
The Buckingham Canal which passes through Chennai has been modelled using the software QUAL2E-UNCAS. After testing and validation of the model, simulations have been carried out. The exercise enables forecasting the impacts of different seasons, base flows, and waste water inputs on the water quality of the Buckingham Canal. It also enables development of water management strategies.


Adsorption behaviour of Ni(II), Zn(II), Cd(II) and Cr(VI) on untreated and phosphate-treated rice husk (PRH) showed that adsorption of Ni(II) and Cd(II) was greater when PRH was used as an adsorbent. Sorption of Cd(II) was depended on contact time, concentration, temperature, adsorbent doses and pH of the solution. The Langmuir constants and thermodynamic parameters have been calculated at different temperatures. It was found that recovery of Cd(II) from synthetic wastewater by column operation was better than a batch process.


Attempt has been made to assess the environmental impacts of lime kilns at Maihar (MP). Battelle Environmental Evaluation System (BEES) has been applied in the present assessment study. The addition of environmental impact unit values of all the four sections provide with a over all negative values as – 476.6 and 36 positive values. This indicates that due to lime kilns and on going mining and expansion work and also other related activities approximately 56.07% of the over all environmental quality is negatively affected or likely to be affected while only 3.6% of the benefits could be sought in improving living standard.

Remote sensing technology and Geographical Information System have been extensively used in exploitation of ground and surface water in many areas. These technologies have the potential to help in reaching the ultimate goal of water resource management so that every one can get sufficient amount of water. The article explores the potential of remote sensing and Geographical Information System in water resources management, development and its capability to handle the issues related to water management and development.

0301-005. Bhargava Renu, Gupta Manoj (Dept Civil Engng, Univ Roorkee, Roorkee). **Expert system for solid waste management.** *J Indian Assoc Environ Manag, 29*(2)(2002), 81-84 [5Ref].

A prototype expert system (SOLDMANG) has been developed for selection of a suitable solid waste management system, using EXSYS shell. Knowledge for the expert system has been elicited from extensive review of manuals, research papers and opinions of experts from various fields. The expert system “SOLDMANG” is also able to design various disposal units of solid waste management system.


The ability of the microbiota of six mangrove ecosystems within Mumbai city to degrade phenolic effluent was investigated. A total of 14 potent isolates able to degrade 500 ppm of phenol in mineral based medium were obtained through three successive enrichments using increasing concentrations of phenol. Selective pressure of pH 5.0 and 9.0 were incorporated in screening media to enable wider usage of the culture for industrial applications.


The concept and significance of carrying capacity with respect to sustainable eco-tourism has been explained and analysed. The emerging importance of Carrying Capacity and eco-development linkages in eco-tourism and wildlife management has been addressed and critically examined.

Paper deals with degrading coastal habitats in northeastern India, and projects the intensity of the stress arising from the collection of tiger prawn seeds (Penaeus monodon) for aquacultural farms and molluskan shells for poultry feed and edible lime. The magnitude of such destruction has been quantified. The impacts of biodiversity loss and their after-effects on the ecobalance of this coastal system have become a matter of great concern to ecologists to maintain security and sustainability. Paper proposes a public awareness program on themes relating to the importance of biodiversity for human livelihoods.


Paper gives a distinct picture about the changes that have taken place on the nature and extent of interaction between the mangrove forests and human population over decades. Seeds of different types of fishes are main food materials of commercially important and endangered species of fishes. Increasing destruction of the said aquatic fauna may affect different stages of the life cycle of the predators and may break the food chain of mangrove eco-system.


Indian coast line particularly Tamilnadu, Andaman and Nicobar Islands, Lakshadweep Islands and Gulf of Kachchh are characterized by mangroves, coral reefs, sea grass and seaweeds. The need for better monitoring and mapping of these resources has increased dramatically in recent years. Paper reviews the potential of high resolution satellites used for coral reef ecosystem.

A study has been carried out on the shoreline changes and coastal processes operating in the Dakshina Kannada coast using remote sensing and GIS technique. Erosion is observed at southern spit (Ullal) upto Talapadi and also northern spit (Bengre) upto New Mangalore Port. Accretion is observed at north of New Mangalore Port. Gradual shifting of the estuarine mouth of Nethravathi-Gurpur to the north is also observed. The changes could be attributed to human interference by way of constructing coastal structures.


Study was to assess as the skills and understanding by a specific group of students for responsible citizenship. The results suggested that the students were familiar with a wide variety of environmental issues; however; their understanding of these issues was shallow. Statistical analyses found no differences or negligible difference in the performances of these various issues related to the gender, age and urban-rural background of the students.


The city of Bhopal is crowned with lakes and reservoirs, which are major sources of potable water, recreational activities and aquaculture. In order to maintain Upper lake as a healthy water-resource for dinking purposes, lower lake as a recreational ground and Shahpura reservoir as a pisciculture station, an attempt has been made to formulate certain measures, that can cure the already spoilt lakes and check the water sheds from getting eutrophicated further.


The extent of natural resources degradation is increasing with the rate of withdrawal and unmanaged utilization of our natural resources. Sustainable development can be achieved either by utilizing our natural resources more effectively and more efficiently and/or by converting the so termed waste into wealth. Paper explains the ways to understand the nature of waste and to approach for the best suited treatment of the waste so as to ascertain the sustainable development.

0301-015. Jayaseeli Antony Amala, Murugan A (Suganthi Devadason Marine Res Inst, 44-Beach Rd, Tuticorin 628001, Tamil Nadu). Mangrove in Punnakayal,
A survey was carried out to assess the socio-economic status of the people depending on mangroves in Punnakayal, south of Tuticorin in Gulf of Mannar region. The mangrove destruction is estimated to be at a higher rate. Awareness creation is considered very much necessary among the villagers in order to conserve the mangroves from destruction and to safeguard its resources for posterity. Replantation of the mangrove is another option, which has to be carried out with the participation of the local people.


The carbon store in forest land is higher than agricultural lands followed by pastures and barren land. The variety of soils occurring in India offers different potential for carbon sequestration. Paper deals with the global carbon store in soil and vegetation, global carbon exchange between forest and atmosphere, organic carbon store in some Indian soils, soil carbon store under different land uses, soil carbon store in plantation and natural forest in India and carbon sequestration in wastelands etc.

0301-017. Jha Mohan (Indian Coun Forestry Res Edn, Dehra Dun, Uttaranchal). **Community based conservation and management of medicinal plants in India.** (The) Indian Forester, 129(2)(2003), 187-197 [18 Ref].

Successful implementation of activities related to medicinal plants conservation and their sustainable utilization needs the involvement of local communities, especially women groups and provides scope for income employment and empowerment of primary users of medicinal plants. Some of the works by Government and non-government organization related to community based conservation is discussed.

0301-018. Koul Monika (Environ Bio Lab, Dept Bot, Univ Delhi, Delhi 110007). **Forests and ecological security.** (The) Botanica, 51(2001), 100-109 [21 Ref].

Human actions have caused forest cover to shrink significantly over the last several decades. Continued forest loss and degradation have serious implications at local, regional and global levels. The state of forests should not simply be a matter of their extent. More attention should be focused upon the health, genetic diversity and age profile of forests, collectively known as forest quality. Forests should not only be quantitatively adequate but qualitatively rich.

Some simple glassware has been developed for recirculation of liquid medium. These glassware have wider applications and have been tested in experiments involving leaching, biodegradation, and desulfurization. The fabrication cost is minimum and can be developed in a small glassware workshop. Paper discusses the developed, design and fabrication of some specialized glass recirculation systems and its environmental applications.


The state of Assam is endowed with natural flood plain lakes in the form of beels which have very rich fishery resources. A situation exists whereby many individual fish stocks have been or are being fished beyond their sustainable level with the consequences that many stocks have depleted alarmingly. The combined action of the natural changes and anthropogenic interferences will prove disastrous to the biodiversity if measures are not adopted in time. Issues related to the present situation and suggestion to improve the productivity of beels are discussed.


Paper reviews and discusses the development and impact of commercial aquaculture on environment particularly in Indian context. Aquaculture adversely affects the biodiversity and so there needs to be a control, proper management and training for the users as well as general population. Sustainable aquaculture should be promoted and encouraged and Government should keep a vigil and proper acts or laws should be made.


Removal of toxic heavy metals like lead and chromium from potable water has became essential due to their stringent limit imposed by the Public Health Authorities. Several options are made for their removal using different technologies. Tree bark substrate (*Artocarpus heterophyllus*) has been tried for the removal of lead and
chromium ions from aqueous phase. The maximum removal of lead and chromium was observed at pH 7 and 4 respectively. Instant adsorption of both the metals (>90% and >50% respectively) was found to be achieved within 10 minutes by the product and increased with increasing dosages.


The impact of extraction on sustainability of forests under Joint Forest Management in West Bengal has been assessed by comparing productivity and extraction of NTFPs in terms of biomass. Study conducted on productivity of certain fuelwood producing species show that perfect protection leads to dominance of a particular species on the one hand and decreases level of total production on the other. Earmarking certain species for fuelwood by some Forest Protection Committees has certainly some positive impact on forest ecosystem, but lack of attention towards a valuable species like Bassia latifolia leads to total elimination of the species.


Paper studies the effect of environmental regulation on the productive efficiency of water polluting industries in India. The panel data of 92 firms belonging to sugar industry of India are used to test the Porter hypothesis of having win-win opportunities for the firms subjected to the regulation. The main empirical result is that the technical efficiency of firms increases with the degree of compliance of firms to the environmental regulation and the water conservation efforts there by supporting the Porter hypothesis.


Keen to market Nanda Devi on the lines of Mount Everest, the Uttaranchal government is contemplating opening up the Nanda Devi Biosphere Reserve (NDBR) for limited tourism activities. All these steps have resulted in giving rise to conflicts, both within and outside the reserve, which is most, if not all, have been a result of indifferent attitude of the governing officials towards the wants and aspirations of the local inhabitants. The paper delves into the major areas of conflicts and offers policy options towards sound conservation strategies and amelioration of the conflicts.
Training is obviously a most important component in pre-disaster, during disaster and post disaster activities. A permanent training system and programme is desirable for effective management. This should cover not only the needs of government officials but also those of non-government organizations. Government carries the major responsibility for dealing with disaster and the government resources must be utilized to optimum effect.

The technology for reef rehabilitation has been developed mainly to repair damaged reef areas by natural and manmade causes. So far several methods were adapted for reef restoration in several countries. In India it is virgin field and small-scale restoration work was started on experimental basis to study the feasibility using low-tech methods. The status of reef restoration in general and its need in India especially in Gulf of Mannar are discussed.

The tremendous pressure on the mangrove ecosystem of Sundarban due to collection of firewood during dry fish trade in winter as well as by the crab catchers round the year has been investigated and analysed. The extent of dry fish trade and crab catching has been discussed while highlighting the mud crab fattening project as an alternative to capture fisheries in the region.

Lack of awareness about water quality parameters, purification methods, health impacts and measures to overcome is a hurdle in achieving safe water practices. Paper reviews the water quality problems and the prospects with the available source of information.

To increase and sustain the crop production and to ensure food security and environmental quality, watershed covering an area of 1120 ha at Chinnatekur, Kurnool district, Andhra Pradesh representing red soils was developed on watershed basis. The conservation measures reduced runoff and increased the yields of major crops. Conservation of natural resources on watershed basis on semi-arid region with benefit is to cost ratio 2.29 in Chinnatekur proved to be economically viable and environmentally sustainable.


Threat assessment has indicated that about 200 species out of 1500 species of medicinal plants are rare, endangered or threatened. Conservation and cultivation strategies have been suggested and a holistic approach recommended because cultivation alone cannot prevent extinction. *In-situ* conservation of wild population, establishment of taluka-level herbal gardens, thousands of home gardens and large scale cultivation of selected cultivators are the four important measures, which are likely to effect conservation and reduce threat at present facing them due to over-exploitation as well as their destructive utilization, as roots barks, whole plants etc. in these systems.


Sediment samples collected in Moradabad area, lying in the interfluve of the Ganga and Ramganga River, were analysed for heavy metals, after studying the geomorphology of the area. The sediments are redistributed and redeposited within the basin itself, and thus these basins serve as sinks. The concentrations of heavy metals in such a basin will show exponential increases with time, because there is no activity to funnel out the sediments and dilute the effect of pollution. This increase will pose more threats, as ultimately it will make its way laterally and vertically through the sediments, thereby polluting groundwater.

0301-033. Shi Hua, Singh Ashbindu, (UNEP/GRID, Div Early Warning Assessment, North America USGS/EROS. Data Cent 47914 252nd St Sioux Falls, SD 57198 USA).
Status and interconnections of selected environmental issues in the global coastal zones. *Ambio*, **32**(2)(2003), 145-152 [40 Ref].

Study focuses on assessing the state of population distribution, land cover distribution, biodiversity hotspots, and protected areas in global coastal zones. The application of Geographic Information System (GIS) layering methods and consistent datasets has made it possible to identify and quantify selected coastal zones environmental issues and their interconnections. It is expected that such information provide a scientific basis for global coastal zones management and assist in policy formulations at the national and international levels.


In India nearly 175 million ha of land is degraded, out of which 93 million ha is lying waste. This land is not suitable for growing agricultural crops economically but can be effectively used for growing medicinal plants after proper management. Species suitability for different types of wastelands, proper amendments for boosting the growth of these plants etc. have been discussed.

0301-035. Singh NP, Chowdhery HJ (Botl Surv India, P-8, Brabourne Rd, Kolkata 700001). Plant diversity and conservation priorities. *(The) Botanica*, **51**(2001), 83-90 [20 Ref].

It is estimated that out of nearly 2,50,000 species of vascular plants nearly 20-25,000 species are seriously endangered or coming under severe threat. National Biodiversity Strategy and Action Plan has been launched with the sole objective of preparing detailed micro level action plans at state and regional levels. Urgent need to declare Biological Diversity as National Resource and its conservation and sustainable utilization as national goal and national priority have been emphasized.


In dairy industry, primary and secondary treatment methods are quite common for effluent treatment. However, this type of treatment is not effective in filtering the nutrients from the dairy waste water. Nutrient removal capacity of some important macrophytes i.e. *Eichhornia crassipes*, *Lemma minor* and *Azolla pinnata* have been tested individually as well as in combinations under microcosm investigations. The results are presented.