

## **Pattern of Tree Communities and Descriptions of Papagni River Basin, Andhra Pradesh**

**S. Rajendrakumar**

*Amrita Vishwa Vidyapeetham (Amrita University), Centre for Sustainable Future, Amrita Nagar, Coimbatore-641 112*

Tree communities of Papagni river basin was assessed using random transect method, 42 transects were developed at the length of 1 km. At every 200 m of transects nested circular plots (mature trees - 15 x 15 m; seedlings and saplings - 8 x 8 m) were developed, a total of 210 nested plots were developed and quantified tree species. Richness of mature trees showed 30 species and 25 and 32 species from seedlings and saplings stage, respectively. The density and diversity ( $H'$ ) of mature trees showed 23/ha and 2.83, seedlings 50/ha and 2.51 and saplings 211/ha and 2.63. Tree species association was measured using Hierarchical cluster analysis, dominant species of the river basin were associated and forms unique communities. Variation of species between mature trees, seedlings and saplings was tested with Mann-Whitney U test. Significant variations were observed between each stage. As a result less tolerant native species were disappearing and non-native fast growing species overbearing in this region.

### **KEYWORD**

Papagni, Trees, Diversity, Mann-Whitney, Seedling.

### **AUTHOR**

1\*. Dr. S. Rajendrakumar, Assistant Professor, Centre for Sustainable Future, Amrita Vishwa Vidyapeetham (Amrita University), Amrita Nagar, Coimbatore - 641 112.

# Estimation of Aquifer Thickness of Groundwater Using Resistivity Survey in Tripura

Jayanta Debbarmar, Pankaj Kumar Roy, Manish Pal and Asis Mazumdar

*Jadavpur University, School of Water Resources Engineering, Kolkata - 700 032*

Resistivity sounding using Schlumberger array was conducted in different parts of Tripura for locating aquifer zones as a part of water supply scheme for household and irrigation purpose. The areas broadly include Agartala valley, Udaipur valley, Kailasahar valley and Dharmanagar valley. These data were critically examined, processed and interpreted using curve matching technique and resistivity 1-D software of dynamic studies of groundwater in Tripura. Resistivity investigation data of 18 locations in the above valleys, where data collection was excellent, was selected for detail interpretation. Among these, 6 are in Agartala valley, 4 each in Udaipur, Dharmanagar and Kailasahar valley were found to be 71.25 m, 118 m, 85.18 m and 111.13 m, respectively.

## KEYWORD

Aquifer thickness, Resistivity survey, Litholog strata, Groundwater.

## AUTHOR

1. Mr. Jayanta Debbarmar, Executive Engineer. Water Resource Division V, Kam-alpur, Dhalai, Agartala - 799 006.
- 2\*. Dr. Pankaj Kumar Roy, Associate Professor, School of Water Resources Engineering, Jadavpur University, Kolkata - 700 032.
3. Dr. Manish Pal, Associate Professor, Department of Civil Engineering, National Institute of Technology, Agartala - 799 046.
4. Dr. Asis Mazumdar, Director and Professor, School of Water Resources Engineering, Jadavpur University, Kolkata - 700 032.

## Industry Perspective for Greenhouse Gas Emissions Reduction

**Eman A. Emam**

*Suez University, Department of Refining and Petrochemical Engineering, Faculty of Petroleum and Mining Engineering, Suez, Egypt*

One of the most vulnerable countries to climate change is Egypt, with an annual average increase of greenhouse gas (GHG) emissions is 5.1 %, resulting the negative impacts on social and health. The Clean Development Mechanism (CDM) can play an essential role in conquering barriers facing the projects of the greenhouse gas emissions reduction in developing countries, like Egypt. This paper reports 5 industrial projects to reduce the greenhouse gas emissions, based on sustainable development criteria for clean development mechanism to promote cleaner climate in Egypt. The selected projects are focused on flare gas recovery system, electricity generation, fuel switching and heat recovery and CO<sub>2</sub> capture. The studied projects reduced the CO<sub>2</sub> emissions, using more efficient technologies. Heat recovery project in cement industry provided the highest reduction emission cost (\$ 21 per MtCO<sub>2</sub>e), according to the selected crediting period. Fuel switching project was the highest economic project, while, CO<sub>2</sub> capture technology presented the same values of reduction emission cost (\$ 12 per MtCO<sub>2</sub>e) according to the selected crediting period and project life time. Additionally, the projects were able to enhance the capacity building and employment opportunities for Egyptian industry. The projects also represented the major stepping stone for implementing reduction of emissions in Egypt as a future perspective.

### KEYWORD

Greenhouse gases (GHG) reduction emission cost, Flare gas recovery system, Electricity generation, Fuel switching, CO<sub>2</sub> capture, Heat recovery.

### AUTHOR

1\*. Dr. Eman Abd El-Wahab Emam, Department of Refining and Petrochemical Engineering, Faculty of Petroleum and Mining Engineering, Suez University. Suez, Egypt.

## **Assesment of Fluoride Concentration in Groundwater in and Around Thondure Mandal of Kadapa District**

**G. Sudarsana Raju**

*Yogi Vemana University, Department of Geology, Kadapa - 516003*

The present study is aimed at to evaluate the water quality index (WQI) for groundwater of Thondure mandal, Kadapa district, Andhra Pradesh. The evaluation of water quality of different localities of Thondure mandal was studied. Water Quality Index (WQI) for drinking water of the Thondure mandal has been calculated with the help of estimated values of different physico-chemical parameters, such as Ca, total hardness,  $SO_4$ ,  $NO_3$ , F, pH, Cl, total dissolved solids (TDS), Fe, alkalinity has been carried out. Results obtained were compared with standard values recommended by WHO for drinking and public health. Fluoride concentrations in groundwater ranges from 0.6 to 2.3 mg/L. Out of 40 samples 3 samples are within the desirable limit and 15 samples are within permissible limit remaining samples are above the permissible limit. The chief sources of fluoride in the groundwater are the fluoride bearing minerals in the rocks in the sediments. The important fluoride bearing minerals in the study area are fluorite, apatite, hornblende and micas. Fluoride concentrations of groundwater in the study area are significantly correlated with pH, chloride, total dissolved solids and alkalinity and negative correlation with iron.

### **KEYWORD**

Fluoride, Groundwater, Thondure.

### **AUTHOR**

1\*. Dr. G. Sudarsana Raju, Assistant Professor, Department of Geology, Yogi Vemana University, Kadapa-516 003.

## Effect of Factory Effluents of Bokaro Steel Plant on Phytochemistry of Three Species of *Crotalaria* of Fabaceae

A.K. Jha and J.N. Singh

*R.S.P. College, Jharia, Dhanbad - 828 108*

Qualitative analysis of saponin, syringin, leucoanthocyanin, naphthoquinone, flavonoids, alkaloids were carried out in 3 species of *Crotalaria*, namely *Crotalaria juncea* Linn, *C. sericea*, retz, *C. verucossa*, Linn belonging to family Fabaceae growing on naturally in natural soil and in the soil containing effluents of Bokaro Steel Plant falling on Damodar river water to get a data for detecting effects of the effluents and the presence and absence of above phytochemicals in the aforesaid plants. Plants growing on natural soil did not show the presence of saponin, syringin, leucoanthocyanin, naphthoquinone but alkaloids and flavonoids were found in all 3 species of *Crotalaria*. The plants growing in the soil containing the Bokaro Steel Plant effluents, when tested for aforesaid phytochemical indicated different results. This has developed an interest for detailed study of these phytochemical compounds in these plants which is in progress.

### AUTHOR

- 1\*. Mr. A.K. Jha, Assistant Professor, R.S.P. College, Jharia, Dhanbad - 828 108.
2. Dr. J.N. Singh, Associate Professor, R.S.P. College, Jharia, Dhanbad - 828 108.

## **Study of Infiltration Rate With Various Concentrations of Soil properties in Srikakulam Coastal Belt, A.P.**

**G.Venkata Rao, B.Neelima Sri Priya, R. Srinivasa Rao and N.Harika**

*GMR Institute of Technology, Department of Civil Engineering, Rajam- 532 127, Srikakulam*

Infiltration rate is the volume flux of water flowing into the profile per unit of soil surface area when the soil is subjected to a shallow depth of ponding at the surface or when the water supply is not limiting. Infiltration rate is generally expressed in cm/hr. The term infiltration capacity is frequently used in hydrology to refer to infiltration rate. It is generally observed that under continued ponding, infiltration rate is high at the beginning, decreases rapidly and then more slowly until it approaches a constant rate asymptotically. Infiltration rate affects many aspects of hydrology and agriculture including runoff and water content of the soil and is related to evapotranspiration. In the present work, the Srikakulam district is selected as our study area. In order to obtain a solution for this problem the infiltration capacity of the area is found by conducting experiment at identified points and the variation of the infiltration capacity with respect to various parameters is studied. Graphs are plotted showing fluctuations in maximum and minimum infiltration at each point with the water content, density, plasticity index and the conclusions drawn. The maximum rate of infiltration is varying significantly with the water content. The maximum rate of infiltration and minimum rate of infiltration are not found to follow a particular trend with respect to density. The maximum rate of infiltration is varying significantly with the plasticity index where as the minimum rate of infiltration is not varying significantly.

### **KEYWORD**

Infiltration rate, Water content, Bulk density, Liquid limit, Plastic limit, Plasticity index.

### **AUTHOR**

1\*. Dr. G. Vankta Rao, Professor and Head, Department of Civil Engineering, GMR Institute of Technology, Rajam-532 127, Srikakulam.

2. Ms. B. Neelima Sri Priya, Student, Department of Civil Engineering, GMR Institute of Technology, Rajam-532 127, Srikakulam.

3. Mr. R. Srinivasa Rao, Assistant Professor, Department of Civil Engineering, GMR Institute of Technology, Rajam-532 127, Srikakulam.

4. Ms. N. Harika, Student, Department of Civil Engineering, GMR Institute of Technology, Rajam-532 127, Srikakulam.

## **A Morbidity Study Among Villagers Residing Near Industrial Units**

**A. Saha, D.S. Munda, J. Alam and K. Nayak**

*Regional Occupational Health Centre (Eastern), (Indian Council of Medical Research), Block-DP-1, Sector-V, Salt Lake City, Kolkata-700 091*

Environmental health studies involving residents near industry are not frequent. More such studies in different settings involving different population may prove useful in finding newer health adversities and planning interventions. This present study was initiated in a population residing near a metal smelting industry to explore the epidemiological details as well as prevalent morbidity of the population. This cross sectional prevalence survey was conducted in a small village. This epidemiological study was done including the parameters, like questionnaire survey, clinical examination, pulmonary function test as well as hematological examination. Acute allergic symptoms, dental abnormalities, musculoskeletal complaints were the major morbidity reported. About 23% subjects were having evidences of very mild, mild or moderate fluorosis. Backache was present in 28.3% subjects. Joint pain was reported by 22.2% subjects. This study concluded that regular monitoring of population around industries should be carried out in respect to health effect and exposure patterns so that early intervention, if needed can be taken at the earliest.

### **KEYWORD**

Morbidity, Population, Industry, Pollutants, Exposure.

### **AUTHOR**

- 1\*. Dr. Asim Saha, Scientist E, Regional Occupational Health Centre (Eastern), (Indian Council of Medical Research), Block-DP-1, Sector-V, Salt Lake City, Kolkata-700 091.
2. Mr. D.S. Munda, Scientist D, Regional Occupational Health Centre (Eastern), (Indian Council of Medical Research), Block-DP-1, Sector-V, Salt Lake City, Kolkata - 700 091.
3. Mr. J. Alam, Technician C, Regional Occupational Health Centre (Eastern), (Indian Council of Medical Research), Block-DP-1, Sector-V, Salt Lake City, Kolkata - 700 091.
4. Mr. K. Nayak, Technical Assistant, Regional Occupational Health Centre (Eastern), (Indian Council Medical Research), Block-DP-1, Sector-V, Salt Lake City, Kolkata-700 091.

## **Physico-chemical Characteristics of Surface Water in Angul-Talcher Industrial Zone of Odisha**

**Basanta Kumar Sahu**

*Forest and Environment Department, Government of Odisha, Bhubaneswar-751 001*

Water is essential for our survival. Since most of the surface water sources are threatened by pollution and contaminated with untreated/partially treated wastes from industries, waste water from mines and domestic sewage in Angul-Talcher industrial area, a study was taken upto ascertain the water quality. Water samples were collected from strategic river points and ponds located in the area during the 3 seasons (pre-monsoon, monsoon, post-monsoon). It was observed that the values of electrical conductance, total alkalinity, total hardness, chemical oxygen demand (COD), chloride, sulphate, nitrate, phosphate and total solids, etc., in surface water were fluctuated widely from station to station, which is an indication of pollution from anthropogenic origin.

### **KEYWORD**

Surface water, Water quality parameters, Physico-chemical characteristics.

### **AUTHOR**

1\*. Dr. Basant Kumar Sahu, Junior Scientist, Forest and Environment Department, Secretariat, Government of Odisha, Bhubaneswar-751 001.



## **Wastewater Recycling and Reuse – A Case Study of Amrita Vishwa Vidyapeetham University at Ettimadai, Coimbatore**

**Kewal Krishan Gupta**

*Amrita Vishwa Vidyapeetham (Amrita University), Amrita School of Business, Amrita Nagar, Coimbatore - 641 112*

Clean water is essential requirement of humanity. There is sufficient fresh water available on our planet but due to wrong policies of the national government, millions of people die due to lack of water availability and bad hygiene and sanitation. India has many perennial rivers spread across length and breadth of the country. They receive water from rains and glaciers which cover Himalayas. Because of massive industrialization of the country, rivers have become highly polluted. Untreated effluents are discharged into the rivers. There is another big source of fresh water, that is ground water. The country's ground water is over exploited, especially in green revolution states. Ground water is disappearing fast. Water policy of the government and awareness level of the people towards conservation of water are of vital importance for sustained development of the nation. Encouraged by importance of conservation of water, the author wants to present the picture of water conservation steps including recycling at Amrita Vishwa Vidyapeetham University, Ettimadai, Coimbatore, Tamil Nadu. The quantity of waste- water which is treated is 8.5 Lakh L/day approximately. The treated water is used for planting and watering of trees in the campus. Over the past decade or so population of trees on the campus has grown to over one lakh. The entire campus has been transformed into oasis of greenery. With the presence of so many trees on the campus, the air pollution has come down, summer heat has reduced and biodiversity has been enhanced. The clean and green ambience of Amrita Vishwapeetham University is a shining model for adopting all over the country.

### **KEYWORD**

Biodiversity, Effective micro organism, Photosynthesis, Soil erosion, Water recycling.

### **AUTHOR**

1\*. Dr. Kewal Krishan Gupta, Visiting Faculty, Amrita School of Business, Amrita Vishwa Vidyapeetham (Amrita University), Amrita Nagar, Coimbatore-641 112.

# Management of Tannery Wastewater in Kanpur - A Review

**R.K. Singh, P.K. Mishra and A.B.Akolkar**

*Central Pollution Control Board, Delhi-110 032*

India has relatively stringent environmental regulations yet, the country continues to encounter enormous environmental problems, many of these can be addressed through progressive management of industrial activity, sewerage system and overall stress on a holistic approach on enforcement. Kanpur an important industrial centre for production of leather and allied products in northern India, witnessed concerted efforts made through interception and treatment of wastewater and domestic sewage in the city. Owing to the stretch of river Ganga along Kanpur city, identified as the most polluted due to discharge of untreated tannery wastewater and domestic sewage- the first phase of Ganga Action Plan, Kanpur city was identified for priority action. Establishment of sewage interception, diversion and treatment facility in the city established in post 1985 period followed by establishment of, 5 MLD upflow anaerobic sludge blanket system sewage treatment plant (UASB-STP), 36 MLD upflow anaerobic sludge blanket system common effluent treatment plant (UASB-CETP) laying down of conveyance system, network of new pumping stations and up-gradation of existing setup common chrome recovery plant to address the major industrial pollution issues and improve the quality of river Ganga. However, the current status of measures reveal that, the impact of these measures on recipient environment has been far from satisfactory. The reason being poor appreciation of in-house measures for cleaner production, increase in processing capacity of tanneries, lack of operation and maintenance of waste interception and treatment infrastructure and a general disowning responsibility of key stakeholders. The present paper takes into account all the major issues, salient observations made by Central Pollution Control Board (CPCB) and attempts to bring out a suggestive approach to address environmental issues at Kanpur and restricting adverse impact on river Ganga at Kanpur.

## **KEYWORD**

STP, CETP, Tanneries, Chromium, Waste minimization, Sustained efforts.

## **AUTHOR**

1. Dr. R.K. Singh, Senior Scientist, Central Pollution Control Board, Zonal Office (North), PICUP Bhawan, Vibhutikhand, Gomtinagar, Lucknow - 226 010.

2\*. Mr. P.K. Mishra, Additional Director and Incharge, Central Pollution Control Board, Zonal Office (North), PICUP Bhawan, Vibhutikhand, Gomtinagar, Lucknow - 226 010.

3. Dr. A.B. Akolkar, Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.