



NAAC Accredited "A" Grade

SHIVALIK 2018

Annual Magazine
Department of Geography
Shivaji College
University of Delhi



Environment and Development



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Principal's Message

I feel great pleasure in congratulating the Department of Geography, Shivaji College for releasing the current edition of their annual magazine- '**Shivalik-2018**' on the theme '**Environment and Development**' on the occasion of Geography Annual Fest. Over the years, Department of Geography has grown by leaps and bounds. It has been successfully blooming with outstanding performances in both the academic and extra-curricular activities.

Regarding the theme of the annual magazine I appreciate the concern of the department for such an important issue. We have a dream – a world without poverty – a world that is equitable – a world that respects human rights. A world with increased and improved ethical behavior regarding poverty and natural resources that is environmentally, socially and economically sustainable. A world where economic growth is accomplished within the constraints of realising social objectives of poverty eradication and social equity and within the constraints of nature's life support carrying capacity.

Certainly, the magazine 'Shivalik-2018' covers issues of environment and development and provides a geographical outlook in boosting sustainable development.

My best wishes to the Department of Geography.

Dr. Shashi Nijhawan
Principal
Shivaji College
University of Delhi

Message from the desk of Teacher-in-charge

Sustainability is a key focus in development studies. Many academics, NGOs and practitioners are increasingly aware of the impossibility of separating development from changes in the environment. Some university courses offer modules on the relationship between the environment and development, and some institutions offer entire courses on the subject. Studying the environment and development together will help understand how development, growth and environmental degradation are interrelated. Shivalik our Annual Magazine enthusiastically undertaken by the Department of Geography, Shivaji College for the past few years addresses a variety of issues. While students were free to express themselves on any issue of their choosing, teachers were requested to write on subjects from the undergraduate syllabus.

I hope readers will enjoy reading the current issue of Shivalik-2018 on **Environment and Development**.

Dr. Rajender Singh

Message from the desk of Student Advisor

It is matter of privilege to present the current issue of Shivalik to enlightened audience. This year the theme of Geo-Fest is '*Environment and Development*'. Considering the emerging challenges facing farmers, consumers, policy-makers and community related to water and environmental impacts, social inclusion and regional development students and teachers have presented their views in the magazine. This issue deals with general topics associated with various themes and branches of geography and tries to promote writing skills of the students. The magazine would be useful for students and teachers of Geography and Environmental Studies. On behalf of the Student Advisor of the Department, I welcome the annual magazine Shivalik-2018.

Dr. Prabuddh Mishra

Message from the Editorial Desk

It gives me immense pleasure to bring out the latest issue of our annual magazine, Shivalik-2018. Each issue of our departmental magazine is a milestone that shows our progress. The magazine gives us an opportunity to pen down our thoughts and of course to unleash our creativity. The publication of the magazine included a lot of preparation compounded with team work and the end result is now in front of you. We have for you, from the faculties and students a diverse range of articles that will not only increase your knowledge but will also challenge your thoughts.

Happy Reading!

Executive Editors

Dr. Lalita Rana

Dr. Prabuddh Kr. Mishra

Dr. Nitin Punit

(**Note:** Views expressed by individual authors are their own and do not necessarily reflect of the Department.)

Annual Report

Department of Geography 2017-18

Department is teaching BA (H) and BA (P) and interdisciplinary courses to approximately 350 students cutting across all social science disciplines. Presently 10 faculty members are providing their expertise to the students and two non-teaching staff members are engaged in lab work. The faculty of the department is actively engaged in teaching and research activities. Department has received one major research project funded by ICSSR for the year 2017-18. The department has successfully completed one innovation project. One scholar is pursuing her research under the supervision of Dr. Lalita Rana. Faculty members have participated in a number of national and international seminars, workshops and conferences and have also contributed research papers in various journals and books. The department has a well-developed lab with a variety of instruments and GIS software.

The department organized a long excursion for B A (Hons) V semester students to Diu and Gujarat in the month of March 2018. On January 18th, 2018 department had organized a one-day local excursion for 3rd year students to Khurampur village of Sonapat Haryana. Under the local excursion, the department visited Teliyar Lake, Rohtak, Haryana on 20th January, 2018. The Department has also organized a workshop entitled “Indian Cultural Values and Sustainable Environment: Emerging Grassroot Activism in Environmental Management and Rural Development” on August 25, 2017.

Number educational and co-curricular activities were organized in the current session. Students showed their enthusiasm by participating actively in organizing activities like Pictionary, Debate, and Map Pointer contests.

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Nature and Scope of Geography

Dr. Lalita Rana, Associate Professor, Department of Geography, Shivaji College

Geography, as a field of learning, is related to the study of location and distribution of various phenomena on the surface of the earth. The face of earth is a zone extending as far down below the surface as man has been able to penetrate and as far as above the surface as man normally goes. The geographers are concerned with 'terrestrial space' within this zone. Geographical queries are related to the questions like 'where', 'how' and 'why', etc. on this 'terrestrial space'. Precisely, Geography as a discipline concerned with five sets of questions, viz.: *Generic questions*: relating to the kind (class) of phenomena distributed on the earth's surface; *Genetic questions*: concerned with the sequences of events and interaction that have gone making of present day landscapes; *Theoretical questions*: relating to formulating rules, laws and generalizations; *Remedial questions*: concerned with the application of geographic concepts to real life problems; and *Methodological questions*: concerned with the improvement of geographers' scientific skills. Taken together, all these questions take care of distributional aspects of the natural and cultural features. Today geography is recognized as a spatial science, dealing with the study of the location and arrangement of phenomena (physical, biotic and human) on the surface of the earth and the processes that generate these distributions. With the advancement in geography, its nature (meaning, content, purpose and scope) has also changed with increased dependence on other disciplines. The nature of geography is integrative, interdisciplinary, empirical and also anthropocentric. Every discipline, concerned with scientific knowledge is linked with geography as many of their elements vary over space. Various disciplines geography relies on, may be categorized as: Earth Sciences; Pure Sciences; Life (Biological) Sciences; Social Sciences; Behavioural Sciences; and the Sciences dealing with data collection, representation, computation and analysis. Geography, in other words, has strong interface with all the natural and social sciences, as described here.

The 'scope' of geography covers its whole sphere of influence, the range its study and practical importance of the discipline. More precisely, it may be understood in three ways, viz.: Geography as a discipline of knowledge & research (academics), Geography as a sister-discipline to other fields of study, and Geography as a discipline of profession.

The field of geographical study appears to be so broad that it merits the remark - 'it is fit subject for encyclopedia, but far too inclusive for a scientific discipline'. But there is no reason for despair. Geography has a domain of its own – the terrestrial space, which makes it distinct from other disciplines. The broad emphasis is on the spatial arrangement of phenomena and their interrelationships, and all those processes that are responsible for spatial patterns are taken into account. Geography shares the man-environment system with many earth, biological and social sciences. While focusing its attention on spatial patterns and processes geography performs a function that no other discipline does, i.e. integrating the data from a number of disciplines and conceptualizing the total unity of earth, a holistic view which no other discipline can achieve by

itself, and which is the ultimate objective of man's quest. Geography is the backbone of human knowledge and is, therefore, the most important science.

The Greek Scholar, Eratosthenes, first used the word 'geography' in 3rd century B.C. It is derived from Greek 'geo' (the earth) and 'graphe' (description), so that geography as a discipline is focused on the description of the world phenomena on the earth's surface. As a discipline, "geography is concerned to provide accurate, orderly and rational description and interpretation of the variable character of the Earth's surface" (Hartshorne, 1959). By the phrase "earth's surface", the geographers imply the zone extending as far down below the surface and as far high above the surface as man is able to reach. Since man's reach above as well as below the earth's surface is relative to the level of his technological progress, the thickness of this zone of study has been progressively increasing. In the modern period, the prestige of geography as a useful branch of knowledge has been further enhanced owing to the valuable service rendered by geographers in the context of inter-disciplinary work in the study of nature and society. The geographers' locational perspective and their cartographic expertise have proved particularly useful. This has led to liberal funding for geographic research and education. Thus, though the word is originally derived from the ancient Greek "geographikos", meaning 'the description of the earth', the modern geographical scope extends far beyond describing the earth. Today, the geographers' ambit includes spatial analysis, the creation of theoretical models involving extensive use of mathematics, as an essential component. If one wishes to study the subject, he should be interested in the earth, its produce and its people and their activities. Mathematical ability would be an advantage, as would basic drawing skills. Besides, a geographer's work calls for practice and meticulousness to handle detailed tasks and analyze data.

Beside its academic growth, the professionalization in geography is also increasing day by day. Penetrating in so many spheres, geography opens job avenues in numerous areas, and the discipline is becoming more and more job-oriented. A graduate or post-graduate in geography, for instance, has a lot of scope being absorbed in the fields of Education, Administration, Research, Cartography, Town & Country Planning, Surveying and Civil Services. The job prospects are also open in the departments of Remote-Sensing, GIS, Demography, Defence, Meteorology, Soil Science, Forestry, Industry, Agriculture and Environmental Studies.

The students of geography can opt for teaching at school and college level, and take up professions as TGTS (Trained Graduate Teachers) or PGTS (Post Graduate Teachers) in the school level and as Lecturers, Readers or Professors at university level. B.Ed. or M.Ed. is desirable at school level, whereas, at university level it is M.Phil. and Ph.D. In the field of administration, the jobs may be taken through UPSC (Union Public Service Commission), All India Central Services, SPSC (State Public Service Commission), SSC (Staff Selection Commission) and Block Development Offices.

Remote Sensing and GIS is the recently emerging area of job prospects for the geographers. This field also opens a booming career options for the students of geography those who wish to be a breed apart in the corporate world. The geoinformatic¹ institutes like SIG (Table 2.1) aim to train and empower the students with analytical decision making and management skills, besides enabling them to offer complex geo-information solutions in infrastructure development, natural resources monitoring and urban development wherein the data are analyzed and used in areas like disaster management, environment, logistics and asset management, to name a few. A number of Institutes offer courses of different types and durations in this field. A list of such institutes is given in the Table (1):

Table 1: Remote Sensing & GIS Institutes in India

Institute	Address
1. Birla Institute of Technology	Mesra, Ranchi, Bihar.
2. Centre for Spatial Database Management & Solutions (CSDMS)	A-33, Sector-22, NOIDA-201301
3. Electronics Development & Research Centre	NOIDA
4. GEO Concept Coordinates	Saket, New Delhi.
5. GIS Institute	G-4, Sector-39, NOIDA,-201301.
6. Indian Institute of Remote Sensing	4, Kalidas Road, Dehradun, Uttaranchal.
7. National Remote Sensing Agency	Department of Space, Government of India, Hyderabad-500037.
8. NIIT GIS Ltd.	Kalkaji, Delhi-110019
9. PENTASOFT Technologies Ltd.	International Trade Tower Nehru Place, New Delhi.
10. Riding Consulting Engineers India Pvt. Ltd.	Safdarjung Enclave, New Delhi-110029
11. Rolta India Ltd.	Rolta Bhawan, Andheri, Mumbai-40093.
12. Symbiosis Institute of Geoinformatics (SIG)	SIMS Campus, 2 nd Floor, Range Hills Corner, Kirkee Cantt., Pune-20 Email: admissions @sigpune.com

Computer technology is now overwhelming the world and computers can handle vast amount of information in comparison to the traditional skills. Therefore, Computer Assisted Cartography (CAC) is emerging as another field of profession. Particularly the young generation of geographers has a considerable degree of mastery over this technology. A number of Organizations are offering professional courses in this field. They are listed in Table 2.

Table 2 Organisations Offering Courses in Computer-aided Cartography

1. All India Land Use & Soil Survey, IARI Campus, PUSA, New Delhi.
2. Department of Geography, Jamia Millia Islamia University, Jamia Nagar, New Delhi
3. Directorate of Census Operations (all states)
4. National Atlas & Thematic Mapping Organization (NATMO), Calcutta.
5. National Bureaus of Soil Survey & Land Use Planning (NBSS & LUP), Amravati Road, Nagpur, Maharashtra.

Besides the above, there are a score of other institutes offering different professional courses where the students of geography may be absorbed (Table 3):

Table 3: Professional Courses & Institutes

<u>Field/Course</u>	<u>Institute</u>
Demography	International Institute for Population Sciences (Deemed University), Deonar Mumbai-400088.
Environment	G.B. Pant Institute of Himalayan Environment & Development, Almora, Uttaranchal.
	National Institute of Environment & Management, Alkapuri, Kurshi Road Lucknow, Uttar Pradesh
Forestry	Institute of Forestry Research & Human Resource Development, Chhindwara, Madhya Pradesh.
Planning	School of Planning & Architecture 4, Block-B, Indraprastha Estate Delhi-110002
	Post-Graduate diploma in Environmental Management
	Post-Graduate diploma in Forest Management.
	Masters Program with specialization in (a). Environmental Planning; (b) Regional Planning; and (c) Urban Planning.

Centre for Development Studies and Activities (CDSA), School of Development Planning (SDP), Pune

(a) M.A. /M.Sc. in Development Planning & Administration; and
(b) Diploma in Development Planning

Social Science **Delhi School of Social Work**,
University of Delhi

Masters Program in Social Work

Tata Institute of Social Sciences
specialization in
Deonar, Mumbai.

M.A. in Social Work with

- (a) Criminology
- (b) Family & Child Welfare
- (c) Urban & Rural Community Development
- (d) Social Welfare

Administration

Tourism **Indian Institute of Tourism & Travel Management**, Govindpuri,
Gwalior-474011, Madhya Pradesh.

Diploma and Degree in
Tourism & Travel Management

To conclude, in spite of its inter-dependence cutting across on so many sister disciplines, one cannot deny that geography in itself is an independent field of study. It is the science of place, i.e., the study of the surface of the earth, the location and distribution of its physical and cultural features, the areal patterns or places that they form, and the interrelation of these features as they affect humans. Geography is a synoptic science that uses the same elements as the other sciences but in a different context. It integrates data spatially, making elaborate use of maps as its special tool. Geography may be studied by way of several interrelated approaches, i.e., systematically, regionally, descriptively, and analytically. Not only the definition, purpose and methodology of geography is changing, but its scope and subject matter is also widening with time.

Notes:

Geoinformatics is a [science](#) which develops and uses [information science](#) infrastructure to address the problems of [geosciences](#) and related branches of [engineering](#). The three main tasks of geoinformatics are: (1) development and management of [databases](#) of [geodata](#) ; (2) analysis and modeling of [geodata](#) ; and (3) development and integration of computer tools and software for the first two tasks. Geoinformatics is related to geocomputation and to the development and use of [geographic information systems](#).

Environmental Impact of the Industrial Revolution

Dr. Preeti Tewari, Associate Professor, Department of Geography, Shivaji College

The industrial revolution that marked the end of the agrarian economy had a profound impact not only on the manufacturing sector but thoroughly changed the way things were done in almost every field. It did bring about a dramatic improvement in the quality of life in many parts of the world, but the improvement came at a huge environmental and human cost, the full impact of which started to unfold almost a century after the revolution began in England in the mid eighteenth century. The industrial phase has been the shortest in human history, yet its impact has been the most dramatic.

The most significant change ushered in by the Industrial Revolution has been in the field of energy. Per capita consumption of energy increased manifold on the one hand and a shift from renewable to non renewable sources on the other. Though the revolution was initially powered by charcoal, by 1850, most of the forests around the industrial centres were depleted and humanity soon began to depend on fossil fuels to meet its increasing demand for energy. Industrialisation was also marked by an increased dependence on metals, chiefly iron (and steel). This meant that mining became a major activity. Important developments in the transportation sector accompanied industrialisation and the steam locomotive and steamship made it possible to transport even bulky material over long distances, so production was no longer limited by the availability of local raw materials. As the industrial powers exhausted their own resources, they began to seek resources in other parts of the world. This led to a massive increase in trade and also marked the beginning of colonisation.

Work also came to be organised differently. The scale of production changed and home-based production units were replaced by factory-based units. Production was now done by machines rather than by hand, and skilled artisans were reduced to being machine operators. Changes in agriculture increased food production so that a large non-agricultural population could be supported by a small number of farmers. This created surplus labour in rural areas which migrated to urban areas. Industrial cities grew larger and more densely populated. In the early stages of their growth these cities stood out for their squalor though living conditions improved with time. This improvement, along with better nutritional standards and advances in medicine, led to a rapid increase in human population. Six billion people were added in just 250 years after the industrial revolution, adding to the pressure on all resources.

As mentioned earlier, the industrial revolution brought far reaching social, political and economic changes in its wake. This paper however, discusses only the environmental impact as the revolution greatly altered the dynamics and scale of how humans interacted with the environment. A fundamental change occurred in the human attitude towards nature and the discourse changed from human beings with nature to human beings versus nature. Nature was

bountiful if it could be harnessed, and science and technology gave humans the power to understand and control nature. So mighty rivers could be dammed and their waters diverted to make deserts bloom. Mountains could be blasted and tunnels bored through them, and the tyranny of distance could be overcome by building faster and more powerful means of transport.

Large-scale land use change and land degradation accompanied the industrial revolution. Vast tracts of forest land and grasslands were converted to agricultural use. Wetlands were reclaimed to create land for farmland or to accommodate fast expanding cities. Mining activity led to the degradation of land (as well as the pollution of air and water). Indiscriminate use of irrigation water caused problems like water logging and alkalinity and salinity of soil. Removal of vegetation cover led to accelerated soil erosion by wind and water, leading to a permanent loss of fertility.

Factories in urban areas spewed out soot and noxious gases and polluted air soon became the bane of industrial cities. Killer fogs were observed in London as early as in 1873. Samples of hair of historical figures like Newton and Napoleon Bonaparte show the presence of substances like antimony and mercury at toxic levels. With increase in the use of fossil fuels, acid precipitation began to destroy terrestrial and aquatic ecosystems as early as in the 1850s, while also causing damage to human health. Rising concentration of greenhouse gases threaten humanity with climate change- a challenge that it is struggling to solve.

Water pollution too emerged as an important issue in industrial societies as industrial waste and sewage from cities was discharged into water bodies. Epidemics of diseases like cholera would frequently break out in towns and cities. Thermal pollution of water bodies resulted from the release of water used as a coolant by factories. Indiscriminate application of fertilisers and domestic use of chemicals, like detergents, led to eutrophication of water bodies. Withdrawal of groundwater at rates faster than the rate of recharge also brought its own set of problems.

The expansion of the transportation network spread air and noise pollution into the countryside while opening up newer areas for settlement and exploitation by humans. The huge oil tankers and cargo ships that crisscrossed the oceans took pollution to the deepest and remotest parts of the oceans while jet aircraft took it to the upper atmosphere. Large-scale movement of people and goods facilitated deliberate as well as accidental invasion of ecosystems by alien species. The arrival of the private automobile not only added to the quantum of pollution but also created problems like congestion on roads and urban sprawl.

As industrialisation progressed, more and more substances came to be created, first in laboratories and then in factories. Some of these were highly toxic and/or non-biodegradable. The latter quality allowed these synthetic chemicals to persist in the environment for long periods of time, causing various types of damage. Some examples of such substances are the CFCs which damage the ozone layer, and various pesticides and plastics that have a deleterious

impact on the environment. Human societies also generate huge quantities of waste, the safe disposal of which is a major challenge. This includes nuclear, biomedical and electronic wastes, that are especially hazardous. Light pollution and the presence of EMR in the environment have emerged as new forms of pollution.

Large-scale destruction and fragmentation of forests, grasslands, coral reefs, mangroves and other terrestrial habitats caused biodiversity loss on a large scale. Habitat loss, together with the havoc caused by invasive species and pollution, and poaching and overharvesting, marked the beginning of what is believed to be the sixth major extinction in the history of the earth.

Scientists have raised alarm over the above mentioned problems for more than a century. Several international conferences have been held in the last few decades to discuss them. The United Nations has played an important role in building international consensus over major issues and initiating action towards solving them. National governments too have enacted laws to check air, water and other forms of pollution. Civil society has also played an important role in demanding a clean environment. Environmental movements have been witnessed in different parts of the world. Scientists and industry have collaborated to design energy efficient and eco-friendly products. However, a lot remains to be done and much more action is needed at various levels before time runs out.

Forest Resources and Associated Problems

Dr. Rajender Singh, Assistant Professor, Department of Geography, Shivaji College

Introduction

Human population is growing day-by-day. Continuous increase in population caused an increasing demand for natural resources. Due to urban expansion, electricity need and industrialization, man started utilising natural resources at a much larger scale. Non-renewable resources are limited. They cannot be replaced easily. After some time, these resources may come to an end. It is a matter of much concern and ensures a balance between population growth and utilisation of resources. This over utilisation creates many problems. In some regions there are problems of water logging due to over irrigation. In some areas, there is no sufficient water for industry and agriculture. Thus, there is need for conservation of natural resources.

There are many problems associated with forest resources:

a) Forest Resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams, and their effects on forest and tribal people.

i) Use and over exploitation: Forests are one of the most important renewable natural resource on earth. Forest defined as the aggregate of innumerable number of various wild plants which are in dominance in specific area at given time. The forest are complex ecosystem with many layers of characteristic population of plants, animals and lower organisms with a typical organization. About 1/3rd of the world's land surface (approx. 4.038 hectors) is covered with forest, which are ecosystems that are dominated by trees. These forests not only produce innumerable material goods like fuel, timber, paper, fodder, water yield, medicine, resins, gums, various animal products like silk, honey, hide, bones, wool, etc but also provide several environmental services which are essential for life.

Use of forest

Forest provide us a large number of commercial goods, they are as firewood, resins gums, pulp wood, non-edible oils, food, fodder, rubber, silk, lac, fibres, bamboo, medicine, honey, and many more raw products, the total worth of which is estimated to be more than \$ 350 billion per year. Some advantages of forest given below:

- Many organic fertilizers and pesticides are produced from the wild plants.
- Large quantities if various plant and animal products like fire wood, furniture, pulp for paper industry, medicinal plants like aloe vera, *Asparagus*, *Raulfia*, hirda, beheda, amla, safed musli, etc. honey, silk, resins, lac, wool, hides, bones, and so on.
- Tribal and adivasi people get employment and earn money from forest products.
- It helps to decrease air, soil and water pollution.
- Forest are associated with culture and civilization.

- Various raw materials like pulp, paper, timber for construction, silk, honey, skin etc. provided by forests.
- Indian forests supply minor forest products like canes, gums, resins, dyes, tannins, fibres, katha etc,
- It gives protection to the wild life against strong cold, heat and winds thereby protect biodiversity.
- Forests have aesthetic and tourist values.
- Forest serves as a gene reserve.
- It tends to increase water holding capacity of soil therefore it help to increase the ground water level.
- It regulates earth's temperature, regime, and water cycle.
- It maintains fertility of the soil by returning nutrient to it through litter.
- It maintains the food chains and food webs of the ecosystems.
- The forest helps to reduce particulate matter, dust and carbon dioxide in air to decrease the air pollution.
- Forests are also useful to reduces the soil erosion and increase the rainfall.

Over exploitation

Since time immemorial human being have depended heavily on forest products like firewood, resins gums, pulp wood, non-edible oils, food, fodder, rubber, silk, lac, fibres, bamboo, medicine, and also the growing demand in various sectors like agriculture, shipping, railways, industries, mining, and residence puts pressure on available resources like forest, water, soil, minerals, energy sources etc. More than 45 % of the total forest area is standing barren today and the deforestation is continuous at alarming rate. Recent study shows that deserts of the world are increasing because of deforestation, agriculture and raw materials. Over grazing illicit cutting, reckless uses are the chief reasons decreasing the forest cover of the world. Thus excessive use of timber, firewood, fuel wood, urbanization, industrialization, and over grazing have together led to over exploitation of our forest leading to their rapid degradation. Therefore the problem of deforestation of the earth creates many hazards.

Deforestation: The destruction of forests by nature or manmade cause is called deforestation. Or The clearing or cutting down of forest trees is called deforestation. The total forest area of the world in 1900 was estimated to be 7,000 million hectares which was reduced to 2,890 million hectares in 1975 and fell down to just 2,300 million hectares by 2000. Deforestation rate is very alarming in tropical countries as compare to temperate countries. As per FAO (Food and Agriculture Organization) estimate deforestation rate per unit population in India is the lowest amongst the major tropical countries, despite the fact that we have a huge population size and very low per capita forest (0.075 hectare per capita). There are various reasons for deforestation as follows:

1. **Fuel requirements:** Increasing demand for fuel, India consumes nearly 170 million ton of fire wood annually and near about 11 million hectares of forest cut down every year.
2. **Grazing food needs:** To meet demands of rapidly growing population (urbanization), agricultural lands, industrialization, and settlements responsible for deforestation.
3. **Shifting cultivation:** Near about 300 million people living as shifting cultivators and are supposed to clear more than 5 lakh hectares of forest per year.
4. **Overgrazing:** The poor people in the tropics mainly depends on wood as a source of fuel, earn money, for construction of huts and energy source to cleared forest and turned in to grazing land. Local cattle's, goats, sheep and other grazing animals pull out the roots of plants leads to further degradation of these lands.
5. **Raw material for industrial use:** Industrial use resulted in the deforestation, for example: wood for making boxes, furniture, railway sleepers, plywood, match boxes, pulp for paper industry have exerted pressure on forests. Plywood is in great demand for packing tea in tea industry in Assam while fir tree wood is used greatly for packing apples in Jamu and Kashmir.
6. **Development projects:** Mining operations have a serious impact on forest areas. Massive destruction of forest due to various developmental projects like hydroelectric projects, construction of large dams, roads etc.
7. Forest sometimes may suffer from **forest fires**. Some of the forest fires are deliberately burning of tree by smugglers.

Major consequences of deforestation

The problem of deforestation has brought many hazards as follows.

- Deforestation has impact on the productivity of crop lands.
- Problems of soil erosion and loss of soil fertility increases and soil actually gets washed leading to accentuated cycle of floods and droughts
- Hydrological cycle gets affected thereby influencing rainfall.
- Deforestations create shortage of firewood ultimately poor people use cowdung and crop waste as fuel mainly for cooking. These waste products of plants and cow dung used for bio-fertilizers by farmers but nothing goes back to the soil. Hence soil lost its fertilizers and crop productivity decreases
- Biodiversity and ecosystem is lost and along with that genetic diversity is eroded.
- It threatens the existence of many wild life species due to destruction of their natural habitat
- The mineral extraction (mining) drastically alters the physical and biological nature of mixed area.
- The growing need of population on for wooden material resulted in large scale deforestations. The main reason being its use for door windows and other household furniture from ancient days.
- Other Problems of deforestations such as

- imbalance of atmosphere conditions and helps global warming by releasing CO₂ which is a green house gas (CO₂ , Ozone layer)
- Aridity of climatic conditions
- Environmental pollution etc.
 - Therefore looking at deforestation process, this is a peak time to examine the rate of plants in conservation of environment.
- Major activities in forests:
- Timber Extraction: India and other tropical countries have particularly abundant timber resources. Timber accounts for 25% of all photosynthesis materials produced on the earth and about half of the total biomass produced by a forest. The valuable timber like sisum, teak, pine, sandal, mahogany, fir etc greatly demanded for making furniture, pulp, ship building and other purposes.
- Mining: Extraction of minerals and fossil fuels like coal from the earth is known as mining. Mining is the primary economic activity of man for obtained energy. More than 80,000 hectors land of the country is presently under the stress of the mining activities. Mining and its associated activities require removal of vegetation along with underlying soil mantle and overlying rock masses. This results in defacing the topography and destruction of the landscape in the area.

In Goa, since 1961 indiscriminate mining in forests has destroyed more than 50,000 of forest land. Coals mining in raniganj, Jharia and singrauli area have caused extensive deforestation in Jharkhand. Mining of magnetite and soap stones have destroyed 14 hectors of forest in the hill slopes at khirakot, kosi valley, almora, mining of radioactive minerals in kerala, tamilnadu and Karnataka has become threats in Kerala. The rich forest of western has ghats are also facing a lot of problems because of mineral extraction like magnetite, bauxite, copper, chromites. Large scale of deforestation has been reported in Mussorie and Deharadun valley due to indiscriminate mining of various minerals over a length of about 40 km.

Effect of mining on forest

Ecosystem destruction by mining for coal, extraction of minerals and other purposes to meet demand of industries is an evitable part of civilization. The mineral extraction process drastically alters the physical and biological nature of mining area. The following are impacts on forest:

- The original plants are inevitably destroyed
- The soil is lost in mining areas.
- Strip mining can cause compaction changes in soil textures, loss of soil structure and reduced water infiltration
- In some mining area minerals when exposed to moisture produce acids and soluble salts which destroy vegetation.
- The fertile land is turned into a barren land.

Bio-Cultural Heritage

Dr. Prabuddh Kumar Mishra, Assistant Professor, Department of Geography, Shivaji College

Bio-cultural Heritage (BCH) refers to the knowledge and practices of indigenous people and their biological resources, from the genetic varieties of crops they develop, to the landscapes they create. As indigenous peoples have adapted to harsh climates over many generations, this heritage is important for food security in the face of climate change. This write up shows how the concept of bio-cultural heritage can be used to protect the bundle of rights that support indigenous peoples and local communities. It provides tools to protect and promote bio-cultural heritage, such as community protocols and Access and Benefit-Sharing (ABS) partnerships. It shares research developed through Protecting Community Rights over Traditional Knowledge and Smallholder Innovation for Resilience. It reviews policies to protect BCH at international and national level.

Biocultural heritage is a complex system of interdependent parts centered on the relationship between Indigenous Peoples and their natural environment. Its components include biological resources, from the genetic to the landscape level; and long standing traditions, practices and knowledge for adaptation to environmental change and sustainable use of biodiversity.

Biocultural heritage is held collectively, sustains local economies and is transmitted from one generation to the next. It includes thousands of traditional crop and livestock varieties, medicinal plants, wild foods and wild crop relatives. These precious resources have been conserved, domesticated and improved by communities over generations — and sometimes millennia.

We all rely on bio-cultural heritage for food and health security, particularly in the face of climate change risk and uncertainty. For some 370 million indigenous people who depend directly on natural resources and are vulnerable to climate change, this heritage is vital for survival. It is also closely linked to their cultural identity and religious beliefs. Biocultural heritage is vital for resilient farming and adaptation to climate change. The rich genetic diversity in traditional crop and livestock varieties offers valuable traits like pest and drought resistance that help farming survive extreme weather and changing climates. Wild crop relatives provide the gene pools needed for improving varieties in response to change. The greater the local diversity, the more local communities can build their own resilience, instead of relying on outsiders.

Many indigenous farmers are already using their bio-cultural heritage to adapt to climate change. For example, by planting more varieties each season to cope with more variable weather, planting different varieties acquired through exchange with other communities, and modifying their farming practices, based on traditional knowledge.

The diversity of crops, varieties, agro-ecosystems, culture, knowledge and farming practices enhances resilience to change at global level too. The value of such diversity will increase as

climate changes. Since modern farming and global food security relies on only a small number of crops, it is vital to conserve the diversity within these crops.

Indigenous customary laws have conservation values at their core. Many indigenous peoples still hold strong religious and spiritual beliefs, centered on the ecosystems they depend on. Seeds, forests, mountains, rivers, medicinal plants etc. often have associated gods and goddesses. Reverence for these gods, along with other customary laws, ensures natural resources are conserved. Customary values and laws also promote poverty reduction. They emphasize sharing, open access to resources and solidarity. People in need are helped, wealth is distributed and resources are exchanged in equal measure (reciprocity).

As well as agricultural resilience, crop diversity helps with nutrition. Knowing how to use wild foods often helps rural people add vitamins, minerals and protein to their main diets, and can be a safety net when crops fail. And traditional medicinal plants are important for healthcare, particularly for the isolated rural poor. Eighty per cent of people in some Asian and African countries depend on traditional medicine for primary healthcare.

Without intact landscapes, these vital functions are lost. Landscapes sustain wild gene pools, wild foods and medicines, and essential ecosystem services (eg. water) that support people and agriculture. Ancestral landscapes and sacred sites (eg. forests, mountains) are closely tied to cultural identity and spiritual beliefs, which in turn promote traditional knowledge and conservation practices. Landscapes also provide the physical space for sharing and exchange of genetic resources and knowledge based on customary laws, which enhances diversity.

Sustainable Development Goals: A Brief Overview

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“Environmental, economic and social indicators tell us that our current model of progress is unsustainable. Ours is a world of looming challenges and increasingly limited resources. Sustainable development offers the best chance to adjust our course.” (Ban ki moon, UN secretary general.)

Introduction: The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations. The broad goals are interrelated though each has its own targets to achieve. The total number of targets is 169. The SDGs cover a broad range of social and economic development issues. These include poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, environment and social justice. The SDGs are also known as "Transforming our World: the 2030 Agenda for Sustainable Development" or Agenda 2030 in short. The goals were developed to replace the Millennium Development Goals (MDGs) which ended in 2015. Unlike the MDGs, the SDG framework does not distinguish between "developed" and "developing" nations. Instead, the goals apply to all countries.

Sustainability is not just about environment but the sustainability is anthropocentric. In Rio declaration on environment and development (UNCED, 1992): principle 1: human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Historical Background: In 1984, The United Nation (UN) Establish an independent group of 22 people drawn from member state of both developing and developed world and charge them with identifying long term environmental strategies for the international community. The report on the world commission on environment and development entitled Our Common Future (WCED, 1987). This report putting the Sustainable Development to the political arena of international development thinking. The term Sustainable Development is extensively defined it as “Development that means the needs of the present without compromising the ability of the future generation to meet their own needs”. This report has been translated into more than 24 languages so that the world will understand the gravity of the environmental crisis and the concept of Sustainable Development. The recommendation focused: Integrating world Strategies, Environmental policies, Global Partnership.

The work of commission has undertaken as the basis for the UN WCED to held 5 year later. In 1992 – The Earth Summit at Rio-de-Janeiro at Brazil, 116 Head of the states, 8000 Delegates and more than 3000 NGO’s were participated. The central Aim: To identify the principles for action toward sustainable development. Key Outcome: ‘Agenda 21’ – 40 chapters and 600 Pages. Which includes Socio-economic dimension – Combating Poverty, population, Health etc. Conservation and management of resources- desertification, deforestation etc. Strengthening the

role of major groups- women, farmer, NGO's, local authority etc. Means of implementation- transfer sound technology, role of education, capacity building etc. No. of international conventions were agreed Convention on Biodiversity- unsustainable use of ecosystem. Framework convention on climate change – Human induced climate change

In 2002, UN World Summit for Sustainable Development (UNWSSD) at Johannesburg in South Africa. This was the more inclusive (Human Right, Social justice, Business Accountability etc.) and more decentralized Summit. Aim: Global Partnership to achieve Sustainable Development Interdependence – Economy, Society, Environment.

But Still Environmental deterioration continue, persistence of poverty and a wide gap between developing and the developed world. The globalization was a major concern because it is not discussed in the Rio summit.

In 2012, a further UN summit at Rio-de-Janeiro in Brazil. All stakeholder are invited not just to the conference but to contribute in advance working in document. The SDGs build on the principles entitled "The Future We Want". Two themes are considered priority i.e. Challenge of moving to a 'Green Economy' and Future institution framework for Sustainable Development.

Now it was understand that the no. of crisis facing the world like climate, economy, food, energy, ecology and poverty are interlinked and should address simultaneously under the one umbrella.

The Goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet:

Goal 1: End poverty in all its forms everywhere

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Goal 4: Ensure inclusive and quality education for all and promote lifelong learning

Goal 5: Achieve gender equality and empower all women and girls

Goal 6: Ensure access to water and sanitation for all

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Goal 10: Reduce inequality within and among countries

Goal 11: Make cities inclusive, safe, resilient and sustainable

Goal 12: Ensure sustainable consumption and production patterns

Goal 13: Take urgent action to combat climate change and its impacts

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

Goal 16: Promote just, peaceful and inclusive societies

Goal 17: Revitalize the global partnership for sustainable development

To sum up all the seventeen SDG's into these five pillars such as people, planet, prosperity, peace and partnership.

People: We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment.

Planet: We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.

Prosperity: We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature.

Peace: We are determined to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development.

Partnership: We are determined to mobilize the means required to implement this Agenda through a revitalised Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity, focussed in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people.

The inter linkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realised. If we realize our ambitions across the full extent of the Agenda, the lives of all will be profoundly improved and our world will be transformed for the better.

So, there is an urgent action needed to mobilize, redirect and unlock the transformative power of trillions of dollars of private resources to deliver on sustainable development objectives. Long-term investments, including foreign direct investment, are needed in critical sectors, especially in developing countries. These include sustainable energy, infrastructure and transport, as well as information and communications technologies. The public sector will need to set a clear direction. Review and monitoring frameworks, regulations and incentive structures that enable such investments must be retooled to attract investments and reinforce sustainable development. National oversight mechanisms such as supreme audit institutions and oversight functions by legislatures should be strengthened.

Globalization and Geography: Are These Two Inter-Related?

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Globalization is the increasing interaction of people, states or countries through the growth of the international flow of money, ideas and culture. Many see this process to be solely economic as they believe that all of this started through trade and exchange of goods. Moreover they think that it is a modern phenomenon that started acting only after the commencement of international trade. However, since ancient times we can see that, the Arab traders used the silk route to trade with other parts of the continent. And that was when, with goods, ideas and cultures also started getting intermixed.

Though it remains undoubted that the increase in means of transportation has given a boon to this process in the recent times. But also thanks to the new methods of communication that make people curious to know what is happening on the other side of the world. People now not only understand but also try to make themselves acceptable to new and different cultures across the world. So it is globalization that has brought people closer. It is globalization that has helped people to glorify the grandeur of their own tradition and practices across borders.

Now, the main question is, what has globalization to do with geography?

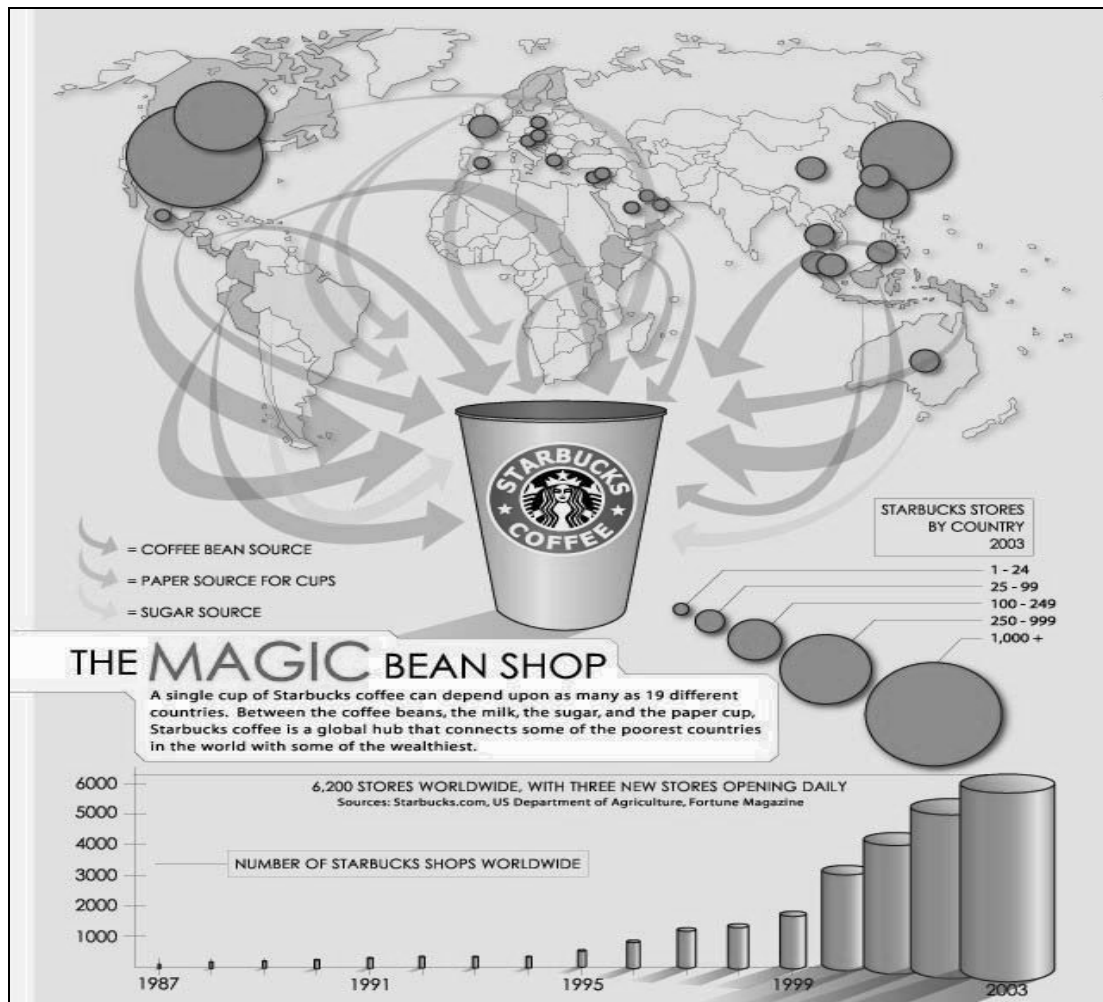
Geography, earth sciences, has been a great field of discoveries since ages. There have been many debates as to what should be inside the sphere of this subject and what not. Finally, the main objectives that came out to be the central theme in geography were:

- Where?
- What?
- Why?

Out of these three also, the importance of “where” was dealt more seriously than others. It was the “space” which geography aimed to study and because of which it became distinct from other disciplines.

With time, the people started separating themselves into groups, societies and finally into States and countries. With borders coming up, people of different cultures remained wide apart. But now in the growing presence of globalization there is an increased closeness of the people and societies, the boundaries between states, nations and even continents are vanishing slowly and slowly and therefore, the concept of “where” is diminishing.

Due to globalization, everything is found everywhere. It is hard to find something particular to any place on this globe. A single place is now host to a variety of cultures, ideas, linguistic groups, arts and identities. The practicality of WHERE is ending i.e. for example the concept that woollen clothes will be available only in mountains is now ought to be false, because the same might be available in plains too.



So, the fact that globalization is an economic phenomenon is partially true because its implications are seen to be touching other disciplines too. We can see its further consequences in political geography and environmental geography also.

In political geography, we can see this process to be affecting the State boundaries. The fact that people are now aware of the whole world is because countries are opening up their borders for the exchange of commodities to take place. With globalization the boundaries are fading away and therefore the world is getting transformed to a single democracy wherein those who feel that something wrong is happening, soon, stand against the government even if they are continents apart. So eventually we may see that the role of civil society organizations is increasing day by day whereas the sovereignty of the State may get severely threatened in the near future.

Globalization has also meant an important conceptual change in the way we think about the environment. Many of us now see environmental problems as being of international concern, not

just national interest—such as protection of the oceans and the atmosphere from pollution. The environment is now considered the “common heritage of mankind,” and environmental problems are increasingly the subject of international efforts because of their cross-border effects and the impossibility that just one or a few nations can solve these problems on their own. So here globalization plays an important role for resolving ecological issues worldwide.

Thus we can see that there are both aspects of globalization. On one hand it may be seen as a negative force of which diminishing State boundaries and threat to national sovereignty may be some examples. But on the other hand it also has a positive aspect. For example, bringing people together across continents to fight against the undemocratic acts of governments, to reach for sustainable growth as an aim for the globe, to bring sensitivity in people while interacting with other cultures and ideas, and to shrink the world to a single continent as a home of all living beings.

Koshi: The Sorrow of Bihar

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Koshi River has been referred as the “Sorrow of Bihar” for its misbehavior since a long time. It drains the northern slopes of Tibet and southern slopes of Nepal. It is formed after the confluence of its three main tributaries i.e., Tamur Koshi which originates from Kanchenjunga in the east, Arun and Sun Koshi from Tibet. There after the river is also referred as the Saptakoshi. The confluence takes place north of the Chatra gorge. The Sun koshi's tributaries from east to west are Dudh Koshi, Bhote Koshi, Tamba Koshi and Indrāvati Koshi. Then it flows through the alluvial plains of Bihar before merging with Ganges at Kursela. The river is almost 720 km long and only a small part of it flows through Nepal. The river basin is surrounded by the ridges which separates it from YarlungTsangpo River in north, Mahananda in the east and Gandak in west. It descends from a very significant height in Nepal and then flows through the plains. Its velocity reduces dramatically after it enters the plains. Because of the reduction in velocity of channel extensive siltation process takes place and forms the largest alluvial, measuring 180 km in length and 150 km in width. Koshi is known for bringing floods almost every year.

Why floods?

A river channel is formed in the process of drainage of water from its catchment area to the sea it falls into. A river channel adjusts automatically itself according to its flow requirement. River water moves in a straight line, down the inclined plane under the force of the gravity. The average velocity of flow through a river channel is given by the Cheezy formula;

$$V = c \times \sqrt{r \times s}$$

Where

V = velocity in feet per second;

r = HMD(hydraulic mean depth), being equal to cross sectional area divided by the wetted border

s = slope of the water surface, equal to the difference in the level between two slopes divided by the distance between them

c = coefficient varying with the different conditions of flow in a river channel

A river has mainly two functions, first it is to drain the water from its basin to the outfall, and second is to transport the sediments to the sea. The river will be able to do a good job if it is able to maintain its channel properly. And for this to happen it must transport its sediment continuously without allowing it to accumulate in its bed. As soon as the velocity of river decreases its transportation capacity also decreases and thus the deposition of silt in the river bed starts taking place. The velocity of river should be high particularly in the flood season when

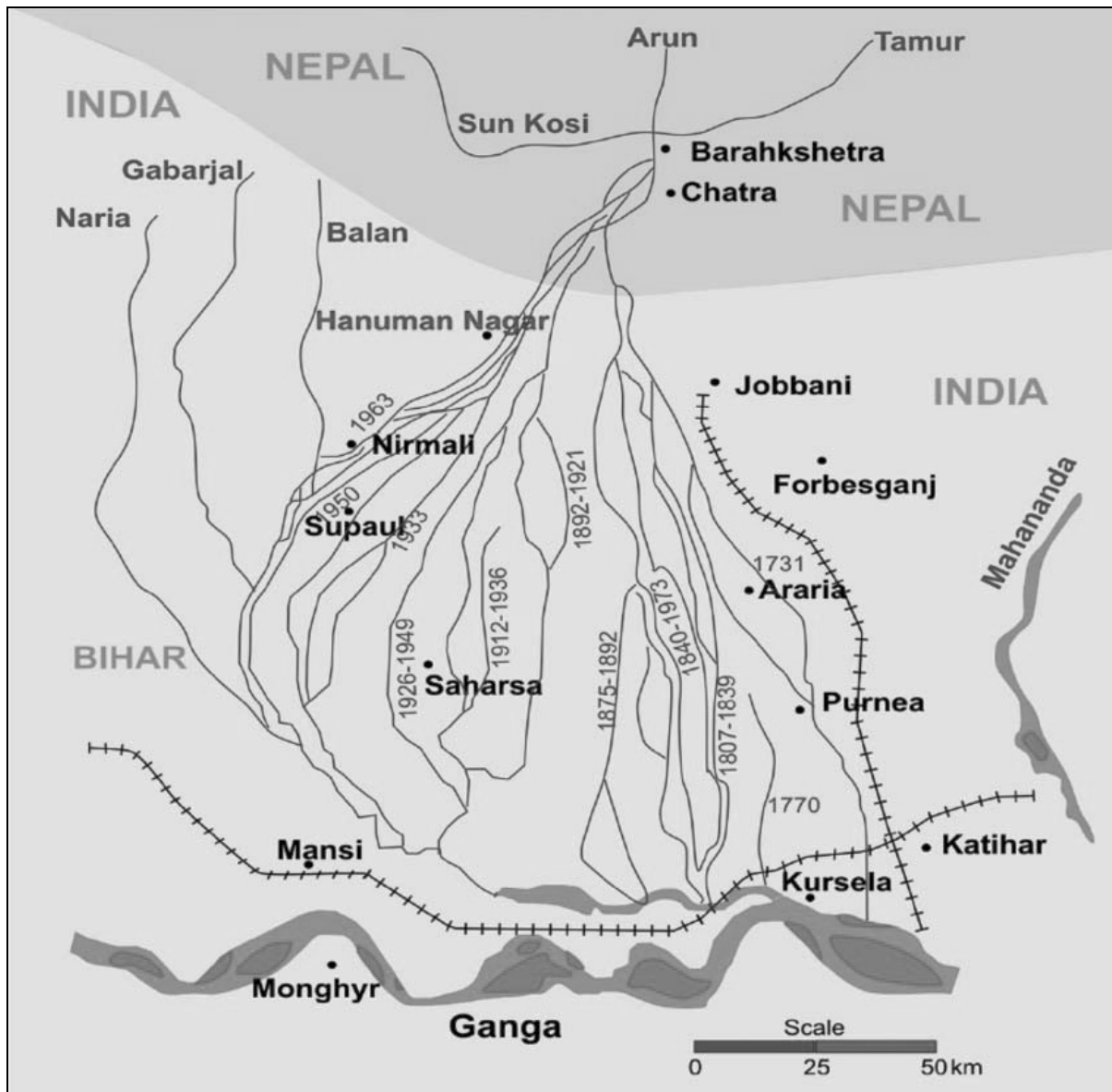
there is a lot of silt for the river to transport. So as the sedimentation takes place in the river bed, the level of river bed rises and thus the channel becomes shallower and wider and consequently the channel becomes sluggish and its velocity decreases. Erosion of river banks also leads to the bending of river course and so the slope of the channel decreases as the difference between elevation remains the same but the distance between two points increases thus reducing the slope.

The Koshi River arguably carries the largest annual silt in its catchment when compared to all other rivers of the world. Hence, due to uncontrolled erosion of river banks and reduction in its velocity, a considerable part of this silt is deposited in its river bed, which then causes it to rise. The water in the river keeps on rising, until river banks are overtopped and riverside lands are submerged.

Change in the course of the river

The river has been known for notoriously changing its course. The change in the course of the river is quite apparent when one considers the map of the river basin. In 1731, the Koshi had its channel along Kali Koshi, and in 1770 along the Livari. From 1807 to 1830 it flowed along the Dhamdaha, from 1840 to 1873 along the Iran, from 1874 to 1892 along the Sursar, from 1893 to 1921 along the Mircha, from 1922 to 1936 along the Dhusan, from 1926 to 1948 along the Tilabeh, in 1933 along the Dhemra, and in 1954 along the lower course of Tifjuga. And in 2008 it breached the Koshi barrage and flowed again to its route since where it left almost 250 years back. This nature of the river to change its course on a periodic basis has often been called as the misbehaviour of the river. This has always caused a lot of problems.

It has already been explained that uncontrolled river erosion cause shallowing and shallowing of the channel, leading to formation of bends and lengthening of the course of river, which further leads to the reduction in velocity of flow, which leads to the increase in the deposition of silts in river bed so that the river bed and also the water level in river rises, leading to the overtopping of river banks, overflow and submergence of riverside lands. In 1731, Koshi flowed along the Kali koshi, the distance from Chitra to its outfall was only 110 miles. As a result of the overflowing from the Kali Koshi it found its way into the parallel western flowing river Livari. The diversion of water from Kali Koshi led to its decadence and improvement in the flow of Livari. And subsequently due to dramatic reduction in velocity of Kali Koshi it got choked up because of excessive sedimentation. Thus in this manner the river has been changing its course since a long time. At present the river has shifted westwards by about 112 km. The present channel has the length of almost 170 miles from Chitra to its outfall.



Measures

Embankment

In 1954, an embankment was created of length 3,384 km. Flood prone areas in the state have more than doubled up since its formation. Embankments have increased the flood prone areas from 14.3 per cent in 1950 to 39 per cent of the state's total area in 1990. Of this close to 65 per cent lies in embankment-locked plains of north Bihar. But embankments gives a false sense of security. Because earlier the overflowed water stayed for a week or two but now in the case of a breach it stays for almost 3 to 4 months. Central Water Commission has argued that embankments and barrages are temporary solutions and ineffective in controlling floods.

Dams

A dam on Koshi was first proposed on Koshi in 1937 and then in 1951, but that project was shelved as it was concluded that “a large capital would be blocked unproductively in the name of power production”. As at that time demand for power was 1100 MW whereas 1750 MW was being produced.

Another project was proposed in 1991, wherein the government of Nepal and India agreed to study the possibility of a high dam on river. The Saptakoshi high dam at Barahshetra near Chatra Valley in Nepal will have a 269 meter tall concrete structure and will produce 3,000 MW at 50 per cent load factor. This project is yet not completed. Ecologists fear that this will only aggravate the flood. Another cause of concern is that it will be located in a high seismic zone. And if an earthquake of high intensity as in 1934 occurs, then a breach in dam as large as this could spell a disaster of an unprecedented scale in Bihar. There is growing evidence that huge reservoirs

induces earthquakes. Siltation is another cause for concern. The proposed dam will silt up sooner than 40 years according to the government reports. The silt from it cannot be released, as it will end up along the Koshi embankment and in downstream Farakka barrage. Increased siltation could also force Ganga to change its course and bypass the Farakka barrage. But the reservoirs in the Himalayan region cannot be large and thus there are not only economic constraints but also it is due to geological, seismological and topographical constraints.

The isolated engineering approach has not proved to be an effective measure in achieving its objective as at present the barrage at Hanuman Nagar is full of sediments. Soon the embankments would be ineffective in controlling the Koshi floods.

Perhaps the best course of action would be to improve the channel i.e. to stabilize the channel by making the channel a bit straighter or by down scouring it or by making parallel river channels as in the case of Mississippi.

One approach is to deal with the floods. That the natural flood should be allowed to happen. Because it's natural for a river to flood. Emphasis should be given on how to provide more open area for its water to drain, that is by reducing land congestion. Other aspect would be to mitigate the effects of flood by having an effective plan.

Light Pollution

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Most of the people are familiar with air, water and land pollution. But do you know that Light can also be a pollutant??

“Light pollution is the Excessive presence of anthropogenic or artificial lights in night environment which alerts the natural light levels. It is also known as photo pollution or luminous pollution”

Light pollution is mostly prevalent in the countries of Europe, North America, Asia and particularly in the cities like New York, Washington, Los Angeles, Hong Kong (being the most light polluted spot of the world in 2013) . Now in 2016 Singapore is crowned by the tag of most light polluted country in the world. In US and Europe 99% of the public can't experience a natural light.

Causes of Light Pollution

Light pollution is caused by excessive and misdirected use of artificial lights when they are not in use. Poorly designed residential, commercial and industrial outdoor lights also contribute significantly to the light pollution.

Unshielded light fixtures emit more than 50% of their light skywards. Much of the time only 40% of the light emitted actually illuminates the ground. Light pollution is increasing at an alarming rate because the demand for Artificial light is increasing due to increasing urbanization and industrialization.

In the US alone, wasted light accounts for 1.7 million tons of carbon dioxide and 2.2 billion dollars wasted in electricity each year.

Types of Light Pollution

1. **Light trespass-** occurs when an unwanted light source enters someone's property.
Ex: when light from a street light coming through a window and illuminating a bedroom causing problems such as sleep deprivation.

2. **Glare** is a kind of visual sensation experienced by a person when a light greater than the light to which our eyes are adapted, fall into our eyes.

3-types of glare—

- Discomfort glare,
- Disability glare and
- Blinding glare.

Glare causes irritation and can hamper the visual performance. It reduces contrast and colour perception which can lead to unsafe driving conditions.

Sky glow occurs when light is emitted directly into the atmosphere where it is scattered by dust and gas molecules, which creates a dome like brightening glow that covers the night sky. This glow makes the view of celestial bodies difficult even through a telescope. We can see Sky glows in Metropolitan hubs and towns throughout the world. According to a National park study, artificial Sky glow from major cities is visible up to 200 miles away in many national parks.

For example :The bright lights of Los Vegas are visible in Nevada's Great Basin National Park which is located 295 miles west of the city.

Light Clutter It is the excessive groupings of light. Light clutter is observable on roads, where the brightly lit advertisements, lights of automobiles and the street lights are grouped. This can generate distraction, confusion and can cause accidents.

Consequences of Light Pollution

1. ON ENVIRONMENT

The excessive night time lighting releases more than 12 million tons of carbon dioxide into atmosphere each year.

It would take around 702 million trees to absorb the carbon dioxide produced by wasted light.

A study by National oceanic and atmospheric Association (2010) states that Light Pollution increases air pollution by suppressing a natural Nitrate Radical a form of Nitrogen oxide that cleans the air at night. The artificial lights from buildings, automobiles and streetlights affect Nitrate Radical and slows down the cleansing process by 7%. The artificial lights can also increase the chemical for Ozone pollution by 5%.

2. ON ENERGY

The overuse and misuse of lights results in waste of light and waste of energy also. A study by International dark Sky Association (2002) states that 30% of light emitted by outdoor light fixtures is wasted, which amounts to 22 Terawatt hours wasted electrical energy. This is equal to 3.6 million tons of coal per year and 12.9 million barrels of oil per year.

3 .ON WILD LIFE

Light pollution affects the sleeping, mating, feeding and migration cycles of wildlife. They can also experience disorientation of time when there is too much artificial lights at night.

These are the following impacts of light pollution on wildlife-

- Due to over illumination they experience difficulty in searching food.
- Risk of exposure to natural predators.
- Increased mortality due to night vision impairment.
- Decline in reproduction which leads to shrinking population.
- Nocturnal Birds such as owls and hawks use Moonlight to hunt and migrate at night but the artificial light sources can overwhelm the natural light sources which results in birds deviating from their intended natural route of migration and becoming prey to other animals.
- Reptiles (such as sea Turtles) The female Turtles nests on dark and remote beaches but bright coastal lights prevent them from finding safe nesting areas for their eggs and leads the female Turtles depositing their eggs in an unsafe area of the ocean.

3. ON ASTRONOMY

Light Pollution alters the work of astronomers. Sky Glows make the view of celestial bodies faint even with the help of a telescope. In order to conduct research the Astronomers require Dark Skies which are now difficultly available.

4. ON HUMAN BEINGS

Melatonin (a hormone that regulates the sleep and wake cycle) is affected by Light pollution. Melatonin deficiency can result in anxiety, insomnia and mood disorders.

Circadian rhythms regulate physiographic activities such as brain wave patterns, hormone production and cell regulation.

Light Pollution disrupts these rhythms and leads to health problems like sleep disorder, decrease in sexual functioning, anxiety, depression, diabetes, cancer (breast and prostate) and cardiovascular diseases.

How to Control Light Pollution

- Turn off light when not in use to prevent Light pollution
- Use CFL and LED bulbs that produce warm white lightning.
- Outdoor light fixtures should be shielded that means there should be a solid cap above the light bulb so that the light cannot directly emitted to the sky to minimize Sky Glow.
- Installing motion sensors on outdoor fixtures so that they turn on when needed and turn off when not in need.
- Use IDA certified lightning which is designed to minimize Glare, light spill and sky glow.

Conclusion

Light is a boon as it sheds the darkness and allow the humans to carry out their activities, but it can be a bane if not used properly as we are suffering from Light Pollution today. So it is in our hands what to choose Good or Bad? So light pollution must be addressed by changing the habits of society. So that lighting is used more efficiently with the less wastage and unwanted illumination.

Degrading Land

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Land degradation is a process in which biophysical health of land is affected by a combination of human induced processes acting over it. Surprisingly, natural hazards are excluded as a cause. Estimations made by geologists, suggest that up to 40% of the world's agricultural land is seriously degraded. In easy terms, global estimates of total degraded area vary from less than 1 billion ha to over billion ha, with equally wide disagreement in their spatial distribution. The list of threat to land is just as long varying from clear cutting or deforestation, agricultural depletion of soil nutrients, overgrazing, over drafting, inappropriate irrigation, urban sprawl and commercial development, quarrying of stone, sand, ores, monoculture and more. Also land degradation means different things to different people say, what planting crops at a location with heavy rainfall and steep slopes would concern a group of scientists regarding the risk of soil erosion by water, yet farmers could view the location as a favourable one for high crop yields. Degraded lands have often been suggested as a solution to issues of land scarcity and as an ideal way to meet mounting global demands for agricultural goods, but their locations and condition are not well known. The 2 factors sensitivity and resilience combine to define the degree of vulnerability of a landscape sensitivity is the degree to which a land system undergoes change due to natural forces, human intervention or a combination of both. And resilience refers to the ability of the region to return to its original state after being changed in some way. The resilience of a landscape can be increased or decreased through human interaction. Four approaches have been used to assess degraded lands at the global scale by scientists: expert opinion, satellite observation, biophysical models, and taking inventory of abandoned agricultural lands. We review prominent databases and methodologies used to estimate the area of degraded land, translate these data into a common framework for comparison, and highlight reasons for discrepancies between the numbers. The risk of over estimating the availability and productive potential of these areas is severe, as it may divert attention from efforts to reduce food and agricultural based on the demand for the land- intensive commodities. Land fill or land reclamation or rehabilitation or land is what genius minds are directed to resolve the problem which practically means creating new land from oceans and river beds. All through it has different meaning under different jurisdiction where it is referred as process of reconverting disturbed lands to its former state. Our world has a list of dangerous environmental issues which one day might scourge mankind. To prevent that we must not just write articles but as well spread awareness to defend our future. Unless we practice conservation, those who come after us will have to pay the price of misery, degradation and failure for the process and prosperity of our day. Every little steps count make sure you make yours before it's too late.

Electoral Politics in Geography

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“A politician thinks of the next election, A statesman, of the next generation”.

General Elections are a process of electing the members of Lok Sabha the lower house of the Indian Parliamentary structure. They are normally chosen for a term of 5 years. Likewise, elections are conducted for the Rajya Sabha (the upper house) State legislative assembly and the legislative council. Elections are also conducted for choosing other members of the Executive branches, such as the municipal corporations, municipalities, and panchayats.

Election commission being an autonomous body is responsible for conducting free and fair electoral processes in India. It is a permanent constitutional body too. The duty of the Election Commission involves the overseeing, direction and overall governance of all elections to the Parliament, the state legislatures, to the office of the president and to the office of the Vice-President of India.

In our country like India which has seen 70 years of independence, elections have only now gained a relatively clean and fair image. Still, there is a whole lot that can be done. These days, politics has become a loaded word. People use the word to imply any dirty, underhand, shady dealing that goes on in their lives. For example: Workplace Politics` is a common term that is used to imply situations wherein people try to attain more than their share in the workplace.

What does it mean?

It means that our minds have started associating the `Politics` with `dirty, unethical, and unfair` practices. Whereas, the word `Politics` should mean a process of improving and maintaining the governance of the country. This situation has crept up because of the 3 C's and 3 M's in the world politics.

3 C's = Criminalisation
Communalism
Casteism

3 M's = Money
Muscle
Misuse

Criminalisation

Many of our politicians face serious criminal charges on affairs such as murder, attempt to murder, running scams, bribery, etc. These aren't just politically motivated charges. If we go in depth, we will find out that a lot of charges stem from these politicians past, when they were not supposedly associated with their political overlords. The Supreme Court of India had made amendments with the Representation of the Peoples Act and rulings ensuring that the MP's, MLA's and MLC's cannot hold on to their seats of power if found guilty for a crime that

sentences them for an imprisonment of more than two years. It has helped to a certain extent, but the problem has not been uprooted because it becomes very easy for these tainted politicians to get away from these charges by influencing the investigation.

Communalism and Casteism

In India, the masses are very attached to the concepts of religion, culture and caste. These weaknesses are exploited by the political parties to play the 'divide and rule' card by spreading hate and fear. Also, in situations where the candidates are not well educated, or don't have many accomplishments to boast, caste/religion/culture becomes the major deciding factors for the voters. In a situation like this, voters cast their votes in favour of those candidates that belong to the same caste or religion, in hopes of future favours.

Money

In the world of politics, what can one not buy? A contesting party can influence volunteers and voters by offering them free electronics or cash or liquor or even pressure cookers. After elections are over, the parties get on to making more shady deals like buying elected candidates. Where do these political get these huge amounts of money to spend heavily on these expenses? These funds are procured from the big corporate houses of the country. These business owners or corporates flush in astronomical amounts of black money in return for hefty benefits which can be exploited later for their business operations when their supported political party comes to power. This nexus ensures that the political party that wins cannot function in the best interests of the country. Its loyalties are already purchased.

Muscle

When one cannot buy the votes, one takes them at gunpoint. As discussed above, the political parties promote the local goons who have the most hold on the area. These goons are required to silence any voters who disagree with the particular party. Stealing the ballots a gunpoint or booth capturing is still a reality in today's rural India and even in some urban areas.

Misuse

A huge chunk of our hard earned money is given to the running government in the form of taxes. Since, the government in power has access to our money; most often they end up exploiting this money to run their political campaigns (advertisements, transportation and manpower management).

Miyawaki Method: Faster Way to go Green

Chirag Sharma, B.A (H) Geography 3rd Year Shivaji College.

A forest planted by humans, then left to nature's own devices, typically takes at least 100 years to mature. But what if we could make the process happen ten times faster? Based on the practices of Japanese forester Akira Miyawaki, it would become possible. Miyawaki is quite famous and very old 86 yrs old man. He has planted around 40 million trees all over the world. He has been planted forest along the coast of Japan to protect from tsunami and soil erosion. In 2006, he won the Blue Planet Prize — the equivalent to the Nobel Prize in the environmental field. His method is based on what's called "potential natural vegetation" — a theory that if a piece of land is free from human intervention, a forest will naturally self-seed and take over that land within a period of around 600 to 1,000 years, with the species that would be native and robust, and that would require no maintenance. Miyawaki's methodology amplifies that growth process to establish a mature, native forest in ten years — ten times the normal rate of forests planted by humans.

In our city, where real estate rules, space is scarce. Concrete structures loom where once there were trees, and many old timers mourn the loss of the green cover. One day when I was travelling back to home, I saw construction was going on metro station Punjabi Bagh west and there I saw that they planted very beautiful plants in comparatively large piece of land, then I realized that if they used the miyawaki method to grow tress then they can plant many times the tress they have planted. This is where I got inspiration to write about miyawaki method so more and more people get knowledge about it and use this method wherever possible. Due to the construction processes in these cities there is very less scope to invest and develop a fully green area in the cities but wherever there is place i think we can return into that greeny times by miyawaki method.

How does the method work, exactly?

It takes six steps. First, you start with soil. We need to identify what nutrition the soil lacks. Then we identify what species we should be growing in this soil, depending on climate. We then identify locally abundant biomass available in that region to give the soil whatever nourishment it needs. This is typically an agricultural or industrial by product — like chicken manure or press mud, a by product of sugar production — but it can be almost anything. Once we've amended the soil to a depth of one meter, plant saplings that are up to 80 cm high, packing them in very densely — three to five saplings per square meter. The forest itself must cover a 100-square-meter minimum area. This grows into a forest so dense that after eight months, sunlight can't reach the ground. At this point, every drop of rain that falls is conserved, and every leaf that falls is converted into humus. The more the forest grows, the more it generates nutrients for itself, accelerating growth. This density also means that individual trees begin competing for sunlight — another reason these forests grow so fast.

The forest needs to be watered and weeded for the first two or three years, at which point it becomes self-sustaining. But after that, it's best to disturb the forest as little as possible to allow its ecosystem — including animals — to become established.

Don't you have to keep an eye on the forest in case of changing conditions? Rainfall patterns, for example, are different from what they were in the past, and that could affect native species.

In Oman, for example, where the forestation has been done through this method, the climate is changing rapidly. The country is getting more rainfall year after year, so biodiversity is actually increasing. The management team has gone from having to plant thorny, bushy species that can grow in any desert to choosing more deciduous species. This is why, for every species chosen, they do a thorough survey first. We go by real-time data, gathering information for our native species databases. So while a book on native trees may say that X, Y, Z species belongs to a particular geographic region, until that species grow full bloom and in good health in that region

How do you decide what native species to plant?

Make a parameter like how high it grows, in what months it blooms, the kinds of temperatures it can tolerate, and so on. For example, if there is a species that grows up to 50 feet, this one next to it should grow only up to 20 because it would create conflict after five years. In other words, we have to use an ideal combination of trees to best utilize vertical space. So we can figure it out by using some computer based softwares which are designed only for this method, those softwares can really help us to make this method possible.

Software takes into account height and area — but what if, say, one kind of tree needs much more water than another. Or what if one kind of tree attracts a particular kind of bird that is too much of a predator for another tree's insects?

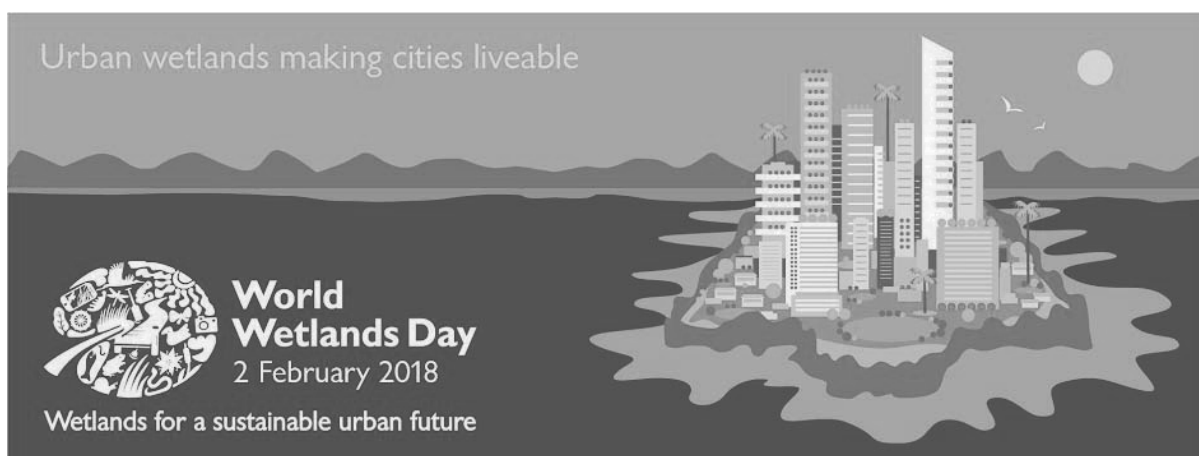
For water, we have a pattern requirement of how much water is required per square meter. For example, in India, that's five liters per square meter. But as for animals and pests, we cannot predict with 100% accuracy the behaviour of forests after five or ten years because you can't know what kind of bird species, predators or pests are going to attack in time. Everyone wants 100% survival, but the survival rate we have is around 92%. That 8% gap is what we work to bridge. For that take our methodologies to such perfection that no trees will die. But it's still a natural process: we have to let the forest grow and see what can or can't live in complete harmony with surrounding species. Those that die, we do not replace — that's nature. It evolves by trial and error.

It would be ideal if native forests could be planted along highways to form a green corridor and even by the side of railway tracks, The area along the railway track there was bare and nothing more than a garbage dump.

Wetland

Umarjit Lairenjam B.A(H) Geography 3rd Year, Shivaji College.

Low-lying areas land saturated with moisture, especially when regarded as the natural habitat of wildlife. They are the areas of outstanding natural beauty or historical or heritage area and the areas rich in genetic diversities. Under **Ramsar Convention** 1971 of IRAN, every 2nd February is celebrated as World Wetland Day by undertaking actions to raise public awareness of wetland values and benefits and promote the conservation and wise use of wetlands. These activities include seminars, nature walks, festivals, announcement of new **Ramsar** sites, newspaper articles, radio interviews and wetland rehabilitation. Recently the international theme for World Wetlands Day 2018 is 'Wetlands for a sustainable urban future'. This theme will be reflected in the February 2018 edition of Wetlands Australia. Urban wetlands make cities live able in many important ways. They reduce flooding, replenish drinking water, filter waste, provide urban green spaces, and are a source of livelihoods. Urban wetlands should be integrated into a city's sustainable future planning and development.



Wetlands vary enormously in size and character. They can range from a small neighborhood pond to lakes, bogs, marshes, rivers, and desert oases, all the way to the vast, 10 million hectares Canadian Arctic bays, the huge peat bogs of Western Siberia, or the largest wetland in the world, **the Pantanal** Brazil, Bolivia and Paraguay - covering an area 3 times the size of Ireland. Wetlands cover approximately 6% of the Earth's surface.

Based on its geographical location, they are mainly divided into two namely- **the coastal** and **the inlands**. They include marshes, swamps, bogs, lagoons, mangroves, estuaries, backwater etc. There also another type of wetlands based on altitudes like **high altitude** wetlands with a height of or above 2500m covering an area of 5 hectares at least and **low altitude** wetlands below 2500m. They are also among one of the most beautiful places often impaired incessantly by human activities directly or indirectly. Besides its large ecological contribution like providing **natural habitat** to varieties of wild lives, aquatic creatures and many other migratory birds, it

also helps in recharging groundwater supplies, trapping flood waters, cleaning pollution controlling climate etc. Surprisingly, they become vulnerable to over exploitation due to their abundance of fish, fuel and water.

Albeit its far reaching importance, its beauty is often demystified and wrongly viewed as some sort of wastelands and marginal lands targeted for drainage and conversions. As a matter of fact, the wetlands have great **economic value** in terms of **tourist purposes, recreational values, agriculture, fishing** and above all due to its **mystic beauty**.

IMPORTANCE

Wetlands perform such vital services for an ecosystem, if they are drained and developed, the knock-on effects are far reaching and long lasting. They have a vast capacity to absorb chemicals, filter pollutants and sediments, and cleanse millions of liters of life-bearing water. They even act as highly effective sewage treatment works, and are quite capable of breaking down suspended solids and neutralizing harmful bacteria. Floodplains alongside rivers naturally absorb rainfall and prevent harmful and potentially devastating floods.

Half of humanity about 4 billion people live in urban areas today. By 2050 that proportion will reach 66% as people move to cities in search of jobs and a vibrant social life. Cities account for around 80% of global economic output. As cities expand and demand for land increases, the tendency is to encroach on wetlands, they are degraded, filled in and built upon. Yet when left intact or restored, urban wetlands make cities live able.

Reduce flooding

Wetlands act as giant sponges that absorb flood waters. Rivers, ponds, lakes and marshes soak up and store heavy rainfall. In coastal cities, salt marshes and mangroves work as a buffer against storm surges.

Improve urban air quality

Wetlands radiate moist air thanks to their high water levels and lush plant life. This naturally cools the air in the local surroundings; a relief both in tropical cities and in extremely dry climates.

Replenish drinking water

Groundwater aquifers, rainwater and rivers are the source of almost all drinking water. Wetlands filter the water that seeps into aquifers, helping to replenish this important water source. Protecting rivers and limiting harmful run-off also helps safeguard the water supply.

Promote human well-being

When preserved as green spaces in cities, wetlands offer residents a space for recreation and access to diversity of plant and animal life. Studies confirm that interacting with nature reduces stress and improves our health.

Filter waste and improve water quality

The silt-rich soil and abundant plants in wetlands function as water filters, which absorb some harmful toxins, agricultural pesticides and industrial waste. Urban wetlands also help treat sewage from households.

Enable people to earn a living

Many types of fish spawn and breed in wetlands, making them popular fishing grounds. Wetlands provide reeds and grasses for weaving, medicinal plants and fruits; all valuable goods for local residents. Wetlands also attract tourism, another important source of jobs.

THREATS

Conversion of wetlands for commercial development, drainage schemes, extraction of minerals and peat, overfishing, tourism, siltation, pesticide discharges from intensive agriculture, toxic pollutants from industrial waste, and the construction of dams and dikes, often in an attempt at flood protection, are major threats to wetlands everywhere.

Industrial Threats

A major threat is the draining of wetlands for commercial development, including tourism facilities, or agricultural land. In addition, unwise use of freshwater to feed these developments poses a further threat. In all too many places, the amount of water being taken from nature's underground aquifer is far outstripping its ability to replenish itself. The result is that as the water level drops, millions of trees and plants are dying because they are deprived of their life sustaining supplies. Hundreds of thousands of hectares of wetlands have been drained for agriculture. Globally, agriculture accounts for 65% of the total water withdrawal on Earth. Agriculture and other industries such as paper making are often very wasteful and inefficient with water.

Invasive species

An invasive species has had severe impacts on local aquatic flora and fauna, and can upset the natural balance of an ecosystem. For example, the introduction of Nile perch to Lake Victoria has pushed many of the lake's native cichlid species to extinction.

Pollution

Pollution in wetlands is a growing concern, affecting drinking water sources and biological diversity. Drainage and run-off from fertilized crops and pesticides used in industry introduce nitrogen and phosphorous nutrients and other toxins like mercury to water sources. These chemicals can affect the health and reproduction of species, posing a serious threat to biological diversity.

Climate Change

Climate change is also taking its toll. Increases in temperature are causing polar ice to melt and sea levels to rise. This in turn is leading to shallow wetlands being swamped and some species of mangrove trees being submerged and drowned. Yet at the same time, other wetlands - estuaries, floodplains, and marshes - are being destroyed through drought.

Dams

Worldwide there are now over 40,000 dams which alter the natural flow of water and impact on existing ecosystems. Whilst there is much debate about the need for dams to be built, WWF argues that development should be as sustainable as possible to ensure minimum negative impact on biodiversity.

Urbanization

Urbanization is a major cause of impairment of wetlands. Urbanization has resulted in direct loss of wetland acreage as well as degradation of wetlands. Degradation is due to changes in water quality, quantity, and flow rates; increases in pollutant inputs; and changes in species

composition as a result of introduction of non-native species and disturbance. The major pollutants associated with urbanization are sediment, nutrients, oxygen-demanding substances, road salts, heavy metals, hydrocarbons, bacteria, and viruses. These pollutants may enter wetlands from point sources or from nonpoint sources. Construction activities are a major source of suspended sediments that enter wetlands through urban runoff.

With its growing importance, many countries have started recognising the importance of wetland preservation leading to the declaration of certain mitigation measures legally like Wetland Prohibition Act 1972, Wetlands (Conservation and Management) Rule, 2010 and recently Wetlands Rule 2017 etc. Sometimes situation like conflict due to the pressure with the preservation of wetlands on the other hand the proponents of a development near wetlands are required to evaluate the potential impact on the wetlands and take steps to minimise environmental damage. As mentioned above, wetlands sites as recognised by Ramsar Convention and UNESCO are protected and conserved under specific legal Acts.

The mitigation of wetlands conservation consists of three stages in descending order of preference: Avoid; Minimize; and Replace.

Avoid

Avoidance is the primary response and the highest priority of wetlands mitigation. It includes evidence for avoidance including options for relocating activities, alternative activities, modifications etc.

Minimize

Minimization is the second preference for wetlands mitigation. A proponent may undertake minimization once they have demonstration that avoiding impacts to the wetlands is not possible following the above mention processes of avoidance.

Replace

Replacement is the last option for wetland mitigation that a proponent should considered only when permanent loss of a wetlands will occur and the proponent has demonstrated that impacts cannot be avoided or minimized.

Besides the above mentioned mitigation, there are few other restriction under regional government provisional Act like restriction on the reclamation of wetlands, setting up of new industries, expansion of exerting industries, controlling handling of hazardous substances. WWF also initiated policies of preserving wetlands, working in partnerships with NGOs, local communities etc.

CONCLUSION

The benefits of wetlands are immense. They control the climates keeping the surroundings pollution free, preventing flash flood, providing home to many species etc. But wetlands are disappearing very quickly. Not everyone knows the importance of wetlands rather often mistaken as wastelands. Hence it is the high time to take every possible measures to protect the wetlands.

Lights Polluting Nights

Saaransh Bhardwaj, 2nd year of B.A (H) Geography, Shivaji College

Light pollution also known as photo pollution or luminous pollution is the excesses, misdirected or invasive use of artificial outdoor lighting. It is the presence of anthropogenic light in the night environment.

Photo pollution is not a new phenomenon. Over the last 50 years, as countries became affluent and urbanized, demand for outdoor lighting increased and light pollution sprawled beyond the city limits and into suburban and rural areas. This form of pollution is now prevalent in Asia, Europe, and North America. However, the most light polluted spot in the world is Hong Kong, China. A study by the University of Hong Kong in March 2013 found that the night sky in Sim Sha Tsui, an urban neighbourhood in southern Kowloon, Hong Kong, to be 1,200 times brighter than the normal urban city sky. India as a country is also one of the fastest growing polluting countries. Between 2012 and 2016, artificially lit areas across the country increased by 33%-or 7.4% every year.

Causes of light pollution

Luminous light is caused by using outdoor lights when and where they are not necessary. Poorly designed residential, commercial and industrial outdoor lights also contribute significantly to light pollution. Unshielded light fixtures emit more than 50% of their light skyward or sideways. In many instances, only 40% of the light emitted actually illuminates the ground. It is estimated that nearly 30% of outdoor lighting is wasted due to this poor design. In the United States alone, wasted lighting accounts for 1.7 million tons of carbon dioxide emission and \$2.2 billion is the value wasted electricity every year.

Effects of light pollution

- ON REPTILES – reptiles such as sea turtles are greatly affected by light pollution. Female turtles nest on dark, remote beaches, but bright coastal lights prevent them from finding safe nesting areas for their eggs. This leads the female turtles to depositing their eggs in an unsafe area or the ocean.
- ON AMPHIBIANS – Sky glow affects amphibians such as frogs, toads and salamanders in marshes and wetlands. It confuses and disorients them, which causes a decrease in feeding and mating.
- ON BIRDS- Navigation of birds, both migratory and non-migratory, that use the horizon as orientation for the direction is disrupted by lightning and sky glow. Light pollution also prevents birds from nesting in trees. In North America alone, 100 million birds die annually in collisions with illuminated buildings and towers.

- ON MAMMALS- Mammals such as bats, raccoons, deer, and moose can experience difficulty foraging for food at night to over illumination. They seek exposure to natural predators and increased mortality due to night vision impairment.
- ON INSECTS- Insects such as moths are naturally attracted to light and may use all their energy to stay near a source of light. This interferes with mating and migration as well as makes them vulnerable to natural predators.
- ON ASTRONOMY- light pollution alters our view of the sky and stars, but no group of people is more affected by this phenomenon than astronomers. Light spill and sky glow interferes with astronomical equipment and makes viewing faint celestial bodies different with the aid of a telescope.
- ON HUMANS- Studies have found that light pollution causes increased headaches, loss of sleep, fatigue, stress, decreased sexual functioning, retinal damage, reduced sperm production, anxiety, mood fluctuations and even genetic mutation in humans.
- ON PLANTS- light pollution affects the growth and flowering of plants, and keeps insects away from using plants for food and

Prevention of Light Pollution

- Light pollution may be reduced by the use of compact fluorescent lamps and LED bulbs that produce warm white lighting.
- Outdoor light fixtures that are shielded (meaning there is a solid cap above the light bulb that prevents light from being emitted directly into sky) also minimizes sky pollution.
- Motion sensors installed on outdoor fixtures so they turn on when needed and turn off after short time can contribute to reduced light pollution.
- Citizens can also contribute by turning off any unnecessary outdoor lights when they are home for the night or before going to bed to prevent wasteful dusk to dawn lighting.

Pictures from Various Events/Activities for the session 2017-18



Orientation Day



Extempore



Map Pointer



Local Excursion, Teliyar Lake, Rohtak



Long Excursion: Diu and Gujarat



Local Excursion: Khurampur, Sonapat, Haryana

Awareness program conducted by IPGI at Shivaji Collage Delhi University

Institute of Photogrammetry and Geo Informatics (IPGI) is an NGO with the mission of spreading GIS awareness and its application. IPGI is also involved in professional training, geospatial research and development, contributing in skillful GIS building in India. IPGI has conducting awareness programs for Geography Department of Shivaji collage of Delhi University since last 4 years. Prof. Dr Tejbir Singh Rana and his staff very well support IPGI. This year session was conducted in March 2018. Students of all three years were involved in the program. This included Information about Geographic Information System, Global positioning System, Remote sensing, LiDAR technology, Drone technology,UAV etc. This technology has been extensively used on different Govt projects for example Pradhan Mantri GramSadakYojna, Bullet and Railway Department, Forces and Paramilitary Forces, Power Sector, Reliance Infrastructure, Smart Cities, etc. Potential of technology was also discussed with the students and how student can make this stream as a career. IPGI conducts Three-month, Six months and One-year training program.

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