur, West Bengal

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## Hexabromocyclododecane Based Toxicity In Aquatic Environments And Humans

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Aquatic toxicology is considered as an investigation of the effects of toxic substances on living organisms, especially population, culture, environment and biosphere scales. Especially, brominated flame retardants (BFRs) are the type of chemicals typically used to minimize consumer goods flammability and are considered as contaminants as they have become widely detached throughout the atmosphere and have also been shown to bioaccumulate within animals and humans. Moreover, hexabromocyclododecane (HBCD) has been commonly used in interior textiles, car cushions, electrical and electronic equipment, polyvinyl chloride wire, as a flame retardant and is omnipresent in all types of environmental media. Previous studies clearly documented that, these brominated flame retardants are highly toxic not only to fish but also to the other species that form the food chain. Through altering their operational status, the aquatic pollutions cause various deleterious effects on the non-target organism fish predominantly in an aquatic environment. HBCD produces lethal effects on biochemical and haematological, enzyme profile and levels of protein status. In this review, by analysing toxicity levels of toxicants, we have attempted to demonstrate the toxic effects of commonly used brominated flame retardants on uncommon fish species.

### KEYWORDS

Hexabromocyclododecane, Aquatic environment, Biomarkers, Fish, Toxicity

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## Cadmium Behaviour In Urban Soils Of Mashhad : Its Impact On Plants And Soil

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To investigate cadmium (Cd) behaviour in soil due to vehicular traffic under rosemary and grass plants in three urban areas of Mashhad, this study was carried out in a completely randomized design (factorial). In the studied sites, the first 30 cm of upper soil was replaced with new superficial soil (alongwith compost and cow manure) as control, prior to soil contamination. In four seasons, sampling from soil, shoots and roots of rosemary and grass plants was taken and Cd concentrations were measured. The results showed that the average Cd concentration in control soil (without cultivation) in two sites: 100 m (Mosalla complex) sites and Imam Reza bus terminal during the experiment period increased significantly from spring to winter season, while on the third site: Botanical garden, soil Cd was almost constant. The highest soil Cd concentration was noted in winter, while in three sites, the soil Cd concentration decreased. The Cd concentration of aerial parts of each plant was significantly different during the seasons. The plant Cd concentration decreased during the spring and summer, while it increased in the autumn and winter season. It is concluded that rosemary cultivation in urban parks is a good candidate for Cd phytostabilization.

### KEYWORDS

Rosemary, Grass, Soil, Cd toxicity, Urban environment

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## Water Quality Investigation Of Yamuna River For Assessing Its Impact On Durability Of Concrete Structures Alongwith The Yamuna River Bed

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Due to rapid industrialization and urbanization, the surface water resources get severely polluted. All the major rivers flowing through the big cities receive heavy flux of sewage and industrial effluent. The river Yamuna is among the most polluted rivers which originate from Yamunotri glaciers (elevation 6300 m) in the Himalayas. The discharge of untreated domestic and industrial effluents has affected the quality of the Yamuna river. The poor water quality makes river water unfit for any purposes. The river water quality also affects the durability aspects of concrete structures along with the river bed. The dual hazards, that is health and construction, making a severe impact on large numbers of population and structures. Impurities in the form of sewage, dirt and other floating materials contributed to downgrading water quality. At the same time, due to rapid modernization, a large number of upcoming construction projects can be seen in the catchment area of the river. In this scenario, it is important to evaluate its water quality to envisage its effect on concrete durability. The study carried out by CSMRS was focused on the water quality of the Yamuna river and nallahs flowing in the NCR region from Wazirabad to Okhla barrage. The water samples were analysed for in-situ parameters such as pH, total dissolved solids, temperature, conductivity, etc. The samples then brought to the laboratory for conducting detailed chemical analysis as per IS codes procedures. The results of the analysis show that the water quality of the river is degrading with the downstream course. All important parameters for health and construction point of view are almost above the permissible limits as per standard codes. The water is aggressive towards a durability point of view for concrete structures.

### KEYWORDS

Water quality, River pollution, Durability of concrete, Domestic and industrial effluent, Aggressivity

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## Time Series Analysis Of Different Pollutants Of Air At Different Location Of Jaipur, Rajasthan

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Ambient concentrations of nitrogen oxides (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and respirable suspended particulate matter (RSPM) were measured from March 2010 to November 2018 in the centers of six sites (Ajmeri gate, Chandpole, Board office Jhalana Dungri, MIA RIICO Office, RO Vidhyadhar Nagar, VKIA) Jaipur, Rajasthan, India. The data consist of monthly average of NO<sub>2</sub>, SO<sub>2</sub> and RSPM. The measurement were made in an effort to characterize air pollution in the urban environment of Jaipur and assist in the development of an air quality index. The yearly average of NO<sub>2</sub>, SO<sub>2</sub> and RSPM concentrated were taken to find out the trend. It is observed that the maximum NO<sub>2</sub>, SO<sub>2</sub> and RSPM was occurred during winter and minimum values were occurred in summer which is due to the combination of metrological conditions and photochemical activities in the region. The ratio of SO<sub>2</sub>/NO<sub>2</sub> (~0.19) indicates that point sources are contributing to SO<sub>2</sub> pollution in the city. Further all measured concentration of RSPM exceeded the National Ambient Air Quality Standards (NAAQS) except for NO<sub>2</sub> and SO<sub>2</sub>. Yearwise trend of NO<sub>2</sub>, SO<sub>2</sub> and RSPM of different station are obtained by using the least square method.

### KEYWORDS

Sulphur dioxides, Nitrogen oxides, Respirable suspended particulate matter, Air quality index, National air quality index by CPCB, Ambient air quality, Environmental Protection Agency, Planetary boundary layer

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## Assessment Of Physico-Chemical Parameters Of Effluent From Orient Paper Mill, Amalai And Son River Water, District Shahdol, Madhya Pradesh

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Study of physico-chemical parameters of effluent from Orient Paper Mill (OPM), Amalai and Son river were selected for assessment of water quality variation. During the study of 10 sampling stations were selected, out which 6 sampling stations were downstream of effluents running toward Son river and 4 sampling stations were in Son river nearby village area. The study was carried out during January to June, 2015. The colours were milky colloidal at sampling station SS-01 (Near first paper mill) and SS-02(Near first boiler tunnel). Effluent was found acidic in nature at sampling stations SS-01 and 02 near OPM. The higher mean values of TSS were  $183.8 \pm 19.0$  and  $143.8 \pm 1.5$  mg/L at sampling stations SS-01 and SS-02 respectively. The high mean value of alkalinity  $239.5 \pm 20.7$  mg/L was observed at sampling station SS-05. The higher mean values of total dissolved solids (TDS) were  $1823 \pm 141.7$ ,  $1652.7 \pm 2.1$  and  $1086.8 \pm 149.7$  mg/L at sampling stations SS-04, SS-05 and SS-01 respectively in effluents of OPM. The high mean value of potassium  $45 \pm 7.3$  mg/L was observed at sampling station SS-05. It was observed that the values of total dissolved solid, hardness, calcium and sodium were fluctuated widely from station to stations which were an indication of pollution in paper mill effluent. Water sample of Son river was yellowish in colour at the sampling station SS-07. The higher mean turbidity was found at sampling station SS-01 and SS-02, in effluents of OPM, Amalai during the study.

### KEYWORDS

Effluent, Son river, Orient paper mill, Physico-chemical parameters

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## A Study On The Factors Influencing Segregation Of Household Waste By The Residents Of Bengaluru City

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The research is aimed at finding out the various factors that are responsible with the intention to segregate solid waste in the household before disposal and the influence of the same to actually segregate solid waste. Theory of planned behaviour (TPB) was used as the base model to study the relationship between different variables of interest. Environmental consciousness and awareness were introduced in the TPB model as the independent variable affecting segregation intention and extended theory of planned behaviour was developed. As a part of the study, a sample of 140 respondents were chosen from the household of Bangalore and questions were asked related to the study. The data collected by field visit was analysed using SPSS and AMOS. The extended theory of TPB was tested by structured equation modelling using AMOS. It was observed that the variance in segregation intention is better explained by introducing environmental consciousness and awareness in TPB model, proving the model fit of the extended theory TPB.

### KEYWORDS

Solid waste, Segregation, Environmental consciousness, Awareness, Theory of planned behaviour

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## Characterization Of Metallic Trace Elements In The Products Of Composting And Co-Composting Coming From The Sludge Of The WWTP Of Fez And The Pomace From The Region Of Ain Taoujdate (Morocco)

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Sludge disposal is a major challenge for sewage treatment plant managers given their reputation as a high-risk source of environmental pollution. The objective of this study is to propose a way to eliminate and recover sludge from Fez wastewater treatment plant (WWTP), Morocco through its co-composting with pomace from Ain Taoujdate region (Morocco). The study focused on the production of three composts (C1, C2 and C3) from sludge and pomace, which differ in terms of their proportions of these two components (C1 = 1/1, C2 = 1/2 and C3 = 1/4). Composting is carried out in greenhouses using the method of turned over Andean trees for 105 days. The characterization analyses of the final product focused on the determination of the contents of the three composts, such as total chromium, lead, nickel, mercury and cadmium. This was necessary in order to evaluate the fate of the initial levels present in the starting sludge and to judge the quality of the composts through the standards provided. The co-composting thus carried out made it possible to significantly reduce all levels of the trace metal elements studied in the three composts. The reductions recorded for total chromium were significant as 81.9%, 88.9% and 93.7%, respectively in C1, C2 and C3; whereas they were 72.9%, 82.2% and 89.4%, respectively for lead in C1, C2 and C3. Nickel, mercury and cadmium levels also declined with relatively lower than initial levels. In general, all grades have declined and are believed to be due to leaching from watering applied during rollovers. The study of quality of the three composts (according to standard NF U 44-051) showed that compost C3 is the only compost that complies with the standards applied to the metallic trace elements studied. The total chromium content exceeding the applied standard will exclude C2 and C3 composts from the NF U 44-051 standard. Thus, the initial total chromium content, which averaged 1900 mg/kg, had a negative influence on the classification of these two composts.

### KEYWORDS

Wastewater treatment plant sludge, Pomace, Co-composting, Metallic trace elements

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## Soil Quality Analysis Of Different Fallow Periods In Swidden Cultivation System Of Dhomara Hills, Assam

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Swidden cultivation is practiced by tribes in hilly regions of northeast region of India. It is seen both as source of livelihood and environmental destruction. The study was conducted to assess the soil quality in different fallow periods of swidden cultivation in high elevation areas of Dhomara Hills of Assam. The important soil quality indicators, namely texture, temperature, moisture content, bulk density, pH, organic carbon, total nitrogen, phosphorus and potassium were investigated in 5 stations under different fallow periods and compared with a nearby natural forest vegetation. The study revealed that different fallow periods under the shifting cultivation area differ in soil physico-chemical parameters. Different measures can be adopted for maintaining and restoring the soil fertility for long term success of a shifting cultivation system.

### KEYWORDS

Physico-chemical properties, Soil organic carbon, Soil quality, Swidden, Fallow period

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## Drinking And Treated Water Assessment For Coliform Bacteria In A Tertiary Care Charitable Hospital

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Identification of coliform bacteria is extensively used to assess the bacteriological quality of water. The objective of the study is to analyze the drinking and treated water for the level of coliform contamination. A cross-sectional study was carried out for six months after obtaining ethical clearance. A total of 43 samples of drinking and treated water were analyzed for the presence of coliform bacteria by the membrane filtration method. The results obtained were compared with the reference value of the World Health Organization, Central Pollution Control Board of India and the Karnataka State Pollution Control Board. Out of 18 samples collected from drinking water points, nine samples (50%) were found to be satisfactory and the remaining nine samples (50%) exceed the permissible range. Out of 25 treated water samples, seven samples (28%) were positive for coliform and the remaining 18 samples (72%) were negative. Suitable recommendations were given to the hospital infection control committee and maintenance department. Filters were calibrated, proper chlorine dosing was carried out and maintenance of filters was done. Coliform bacteria in treated were in permissible range of Karnataka State Pollution Control Board and Central Pollution Control Board.

### KEYWORDS

Coliform bacteria, Drinking water, Membrane filtration, Treated water

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## Application Of Monitored Natural Attenuation To Groundwater Contaminants - A Case Study Of Bhagwanpur Industrial Area, Uttarakhand

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An industrial area has been developed in Bhagwanpur near Roorkee in Haridwar district of Uttarakhand. Due to growing industrial activities and urbanization the impact on natural resources especially on groundwater and soil has increased substantially. Consequently, the groundwater samples were collected from five identified locations in the vicinity of Bhagwanpur industrial area to monitor the groundwater. These water samples were analyzed for 19 drinking water quality parameters, such as colour, odour, temperature, pH, total hardness, alkalinity, chloride, TDS, nitrate, sulphate, fluoride and heavy metals, etc., using the BIS protocol. The values of most of the parameters chosen for the site samples for the Bhagwanpur area were found to be less than the permissible BIS limits during observation except for fluoride, copper, iron and arsenic at few sites. Despite the location of the sites within the industrial zone and increasing sub-urbanization, observance of the parameters within permissible limits indicate the potential role of natural attenuation of groundwater contamination in this case. Though, some natural attenuation can be provided by geochemical mechanisms that remove heavy metal contaminants from the aqueous phase, that is sedimentation and adsorption. Some concepts have been established to take advantage of the monitored natural attenuation (MNA) as a management option for the contaminated land and groundwater. Therefore, systematic monitoring of the groundwater comprehensive studies will clarify the possible mechanism of play.

### KEYWORDS

Natural attenuation, Heavy metal, Groundwater, Contaminants, Alluvium, Biodegradation

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## Estimation Of Water Spread Area For Chembarabakkam Lake Using Remote Sensing

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Sedimentation in lakes and reservoirs are a serious threat to the storage capacity of the reservoirs. Quantification of reservoir sedimentation can be carried out using conventional methods but is time consuming. In this study, an attempt is made to estimate the water spread area and therefore, the volume of the Chembarabakkam lake, Chennai, India using a range of remote sensing and image processing techniques. Satellite images of the study area under investigation are used to derive the water spread area of the reservoir. With differences in elevation between various dates, estimates of reservoir capacity can be derived. An accurate estimation of the reservoir water spread area was achieved through the sub-pixel approach. The high accuracy of the estimated area by the sub-pixel approach is due to the incorporation of the purest and accurate endmember with the spectral unmixing approach. It could be observed that remote sensing is highly successful in the estimating the water spread area of the reservoir which could result in accurate quantification of sedimentation in reservoirs.

### KEYWORDS

Reservoir sedimentation, Chembarabakkam lake, Remote sensing, Sub-pixel approach

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## Monitoring Of Noise Levels During Maghmela At Sangam Area, Prayagraj (Allahabad)

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Nowadays noise is significant environmental pollution that leads to psychological and physiological disorders. The high noise levels may have induced several health problems related to headache, annoyance, lack of concentration and other varied effects on human health. Magh Mela is a large mass gathering of pilgrims and an event of such magnitude present challenges. Due to more crowd during bathing dates (Shahisnan) at Magh Mela areas enhanced the population density and number of automobiles and also increased the noise level compared to normal days. In the present study, an attempt has been made to evaluate noise level on pre, post and mauni amawashya (bathing dates) near Sangam area during Magh Mela, 2017 and 2018 at Prayagraj (Allahabad), Uttar Pradesh, India. The maximum equivalent noise level observed were 93.0 dB at 12:00-1:00 PM, 114.1 dB at 9:00-10:00 AM and 94.8 dB at 6:00-7:00 PM and 89.8 dB at 10:00-11:00 AM, 98.7dB at 6:00-7:00 PM and 88.5 dB at 8:00-9:00 PM during pre, during and post mauni amawashya in the year 2017 and 2018, respectively. The results of the study reflected that higher noise levels during mauni amawashya (bathing date) for both year 2017 and 2018, followed by pre and post mauni amawashya and the main reason for higher noise levels during bathing dates are heavy crowds, powerful sound systems, drum and other activities performed near the Sangam areas.

### KEYWORDS

Noise pollution, Monitoring, Magh Mela, Human health

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