Anthropogenic Impact on the Environment, Society and Human health

Editor
Prof. Ashwani Kumar Dubey (FIASc; FESW; FSLSc)
(Zoology, Ichthyology, Biochemistry, Free Radical Biology,
Toxicology & Stress Monitoring)

The Editor

DR. ASHWANI KUMAR DUBEY[(FESW, FIASc., FSLSc.)] is a Leading Scientist, Environmentalist, Academician and current Researcher, in the beginning of 21st century in India. He is serving as Executive Director, Godavari Academy of Science & Technology, Environment and Social Welfare Society, Chhatarpur 471001 India. *He is dedicated to Environment, Education, Art and Sciences & Technology entire India since bi-millennium.* And he has delivered 6327+ Academic Lecture on relevant topics of Life Sciences and a distinguished fellow of the learned societies. He has born in Village Nahdora near UNESCO heritage Khajuraho in July 01, 1970. He is a graduate & Post Graduate of Government Maharaja College, Chhatarpur, Madhya Pradesh and obtained his Ph. D. at Vikram University, Ujjain, Madhya Pradesh, India at the age of 25. During this period his research field was Biochemistry, Free Radical Biology, Toxicology and Stress Monitoring. *He has devoted his life in Academic and Scientific research because of not having fulltime employment.* Twenty Six Research papers have been published in International, National Journals, Proceeding and in *Book.*. Ten Book published by repute publisher in India including Astral International; Eighty abstract in Souvenir/Abstract book. Seven Interdisciplinary academic articles in Standard Magazine, *Two Scientific talk broadcasted by All India Radio. Eighty eight+ Research paper presented in International and National Conferences/ Seminar/ Symposium as Invitee lecture and Delegates*.

After completing his Ph.D. he spent 2 years worked as a **Scientist (R&D)** in the Rank Industries Ltd., Nellore, in Andhra Pradesh State. During this service period his field was Pathological and Water Quality Assurance (Aquaculture). He was appointed as an **Assistant Professor of Zoology** at RBS College, Rajnagar, MP in 1998 and managed the College through a major transformation of its research and teaching. He played a major role in the design and construction of a new Fisheries Demonstration Centre at Godavari Estate, Nahdora-Khajuraho, India. In 2004 became the **Guest Professor**, in Higher Education Department, Government of Madhya Pradesh. For most of his career his research interests have focused on the Biodiversity, Environmental Impact Assessment and Bio-Resources Conservation. In 31 December, 2016 Joined as **Officer, Information Technology**, Maharaja Chhatrasal Bundelkhand University, Chhatarpur, MP with Responsibilities of Digital Financial Literacy Campaign, Research and Development, Cultural, UGC. Presently serving as **Professor & Head,** Department of Zoology, **Dean** Faculty of Science, **Chairman,** Board of Studies in Shri Krishna University, Chhatarpur, MP.

His personal interests include Reading, Writing, Traveling and Photography.

Dr. Ashwani is widely regarded as one of India's foremost experts on Zoology & Environmental sciences. He awarded many prestigious awards by National and International institution. He is in editorial board member of Research Journals in India, America, United Kingdom, Egypt, France, Syria, Nepal, Iraq, Sudan, Malaysia and Japan. And he is member of The Indian Science Congress Association, Government of India and Advisor of Research Board of America, USA.

Research output: Proposed peroxidative theory of mucous secretion in *Heteropneustes fossilis* published in Comp Biochem Physiol C Pharmacol Toxicol Endocrinol. 1995 Nov., 112(3): 309-13.

Currently: Honored for **Vigyan Ratn** 2020.

ESW 8th Annual National Research Conference on

Anthropogenic Impact on the Environment, Society and Human health

On 30 & 31 January, 2021. At Online Zoom app at 11:45 AM to 04:30 PM.

Organized by

Environment and Social Welfare Society, Khajuraho, Madhya Pradesh

In Association with

Bhopal Chapter, MP
The National Academy of Sciences India

Central University of Jharkhand, Ranchi, Jharkhand

Zoological Survey of India, Ministry of Environment, Forest and Climate Change, Government of India, Kolkota

Madhya Pradesh Council of Science & Technology, Bhopal

Shri Krishna University, Chhatarpur, Madhya Pradesh

Assisted by
Godavari Academy of Science & Technology, Chhatarpur, MP

International Collaboration

08th Annual national research conference: 2021

Anthropogenic Impact on the Environment, Society and Human health

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MESSAGE

I am delighted to know that the Environment and Social Welfare Society, Khajuraho, Madhya Pradesh is organizing its ESW 8th Annual national research conference on **Anthropogenic impact on the environment, society and human health** On 30 & 31 January, 2021. At Online due to COVID-19 during 11:45 AM to 04:30 PM.

This conference would provide a common platform to thinkers, planners, policy makers and executors to interact on burning theme and yield some positive fruitful conclusion.

I extend my best wishes for the grand success of the conference

Dr. Anil Kothari

(Approved By - MP Govt./U.G.C.)
SHRI KRISHNA UNIVERSITY
Chhatarpur, Madhya Pradesh
Dr. Brajendra Singh Gautam
Chancellor

Ref/.RI9/SKU/2021 Date : 29/01/2021

MESSAGE

I am indeed happy to learn that the Environment and Social Welfare Society, Khajuraho, Madhya Pradesh is organizing its ESW 8th Annual national research conference on "**Anthropogenic Impact on the Environment, Society and Human health**" during 30 & 31 January 2021 through online mode.

It is a matter of great satisfaction that the Environment and Social Welfare Society is engaged in conducting a regular conference on such an important subject.

I extend my heartiest congratulations and greetings to the organizers and participants of the ESW 8th Annual National Research Conference.

I wish the event a grand success.

Dr. Brajendra Singh Gautam

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Acknowledgement

This is an honor for Environment and Social Welfare Society, Khajuraho, organize its ESW VIII Annual National Research Conference on "**Anthropogenic Impact on the Environment, Society and Human health**", to be held during 30 & 31 January, 2021 at online due to pandemic COVID-19 assisted by Godavari Academy of Science & Technology, Chhatarpur, MP.

I am Thankful to Dr. Niraj Kumar, Executive Secretary, The National Academy of Sciences India, Allahabad, UP, for Support this conference to ESW Society to organize this Conference. I am thanking to National institute Dr. Kailas Chandra, Director, Zoological Survey of India, Government of India, Ministry of Environment, Forest and Climate Change, Kolkota, West Bengal, Prof R. K. Dey, Vice Chancellor, Central University of Jharkhand, Ranchi, Dr. Brajendra Singh Gautam, Chancellor, Shri Krishna University, Chhatarpur, Madhya Pradesh, Dr. Anil Kothari, Director General, MP Council of Science & Technology, Bhopal. And International institute Technology Basha Research Corporation, Singapore. MONACHUS, Romania."Dr. Fawaz Azki" Geological Museum, Kismin, Syria, Iranian Ornamental Fish Society, Tehran, Iran for its association in VIII ESW ANRC-K 2K21.

It is my privilege and pleasure to express my profund gratitude to our Brand Ambassador Maharaja Pushpraj Singh Ju Deo, Member Indian Wild Life Board, Govt. of India and Former Education Minister. **Chief Guest** Prof. Anil Kothari, Director General, M.P. Science and Technology Council, Bhopal **Key note speaker:** Dr. Kunal Kumar Das, Former Scientist, IIRS, ISRO, Dehradun, UK, **Guest of Honour** Dr. Shiv Ji Malviya**,** Deputy Secretary, Uttar Pradesh Higher Education Service Commission, Prayagraj, Uttar Pradesh, Prof R. K. Day, Vice Chancellor, Central University of Jharkhand, Ranchi, Jharkhand, Prof. K. K. Sharma, Former Vice Chancellor, Maharishi Dayanand Saraswati University, Ajmer, Prof. Akhilesh Kumar Pandey, Vice Chancellor Vikram University, Ujjain, Prof. Arvind Chandra Pandey, Central University of Jharkhand, Ranchi, Mr. Santosh Gupta, CEO, Indian Social Responsibility Network, New Delhi who have very kindly consented and given us an opportunity to share valuable thought which will provide milestone on the way of leading Scientists in the Conference during inagural session.

I am heartly thankful to Patron Dr. M. S. Parihar, President, BIOEXONS, LLC Washington, USA, **Chief Guest** Prof. Asha Shukla, Vice Chancellor, Dr. B. R. Ambedkar University, Mahow, President Dr. Kanhaiya Tripathi, Former OSD to the President of India, Govt. of India. **Special Guest** Prof P. K. Verma, Former Vice Chancellor, BU University, Bhopal**,** Cdr. Bhushan Diwan, Bombay, Maharashtra**,** Dr. A. K. Bhattacharya, MD, National Green Highway Mission, Govt. of India, Prof. Premendu Prakash Mathur**,** VC, KIIT University, Bhubaneswar, Odisha who have kindly consented for Valedictory function & Award Ceremoney of this ESW VIII ANRC-K 2K21

I am especially thankful to all delegates who actively participated in this Conference. I am thankful to Electronic and Print Media. I am profoundly thankful to my Board of Director and All members of ESW Society for their invaluable cooperation, and those entire person who are directly or indirectly concerned with this conference.

Dr. Ashwani Kumar Dubey

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EDITORIAL

Humans impact the physical environment in many ways: overpopulation, pollution, burning fossil fuels, and deforestation. Changes like these have triggered climate change, soil erosion, poor air quality, and undrinkable water. These changes are interacting to generate five major emerging public health threats that endanger the health and well-being of hundreds of millions of people. These threats include increasing exposure to infectious disease, water scarcity, food scarcity, natural disasters, and population displacement. Human impact on the environment or anthropogenic impact on the environment includes changes to biophysical environments and ecosystems, biodiversity, and natural resources caused directly or indirectly by humans, including global warming, environmental degradation

The ESW VIII Annual National Research Conference on "**Anthropogenic Impact on the Environment, Society and Human health**", to be held during 30 & 31 January, 2K21. The theme is "To take some positive steps towards improving our Environment, Society and Human health management for future generation" which will underpin the need for collaboration and cooperation of individuals from a wide range of professional backgrounds.

The ESW Conference will strive to offer plenty of networking opportunities, providing you with the opportunity to meet and interact with the leading professionals as well as sponsors and exhibitors. And also to provide a platform to Educational Administrators, College Principals, Deans, Readers, Head of Departments, Professors, Assistant Professors, Scientists, Environmentalist, Stakeholders, Researchers, Young scientists and Students to disseminate knowledge related to Nature Conservation, Resource Management and possible solution by Technological Approach.

Dr. Ashwani Kumar Dubey

About Environment & Social Welfare Society, Khajuraho

Environment & Social Welfare Society (ESW Society) *Dedicated to Environment, Education and Sciences & Technology entire India since bi-Millennium* is an ISO 9001:2015 certified organization of the India. Now it's worldwide known by its impact. ESW Society has been to develop relationship between Environment and Society envisions the promotion of Education and Sciences among the University, College and School students as well as in the society for Environment and Social welfare as well as Human Welfare.

It is registered under the society Act 1973, Government of Madhya Pradesh, India on 31 January 2000 with No SC2707. It was affiliated by Nehru Yuva Kendra Sangathan, Ministry of Youth Affairs and Sports, Government of India. It accredited by Madhya Pradesh Jan Abhiyan Parishad, Government of Madhya Pradesh, since 2013, also enrolled in Navankur Yojana with enrollment number NV2016CHH0062 Dated 29/09/2016. It is also registered with NGO-PS, Government of India And having The NGO-Partnership System, Portal (NGO-DARPAN), NITI Aayog, (National Institution for Transforming India), Govt. of India. ID MP/2014/0076324.

Object of The ESWSociety:

1. To establish, arrangement and management all around development in the field of Education and expansions of educational institutions.
2. To develop Ideal morality, Character building in the Children according to Indian tradition and Culture.
3. All around development of the Children. Arrange training programme to establish Self Employment Centre.
4. To organize Seminar for Environmental management, Pollution control, and establish Awareness centre for the same.
5. To make awareness for Social welfare. Check against Animal cruelty and to protect against cruelty and Tyrany.
6. Open animal house for improvement of animal health and provid necessary facility for them.
7. To highlight modern Technology, Computer, Games & Sports, Music, Art, Literature, and various languages Hindi, English, Urdu, and other foreign languages in the field of Education.
8. Establish Research Centre

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About ESW VIII Annual National Research Conference

It gives us immense pleasure to invite and welcome you in the **Environment and Social Welfare Society (ESW Society),** Khajuraho, Madhya Pradesh, India to participate in The **ESW 8th Annual National Research Conference** on "**Anthropogenic Impact on the Environment, Society and Human health**" to be held during 30 & 31 January, 2021 at online due to pandemic COVID-19.

Object: To provide a platform to Vice Chancellors, Educational Administrators, College Principals, Deans, Head of Departments, Professors, Readers, Associate Professors, Assistant Professors, Scientists, Environmentalist, Researchers, Young scientists and Post Graduate Students to disseminate knowledge related to Anthropogenic Impact on the Environment, Society and Human health.

Goal: The principal goal of this conference will be to present some of the latest outstanding breakthroughs in Climate change and Global health management, to bring together both young and experienced scientists from all regions of the world, and to open up avenues for research collaborations at regional and global level

Theme: To take some positive steps towards improving our Environment, Society and Human health for our future generation

THE GENERAL TOPICS COVERED IN THE CONFERENCE WILL BE AS UNDER

Environmental Sciences: Environmental Ethic, Environmental Legislation, Environmental Impact Assessment, Environmental Management, Environmental Policies, Environmental Pollution, Natural Resources Conservation,

Bio-sciences: Agricultural Science, Anthropology and Behavioral Sciences, Animal Husbandry, Aquaculture, Biodiversity, Biotechnology, Biochemistry, Bioinformatics, Cell and Molecular Biology, Fish and Fisheries, Home Sciences, Immunology, Life Sciences, Limnology, Medical Sciences, Microbiology, Nutrition, Plant Sciences, Taxonomy, Tissue Culture, Toxicology, Veterinary Sciences, Wildlife Conservation, Zoology,

Earth and Atmospheric Sciences: Mineralogy and Wildlife

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INVITED LECTURES

Water Pollution and possible solutions: Empowering Communities

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We all are exposed to a wide array of toxins in our day-to-day life, whether they are chemicals, plastics, medicines or various household goods, and they all pose potentially toxic effects on human health and the environment. Released indiscriminately into the environment, via sources like industry, agriculture and our households, toxins pollute the air we breathe, the water we drink and the food we eat. They also affect our rivers, lakes and forests, harm wildlife, change climate and ecosystems.

The quality of surface water at different places has been assessed to see the suitability for domestic applications. The various parameters analyzed were pH, Electrical conductivity (EC), Carbonate (CO_3^{2-}), Bicarbonate (HCO_3^-), Chloride (Cl^-), Sulphate (SO_4^{-2}), Nitrate (NO_3^-), Fluoride (F^-), Calcium (Ca^{2+}), Magnesium (Mg^{2+}), Sodium (Na^+), Potassium (K^+), Iron (Fe) and Total hardness (TH). The results were compared with standard values of drinking water prescribed by IS:10500, BIS and WHO.

To analyse the data with statistical point of view the statistical parameters like Mean, Range, Standard deviation, coefficient of variation, correlation coefficient, Kurtosis, Skewness were systematically calculated for each parameter. Also, Single factor Anova tables, Piper Diagram and Schoeller graph were prepared to signify the major results.

Also, an account has been prepared to analyze the factors like Sum of Anions (meq/l), Sum of Cations (meq/l), calculated TDS (mg/l), Dissolved Minerals (mg/l) like Halite (NaCl), Sylvite (KCl), Carbonate ($CaCO_3$), Dolomite ($CaMg(CO_3)2$), Anhydrite ($CaSO_4$), permanent hardness, temporary hardness and alkalinity.

For studying the effect of these pollutants the chironomids have been used as test animals. Chironomids represent one of the most important groups of aquatic invertebrates. They belong to family Chironomidae (that includes all the non-biting midges) of order Diptera, class Insecta. They display exceptionally wide range of sensitivity to environmental parameters such as DO, pH, salinity, substrate, and pollution by organic wastes, heavy metals and contaminants, hence, play an important role in indicating radioactive pollution.

The results of our research indicate that the toxins present in the aquatic environment are capable of producing numerous structural alterations in chironomid polytene chromosomes and hence, confirm the genotoxicity of the different toxins and also the potential for enhanced activity of the chironomid genome in response to environmental stress. These responses are thus used as cost effective and sensitive biomarkers for detecting a range of genotoxic agents under natural environmental conditions.

Key words: human health, pollutants, toxin

Environmental pollution of our Planet Earth - and how mankind can heal the damage done

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During the last one hundred years, mankind has made great technological achievements in many different areas. Mostly these achievements were about increasing efficiency, increasing production, travelling faster, making life more comfortable. On the other hand we see terrible destruction of Nature, of our Mother Earth. The air we breathe is toxic, the water in our rivers is no longer safe to drink, and the soil is getting depleted at an alarming rate.

This environmental pollution is one of the biggest problems of our time and it affects all areas of life including human health and agriculture.

We humans have caused this severe imbalance of Nature. Now it is our responsibility to try and set things right again.

In this situation it seems plausible to make use of every method including traditional knowledge which may help to overcome these problems (as it was suggested in the Convention on Biological Diversity (known also as the Rio Convention).

Homa Therapy with Agnihotra as its basic tool comes from ancient Vedic Knowledge and has wide-reaching beneficial effects on our whole environment, means on our atmosphere, on the soil, and on our water resources. Bacteria in air are reduced, water purified, and beneficial bacteria in soil prosper whereas harmful microbes are controlled.

The medicinal power of plants which is now reduced because of pollution is again restored in Homa Atmosphere, and also biodiversity is increased.

But this method has to be understood and evaluated in terms of modern science. This will be done - the method will be explained, and its application in solving environmental problems in different areas will be shown.

The presentation will give an overview on the research done so far on future research suggested about how Agnihotra and Agnihotra Ash help to mitigate problems of the pollution of our atmosphere, the soil, and water resources.

Also the impact of an environment purified by these methods on human health and on plants will be shown.

We are creating a healthy microclimate with Homa Therapy methods – and if more and more people are joining these efforts, climate disasters can be avoided.

Key words: Pollution of Soil, Water, Atmosphere; Biodiversity, Human Health, Agriculture

The role of Legal Regime for the effective Environmental Management an Pollution Control in India

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Though Sustainable Development word has come in to existence from Rio Declaration (1992) . But if anyone could trace the history of the Indian culture, whatever the practices we were doing from time immemorial were all of towards Sustainable Development. But most unfortunately due to the introduction of western culture in to our system it has slowly changed into consumerist culture. From the repair to remove and replace to use and throw culture. Even though the Sustainable Development principle has come into existence since Rio Declaration (1992), strictly and judicially speaking it was in the form of soft law only , which is judicially non enforceable and non obligatory on the part of signatories. It is needless to say India was also partner for the Declaration. But still the soft law was given hard law status in India by our Hon Supreme Court in its land mark judgement in the Vellore Citizen Welfare Forum vs Union of India case in the year 1996. For the effective Environmental Management three "E" s are essential vide Engineering, Education and Enforcement. In engineering point of view to attain the sustainable development we have to have a comprehensive look and control of all the sources and types of pollution through technological input and ways and means. It is highly imperative to blend the scientific principles into the engineering and develop technology to control and manage the pollution both at the source and end pipe treatment with clean development mechanism where it is possible. The second "E" is Education –namely creating an awareness and sensitizing the people the importance of pollution control, changing the life style and behaviour of the people and practice more ecofriendly methods. Infact Hon Supreme Court in one of its land mark judgements made Environmental Education as one of the compulsory paper in the college and University curriculum irrespective of the branch of study , with same syllabus throughout the length and breath of the country. Finally with reference to third "E" namely Enforcement here the laws play good amount of role in managing and controlling the Environmental pollution and Environmental Protection. Laws are the tools in the hands of the enforcement agencies to control and combat the pollution. Again for the purpose of enacting the laws the Constitution has give room for the legislature. In this connection it can be very proudly said that India is one among the few countries in the world where the Environmental Protection is given the Constitutional status. We have enacted a plethora of Environmental Legislations in the last two decades in addition to the Indian Penal Code for the effective environmental management. Apart from this Legislature, Executive, the third arm and pillar of the democracy namely Judiciary also played a very active role and paved the way for the emergence of environmental Jurisprudence. In my paper, I am going to discuss the how far the Sustainable Development has been given a hard law status by the Judiciary and more so the higher judiciary innovatively interpreting the Constitution elevated the Environmental Right in to a Constitutional Right from the ordinary simple public nuisance under the IPC. Apart from that the judiciary also ingrained certain principles and doctrines into our Environmental Jurisprudence. Inspite of all these we could not able to achieve the requisite or expected target, why .Apart from this the global concern for environmental crisis have led to the evolution and remarkable growth of international environmental Law also

The analysis has been made under the following headings:

1. The different principles of International Environmental Law
2. The Legal Status of General International Environmental Principles.
3. The various concepts and Principles of Sustainable Development
4. Right to Development - Human Right
5. Role of Human Rights Law in the Protection of Environment and the advantages and disadvantages of Human Rights Approach
6. Treaties concerned with Third Generation Rights
7. Advantages and Disadvantages of Human rights Approach
8. The International Law and State Courts
9. International Law and the Indian Constitutional Scheme.
10. International Law and the distribution of Legislative power
11. International Law and the Constitutional Duty
12. International Law and Indian Courts

The Judicial adoption of international environmental law into domestic law in India has not been done overnight rather it has been gradual. In order to understand the Judicial process of such adoption Finally a blend of technological solution with Economic, ecological and legal regime together with political will, public participation and professional ethics, alone can solve the Environmental problems effectively and for the sustenance AND EFFECTIVE MANAGEMENT of Sustainable Development.

Key words: Legal Regime, Environmental Law, Sustainable Development

Communication, Public Policies and the Environment

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This presentation describes from the communicational field the public environmental policies that are developed in the province of San Luis, Argentina, in the period 2020-2021. We establish as a key means from which to look at the website of the Secretary of State for the Environment and Parks of the government of San Luis and the laws in force. The initiatives that are currently carried out by the government agency are Inspection, Environment Program, Provincial Parks and the Recycling Agency. It is more and more frequent for organizations to include issues related to caring for the environment in their agenda of relations with various audiences and the media and, furthermore, these issues are inserted into broader policies that encompass the sustained development of each country, region and city of belonging. The relationship that communicational phenomena manifest with respect to the Environment and its multiple complexities is relevant as an object of study and in-depth investigation.

The communicational competence linked to environmental communication management in organizations aims to generate a communication intervention aimed at promoting changes towards healthier and less harmful habits for the environment for its different internal and external audiences. Promising lines of action for the link with the public, even absent in government initiatives, are social responsibility campaigns, social marketing strategies, opinion polls; feasibility and environmental feasibility analyzes; the design and management of environmental communication strategies and plans; environmental management models; action programs with the community; institutional environmental quality audits; communication campaigns on environmental issues; among others.

Key words: communication, public policies, environment

COVID-19

Covid-19 pandemic and its Impact on Water and Air Quality Index in India: A Study

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Due to outbreak of coronavirus pandemic and lockdown across the globe; a reduction in economic activities, less human intervention on the environment, reduced industrial and transport emissions & effluents resulted in clearing of pollutants from atmosphere, soil and water which also reduces carbon emissions, that shot up by 5 percentage points after the global financial crash over a decade ago, as a result of stimulus spending on fossil fuel use to kick start the global economy. The pollution level in water bodies has reduced and the rivers of Yamuna and Ganga have seen significant improvement since the enforcement of a nationwide lockdown. The average water quality of 27 points of the Ganga tested recently is suitable for bathing and propagation of wildlife and fisheries. Due to cancellation of domestic and international flights, the air pollution levels in Delhi have dropped 71 per cent in just one week. The study focused on all the parameters that resulted in the improvement of environmental improvement. The data for the study was collected from all the relevant quarters like Pollution Control Board and Indian Institute of Water Management. The study reveals that due to pandemic quality of air and water has improved up to a great extent, but after post-lockdown the situation again starts deteriorating. Therefore, to maintain the environmental balance, certain steps need to be taken by the government.

Key words: Quality, improvement, precautions, exposure, sequestration

A resilient approach to make the tourism industry sustainable during and post Covid-19 pandemic

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Tourism is an economic and social activity in tertiary sector for national economy. Tourism is traveling from place of residence for 24 hours to one year for reasons of relaxation, recreation, religious, sporting etc without doing any paid work in those places. In 2019, tourism industry has contributed more than US$ 2.5 trillion. In many countries, tourism contributes more than 50 percent of their Gross Domestic Product. Covid-19 has brought the world to stand still, which affected many industries, and tourism industry is worst affected. Travel restrictions were strictly imposed to curb the spread of pandemic which led to sudden closure of tourism. The paper's objective is to understand the effect of covid-19 on tourism and study the impact upon both tourism service provider and receiver. This paper is based on secondary research and data source. The data used is from United Nations World Tourism Organization, published and unpublished research papers and articles, print and electronic media. Decline in tourists' activities in the present time has reduced the vulnerability of the people worldwide, thereby reducing the risk associated with tourism. Tourism resilience need to be achieved both during and post Covid-19 situation to make it sustainable.

Key words: Covid-19 pandemic, tourism resilience, sustainable tourism.

Life management and sustainable development during post lockdown phase of COVID-19

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The post lockdown period will left the 'the biggest lesson' regarding Covid-19 to the country and that 'is to become self-reliant' which is imperative that every village/town/city should be self-reliant for their basic needs which may be related to manufacturing or production strategy. There are some basic suggestions to achieve the goal of life management. The coronavirus pandemic has exposed the weakness of the public health and the tertiary care infrastructure across most of the country. State governments play an important role in public health care and systems in present situation. Second, public transport requires greater public investment to reduce the disruptive impact of migration created by the students, labour and professionals. Cross-border movement of products and services has become key to financial movement in subcontinental India. Reviving the transport sector is key to reviving growth. Most of the people has been adapted to 'Work From Home', home-schooled their children, and used video-conferencing for work calls and family socials and it will be the safest platform to survive healthy life. The migrated labors should have to do agricultural production work at their farm or village field which is the more than 70 percent of food source of our basic need of life. We have no solid information to reveal to us when the pandemic will end. The new ordinary of social separating, covers, gloves and washing of our hands is digging in for the long haul. Even if all restrictions are lifted, until a vaccine is distributed in local communities, we have to remember that the virus is still among us.

Key words: Lockdown, COVID-19 and life management.

Analysing Importance of Indoor Games Aimed Covid-19 Pandemic

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Covid-19 pandemic has delimited the social gathering of people globally. The scope of has widened. Self-isolation means far fewer opportunities to be physically active if you are used to walking or cycling for transportation and doing leisure time sports. But equally worryingly, the home environment also offers abundant opportunity to be sedentary (sitting or reclining). While self-isolation measures are necessary, our bodies and minds still need exercise to function well, prevent weight gain and keep the spirits up during these challenging times. Keeping in view, the investigator in the presents study intended to explore the importance of indoor games aimed covid-19 pandemic. The study has been carried with the help of descriptive research. After analysing the research studies at global level the investigator revealed that those indoor games hold immense value during covid-19 pandemic. Besides, keeping the imperativeness of the SOPs (Standard operating procedure), the investigator interfered that indoor and may prove fruitful in boasting our immunesystem immune system. Accordingly, the people may become strong, less susceptible to infections and their most severe consequences and better able to recover from them. The results of the

study are inconsonance of the guidelines of the World Health Organization after their fundamental emphasis on indoor physical activity during COVID19 response.

Key words: COVID-19, Indoor Games, Standard Operating Procedure

The Effect of COVID-19 on Environment in India

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The COVID-19 pandemic has impacted every aspect of human life and the global economy. The measures taken to control the spread of the virus and the slowdown of economic activities have significant effects on the environment. Therefore, This study indicates that, the pandemic situation significantly improves water quality cities across the world, by reviewing the available scientific literatures. .Water bodies have also been clearing and the rivers Yamuna and Ganga have seen significant improvement since the enforcement of a nationwide lockdown. This study intends to explore the positive and negative environmental impacts of the COVID-19 pandemic.

In addition, there are also some negative consequences of COVID-19, such as increase of medical waste, haphazard use and disposal of disinfectants, mask, and gloves; and burden of untreated wastes continuously endangering the environment. It is expected that the proper implementation of the proposed strategies might be helpful for the global environmental sustainability.

Key words COVID-19, environmental impacts, haphazard, nationwide lockdown, environmental sustainability.

COVID-19: Mitigation Strategies and their implications for the Global Environment

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The outbreak of COVID-19 has become the most significant global public health emergency to human society in the 21st century. Until now, there has been a lack of effective antiviral medication and vaccines against COVID-19. Various mitigation strategies have been taken to slow down the rapid spread of COVID-19, such as complete or partial lockdown, travel bans, mass gathering restrictions, home quarantines within communities, social distancing measures, personal protective actions, and other non-pharmaceutical interventions (NPIs). These intervention and prevention measures have not only sharply reduced global economic activity, but also have greatly changed patterns of human behavior. Thus, the environmental response to the COVID-19 pandemic can help us to better understand the interplay between human and nature, and has drawn great attention from the academic community and from policy makers. Moreover, a thorough understanding on the environmental consequences of mitigation strategies in communities would assist in preventing and controlling an emerging public health emergency in the future. The COVID-19 pandemic has posed unprecedented challenges for public health, the economy, the environment, and human society. Mitigation measures against COVID-19 have resulted in contaminated aquatic environments owing to the sewage carrying coronaviruses, disinfectants, and antiviral medicines. The sharp increase in the amount of medical and hazardous waste such as masks also threatens local ecosystems during the pandemic. On the

other hand, environmental pollution across the world has been greatly mitigated after the outbreak of COVID-19 due to the implementation of lockdown, travel bans, and stay-at-home advice, which has had a positive impact on the global environment despite the economic and social disruptions caused. Based on current knowledge on COVID-19, a second wave of the disease could be highly possible, especially when our society is gradually getting back to normal after the primary attempt to gain control of COVID-19. Nonetheless, the consequence of the long-term battle against COVID has barely been elaborated. Currently, there are many relevant questions that remain unanswered due to the limited understanding of the interactions between COVID-19 and the global environment, such as the role of environmental change on disease transmission, the impact of human activity and lifestyle change on the environment, and environmental concerns during a long-term battle against COVID-19.

COVID-19 PANDEMIC: Emerging Perspectives and Future Trends

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Human population faces a grave health-related challenge in the form of infectious diseases that are responsible for the highest number of deaths globally. The tiniest primitive invisible life form is now controlling the behavior of the most powerful and evolved life form on earth. Tough times ahead! Between 1940 and 2020, around 340 new infectious diseases have emerged globally. The compromised health and disability due to infectious diseases, which accounts for 30% of all disability- adjusted life years, decreases work productivity, and increases morbidity.1,2 Since the dawn of civilization, humans and microbes have co-existed and interacted with each other. Is the situation worse now? The answer to this question might be yes. It is because of our immense population and our several activities that lead to flourishing of infections. World is living on the edge. The human cost of COVID pandemic could be extraordinary. We find ourselves in a time of great economic, social, and medical uncertainty. The pandemic demands action on many fronts, from prevention to testing to treatment. We need to create simple, cheap, more accessible testing for SARS-CoV-2. A faster way has to be developed to identify antibodies that neutralize the virus. More than 100 vaccines for the SARS-CoV-2 are at various stages of development. Some six groups have already begun injecting formulations into volunteers in safety trials; others have started testing in animals. The biggest challenge is to determine which vaccine is ideal. Reason and science have to guide us. There is urgent need to critically appraise evidence in deciding how to treat patients. We need a drug or combination of drugs that work. Remdesivir has generated hope. It may prove to be a magic bullet. Countries like Taiwan, Vietnam, Singapore, Hong Kong, South Korea, New Zealand have done exceptionally well to contain the spread of COVID-19. It is widely believed that during the pandemic treatment suffers. Patients with diseases like cancer, diabetes, renal failure, CAD and pregnant women need special attention. As the pandemic pushes up levels of hunger among the global poor, governments must prevent devastating nutrition and health consequences for children missing out on school meals amid school closures. Nations will have endemic SARS-CoV-2 infection for the foreseeable future. A structured and well-coordinated approach is critical for tackling this global crisis.

A Study on Impact of COVID-19 lockdown on economic sector of Kashmir Valley of Jammu and Kashmir

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The COVID 19 has adversely affected every aspect of human life. Our health, education and social relationships and all other aspects of life have been hit hard but the most important profound impact has been on economic activities e.g., production, consumption and on distribution. The scale of the global spread of COVID- 19 is unprecedented and it has taken a colossal toll on global economy and all the global bodies- WHO,UNO, EU, ILO and major financial institutions of the world-IMF, WB, EUB have warned that the days ahead will be very hard and trying for an overwhelmingly chunk of world population. The IMF has warned that the world economy would shrink at its fastest placed in decades rasing fears that there would be worst L type prolonged Economic Recession against V, W and M types since 1930's Great Economic Depression adding that the negative economic effects will be felt very intensively in developing countries. The Asian Development Bank Forecast that the global economy could suffer between $ 5.8tr to $8.8tr equalivant to 9.7 pc of global GDP. The Report "Updated Assessment of the Potential Economic Impact of COVID 19" states that broader closures, travel restrictions, and lock downs will likely cut global trade by $ 1.7trn to $2.6 tr. The ILO has estimated that half of the global workforce (1.6 billion people) employed in the informal sector could see their livelihood destroyed.Labour incomes around the world will decline by $1.8tr, 30 pc of which will be alone in Asia and Pacific region.(UAPEI COVID 19 Report). The report in its analysis states further that in Asia alone there will be 70 pc employment loss and 30 pc of the overall decline in global output. The US economy which is the world's largest economy sank at annual rate of GDP growth by 4.7 pc.

India's production engiene was showing signs of decline before outbreak of pandemic (GDP annual growth was 4.7 pc) which was ever low from last six years and it could be 1.9 pc in FY21.(IMF projection) The worst hit areas of Indian economy are farming, industries, textile, Aviation and tourism, Building and construction, IT and Financials, fearing that India should prepare for negative economic growth in FY21.since the outbreak of pandemic 140 million people had lost there employment across the country and Indian economy is loosing 32000 cores $ 4.5 billion every day. Governments across the globe should manage supply chain disruptions support and logistics for the delivery of goods and services and fund temporary social protection measures, unemployment subsidies and distribution of essential commodities- particularly food to prevent Sharp fall impact of COVID 19. In the present paper, we discuss the impact of COVID-19 on economic sectors of Jammu and Kashmir.

The valley of Kashmir has suffered a loss of Rs 8,500 crore due to COVID-19 lockdown in the last two months and it is the valley's second lockdown in a row as the first was imposed by the Centre on August 5, 2019 when the special status of J&K article 370 was abrogated. We observe that like other parts of the world there was impact of COVID-19 lockdown and huge loses on different economic sectors of J&K like Agriculture, Tourism,

Transport, Education etc. Finally, we report the measures taken by the government to help the people involved in business

Key words: COVID-19, Lockdown, Jammu and Kashmir, Economy, Kashmir conflict

Applications of Viruses

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As we all know, that virus is a small collection of genetic code, either DNA or RNA, and surrounded by a protein coat. A virus cannot replicate alone. It infects cells and uses components of the host cells to make copies of themselves**.** Viruses are significant and have a great impact on humans. The work on viruses provides knowledge that will benefit society. They are important because they are active and abundant in aquatic environments and affect community composition. Hence, we need to know about the nature of viruses and to implement knowledge-based management of our resources. The naming of viruses is done according to their genetic structure to facilitate the development of diagnostic tests, medicines, and vaccines. Viruses are designated by the virologists of the International Committee on Taxonomy of Viruses (ICTV).Viruses are used in the following branches

Viruses in biological studies: Viruses are used extensively in genetics research and understanding of the genes and DNA replication, RNA formation, translation, protein formation, transcription, and immunology basics.

Viruses in medicine: Viruses are being used as vectors or carriers that take the required material to treat a disease to various target cells.

Viruses in bacteriophage therapy: Highly specific viruses can target, infect, and (if correctly selected) destroy pathogenic bacteria.

Viruses in nanotechnology: Viruses can be used as carriers for genetically modified sequences of genomes to the host cells

Viruses in weapons and biological warfare: Viruses can be used in war to cause death and devastation of large populations by epidemics and pandemics.

Viruses in agriculture: Viruses can be used as vectors or vehicles to carry genomes into plants and animals by modification and genetic engineering methods

Viruses and vaccines: Viruses have been used as vaccines. When introduced to a healthy individual, the immune system works against the virus, causing the formation of antibodies that help recognize and attack the virus in case of later infection, thus preventing the disease.

Vaccines for cancer prevention: Vaccines for hepatitis B and those for human papillomavirus protect against liver and cervical cancer, respectively.

Viruses and biological pest control: Viruses are used to control damaging pests. For this purpose, the agents maybe parasites on the target pests, prey on the target species, be pathogens or cause disease in the target species, or be competing species.

Success in the development of Diagnosis tools for SARS-CoV-2

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Covid 19 or SARS-CoV-2 is an acute respiratory illness.It is caused by Novel corovirus SARS-CoV-2 It causes acute respiratory symptoms and sometimes death in eldery persons and persons with health conditions. It has taken a great toll of life affecting lakhs of people around the globe. It was detected initially in Wuhan, China and has spread rapidlyacross the globe The International Committee on Taxonomy of Viruses (ICTV) permanently named the pathogen SARS- CoV-2 and the disease it caused coronavirus disease 2019 (COVID-19) and declared the crisis a pandemic. It was preliminarily identified as a causative agent of a series of unusual pneumonia cases In the intial reported cases of COVID -19 symptoms such as fever, cold, shortness in breath very similar to the common cold .within a week there were cluster cases of acute pneumonia The symptoms for SARS-CoV-2 vary from patient to patient. The symptoms are highly influenced by factors such as sex, age and the attributed diseases underlying a person like hypertension, cardiovascular diseases or even diabetes. The symptoms can range from mild fever, cough, fatigue in certain cases symptoms like diarrhea and even headache are also reported. In certain cases, compli- cations like acute respiratory distress syndrome, anemia, acute cardiac injury and other secondary infection were also reported The Computerized Tomography (CT) scan of the patients revealed slight opacity and difference from the healthy scan of the lungs

It was regarded as a as a possible case of pneumonia but the speculation was rejected as soon as PCR results revealed it belongs to corona- virus family using the bronchoalveolar lavage samples of the patients It was observed that the viral disease caused had a zoonotic source. Genome sequencing of SARS- CoV-2 has revealed that it is 96.2% identical to the bat coro- navirus and 79.6% identical to SARS-CoV, while 50% simi- larity to MERS-CoV Although, structural analysis and molecular characterization has illuminated a lot of advancement to fight the COVID-19 outbreak even though there is a lot to be uncovered for better disease detection A range of molecular and immunoassay-based techniques ranging from laboratory testing to point-of-care tests have been developed for the diagnosis and management of COVID-19 patients. Few advancements using nano- technology is a field of COVID-19 diagnosis have been already done In recent time, the field-effect transistor have been develoed for the rapid and highly sensitive detection of COVID 19 A lot of development has also taken place for the development of vaccine against Covid-19

Assessment of Immunomodulatory and Anti-inflammatory potential of *Trigonella foenum graecum* L. Due to *in vitro* exposure in Chicken Splenocytes through Cytokines' Expression Analysis

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Trigonella foenum graecum L., commonly known as fenugreek, is an annual plant belongs to Leguminosae family. In Ayurvedic and Unani systems of medicine, fenugreek is used as antidiabetic, hepatoprotective, immunomodulatory and anticancer agent. In current pandemic of COVID-19 and avian influenza, herbal additives displaying immunomodulatory effect could have potential to be exploited as preventive and therapeutic agent. The present

study was planned to evaluate immunomodulatory and anti-inflammatory potential of *Trigonella foenum graecum* L. in chicken lymphocytes culture system through semi-quantitative expression analysis (iNOS, IL-6, IL-10 and IL-4) by reverse transcriptase PCR. The hydromethanolic extract from dried seeds of *Trigonella foenum graecum* L. (TFE) was prepared and maximum non-cytotoxic dose (MNCD) was confirmed in the chicken splenocytes through MTT assay which was further used to give *in vitro* exposure. The expression levels of IL-6 and iNOS were found to be down-regulated while IL-10 and IL-4, expression levels were elevated significantly in TFE treated cells as compared to control untreated cells. Decreased expression of iNOS and increased expression of IL-10 and IL-4 are indicative of the anti-inflammatory property of TFE which can also be correlated with the increased Th-2 response. IL-4 inhibits LPS-induced pro-inflammatory cytokine synthesis therefore, can be linked with down-regulation of IL-6. IL-4 stimulates differentiation of naive CD4-T cells indicated the immunostimulatory effect of TFE. The findings of this study indicated that TFE modulated the expression of iNOS, IL-6, IL-10 and IL-4 in chicken splenocytes. Thus, considering the immunopotentiating and anti-inflammatory potential of TFE, it is worthwhile to explore it further.

Biological Sciences:

Agricultural Science, Anthropology and Behavioral Sciences, Animal Husbandry, Aquaculture, Biodiversity, Biotechnology, Biochemistry, Bioinformatics, Cell and Molecular Biology, Fish and Fisheries, Home Sciences, Immunology, Life Sciences, Limnology, Medical Sciences, Microbiology, Nutrition, Plant Sciences, Taxonomy, Tissue Culture, Toxicology, Veterinary Sciences, Wildlife Conservation, Zoology.

Evaluation of efficacy of macronutrients to achieve better reproductive profile of common carp and amur carp

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Proper nutrition is one of the most important factors influencing the ability of cultured fishes to attain the genetic potential for growth, reproduction and longevity. Food quality and quantity affect fish reproduction. Adequate protein is essential for egg development, spawning, formation of follicles, ovarian tissues, growth and development of embryo. Feed should be formulated to meet the nutritional needs of the reproducing fish which is the key factor of attaining desired brood and seed quality. Dietary protein significantly affects fertility, gonad maturation, fecundity, hatching and viability of fish eggs and larval growth. Egg size and composition are useful indicators of seed production in terms of hatchability and larval quality. The present study was conducted to evaluate the effect of individual ingredient of feed on the gamete quality and hormones *viz* estrogen & testosterone of male & female of common carp and amur carp. Three diets were prepared *viz* high protein, lipid and carbohydrates separately & fed to the experimental species. The thirteen months study revealed that the high protein and lipid diet showed better results in all aspects evaluated.

Key words*:* Nutrition, Reproduction, Gonad maturation, common carp, amur carp.

Self reliance through Vermicomposting

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Urgain Phuntsog is a small and innovative farmer from village Gya; situated at a height of more than 14000 feet in Leh district of the Union Territory (UT) of Ladakh. In this UT the temperature dips down to as low as -30 degrees during winters. Under such harsh climatic conditions and freezing temperature, it is impossible for even human beings to survive. Motivated by Krishi Vigyan Kendra-Leh, SKUAST-K to go for organic farming by production of vermi compost, Mr. Phuntsog decided to produce vermi compost. Initially, he started with two kilograms of vermi worms which were provided to him by KVK-Leh. Animal dung was not a problem for him as he has more than 250 sheep and goats. He successfully reared the two kilograms of vermi worms and ensured that the worms do survive even at -30 degrees Celsius. After multiplying the worms for two years, this year he produced more than 4 quintals vermiworms. He sold more than 300 kilogram of these worms to department of agriculture and other line departments of union territory of Ladakh. Krishi Vigyan Kendra-Leh decided to give marketing support to Urgain and under its buy back arrangement purchased about 90 kilogram of vermi worms from him. He sold the worms at the rate of rupees 300 per kilogram. Urgain Phuntsog earned more than 1.20 lakh rupees from his vermi worms. He has also produced four quintals of vermi compost for himself and for distribution to his fellow farmers. Besides this, Mr. Urgain also has been successfully raising food grains like Barley; Oilseeds like Mustard and different vegetables like cauliflower,

Cabbage, Radish Brocolli, Peas, Potatoes, Beetroot, Knolhol, Spinach, Kale and Tomatoes organically around the year in the open as well as under protected cultivation in Green houses. He produces everything from 'eatable to wearable' at his home. Now, Urgain is a master trainer in vermi compost and is a resource person who is invited to give lectures and practical demonstrations on vermi compost production in this cold arid region. He has also received various prizes and appreciation certificates. Urgain gives all the credit to KVK-Leh for this intervention. This year, Urgain got first position in the *'Diversified Farming System'* Competition in the 27th annual Ladakhi E Kisan-Jawan-Vigyan Mela organized by the Defence Institute of High Altitude Research (DIHAR-LEH) at Leh; an institute under Ministry of Defence, Government of India.

Green synthesis and characterization of nanoparticles of *Withania somnifera*

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Due to their wide applications ecofriendly synthesis (green synthesis) of nanoparticles of metals become an important branch of nanotechnology. Commercal demand of synthesis of nanoparticles increasing day by day. In the present work , an eco-friendly synthesis of silver nanoparticles of leaf extract of *Withania somnifera* had been carried out. *Withania somnifera* belongs to family Solanaceae, also popularly known as ashwagandha, Indian ginseng and winter cherry. In India *Withania somnifera* is cultivated for medicinal purpose. Green synthesis of silver nanoparticles done by using the leaf extract of *Withania somnifera* and 1M silver nitrate solution . The nanoparticles prepared were characterized by Using UV-Vis, TEM. Within 24 hours of incubation period silver nanoparticles were synthesized. This study indicates that leaf extract of *Withania somnifera* had a good valuable potential in the future for production of silver nanoparticles.

Key words: Green synthesis, nanoparticles, *Withania somnifera*,

Biodiversity

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What is the total number of species in the world is unknown but some estimated number of them is between 3 million to 10 million, 1435662 species have been identified in the world but many species are yet to be identified, however 751000 species of insects have been identified. Of the 248,000 thousand animals of 281000 thousand animals, and about 1000 thousand species of viruses, about 2700 thousand species are becoming extinct every year. Biological diversity is also important in fulfilling the need of our food, cloth, medicinal fuel, etc. Biodiversity plays a role in maintaining ecological system, besides providing relief from natural calamities like floods, droughts, earthquake landslides, tsunamis, storms. Biodiversity is a combination of words of life and diversity which is usually life on earth. According to the United Nations Environment Program (UANEP) refers to the

diversity and diversity of biodiversity, especially the level of diversity of genetic ecology. Biodiversity is the symbol of the health of any biological system. Two species are found, the year 2020 has been declared as the International Year of Biodiversity, Biodiversity is a natural resource which fulfills the entire needs of our life.

New Record of Jewel Bug *Chrysocoris stollii* (Wolf, 1801) (Hemiptera: Scutelleridae) from Chhatarpur, Madhya Pradesh (India), with its Systematic Account, Host Plants and Biological Control

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Present communication deals with the new record of *Chrysocoris stollii* (Wolf, 1801), the Jewel Bug, belonging to family Scutelleridae under order Hemiptera, from Chhatarpur, Madhya Pradesh (India), with its systematic account, distribution, food & feeding, life cycle, host plants, symptoms & damage caused and biological control. Earlier it was recorded from Kanha Tiger Reserve.

Key words: New record, *Chrysocoris stollii*, Chhatarpur, Madhya Pradesh

Turmeric – Spice or Medicine?

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The natural plant produces are used throughout human history for varied functions. Having co-evolved with animal life, several of the plants from which these natural produces get derived, are usually billions of years old. Tens of thousands of those products were synthesized as secondary metabolites by higher plants as a part of their natural defence system against infectious diseases. Several of these have medical specialties that may be exploited in pharmaceutical drug discovery and drug styling. Starting from ancient times to the present, medicines derived from plants have contended a polar role within the health care in of many cultures. The Indian system of medical aid called "Ayurveda" uses primarily plant-based medicine or formulations to treat varied ailments which include dreadful diseases like cancer. As per the data, out of approximately 877 medicines introduced worldwide between 1981 and 2002, the origins of most (61%) were found to be derived from natural produces.

Turmeric may be a plant that features a long history of meditative use, the chemical analysis which may date back nearly 4000 years. In Southeast Asia, turmeric is employed not solely as a spice but conjointly as an element in spiritual ceremonies. Due to its good yellow color, turmeric is additionally called "Indian saffron." Modern medication has begun to acknowledge its importance, as indicated by the over 3000 publications on properties of turmeric in the last twenty-five years. This review discusses various applications of turmeric both in in-vitro as well as in-vivo studies, stating its effectiveness in several areas of research.

Key words: Turmeric, Pandemic, Sustainability, Environment, Spices.

Human impact on marine ecosystem

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Earth is full of diversified faunal in terrestrial as well as aquatic ecosystem. Major impact on aquatic ecosystem includes anthropogenic pressure, which includes all manmade activity. Inshore marine ecosystem are used and affected by many anthropogenic activities other than fishing, including coastal development, forestry, agriculture, shipping, and industry. Human activity over the centuries has depleted 90% of marine species. Many of this activities result in coastal water being the depositories of runoff, waste and pollutants. Pollution can be defined as the introduction of any substance or energy into marine environment which result harm to marine life and hazards to human health. Some substance such as sewage and fertilizer entering seawater are beneficial to primary productivity but larger quantity cause excessive plant growth, the decay of which result in oxygen depletion. Some discarded packaging, typically plastic and polystyrene is harmful to marine species. Impact on marine ecosystem result from fishing and coastal development, both of which affect fish stock, fish habitats and ecosystem. Climate change and ozone depletion are global factor that also have the potential to affect the marine ecosystem. There are several ways that people can help protect the environment.(1) Control population growth (2) Develop sustainable technology and practices (3) Protect and maintain ecosystem.

Pharmacological applications of *Azadirachta indica*

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Plant or natural products shows a vital role in sickness treatment through the improvement of inhibitor activity, inhibition of microorganism growth, and modulation of genetic pathways. The medical specialty role of a variety of plants in sickness management continues being a highly researched area thanks to their reasonable properties and fewer side-effects. *Azadirachta indica*, normally called neem tree, or Indian lilac, is a tree within the Meliaceae family. It is one of 2 species within this genus and is native to India. The tree usually grows in tropical and semi-tropical regions. Diverse types of preparation supported by the plants or their constituents are in use in several countries during sickness management. In this regard, *Azadirachta indica*, normally found in India, Pakistan, Bangladesh, and Nepal, has medical specialty implication in disease cure and formulation, supports the actual fact that neem tree is additionally being used to treat varied diseases. Its role as a health-promoter is attributed as a result of its rich supply of antioxidants. It is been widely employed in Chinese, Ayurvedic, and Unani medicines worldwide particularly within the Indian subcontinent for the treatment of varied diseases. The previous finding confirmed that the neem tree and its constituents play a key role within the scavenging of free-radicals and check the sickness pathologic process. The studies that supported the animal model established that the neem tree and its chief constituents play a crucial role in metastatic tumour management through the modulation of varied molecular pathways. The tree is thought-about a secure medicative plant and modulates various biological processes with no adverse effects.

Study of seedling growth attributes of Sunflower (*Helianthus annuus*L.*)* under different concentrations of organic fertilizer amendments – A table-pot scale experiment

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The present research work focuses on the effects of different compost concentrations on the growth of Sunflower seedlings. This paper is a part of evaluated research work. Different doses of organic fertilizers (vermicompost, NADEP and pit compost) were used for the growth of seeds in present experiment. The organic fertilizers were weighed and mixed to in 1 kg of soil in each treatment. Seedlings growth parameters such as root length, shoot length, fresh weight of root-shootand dry weight of root-shoot were recorded on 10^{th}days. It was observed that seedlings grown with pit compost produced the lowest growth and biomass of Sunflower. The results obtained from the experiment showed that seedlings treated with vermicompost have best performance evidenced by recording the growth response and biomass of Sunflower seedlings.
Key words: Biomass, fertilizers, growth, root, shoot, Sunflower, treatments

Root–shoot growth responses of various vegetables with application of organic fertilizer treatments in laboratory table and pot scale experiment

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A laboratory table and pot scale experiments were conducted to determine the effect of different concentrations of organic fertilizer treatments onseedling growth of various selected vegetables. The test vegetables such as Tomato, Brinjal, Chilli and Coriander are taken for seedling growth studies. Germination experiment of some of selected vegetables were done in sterilized petridishes containing 0, 25 and 50% concentrations of three different types of organic fertilizers (vermicompost, NADEP compost and pit compost).Three replications were used for each treatment. Growth parameters like root and shoot lengthof some of selected vegetables were measured with application of different organic fertilizers at various concentrations. Root-shoot ratios were also calculated.
In case of growth study of Tomato seedling, highest root shoot length ratio (2) was obtained with 25% dose of vermicompost, on other hand lowest root shoot length ratio (0.93) observed in control.

In case of growth study of Brinjal seedling, highest root shoot length ratio (3.38) was obtained with 50% dose of vermicompost, on other hand lowest root shoot length ratio (0.45) observed in 25 % dose of vermicompost and 50% of pit compost. In case of growth study of Chilli seedling, highest root shoot length ratio (1.90) was obtained with 25% dose of NADEP compost, on other hand lowest root shoot length ratio (1.13) observed in 25 % dose of vermicompost. In case of growth study of Coriander seedling, highest root shoot length ratio

(1.30) was obtained with 25% dose of NADEP compost, on other hand lowest root shoot length ratio (0.32) observed in 50 % dose of NADEP compost.
Key words: Growth, organic, Root, seedlings, shoot, vegetables

Habitat effect on Bird Species Diversity and Richness: a case Study of Sakponba Forest Reserve Edo State Midwestern Nigeria

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This study examined the habitat effect on bird species diversity and richness in Sakponba forest reserve, Edo state, Midwestern Nigeria. The forest reserve was divided into four compartments for this study: undisturbed forest, secondary forest, farmland, and wetland. The crop grown on the farm is as follows, rice, cassava, maize, and yam. Others are cashew, mango citrus, and oil palm plantations. The point count method was used to collect data on bird species. Counting stations or predefined spots were established in roosting sites, wetland and feeding sites as well as forest edges. Counting bands of 50m radius were used for all the stations. The minimum distance between two counting distances per each study site was 200m. The number of counting stations was determined by the site size and 15 counting stations in each compartment were laid out and used for data collection. In all, 60 counting stations were used. Data were analyzed using the PAST model version 3to analyze the diversity index. A total of 712 bird encounters were made with one hundred and twenty (169) bird species belonging toforty-six (48) families and twenty (20) orders were observed in the study area. Undisturbed forest compartment has the highest bird species diversity (78), secondary forest (34), wetland (30) and farmland (27). Farmland compartment has bird species richness (273) followed by and secondary forest (149) undisturbed forest (121) and wetland (115).The diversity index indicates it was higher in the dry season 4.996 than the wet season 4.922.
Key words*:* Land use, Crop, Bird species, Richness and Diversity, conservation

Impact of canal Irrigation on vegetation cover area in Mangalwedha tahsil Dist-Solapur, Maharashtra.

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The term 'Agriculture' is originated from the Latin word 'Ager means "cultivation". Irrigated agriculture plays an important role in economic development of many countries worldwide. Agriculture is a large activity in India. In this study, performance of an irrigation system in Mangalwedha has been investigated**.** But now a days, the concept of cultivation or taking crops from the farms, is changed and has become larger concept. Agriculture is done with the help of human resource, high tech instruments, and various new methods are applied to take crops and hence called as 'modern agriculture'. In the world large numbers of the people are engaged in agriculture. More than 50% world

population is directly or indirectly dependent on agriculture. Agriculture is the backbone of Indian economy. After independence, Indian govt. has provided much attention on agriculture through five year plans to develop it in a systematic way. We have come across many changes in its agriculture and vegetation covered area. Landsat ETM images supervised classification with parametric rule as Maximum Likelihood is performed. Four classes have been made for all images, i.e. vegetation, Built-up, Wasteland and water-body.

Key words: Remote sensing, GIS and canal irrigation etc.

Reactive oxygen species production in plants and defensive role of antioxidants under ozone stress

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Oxidative stress especially ozone causes the overproduction of reactive oxygen species in plant cells. Reactive oxygen species (ROS) are produced as a normal product of plant cellular metabolism and it plays a key role during cell growth and developments. Due to the overproduction of reactive oxygen species in plants which are highly reactive and toxic, causing damage to proteins, lipids, carbohydrates, and DNA which finally results in oxidative stress. The antioxidative defense mechanism of plants protects itself against oxidative stress damages by scavenging of reactive oxygen species. Plants possess very efficient enzymatic (superoxide dismutase, catalase, ascorbate peroxidase, glutathione reductase, monodehydroascorbate reductase, dehydroascorbate reductase, glutathione peroxidase, guaiacol peroxidase, and glutathione–S-transferase, and non-enzymatic (ascorbic acid, glutathione, phenolic compounds, alkaloids, non-protein, and amino acids) antioxidants. This review focused on the possible role of ROS production in plants and its scavenging by antioxidant defense mechanisms such as Enzymatic and non-enzymatic. Therefore, on the basis of the strong antioxidative potential of plants will be a useful tool for the assessment of ozone tolerance cultivars selection in ozone-prone areas.

Key word: Ozone stress; reactive oxygen species; abiotic stress; enzymatic antioxidants; non-enzymatic antioxidants.

Role of Physical education in Shaping health contemporary environment

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Health is the fundamental concern of entire universe. Keeping in view, health education is considered as an integral part of complementary health promotion for any nation. In pursuance to same, the investigator intended to explore the role of health education programmes in promoting health in contemporary degraded environment. The investigator employed descriptive approach in exploring the present study. On the basis of same, the investigator found that physical education programme acts as a backbone in transmission of knowledge, shaping attitudes and the acquisition of certain skills, patients receive help in coping with health problems which improves their well-being, satisfaction, and the process of recovery. It was revealed that the role of physical education is perceived as an inseparable

part of a high-quality healthcare. The importance of health education has been also recognized as one of the main factors that determine the long-term health policy, which indirectly may be reflected in the reduction of costs in the healthcare. Indeed humanising is observed busy in degrading the quality of environment, but is the results of lack of knowledge about physical education that individual has not left any stone unturned in degrading the human environment. As observed in India, in the current years, more and more emphasis has been placed on preventive and educational aspects of the healthcare. Family medicine, as the source of the initiation of shaping health-oriented attitudes, has a prominent place in the system organized in such a way. In patients' opinion, medical staff is the best and most reliable source of knowledge on health. Such expectations increase the importance of primary care physicians in preventing diseases and shaping health-oriented skills in a given society. The main task of a modern health education is primarily to support the creation of circumstances for change, the growth capability of individuals and groups in the sphere of independent action for health at different levels of the organization of social life. The investigator recommended that government should make an ample effort to explore the role of physical education in all government institutions and department. According its applicability should be considered integral.

Key words: Physical education, Shaping Health, Contemporary Environment

Sustainable Development of Mathematical Approaches

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The question of sustainability has assumed great importance in the contemporary context of development scenario emerging at global as well as local levels. The fundamental concern of the sustainable development is to achieve the development without destruction. But the degrading environment accompanied with the problems of extinguishing species of flora and fauna which constitute the life support system, have been falsifying the objective. Keeping in view, the presents study was intended to explore the sustainable development by identifying a few measurable correlates of sustainable development and present a mathematical approach for its application with special reference to developing economies. In addition to stability analysis, we have derived a criterion for coexistence of agricultural wealth, industrial wealth and the population residing in the area of system under consideration. It has been established that agro-based small scale industries are promoted to meet out the depreciation cost of industrial products, so that the industries survive and the development is sustained. The investigator found that the development is a dynamical process and, therefore, it is difficult to quantify. The human dimension built into it, further complicates the matter. Sustainability is area/region specific and, therefore, the parameters cannot be generalized. It is a micro process. Even at a larger scale, the parameters of sustainability are likely to vary, depending upon whether a region is developed or underdeveloped. In a developing economy like India, population, agriculture and industry are the most vital parameters for developing a robust model of sustainable development. There is a scope to further refine the present model by adding the variables such as: infrastructure, irrigation, soil characteristics, rainfall, temperature, size of holdings and land use/land cover types, etc.

Key words: Sustainability · Agricultural wealth · Competition · Industrial wealth · Coexistence

Male and Female Adolescents Attitude Towards Yoga In District Kulgam

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Yoga helps us to discipline ourselves, and as a result of this discipline we feel a stronger union with the divine and that includes the divine in ourselves and in those who also follow this discipline. The art of practicing yoga helps in controlling an individual's mind, body and soul. In pursuance to same, Present study was intended to analyse the attitude of adolescents towards yoga. The total sample for the present study consists of 200 male and200 female secondary school students.. Whole data was collected from Higher Secondary School (HSS) of District Kulgam with the help of random sampling technique. Yoga Attitude Scale (YAS– M) developed bySharma, K. M. was used for data collection. The data was subjected to statistical treatment by using Mean, S.D., Frequency distribution, percentage and independent 't' test. The results of the study indicate that there is significant impact of gender on the attitude of adolescents towards yoga. Male adolescents of Kulgam districtwere seen with more favourable attitude towards yoga as compared to female adolescents.

Key words: Male Adolescents, Female Adolescents, Attitude Towards Yoga.

Integrating Physical Education for Sustainable Development in Context of Health

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Sustainable development emerged as a response to a growing concern about human society's impact on the natural environment. Physical Education must find ways of responding to such challenges, taking into account the consideration of different stakeholders of education. The present paper wasaimed to study education for sustainable development with regard to collaboration of different stakeholders of physicaleducation. Going beyond content based knowledge, physical education has to development of motor skills was also studied. The results of the study revealed that different stakeholders and sectors of physical education need to be involved to create collective educational environment that respond to community needs. It was revealed that important insight should be developed regarding the extent to which their current physical education will equip learners with the necessary worldviews, skills and competencies for a sustainability-oriented society. It was found that integration of physical education will focus on skills development for sustainable development, particularly through promoting learners' skills for social transformation including skills for critical reflection, futures thinking, creativity, innovation, and participatory and problem solving abilities. Besides, this the study revealed that efforts should be made to go beyond content knowledge in order inculcate concept of sustainable development among children.

Key words: Integrating physical Education, Sustainable Development, Content based Knowledge,

Financial Inclusion as Backbone for Sustainable Development

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Demographically speaking, India is the second largest country in the world. In India financial inclusion is one of the recent tools used by financial entities in order to provide suitable education for potential clients from groups of society that have a low level of education, in general, and almost no financial, in particular. Financial inclusion actions aim at explaining to lower educated groups of people and the mechanisms of the financial instruments that they can access in order to improve their day-to-day life. These programs are targeted towards people that are exposed to the risk of poverty and social exclusion. According to Universal Financial Access 2020, around 3 billion people from the global workforce do not use any form of financial services. As a result, the World Bank and the International Finance Corporation set the target to include 400 million adults in transactions by providing technical and financial support in the case of the World Bank and help 600 million adults to be included in investments and advisory services in the case of the International Financial Corporation. The highest impact of financial inclusion programs will be made in emerging countries with low economic literacy. As sustainable development became the highlight of nowadays agenda, financial inclusion may be viewed as an important tool to promote sustainable development in least developed countries and developing ones. The investigator in the presents study explored that the financial inclusion became a target for regulators and global development agencies, many countries including India around the world made commitments and some were developing national strategies to promote it. The development of financial inclusion may take on many forms, so the field is open to financial and non-financial institutions, which can innovate and explore new forms of financial services, like the case of microfinance that became very used in many developing and developed countries as a tool to lift people from poverty. Besides, it was found that financial inclusion has emerged as a tool for shaping the sustainable development in entire world.

Key words: Financial inclusion, Sustainable Development

Apis mellifera L. as a pollinator for Pomegranate crop

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Deola is one of the small revenue place of Nashik District. In Deola region onion, bajra, maize, pomegranate, vegetables, ground nut, sugar cane etc. crops are commonly cultivated. Deola is one of the large market place for onion and pomegranate. Pomegranate is one of the important major cash crops cultivated on large scale.

In the present study the role of honey bees (*Apis mellifera* L.) in the production of pomegranate crop has been carried out. Ten colonies of Apis mellifera were handover to pomegranate growing farmers during flowering condition. It was found that pollination rate increased and fruit setting enhances ecofriendly, hence yield increased significantly (Bhalchandra et al, 2014). Pollination rate enhances by the honey bees eco-friendly and increasing yield up to 30-44%. Honey bees are very useful insects for cross pollination crops like sunflower, pomegranate, onion, wheat, bajra etc. (Abrol D.P., 2012). It was found that

fruit setting rate was 100% and dropout rate lowers to zero percent. Similarly spraying of different chemicals decreases up to 40% for this crop. Fruits produced in the presence of honey bee were larger in size, shape, weight, bright coloured and more tastier. Along with crop yield production of honey enriched farmers economy and getting double advantage to the farmers. After the use of honey bee colony fruits were healthy and disease free.

Key words: *Apismellifera* L., pomegranate crop, ecofriendly yield, Deola region.

Study of water quality parameters of Neemuch District

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Neemcuch district is spreading over an area of about 4,000.44 Km^2 lies in the northwestern part of the state of Madhya Pradesh. The district is bounded by Mandsaur district on the southeast and Rajasthan state on the northeast. The climate of Neemuch district is generally dry except the southwest monsoon season. The normal annual rainfall of the Neemuch district is 797.2 mm. District receive maximum rainfall during southwest monsoon period i.e. June to September. Water quality of different water samples of different areas of Neemuch district analyzed by different physical parameters such as pH, salinity, conductivity, D.O, TDS and temperature.

Key words: Water, Dissolved Oxygen, TDS, Conductivity, pH

Cephalopod ink: Properties and applications

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One of the most distinctive and defining features of coleoid cephalopods squid, cuttlefish and octopus is their inking behaviour. Their ink, which is blackened by melanin, but also contains other constituents, has been used by humans in various ways for millennia. Topics include: (1) the production of ink, including the functional organization of the ink sac and funnel organ that produce it; (2) the chemical components of ink; (3) the neuroecology of the use of ink in predator-prey interactions by cephalopods; (4) the use of cephalopod ink by humans, including in the development of drugs for biomedical applications and for industrial and other commercial applications. As is hopefully evident from this review, much is known about cephalopod ink and inking, yet more striking is how little we know.

Fisheries: A solution to food and nutrition security

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Food and nutritional security remain urgent challenge. Hunger and malnutrition problem is critical because the global population is likely to grow by about two billion over the next two decades. According to the recent data (FAO 2019) before the COVID-19

pandemic, almost 690 million people, or 8.9 percent of the global population, were undernourished. In India 230million are undernourished people 21% population suffer from under-nutrition. In 21st century nutritional and healthy food is global demand. Fish and Fisheries product providing a crucial source of food at global, national, and local levels. It is best source of protein and all nutritional value. Globally, more than 3.1 billion people depend on fish for nearly one-fifth of their average per capita protein from animal sources. The most important contribution of fish is source of multiple micronutrients which essential to addressing a variety of health issues worldwide. It play major role in helping to solve problem like hunger and malnutrition and food security. Due to the particular nutritional value of fish, fisheries represent far more than a source of protein. They are sufficient source of micronutrients vitamins and minerals and omega-3 fatty acids, which are necessary to end Hunger and food insecurity and reduce the burden of communicable and non communicable disease around the world.

Common Diseases of Betelvine (*Piper betle* L.) in Bhanpura Tehsil of Madhya Pradesh

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Betelvine is an evergreen climber with heart-shaped leaves. It is known as "Paan" in Hindi. There are archaeological evidences that the betel leaves (Paan) have been chewed from very ancient times. In Indian traditional medicinal system betelvine has been used for its remedial properties. It is mainly cultivated in Madhya Pradesh, Bihar, Uttar Pradesh, Assam, Andhra Pradesh, Tamil Nadu and West Bengal. Cultivation under controlled condition is practiced in areas where relative humidity is often low and temperature remains high (above 40°C) in summer and low (below 10°C) in winter. Cultivation under controlled conditions (Panwari) is practiced in Bhanpura. Panwari is a hut like structure which provides shade and humid condition to the crop. Shade and humid condition is also favourable for fungal growth also. In Bhanpura we found two major types of diseases 1) caused by insects and Mites and 2) by microorganism (Bacteria and fungi). Common diseases of betelvine are Foot rot, Stem rot, Leaf rot, Yellow leaf disease, Leaf spot, Wilting, Sooty Mold, Red spider mites and White fly. We identified six pathogenic soil fungi, which are responsible for major fungal diseases of betel vines. *Aspergillus sp.* was reported in all soil samples of all seasons. Comparatively more fungi were found in rainy season than in winter and summer.

Key words: Betelvine, Foot rot, Fungi, Leaf rot, Panwari, Paan, Stem rot

Assessment of intraspecific sensitivity of soybean cultivars under the two-variable concentration of salt stress

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Soil salinity is the major problem in world agricultural countries causes harmful effect on plant growth and developments. It has been accounted for that around 19.5% of all irrigated

land and 2.1% of dry land is influenced by salt stress, and these percentages continue to increase. Soybean (Glaxine Max. L) is an important oilseed crop around the world. Therefore an experiment was conducted to examine the impact of salinity stress on two soybean cultivars for assessment of intraspecific sensitivity. Two concentration of salt was applied in this study i.e. 100ppm and 50ppm on the basis of various research data presentation. It was determined by performance comparisons against control (without NaCl) which acts as a pointer. Cultivars chose for the experiment were JS-9095 and JS-335 and the results of the study show that the salinity stress significantly affects the growth, biomass, and yield of both soybean cultivars. Application of 100ppm NaCl, highly affected the growth and biomass and yield of soybean cultivars than 50ppm salt application as compared to control plants. On the basis of growth, biomass, and yield of soybean cultivars, cultivar JS-9095 was most sensitive than cultivar JS-335. Therefore cultivar JS-335 will be useful for cultivation at salt prone areas.

Key words: Salinity stress, Soybean, intraspecific sensitivity, growth, biomass, Yield.

Study on the prevalence of dental and skeletal fluorosis in the fluoride endemic regions of Mandya district, Karnataka, India

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High level of fluoride in the drinking water, especially ground water results in dental and skeletal fluorosis. This study was conducted to assess the fluoride concentration in drinking water where the population completely dependent on groundwater and to know the prevalence of dental and skeletal fluorosis in that population. The water sample was collected in few taluks of Mandya district and the survey was conducted to know the dental and skeletal fluorosis in the taluk which is endemic to fluoride. Nagamangalataluk of Mandya district has higher fluoride concentration which ranges from 1.2ppm to 4.4ppm in ground water which is above the permissible limit according to WHO and BIS. Fluorosis survey was conducted by randomly selecting fifty families in few villages of Nagamangalatalukby using Dean's index. The survey revealed that Dental fluorosis was present in 88% and skeletal fluorosis was present in 12% of the population.The study indicates that there is need to take measure to prevent fluorosis among residents of Nagamangalataluk by educating them to drink defluorinated water.Government should also provide water with permissible level of fluoride concentration.

Key words: Dental fluorosis, Skeletal fluorosis, Prevalence, Endemic

Human impact on Forest, Vulnerability Assessment of South Andaman using Remote Sensing and GIS Application

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Andaman and Nicobar Island is a reserved part of the both territorial and marine natural ecosystem. In that Andaman and Nicobar Island have a tropical rainforest canopy rich

biodiversity, flora and fauna is a main ecosystem. Forest is one of the most important natural resource of this Island extend up to North to end of the Nicobar Island. In this study provides spatial information on different forest types, deforestation and associated land-use changes in South Andaman during 1979-2016.As well as this study shows the major changes in the forest cover area and deforestation due to development aspects from 1979-2016 in the South Andaman district of Andaman and Nicobar Island. Satellite Remote Sensing and Geographical Information System is the most developed technology and tool to apply to find and analysis the forest cover changes, rate of deforestation and map patterns of different forest types classification in South Andaman Islands. In this study, different forest types like Andaman evergreen forest, semi evergreen forest, secondary evergreen forest, moist deciduous forest and Mangrove were identified. It is identified that from the year 1979 to 2016, there is a decrease of forest area in Andaman Evergreen forest, Semi evergreen Forest, Secondary evergreen Forest, Moist Deciduous Forest and mangrove forest. This will be helpful for the decision makers to take necessary action to protect the forest resources.

Eco-friendly techniques of IPM in Commercial Vegetable Production

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Insect pests are the major biotic constrains in vegetable production in India. Among these tomato fruit borer (*Helicoverpa armigera*), brinjal shoot and fruit borer (*Leucinodes orbonalis*), chilli thrips, *Scirtothrips dorsalis* and mite, Polyphagotarsonemus latus, fruit and shoot borer, *Earias* spp. on okra, diamondback moth, *Plutella xylostella* on cole crops, fruit fly, *Bactrocera cucurbitae* on cucurbits are important ones. Average yield loss due to major insect pests in different parts of the country is reported to vary from 35 to 40 %. Intensive and indiscriminate use of pesticides causes resistance, resurgence and the problem of pesticide residue. The eco-friendly methods of pest management need to be given due emphasis in vegetables. Focus is to be given on development and use of resistant varieties, biopesticides and insect pheromones. In vegetables, the resistance sources against major insect pests particularly borers are scarce/scanty. Integrated pest management concept was the outcome of challenges before the entomologist to develop tactics while keeping harmony with the ecological principles. Thus the eco friendly approaches of pest management carries a broad sense emphasizing the selection and practice of pest management methods based on ecological principles involving synthesis of components for crop protection in environmentally benign manner. Eco-friendly tactics of pest management in vegetables have special significance not only for reduction in pesticide residues but also to maintain the natural enemy activity and making the production system more sustainable. These methods include suitable cultural practices or their alteration to reduce pest infestation and increase the natural enemy activity, adoption of biological control method either through conservation of natural enemies, mass release of natural enemies or application of microbial control agents, use of botanicals as insecticide against soft insects or both as insecticides and synergist with chemical insecticides against borer and leaf feeders, use of biorational methods particularly the integration of behavior modifying chemicals against lepidopteron and dipterans insects and finally need based use of safe insecticides with least persistence and low toxicity to natural enemies and environment.

Different cropping modules for enhancing the doubling farming income

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In India, there has been a radical change in production and productivity of different crops by use of technological innovations during the last four decades. Obviously it has significantly contributed to livelihood and farm income. Though our nation has witnessed remarkable change in agriculture sector but still this sector is suffering from several social, economic and technological problems. The income of farmers too low to lead a comfortable life in their society.An overwhelming population of our rural youth are migrating to nearby towns from villages in search of livelihood and employment as they are not justifying farming asprofitable venture. With a view to combat these adverse situations, efforts are being made by KVK, Rewa in line with the government mission for doubling the income of the farmersthrough agro climatic system approach (Modules). This approach may be very helpful in enhancing the income of the farming community and providing them ample employment opportunities in their own village. The modules developed for KVK adopted in satellite village Rithi of Rewa block in Rewa district is focused on main goal of sustainable agriculture and with diversified farming system for risk minimization in farming. It can pave path to success in agriculture and allied activities through boosting farm income in the years to come. In this way, three farming modules i.e. Module I -Intervention on Cropping System, Module II –Rice+ Wheat +Greengram and Module III -Farming system model (1 ha model) for Small farmers -Crops + Vegetables+Vermicompost + Dairy have been developed by KVK Rewa. These three modules have been designed and implemented to mitigate the low productivity and low income in rainfed upland farming situation, irrigated land and landless resource poor situation, respectively. Technological interventions have been undertaken as Rice – Chickpea cropping system for Rice-Fallow cropping system and Rice- Wheat – Greengram cropping system and Integrated farming system for small farmers. The results revealed that when the farmers are adopted there three type modules it has enhance in Net income/annum is of Rs.93625.00 (Module I), 172409.00 (Module II) and 221134.00 (Module III) Rs/ha, B C ratio of 2.78 and 3.88 (Module I), 2.66, 3.31 (Module II) and 3.86 and 1.79 (Module III) respectively.

Morpho-Taxonimic description of a new species Capingentidae from Heteropneustes fossilis (Bloch) in Hamirpur (U.P.) India

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While working on helminth parasites of fish, authors examined 40 specimens of the fresh water fish *Heteropneustes fossilis* (Bloch.) from local fish market hamirpur out of which only one was found infected with 5 specimens (alive worm). These parasites were unsegmented tapeworm which was preserved in 5% formalin, in the laboratory these parasites were thoroughly washed stained and mounted. The morphological character of worm viz. flat scolex, medium neck, U shaped ovary, testes medullary, vitelline follicles cortical in position belong to family Capingentidae Hunter, 1930.

Key words: Fresh water fish, Tapeworm, Morpho-taxonomy.

Conservation of *Passer domesticus* common Indian birds

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Passer domesticus is very important bird of our routine life. Man has symbiotic relationship with this bird. This bird builds nest in our houses, it is very close to our daily life its name is *P. domesticus*, it is true & reflecting its behavior. At present we do not see this bird in our surroundings we have observed decline in no. of these birds, Each and every organism has its role to maintain ecological balance.

This bird is important member of urban and rural food chain and food web. it feeds on grains, mosquito larvae , chicks of this bird feed on insect larvae . So this help in natural – pest-control, and helping in increasing crop production, it helps in pollination dispersal of seeds. This bird i included in red list of IUCN. We must do some effort to conserve this bird. Habitat conservation is essential. Air pollution–electromagnetic radiation of mobile towers and viral infections are very harmful to these birds. So save bird and save nature.

Aquaculture

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With the growth of population, It is a worldwide problem that the forest are shrinking for the agro expansion, and the cities are expanding on traditional agricultural land and simultaneously

The rising cities and inhabiting populace are exerting unprecedented pressure on freshwater resources, both by way of it's overconsumption and by addition of pollutants to it . These circumstances pose an important threat to the success of blue revolution, sustainability of aquatic biota and the depletion of aquatic food resources under this situation three categories of problems are discussed here in brief

1) The culture of edible and marketable fish species as proposed under PROFISH program .
2) Prospects of conservation of aquatic biodiversity .
3) To achieve the above two the reduction of pressure on freshwater resources and prevention of their pollution.

Key words: Blue revolution, PROFISH ,

Physico-Chemical characteristics of Akshar vihar pond in Barelly, Uttar Pradesh

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The present paper deals with the monthly variations in physico-chemical parameters of Akshar Vihar pond, Bareilly, U.P., during July 2019 to June 2020. This pond is located at a distance of 2.5 km from Bareilly junction in the cantonment area at latitude 28°20'19"N and longitude 79°25'39"E.Physico-chemical parameters were analysed using standard methods

for water analysis. The mean value ranges for air temperature (17.03-36.03 °C), water temperature (17.97-35.97 °C), transparency (17.93-36.03 cm), pH (6.77-8.63), dissolved oxygen (6.40-9.97 mg/l), free CO_2 (0-18 mg/l), Carbonate alkalinity (0-67 mg/l), Bicarbonate alkalinity (155.58-433.13 mg/l), Chloride (4.52-5.92 mg/l), Calcium (65.76-82.34 mg/l), Magnesium (158.60-538.83 mg/l), total hardness (380-480 mg/l), BOD (1.23-1.80 mg/l) and COD (3.97-8.83 mg/l) were recorded during experimental period. The data were subjected to various statistical analyses to investigate the significant relationship among these parameters.

Key words: AksharVihar pond, Physico-chemical parameters, water quality.

Implication of WQI and Benthic Macroinvertebrates based Indices for pollution assessment of River Narmada in Jabalpur

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Water is the most important natural resource in the world, has the unique property of dissolving & carrying in suspension a huge variety of chemical and hence water can easily become contaminated. Traditionally physico chemical analysis of water will help to know the water quality at the time of sample collection. The benthic macroinvertebrates fauna of river is most suitable biological parameter of water quality. The present research has been focused on Narmada river basin and specifically in three selected sampling sites in Jabalpur region : Bargi Dam, Gwarighat and Bhedaghat. Total 24 sampling have been done in the duration of 2 years (2017-2019). Samples were collected as per standard sampling technique during morning between 8-9 am and evening 5-6 pm. Samples were collected from different methods for physico-chemical analysis (Temperature, pH, Turbidity, Conductivity, BOD, DO, COD, TDS, Total Hardness and Chloride) as well as biological monitoring. Biological samples were identified using keys and books by ZSI. Indices were calculated namely WQI for abiotic factor and saprobic index, HBI, B-IBI for biotic factors. In the present study highest value in Gwarighat while minimum in other stations. WQI value was found to be 64.106 and 59.674 in I^{st} and II^{nd} year respectively in all seasons at all sampling sites. WQI value was decreased in II^{nd} year which shows water in 1^{st} year was of poor quality than II^{nd} year study. A total of 758 individuals of 55 families belong to 18 orders and 4 phylum. Further abundance status of identified families was categorized under four categories, very rare, rare, common and very common and those were 20%, 20%, 47% and 13% respectively. To compared 4 biotic indices used to evaluate water quality *via.*, benthic macro-invertebrates in order to determine health of river Narmada. The saprobic index, B-IBI and EPT% revealed the fair water quality. The calculation results for Hilsenhoff biotic index revealed very poor to good biological condition of water, in all the study Sites, slightly divergent from least disturbed condition.

Scientific approaches of fresh water molluscan in eastern zone-Amarkantak to Narsinghpur

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Taxonomy is the science of naming, describing and classifying organisms which provides basic understanding about the components of biodiversity for effective decision-

making about conservation and sustainable use. Folk taxonomy allows popular identification leads to aware the local people about importance of diversity conservation. Globally 876 species of freshwater Mollusca are known while in Indian subcontinent 34.24 percent *i.e.,* 300 species are present. The communication enumerates a review on freshwater Mollusca and also states biodiversity and conservational approaches. In present study overall 2172 Mollusca specimens were collected and identified from the all five the study sites of river Narmada (Eastern Zone - Amarkantak to Narsinghpur) during 2018 to 2020. On identification of the collected specimen or shells of Molluscan, only two classes Gastropoda and Bivalvia were present. These specimens were identified in the form of 31 species belonging to 15 genera and 11 families. The gastropods species were more in number than bivalves i.e., 1528 Gastropoda specimen while 644 Bivalvia specimens. In the 2018-19 study, family wise maximum numbers of species were reported from family Unionidae i.e., 09 species (29%) while 07 (31%) species found in 2019-20 belonging to Class Bivalvia. Then second highest number of species in 2018-19 was 05 species (16%) i.e. reported from Thiaridae family while 03 species (13%) reported in 2019-20 belonging to Class Gastropoda. Third highest number of species was reported from Planorbidae, Lymnaeidae and Hydrobiidae families i.e. 03 species (10%) from each family belonging to Gastropoda in 2018- 19, while two-two species (9%) were recorded from Planorbidae and Lymnaeidae and three species (13%) of family Hydrobiidae recorded in 2018-19. Rest other family like Viviparidae, Ampullariidae, Ancylidae, Arcidae and Corbiculidae having only one or two species, also Arcidae Family absent in 2019-20 study from the Eastern zone of River Narmada. In addition, A total of 31 different species were studied and while total 27 species were recorded in literature. Specimens were collected, sorted, preserved and identified by using standard identification keys provided by Fauna of British India (1908), Needhem and Needhem (1962) and SubbaRao (1993).

Study of physico – chemical stress on the population of Chlamydomanas specieses of shallow polluted water system: Kanpur (UP).

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In shallow polluted water systems, planktons play an important role as primary producers**.** A lot of work has been done in the field of physico - chemical analysis of lentic water systems. Limnological study is valuable for water quality monitoring. The present work involves the use of abiotic components of shallow waste water system to assess the density fluctuation in different species of Chlamydomonas regarding with seasonal variations throughout the year.

With the seasonal variations, the values of pH, magnesium & calcium (Mg, Ca), dissolve oxygen & dissolved oxygen matter (DO, DOM) indicate variation in water quality which directly influenced the population of Chlamydomonaselliptica,Chlamydomonasglobosa, Chlamydomonas intermedia and Chlamydomonasorbicularis. On the basis of chemical analysis in terms of DO & DOM the shallow water system is moderately polluted. The fluctuation in the population densities of Chlamydomonaselliptica, Chlamydomonasglobosa, and Chlamydomonas orbicularis were greatly negative correlated with all mentioned physico-chemical parameters.

Chlamydomonas intermedia showed positive co-relation with DO and negative co-relationwith DOM. Whenever Mg, Ca& pH showed negligible values.

Key words: physico-chemical study, Shallow polluted water system

Limnological features of Gandhisagar reservoir: Past and Present situation

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Limnological features were undertaken in Gandhisagar reservoir, which is a second man made reservoir situated in the North – Western part of district Mandsaur (M.P.) at latitude 23^0 30' to 24^0 20' and longitude 75^0 8' to 76^0 10' at an altitude of 403.5 msl. The reservoir has a water spread area of 66,000 ha at FTL with maximum depth 49.52 m from bed level at dam site. The physico-chemical data were recorded on a monthly basis for two years at ten study sites viz Dam site, Chaurasigarh, Malasary (Kaonla), Nimod, Rampura, Nanor, Sanjeet, Kharawada, Chandwasa and Basai. For the sake of brevity, data from only three study sites were presented.

The water inputs into this reservoir were highly deviated. 95% water inputs occur in the rainy season. The evaporation levels were very high due to large water front, strong winds and high temperature increase measured by a hygrometer (as relative humidity). The depth of Gandhisagar reservoir was ranged between 23 m (May) – 35 m (Aug, Sep) at Dam site, 4.0 m (June) – 16.5 m (Oct, Nov) at Rampura and 0.5 m (May) – 8.5 m (Sep, Oct) at Basai site.

A positive correlation of pH with conductivity, alkalinity, chloride, calcium, hardness and silicate has been observed. The dissolved oxygen was positively correlated with transparency as well as conductivity and negative correlation with water temperature, chemical oxygen demand and dissolved organic matter.

Key words: Limnological features, Gandhisagar reservoir, Hygrometer.

Impact of coal fired power plants on Fisheries

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Thermal power plants have a detrimental effect on the aquatic and marine ecosystems via two main factors. First, power plants take in cool water from a river or sea and let out water which is anywhere between 5 to 10℃ higher than intake water, back into the waterbody. Second, residues in fly ash contain a cocktail of heavy metals (mercury, cadmium, arsenic, nickel, lead, etc.) and volatile organic compounds (VOCs) which contaminate our air, soil, and water. These heavy metals and VOCs leach into the water and tend to accumulate in fish in a process known as bioaccumulation. Liver, kidney, and gills are the primary fish organs where these heavy metals and VOCs are concentrated. In fish, this can cause endocrine disruption, loss of equilibrium, increased opercula movement, irregular vertical movements, and even lead to death. Mercury, cadmium, lead and arsenic cause gill damage as well as severe damage to the renal and nervous systems of fish2. Some of the adverse effects of heavy metals on human health include chances of cancer, endocrine disruption, renal failure, cardiovascular disease, liver failure, and even death. This poses a grave health risk for people consuming the fish.

An evaluation of Bioaccumulation Factor for heavy metals in Bandhwa Dam on Murna River with reference to fish tissues, Shahdol division in central India

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This research work was conducted to assess the concentration of heavy metals namely Cu, Zn, Fe, Pb and Hg in the Muscle, liver, gills, kidney and gonad of fish species collected from Bandhwa Dam constructed on Murna River, Shahdol district, Shahdol division in central India. The levels of heavy metals varied significantly among fish species and organs. Muscles possessed the lowest concentration of metals. Higher concentration of the essential metals as Cu were accumulated mainly in liver and gonad, Zn accumulated mainly in Gills and Kidney, Fe were accumulated in gills and muscles as well as Pb accumulated mainly in muscle and gill and the highest concentration of Hg found in mainly Gonad and gills. The concentration of metals in the present fish organs within the permissible limits given by WHO and FAO but in case of Pb and Hg these are higher than the limits. This is also noticeable that the concentration of metals is higher in summer and winter seasons while lowest concentrations are found in rainy season. This study indicated that as far as these metals are concerned, the fish is unfit for human consumption. The Bioaccumulation Factor values of the heavy metals analyzed in this study showed that bioaccumulation has occurred in the fish in the alarming rate. According to previous study, muscles are not active site for the accumulation of metals but in our study it showed that muscles are also the site where metals can be accumulated in maximum level and it also showed that particular organs are not responsible for the accumulation of particular metal, every studied organ shows accumulation of all studied metals in different level of concentrations. Consequently, close monitoring of metal pollution and consumption of the fishes of Bandhwa dam is recommended with a view to minimizing the risk of health of the population that depend on the river for their water and fish supply.

Key words: Pollution, Heavy metals, Fish, Bandhwa Dam, Bioaccumulation Factor, health threats

Helminthes Parasitological Studies in Catfishes: A Review

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Helminth parasite is an important group of pathogen causes infection and diseases of fish species both in freshwater and marine environments. With the increasing interests in aquaculture parasitic infestations are becoming threats for fish health management and aquatic crop production throughout the world. The fish parasite causes decreases in growth rate, weight loss and emaciation, affect yield of fish products (liver oil etc), spread human and animal diseases, postphone sexual maturity of fish and mortalities of fishes. Fish

parasitological investigation and research performed India has been reviewed through study of available literature. Considerable works mainly on systematics, nature of infestation and pathology of different groups of fish parasites; protozoa; helminthes and crustacean have been done. A total of 240 species of parasites have been recorded from freshwater and marine fishes. Ectoparasitic protozoans and monogenetic trematodes are recorded mainly from cultured fish species of farms. *Dibothriocephalus latus* and *Gnathostoma spinigerum*; are the two helminth parasites of fishes. Much attention has been given on *Caryophyllid* cestodes of two catfish species (Magur) *Clarias batrachus* and (Singhi) *Heteropneustes fossilis*. Few fish diseases of parasitic origin have been reported and studied. Commonly occurring parasitic diseases are; Argulosis (fish louse), Ichthyopthiriasis (White spot) and myxoboliasis. Salt, Lime, Formaline, Dipterex and Sumithion are the simple chemicals were used to their control measures. Recommendation has been made for the further works on parasitology for sustainable production of fish health.

Key words: Fish parasites, freshwater fishes, marine fishes, Helminth-parasites; *Dibothriocephalus latus* and *Gnathostoma spinigerum*.

Hematology, morphology and blood cell characteristics of Catfish *Clarias batrachus*.

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Background and Aim: Blood acts as an important bio-index of health, the hematological parameters are important in diagnosing the efficient status of the fish infested by parasites health and behave as efficient pathological reflectors. The purpose of the study was to obtain baseline data on hematological parameters, blood cell size and morphology of *Clarias batrachus.*

Methods: Blood samples were collected from healthy as well as infected *Clarias batrachus* fish species in live conditions from the caudal peduncle by using 2ml syringe and a needle treated with anticoagulant. Hematological parameters of the blood samples were analysed using standard techniques. The morphological features of blood cells and different cell count were done on Wright-Giemsa stained blood smears. Erythrocytes, leucocytes (neutrophils, eosinophil, basophil, lymphocytes and monocytes) thrombocytes were distinguished and characterised under light microscope. The various types of blood cells measurement were carried out with the help of stage and an ocular micrometer at magnification of 100X. The percentage of leucocytes revealed predominance of lymphocytes and neutrophil followed by fewer monocytes and esinophil basophil.

Results: The results showed a positive corelation between erythrocyte size and nucleus size for *Clarias batrachus* ($r = 0.570$, $P < 0.01$). Sex dependent differences in hematological parameters such as hemoglobin, erythrocyte count, hematocrit, white blood cell count in *C.batrachus* showed significant difference ($P < 0.01$) other hematological parameters and blood cell morphological characteristics of male and female catfishes *C.batrachus* were not statistically significant. Knowledge of hematological parameters,

morphology and blood characteristics could be utilized to evaluate the health status of the fish both in wild and cultured conditions.

Conclusion : Present study indicated that various hematological parameters in Catfish fish species were found altered in the parasitized fishes as compared to those non-infested ones.

Key words: Hematology. blood morphology, blood characteristics, C. batrachus, sexes.

Statistical Models for Yield Estimation of 'Fuji Zehn Aztec' Applesbefore bloom

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To solve the problems of damage in crops due to natural disasters like frosts, hail storm, it is common to insure crops against the damage. After damage, crop loss must be evaluated, by comparing what crop is left with the amount that would have been obtained under normal conditions. Potential crop must be evaluated quickly through the use of measurements obtainable at the beginning of the cycle of tree's growth. The objective of the study was to develop the best fitted model for estimating yield in 'Fuji Zehn Aztec'. The data used for this research were primary data collected from high density apple block SKUAST-Kashmir (HDP, Plate-1). The study was undertaken at experimental field of Division of Fruit Science, SKUAST-Kashmir, Srinagar, J&K during the years 2015 and 2016. The measurements of various tree/fruit characteristics of'Fuji Zehn Aztec' were recorded. Modelwas developed for estimating yield of Fuji Zehn Aztec before bloom. The model developed wasvalidated using k-fold cross validation and bootstrap validation technique.

Key words: Yield Estimation, Regression Models, Validation**.**

Effects of natural and anthropogenic factors on surface and groundwater quality in rural and urban areas

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Although water constitutes 71% of the earth's surface, only 0.3% of it is available as fresh water for human use. Moreover, the quality of fresh water in ground and surface systems is of great concern, as potable water needs to have appropriate mineral content. Ground and surface water quality in rural and urban environments is affected by both natural processes and anthropogenic influences. Because of this, water is becoming scarcer as the population increases across the world. Natural processes leading to changes in water quality include weathering of rocks, evapotranspiration, depositions due to wind, leaching from soil, run-off due to hydrological factors, and biological processes in the aquatic environment. These natural processes cause changes in the pH and alkalinity of the water, and also phosphorus loading, increase in fluoride content and high concentrations of sulphates. Anthropogenic factors affecting water quality include impacts due to agriculture, use of fertilizers, manures and pesticides, animal husbandry activities, inefficient irrigation practices, deforestation of woods, aquaculture, pollution due to industrial effluents and domestic sewage, mining, and recreational activities. These anthro-

pogenic influences cause elevated concentrations of heavy metals, mercury, coliforms and nutrient loads. This paper studies the effects of natural processes and human influences in rural and urban aquatic systems. Pollution due to environmental parameters such as heavy metal pollution, heavy metals and bacterial and pathogenic contamination of both urban and rural areas is discussed in detail.

Key words: rural; urban; anthropogenic; water quality;

Impact of Tourism in environment in South Asian Context

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The environmental problem is the most challenging issue of this era. Tourism is the most popular global religion. South Asia is one of the most affected areas, due to its geographical situation. Asia consists of the highest peak in the world and the lowest sea level land. Asia is the largest and most populous continent on earth. It is also the site of many ancient civilizations containing 51 countries which arehome to 4.4 billion people. Most of the Asian countries havetheir own historical importance, socio-economic variables, cultural values, architectural varieties, sculptural specialties,and great fine arts along with a wide variation in the natural landscape and climate. Hence, Asia is a destination for scholars and different types of tourists from around the world.

Though geographically together, south Asia is a huge location thus offering a wide range of diversity in terms of climate, landscape, cultures, religion, and altitude. People visiting this region can find whatever they are looking for. Today traveling is being more and more mundane and has become a global religion. Tourism is based on natural beauty, economic expansion, cultural exchange, historical study and much more. South Asia is a wonderful destination for environmental tourism, as it has beautiful natural places, ample opportunities for scientific research and economic investments. Even though tourism is booming in recent years, it also is leaving its negative impact. Due to the inflow of a huge number of people, some of the secluded places have become polluted and overburdened which is making a negative impact for the natives as well as the plants and animals of the area.

Tourism can be a means to raise the living standard locals and can be a sustainable business if planned properly. But unplanned haphazard tourism practices can put a great toll on the natural environment destroying the natural beauty as well as the authentic culture of the area.

The objective of this research is to explore the impacts of tourism on the environment and life circle of the living in Asia. Descriptive methodology and secondary data have been used to explore the paper. The finding of the research is that the overload of tourism on nature is making ecosystem unbalanced and putting a toll on the environment. It is suggested that negative impacts on the environment should be controlled and there must be proper policies in place so that people can enjoy tourism without making a negative impact on the environment.

Key words: Environment, tourism, destination, global, impact

Diversity and Role of aquatic insects in the Functioning of Lake Ecosystem

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Basic unit in ecology formed from the cohabitation of plants, animals is known as Lake Ecosystem. A lake biological community is a freshwater biological community in which groups of living beings depend on each other and the water environment for their supplements and survival. Lakes are a vital part of the hydrological framework; and perform various parts in the biosphere. The role and significance of insect species in relation to functioning of lake ecosystem is discussed the paper.

In the present paper diversity of aquatic insects studied in the lakes of in and around Hingoli during June, 2017 to May, 2018. Insects belonging to six orders were found in these lakes. The most abundant family was Baetidae and Caenidae.

Insects represent the most diverse group of organisms, not only in terrestrial but also in aquatic, especially freshwater, habitats. Among the most diverse aquatic insects orders are the Trichoptera, Diptera and Coleopteran; although the taxonomically best known orders of aquatic insects are the caddis flies (Trichoptera), dragonflies (Odonats) and stoneflies (Plecoptera) and within the Dipterans, groups of medical importance have received special attention.

Key words*:* Lake, Ecosystem, Insect diversity.

Anthropogenic Activities: A major threat to breeding failure of vultures in Bundelkhand Region, India

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Vulture populations declined markedly in recent decades due to increasing anthropogenic activities in Bundelkhand region. Large vulture population decrease in non-protected & urban areas due to closest distance between vulture breeding site and dirt road of railway line town, factory situated by human affected the breeding period of the vulture. In the Bundelkhand region, the main occupation of the people is agriculture and Cattle breeding. Food material of livestock mainly depends on the leaves of trees and the cutting of trees occurring every year is also a serious problem because it destroys the nests of Vultures. Tree cutting, mining, anthropogenic disturbance in forest areas like the collection of tendu leaves for making bedi because bedi is the main source of earning many for the local villagers in the Bundelkhand Region. People in Bundelkhand are very poor they used to collect woods for food preparation as fuel and for making homes as shelter. This leads to the cutting of mature trees, near vulture colony, developmental activities in the natural habitat like uncontrolled mining for stone, construction of railways tracks, dams are the increasing threats in Bundelkhand leads to loss of vulture habitat. In Orchha there is Raja ram temple is very famous. People (approx 1500) used to come daily in raja ram temple for the worship of Lord Rama. The togetherness of local villagers leads to disturbance in the development of chick during the breeding season. collection of wood for fuel, boating in Betwa river, rock

climbing, light and sound program, are the major threats to the breeding colony in Orchha (Monuments).

Increasing urbanization near to breeding habitat is a highlighted threat to the vulture breeding. Due to the co-existence of the breeding site near the urban population in Gwalior and the Shivpuri district of the Bundelkhand region. Moreover, a total of 4 districts with the potential breeding site in Shivpuri, Gwalior, Chattarpur, and Tikamgarh struggled with the increasing urbanization year after year. Therefore there is need to declare all the breeding sites as vulture safe zone.

Key words: Vulture, Anthropogenic disturbance, population, breeding sites

Senga chandrashekhari Dhole 2011in fresh water fish, *Channa punctatus* from Bundelkhand region of Uttar Pradesh India

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The present investigation deals with the preliminary study of tapeworm parasites viz.*Senga chandrashekhari* Dhole et al., 2011 collected from the intestine of a fresh water fish, *Channa punctatus* from Bundelkhand region of Uttar Pradeshduring winter, summer and monsoon season respectively during December 2019 to January 2020.

Key words: Freshwater fish, *Channa punctatus*, Tapeworm, *Senga chandrashekhari*, Seasonal study, Bundelkhand, Uttar Pradesh, India.

Algal Biofuel: An sustainable and eco-friendly source of energy supply

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Continued use of petroleum sourced fuels and the contribution of these fuels to the accumulation of carbon dioxide in the environment had been a source of major concern since many years. The fear of diminishing the available fuel sources and its increasing negative impact on environment had lead towards need of environmental and economical sustainable biofuel production. Biofuels are the promising alternative to exhaustible, environmentally unsafe fossil fuels. Biofuel from oil crops, waste cooking oil and animal fat cannot realistically satisfy even a small fraction of the existing demand for fuels. In such case algal biomass is attractive raw for biofuel production. Microalgae appear to be one of the potential sources of renewable biofuel that is capable of meeting the global demand of fuels. Different types of algae have different production abilities. Like plants, microalgae use sunlight to produce oils but they do so more efficiently than crop plants. Normally algae have 20%–80% oil contents that could be converted into different types of fuels such as kerosene oil and biodiesel. Microalgae can provide several different types of renewable biofuels such as methane produced by anaerobic digestion of the algal biomass, biodiesel derived from microalgal oil and photobiologically produced biohydrogen. Microalgal based biofuel is technically feasible and renewable biofuel that can potentially displace liquid fuels derived from petroleum.

Key words: Fossil fuels, renewable fuel, eco-friendly, microalgae, biofuel.

The Evolution of Environmental Education in India: An Objectives, Aims and Principles

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The goal of this paper is to present environmental problems with certain facets of human behaviour, which are more closely linked to the relationship and capacity of man with the biophysical world. This paper discusses the growth of environmental education and the goals and values of environmental education in India. Environmental education is an approach where citizens develop an awareness of the environment and secure knowledge, skills, beliefs, experiences and enthusiasm which will allow them to act individually and comprehensively in order to solve the current and future environmental issues.

Key words: India, Evolution, Education, Environment, Aims, Objectives, Principles.

Environmental Sciences:

Environmental Ethic, Environmental Legislation, Environmental Impact Assessment, Environmental Management, Environmental Policies, Environmental Pollution, Natural Resources Conservation.

Bioremediation of Distillery Spent Wash (Melanoidin)-A Sustainable Approach

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Distillery spent wash is the residual liquid generated during alcohol production. It has been observed that a typical cane molasses based distillery generates 15 L of spent wash effluent per liter of ethanol produced. Around 212 distillery units in India generate more than 30 billion liters of spent wash annually. The most important characteristic of spent wash is it is strongly acidic, dark brown colored hydrophilic viscous liquid waste with strong objectionable odour. Dark brown color of spent wash is mainly because of the presence of polymeric melanoidin pigments formed by the non enzymatic amino carbonyl reaction means Millard reaction. Melanoidins are recalcitrant due to presence of caramel. Antioxidant natures of the pigments make them toxic to many microorganisms, including those present in waste water treatment processes. Agricultural land looses their fertility due to disposal of the spent wash directly into river. It also harms the aquatic system as its colored pigments reduce photosynthetic activity and depletes the dissolved oxygen in the water bodies. Spent wash polluted water has high biological oxygen demands, chemical oxygen demands , low pH, obnoxious smell. To reduce the dark color, acidic $_{P}$H, High BOD, high COD it is considered highly desirable to exploit the biodegradation potential of soil microorganisms from polluted sites microorganisms from the contaminated site. As such polluted soils can facilitates selection of biodegradation capability in microorganisms and may act as reservoir of selective communities capable of degrading pollutants.

Bioremediation is an eco-friendly technology for treating chemical spills and hazardous waste. It is considered highly desirable to exploit the biodegradation potential of soil microorganisms from polluted sites. Application of microorganisms like, *Aspergillus niger , Leuconostocs sps , Bacillus sps, Staphyloccous aurius and Pseudomonas aeroginosa* will be the cost effective biotechnology for treatment of water polluted by spent wash containing melanoidin.Experimental studies revealed that the individual organisms and their mixed consortia degraded the 75 to 80% concentrated spent wash, after the optimization of various physicochemical parameters the mixed consortia exhibited enhanced activity as compared to the individual cultures alone. The treated effluents were characterized by COD reduction, HPLC analysis.

Key words: Melanoidin, *Aspergillus niger, Leuconostocs sps* , Consortia, Distillery spent wash, HPLC..

Water Pollution

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Water is a unique substance, because it can naturally renew and cleanse itself, by allowing pollutants to scttle out (through the process of sedimentation) or break down or by diluting the pollutants to a point where they are not in harmful concentrations. However this natural process takes time, and is difficult when excessive quantities of hamful contaminants

are added to the water. And humans are using more and more materials that are polluting the water sources that we drink form. In nine of the last ten years, large blue-green algae blooms have appeared on the northern part of Lake Winnipeg. These are caused by excess phosphorus in the ater. Fertilizer use is 15 times higher today than it as in 1945. Beach closures are becoming increasingly common. The lst of pollutants is long and the signs of water pollution surround us, but he point is this: we are dumping contaminants into the small portion of water on the planet that is fit for drinking.

On the recent studies of water quality of perennial ponds of India: A Review

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The present paper reviews the recent published literature on the status of physico-chemical parameters regarding water quality of perennial pond of India. Water is the basis of life that is also a source of energy that governs the evolution and functioning of this vast universe. Therefore, it is necessary to maintain the quality of water of all the resources that are in human use. The physico-chemical parameters of water bodies attracted researchers. In the present paper scientific published literature from the onset of this century are critically reviewed, with some important works of last few years of 20^{th} century.

Key words: Physico-chemical parameters, Water quality, India, Seasonal variation.

Adverse Health Effects of Plastics

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Society has become completely dependent on plastic, yet we rarely stop and wonder how this material might be affecting our health. Toxic additives are often added to plastic in order to improve its properties. Many of these additives do not bind to the chemical chain of plastic which means they can be released in the environment when exposed to various atmospheric conditions. These additives can be absorbed by the skin, evaporate into the air or absorbed via the food or drinks we consume. It is important to know exactly what additives are used and take steps to avoid them to reduce the harmful effects of plastic on human health as all of them are highly toxic in nature. Look around you. Right now. How much plastic can you see? Food containers, plastic bottles, pens, even your phone cover, the list is endless. Despite its ubiquity, the effects of plastic pollution on human health remain mostly unknown to the majority of people. Have you ever thought about the negative effects of the plastic pollution that we're increasing day-by-day on your health? Here we discuss 7 types of plastic and they directly and indirectly effect our .IIn today's world, we use "plastic" as a blanket word to describe the myriad of shapes and forms that this material comes in. In reality, there are 7 types of plastic that vary in their chemical composition, purpose, recyclability, and hazardous nature. It's important to stay informed of these variants as it helps us on our journey as conscious consumers.

1. PET/Polyethylene Terephthalate:

2. HDPE/High-Density Polyethylene:
3. PVC/Polyvinyl Chloride
4. LDPE/Low-Density Polyethylene
5. PP/Polypropylene:
6. PS/Polystyrene

Key words: plastic, hazardous nature, microplastics, toxic chemicals, pollution.

Environmental effects of Pesticides

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The impact of pesticides consists of the effects of pesticides on non-target species. Pesticides are chemical preparations used to kill fungal or animal pests. Over 98% of sprayed insecticides and 95% of herbicides reach a destination other than their target species, because they are sprayed or spread across entire agricultural fields.[1] Runoff can carry pesticides into aquatic environments while wind can carry them to other fields, grazing areas, human settlements and undeveloped areas, potentially affecting other species. Other problems emerge from poor production, transport and storage practices.[2] Over time, repeated application increases pest resistance, while its effects on other species can facilitate the pest's resurgence.

Microplastic pollution in Fisheries

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Plastic particle size smaller than 5mm as called Microplastic. Microplastic is produce mostly by two ways 1. Primary microplastic 2. Secondary microplastic. Primary microplastic, it means those `plastic particle manufactured in microplastic size ranges (e.g. abrasive particle, resin pellets) and secondary microplastics made up of the results of fragmentation of larger plastics material (e.g. weathering and fragmentation at larger litter item, vehicle tyre wear). Source of microplastic such as industrial activities, terrestrial transportation, agriculture waste, wastewater plants and may enter through atmosphere, coastline and runoff. Fisheries (synthetic fibre, rope, line, cage net etc.) and aquaculture activities (culture structure, EPS floats, bags, plastic net sheets, basket, etc.) important role play source of microplastic in ocean. First microplastic enter in to aquatic environment then enter in to aquactic organisms. Filter feeder like organisms (i.e. barnacle, bivalve, etc.) and many planktivores feeding habit posses fishes confused to identified food and microplastic particle because both size is similar due to ingest microplastic in normal feeding routine. Deposit feeding organisms not properly identified settled bottom microplastic contaminated detritus and consume it. Then next trophic level organisms prey on microplastic contaminated organisms. Microplastic entered in to food chain and contaminate food chain. Organisms do not have specific digestive system for plastic digest due to create negative effect on organisms like respiration rate reduce, induce stress, reduction feeding rate, decrease energetic reserve, negative effect on immune fuction, physiological stress and also effect on ecosystem (altered behaviour, altered habitat and population structure)

Key words: Microplastics, Primary microplastic, secondary microplastic.

Ground water contamination due to open cast coal mining and its management

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India is highly dependent on coal for meeting its commercial energy requirements. All the operations of mining, directly or indirectly require water for their functioning. The mining industry has been utilizing water carelessly without anticipating the negative impacts it is having on the ecology and the bio-diversity of the region. Opencast mining methods affect the environment constituents, especially water resources, by discharging huge amounts of mine water. Physical impact of open cast mining mainly results from silting in the surface water bodies. Deterioration in drinking water quality is a serious human health issue due to release both major and trace elements into the environment. Trace elements or the heavy metals are most dangerous groups of pollutants due to their toxicity and persistence in the environment. Metals in the contaminated soils and water may reach human body at dangerous level through agricultural products and bio-magnification process. Leaching of heavy metals from the mine spoils is possible during the rainy season thereby contaminating the groundwater. The water pollution of mining industry can be manage through latest technologies such as water treatment plant or Effluent treatment plant and control the concentrations of most of the parameters within the permissible limits.

Key words: Open cast mining, water pollution, Trace metals, Heavy metals, bio-magnification

Algal Biofuel: An Review

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Continued use of petroleum sourced fuels and the contribution of these fuels to the accumulation of carbon dioxide in the environment had been a source of major concern since many years. The fear of diminishing the available fuel sources and its increasing negative impact on environment had lead towards need of environmental and economical sustainable biofuel production. Biofuels are the promising alternative to exhaustible, environmentally unsafe fossil fuels. Biofuel from oil crops, waste cooking oil and animal fat cannot realistically satisfy even a small fraction of the existing demand for fuels. In such case algal biomass is attractive raw for biofuel production. Microalgae appear to be one of the potential source of renewable biofuel that is capable of meeting the global demand of fuels. Different types of algae has different production abilities. Like plants, microalgae use sunlight to produce oils but they do so more efficiently than crop plants. Normally algae have 20%–80% oil contents that could be converted into different types of fuels such as kerosene oil and biodiesel. Microalgae can provide several different types of renewable biofuels such as methane produced by anaerobic digestion of the algal biomass, biodiesel derived from microalgal oil and photobiologically produced biohydrogen. Microalgal based biofuel is technically feasible and renewable biofuel that can potentially displace liquid fuels derived from petroleum.

Key words: Fossil fuels, renewable fuel, eco-friendly, microalgae, biofuel.

Plastic debris: a global menace

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Plastic debris greatly increases in aquatic environment as a widespread problem which requireurgent method to solve immediately. Plastic debris become a global trouble in marine area that not only up to coastal reaches of developing countries due to lack of waste disposal and its management but also the world oceans where they slowly degraded the larger plastic into microplastic which distributed to large area due to surface driven wind. Since, 1950 when plastic manufacturing began from that marine litter represented about 80% in various surveys as major portion of solid waste in the oceans. These all are results of both land and sea based anthropogenic activities. Plastic debris accumulates at the shoreline due to wind action, current, wave, rivers flows and direct debris dumping at the sea coast. Plastic particles with a size <5 mm at the time of production is called primary microplastics, while secondary microplastics are particles fragmented from larger plastic debris. As an emerging pollutant, microplastics have attracted much attention in recent years. Plastic and synthetic materials are the most common types of marine debris and cause a harmful impact on the marine ecosystem. These pose a considerable threat to marine ecosystem by ingestion and entanglement, distributing non-native and potentially dangerous organisms, absorbing toxic chemicals and degrading to microplastic particles and damaging the habitat. These require an extensive surveys method apply to focus on plastic debris of microplastic and meso-plastic size which generally degraded and causing severe damage to beach ecosystem and their aesthetic value.

Key words*:* *plastic debris, microplastic, meso-plastic*

Role of Medicinal Plants in mitigating Environmental pollution

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From respiratory diseases, cancer, stroke to lung diseases such as asthma and heart disease, both indoor and outdoor pollution are a cause of harmful diseases. According World Health Organisation, 4.3 million people worldwide die due to poor air quality prevailing inside the house. Around 3.8 million premature deaths occur annually from non-communicable diseases including ischaemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer are all attributed to exposure to household air pollution. Medicinal plants have been used as herbal remedy and as affordable health care products worldwide. Phytoremediation is the use of certain plants to clean up soil, sediment, and water contaminated with metals or organic contaminants such as crude oil, solvents, and polyaromatic hydrocarbons (PAHs). Environmental contamination by heavy metals such as mercury, cadmium and lead is a serious problem throughout the world. Heavy or toxic metals are trace metals that are at least five times denser than water. They are also stable elements and can not be metabolized by the body or bio-accumulative and they passed up the food chain to humans. Toxic industrial wastes mixing with liquid agricultural fertilizers disperse

farmlands. Reclamation of agricultural soil and transition of the metal ions into insoluble forms may be quite expensive and can hardly be applied to huge areas. So, heavy metal accumulator plants can be used as alternative solution for solving the problem. Certain medicinal and aromatic plants like mint, Lavender, Thyme, Marigold, Hollyhock, Garden sorrel, Black nightshade, *Dracaena, Sansevieria, Bamboo, Neem* etc. showed that they can be more resistant to some heavy metals and other pollutants than other crops. Phytoremediation is an aesthetically pleasing mechanism that can reduce remedial costs, restore habitat, and clean up contamination in place rather than entombing it in place or transporting the problem to another site. The present paper gives an overview on the importance of medicinal plants in mitigating pollution for a clean environment.

Key words: Medicinal plants, Pollution, Phytoremediation, Reclamation

Conservation of Environment and its Awareness

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Environment awareness is one of the important areas, which is gaining prominence in the modern world. It is an ideology that fosters a sense of connection to the natural world, and encourages its conservation and protection from anthropogenic afflictions. It is therefore emphasized that environmental education must be introduced in the context of school curriculum. A-part from this several measures should be taken time to time in order to develop necessary awareness and desirable attitude towards environment and its conservation in communities. When we are well versed with environmental issues then only, we can take suitable measures to limit those issues. The beneficial practices towards the environment will certainly promote sustainable development and a brighter future for the generations to come. Thus, it is the only means by which we can ensure our descendant's a clean and healthy environment to live in.

Key words: Environment awareness; Environment conservation.

Ethnobotany and forest conservation

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Plants play a vital role in human life, since the time of immemorial. Plants and men are closely associated with each other..Ethno botany deals a study among the tribal people and plants. Primitive men live in virgin forest in ancient time, primitive society also known as Adivasi Janjati depended on forest product for their livelihood. They conserve their surrounding resource for their live hood..Many tribes like Gond, Parthi ,markam etc also believe that their deity live in plants and they protect them so that they conserve the natural resources and never cut plants for future generation. This paper deal all aspect of natural resources conservation.

Key words: ethnobotany, tribal, forest resources

Studies on different methods of nutrient management and mulching practices on productivity of Tomato (lycopersicon esculemtum Mill)

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The nutrient management and mulching practices on tomato cultivation has increased in last decade. In India due to the benefits of maintain favorable soil temperature, reduced weed growth, moisture conservation and higher crop yields. A field experiment was conducted on tomato (Lycopersicon esculentum L.) at farm of Fruit research Station Intkhedi Bhopal which comes under Rajmata Krishi Vishwavidyalaya Gwalior (M.P) during (October -April) in 2017-18 & 2018-19, in a factorial randomized complete block design with three replications. Treatments consisted of nutrient management by different methods of nutrient management and mulching practices (black colour HDPE inorganic plastic mulch), organic mulches of rice straw and soybean straw and control without mulch and farmers practice of nutrient management. Results of the study indicated highest values of plant height, number of flowers per cluster, SPAD values, fruit weight, yield and soil temperature were observed (Black colour Plastic Mulch with100% RDF (100% PK + 50% N basal dose 50% N in 20 & 40 DAT by top dressing) followed by rice sraw mulch and soybean straw lowest found in open bed and farmer practice control. Marketable yield increased by 99.62 % in black colour mulch , 82.82% in organic rice straw mulch 78.47 % organic Soyabean straw as compared to crop over control.

Key words: Black Plastic Mulching, Rice Straw, Soybean Straw, Spad Value, RDF

Effect of medical waste on health of population and environment in India

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In general environmental pollution, medical waste does not take up much, but its specific characteristics are potentially among the most dangerous types of waste. Inadequate care can affect the health of the medical workers, the population and the surrounding areas in which the waste is stored, but also lead to outbreaks of global infection and poisoning. In order to testing the current state of the impact of medical waste on human health, and the possible unwanted consequences that it can produce, if it is treated in an inappropriate manner, a survey was conducted in the rural and urban environment. Research has shown that most of the respondents, unused drugs throw away into a garbage, which is mixed with municipal waste, and without prior separation it is deposited on the city landfill, and according to the Likert scale, more than 50% of the respondents partially or completely agree with the claim that the unorganized landfills are not sufficiently safe and pose a risk for the

possible spread of the disease, as well as that no containers are placed in the public places for the disposal of medical (pharmaceutical) waste. Respondents believe that the Ministry of Health and the Ministry of Environmental Protection should take responsibility for the safe management of medical waste, where over 80% of respondents expressed their willingness to store drugs at suitable locations in their places.

Fluoride contamination of ground water and its harmful effects on human population in Kanpur city

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Ground Water is the chief source of freshwater on earth. In India, about 20 to 25% of the population is fluoride-affected, especially in rural areas, but in the city there are adverse effects of fluoride in the human beings. Drinking water with an excessive amount of fluoride causes fluorosis disease. It badly affects people of all age groups, especially children and old citizens. According to an estimation, fluoride beyond desirable amounts [0.5 to 1.5 mg/Lit] in ground water is a serious problem in many parts of India, but in the Kanpur region of Uttar Pradesh, people are badly affected by fluoride's effects. Fluoride is the electronegative element and it belongs to the halogen group of minerals. Fluoride enters in the body through water, food, drugs, cosmetics materials etc. World Health organization [W.H.O.] recommended that the ideal range of fluoride content in drinking water should be 1.0 to 1.5 ppm. Fluoride concentrations beyond the standards cause dental and skeletal fluorosis. Toxicity of fluoride also causes some non-skeletal diseases like pain in the joint, muscle weakness, fatigue, anemia with low hemoglobin levels, etc. in human beings.

Now-a-days, release of environmental pollutants into the environment through industrial and agricultural usage affects the environment badly.

In the present study, it is observed that some areas of Kanpur have higher quality of fluoride in groundwater. Additionally, it is also concluded and analyzed that the content of fluoride in groundwater is higher in comparison to the standards of WHO.

This paper also presents a review, which focuses on the sources of fluoride in groundwater, its impacts on health and different control measures.

Key words: Dental Fluorosis, World Health Organization [W.H.O.] Skeletal Fluorosis, Low Hemoglobin Levels, Ground Water.

Environmental Impact due to Natural Recourse Degradation

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The major adverse effects of surface mining are the disruption of the geology, soil plant stability circuit and disequilibrium in the geomorphic system, increased nutrient export from the system and depletion of soil organic pool. All surface mining methods results in dramatic changes in the landscape due to large-scale excavation in the form of soil dumps, large overburden dumps and huge voids in the mining sites. This study evaluated soil and

potential groundwater with toxic metals in and around an abundant granite mines in Jhansi. The pH values for ground waters were neutral, with a slight increase of the values in the mining areas. Higher values of electrical conductivity were observed in the mine areas. Observation for soil quality showed average concentration of acidic pH (5.5), low organic content (17.31%), and reduced sulphate concentration (34.82 mg/kg) in mining affected soil which has been compared with control site (i.e. pH – 6.1, OC – 29.25%, and SO_4^{-3} – 254.62mg/kg). The average concentration of lead detected lowest in control site (site-2) comparatively highest in mining (site-3). In these areas, groundwater contamination by Cd, Fe, and Pb were observed. The present paper also focuses in brief about the different aspects of impacts on land environment particularly with a case discussion of granite mining.

Key words: Mining; Heavy metals; Groundwater; Soil and Environment

Importance of Vulture Conservation in Central India

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This paper presents progress of vulture conservation towards Aichi Targets 1, 8, 12, 14 and 20 through the conservation of critically endangered vultures in India. Under this conservation programme, a range of initiatives are being undertaken to protect vultures and their habitats including: 1. Using vultures as a flagship species to educate and promote awareness of the value (both intrinsic and to humans) of biodiversity (Target 1); 2. Profiling the vital role of vultures in nutrient cycling and pollution control (Target 8); 3. Conservation of vulture species in imminent danger of extinction (Target 12); 4. Safeguarding critical ecosystem services provided by healthy vulture populations (Target 14); and 5. Working with corporates, specifically Rio Tinto, to develop and implement the business case for supporting vulture conservation (Target 20).

Vultures are critical part of the food chain in various ecosystems. By removing dead meat they maintain a balanced ecosystem and prevent the spread of diseases. The dramatic crash in the Indian vulture populations is directly linked to animal husbandry practices, namely the use of the pain killer, diclophenac, to treat cattle. Today almost 99% of the vulture populations in India have disappeared.

Conservative estimates show that stray dog numbers have increased by 7 million between 1992 and 2003 despite sterilisation programmes in India. During this same period, vulture numbers declined from 10 million down to 0.1 million. From 1982-1987, when vulture populations were relatively stable, so was the population of stray dogs. Calculations of the available food freed up by the vulture decline is consistent with the amount of food required by approximately 7 million dogs.

In 1990's where 8-10 hide and bone collectors used to be found in one village were now reduced down to 0.5. The absence of vultures and introduction of stray dogs and rats to clean the carcasses have eroded the hide and bone collectors. Traditional people losing the only employment they knew for generations.

In the last four years, it is recorded that diclophenac selling reduced from 49% to 25% because of awareness meetings and community engagement under vulture safe zone project in Bundelkhand. The positive impact of project reflected that the vulture population is also reported by Government of Madhya Pradesh stabilised in last two decades.

Key words: Vulture Conservation, Community Engagement, Endangered Species, Aichi Targets

Feeding potential of three Coccinellids, Coccinella Septempunctata, Cheilomens Sexmaculata and Hippodamia convergens on white flies from Nashik District (M.S.) India

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Whiteflies are most common agricultural pest, damaging the some agricultural crops, vegetables, tomato, potato, cotton, guava, and garden plants. The feeding potential was carried for the period October 2015 to September 2016 at laboratory conditions. 25 whiteflies Trialeurodes vaporariorum were provided to three different species of adult ladybird beetles each namely, Hippodamia convergens, Coccinella septempunctata and Cheilomens sexmaculata and daily for three months. The feeding potential of Coccinella septempunctata on the whiteflies was found dominant. It is summarized that the Coccinellids have predation potential against controlling the whiteflies in the farmlands of agricultural crops, vegetables and garden plants and therefore, their numbers in the fields should be augmented for better production of crops yield which will increase the National production of agriculture.

Studies on Trohic Indices for lake-A Review

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Eutrophication has created a serious problem for Lake Ecosystem during past decades. There is need of modeling for nutrient management in water resource and necessitate updating of research findings for utility of trophic indices .Lake trophic state classification provide significant idea about the condition of ecosystem for utilization of resource as clean water, recreational purpose, aesthetics or for management of aquatic biodiversity. There is need of developing and updating proportional logistic models to classify lake trophic status.
This paper is a review for updating of trophic indices for study of lake eutrohication including single variable vs complex aggregate of multi-variables, discrete vs continuous and determinatic vs an inherently random models .

Key words: trophic Status, Lakes, Multiple variables, Trophic indices ,Logistic models.

Earth and Atmospheric Sciences:

Mineralogy, Wildlife.

Climate change human health and mitigation strategies

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Climate change is damaging critical infrastructure and interrupting the provision of basic services such water and sanitation, education, energy and transport (https://www.unenvironment.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-13). Some of the likely psychological impacts of climate change, include anxiety, stress, and depression; increased violence and aggression; and even loss of community identity. There will be critical impact asymmetries due to both climate and socio-economic structures which may deepen current production and consumption gaps between developed and developing world. Substitution of fossil fuels which are major contributors of greenhouse gases requires that the agricultural and municipal wastes readily available in its towns and cities are converted to bioenergy. The Covid 19 pandeic is direct outcome of climate change resulting in virus moving form bats to humans.It has shattered world economy. WHO has warned of more such pandemics if corrective measures are not takenup.The calls for reframing the impact of climate change from an environmental to a public health issue in order to increase public engagement in adaptive and mitigative behaviour change is urgently needed. This review will discuss nuxus between climate change, health and evolving mitigation strategies.

Key words: Climate change, global warming, biofuels, agricultural productivity, human health.

Climate Change and Global Security: A new Challenge for the Planet

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Climate change is rapidly emerging as one of the toughest and most threatening issue of the 21st century. This issue has the potential to substantially damage our planet. The costs and consequences of climate change on our world will define the contours of this century. As early as 1990 the Intergovernmental Panel on Climate Change (IPCC) noted that the greatest single impact of climate change might be on human migration—with millions of people displaced by shoreline erosion, coastal flooding and agricultural disruption. There is an increasing realization that climate change is a core challenge to international peace and security. Climate change could unite the international community to set a course for avoiding dangerous anthropogenic interference with the climate system by adopting a dynamic and globally coordinated climate policy. If it fails to do so, climate change will draw ever deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments. Climate change is best viewed as a threat multiplier which exacerbates existing trends, tensions and instability. South Asia is extremely vulnerable to climate change and will threaten the very survival of these poor

nations. India too is substantially affected by the effects of climate change and is predicted to disrupt her security in many ways.

Climate Change Impact Studies on Historical Rainfall Records: A Case Study of Dindori District, Madhya Pradesh, India

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Climate change is worldwide but there impacts are feeling locally. Dindori district is uniquely known for rich forest wealth and of tribal communities in Madhya Pradesh India. People derive their livelihood and nutrition security from forest resources. Climate change is likely to impact the distribution of these natural resources by altering their Phenology and production. In the Present study, Long-term rainfall (1901-2018) time series has been applied for rainfall analysis using Parametric and non- parametric tests, viz. Regression, Mann-Kendal (MK) and Sen's slope estimator. The negative trends have been found in Dindori district, Madhya Pradesh, India. Detailed study has been carried out for rainfall behavior identification of the district. The present study used for the forest, agricultural, water resources development, planning and mitigation.

Key words: Climate change, Madhya Pradesh, Rainfall, Regression and Mann-Kendall test

Health impact of Stone crushing unit in and around Bundelkhand region

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Increased particulate matter levels due to open cast granite mining cause severe atmospheric pollution, especially in Bundelkhand region which in turn creates severe health issues. Entrances of these particles into the respiratory system of workers as well as residents of adjacent areas are liable for asthma, chronic bronchitis with difficult breathing, and reduced oxygen holding capacity in the lung. The latest research also found that the stone crusher, highway transport is a major cause of PM_{10} with other significant contribution from the method of combustion and non-combustion of power plants in relation to the burning of coal fossil fuel, road dust, etc. in present study the emission of RSPM (PM_{10}) by the stone crusher varies widely from 718±138.52 to 1855±27.71 μg/m^3. The health effects data was obtained from questionnaires answered by the stone-crushing workers showed that the dust exposure causes some serious health problems, such as chest pain (25.9%), a cough (18.5%), wheezing (25.9%), and shortness of breath (29.6%), eye irritation (66.6%), skin irritation (11.1%), headaches (22.2%), vision defects (14.8%), hearing loss (29.6%), hair loss (3.7%), and vertigo (11.1%).

For mitigation purposes a design of green belt comprising species like *Ficus hispida, Calotropis procera, Butea monosperma, Ficus benghalensis, Dalbergia sissoo,* etc. may be useful which are shown the maximum deposition of dust on their leaf surface. Study may be

helpful to find out some species which is resistant or to cope with open cast mining generated dust pollution in and around mining areas and adopt also for the beautification of highways.

Key words: Bundelkhand, Granite mining, health effect, RSPM

Climate Change and Biodiversity Crisis

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Biodiversity has social, cultural, and spiritual importance. Biodiversity supports food security, dietary health, and livelihood sustainability. It provides important resources for medical research; plays an important role in regulating infectious diseases. The **environmental changes** in climate can intensify many **catastrophic events,** such as droughts, decrease water supply, threaten food security, erode and inundate coastlines, and weaken natural resilience infrastructure that humans depend on. Changes in temperature and other biogeochemical cycles can be translated in a drastic shift in water and resources, affecting all forms of fauna and flora. Small animals, like insects and fungi, tend to be more sensitive to environmental changes. These same animals are responsible for maintaining many environmental services provided by nature, like pollination, soil aeration, etc. Graduate extinction of microfauna would then only accelerate biodiversity loss in a cascade effect. **The natural communities are linked between a net of ecological relations,** if climate change affects one group, many others will suffer its effect too. It is essential for climate change adaptation which can reduce disaster risks of biodiversity loss and support relief and recovery efforts.

Study of hydrogeological and ground water quality in Neemuch District, Madhya Pradesh, India

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Neemuch district is spreading over an area of about 4000.44 km^2, lies in the northwestern part of the state of Madhya Pradesh. The district lies between North latitude 24^o 14 ' and 25^o 02' and East longitude 74^o 44' and 75^o 33', falling in Survey of India part of topo sheet No. 45L/13,14,15 and 45P/1,2,3,6 & 7. Groundwater is one of the major resource of the drinking water in Neemuch District of M.P. In the present study groundwater quality of the 10 groundwater samples collected from entire villages and assessed for their suitability for human consumption. In the present area of investigation, the Physical analysis of groundwater with respect to the major elements related properties has been determined. The physically related properties such as Total Dissolved Solids (TDS), Salinity, pH, DO (Dissolved oxygen), Conductivity and temperature were also determined. Integrated overlay technique helped to delineate to prepare spatial distribution of groundwater quality for drinking purposes in the study area. Average values of six water quality parameters were taken to compute the Water Quality Index (WQI). Water quality parameters were under permissible limit as per CPCB, WHO and BIS. Therefore, water can be used to humans and domestic animals consumption as well as for fish production. Furthermore pond and well requires continuous monitoring of water for future conservation and management.

Deoxygenation in Ocean

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Oxygen in the world of ocean keep the largest ecosystem on the earth. It given signal that the oxygen is decline caked deoxygenation, primarly due to global warming through particularly in coastal waters. Global warming now gaining attention as exacerbating the problem leading to oxygen loss in larger region of fresh, brackish and marine waters and marine waters. Further ice melt at the poles and increased freshwater runoff into some coastal areas further lead to stratify ocean waters be causesalt water is higher densethanfresh water.High atmosphericload of nutrients and wetland loss from sea-level rise leads to coastal eutrophication. Anoxic and hypoxic watersare harmful to most fish and shell fish, reduce the metabolic scope for growth. Globally there will be many zone facing the impacts of ocean and coastal deoxygenation. There is need to planning for estimate and determining change. Maximum and improved ocean and also require to coastal observation infrastructure, and continued improvement of models that use the data will be necessary for understanding trends in oxygen in the world's waters. Solutions to slow and reverse oxygen decline:

1. Warming-induced deoxygenation and eutrophication share common causes.
2. Nutrient management.
3. Reducing the threat of global warming.
4. Improving predictions of future.

Arbuscular Mycorrhizal Fungi and Plant Interactions Influences Climate Change for Goble Sustainable Development

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Arbuscular mycorrhizal fungi (AMFungi) provide numerous services to their plant symbionts for sustainable development. Understanding the effects of climate change on AM Fungi, and the resulting plant responses, is a crucial factor in predicting ecosystem responses on a global scale. AM Fungi form mutual symbiotic relationships with the majority of terrestrial plants and provide a wide range of services containing improved macro and micro nutrients and water uptake, drought and disease resistance, and amplified plant productivity, in exchange for carbon. AM fungi are a main provider to global carbon and nutrient cycles and considered a significant link between above and below ground processes. AM fungi are consumed more than 20% of carbon produced by their host plant and the AM fungal hyphae network can occupy over 100 cm in total soil volume making up approximately 30% of the total microbial biomass in terrestrial ecosystems. Production of glycoproteins such as glomalin that are involved in the formation and stability of soil aggregates may have also an important influence on other microorganisms associated with the AM Fungal mycelium. The floristic diversity and productivity of plant community have been shown to depend upon the presence of species rich assemblage of AM Fungal species. Increasing fungal diversity

resulted in greater species diversity and higher productivity. The mechanism behind these effects is likely to be differential effects of specific plant fungus.

AM fungi are sensitive to climate change. Climate change is altering the interactions among plants and soil organisms in ways that alter the structure and function of ecosystems. AM fungi respond to elevated atmospheric carbon dioxide concentrations, climatic warming, and changes in the distribution of precipitation. Elevated carbon dioxide concentrations can indirectly affect AM Fungi through increased carbon allocation from the host plant to the fungus, although this effect might be overestimated under abrupt compared to gradual increases of atmospheric carbon dioxide. Significant amount of carbon flows through mycorrhizal mycelia to different components of soils. The potential consequences of this on plant growth and carbon and nutrient cycling has led to a growing demand for their inclusion in global change models. However, our understanding of their responses to environmental change remains limited. This includes rising atmospheric carbon dioxide and tropospheric ozone levels, altered water availability, warming and nitrogen deposition. Changes detected are often highly variable and context dependent, but trends are emerging such as the similar responses of community composition to enhanced nitrogen deposition and atmospheric carbon dioxide, despite the likely contrasting effects of these environmental changes on carbon availability. AM fungal extraradical formation was highly correlated with soil aggregation and C and N sequestration, suggesting that a decrease in both root and extraradical colonization in response to climate change could have major impacts on ecosystem functions. Interactions between plant vegetation, water availability, and soil characteristics should be considered when analysing the effects of climate change on AM Fungi. Proper management of AM fungi has the potential to improve the profitability and sustainability of agricultural and climate change systems.AM fungal communities are reduce the uncertainty about the community characteristics and functional role of these important AM fungi in the future sustainable development.

Emerging Threats to Human Health from Global Environmental Change

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Anthropogenic changes to the natural environment, including land-use change, climate change, and the deterioration of ecosystem services, are all accelerating. These changes are interacting to generate five major emerging public health threats that endanger the health and well-being of hundreds of millions of people. These threats include increasing exposure to infectious disease, water scarcity, food scarcity, natural disasters, and population displacement. Taken together, they may represent the greatest public health challenge humanity has faced. There is an urgent need to improve our understanding of the dynamics of each of these threats: the complex interplay of factors that generate them, the characteristics of populations that make them particularly vulnerable, and the identification of which populations are at greatest risk from each of these threats. Such improved understanding would be the basis for stepped-up efforts at modeling and mapping global vulnerability to each of these threats. It would also help natural resource managers and policy makers to estimate the health impacts associated with their decisions and would allow aid organizations to target their resources more effectively.

Key words*:* climate change, emerging threats, land-use change, malnutrition, vulnerability

महामारियों की तबाही और साहित्य

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वैश्विक महामारियां अपने समय और भविष्य को प्रभावित करती आई है। राजनीति और भूगोल के साथ समाज और साहित्य भी इससे अछूता नहीं रहा है। दुनिया जब किसी विपदा में घिरी है तो सांस्कृतिक अभिव्यक्तियों में भी उनका असर हुआ है।

महामारियों के कथानक पर केंद्रित अतीत की साहित्यिक रचनाएं आज के संकटों की भी शिनाख्त करती हैं। ये हमें मनुष्य जिजीविषा की याद दिलाने के साथ साथ नैतिक मूल्यों के ह्रास और मनुष्य अहंकार, अन्याय और नश्वरता से भी आगाह करती हैं। इतिहास गवाह है कि अपने अपने समयों में चाहे कला हो या साहित्य, संगीत, सिनेमा- तमाम रचनाओं ने महामारियों को भी रेखांकित किया है ।

ये रचनाएं सांत्वना, धैर्य और साहस का स्रोत भी बनी हैं । समकालीन परिदृश्य को साहित्य के आइने में देखे तो भगवान दास जी की कहानी 'प्लेग की चुड़ैल' 1902 ई.में प्रकाशित हुई इस कहानी में महामारी और उसके प्रभाव का वर्णन किया गया कहानी का आरम्भ ही महामारी से होता है। कहानीकार के शब्दों में- "गत वर्ष जब प्रयाग में प्लेग घुसा और प्रत्येक दिन सैकड़ों गरीब, अनेक महाजन जमीनदार, वकील, मुख्तार के घरों के प्राणी मरने लगे तब लोग घर छोडकर भागने लगें।"

पाण्डेय बेचन शर्मा उग्र की कहानी 'वीभत्स' में सन 1917 ई.की कहानी है। देश के अधिकांश भागों में युद्ध-ज्वर (इन्फ्लूएंजा) का नाशकारी आतंक छाया हुआ था एक एक शहर में सैकड़ों लोग प्रत्येक दिन मर रहे थे।

समकालीन विश्व साहित्य में महामारी पर विशद् कृति 'प्लेग' है जो फ्रांसीसी उपन्यासकार अल्बैर कामू के द्वारा लिखी गई है इस उपन्यास में 'प्लेग' के जरिए कामू स्वार्थों और महत्वाकांक्षाओं और विलासिताओं से भरी पूंजीवादी आग्रहों और दुष्चक्रों वाली दुनिया में किसी महामारी का हमला कितना व्यापक और जानलेवा हो सकता है, जो मध्यवर्गीय अभिलाषाओं को मृत कर देता है।

राही मासूम रज़ा के प्रसिद्ध उपन्यास 'आधा गांव' में भी चेचक से ग्रस्त मुमताज़ का जिक्र किया गया है। इसका कथानक 1947 ई के काल परिप्रेक्ष्य में लिखा गया है । इसमें उस कालखण्ड की सामाजिक राजनैतिक चेतना उभकर सामने आई है।

नरेश मेहता के द्वारा लिखित उपन्यास 'उत्तर कथा' जो दो खण्डों में प्रकाशित हुई है । इसके प्रथम खण्ड में मालवा के हैजे का हृदयद्रावक चित्रण हुआ है।इस उपन्यास के प्रमुख पात्र शिवशंकर, आचार्य, त्रयम्बक और दुर्गा है ।

प्लेग, चेचक, इन्फ्लुएंजा, हैजा, तपेदिक आदि बीमारियों ने घर परिवार ही नहीं, शहर के शहर उजाड़े हैं और पीढ़ियों को एक गहरे भय और संत्रास में धकेला है। रवीन्द्रनाथ टैगोर की काव्य रचना 'पुरातन भृत्य' (पुराना नौकर) में एक ऐसे व्यक्ति की दास्तान पिरोई गई है जो अपने मालिक की देखभाल करते हुए चेचक की चपेट में आ जाता है।

इसी तरह निराला ने अपनी आत्मकथा 'कुल्लीभाट' में 1918 के दिल दहला देने वाले फ्लू से हुई मौतों का जिक्र किया है। जिसमें उनकी पत्नी, एक साल की बेटी और परिवार के कई सदस्यों और रिश्तेदारों की जानें चली गयी थी । निराला ने लिखा था कि दाह संस्कार के लिए लकड़ियां कम पड़ जाती थीं और जहां तक नजर जाती थी गंगा के पानी में इंसानी लाशें ही लाशें दिखाई देती थीं। बेटी की याद में रचित 'सरोज स्मृति' तो हिंदी साहित्य की एक मार्मिक धरोहर है।

समकालीन परिदृश्य को साहित्य के आईने में देखें तो प्रसिद्ध आंचलिक उपन्यासकार फणीश्वरनाथ रेणु जी की उपन्यास 'मैला आँचल' का प्रमुख पात्र डॉ.प्रशान्त बेहद प्रासंगिक दिखाई देते है। समाजसेवा की दृष्टि से एक पिछड़े गाँव मेरीगंज जाते है वहाँ के सैकड़ों लोग हैज़ा, कालाजार, मलेरिया से पीड़ित हैं कई जान गवां चुके है।

डॉ.प्रशान्त मेडिकल काउंसिल बोर्ड से अनुमति लेकर तरह तरह के नमूने एकत्र कर उसकी जांच पड़ताल करते है उसकी तह तक पहुँचने की निरंतर कोशिश करते है ।

नागार्जुन की कविता 'प्रेत के बयान' में भुखमरी के शिकार मृत्यु को प्राप्त दशा का यथार्थ चित्रण किया है---

" ओ रे प्रेत
कड़क कर बोले नरक के मालिक यमराज
सच सच बतला
कैसे मरा तू
बुखार कालाजार से ।।"

टाइम्स ऑफ इंडिया अखबार में पाकिस्तानी लेखक, कवि अहमद अली के उपन्यास 'ट्वाइलाइट इन डेल्ही' में बताया गया है कि महामारी के मृतकों को दफनाने के लिए कैसे कब्र खोदनेवालों की किल्लत हो जाती है और दाम आसमान छूने लगते हैं ।

प्रगतिशील लेखक संगठन के पुरोधाओं में एक, राजिंदर सिंह बेदी की कहानी 'क्वारंटीन' में महामारी से ज्यादा उसके बचाव के लिए निर्धारित उपायों और पृथक किए गए क्षेत्रों के खौफ का वर्णन है ।

प्रेमचंद की कहानी 'ईदगाह' में हैजे का जिक्र है। ओडिया साहित्य के जनक कहे जाने वाले फकीर मोहन सेनापति की 'रेबती' कहानी में भी हैजे के प्रकोप का वर्णन है ।

ज्ञानपीठ पुरस्कार से सम्मानित मलयाली साहित्य के दिग्गज तकषी शिवशंकर पिल्लै का उपन्यास, 'थोत्तियुडे माकन' (मैला साफ करने वाले का बेटा) में दिखाया गया है कि किस तरह पूरा शहर एक संक्रामक बीमारी की चपेट में आ जाता है ।

विश्व साहित्य पर नजर डाले तो कामू से पहले भी लेखकों ने अपने अपने समयों में बीमारियों और संक्रामक रोगों का उल्लेख अपनी रचनाओं में किया है ।

नोबेल पुरस्कार विजेता और प्रसिद्ध पुर्तगाली उपन्यासकार खोसे सारामायो ने 1995 में 'ब्लाइंडनेस' नामक उपन्यास लिखा था जिसमें अंधेपन की महामारी टूट पड़ने का वर्णन है ।

2007 में जिम क्रेस ने 'द पेस्टहाउस' लिखा जिसमें लेखक ने अमेरिका के प्लेग से संक्रमित अंधेरे भविष्य की कल्पना की है।

आज के कोरोना समय में जब अधिकांश लेखक बिरादरी ऑनलाइन है तो दुनिया ही नहीं भारत में भी विभिन्न भाषाओं में कवि कथाकार सोशल मीडिया के जरिए खुद को अभिव्यक्त कर रहे हैं। डायरी, निबंध, नोट, लघुकथा, व्याख्यान और कविता लिखी जा रही है, कहीं चुपचाप तो कहीं सोशल नेटवर्किंग वाली मुखरता के साथ ।

साहित्यकार अपनी रचनाओं के माध्यम से वर्तमान विश्व व्यवस्था आर्थिक, सामाजिक,सांस्कृतिक और व्यापारिक आधार पर महामारी द्वारा हुई तबाही के प्रभाव को रेखांकित कर रहे है ।

संदर्भ :-

1 प्रेमचंद की श्रेष्ठ कहानियां/प्रेमचंद
2-उत्तरकथा उपन्यास भाग (1 व 2)/ नरेश मेहता
3-कुल्लीभाट, उपन्यास/ सूर्यकांत त्रिपाठी निराला
4-मैला आँचल, उपन्यास/फणीश्वर नाथ रेणु
5-प्लेग की चुड़ैल, कहानी/ भगवानदास
6-वीभत्स, कहानी/ पाण्डेय बेचन शर्मा उग्र
7-आधा गाँव, उपन्यास/राही मासूम रज़ा
8-प्रेत का बयान, कविता/ नागार्जुन ।

मानवजनित प्रभाव : पर्यावरण, समाज एवं मानव स्वास्थ्य पर

विश्वजीत डुमार
डॉ. हरीसिंह गौर विश्वविद्यालय
सागर, (म0प्र0)

मानव प्रारंभ से ही प्रकृति प्रेमी रहा है। मानव के उदविकास (Human Evolution) से आज तक पर्यावरण मानव समाज के साथ चल रहा है पर्यावरण और समाज को मानव के जीवन से अलग कर दिया जाये तो समाज को कोई अस्तितत्व नही रहेगा इसलिये दोनों एक दूसरे के पूरक है। म्ण्टण् टायलर के अनुसार ''संस्कृति वह समग्र संकुल है जिसमें ज्ञान, विश्वास, रीति–रिवाज, प्रथायें, परंपरायें, नैतिकता आदि को मनुष्य समाज का सदस्य होने के नाते ग्रहण करता है।'' मानव के उद्विकास के लिये चार्ल्स डारविन ने अपनी पुस्तक "The Origin of species" में उद्विकास की व्याख्या करते हुये कहा है कि जो प्राणी प्रकृति के अनुकुल अपना जीवन ढाल लेते है वही जीवित रहते है। कोरोना यह वर्तमान में सबसे ज्वलंत विषय है जिसने मानव स्वास्थ्य, समाज एवं पर्यावरण को पूरे विश्व में घातक महाविनाश की स्थिति में ला दिया है आज पूरा विश्व पूरे मानव समाज की दिनचर्या और नजरिया सामाजिक दूरी (Social Distance) मे तब्दील हो गया है। वर्तमान में सामाजिक सांस्कृतिक कार्यक्रम प्रथा परंपराओं को भी एक नये तरीके से लोग जीना चाहते है, सामाजिक संगठन में मनुष्य अब कुछ दूरियॉ बना रहे है, कोरोना मानव स्वास्थ्य पर इतनी तीव्रता से हमला करता है कि व्यक्ति का शारीरिक स्वास्थ्य बहुत कमजोर कर देता है यहां तक कि उपचार जल्दी नही हुआ तो मृत्यु निशचित है। हमें पर्यावरण के खिलाफ कभी भी ऐसे अविष्कार नही करने चाहिये जिससे पूरी मानव जाति, मानव समाज, और पर्यावरण के अस्तित्व को खतरा है।

Guidelines of Fellow of Environment and Social Welfare (FESW) award

The Executive Board of the ESW Society, Khajuraho India has approved a Fellow of Environment and Social Welfare (FESW) award to recognize members of the FESW for distinguished contributions to the field of Environment and Social Science, and for promoting and sustaining the professional stature of the field.

A **fellow** is a member of a group of people who work together in a **fellowship** pursuing mutual knowledge or practice. A **fellowship** is a monetary award connected to a specific field. Usually given to scientist, professor, assistant professor and researcher.
Such accomplishments will have advanced the Education, Environment, Art and science & technology, as evidenced by:

- Sustained service and performance in the advancement of science and technology
- Publication of papers, articles, books, and standards which enhance the knowledge of Science
- Innovative development of new technology
- National and international service contributions
- Professional recognition

Requirements and Conditions will

- Candidates will have a minimum of one year's active participation in ESW.
- Candidates will be nominated by their national delegation of FES Fellow. Each delegation may nominate at maximum of two (2) candidates per year.
- Nominations shall be submitted on the official form available from the ESW Secretariat.
- Nominations must be submitted to the ESW Secretariat no later than December 31 of the year prior to that in which the individual is recognized as Fellow.
- Nominations will remain valid for three years.
- All information on nominees will be held in strict confidence.
- Fellows will be selected by the Executive board based on the Performance of Applicant.

Number of Fellows

- Maximum of 06 Fellows will be selected each year, as determined by the Executive committee.

The Award

- The ESW Chair will present the Fellow of FESW Award at the ESW Conference of the ESW Society or Annual assembly.

Letter for ESW Membership

ENVIRONMENT & SOCIAL WELFARE SOCIETY, KHAJURAHO

Dedicated to Environment, Education, and Science & Technology entire India since Bi-millennium,
Under Government of M.P., Firms & Society Act 1973
Accredited by JAP Govt. of MP & NITI Aayog, Govt. of India

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Dear,
Applications are invited from the Eminent Scientist, Professor, Academic Institutes, University, Their affiliated Colleges, Deemed Universities, Autonomous Research Institution, and Industrial R & D Units for **Member** of Environment & Social Welfare Society, Khajuraho India. Membership form may be downloaded from Website http://www.godavariacademy.com.

An application filled dully sign by you in all respects should be submitted to President of ESWSociety**.** Payments are accepted only through Bank or NEFT online transfer in the account.
Name of Beneficiary: Environment and Social Welfare Society
Account Number: 77352200000561
Name of Bank: Syndicate Bank
Branch: Chhatarpur, Madhya Pradesh
IFSC code: SYNB0007735

Please mail us complete membership form dully signed by you along with fee. Please inform us when you transfer payment to ESWSociety account so that we can track your payment (mail scan copy as proof to eswsociety320@gmail.com).
Membership Fee
A. Patron member Rs 10,000/- or more; **B. Life member** (10 years) Rs.5000/- or more**;**
C. Annual member Rs. 600/- per year; **D. Honorary member**

Board of Directors may offer honorary membership time to time the eminent scientist and distinguished persons. You will receive attractive certificate from ESWSociety, you can display on your office wall.

Only selected Life Members are privileged to write the abbreviation **F.E.S.W.** (Fellow of the Environment & Social Welfare Society) with their names.

With Regards,

All correspondence to:
Executive Director
Environment and Social Welfare Society (ESWSociety)
Head Office: Vidhyadahr Colony, Khajuraho Madhya Pradesh, India
Regional Office: Godavaripuram, Bajrangnagar, Ward No.31, Chhatarpur-471001, India
Email: eswsociety320@gmail.com, Mobile: +91-9425143654
Website; http://www.godavariacademy.com

MEMBERSHIP FORM ***Regd. No.SC2707-2K***

ENVIRONMENT & SOCIAL WELFARE SOCIETY, KHAJURAHO

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Website: http://www.godavariacademy.com
Mobile: 09425143654 Email: eswsociety320@gmail.com

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To Photo
The President/Secretary
Environment and Social Welfare Society
Regional Office, Chhatarpur 471001

Dear,

I wish to be a Petron member/ Life member /General member of **ENVIRONMENT & SOCIAL WELFARE SOCIETY** (ESWSociety) Khajuraho-471001, India and agree to abide by your rules and regulations. (For details see Letter call for Membership)

1. Name Dr……..……..……
2. Designation……..……..
3. Date of birth……..……
4. Address

Office……..……

…….

Mailing……..……

……..……

5. Mobile / Telephone:……..
6. Email:……
7. Academic Qualification:……...
8. Field of specialization:

(1)…….

(2)…….

(3)……..

Signature of applicant