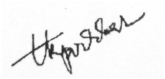
ENVOICE

A Newsletter from the Department of Environmental Science, Vivekananda College, Thakurpukur, Kolkata

Vol. 6 No. 1 | *National Seminar Special Issue* | *March 2015*

FROM THE DESK OF PRINCIPAL

It is really a pleasure to know that Department of Environmental Science is going to publish the 6th issues of ENVOICE, a newsletter, to mark their effort in organizing the National Seminar on Environmental Management and Sustainable Development with active cooperation of the Departmental alumni association. Sustainable Development is the demand of time that can only be fulfilled if the young and forthcoming generations realize it. The Seminar and the ENVOICE – carrying the views of the students and academicians continuously for last six years shoulders this responsibility, march ahead.



Dr. Tapan Kumar Poddar,
Principal
Vivekananda College, Thakurpukur

Let us hear from You

e-mail: envs.vc@gmail.com
Phone: 033-24976023

In This Issue

The Magic Word

Rajarshi Mitra
Head, Dept. of Environmental Science, Vivekananda College

'Sonar Patharbati – a stone bawl made up of Gold' – sounds Rhetoric? But we are subscribing to such concept every now and then when we talk about environment and Sustainable Development.

The buzz word literally means nothing as real as it seems to be. The only constant in life is change and hence, no development can be sustainable in a true sense. The degradation can only be delayed. Even a lot of studies are trying to quantify sustainability without a proper reference of a sustainable system.

However, such a wild goose chase has developed a new era of thinking, where the so called 'environmentally aware' people portray their concerns through use of biodegradable and biogenic goods, booking a flat in a complex with 50% greenery, driving a vehicle with higher fuel efficiency, making a tour every year to the areas of pristine natural beauty and so on. But at the same time, we don't care to call up on a pest-control authority to make the surroundings with '50% greenery' pest free, honking vigorously in traffic while taking a narrow shortcut to save more petrol, demand all the amenities like bright light, geyser and air conditioning within a forest resort run by a generator evoking both noise and pollutants.

It is actually, a tendency to cleanup own back yard and spoil others. It is only a development with a green mask.

If it is the general peoples attitude, the governmental agencies too are not lagging behind. Only to put the example of MoEF, Forest Survey of India is assessing the forest cover of the country and their reports are really encouraging though the figures shown. But ironically, only 58% of the forest cover in the country is found to be natural that means the ecosystem is on stake. But the authority is not ready to separately report the natural and manmade or social forest land apparently due to operational inconvenience. If this is the way, we think sustainable development is to be achieved, in near future neither the development nor the sustainability will be visible. It is therefore, high time to accept developmental concept and practices in a sustainable way, instead of the reverse we are on now.

The Wall: Protector or Wrecker?

AninditaDebnath,
B.Sc 1st yr., Department of Environmental Science, V.C.

Since the ancient times, mankind has been involved in a constant struggle to harness the water of flowing rivers so as to be able to supply the right amount of water to right places to meet their requirement.

Earlier, to control or maintain the flow of water various earthen structures are used. However, in 20th century advancement in civil construction technology the most popular means of achieving this endeavor became erection of Dams across rivers to control the flow of rivers and also to store water for various purposes. Today, nearly all major river systems in the world have dams built across them. This is done for economic and social development of the inhabited areas near these rivers. The major advantages of dams are in flood control, hydropower electricity generation, agriculture and in water transfers to areas with deficit of water. Dams contribute to 12-16% of world's food production. 19% of the world's total electricity supplies are generated by the dam that is present in 150 countries. Near about 24 countries are dependable on dams generating 90% of their power supply.

As with most situations, there are both benefits and drawbacks dams are no exception. Dams bring along many benefits to us, but they have detrimental effects too. It leads to displacement of human lives; devastate small tribal communities and biodiversity by inundating thousands of acres of forests and agricultural land. Disrupt Downstream Fisheries,threaten the regional ecosystem,groundwater table affects,dams and the associated lakes induce seismicity in previously aseismic regions.Dams cause disruption of movement of species (e.g., destruction of up to 75% of riparian bird species on the Colorado).Seepage and evaporation from the big lakes can be significant (e.g.15% for Nile system).

There are several incidents of dam failure. But in 1975 The Banqiao Reservoir Dam is a dam on the River Ru in ZhumadianCity,Henan province, China caused more casualties than any other dam failure in history. The dam failures killed an estimated 171,000 people; 11 million people lost their homes. It also caused the sudden loss of 18 GW of power. The power output equivalent of roughly 9 very large modern coal-fired thermal power stations.

In *India, w*e can still remember the recent catastrophic event of Uttrakhand in 2013. The Uttarakhand disasters have been officially termed a natural calamity caused by cloudbursts and unprecedented heavy monsoon rainfall. But the epic tragedy is unchecked, unplanned development of roads, hotels, shops, however, the worst culprits are the large numbers of hydroelectric dams, which have spread like a rash in the basins of the *Alakananda, Mandakini and Bhagirathi*, and their tributaries. Uttarakhand is extremelyfragile, being part of the world's youngest mountain range. Much of the state lies in the seismically "most active" Zones IV and V, with high tectonic activity that can suddenly alter the contours of land and the course of rivers. As per a report of The Hindustan Times, 70 dams have been built, including 23 mega-projects generating 100 MW or more, which seems to be an invitation calamity. To avert another Uttarakhand catastrophe we should stop pandering to the Indian elite's insatiable appetite for electricity, which is driving reckless dam construction.

NEWS FROM THE DEPARTMENT

- Seven students of the department attended **Youth meet organised by TERI at new Delhi** in February, 2015.
- Two students of the department stood **FIRST** in **District Level Science Fare** in model competition with their model on Rainwater harvesting.
- The Department is organising **National Seminar on Environmental Management and Sustainable Development** on 14th March, 2015.
- During 2014-**15 two students research project** were completed on
  - Impact of Tree canopy on local climate
  - Impact of price hike on luxury consumption.
- Presently **three more students project**s are running on,
  - Ganges water quality variability
  - Improvisation of SODIS technology
  - Habitat preference of migratory birds

Cumulative Environmental Impacts Of Coal Mining: Issues, Challenges and Management Options

Dr. Sukalyan Chakraborty
Department of Civil and Environmental Engineering,
Birla Institute of Technology, Mesra, jharkhand

[Synopsis of paper presented in National Seminar on Environmental Management & Sustainable Development, 14th March, 2015]

Coal continues to be the major source of primary commercial energy worldwide as there is limited reserve potentiality of petroleum and natural gas. Share of coal in world's energy consumption is 27%. The importance of coal in India can be gauged by the fact that it supports about 54.5% of the commercial energy in the country. Mining operations damage the environment and ecology to an unacceptable degree unless carefully planned and controlled. Apart from this involuntary displacement of people due to mining activity also affects the socio-economic values of those people. The major effects of mining are land damage, deforestation and subsidence, water pollution and changes in hydrological regime, air pollution i.e. increase in dustiness of the area, Increase in ambient noise level of the area, ground vibrations due to blasting, loss of biodiversity and disturbance to wildlife, involuntary displacement and loss of livelihood of a large number of persons, socio-economic disturbance in the surrounding villages. Till date various measures has been adopted to judiciously manage the above mentioned cumulative environmental impacts of mining. Some of them are discussed here. In order to minimize the ecological impacts of the mining areas, the mining layout should be planned to have the least requirement of the forest land and develop a suitable compensatory forest. Apart from this a flora bank can be developed to preserve the typical floral species of the area so that these can be replanted and developed as and when needed. Regarding the subsidence of large areas due to underground mining safe barrier pillars have to be left. It is also necessary to save topsoil for later use in a manner to protect the primary root medium from contamination and erosion, and hence, its productivity. To protect the surface and sub-surface water bodies some of the common measures are construction of Effluent Treatment Plants (ETPs) in the down flow line of the workshop as well as mine effluent discharges so that pollution parameters in the effluents are well within acceptable norm while in the underground mining areas underground water bodies can be developed at the time of decommissioning and closure of the mines. Air pollution suppression measures include source emission reduction, management and operational changes, process optimization, combustion modifications, fuel modifications, water spraying on haul roads by mobile and fixed sprinklers, use of dust extractors, black topping of service roads, avenue plantation etc. The Directorate General of Mines Safety (DGMS) and Indian Bureau of Mines (IBM) realized the hazards of noise and vibrations and framed the noise limits (Based on ILO Code of Practice) in order to prevent the risk of hearing impairment, prevent interference of communication essential for safety purposes, and eliminate nervous fatigue. Out of the many societal impacts displacement of the project affected families (PAFs) and their loss of livelihood are the critical ones to be addressed adequately at the planning stage itself. For taking care of these impacts the mining companies have been implementing rehabilitation and resettlement (R&R) packages. So to conclude we can say that by carefully pre-planning projects, implementing pollution control measures, monitoring the effects of mining and rehabilitating mined areas, the coal industry can minimize the impact of its activities on the neighboring community, the immediate environment and on long-term land capability.

Rat Whole Mining

Irrespective of its exploitative nature, illegal mining has become mainstay at local economies. According to a report published in the Hindu in 2004, there are 1000 small wells in Jamuria area, those cater employment for nearly 25000 people. The daily production of coal in Janmuria, Baraboni and Raniganj area of West Bengal almost equaled 30000 – 40000 tonne and generated over 5 crore a day.

Source: Citizens' Report 6. CSE.

Climate Concerns and Trends in Future-Smart Cities in India: a Case Study on Kolkata

Rupayan Dutta
Urban Planner, Kolkata towards a climate-smart urban habitat: interventions under UK-KMC MoU on climate change

[*Synopsis of paper presented in National Seminar on Environmental Management & Sustainable Development, 14th March, 2015*]

Presently we are in an urban century, which means that worldwide people living in urban areas are far more than living in rural areas. Globally this urbanization trend has increased multi-fold in 20th century and has accelerated since. However, the alarming growth of urban population has raised concerns on the support system their cities can offer. Cities are stretched to the limit, struggling to provide basic urban services; viz. cities have started experiencing the socio-economic challenges of unemployment and inadequate housing. Traffic congestion and pollution continue to increase as overcrowding has become endemic. Developing countries face huge challenges in developing urban infrastructure to meet the growing demand in their economies and developing climate resilient infrastructure further toughens the challenge. The impacts of climate change on developing economies are evident in the increasing vulnerability of their economies to climate change. While climate change science is gaining increasing acceptability and impacts of climate change become more visible, the same science is increasingly being used to make economies more resilient to these changes or in other words "climate proofing". This approach is now being increasingly accepted by governments in all levels, national, state and local as well as by multilateral/bilateraldonor partners and aid agencies.

Importance of cities

- Cities are important engine for economic growth & socio-economic development; Cities consume 70-75% of global materials and energy supply and produce 75% of global carbon emissions
- 50% of global population living in cities (app. 3.2 billion)
- More than 80 % of world population is expected to live in cities by 2050
- Middle class population has doubled from 1 billion in 2000 to 2 billion in 2013. This is projected to increase to 5 billion by 2030.
- High density, socio-economic vulnerability, limited access to resource
- Cities are vulnerable to extreme weather events.

Cities, as hubs of the global economy, are recognized as the focal points for this transformational approach. In the immediate future, three interconnected factors will place even more emphasis on the role of cities in sustainable economic development:

- The world is at an unprecedented level of urbanization.
- Cities contain an increasingly large share of the world's highly skilled, educated, creative and entrepreneurial population, giving rise to highly concentrated and diverse pools of knowledge and knowledge-creation networks.
- Cities can support large-scale business and investment networks that create economies of scale in absorbing and extending innovation.

The world is now recognizing the critical role of municipal governance to address climate change. The local governments can play an important role because of its mandate to deliver basic services Most of the cities, under the aegis of administrative autonomy, are better placed to formulate and implement regulations, plans and programmes that can drive adaptation and mitigation.

Urbanization in India

While the urban population is currently around 31% of the total population, it contributes over 60% of India's GDP. It is projected that urban India will contribute nearly 75% of the national GDP in the next 15 years. It is for this reason that cities are referred to as the "engines of economic growth" and ensuring that they function asefficient engines is critical to our economic development. This trend of urbanization that is seen in India over the last few decades will continue for some more time.

It is for this reason that we need to plan our urban areas well and cannot wait any longer to do so. The relatively low base allows us to plan our urbanization strategy in the right direction by taking advantage of the latest developments in technology.

Responses so far at national and state level

The Government has recognized the importance of mainstreaming climate change in developmental

planning and country's 12th (twelfth) Five Year Plan seeks to fulfil"Faster, Sustainable, and More Inclusive Growth". In India, the coastal and the mountainous states are generally seen as more vulnerable to climate change.
India has also put in place an advanced framework for tackling climate change, including a National Action Plan (NAPCC) with eight accompanying sectoral missions. As a federal state, policy turns to action at the state level. The NAPCC outlines the focal components of the strategy in the form of eight National Missions, representing a multi-pronged, long-term and integrated strategy for achieving key goals in the context of climate change. Amongst these, the National Solar Mission, National
Mission for Enhanced Energy Efficiency, and National Mission on Sustainable Habitat are key components ofthe strategy for achieving climate change mitigation related objectives. However, a lack of resources and capacity in many states puts this at risk.
In West Bengal, streamlining climate actions in growth planning started with preparation of the State Action Plan for Climate Change in 2010.

(Future) Smart City: a conceptual framework
The transformational concept of smart city can be looked as a framework for implementing a vision of advanced, modern and future-ready urbanization. This vision envisages achievement of three goals – social equitability, economic viability, and environmental sustainability. Social equitability is based on the principle of inclusion; there is no discrimination in access to benefits across population segments. Economically viable solutions are those that are financially self-sustaining. Environmental sustainability ensures the preservation of the environment for future generations.
Smart civic administrations will take advantage of the opportunitiespresented by the shift in economic development drivers, whileaddressing the challenges of demographic changes. They willalter their investment strategies from attracting and supportingmass labour pools to creating systems of services designed tooptimize the city around highly skilled, innovative citizens andcommunities, as well as knowledge-intensive businesses. Frombuilding better transportation systems to supporting creativeinnovation and technological research and development,strategic design of public services systems can provide asupportive environment for delivering a higher quality of life,making a city more attractive human habitat.

ECOTAGE

Protusha Biswas
B.Sc 1st yr., Department of Environmental Science, V.C.

Ecotage is a popular term, an environmentally concerned person is well-familiar and aware with.
Eco-Terrorism dates back to 1983, when Ron Arnold, a Wise Use Movement activist for *Reason* magazine, defined it as a crime committed to save nature. The Federal Bureau of Investigation (FBI), defines eco- terrorism as the use or threatened use of violence of a criminal nature against innocent victims or property by an environmentally-oriented, subnational group for enviro-political reasons, or aimed at an audience beyond the target, often of a symbolic nature.

In earlier times, eco-terrorism took the form of peaceful direct action by organisations like *Sierra Club* (1892), *Greenpeace* (1971), Earth First!(1980), Earth Liberation Front (1992) and many, which caused a vast change in the form of agitations. With time it shifted from environmental terrorism, which is targeting of natural resources by traditional terrorist groups to inspire fear within a population to further set political or social goal, to eco-terrorism, which is applied to groups that practice destruction of property in the name of saving the environment from human encroachment and destruction.

But in the new century a new term, more or less similar to terrorism has evolved, ECOTAGE, which denotes the use of extralegal tactics by radical environmental groups, who seek to inflict targeted economic harm on individuals and firms that are considered to be causing serious ecological damage (Vanderheiden, 2005). Ecotage is the violence against inanimate objects rather than humans and therefore a conceptually distinct and less serious form of Terrorism.
The main intention of this ideology is not to retaliate for past offences and make certain acts expensive, so as to discourage them; rather it has the capability to appeal directly to the community and to the politicians and law-makers, which in turn would pressurize the law makers to remedy any serious mistakes or injustice.

The **Earth Liberation Front (ELF)** is an international underground organisation that uses direct action in the form of Ecotage to stop exploitation and destruction of Environment.
It is Terrorism without bloodshed, and can be well-accepted for its "Eco"-friendliness!

Sustainable development and Millennium Development Goals

Dr. Tanushree Bhattacharya
Department of Civil and Environmnetal Engineering, Birla Institute of Technology, Mesra, Jharkhand

[*Synopsis of paper presented in National Seminar on Environmental Management & Sustainable Development, 14th March, 2015*]

The World Commission on Environment and Development was established in 1983 under the presidency of Gro Harlem Brundtland, to produce a comprehensive report on the situation of the environment at the global level. The work of the Commission represented a landmark in international initiatives to promote environmental protection as it produced the concept of sustainable development, a concept that would become the basis of environmental politics worldwide. The concept of sustainable development was built as a political expression of the recognition of the "finiteness" of natural resources and of its potential impact on economic activities. The Brundtland Report also promoted the view that global environmental degradation can be seen as a source of economic disruption and political tension, therefore entering the sphere of strategic considerations or environmental policy formulation. The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in June 1992, marked the official institutionalization of environmental issues in the international political agenda. After Rio, environmental considerations became incorporated into development, and a "global bargain" was struck between North and South on the basis of the acceptance from both sides of the desirability of achieving a truly global economy which would guarantee growth and better environmental records to all. The major result of UNCED is called "Agenda 21," a 700-page global plan of action which should guide countries towards sustainability through the 21st century, encompassing virtually every sector affecting environment and development. The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26 August to 4 September 2002.

Further, in September of 2000 in the Millennium Summit the leaders pledged, the world would achieve measurable improvements in the most critical areas of human development by 2015. Eight important goals known as 'Millennium Development Goals' were set up.

BOX 1: The EIGHT GOALs to achieve

Goal 1: Eradicate extreme poverty and hunger

Goal 2: Achieve universal primary education

Goal 3:Promoting gender equality and empowerment of women

Goal 4: Reduce child mortality

Goal 5: Improve maternal health

Goal 6: Combat HIV/AIDS, malaria and other diseases

Goal 7: Ensure environmental sustainability

Goal 8: Develop a Global Partnership for Development

Progress towards reaching the goals has been uneven. Some countries have achieved many of the goals, while others are not on track to realize any. The major countries that have been achieving their goals include China and India due to clear internal and external factors of population and economic development. However, areas needing the most reduction, such as the Sub-Saharan Africa regions have yet to make any drastic changes in improving their quality of life. Fundamental issues will determine whether or not the MDGs are achieved, namely gender, the divide between the humanitarian and development agendas and economic growth.

Community Based Natural Resource Management and Sustainable Development: An Interdisciplinary Perspective

Dr. Biswajit Ray
Department of Economics, University of Calcutta

[*Synopsis of paper presented in National Seminar on Environmental Management & Sustainable Development, 14th March, 2015*]

Sustainable development is defined as that development which ensures non-decreasing income and other development opportunities across the generations. The recent emphasis in the academic world is on the potential link between sustainable development and natural resource management. We focus here on sustainable management of community-based natural resource management (CBNRM) or co-management as it is a leading conservation and development model since 1990s. However, this model has been subject to international controversy regarding the socio-economic inequality, exclusion and marginalization of the weaker sections of the resource dependent households, especially women and the poor. Evidence also suggests that many co-management programs have failed to promote their stated objectives of governance and sustainability, efficiency, equity, decentralised participation and poverty reduction. Thus, the experience of CBNRM has been mixed. This raises the most pertinent query: What explains success and failure of natural resource management? Because institutional failure may not necessarily be confined to ecological or economic criteria alone, there is a need for adopting an integrated framework to analyse why institution (set of rules governing human behaviours) fails. However, we hardly find any works that draw on other literatures and compliment the economics of co-management for a more comprehensive understanding of institutional success and failure. The issue is important for rural communities in developing countries because co-management is not an environmental policy alone, it helps rural households to maintain their livelihoods. Most importantly, amidst dynamic power relations, household level socio-economic heterogeneities, and differences in people's attitudes, beliefs, and perceptions that characterize a CBNRM setting, resource dependent households are more likely to make conservation decisions embedded in a broader socio-cultural context and their attitudes, beliefs, identity and status may affect their decisions.

Based on these arguments, we need to examine whether CBNRM is an environmental policy alone or beyond this. For this, we examine the impacts of some social issues like: (i) household level heterogeneity, (ii) attitudes of the resource-dependent households, and (iii) the household-level status differences on the sustainable CBNRM. Towards this end, we use received wisdom of other disciplines and finally compliment our understanding by some case studies. These case studies show that natural resource management should not be considered as an issue of environmental policy alone but also a social policy as people depend on these resources without any doubt. So, we should give due importance not only to heterogeneity at the household level but also to heterogeneity in people's attitudes, identity and status to understand why some natural resources can be successfully and sustainably managed and why we fail in other cases.

Solar Disinfection: A Natural Treatment

Soham Chakraborty
B.Sc 1st yr., Department of Environmental Science, V.C.

Water, also known as blue gold, is one of the main essential requirements for human being as well as every single organism on earth, which incidentally is known as the Blue Planet. Water, which is life saving, can also be deadly at times playing host to a number of water-borne pathogens which can be fatal. These harmful foreign pathogens in water can cause a range of diseases like cholera, diarrhea, typhoid, etc. Every 8 seconds, a child dies from water related disease around the globe. 50% of people in developing countries suffer from one or more water-related diseases. 80% of diseases in the developing countries are caused by contaminated water. Use of common water filters are not enough to stop these impurities and water purifiers are sometimes beyond the affording capacities of people below a certain level. A possible solution aimed at eradicating the harmful micro-organisms is boiling the water. But this process is costly as it uses either natural gas or electricity.

Therefore, to prevent these pathogens from functioning, SODIS can be used. SODIS, or Solar Disinfection is a very simple, cost effective and efficient process to deactivate the pathogens.

- SODIS primarily uses the ultraviolet wavelength and heating effect from sunlight. UV-A (wavelength 320–400 nm) interferes directly

with the metabolism and destroys cell structures of bacteria.
- It also reacts with oxygen dissolved in the water and produces highly reactive forms of oxygen (oxygen free radicals and hydrogen peroxides) that are believed to also damage pathogens.
- Cumulative solar energy (including the infrared radiation component) heats the water. If the water temperature rises above 50 °C (122 °F), the disinfection process is three times faster.

SODIS is based on the above three principles.

The application of SODIS is very simple. The water is kept in transparent PET bottles and kept suitably in a way that it gets the maximum sunlight possible. Without any additives or modifications in the process, it takes about 6hrs in a clear sunny day. The effectiveness of the SODIS was first discovered by Prof. Aftim Acra at the American University of Beirut in the early 1980s.
Various small scale methods have been used to speed up the SODIS process and eliminate a few barriers.

As for instance -
- Plastic bags are used to speed up the heating process and increasing the efficiency by 74%.
- Photo-fenton system ($Fe^{2+ \text{ or } 3+}/H_2O_2/hv$) is used as $Fe^{2+ \text{ or } 3+}$ has good bactericidal properties and h_2O_2 increases the effect of UV on bacterial cell walls. A few other additives like copper can bring the same effect.
- If the water is highly turbid, NaCl is suggested as a harmless flocculent.

Although the SODIS method is currently the most cost-effectively efficient method in removing harmful pathogens from water, it also has a few drawbacks, which are as follows:
- The biggest drawback is that it functions only in Bright sunlight. It takes about 48hrs to perform its near 100% action on a cloudy day
- Also, it is heavily dependent on the condition of the bottle used. The less transparent the bottle, the less the efficiency.
- Some bottles reflect UV radiation and thus the material of the bottle is critical.
- This process doesn't work on water with high turbidity

According to the World Health Organization, more than two million people per year die of water-borne diseases, and one billion people lack access to a source of improved drinking water. SODIS has shown great results in effectively removing pathogenic contamination from water. Studies have shown that diarrhea has declined by about 30%-80% in SODIS users.

Therefore, it is evident that despite of the drawbacks, it is emerging out as a very effective process. SODIS, till date, doesn't have a huge global impact because the process is relatively new and unknown. But we can hope that it may very soon have a huge global effect.

A Students Research Initiative

Water Quality variations in Ganges

Rahul Chakraborty
B.Sc 1st yr., Department of Environmental Science, V.C.

Ganga, one of the largest and solemn river of India with an extraordinary religious importance for Hindus. The ganges is a sacred river to Hindus along every fragment of its length. All along its course, Hindus bathe in its waters, Hindus consider the waters of the ganges to be both pure and purifying.

The Ganges was ranked as the fifth most polluted river of the world in 2007. It is the third largest river by discharge. Pollution threatens not only humans, but also more than 140 fish species, 90 amphibian species and endangered Ganges river dolphin. The Ganga Action Plan, an environmental Initiative to clean up the river, has been a major failure thus far, due to corruption, lack of technical expertise, poor environmental planning and lack of support from religious authorities.

The present research project under the Students Research Project Scheme of the college hasbeen designed for analyzing the current water quality trend of the Ganges in and around Kolkataand the seasonal variations of the water quality parameters. Till date, a few ghats have been visited and various water quality parameters (pH, Chloride, Salinity, Hardness, EC, Alkalinity etc.) and other data has been collected.

It is found that some of the ghats are having a DO level less than the minimum criteria. According to CPCB, the DO level should be 6mg/l or more. The lower the concentration, the greater the stress. It is expected that collection of more data will lead to further narrowing down of the trend with proper scientific explanation

Click It: as It is

Kasturi Saha
B.Sc 3rd yr., Department of Environmental Science, V.C.

The digital single-lens reflex camera (DSLR) has made a photographer out of many naturalists and has hugely helped in easy identification and proper documentation of many species. On the other hand, the photographers became 'so called' naturalists are sometimes disturbing the wildlife and its habitat unknowingly and even sometimes irresponsibly.

Using flash for wildlife photography may be applied only to the situations that are relatively open to the sun and sky. Since the subject's eyes are already adjusted to the sun's intensity, the less intense fill flash is barely noticeable. But common sense tells us that all bets are off when direct sunlight is not falling on the subject, or when shooting under a dark forest canopy, on a very dark and cloudy day, at dawn, dusk, or at night. In these situations a flash produces an abrupt and dazzling burst of bright white light that frightens and temporarily blinds the subject. Flash should never be used on wildlife under these circumstances. The behavior of intelligent animals like primates is very sensitive to the use of flash.

A record shot just for the documentation may satisfy a scientist but not an amateur photographer. He/she wishes for a clear view, a better angle with a better light, or a different mood with a specific body language may be. For example a hoopoe would beautifully open its crest when alert. Now to make it alert some will prefer pishing (a technique birders use in the field to attract small birds in order to get a better view) but that simply disturbs the bird. A "rare" photo of a nesting bird or a mother feeding its nestlings may be praised among non-birders but it can clearly precipitate predation or abandonment of nests. For this reason, many wildlife photographers have rightfully avoided or shunned this practice and branded it unethical. Disturbing birds at nests is not only unethical, but illegal in the United States and UK (Schedule 1) without permits.

The art of mimicry has taken a set-back as the digital era provides birders a birdsong as mp3. Call playback to attract birds is known to be a particularly effective tool for bird surveys, field-experiments, migration study, bird trapping for science and for food, and often to show 'sought-after' and skulking endemics to paying birdwatcher. A territory call may challenge the bird and stress it out unnaturally and in vein. Playback lures birds into the open, exposing them to predators. Momentarily distracted, the bird could be snatched up by a predatory. When a bird responds to a recording, it is no longer foraging, caring for eggs or chicks, preening, resting or otherwise doing the activities it needs to survive – all because it is chasing a fake bird. Audio playback has been proved to have an impact on bird behaviour. But the studies throw up a bewildered mix of reactions and responses.

Daniel J. Mennill of the University of Illinois led a team that conducted a study (2002) where the results showed that female Black-capped Chickadees eavesdrop on male song contests to make extra-pair mating decisions following simulated playback defeats of their partner. He also found that ".high-ranking males who lost song contests also lost paternity in their nests." and "Finally, our results show that short playback sessions can have long lasting and far-reaching effects on individual fitness." That study found no change in the status of low-ranking males, and no reduction in the overall fledging rate of the nests in the area, just a change in the parentage of some offspring. To speculate, this study has a controversial result where some would say that the playback hampers their natural behavior having an impact on the breeding whereas some suggest another possibility that males exposed to infrequent playback could potentially gain status when they "win" the confrontation and drive away the phantom intruder.

Fundamentally, wildlife viewing almost always involves some form of disturbances. In case of birding, playback might offer a less disruptive way. Playback reduces the need to physically enter the bird's habitat, presumably reduces damage to the habitat and disturbance to the birds. Playing a recording from a roadside so that twenty people can see a bird might be better for the bird than having those twenty people walking or sitting for a long period in that habitat.

Playback targets a single species, without disturbing other species, which is presumably better than using broad-spectrum attractants like pishing, which affect all species. But, there must be a balancing act in wildlife tourism and conservation.

Water Water Everywhere But Not A Drop To Breathe

Vaskar Ghosh
B.Sc 2nd yr., Department of Environmental Science, V.C.

No, it is not a mistake. I know the saying goes not a drop to drink but forget drinking the ocean waters are turning incapable for even breathing for its indigenous inhabitants. City wastes dumped into the sea by India and Pakistan is driving massive blooms of tiny marine organisms called phytoplankton in the northern Arabian Sea that has threatened catch from India's major fisheries zones. A team of scientists from the National Institute of Oceanography (NIO), Goa, in collaboration with institutions in the US warned that these organisms called *Noctiluca scintillans* have an extraordinary ability to thrive in oxygen-deficient seawater and may pose a threat to fisheries in the region.

The advent of this Phytoplankton, which gives the surface of the sea an emerald green hue, appears linked to decrease in oxygen content in the upper layer of the Arabian Sea.

This phytoplankton thrives and proliferates in low oxygen conditions. While phytoplankton lies at the base of the marine food chain, *Noctiluca scintillans* is a unique species that does not help boost fish population. It is fed upon primarily by jelly fish and Salp a tiny marine invertebrate. The phytoplankton itself and the fecal pellets from the jelly fish and salp that eat the plankton add more organic matter into the sea and further contribute to loss of oxygen and are bad for other fishes. These blooms are massive, appear year after year and could be devastating to the Arabian Sea ecosystem in the long run. While phytoplankton populations typically help support the marine food chain, this specie competitively wipes out other species and coincides with the oxygen deficient condition of the Arabian Sea.

No physical mechanisms can explain the appearance of oxygen deficiency in waters above 40m depth in the northern Arabian Sea during winter. One possibility speculated is the vast amount of untreated domestic and industrial wastes dumped into the sea by India and Pakistan and other countries. Mumbai and Karachi discharges 2700 and 1600 million litres waste water respectively each day of which 70% is untreated. The bloom of this specie is pretty detrimental for not only the economically beneficial fishes but the ecosystem as a whole and may have devastating effects in the marine ecosystems throughout the world in the future near or far.