ENERGY MANAGEMENT

1. Botryococcus braunii for biodiesel production

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Among the micro algae Botryococcus braunii is one of the organisms known to have high amount of hydrocarbon up to 85% of its dry weight. Therefore throughout the world intensive investigations are being made to utilize this organism for biofuel to meet the demand in future. India is bestowed with different ecosystems and diversities of flora and fauna. The organism. B. braunii is known to occur in oligotrophic water bodies. In the present attempt, the samples of B. braunii were collected from the Southern part of India such as Tamil Nadu, Kerala, Andhra Pradesh and Karnataka. The specimens were collected with a help of 100µm plankton net since the size between 200-800 µm. They were kept in CHU13 medium and brought to the laboratory and maintained at 24+1°C. 30 µEm⁻²s⁻¹ light intensity and 12/12 light dark cycle. Among the samples, a total of 38 isolates were isolated by hand picking using the basal agar medium. They were repeatedly subcultured and inoculated in the basal medium. The contaminants of blue green algae were eliminated with an antibiotic steptomycin sulphate at 2000 ppm under light for 30 min. and transferred to antibiotic free medium and the contaminants are diatoms were eliminated with the medium amended with 5 ppm of germanium di-oxide. Only nine isolates were survived well in the laboratory conditions and the rest of them did not grow and bleached during the study period indicating that they require certain specific environs for their survival. The rest of 9 isolates were studied for their growth by chlorophyll, a, b and total lipid content. Among them two isolates contained high amounts of lipid content. Therefore they were chosen for intensive investigation. One of the interesting observations that we made that the cells in the colonies searegate and grow independently by means of divisions as well as autospore production. The B. braunii (single cell stage) was also studied for its growth and lipid production. Later the cultures were transferred to the open condition and subsequently to race way ponds. A method had been developed successfully to avoid flies in the race way ponds further it also helped to control the contaminants of blue green algae and diatoms. The growth rate of organisms under open race way pond was high than laboratory conditions. The harvested samples of B. braunii under race pond were extracted for total lipid and transesterified into biodiesel and subjected for GC-MS analysis. The prominent fatty acids such as palmitic, oleic and linoleic are present in the fatty acid methyl ester (biodiesel). Keywords: Alage, *Botryococcus* sp., marine, economic importance.

2. Growth of wind energy: A case of wind energy in Tamil Nadu

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Wind power harvesting started in 1980's in India. The first pilot projects were launched in the states of Gujarat and Tamil Nadu by the respective state electricity boards with the technology from Denmark later picked up by the private investors in early 90's. Few other states like Maharastra, Karnataka, Kerala and Rajastan started their installations in mid 90's. India ranks 5th in wind power installed capacities by having installed 10254 MW (as on march 2009) in the global scenario. Tamil Nadu stands 1st in the installed capacities within the country by having 4301.63 MW (as on march 2009), which is 42% of the country's installation. This paper aims at evaluating the growth of wind energy harvesting in Tamil Nadu. This paper tries to explore the reason behind this fact of Tamil Nadu being the front runner in the field. The possible reasons could be: 1) Availability of wind potential, 2) Availability of land, 3) Electricity grid infrastructural facilities and 4. Policies of the government. The policies of the government include the tax benefits and incentives offered by the central government and the state government. This paper will try to compare different states in the above mentioned aspects. The identification of the reasons for the growth of Tamil Nadu would benefit other states to progress in further and thereby our country's total wind power installation would go up and meet the country's electricity demand.

Keywords: Wind power harvesting, wind potential, electricity grid.

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3. A novel approach for energy generation from wind power R. A. Prasaanth and S. Siddharth

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India's wind energy production is estimated to be 11,875 GW. The objective of this work is to obtain energy from small or large gust produced near the ground surface of a moving object based on the 'Boundary layer theory'. Gust is a current of strong wind. It is produced along the sides of fast moving objects eg: train. According to boundary layer theory, from the point of contact of the body, there will be a decreasing velocity profile (body with maximum velocity and the fluid is stationery). By placing an omni-directional wind mill eg: Helix windmill at an optimum point in this velocity profile, maximum output (electrical energy) is obtained. This highly feasible method is applicable to energy generation using the movement of train and any fast moving objects such as vehicles, on the sides of aircraft runways, along the national highways etc. This method is highly advantageous because it provides high rotational or mechanical power to the wind blades, which in turn can be converted to electrical power. At places where normal wind mills are installed, the minimum wind speed required is 15 km/h. However, at the places where these gust are produced by fast moving objects, the minimum wind speed is 25-35 km/h. This is the most important feature of this method since more kinetic energy is fed to the wind turbine system. The proposed method is a better and efficient way to support the government's plans in the promotion of wind energy sector.

Keywords: Boundary layer, gust, omni-directional, helix.

4. Population and energy consumption - A comparative analysis of India and China R. Sumathi

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The expansion of human population has been supported by a steady growth in our use of high-quality energy. The operation of our present industrial civilization is wholly dependent on access to a very large amount of energy of various types. If the availability of this energy were to decline significantly it could have serious repercussions for civilization and the human population it supports. As industrialization has progressed, the amount of per capita energy used has also increased, rising from a global average of 1.2 tonnes of oil equivalent (toe) per person in 1966 to 1.7 toe per person in 2006. As the global energy supply tripled over that time, the population has doubled. The current global energy mix consists of oil (36%), natural gas (24%), coal (28%), nuclear (6%), hydro (6%) and renewable energy such as wind and solar (about 1%). During the historically recent period of global industrialization, the level of human population has been closely related to the amount of energy we have used. Over the last forty years, the per capita energy consumption has averaged about 1.5 toe per person per year. As industrialization has progressed, the amount of per capita energy used has also increased, rising from a global average of 1.2 toe per person in 1966 to 1.7 toe per person in 2006. As the global energy supply tripled over that time, the population has doubled. The combined populations of China, India, Pakistan and Bangladesh (2.7 billion) today use an average of just 0.8 toe per person per year, compared to the global average of 1.7 and the American consumption of about 8.0. In 1750, the world's population was approximately 720 million people. Over the previous 1000 years, this population had been growing very slowly at an average rate of about 0.13%. At this rate population doubles every 500 years and it would have taken over 1500 more years (sometime near the year 3250) to reach our current population of 6 billion people. But sometime in the 18th century, circumstances changed and population began growing rapidly. Energy consumption is loosely correlated with gross national product and climate, but there is a large difference even between the most highly developed countries, such as Japan and Germany with 6 kW per person and United States with 11.4 kW per person. In developing countries, particularly those which are sub-tropical or tropical such as India, the per person energy use is closer to 0.7 kW. Bangladesh has the lowest consumption with 0.2 kW per person. The US consumes 25% of the world's energy with a share of global GDP at 22% and a share of the world population at 5%. The most significant growth of energy consumption is currently taking place in China, which has been growing at 5.5% per year over the last 25 years. Its population of 1.3 billion people (20% of the world population) is consuming energy at a rate of 1.6 kW per person. Over the past four years, electricity consumption per capita in the U.S. has decreased about 1% per year between 2004 and 2008. Power consumption is projected to hit 4,333,631

million kilowatt hours by 2013, an annual growth rate of 1.93% for the next five years. Consumption increased from 3,715,949 in 2004 to an expected 3,937,879 million kilowatt hours per year in 2008, an increase of about 1.5% per year. The rate of increase has been steadily decreasing - it was 2.5% in the 1990s. U.S. population has been increasing about 1.3% per year, a total increase of about 6.7% over five years. The decrease has been mostly due to efficiency increases. Compact fluorescent bulbs, for example use about one third as much electricity as incandescents. LED bulbs, however, use about one tenth as much, and over their 50,000 to 100,000 hour lifetime are cheaper than compact fluorescents. The Government of Tamil Nadu has recently presented the case of converting all the street lamps in to LED bulbs to reduce the amount energy consumed. This paper is to quantify the degree of correlation between energy produced and consumed, GDP, Industrial development, population, and per capita income. As a case study, the two countries with largest population are taken i.e., China and India are compared. There are studies which has already been made which proved the fact that the link between population and energy involves two intermediate connecting elements. The first link relates to levels and changes in economic development, approximated by income or gross domestic product (GDP) per capita. Typically, the greater a region's per capita income, the greater its per capita consumption of energy: The average per capita GDP and energy consumption of the world's developing countries are, respectively, only about one-seventh and one-eighth those of industrial areas. Notwithstanding, this marked per capita disparity, given the sheer population size of developing regions-over three-guarters of the world total-the absolute amount of energy consumption and of GDP are relatively large: one-third of world energy use and about two-fifths of world GDP. What is true of prevailing levels in the relationship between per capita income and energy is also true of rates of changeover time since as income per capita rises, so does per capita energy use. The reason is evident. Energy-electricity to run motors, fuels for transport, and hundreds of other applications-is a vital complement to other investments for boosting productivity and stimulating economic growth. In turn, that very growth gives rise to acquisition of household necessities and creature comforts associated with increased energy usage. Eventhough income and energy use are conspicuously correlated, the degree of the relationship is by no means perfect and unvarying, which raises the second point to consider in linking population and energy. Even at comparable levels of per capita GDP, the volume of energy use will differ among countries and regions, depending on structural characteristics of the economy, spatial features, climate, fuel and power prices, government conservation policies, and other factors. Similarly, changes in per capita income need not signify commensurate rates of energy use.

Keywords: Population, energy, China, India.

5. Minimizing the usage of thermal power by embedding solar energy with non-renewable energy sources

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India's power sector has a total installed capacity of approximately 1, 46,753 megawatt (MW) of which 54% is coal-based, 25% hydro, 8% is renewable and the balance is the gas and nuclear-based. Power shortages are estimated at about 11% of total energy and are likely to increase in the coming years. In order to overcome the power crisis in future, investment of about Rs. 24 lakh crore are required Therefore, the main objective of this project is to minimize the usage of electricity coming from thermal power station and provide an uninterrupted power supply by embedding solar energy with non-renewable energy sources (such as thermal, nuclear or hydro) with the help of a microcontroller, especially for domestic purpose. Fortunately, India lies in sunny regions of the world. Most parts of India receive 4-7 kWh of solar radiation per square meter per day with 250-300 sunny days in a year. India has abundant solar resources, as it receives about 3000 h of sunshine every year, equivalent to over 5,000 trillion kWh. This means that India can easily utilize the Solar Power which in turn could help us to combat against electrical power crisis in future. The major limitation with solar panels is that it is effective only under clear sky and bright sunlight. Here this major limitation is going to be one of the greatest boons for our project. In this project we are going to generate uninterrupted electrical energy for the domestic purpose both from the solar panel and the EB line. It mainly consists of four blocks- Solar panel block, EB line block, controller block, rechargeable battery block. Under normal condition, the function of the controller is to draw electrical energy only from the solar panel and if insufficient energy is produced from solar panel, then electrical energy will be drawn **GESIS 2010-CHENNAI**

from EB line. During power failure electrical energy will be drawn from the battery which will periodically get recharged through the solar power lines. This minimizes the usage of electricity from EB line. In this way we will not only save electrical energy for our future generation but also reduce global warming that is resulted from thermal and nuclear power house.

Keywords: Power sector, microcontroller, solar power, nuclear power house.

6. Energy and economic growth

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This article surveys the relation between energy and economic growth and more generally the role of energy in economic production. While business and financial economists pay significant attention to the impact of oil and other energy prices on economic activity, the mainstream theory of economic growth pays little or no attention to the role of energy or other natural resources in promoting or enabling economic growth. An exception of course was the extensive discussions concerning the "productivity slowdown" following the 1970s oil crises. Resource and ecological economists have criticized this theory on a number of grounds, especially the implications of thermodynamics for economic production and the long-term prospects of the economy. While a fully worked out alternative model of the growth process does not seem to exist, extensive empirical work has examined the role of energy in the growth process. The principal finding is that energy used per unit of economic output has declined, but that this is to a large extent due to a shift in energy use from direct use of fossil fuels such as coal to the use of higher quality fuels, and especially electricity. When this shift in the composition of final energy use is taken into account energy use and the level of economic activity are found to be tightly coupled. When these and other trends are taken into account the prospects for further large reductions in the energy intensity of economic activity seem limited. These findings have important implications for environmental quality and economic and environmental policy. This article is structured to cover these key points in a systematic fashion. The first section of the article reviews the background theory of production and growth from different points of view - those based in economics and those based in the natural sciences. The starting premise is that gaining an understanding of the role of energy in economic growth cannot be achieved without first understanding the role of energy in production. The section starts by reviewing the scientific basis of the role of energy in production and hence also in the increasing scale of production involved in economic growth. However, institutional phenomena also affect how this role plays out and therefore the economist view of growth and production and potential role of energy is necessarily more complex than just this scientific understanding. The mainstream theory of economic growth is, therefore, reviewed next. The development of both natural and especially social sciences such as economics partly reflects historical accident both in those subjects that have been considered worthy of study and the ways in which they have been studied. This is certainly true of the theory of growth and the limitations of its consideration of energy and other resource issues has been the subject of strong criticism grounded in the biophysical theory of the role of energy.

Keywords: Economic growth, thermodynamics, production, electricity.

7. Demand side management of electrical energy efficiency and environmental sustainability in India

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Electricity has a peculiar characteristic that it cannot be economically stored in large quantities. Electricity demand is the fastest growing form of energy consumed worldwide and it is predicted that the world's net electricity consumption will double by 2030. Therefore its generation and consumption need to be matched at all times. Demand side management (DSM) refers to the ability to alter end user electrical consumption in response to system conditions. It aims at improving energy efficiency through reduction of Kilowatt hours of energy consumption for the same service or activity. Other benefits of DSM could include higher end-use energy efficiency, improvement in quality and reduction in cost of power. Energy-efficiency improvements can slow the growth in energy consumption, save consumers money and reduce capital expenses for energy infrastructure. Innovative and efficiency improvements through DSM programmes have been carried out in a more open energy market. At the

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same time, government intervention has also been strengthened by the worsening of environmental situation and the need to significantly reduce emissions of greenhouse gases. DSM programmes are used to eliminate or reduce the need for additional peak or base load generating capacity and/or distribution facilities. Losing this opportunity to build efficiency into new economies would have serious financial, environmental and social consequences in the future. India is the world's sixth largest energy consumer. The power generating capacity increased from 66086 MW to 97846 MW during 1990-91 to 1999-2000 at an annual rate of 4.5%. The installed capacity of the power sector increased 60 fold between 1950 and 2000 at an annual growth rate of 8.5%. The per capita electricity consumption in India increased from 354.75 kWh in 1999-2000 to nearly 704.00 kWh in 2007-2008. The CO₂ production in India has been showing an increasing trend in the new millennium in consonance with the rate of growth of Indian economy. Emissions per unit of electricity supplied from fossil fuels are estimated at 167 tonnes of carbon per GWh in 2005. In India power plants burn mostly coal with approximately 10-30% excess air. The national inventory of green house gases indicates that 55% of the total emissions in India come from energy sector. While public is interested in using energy more efficiently, there are several market barriers that prevent it from making rational investments in efficient technologies and practices. As the economy develops, households switch over from traditional fuels to modern and cleaner energy. Hence it is certain that household consumption of electricity is expected to increase rapidly with the increase in the growth of the economy and rise in per capita income. Urbanisation and increased flow of income call for ever-expanding sets of diverse needs. If those appliances are used efficiently, they will augment electric supply. Energy conservation potential for the economy as a whole has been assessed as 23% with maximum potential in industrial and agricultural sectors. At present new rare-earth phosphors have been developed to provide a warm light that is close in quality to the light of an incandescent. The new phosphors improve the colour of fluorescents with the same efficiency. Electricity for lighting represents approximately 34% of Indian peak power and roughly 17% of the electrical energy consumed. Incandescent lighting is estimated to constitute at least 17% of the peak demand, and roughly 10% of the national electricity consumption (135 TWh in 1984-85). Experts suggest that transferring subsidies from electricity to compact fluorescent lamps (CFLs) is a good proposition. Energy labelling provides information in a form that is objective and easy to understand for customers. The specified products are required to supply and declare energy data that has been determined when tested to the relevant Standard. The operating cost is also known as the 'second price tag,' and can help customers choose between models. Both energy labelling and standards stimulate technological change or innovation. This paper aims to examine electricity production and consumption at the All-India level and analyse the social and environmental aspects of electricity in the household sector.

Keywords: Electricity, energy-efficiency, green house gases, uurbanization.

8. Population growth and energy demand: Issues for India Roselin K. Philips Dept. of Business Economics, Anna Adarsh College for Women, Anna Nagar, Chennai-40, TN, India roselinprince@yahoo.com

World population had grown from 230 million in 1 AD to 1 billion in early 1800s, at the start of industrial revolution, with a decadal growth rate of 0.8%. Since then it exploded to 6.5 billion plus, at a decadal growth rate of over 11% till to date. In the past century alone, the population quadrupled. This population explosion was closely accompanied by a simultaneous rise in wealth creation, which led to an increase in consumption of goods, services and energy. The world per capita income has also grown by several folds, in the past 150 years. The UN predicts world population to grow from 6.6 billion in 2007 to 8.2 billion by 2030. This means, the demand for energy must increase substantially over this period. The World energy outlook 2009 from the OECD's International energy agency (IEA) states that from 1980 to 2007, total world primary energy demand grew by 66% and to 2030, it is projected to grow at a lesser rate, which is 40%. Electricity growth is projected to grow by 76% from 2007 to 2030, i.e. growing at an average of 2.5% per year, but the demand is most dramatic in Asia, averaging 4.7% per year to 2030. Over 70% of the increase in energy demand is from developing countries led by China and India. So population growth and increased standard of living in developing countries will cause strong growth in energy demand, which is not supported by increased energy production. Shifting the focus to India, the situation is no different. India accounts for about 2.4% of the world's total annual energy production, but consumes about 3.3% of the world's total annual energy produced. This

imbalance is growing and the country is projected to surpass Japan and Russia to become world's third biggest energy consumer by 2030. This gap between the energy demand and supply will slow down the economy. At the same time, India's electricity transmission and distribution losses are the highest in the world, accounting to 27% according to World resources institute (WRI), where as the total power transmission and distribution losses of OECD countries are just 7%. Solving the energy challenge requires behavioural change and new technological approaches. There is a need to dramatically change the way we create, distribute and consume energy. This paper focuses upon the energy demand and supply disparity in India and suggests certain measures to reduce the gap by increasing energy production through renewable and non-renewable sources, by reducing transmission and distribution losses and by adopting efficient energy use.

Keywords: World population, world energy outlook, electricity growth, world resources institute.

9. Demand and supply of power in India

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Region wise demand and supply of power in India was examined in this paper. For which the country was divided into 5 region, northern region, western region, southern region, eastern region, north eastern region. The annual generation of power in different sources 1980-81 to 2006-07 in India was increasing continuously throughout the period of reference. The demand and supply of power generation in northern region indicated that nearly 11% of shortage. Nearly 16% of shortage was observed in western region. Among the four regions the shortage of power was less in southern region and eastern region.

Keywords: Northern region, western region, southern region, eastern region, north eastern region.

10. Status of power generation in India

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In this paper an attempt was made to analyse the installed capacity of power utilities in India. For which the country was divided into five regions namely northern region, western region, southern region, eastern region, north eastern region. Installed generating capacity plan wise also examined which indicated that the generating capacity was in an increasing trend in case of all sources of energy during 1947 to the end of 10th plan. Power generation was maximum during the 6th plan period and during 7th plan period it was decreased to below 80,000 MW from then onwards it was gradually increased upto 1, 40,000 MW approximately. In northern region central sector contribution was more. In case of Western region Central sector once again contributed more. In certain states and union territory in India certain type of energy production was observed to be nil. Renewable energy production was observed to low in India. The renewable energy source in more reliable source for future generation and it could meet the demand of future India.

Keywords: Northern region, western region, southern region, eastern region.

11. The trends and pattern of wind energy production in India

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Wind energy is one of the fastest growing energy sectors in the world. This is the best opportunity to start the transition to a Global economy based on renewable energy. Wind is the hot issue over the world for last two decades or so. Wind energy sources have the potential to reduce the fuel cost, emission of green house gases and disturbances to the natural habitat significantly that are common with conventional energy generation. The environmental degradation and global warming caused by the large scale deployment of fossil fuels brought to focus the need to harness renewable energy in a bigger way to supplement energy supplies from conventional sources and provides energy security to the country. Small hydro, biomass, solar, wind and ocean energy are some of the sources of renewable energies which attracted a lot of attention. Amongst them wind is the most preferred option, because

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it is not only eco-friendly but also viable and cost effective with the present level of technology India is the fifth largest wind power producer in the world India witnessed unprecedented growth in the wind energy sector. Thus this paper presents a comprehensive overview of global scenarios in the availability and usage of wind energy. Further this paper highlights towards the harnessing of wind energy and finally the generation of electricity with wind power in different states in India has been presented. **Keywords:** Wind energy, renewable energies, wind power producer, wind energy.

12. Population growth and energy demand in Tamil Nadu

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Demand for energy is growing steadily and is likely to reach increasingly higher levels as population and the economy expand. During the last quarter-century, world energy demand increased by over half and a similar increase is projected between now and 2030. However, future growth builds from today's much larger base, meaning that tomorrow's energy requirements are unprecedented in scale. This will pressure the global supply system and require increased emphasis on energy use efficiency in transportation, residential, commercial, and industrial sectors. The household sector accounts for 15 to 25% of primary energy use in developed countries and higher share in developing countries. A huge gap remains between household energy use in developed and developing countries. Increase in energy-based living standards and more efficient energy use are major opposing trends in developed countries that affect household energy consumption. Diffusion of energy efficient technologies for cooking, heating, lighting, electrical appliances, and building insulation in developing countries has been slow. Governmental policies to influence household energy consumption are often contradictory and have brought mixed results. The researchers have selected Namakkal district due to the equal distribution of both rich and poor population. In this district, Thiruchengode taluk Chittalandur village is selected for the present study. The study randomly selected the 50 samples. The study highlights the household electricity consumption in selected Area.

Keywords: Energy, industrial sectors, electrical appliances, household electricity consumption.

13. A method for generating electricity by fast moving vehicles S. Bharathi, G. Balaji and M. Manoj Kumar

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A method for generating electricity using high wind pressure generated by fast moving vehicles channelling the induced wind in the direction of the wind turbine; converting the energy of the wind into mechanical energy by using wind turbine; and converting the mechanical energy into electrical energy by using a generating device and can be used for applications. In this modern age more and more energy is required for daily consumption in all walks of life. Sources and quantum of fossil energy are dwindling day by day and getting exhausted at a very fast rate. Hence conservation, tapping new sources of energy and harnessing of the same from the various non conventional sources, is an important aspect of energy production/conservation and utilization all over the world. The sky-rocketing price of crude oil has ruined the economy of many countries, hence there is a crying need for production of energy from non conventional sources at the earliest. The present concept is one of the answers to this problem, as the said induced wind into useable electric energy which can be utilized straight away or stored in batteries. The fixed wind powered electricity generation systems in use, till now are dependent on wind direction and the force of the wind. But the wind is not available at all places and all time throughout the year. Therefore, there exists an immense need of a system for generating electricity from wind induced by moving vehicles, trains or airplanes, which is available throughout the year at various places and with sufficient force of wind. Therefore this invention provides a solution to the problem for generating electricity in this manner.

Keywords: Fast moving vehicles, mechanical energy, fixed wind, electricity generation systems.

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14. Urban population growth and energy demand

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A rapid rise in population and urbanization has increased the demand for energy. The available energy resources are not sufficient to meet the needs of growing cities and towns. Globalization and advancement of technology provide greater job opportunities in cities. The educated, organized and unorganised skilled labour migrate to cities. The population in cities is growing at faster rate for education, comfortable and better standard of living. Hence, there is continuous pressure on available energy resources in meeting the increasing demand. The demand from domestic, industrial and commercial sectors is comparatively high. Rapid urbanization has increased the consumption of non-renewable energy resources. The changes in lifestyle, increased affordability and availability have increased the usage of energy. Advancement in technology and provision of urban infrastructure has increased the demand from industrial and commercial side. The depletion of energy sources, the impact on energy markets and environmental issues due to emission of gases requires effective policy implementation and awareness among the public for better and intelligent utilization of available scarce energy resources. This article focuses on the impact of increase in demand for energy and possibility of using alternate energy resources.

Keywords: Urbanization, globalization, non-renewable energy.

15. Power crisis in Rajasthan-Strategies to attain sustainable development

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In the past hundred years development has been witnessed in the economy. Human beings have moved from carts driven by horses to space flight. All these have become possible only because of energy. And this is the reason why energy has been considered as the life blood of modern economy. No doubt the development of any economy depends on availability of energy, as development is positively correlated with the demand for it. Since industrial revolution, the use of more and more of energy has led to the path of prosperity and human welfare. In the modern era, energy is considered as inevitable and prime indicator of welfare. Energy is available in many forms but among all the sources electricity is considered as one of the important requisites for all economic and social activities. India is one of the fastest growing country in the world. But the development has resulted in many serious problems, and one among this is the growing power crisis. Power sector an important part of country's infrastructure is going through the process of churning. The power sector of our economy is confronted with the major problem of growing demand - supply gap. The per capita consumption of power has been continuously increasing in the past few decades but the increment in the production rate could not keep pace with the growing demand which has ultimately resulted in the widening of demand supply gap of electricity. The policy of the government in order to overcome the power deficit has been oriented towards increasing the supply of electricity, to bring a balance between demand and supply. But this would in fact have an adverse effect on the environment, since a major portion of installed capacity is based on thermal power resulting in climate change. The present paper would focus on the electrical power crisis in India with special reference to Rajasthan, the reasons for power crisis and the strategies to be adopted in order to overcome the crisis. The objective of the study is : To focus on growing power demand and supply gap in India and Rajasthan; To highlight the Socio economic aspects responsible for power crisis in Rajasthan; Demand side management approach to attain sustainable development.

Keywords: Power crisis, demand side management, socio economic aspects.

16. Population growth and environmental degradation in India

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Population growth and economic development contribute serious environmental problems in India. These include pressure on land, deforestation and water scarcity and water pollution. India faces the most acute pressure on agricultural land. Over the past fifty years, while India's total population increased by about 3 times, the total area of land under cultivation increased by only 15.92 percent

from 118.75 to 141.23 million hectares. Despite past expansion of the area under cultivation, less agricultural land is available to feed each person in India. Direct impacts of agricultural development on the environment arise from farming activities, which contribute to soil erosion, land salination and loss of nutrients. The spread of green revolution has been accompanied by over exploitation of land and water resources and use of fertilizers and pesticides have increased many folds. Land is degraded when it suffers a loss of intrinsic qualities, decline in its capabilities or loss in its productive capacity. Land degradation may be due to natural causes or human causes or it may be due to combination of both. Soil erosion is the major cause of land degradation. Soil is the non-renewable natural resource. which supports life on earth. Forests are an important natural resource of India. They have moderate influence against floods and thus they protect the soil erosion. Forests also play an important role in enhancing the quality of environment by influencing the ecological balance and life support system. Due to population pressure, the forests are being destroyed. Water use in India has been increased over the past 50 years. Out of the total replenishable ground water; about 84 percent is made available for agriculture and livestock, the rest 16 percent is made available for domestic consumption, industrial use and power generation. Access to safe drinking water and proper sanitation is both a right and a basic need. Access to safe drinking water in many households is non-existent or inadequate and remains an urgent need. The study reveals that rapid population growth has led to the over exploitation of natural resources.

Keywords: Economic development, water pollution, soil erosion, land degradation.

ENVIRONMENTAL MANAGEMENT

17. Coastal resource management

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This article highlights some salient ecological features of Indian coastal resources and the need for its sustainable management. The transition between the land and the sea is one of the most fragile, complex and a productive ecosystem. It is bestowed with enormous resources, both-living, non-living and is a potential area for recreation and harnessing non-conventional energy resources (wave & wind energy). This is the zone of dynamic activity, constantly transforming itself to maintain equilibrium, under the varying intensity of the natural processes operating. The coastal zone of India has diverse ecosystems like mangroves, corals, beaches, wetlands, estuaries, lagoons and backwaters harboring many ecologically and economically important fauna and flora and also serves as a barrier against many destructive natural hazards. Indian seas are witnessing increased anthropogenic activities like marine fishing, off-shore oil and gas, marine transport, dumping ground for waste disposals, etc all of which have been bringing about changes in the coastal environment. Increasing stress due to development of industries, trade and commerce, tourism and resultant human population growth and migration towards coastal cities and urban centers pose a serious threat to the to the health of these coastal ecosystems and to lives and livelihoods of coastal communities. The industrial development of coast has resulted in degradation of coastal ecosystems and diminishing the living resources of exclusive economic zone (EEZ) in the form of coastal and marine biodiversity and productivity. Municipal sewage, land use, tourism, maritime transport, offshore oil exploration and production, dumping at sea degrade the marine environment. Felling of mangroves and clearing of forests increase the sedimentation rate affecting the live coral and species diversity. Mangroves are a crucial component deserving high priority in any coastal zone management plan as they are degraded and destroyed due to conversion into agriculture, aquaculture and industrial land. Fishery and fishery resources are another major component in coastal resource management. Preliminary efforts to develop a model coastal zone plan in three different stretches refined our skills to expand the plan at country level. As a result, an exhaustive management plan is being implemented at three different coastal states of the country. It is strongly hoped that many maladies afflicting coastal environment could be effectively addressed by formulating and actively adopting an all encompassing and exhaustive coastal zone management plan. Options to tide over this persistent issue is being debated at national and even international levels and some suggestions consistently made by public interest groups and NGOs includes: Earmarking exclusive zone for fishery, mangroves and other coastal biodiversity and for settlement for fishing communities. All fishery development recommendations suggest that Integrating fishing community with the ongoing development could be initiated to reverse their poverty. It could be done only through long term planning to enhance their special skills which will make them employable and eventually integrate them with the ongoing developmental process. It is also to be remembered that downslide in economic returns of fishing sector is a global phenomenon and Indian fishermen are no exception to this. It is strongly hoped that many maladies afflicting coastal environment could be effectively addressed by formulating and actively adopting an all encompassing and exhaustive coastal resource management plan.

Keywords: Coastal resources, Industries, fishing communities, mangroves.

18. CO₂ capture and storage: Filling up knowing-doing gap Ankur K. Bansal¹ and Diwan Singh² ¹Dept. of Environmental Engg., NIT Kurukshetra, India

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The aim of this paper is to fill up the knowing and doing gap of carbon capture and storage technologies to mitigate the climate change. To keep greenhouse gases at manageable level, it is essential to decrease the CO₂ concentration in ambient air through capturing and separation. The three main CO₂ capture technologies discussed include post-combustion, pre-combustion and oxy-fuel combustion. Other various separation techniques such as physical adsorption, chemical absorption, membrane

conjunction and chemical looping combustion (CLC) are also thoroughly discussed. This paper describes the technology, current status of the development, bottlenecks towards implementation and potential use.

Keywords: CO₂ capture, CO₂ storage, post-combustion, pre-combustion, oxy-fuel combustion.

19. Epigenetics-Cellular differentiation and a note on the consequence of childhood neglect

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The term 'epigenesis' was introduced by Casper Friedrich Wolff to comprehend the mysterious workings of Nature that awakes the structures to form *de novo* from the apparent homogeneous (structureless) mass of zygote. The jargon of epigenesis is further brought into limelight through one of the branches of biology viz., Developmental Biology, which deals with the causative features of embryonic development wherein it is elaborated as: the study of changes in gene function due to combinatorial factors that are heritable across trans-cellular generations in an embryo without bringing alterations in the gene sequence, which means that the factors other than DNA impinge on Heredity. Further, the heritable epigenetic changes are called 'epimutations'. McClintock observed one of the first epimutations in maize through transposon activity. The epigenetic factors play a pivotal role in eukaryotic organisms. The reviewing of literature indicates that despite the invariant nature of genomic DNA, the epigenetic processes dictate tissues' specificity. The role of epigenetics in the reprogramming, cellular differentiation and tissue specificity during growth and morphogenesis are reviewed and found amazing. Epigenetic regulation of biased expression of sex-specific genes and preferential expression and silencing of tumor suppressor genes, their transgenerational phenotypes and therapeutic avenues respectively have generated impetus to unfold methylation maps of genomes of respective tissues. The survival and well-being of a species invariably depends upon its reproductive investment and parental care. The occurrence of relatively a long duration of post-natal care among primates is not only a biological means to impart juvenile learning but also to provide an opportunity to acquire tools for social adaptation. Neuro-endocrine system favours potential acquisition of adaptations in an individual to meet challenges in the environment. Epigenetic interactions between the genome and the environment nurture an offspring and further serve to build the framework with enriched phenotypic plasticity. Histone proteins and DNA in the chromatin undergo methylation and the same has been unequivocally proven to be susceptible to stress and childhood neglect. Aberrant chromatin methylation in an offspring is believed to be a consequence of maternal neglect, which could cause a long-lasting neuroendocrine illness. Childhood neglect/abuse deregulates the response of HPA to stress possibly through epigenetic distortions. There is a lot of scope to unravel the signaling events linking the social exposure and the state of chromatin.

Keywords: Epigenesist, Casper Friedrich Wolff, transposon activity, neuro-endocrine system.

20. Environment and health perspectives of industrialization in India: Ennore Creek as a case study

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An approach towards deducing economic income values in terms of either environment or health is vital for global sustainability. At the same time, the growing population and industrial developments create stress to environment and health. This leads to neglect on a environmental hygiene in terms of good food, air, and water. Ultimately, the priority to short term benefits compromises the support to various biological systems result in environmental degradation leads to genomic erosion and threat to food security and health. The sluggish economic development in the last four decades becomes inevitable for introducing New Economic Policy in India, while countries like China, Singapore and Thailand introduced the tools of NEP and has achieved high economic growth with rapid social progress. NEP consists of three components such as, privatization, liberalization and globalization. Since 1991, the key thrust of the Indian policy was to open the economy and infiltrating the competition into various sectors so that the rapid growth of internal and external sectors would be inevitable. Thus, globalization

is aimed to integrate domestic economy with world economy through structural adjustment, such as devaluation of currency, removal of licensing import items, reducing custom duties and opening the economy with respect to exchange rates. The low income group who are dependent on the coastal resources for the livelihood is taken up as a case study for an economic appraisal of environmental degradation on human health. The national economy is dependent on industrial growth of the country. These industries are located close to the coastal resources for easy discharge of industrial effluents. These in turn affect not only the coastal resources but also the health of the people who would depend on these resources for their sustenance and livelihood. This paper brings about the consequences of the globalization in environment and health sectors when industrialization were allowed free access in India at the same time no strict labour and environmental regulations in force. Therefore, economists have to relate human health with environmental degradation to identify factors that have to be immediately taken up to reduce degradation of both environment and health. **Keywords**: Environment, economy, Ennore Creek, pollution, globalization.

21. Beach rocks from the south east coast of Tamilnadu, India - Occurrence, characteristics, formation and impacts

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Beach rock has only rarely been observed in the coasts. It is a hard costal sedimentary formations consisting of various beach sediments, lithified through the precipitation of carbonate cements. One such formation is noted on the South East Coast of Tamil Nadu, India. The objective of this contribution are to (a) collect and review information on reported occurrences, characteristics and formation mechanism of beach rocks and (b) consider their impacts on the coastal zone. The beach rock formation and evolution is studied by the various spectroscopic techniques. The FT-IR and XRD technique is used to identify the constituent of minerals and cementing materials of the beach rocks. The instrumental neutron activation analysis (INAA) is used to determine the elemental geochemistry of the beach rocks. Results are discussed and the conclusions are drawn. The combined spectroscopic techniques are used to throw light on the nature and cause of cementation.

Keywords: Beach rocks, mineral analysis, FT-IR, XRD, multi-elemental analysis, INAA.

22. Environmental impact of coastal aquaculture in Nagapattinam district of Tamil Nadu, India

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Aquaculture has developed rapidly over the last three decades to become an important economic activity worldwide and has witnessed high growth rates. Aquaculture is the rearing of aquatic organisms under controlled and semi-controlled conditions such as fishers, mollusces crustaceans and aquatic plants. Farming implies some. In India, along the 8118 kms coastline, 3.9 million ha of estuaries and 3.5 million ha brackish water areas in the country. Next to Andra Pradesh, Tamil Nadu has the second largest coastline of 1076 kms using 4,455 ha for farming of shrimp out of 56,00 ha of potential shrimp farming ranking sixth among the maritime states of the country. The rapid development of culture of shrimp is coastal areas of a large number of countries situated both in the eastern hemisphere and western hemisphere during the last decades has also been accompanied by many controversies resulting in environmental and socio-economic impacts of shrimp aquaculture. In India shrimp aquaculture and its unregulated growth during the early nineties has resulted in the matter being taken to the Supreme Court as public interest litigation. This paper discusses about the issues which have been raised regarding the prawn farming in the Nagapattinam district and the environmental impact of prawn farming is the same district, as the Nagapattinam district is one of the most prominent districts where nearly 1,283 prawn farms are registered.

Keywords: Aquaculture, mollusces crustaceans, prawn farming.

23. Removal of iron from wastewater using goose berry seed (big) as adsorbent G. Anusha and S. M. Suneethkumar

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Iron is normally found in spent pickle and from plating shops, steel mills, foundries, chemical milling, and wire drawing operations. It is also found in ground water. Iron in water is normally found in the ferrous state. Next to hardness, the presence of iron is probably the most common water problem faced by consumers and water treatment professionals. The secondary maximum contaminant levels (MCL) for Iron is 0.3 mg/l. Iron may cause conjunctivitis, choroiditis, and retinitis if it contacts and remains in the tissues. Hence to remove iron from water, a batch study has been conducted by adsorption process using activated carbon prepared from gooseberry seeds (big) as adsorbent and the removal efficiency was found by varying the parameters such as dosage, time, pH and concentration. The removal efficiency was found to be more than 75%. This experimental study has been carried out to develop an economical method of iron removal, so that even small industries can adopt this method for their wastewater treatment and hence they can prevent the polluted water entering the stream.

Keywords: Iron, spent pickle, maximum contaminant levels, conjunctivitis, wastewater treatment.

24. Climate change, water, agriculture, food security and livelihoods in Ponnaniar reservoir system

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The impact of climate change is proving to be one of the biggest influences on agriculture, water, food security and livelihoods. The IPCC's fourth assessment report (IPCC, 2007) reiterated the threats from global warming to developing countries like India. India is very vulnerable and many states in India are not prepared to meet the threats from climate change and extreme weather events. Climate change will most likely result in new combinations of soil, climate, atmospheric constituents, solar radiation and pests, diseases and weeds. Thus, the expected changes in climate will alter regional agricultural systems, with consequences for food production and it is estimated that under moderate climate change scenarios, there could be about 9% decline in farm-level net-revenues in India. As a part of ICAR network project, Indian Institute of tropical meteorology has run the regional climate model (PRECIS) for Tamil Nadu region and mapping of the results indicate that the temperatures are expected to increase with time and by 2100, there would by 3.5-5°C increase in temperature. Rice vield predicted using the PRECIS data through crop weather model over Tamil Nadu indicated reduction of rice yield by 6.7, 15.1 and 28.2% during 2020, 2050 and 2080 respectively. It is proposed to take Ponnaniar Reservoir System as the study area. The Ponnaniar Reservoir is situated in Mogavanur village of Manaparai taluk across river Ponnaniar river. The reservoir is located in between Sommalai hills and Perumal malai hills. Ponnaniar River is one of the three tributaries to Ariyar River, the other two tributaries being Therkumalayar and Kannuthu Odai. All the branches carry large discharges during the monsoon period. The project comprises a Reservoir of 120 MCft. capacity across the Ponnaniar River D.Edayapatty Village of Kulithalai Taluk in Tiruchirapalli District and a left-side contour canal of about 3.5 km. long, to irrigate about 1,830 acres of dry lands to be converted in to wet lands. In addition, about 271 acres of existing wet lands will get stabilized by the waters of Ponnaniar Reservoir. The entire new ayacut lies in Mughavanur village of Manapparai Taluk. The Ponnaniar dam is an earthen dam with masonry spillway. The construction of the dam was started in 1970 and completed in 1974. The purpose construction of this dam is for irrigation but fish culture is catching up in the recent years. The reservoir with a catchment area of 33.60 sq. miles is designed for a design discharge of 7028 Cusecs. The length of the dam is 247 m with a maximum height of 51 feet. The reservoir is already having the following problems and the Climate change will play a major role in the operation policy of the reservoir, the cropping pattern and the per capita income of the water users and so forth. The inflow, out flow details from 1975 to 1999 reveals that there is a great variation in the inflow pattern ranging from 28 M.cft to 777 M.cft. Moreover, the outflow from the reservoir has also revealed an interesting point on the operational aspect of the reservoir. When the inflow was 777 M.cft during the South West Monsoon, the outflow from the reservoir was 716 M.cft i.e. almost all the inflow has occurred in the South West monsoon had completely been utilized in that monsoon itself. Moreover,

night supply is not made by the PWD and only in scarce condition turn system is adopted. Since the main canal is with Black cotton soil and the field bothies are with sandy and loose soil this poses another problem. The duty given in the Compendium is not a workable one for the farmers and the field officers are supplying more than the prescribed quantity. The following methodologies are adopted in the study. 1) Situation analysis: to understand the current status and future threats of climate change in this irrigation system. The main objective is to analyze existing knowledge base, assess vulnerability status, ongoing adaptation measures, and capacities. Identify gaps and measures to address them, 2) Scenario modeling (climate, hydrology, crop-modeling, livelihoods/socio-economic and food security): to generate the simulated spatial and temporal land and water information for the selected project site, under present and future conditions/scenarios for identifying sustainable adaptation strategies and 3) Recommending adaptation measures in agriculture and water sectors: pilot scenarios developed from the above methodologies will be recommended to the implementing agencies to develop local specific adaptation measures and framework and up-scaling. **Keywords:** Ponnaniar reservoir, agriculture, climate change, hydrology.

25. Self help group and tribal women empowerment in Samakuttapatty village in Salem district

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Women need improvement, betterment, development and uplift to effect their empowerment. Status is often described in terms of their level of income, employment, education, health and fertility as well as their roles within the family, the community and society. Status of women varies in different societies. Self help groups are changing the position of tribal women community. The tribal women, as women in all social groups are more illiterate than men. Like other social groups the tribal women share problems related to reproductive health. When primary and secondary subsistence activities are counted women work more than men. Self help groups are formed to reduce poverty among family by way of collective action. Economic empowerment of tribal women in everywhere is an essential part of any social or community development. The present paper reviews the emerging perspective in the context of the socio-economic empowerment of tribal women and changing paradigms of development. The main objective is to study socio-economic background of the respondent to analyse impact of the SHG on women empowerment and the role of women in human resource development. The methodology was a formative evaluation of the SHGs in the Samakuttapatty village in Salem district. Data were collected through questionnaire, group discussion, and interview with SHG leaders, representatives and other stakeholders, such as local bank managers and the government representatives. Annual reports that is primary and secondary sources are used for data collection. Keywords: Tribal community, self help group, women empowerment.

26. Seismic performance of moment resisting frames in different seismic zone

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The occurrence of earthquake in certain areas of various countries in the world becomes a regular feature. Similarly, several states in India are prone to earthquakes in high magnitude. Five damaging earthquakes occurred in the last 10 years, causing heavy loss of life and damage to property. These earthquakes occurred at Uttarkashi (1991) M=6.5, Killari (1993) M=6.2, Jabalpur (1997) M=5.8, Chamoli (1999) M=6.3 and Bhuj (2001) M=7.7. What is noteworthy about this sequence of earthquakes is that three out of these five events occurred in peninsular India, a part of the stable continental region (SCR), characterized by slow deformation and low seismic productivity. So it is very vital to analyze and design the structure for seismic load in all the four zones (II-V). India is basically divided into four different zones (II, III, IV & V) depending up on the frequency and intensity of the earthquake. In this paper, dynamic response study of a four-storied moment resisting building is carried out to study the response of the structure when located in all the four zones. Keeping the properties of the structure constant, a comparative study is carried out on the structural behaviour of the structure in all the four zones (II-IV). STAAD Pro2003 and SAP software's are used to perform the detailed analysis. This paper stresses the need for structural assessment and retrofit in regions where earthquakes are

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prevalent. **Keywords:** Earthquake, stable continental region, seismic productivity.

27. Heavy metal removal from industrial wastewater using Chitosan

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Heavy metal ion from waste water are commonly removed by microorganisms, chemical precipitation, reverse osmosis and ion exchange processes. The method depends on the process conditions. The use of microorganisms takes a long time to remove metals. Reverse osmosis is an important option for separation of water from a solution of dissolution of solids of heavy metals by forcing water through a semi permeable membrane but the cost of the membrane is very high. Hence the present study aims focuses the preparation of an alternative biodegradable membrane, chitosan, for treatment of separation of heavy metals from contaminated industrial waste water. These membranes are synthesized and characterized by IR and tried for separation of heavy metals present in contaminated industrial waste water. The membrane synthesized is cheap and cost effective. Regeneration is done through sulphonation for the cation exchange resin and chloromethylation for the anion exchange resin. Resins are discussed in this paper.

Keywords: microorganisms, chemical precipitation, biodegradable membrane, chloromethylation.

28. Effect of textile mill effluent on growth of *Sorghum vulgare* and *Vigna aconitifolia* seedlings

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The wastewater discharges are unavoidable in the process of industrial developments which lead to the pollution of water and soil. The water bodies and soils are becoming major sinks for industrial pollutants. These pollutants affect the ecosystems and agricultural lands. The establishment of industries or any manufacturing unit accelerates the development and helps to increase employment opportunities but unintentionally pollutes the environment, especially through the release of effluent and emissions. Such impact of industrial development is highly complex and many times unintentional. The production of wastewater is a continuous process; in water shortage regions of the Solapur, where water becomes limiting factor, the effluent is being used for irrigational purposes by the farmers in agriculture and agro-forestry practices. The present research work deals with assessment of the physico-chemical characteristics of industrial effluent and the effect of Industrial effluents on germination of various seeds such as Sorghum vulgare (Jowar), Vigna aconitifolia (Matki), which grow abundantly in study area and very demanding species for food purposes. The effects were examined in relation to various concentrations (viz. 20,40,60,80 & 100%) of effluent and distilled water as control and various parameters such as Seed Germination, Mean Root Length of germinated seedlings, Plumule germination, Mean Plumule Length of germinated seedlings, Disease (Fungus) causes in germinated seedlings and other morphological characters.

Keywords: Seed germination, textile mill effluent, growth, seedlings.

29. Effect of raw and treated dye industrial effluent on pulse crops

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Textile dyeing industry is one of the major water consuming and high polluting industries in India. The effluents contain inorganic chemical which have potential of enhancing the growth and yield of black gram crops. Effluent in higher concentrations affect soil and causes heavy damage to crops grown on them. Recent awareness and growing global concern for deterioration in the quality of environment has induced great interest in the identification of pollutants and their effects on plants, animals and human beings. The main objective of this study is solving the problem occurring by textile and dyeing industrial waste by using the agricultural important crops. The present research work carried out to find the physico-chemical analysis of textile dyeing industry effluent, suitable black gram variety for

tolerance to textile dye industry effluent through germination studies, identification of biochemical concentrations in treated black gram crop etc. Germination studies were carried out for various black gram varieties ADT.5, CO.2, CO.5, CO.593, LBG.20, T.9, TMV.1, TU.942, Vamban.2 and VBG.23. Physico-chemical characters of textile dyeing industry effluents were studied. Low concentration of the dye industry waste at 10% concentration proven that it is a growth promoting substances were present in the effluent. In the present study, the shoot length, root length, total leaf area, dry weight and yield of black gram reduced due to sludge application. It is concluded that the textile dyeing industry effluent in higher concentration is toxic to crop plants i.e lower concentration of textile dyeing industry enhances the germination and seedling growth. The lower concentration of effluent can be used for irrigation after suitable treatment. Toxic effluents should be treated to reduce the toxic elements from the sludge. The treated sludge can be utilized for the cultivation of crops with various combinations of soil, coir waste, vermicompost, biofertilizer and cow dung etc.

Keywords: Textile dyeing industry, physico-chemical, germination studies, toxic.

30. Environmental impact assessment on four laning of NH-7 corridor

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The massive national highway development program (NHDP) comprises of widening and strengthening of NH sections connecting four major metros popularly known as golden guadrilateral amounting to a total length of 5846 KM to North - South corridors connecting Kashmir with Kanyakumari. This paper aims at studying the environmental impact assessment components affecting the various environments along the Salem - Namakkal stretch. The Salem - Namakkal corridor has a two lane, 6.5 - 7.0 m wide carriageway with varying width of shoulders from 1 - 1.5 m on either side. The corridor generally traverses through plain terrain for most of its length for few locations was undulating. Exposed rock has been observed at several places along the corridor. Most of the water bodies along the corridor are in dry state. Agriculture is the predominant land use along the corridor. Several educational institutions, textile industries, hatcheries, poultry farms have also been observed along the corridor. This widening scheme through the urban settlements would not only cause traffic safety hazards, congestion delay, but also cause several environmental and social concerns of resettlement and rehabilitation. The environmental screening has been carried out as an integral part of this feasibility exercise. Based on the policies, legal and administrative framework at national and state levels the assessments for the baseline environmental status, alternative alignments and sections of right of way and their significant impacts requiring mitigation measures have been identified. The design and decision making process integrated with environmental settlement and rehabilitation issues have been carried out. Public Participation and Community Consultations and suggestions from them played a major role. For the given situation, the analysis of most appropriate method to carry out an Environmental Impact Assessment is considered. Some of the most specialized approaches and methods that have evolved to meet the changing needs of Environmental Impact Assessment include predictive methods, environmental risk assessment, economic analysis and expert systems. Most methods and techniques for identifying, measuring and assessing impacts rely on expert judgment. Checklists and matrices are commonly used to organize and present information. Matrix methods identify interactions between various project actions and environmental parameters and components. Most matrices were built for specific applications, although the leopold matrix is guite user friendly. Leopold matrix the gross screening technique is employed to identify the impacts during the various parts of the entire project cycle, say construction and operation phases. Based on satellite data, areas that suffer most may be identified and analyzed on the basis of overlaying data on various requirements. This GIS approach indicates the change in quantitative terms. Based on the baseline information, primary surveys and consultations with the stakeholders, the major issues emerging are: About 4217 trees are affected, noise impacts are likely to be higher, Impacts on wells along the corridor is observed, Air quality was found in compliance with CPCB/TNPCB standards, Air impact due to bitumen production, hot mixing plants, material transfers, site clearances, vehicular movements etc., were studied, effect on sago industries along the corridor was observed, Issues of highway diseases need to be addressed as Tamil Nadu state AIDS control society has identified Namakkal as the AIDS epidemic center of the state. Measures such as water sprinkling on vehicular movement, regular maintenance of dust collectors, providing exhaust vents and silencers, re-plantation of saplings,

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resettlement of habitats, alternate suggestions for the cultural properties, provision of cross drainage works etc., are the various control measures for air, noise, forest, socio-economic, cultural and water environments respectively.

Keywords: National highway development program, gross screening technique, AIDS.

31. A study of power tariff policy for groundwater management in Tamil Nadu N. Suresh Babu

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In recent decades, for purposes of irrigation and urban water supply, groundwater development has been growing at an exponential rate. In India, over 63% of the gross cropped area is irrigated by groundwater. The increasing dependence of farmers on groundwater irrigation in India is mostly due to the failure of surface water irrigation (tanks & canals) system to meet the growing water needs of farmers. In many states, India groundwater has become the sole source of irrigation. The development of groundwater irrigation has been encouraged by the pricing policies of the State governments in respect of power for pumpsets. The policy of providing free or highly subsidised power for pumpsets made the number of agricultural power connections multiply many times, besides having a long waiting list. After Independence, there has been a sporadic growth of pumpsets and tubewells. The growth of pumpsets has been made possible through the government's liberal subsidy and overheads creations like rural electrification and capital financing. Much of the growth in groundwater irrigation in Tamil Nadu is associated with the electricity tariff for agricultural use. In Tamil Nadu, agricultural power consumption was based on metered tariff till the mid-seventies. Thereafter, agricultural power pricing was based on a flat rate. From 1991 onwards, the State government had been offering free electricity to all categories of landholders irrespective of farm-size. In 2002, the government levied a modest power tariff on farmers. However, these initiatives were rolled back after the Parliament election in 2004. The State government of Tamil Nadu extended free power to 2.4 lakh agricultural pumpset connections in 2006, which were under the self financing scheme. The policy of cheap power coupled with pernicious flat power tariff has given rise to deleterious environmental consequences. Free power has encouraged an indiscriminate exploitation of groundwater. This has resulted in the falling of groundwater tables in many areas. Out of 384 blocks in Tamil Nadu, 97 were dark or over-exploited (that is, blocks where the stage of water development exceeds the annual rate of replenishment) in 1992-93, whereas in 1984-85 only 64 blocks were dark or over-exploited [Central Groundwater Board 1991; Central Groundwater Board, 1995]. Although data are not available for more years, it is the common knowledge which confirms that the groundwater situation has gone worse since free power was offered to agriculturists. Groundwater is more than 100 feet deep, and in many places, it is more than 800-900 feet especially in Coimbatore, Erode, Namakkal, Dindigul etc. In about 86 blocks the groundwater development varies between 65 % and 85 % (categorized as grey) and in the remaining 299 blocks the level of extraction is 65 % (categorized as white). At present, irrigation through tubewells has increased three fold compared to what it was a decade ago. With the over-exploitation of groundwater resources, water tables have declined sharply resulting in more electricity being needed to draw water from greater depths. Eventhough agricultural power subsidy is addressed to lift groundwater for irrigation purposes of the individual farming household; it has a wider economic and environmental ramification when compared to the subsidies on irrigation water, fertilizer and agricultural credit. This study examines the impact of agricultural power tariff policy on groundwater extraction of the selected sample households in Thiruvallur and Theni districts of Tamil Nadu located in India. This study also attempts to find a solution for management of groundwater resources. Keywords: Groundwater, power tariff, electricity, irrigation, Tamil Nadu.

32. Environmental management new frontiers in Indian agriculture through sustainable agriculture development D. Uma and Shanthi

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Agriculture production has sustained man and great civilizations. Modern crop production technology has considerably raised output but has created problems of land degradation, pesticide residues in farm produce, gene erosion, atmospheric and water pollution. The natural resource base is degraded and diminished and the quality of the environment, sustaining human life is adversely affected. With

exploding population and rapid depletion and degradation of natural resource base, the task of meeting the needs of the present generation is receiving top priority by environmental planners. Hence sustainable agriculture has assumed very great significance in this context. Sustainable agriculture is a form of agriculture aimed at meeting the needs of the present generation without endangering the resource base of the future generation. In order to feed the growing population more food has to be produced and this has to be done without degradation if the resource base expanding agriculture to ecologically fragile area means greater threat to environment. Sustainable agriculture is of minimal dependence on synthetic fertilizers, pesticides and antibiotics. It is also considered as a system of cultivation with the use of manures, crop rotation and minimal tillage. Sustainable agriculture is a balanced management system of renewable resources including soil, wild life, forests, crops fish, livestock, plant genetic resources and ecosystems without degradation and to provide food, livelihood for current and future generation maintaining or improving productivity and ecosystem services of these resources. Sustainable agriculture system has to be economically viable both in the short term and long term perspectives. Sustainable agriculture along with the integrated intensive farming system will make higher productivity. The IIFS methodology shows the path to achieving the goal through agricultural intensification, diversification and value addition in an ecologically economically and socially sustainable manner. IIFS programme properly implemented will trigger an ever green revolution if naturally reinforcing packages of technology, training techno infrastructure and trade are introduced. Thus this paper explores the path of sustainable agriculture and integrated intensive farming system in the growth of agricultural sector without degrading natural resource base, guality of environment and adversely affects human life.

Keywords: Crop production technology, sustainable agriculture, crop rotation, green revolution.

33. Industrial use of wastewater to minimize its misuse

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Global warming, a huge problem for the world generated by green house gases, chemical reactions, biological factors and boiling of earth day by day due to decrement of water level is a reason for the melting of glacier which in turn causes flood in the sea side area where lot of population lives. Any factor attribute global warming affects the environment directly. The decrement of water level affects the people in two ways; one is access to water and saline intrusion near coastal area. In this paper, there is a solution proposed to minimize the wastage of water through its industrial use. This paper also outlines about the fruitful use of water but here we have not considered the cost aspect for the solution to minimize the wastage of water because lives are more costly than any cost at any given scenario.

Keywords: Global warming, glacier, cost aspect, waste water.

34. Traditional social organisation and water resources management A. Karuppiah Dept. of Sociology, University of Madras, Chennai-5, TN, India akaruppiah2002@yahoo.co.in

Water is an important natural resource and the traditional village community has developed mechanism to manage and distribute the water for agriculture. Thus, in this study, an attempt is made to analyse the role of traditional social institutions in water resources management and the influence of changes on traditional social institutions in sustainable development. The study was conducted in a village community in Usilampatty taluk of Madurai district. The data for this study were collected through survey from the field work. The important findings are: the traditional social institutions played vital role in water resources management and the changes that have taken place in rural communities undermined the role of social institutions in water resources management.

Keywords: village community, agriculture, sustainable development, social institutions.

35. Sustainability assessment of wastewater treatment plants

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Rapid growth of industrialization and urbanization leads to degradation of environment. Especially discharge of untreated and partial treated sewage from urban area leads to the contamination of water bodies and ground water. For control of water pollution due to domestic wastewater, the conventional wastewater treatment using aerated lagoon, waste stabilization ponds, anaerobic and facultative lagoon, activated sludge process are being adopted, which are energy intensive or requires more land. The main objective of this paper is to select sustainable sewage treatment technology for urban areas considering energy requirement suitable for urban areas.

Keywords: Water pollution, domestic sewage, sustainability, urbanization.

36. Surface ozone air pollution in Nagercoil, India.

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Ozone (O_{α}) , one of the most powerful oxidants known, is a naturally occurring allotrope of oxygen that is phytotoxic and also causes adverse health effects on human beings at high levels in the troposphere. It is a secondary pollutant formed through complex photochemical oxidation reactions. In this study the measured surface ozone with one of its precursor nitrogen dioxide (NO₂) and important meteorological parameters at a semi-urban area during 2009-2010 has been analyzed. The maximum concentration of surface ozone was obtained during summer season (May 2009, 42.24 ppb) and the minimum was obtained during north east monsoon season (October 2009, 28.08 ppb). The results of this study show that the surface ozone concentration noticeably correlates with temperature (r=0.66), relative humidity (r=-0.55) and NO_2 (r=0.95).

Keywords: NO_a, photochemical, pollutant, precursor, surface ozone, troposphere.

37. Coastal resource management in Tamil Nadu

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The ocean is one of Earth's most valuable natural resources. It feeds us in the form of fish and shellfish of about 200 billion pounds each year. Being a cheaper route for trans-continental goods across the globe, ocean provides a treasured source of recreation for humans. It is mined for minerals (salt, sand, gravel & some manganese, copper, nickel, iron & cobalt can be found in the deep sea) and drilled for crude oil. The ocean plays a critical role in removing carbon from the atmosphere and providing oxygen. It regulates Earth's climate. The ocean is an increasingly important source of biomedical organisms with enormous potential for fighting disease. These are just a few examples of the importance of the ocean to life on land. Explore them in greater detail to understand why we must keep the ocean healthy for future generations. Phytoplankton accounts for possibly 90% of the world's oxygen production because water covers about 70% of the Earth and phytoplankton are abundant in the photic zone of the surface layers. Some of the oxygen produced by phytoplankton is absorbed by the ocean, but most flows into the atmosphere where it becomes available for oxygen dependent life forms. To protect the coastal community, from the natural disaster coastal area planning for locating coastal communities in safer areas, protecting and propagating the natural protecting systems such as mangroves, coral reefs, shelter belt plantations, along with installation of early warning systems, can be thought of.

Keywords: Enormous potential, biomedical organisms, phytoplankton, photic zone.

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38. E-Waste an opportunity or a threat - An Indian perspective

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The electronic industry is the world's largest and fastest growing manufacturing industry. It is an emerging problem as well as a business opportunity of increasing significance, given the volumes of e-waste being generated. Solid waste management, which is already a mammoth task in India, is becoming more complicated by the invasion of e-waste, particularly computer waste. This everincreasing waste has very complex characteristics and requires an equally complex set of efficient technology and processes to deal with it. Management of electronic waste is a much more formidable challenge in developing countries on account of lack of proper infrastructure, poor legislation and awareness among citizens. The import of e-waste, which is illegal, is another major source and preliminary estimates do point that the quantity being brought in is very significant. The paper highlights the associated issues and strategies to address this emerging problem, in the light of initiatives in India. There exists an urgent need for a detailed assessment of the current and future scenario including quantification, characteristics, existing disposal practices, environmental impacts etc. Institutional infrastructures, including e-waste collection, transportation, treatment, storage, recovery and disposal, need to be established, at national and/or regional levels for the environmentally sound management of e-wastes. Establishment of e-waste collection, exchange and recycling centres should be encouraged in partnership with private entrepreneurs and manufacturers. Due to the increasing volumes of ewaste generated and the glaring inadequacies in its management there is, more than ever, a necessity to evolve a sustainable solution for managing e-waste in India. Model facilities employing environmentally sound technologies and methods for recycling and recovery are to be established. Criteria are to be developed for recovery and disposal of e-wastes. Policy level interventions should include development of e-waste regulation, control of import and export of e-wastes and facilitation in development of infrastructure. An effective take-back program providing incentives for producers to design products that are less wasteful, contain fewer toxic components, and are easier to disassemble, reuse, and recycle may help in reducing the wastes.

Keywords: Electronic industry, e-waste, solid waste management, poor legislation, sound technologies.

39. Environmental management on E-waste

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"E-waste" is a popular, informal name for electronic products nearing the end of their "useful life. Discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem. E-waste is now the fastest-growing part of the municipal waste stream EPA. Electronics like computers and cell phones contain a lot of different toxins. 80% of the world's population lives in an area with cell phone reception, recycling old phones just makes sense. Each year, we dispose of roughly 250 million computers. For example, cathode ray tubes (CRTs) in computers contain heavy metals, such as lead, barium and cadmium, which can be very harmful to health if they enter the water system. These materials can cause damage to human nervous and respiratory systems. Flame retardant plastics, used in electronics casings, can release particles that damage human endocrine functions. Individual consumers are obviously not solely responsible for e-waste issues. Parties who make, use, sell or purchases electronics have a responsibility to participate in some form of e-waste management program. In most instances, the mobile phone company should be able to recycle old phones for the consumer at no charge. NGOs can also be encouraged to recycle old cell phone. Most major computer hardware retailers, like Apple, HP, IBM, Gateway and Dell, have some kind of "product take-back" program in place. For a small fee (in most cases), owners can send their old hardware back to the manufacturer for processing, recycling and disposal. Other retailers, like Office Depot, may offer free electronics recycling on designated dates. Recycling and the proper disposal of electronics is a major part of the solution to our growing e-waste problem. Responsible practices in the manufacture of hardware must also contribute to the solution. Regardless of whether these positive actions are mandated by industry or government, progress occurs when individuals and businesses change their thinking about e-waste. Keywords: E-waste, electronics, hardware.

40. Mitigation of environmental noise pollution

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There are numerous effects on the human environment due to the increase in noise pollution. This study identifies the sources of noise that create noise pollution. Moreover, the study explores the effects of noise on publics and their reactions. Finally, various measures to control the pollution are contemplated. The empirical evidence gathered through this study can be employed for developing appropriate legal and public action programme. The objectives of the present study are: 1. To collect data on the socio-economic structure of male and female respondents in Tuticorin district. 2. To study the various sources of noise affecting male and female respondents of different age-groups in Tuticorin district of Tamil Nadu. 3. To analyze the data on effect of noise pollution and reactions of different age-groups and sex. 4. To offer suggestions by sex and different age groups to control noise. This empirical study is based on a sample survey of the Tuticorin district of Tamil Nadu. 400 respondents were interviewed personally. The data relates to the month of August 2010. The sample represents a cross-section of different age groups, sex, geography, educational levels; income levels of respondents and therefore it could be treated as a representative sample for such an exploratory study. The data was collected by using a structured questionnaire blended with suitable open-ended questions. The analysis has been carried out with the help of percentages and cross-classifications on sources of noise, effects of noise, reactions to noise, and suggestions to control noise in terms of age as well as sex. Percentage analysis, averages, standard deviation, standard error, F test, chi-square tests, Cramer's V and probability analysis were used owing to the constraints imposed by the nature of data.

Keywords: Noise pollution, open-ended questions, F test, chi-square tests, Cramer's V.

41. System dynamics view of sustainable development of environment P. Shantha PG and Research Dept. of Economics, Ethiraj College for Women,

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The environment provides both a direct value as well as raw material intended for economic activity, thus making the environment and the economy interdependent. It is paramount to consider issues such as the conservation and valuation of natural resources, pollution control, waste management and recycling, and the efficient creation of emission standards. Economics is an important tool for making decisions about the use, conservation, and protection of natural resources because it provides information about choices people make, the costs and benefits of various proposed measures, and the likely outcome of environmental and other policies. Since resources - whether human, natural, or monetary - are not infinite, these public policies are most effective when they achieve the maximum possible benefit in the most efficient way. Therefore, one job of policymakers is to understand how resources can be utilized most efficiently in order to accomplish the desired goals by weighing the costs of various alternatives to their potential benefits. Traditional fragmented and mechanistic science is unable to cope with issues about sustainability, as these are often related to complex, self-organizing systems. It is argued that, in order to understand the sources of and the solutions to modern problems, linear and mechanistic thinking must give way to non-linear and organic thinking, more commonly referred to as systems thinking. System dynamics, which operates in a whole-system fashion, is put forward as a powerful methodology to deal with issues of sustainability. It has been believed that science and technology can provide effective solutions to most, if not all, environmental problems facing modern society. However, the validity of this optimistic assumption has become increasingly questioned. The scientific system, thus, faces a crisis of confidence, of legitimacy, and ultimately of power, as there is a growing feeling from many quarters that science is not responding adequately to the challenges of our times, and particularly, those posed by the quest for sustainable development. Issues about sustainability are often related to complex, self-organizing systems. There is an unavoidable need to try to bridge the gap between what is known and what is done. To this end, it is essential that research move beyond classical mono-disciplinary and even inter-disciplinary lines to one trans-disciplinary in nature, and fully integrates this approach in its problem solving efforts. Therefore, the aim of the present paper is to show how sustainable development can be dealt with by using the system dynamics approach-a feature of systems thinking that considers dynamic relations in a system holistically.

Keywords: Economic activity, natural resources, pollution control, waste management, recycling.

42. Water quality assessment and its impact on human health: A case study of somni stream watershed, patan block, durg district, Chhattisgarh

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Indiscriminate disposal of hazardous chemicals and industrial wastes causes pollution of ground water regime as well as subsurface soil layers. Various processes and mechanisms control the transport of pollutants when they come in contact with soil water system. Somni stream watershed is suffering from such disposal of effluents from steel industries. Therefore an attempt has been made to assess the water quality deterioration as well as its impact on human health. The present study area falls on survey of India toposheet No. 64G/8 and 64G/12. Based on the survey results, a network of 23 observation sites were selected for periodic water quality in pre-monsoon and post-monsoon seasons. Water samples were collected and analyzed for various physico-chemical characteristics. Waste effluent from steel industry were also collected and analyzed. The results of the analysis indicated significant variations in the ground water quality with respect to space and time. From analysis it is found that the trace elements like, cyanide, cadmium, chromium, boron, lead and phenol are present in both surface and ground water samples exceeding the limits prescribed by WHO and other agencies. Due to this higher concentration of trace elements, health of villagers residing in this watershed has been affected. Cases of skin diseases, diarrhoea, jaundice, hepatitis are found in the present study area.

Keywords: Industrial wastes, soil water system, diarrhoea, jaundice, hepatitis.

43. Impact upon the Indian socio-economic fronts by climate change

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India is the seventh largest country in the world with fast developing economy. The climate change has an adverse additional stress upon ecology, socio-economic developmental activities. A very long 7500 KM coastline with three metros, several cities, towns and villages with thick population density is the high light of our country. It possesses almost all type of climatic zones. The economy of our country is based mostly upon monsoon rain fall patterns. The climate change has vulnerable impact over monsoon rain fall patterns. The anticipated sea level raise will adversely affect coastline ecosystems and submergence of coastal islands and deltas. The sea water intrusion into aquifers which acts as water resources for delta and coastline settlements will badly affect. The vector diseases are spread across the country due to water shortage due to climate change. The climate change and its impact will adversely affect the livelihood of the weaker section of society. The sustainable development of the country is based upon the development of women and children. In recent years the death tolls due to adverse heat wave, cold wave and sudden heavy rains and fresh floods have the vulnerable impact upon economic and social warfronts of our country. It is the time to think and act upon and the challenges which are going to face by Indians and the strategies to be adopted in near future.

Keywords: Climate zones, sustainable development, monsoon rainfall, hot wave.

44. Developing performance indicators for effective functioning of drainage network

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Conventional urban water management practices aim to meet water supply-demands while conveying wastewater and storm water away from urban settings. Alternative approaches which consider water demands to be manageable and wastewater and storm water as valuable resources, although being increasingly sought, lack reliable site specific implementation methodologies. The current management frameworks intended to address major flood risk must consider not only receiving water health and ecosystem functioning but also issues of land use capacity and potential, social/community values and expectations as well as cost viability. Specific objectives, targets and performance-based criteria will therefore need to be set, monitored and evaluated for a variety of biophysical, ecological, social

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and economic environmental parameters. There is also a need to relate drainage decisions to practical planning solutions. In this paper, various performance indicators are identified and analyzed. The outcome indicators will be classified under operational, institutional, constitutional categories. An environmentally adaptive performance indicator for drainage system will be developed within the framework of best management practice.

Keywords: Conventional urban water, wastewater, cost viability, drainage system.

45. Sustaining ecohydrological capacity of Adyar Eco Park with stakeholders involvement

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Adyar Eco Park located in Chennai, Tamil Nadu was recently developed. The once undeveloped park is now modernized by rehabilitated water body and vegetation along its banks. The effect of this green cover on the water body needs some study. Evaporation is an important climatic parameter that affects both plant and animal life. It is a crucial consideration particularly in water resource planning and management programmes. Vegetation shifts are important for climate-ecosystem-hydrology feedback as they alter carbon, water and energy exchanges at the land surface. Over short timescales, vegetation can respond adaptively to variations in climatic factors. Although recent ecohydrological studies have focused on understanding interactions between hydroclimatic variables and ecosystems response, we lack a comprehensive theory of how vegetation will respond to changes in the water and energy balance of a region. This study is an attempt towards this direction. Vegetation productivity. estimated from patterns of above ground net primary production (ANPP), and growing season actual evapotranspiration are strongly related (P. A. Troch et al, 2009). This analysis is focused on the catchment water balance in an attempt to understand the role of vegetation on hydrological partitioning. The sensitivity of annual stream flow (runoff) to changes in temperature and precipitation has been investigated which will help in maintaining the sustainability of the ecohydrological capacity of Advar eco park. Policies have been suggested to ensure effective stakeholder involvement in the conservation and management of the water body.

Keywords: Evaporation, vegetation shifts, climate-ecosystem-hydrology.

46. Analysis of drinking, borehole, well and sewage water in Auxilium college campus, Vellore, India

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Water is undoubtedly the most precious natural resource that exists on our planet and it is essential for everything. The lack of water quality and sanitation is the primary reason for various ailments and disease spread. The most important diseases like typhoid, dysentery, jaundice caused by lack of water quality. The aim of the present study is to investigate the quality of drinking, borehole and well water in Auxlium college campus whose area is 100 acres, situated in Vellore district, Tamil Nadu, India. The different water sources are utilized by more than 7,000 inmates of the campus both residential and non residential students, staff, non teaching staff and the workers. Vellore is surrounded by many tanneries; the effluents of these tanneries may be the main cause of ground water pollution. Besides these, there are also three sewage water canal running through the College Campus, which may be the source of some negative influence on water sources inside the campus. The results clearly indicated that the metals present were within the permissible limit and the heavy metals were found to be below detectable limit. The result of microbiological analysis for six drinking water samples indicated that the sample number 1 to 3 had the highest microbial load after 24 hours of incubation, having a value of TNTC (too numerous to count) cfu/ml, which was higher than the recommended value. The recommended cfu was 100. This clearly indicates that consumption of this water may lead to water borne diseases like diarrhea, typhoid and paratyphoid fevers, dysentery and cholera, polio and infectious hepatitis etc. The samples 4-6 has the Total Viable Counts (TVC) at the concentration 10⁻⁴ are 6, 24 and 70, which is less than 100 cfu/ml which is suitable for drinking purpose. As the concentration increases the TVC also increases. It was proved that the sample number 1-3 which was used by the inmates for drinking purpose contains TNTC (Too numerous to count) colonies. The problem was presented to the college authorities and the purified drinking water plant was cleaned. The sample was collected after purification and the microbial studies were conducted. The result of such studies

shows that there is no growth of colony in sample number 2 and 3. The colony formation in sample number one was only one cfu which was very least, when compared to the permissible value (100 cfu). This clearly indicates that the water plant needs periodical cleaning to get good and clean drinking water. The high content of the Chloride in well water and borehole water needs futher treatment. From the study, it is proved that the inmates of the Auxlium College Campus are provided with good drinking water facilities which are clean and free from contaminants.

Keywords: Auxilium College, microbiological, drinking water, borehole water, well water.

47. Comparitive study of three design method of cw's: Aerial rate constant method, environmental protection agency method and considering the background concentration of water

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Constructed wetlands are the wastewater treatment unit whose phenomena are similar to natural wetlands. There are various methods in designing these artificial wetlands. This paper is intended to compare three different design methods considering same design parameters. These methods of design include aerial rate constant method, Environmental protection agency method and by considering the background concentration of water. These design method is compared by taking the case study of Kathmandu University. Aerial rate constant method recommended by UN-HABITAT is found to be the most suitable method for design in Nepal from the economical point of view. **Keywords:** Constructed wetlands, surface area, flow rate, retention time and surface loading rate.

48. Solid waste management at landfill sites of Nepal

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The waste management practice in sanitary landfill sites (SLF) plays a significant deciding factor for the assessment of environmental impacts caused like littering, odour, groundwater, surface water and soil contamination. This article focuses on the types of waste coming to landfill and existing waste management practices followed at sanitary landfill sites of Nepal. The study was carried out at Sisdole, Pokhara and Karaute Danda sanitary landfill site of Nepal. The waste composition was performed and minute particles were sent to lab to test the composition. Waste management practice was observed at field and by interviewing key informants. The organic composition of waste were found high as 61.86%, 49.12% and 65.81% at Sisdole, Pokhara and Karaute Danda landfill sites respectively. The presence of heavy metals like lead, chromium and nickel reveals that the landfill is contaminated with industrial wastes as well. The waste management practices at Karaute Danda landfill site was better compared to other two sites, where sorting, composting and selling of recyclable and reusable wastes are done. Segregation of waste at source can be the best alternative to combat the existing waste problems at the site. Also, application of 3R Principle can help in the sustainable management of waste.

Keywords: Waste management, soil contamination, sanitary landfill, Karaute Danda.

49. Sustainability of the environment; individual and corporate responsibility and green business in chemical and allied industries perhaps to be analyzed by risk and detrimental effects of increasing population and pollution

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The word recycling of waste could be essential both in developing and developed nations to sustain the loads of increasing pollution (sound, solid, liquid & gas) causing by increasing population and corruption. PPP-C (population, pollution & poverty as controlled by corruptions) in developing nations, especially in India, Latino America and in Africa are interlinked and are detrimental, impregnated by socio-economical-political relations. Only innovative technology associated with chemical and nanotechnology, international cooperation and attitude can solve partly the above process and essentially the recycling of waste to energy as green business. However one should not forget that

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the increasing "global warming" is exponentially growing along with increasing population. The detrimental effects of CO₂ emission, as caused by fossil fuel burns determine the measure of global environmental sustainability. In this case one should know the reason for developing holes in stratospheres caused by carbon particles due to direct burning of coals, emitting could be the main reason for causing increasing "global warming" and to destabilizing the sustainability of global environment. It should be compared that the direct burn of coal could be more dangerous, compared to petroleum, and other non-conventional methane and propane gases used as fuel and to generate energy through wind, weave and solar system. Finally a solution may be sustained on atomic energy, especially for third world. In this paper the author will describe by the facts, that although the developed nation uses per capita more energy compared to developing nations like China, Latino America, Africa and India, they may cause more pollution to the environment and may cause more global warming compared to developed nations. The reason could be the environmental pollution, recycling and clean fuel burns. In stratospheric and magnetosphere layers, the nano and pico particles of carbons and other dusts might have some consequence in sustaining the global warming and which perhaps is reduced through intensive recycling and green businesses.

Keywords: Recycling of waste, pollution, socio-economical-political relations, global warming.

50. Evaluation of e-waste chemicals leaching into the soil due to unprotected landfill

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Electronic waste, also known as e-waste is waste consisting of any broken or unwanted electrical or electronic appliances. Air conditioner, cellular phone, television and personal computers are some of them. The total e-waste in India has been estimated to be 1, 46,180 metric tons per year (source: IRG systems South Asia). The statistics show that Mumbai with 11,017 tons tops the list of e-waste generation cities in India. Delhi with 9,730 tons, Bangalore with 4,648 tons and Chennai follows next in the list (Source: express computer). Today an estimated 30,000 computers become obsolete every year from the IT industries in Bangalore alone. At present India has about 16 million computers and is expected to grow to 75 million computers by 2010. Over 2 million old PC's are ready for disposal in India (Source: express computer). E-Waste is a safety related issue. It contains toxic substances and chemicals like BFR, PCB, Arsenic, Cadmium, lead etc which are likely to have adverse effect on environment and health. The disposal and recycling of computer waste in the country has become a serious problem. There are various means of disposal of electronic wastes such as incineration, open burning, land filling and wet acid leaching. The main objective of this paper is to find a better practice in handling the e-waste generated from the Indian IT industries and dumping of e-waste by unprotected landfill. The management of electronic waste has to be assessed in broad framework, so that the future policies can be made more responsive in addressing this issue.

Keywords: Electronic waste, computer waste, incineration, open burning, land filling, wet acid leaching.

51. E-waste-A major threat to environment and health D. Janagam and M. Jeyamani Dept. of Economics, Periyar University, Salem- 11, TN, India janagam_pu@yahoo.co.in

The electronic industry is the world's largest and fastest growing manufacturing industry. During the last decade, it has assumed the role of providing a forceful leverage to the socio- economic and technological growth of a developing society. The consequence of its consumer oriented growth combined with rapid product obsolescence and technological advances are a new environmental challenge- the growing menace of electronics waste or e waste that consists of obsolete electronic devices. The production of electrical and electronic devices is the fastest - growing sector of the manufacturing industry in industrialized countries. At the same time, technological innovation and intense marketing engender a rapid replacement process. Every year, 20-50 million tones of electrical and electronic equipment waste (e-waste) are generated world-wide, which could bring serious risks to human health and the environment. The paper highlights the emerging problem of health and environmental impact of E-waste.

Keywords: E-waste, health impact, environmental impact.

52. Water crisis: A study on interlinking of rivers project in India D. Vijayalakshmi

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Water constituted one of the most important challenges for each and every country in the world. The availability of freshwater at various spots on earth terrestrial surface will continue to be determining by the hydrological cycle till such a time when technologies like desalination of seawater in practiced on a reasonably extended sale. The rapid growth in the demand of fresh water driven by growth in global population and of the economics, has led to this natural people and the available water resources in worsening day by day. By 2020 the global population is projected to touch 7.9 billion, which is 50% larger than that in 1990. Because of this rapidly, growing population, the world may see more than a six told increase in the number of people living in conditions of water stress from 470 million today to 3 billion in 2025. To avoid the water crisis problem, our government draws up a plan, which is called ILR project (Interlinking of Rivers Project). This has been one of the most ambitious ideas ever, of any government till date. It is an idea that has conjured up visions for the common Indian-of a country free from floods and droughts, and people in Tamil Nadu tasting the sweet waters of the holy Ganges. Such images of passion and emotion contrasted together with the recurring floods and droughts in various parts of the country have helped those in power to sell the dream of river linking to the people. Interlinking of major rivers in India, aimed at modifying the acute spatial inequity in the availability of water resources in India, has its origin in the ideas of K. L. Rao and Captain Dastur, in the form of Ganga-Cauvery link canal and the Garland canal respectively. This paper deals about the background of ILR project. It also portrays the various related issues of this project. At last it makes its earnest attempt to examine the advantages and disadvantages of Interlinking of Indian Rivers project. This is a descriptive study, which is based on secondary data.

Keywords: Hydrological cycle, desalination, ganges, garland canal.

53. Impact of pollution on marine environment-A case study of coastal Chennai

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This paper makes an effort to study the impact of pollution on marine ecosystem, it analyses, the factors responsible for degradation and suggests suitable corrective measures to reduce its effects on marine life and indirectly to human survival at large. Around the world, marine ecosystems are being threatened, degraded, damaged or destroyed by human activities, one of which is pollution. The rapid population growth and enormous urban and coastal development in many of the world's coastal regions have caused considerable concern that anthropogenic pollution may reduce biodiversity and productivity of marine ecosystems, resulting in reduction and depletion of human marine food resources. In addition, pollution reduces the aesthetic value and also the intrinsic value of the marine environment, whether the pollution is visual (such as oil pollution & plastic debris) or invisible (such as chemical compounds). The recent pictures coming out of the oil spills off the Gulf of Mexico in the United States and also the container tanker collision off the Mumbai coast are vivid examples. Another main reason for concern about marine pollution is related to the direct effects of pollution on human health. Because many pollutants accumulate in marine organisms, humans are exposed to pollutants when they consume food from polluted areas. Marine pollution occurs when unsustainable elements gain entry to water masses, potentially causing spread of invasive organisms, diseases and can turn water quality potentially toxic. Most sources of marine pollution are land based, such as windblown debris, industrial/domestic pollutants discharged and potential spillovers from freight/bulk ocean carriers. When toxins are concentrated upward within the ocean food chain, many elements combine in a manner highly depletive of oxygen, causing estuaries to become anoxic. As these materials are incorporated into the marine eco system, they quickly become absorbed into marine food webs. Once in the food webs, these cause mutations, as well as diseases, which can be harmful to humans as well as the entire food web. Globalization has brought in its wake increased demand on scarce resources leading to rapid depletion of a wide range of non degradable products viz., metals, plastics, rubber products, which in turn generate huge amounts of solid wastes causing pollution at the entry of marine waters. Besides the coastal regions of India are characterized by slums, with poor sanitation facilities aggravating the problem. Suggestions are offered, both invasive and non invasive which can definitely reduce the burden placed on our valuable resources which may soon vanish unless the counter measures are implemented effectively.

Keywords: Marine ecosystem, bulk ocean carriers, coastal regions, marine food resources.

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54. Economics of pollution control

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This paper estimates the level of industrial pollution in Chennai, a fast developing metropolitan city in South India. The level of industrial pollution was estimated using econometric, the analysis of data and the development and testing of theories and models. In order to study the relationship between elements of effluent the Pearson's correlation coefficient is worked out. The primary data collected through questionnaires were used in the estimation model. Measuring and valuing the pollution control measures is very complex and the available methods of economic valuation are often rudimentary. The study analyzed how the monetary value of pollution control measures could be increased by reducing the pollution level in industries, which will be useful for policy makers to reduce the incidence industrial pollution in the urban population of Chennai city. This study addresses the current status and consequences of industrial pollution, which causes concern in developing countries. The study would highlight the status of the environmental economic and pollution control used by industries. **Keywords:** correlation coefficient, economic valuation, urban population, developing countries.

55. A study of automobile air pollution in Chennai and its impact of qualitative and sustainable development

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Being a metropolitan city, Chennai is associated with industrialization in various forms. Urbanization and industrialization have also had deleterious impacts leading not only to pollution loads but also social stress. Today, the air in most large Indian cities is severely polluted and this pollution has a tremendous impact on the health of the population. Industrialization the growth in the number of vehicles in urban areas and the burning of bio fuels in rural households has lead to a rapid deterioration of indoor and outdoor air quality. The main sources of air pollution in India are the industrial and transport sector. In urban area the transport sector causes the most pollution, producing nearly 74% of the carbon monoxide and all the lead emitted. The number of vehicles in India has steadily increasing leading to the concurrent increase in pollution. In the next few years the number of the vehicles is expected to double. All vehicles burn petrol and diesel. Often this fuel is of low quality due to illegal contamination and engines of Indian vehicles are not very efficient leads o increased pollution. Clean air has so far been treated as an unlimited and free natural resource. Only now as the health costs of polluted air are mounting, and the people are beginning to realize that clean air is valuable. The health impact of pollution is considerable. Premature death due to respiratory and cardio vascular diseases like asthma have increased. It is the duty of the government to control the air pollution and the pollution control board should have watch and it has to enforce the law effectively for the betterment of the society.

Keywords: Urbanization, industrialization, clean air, cardio vascular diseases, air pollution.

56. Emerging scenario of environmental issues and sustainable development in the global era

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Our forefathers bequeathed a glorious, unpolluted, mineral-rich resourceful environment. Since the very beginning of human civilization man has been interfering with the environment resulting in the irremediable environmental crisis and ecocide. The major crises that we face today are the threat of nuclear conflict, the twin problems of overpopulation and depletion of food energy resources. The crisis stems from a philosophy of exploitation (unethical use) expansion (over population) and aggression (harmful action of offensive activity). Environmental problems also arise by the unsustainable lifestyle of rich nations and of the rich in poor nations. The overuse of natural resources results not only in resource depletion and ecological degradation that threaten the livelihood of the

poor but also result in high environmental health risks, manifested by high infant and child mortality and high morbidity specially among the poor. The environmental problems that a country faces often have a correlation with the stage of its development, the structure of its economy, and its environmental policies. Some problems are associated with the lack of economic development. Inadequacy of sanitation and clean water, air pollution due to biomass burning and many types of land degradation have poverty as their root cause. It is therefore, our prime duty to sustain (maintain) a healthy environment and pass it on to our successors as our legacy. Exploitation should be replaced by conservation. Expansion should be replaced by (population) control. Aggression should be replaced by tolerance.

Keywords: Human civilization, environmental health risks, ecological degradation.

57. Consumption pattern of energy and its impact on environment in India

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Power is the core infrastructure and plays a major role in increasing production and enhances the economic development. The major contributors of climate change can be classified into two groups. The first consists of greenhouse gases such as carbon dioxide, methane, nitrous oxide, and halocarbons. Greenhouse gases are globally mixed pollutants with long residence times in the atmosphere. Particulate emissions constitute the second group; they do not disperse as quickly and their impacts on the climate are mainly felt in their region of origin. Western countries started industrializing earlier than others and historically contributed the vast majority of the greenhouse gases that are threatening the earth today. Developing countries like India, on the other hand, have only recently begun industrializing, and have contributed relatively little to the aggregate level of carbon emissions accordingly; countries like India should not have to sacrifice their present development for the global commons. They are two major sources of energy production viz. renewable energy resources (wood, solar, wind, wave, mini hydroelectric power projects, biogas, agricultural wastages and geothermal energy) and non- renewable energy resources (coal, petroleum, natural gas, electricity and atomic energy). With over 1.13 billion people, India has the greatest population that lives on less than one dollar a day, which constitutes over 40% of India's population. Most of India's poor live in rural areas that are directly dependent on climate-sensitive resources such as agriculture, forests, and river water. India's diversity of topography - mountains, rivers, forests, deserts, coastlines - means that climate change would affect different regions in different ways and single across-the-board responses may not work. The Indian power industry has since independence faced the demand and supply gap. India failed to achieve any noteworthy progress in the management and development of its energy sector, especially in the areas of cleaner and renewable energy. The requirement of electricity in India has grown up from 120118 Million Kilowatt Hour (MKwH) in 1980-81 to 690587 MKwH in 2006-07. This indicates a continuous rise in the requirement of electricity at the all-India level over the years. The annual growth rate of electricity requirement has fluctuated from 7.6 per cent in 1981-82 to 9.3 per cent in 2006-07. On the other hand, availability of electricity has increased from 103734 MKwH in 1980-81 to 639008 MKwH in 2006-07. This indicates that the amount of electricity availability is less than its requirement for the entire period. Consumption of petroleum products in India increased at the rate of 3.8% per annum during 2002-04; Coal consumption increased the rate of 5.4%. Coal accounts for over 50% of India's commercial energy consumption and some 78% of domestic coal production is dedicated to power generation. In terms of consumption of energy fossil fuel is emitting highest level of Carbon Dioxide, next is coal. Above consumption pattern of energy clearly envisaged that India is heavily depend on non-renewable sources of energy. On this background the present study analyzes production and consumption pattern of energy ad environmental effects in India. Source of statistical data has been collected from various international and regional reports and iournals.

Keywords: Economic development, renewable energy resources, topography, petroleum products.

58. Wetlands an attempt to value ecosystem goods and services B. P. ChandraMohan¹ and D. Bharathi² ¹Dept. of Economics, Presidency College, Chennai 5, TN, India ²Dept. of Economics, SIVET College, Chennai 73, TN, India bharathipugazhenthi@yahoo.co.in

In many, if not all cases of developmental activities, there is a conflict between economic development and environmental management. The conflict arises out of the fact that environment falls outside the

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conventional system of economic analysis. The prime objective of economic development is to enhance the welfare of mankind, but development activities degrade the environment and deplete ecologically rich natural capital, which cause extensive damage to the environment. The reduction in the quality and quantity of ecosystem functions of wetlands due to shrinkage and degradation has serious impact on human welfare. Wetland ecosystems are the most productive of all ecosystems with rich in biodiversity comparable to rain forests and coral reefs. The urban wetlands have been disappearing at a faster rate besides its quality degradation and contamination. Pallikaranai Marshland (PML) is the finest example of shrinking and degrading urban wetlands in India. Stages of the development of Chennai City show filling of wetlands for industrial, commercial, housing and waste disposal purposes. Many waterbodies associated with PML have been polluted and converted into waste water drains. which resulted in the loss of habitats for many species. Concentration of slums close to these waterbodies further degrades the quality and depletes the areas of wetlands. Wastes generated by slums are directly disposed into the wetland, using it as a dumping site by Chennai Corporation further pollutes the waterbodies. The increased pressure of population and rapid economic activities of Chennai City have a strong impact on the shrinkage and degradation of PML. Economic valuation is an attempt to assign quantitative values to the goods and services provided by environmental resources, whether or not market prices are available to assess. One must be more specific about what economists mean by the term value. The economic value of any good or service is generally measured in terms of the amount people are willing to pay for the commodity, less what it cost to supply. If an environmental resource simply exists and provides products and services at no cost, then it is the willingness to pay alone describes the value of the resource in providing such commodities, whether or not to make any payment. It is not just to say that such resources are important, based on their wise use. PML offers many direct and indirect use values by supplying wetland goods and ecological services. Quantification of these goods and services is very difficult because it requires the understanding of ecological, geographic and geological characteristics of soil, water and the ecosystem services. The valuation of wetland goods and services is difficult because many of them do not have a market

Keywords: Economic development, environmental management, ecosystem.

59. Sustainable agronomy

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This paper examines sustainable agronomy and its importance in the present situation. Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Starving people in poor nations, obesity in rich nations, increasing food prices, on-going climate changes, increasing fuel and transportation costs, flaws of the global market, worldwide pesticide pollution, pest adaptation and resistance, loss of soil fertility and organic carbon, soil erosion, decreasing biodiversity, desertification, and so on. Despite unprecedented advances in sciences allowing us to visit planets and disclose subatomic particles, serious terrestrial issues about food show clearly that conventional agriculture is no longer suited to feeding humans and preserving ecosystems. Sustainable agriculture is an alternative for solving fundamental and applied issues related to food production in an ecological way. It is the science and technology of using plants for food fuel, feed, fiber and reclamation. Agronomy encompasses work in the areas of plant genetics, plant physiology, and meteorology and soil science. Agronomy is the application of a combination of science like biology, chemistry, ecology, earth science, and genetics. Agronomists are involved with many issues including producing food, creating healthier food, managing environmental impact of agriculture and creating energy from plants. The concept of sustainability is well accepted by a large public.

Keywords: Sustainable agronomy, soil fertility, organic carbon, soil erosion, biodiversity, desertification.

60. Emerging aquaculture development in coastal area of Tamil Nadu and Andhra Pradesh: Problems and prospects

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Aquaculture is the farming of water area, like farming land for agricultural products, in order to rear selected of aquatic plants or animals for human utilization. The medium of aqua - culture can be fresh water, brackish water of marine environment, depending upon the species to be cultured. India possesses abundant marine and inland fishery resources with a coast line of over 8000 k.m. in length

and vast stretches of fresh and brackish water land i.e., boundless expanse of bays, backwaters and open seas, the extensive estuaries or river mouths, lagoons and mangrove swamps. These extensive water bodies and eco-systems associated with suitable food webs are two major prerequisites for successful aquaculture. In India, there is plenty of scope for aquaculture either be it inland or marine which is mainly due to the physiography of the land, its impounded water bodies and its rivers, the presence of large number of estuaries and back waters, mangrove swamps, the extensive seas surrounding the peninsular india and the islands associated with lagoons and coral reefs. These are not only areas of aqua farming but are also areas of production of seeds, otherwise nurseries that are required for farming. With this wide diversity of geographical and climatic conditions, different dimensions are formed for the development of a multi- billion dollars aquaculture industry in our country. In the southern maritime states of India, Goa, Karnataka, kerala Tamil Nadu and Andhra Pradesh are the places were prawns are commercially cultivated.

Keywords: Aquaculture, agricultural products, brackish water.

61. Status and causes for the change in the concentration of natural marine wealth - Coral reefs

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Coral reefs are under water structures and natural marine wealth which is present in more than 100 countries. In many ways its useful - protects the seashore from natural ocean disaster, home to one third of all fishes, and generates revenue by tourism. The reefs are at risk by the changing climate, legal and illegal extractions by the human beings. In India, more than 25% of the corals are dead, 20% are in risky stage and 25% are in the threatened stage. Corals are extracted by four ways-Marine-based pollution, Overexploitation, Coastal development and Inland pollution and erosion. The present study valuates the concentration of corals and the reasons for these getting depleted by both natural and manmade activities. The present work also provides suggestions and recommendations for the protection of the natural marine wealth -corals in our country perspective based on the policies and regulations being formulated in other countries. In the present research work, an economic valuation method for the coral reef associated tourism for the two islands in Indian Ocean - Andaman and Nicobar Island and Lakshadweep has been developed. The coral reef associated tourism generates revenue by not only from the tourist visit but also by the accommodation, recreation of the tourists in the locations where reefs are concentrated.

Keywords: Coral reefs, marine wealth, erosion.

62. Water- effects on human life

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Water, the most essential of all human requirements, is spread over Mother Earth in abundance; yet 1.2 billion people in the developing world suffer without a reliable supply of potable water. It can be shown that mismanagement of water resources, the world over, has added to this problem. If water is made available it will not only reduce poverty level but also child mortality and morbidity. The water quality is important to be devoid of micro organisms, pathogens, as also harmful chemicals. The economics of water on human life need to be estimated and the willingness to pay be assessed. The area of study is Pallavaram in Kanchipuram district has several water bodies that mainly recharge the water sources. It also gets water from municipal sources, apart from water fountains and over head tanks. But the poor quality of water necessitates the use of can water even by those who live below the poverty line. There are many instances of exposure to water borne diseases in this area which leads to several consequences. Falling ill entails expenditure both for treatment of disease and man days lost. The exposure to illness has been recorded to be Rs. 250 for 24% of the people, Rs. 251 to Rs.500 for 46%, Rs.500 to Rs.1, 000 for 16% and above Rs.1, 000 for 4%. In the same way the willingness to pay has also been worked out. The hypothesis that there is no endangering of health of the residents in the poor water quality areas has been rejected at 1% level of confidence. This categorically implies that water especially good quality water, impacts on human life. Water finds its own level and in consonance with Thiruvallur's dictum, it must be made available to everyone equally. Keywords: Potable water, over head tanks, water borne diseases.

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63. Knowledge management

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The world is full of knowledge. In fact we are in midst of knowledge explosion. The characteristics of explosion are fully present and felt in the above in terms of advantages and disadvantages. Explosion, in its fury sometimes bring equality through its destruction. But destruction has a different perspective from the eyes of a great philosopher Confucius who has stated, 'destruct thoroughly before you construct anything'. We need to build a strong edifice to erect tall towers of knowledge by demolishing our existing knowledge-learn and unlearn. Knowledge is not merely information. Exponential growth of information is available seamlessly for all across the globe. Thanks to technology. The real challenge is not in getting this information, but how one skilfully selects, prioritizes, constructs and delivers this to oneself and others. This can be understood by the poignant statements that Toffler has made:

Collection of data is not information. Collection of information is not knowledge. Collection of knowledge is not wisdom. Collection of wisdom is not truth.

In this backdrop, knowledge management gains significance. Knowledge, knowledge managers and knowledge customers are equally responsible for usurping our country to its pinnacle. Knowledge *per se* will not be useful as it sometimes remains as a burden, only application of knowledge can bear fruits. The biggest challenge India will face / is facing is 'dearth of skill' to transfer this knowledge and application of knowledge to take on industries, R & D and economics and other commercial activities. A 'Study on mapping of human resource skill gaps in/ for India till 2022' which was prepared on behalf of National Skill Devt. Corporation reveals the growth of higher education as follows.



Source: Time Series Data - 2005-06, Ministry of Human Resource Development, I MaCS analysis

The graph above shows a trend of growth, and the report predicts the projection of students in higher education till 2022 would approximately be 80 million. Also the number of teachers in India need to be trained is around 12-15 million annually to meet the need of higher education population alone. This is going to be single mammoth challenge for the educational sector and all the catalysts who intent to bring educational reforms. Let me put forth few trends before them.

Keywords: knowledge explosion, knowledge managers, knowledge customers.

64. The interrelationship between ecological imbalance, crime rate and inequality of economic factors in India: An overview

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Poverty and crime may be aggravated by falling agricultural productivity which is attributed to global warming, ecological imbalance and climate changes. Global warming threatens to reverse human progress, making the United Nations' millennium development goals (MDGs) for poverty reduction unachievable. Meanwhile there has been an enormous increase of crime in the recent past in India. This paper investigates the interrelationship between ecological imbalance, crime rate and inequality

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of economic factors. Our finding shows that there is a strong and robust effect of inequality of economic factor and crime due to ecological imbalance. We observed that the crimes in India show an increasing trend. Based on our finding we recommend some of the suggestion to reduce global warming and crime rate: We reiterate the need for our people to obtain good education and training. We have to consulates more on birth rate, migration from rural to urban area, employment assurance, awareness about global warming. People should get some self-defense training to safeguard them against crime. Our government must try to maintain stability in food-prices. Finally, we conclude that ecological imbalance and global warming is the prime cause for increase in crimes and poverty rate. Increase in poverty and inequality is the main cause for increase in crime rate. Hence, if the Government and public are jointly participate in controlling of global warming, ecological balance, equal distribution of wealth and income, poverty rate, unemployment rate that will reduce the crime rate in a considerable manner.

Keywords: Global warming, ecological imbalance, inequality, crime, poverty, unemployment, GDP.

65. Intellectual renaissance-ICT as a stress free driver in developing countries M. Beulah Viji Christiana and V.Mahalakshmi

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Intellectual development in the current scenario is totally stress free and involves a range of pedagogical approaches making teaching and learning process stress free. More emphasis is to be given for hands-on experiment and activities. ICT (Information & communication technologies) today stresses more on the application of activity based learning in educational technology. The idea of ICT is rooted in the common notion that students are active learners rather than passive recipient of information. If they are provided the opportunity to explore on their own and by providing optimum learning environment learning becomes joyful and long lasting. Education is one of the main keys to economic development and improvements in human welfare. As global economic competition grows sharper, education becomes an important source of competitive advantage, closely linked to economic growth, and a way for countries to attract jobs and investment. In addition, education appears to be one of the key determinants of lifetime earnings in many countries. Developing countries frequently see raising educational attainment as a way of tackling poverty and deprivation. In developing countries, education is also linked to a whole batch of indicators of human development. There are, however, many constraints on delivering education to the right people at the right time. In developing countries, there is frequently a shortage of qualified school teachers. People may live in scattered communities in rural areas. All these factors have encouraged an interest to deliver education and training. For developing countries ICTs have the potential for increasing access to and improving the relevance and quality of education. Thus it represents a potentially equalizing strategy for developing countries. ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, is their sense of isolation. The impact of the ICT on learning can be approached in different ways. There is no single concept of learning through the use of ICT. Many different types can be envisaged: computer- assisted learning, web-learning, computer-classes, online training, distance education, e-Learning, virtual learning, digital training, etc. In this review, a broad view on ICT and learning is taken. ICTs are perceived as fundamental development tools of the 21 Century which rests on several assumptions. At the macro level, it assumes that the introduction and use of ICTs will improve the efficiency of developing countries' industrial infrastructure, enhance their overall economic performance and strengthen their competitive capacities in the global market. ICT has been identified as an important aspect of the wider strategy for the social inclusion of students with intellectual disabilities. Futurist Alvin Toffler opines that "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." Global changes also put pressure on all groups - especially low income and middle income groups in developing economies to constantly acquire and apply new skills. Several decades in the past suggests that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others. The reality of the Digital Divide-the gap between those who have access to and control of technology and those who do not-means that the introduction and integration of ICTs at different levels and in various types of education will be a most challenging undertaking. Failure to meet the challenge would mean a further widening of the

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knowledge gap and the deepening of existing economic and social inequalities. It is necessary to take a broad view in order to understand and determine how ICT impacts on learning. This is because educational achievements are shaped not only by the way education is organized but also by the socio-economic background of the learners, their socio-cultural environments, the changing skills and competences that are necessary for employment, education and training, self-development and participation in society. This clarifies partly why non-formal learning, informal learning and adult learning are increasingly seen as crucial for the future of learning. There is evidence that educational achievements are positively influenced by ICT. This paper titled "Intellectual renaissance - ICT as a stress free driver in developing countries" throws light on the key issues and growing significance of ICTs on the intellectual development of learners in the developing countries. Prospective work on ICT-enabled learning would help to grasp the opportunities offered by ICT to prepare for learning in the 21st century that embraces digital technologies for better learning, for better assessment of learning outcomes and achievements, for better teaching and for better social inclusion.

Keywords: Pedagogical approaches, Information and communication technologies, web-learning.

66. Health and environment

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In India, during recent years, there has been an increasing trend towards the sale and consumption of foods at the roadside. This phenomenon is more obvious in the urban areas of the country. The growing pressure of population, increase in the number of working women and the breakdown of the joint family system, resulting in rising numbers of nuclear families, compel people, especially of the lower economic strata, to depend more on ready-to-eat foods at cheaper cost than on foods available at regular eating establishments. Most of these street sales centers have been mushrooming on the roadside, either on the pavements as temporary structures or as push carts parked on the wayside near public places such as railway stations, bus stands, cinema halls and busy market areas. The emphasis in these establishments is to serve food which caters to the daily needs of the people belonging generally to the lower economic strata. Such foods mostly satisfy the people, served specially to the taste of the consumer, with little attention bestowed on hygiene, food safety or nutritional aspects. Regular catering establishments need capital investments in terms of space, equipment, and number of employees. On the other hand, a street foods operation often involves entire families with regard to procurement of the raw material, preparation and cooking as well as the sale of prepared food. With little or no rent given, few overheads and negligible control by the Government as compared to regular catering establishments in terms of taxation or regulation compliance, the street food vendors are able to serve foods to the masses at a comparatively cheaper cost, sometimes even less than that at the household level. These factors lead to a proliferation of this sector at a fast rate. Main objective of this study is to find the impact of junk food on health aspects. The rich and the middle class are spending more on unhealthy food, according to the guick estimates of the national consumption expenditure 2007-08. The study measures the amount of money that consumers spend on food. This has led to increase in incidence of lifestyle-related diseases. The report was released by the central statistical organization, ministry of statistics and programme implementation, on January 30. The report was compiled using data obtained from sales tax records in the country between 2000 and 2008. The results showed that expenditure on beverages, paan and intoxicants almost doubled from 1.6% to 3.1%. The money spent in restaurants increased from 1.9 to 2.6%. Expenditure on healthy food like cereals and pulses reduced from 11.7 to 9% and consumption of fruits and vegetables slumped from 9.5 to 7.7%. "The repercussions of such unhealthy lifestyles are obesity, diabetes and heart diseases," S. K. Wangnoo, senior consultant in endocrinology at the apollo hospital, Delhi. He pointed out India, with over 45 million diabetics, is already the diabetes capital of the world. The expenditure estimates said money spent on healthcare rose from 4.7%-5.7%. Sedentary lifestyle and easy access to unhealthy food items are some of the reasons cited for the rise in incidence of lifestyle related diseases. The World Bank has said that by 2015, coronary heart disease would become the leading cause of premature deaths in India. To curb this trend, the Union ministry of health intends to put a ban on junk food in schools and colleges. It also plans to improve labeling on food items to show their calorie content. These measures need to be strictly implemented.

Keywords: Junk food, health aspects, obesity, intoxicants, diabetes, heart diseases.

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67. Applications of ICT tools in learning process e-learning an outlook R. Usha¹ and R. Geetha Lakshmi²

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Electronic learning (e-learning) is a type of technology supported education/learning (TSL) where the medium of instruction is computer technology. In some instances, no in-person interaction takes place. E-learning is used interchangeably in a wide variety of contexts. In companies, it refers to the strategies that use the company network to deliver training courses to employee. Lately in most universities, e-learning is used to define a specific mode to attend a course or programmes of study where the students rarely, if ever, attend face-to-face for on-campus access to educational facilities. because they study online. E-learning can provide for major benefits for the organizations. E-learning allows people to avoid travel, thus reducing the overall carbon output. The fact that it takes place in a virtual environment also allows some reduction of paper usage. The fact that instructors of the highest caliber can share their knowledge across borders allows students to attend courses across physical. political, and economic boundaries. E-learning is self-paced and the learning sessions are available 24x7. Through technology facilitated approaches contemporary learning settings now encourage students to take responsibility for their own learning. The use of e-learning in educational settings, by itself acts as a catalyst for change in this domain. The emergence of e-learning as learning technologies has coincided with growing awareness and recognition of alternative theories for learning. Keywords: Electronic learning, technology, online, carbon output, virtual environment, self-paced.

68. ICT in education

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Globalization and technological change processes that have accelerated in tandem over the past fifteen years have created a new global economy powered by technology, fueled by information and driven by knowledge. The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the half-life of information continues to shrink and access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote "learning to learn." i.e., the acquisition of knowledge and skills that make possible continuous learning over the life time. The International Labour Organization defines the requirements for education and training in the new global economy simply as "Basic Education for All", "Core Work Skills for All" and "Lifelong Learning for All". Information and communication technologies (ICTs)-which include radio and television, as well as newer digital technologies such as computers and the Internet have been routed as potentially powerful enabling tools for educational change and reform. ICT drives education towards-effectiveness, cost, equity, and sustainability. We conclude with a discussion of five key challenges that policymakers in developing countries must reckon with when making decisions about the integration of ICTs in education, namely, educational policy and planning, infrastructure, capacity building, language and content, and financing. The integration of ICTs in education and their use in developing countries are offering opportunities to enhance educational systems and expand the range of opportunities fo social change in even the poorest communities, while facilitating the acquisition and absorption of knowledge regardless of socio-economic obstacles. A private sector-public sector partnership to either pilot or fast track ICTbased projects is a strategy that has gained currency among Ministries of Education in developing countries. These partnership stake many forms, including private sector grants with government counterpart contributions, donations of equipment and education-related content by corporations to state-run schools, and the provision of technical assistance for planning, management, and strengthening human resources at the grass roots level. Multilateral organizations and international aid agencies have also driven many of the most significant ICT in education efforts in the developing world. In developing countries where higher education is fraught with serious challenges at multiple levels, there is increasing pressure to ensure that technological possibilities are viewed in the context of educational needs. This paper deals with how ICTs help expand access to education, how the use of ICTs help improve the quality of education, the promise of ICTs in education, radio and TV broadcasting used in education, Teleconferencing and its educational uses computers and the internet 34

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used for teaching and learning, computers and the Internet used in distance education, telecollaboration, key challenges in integrating ICTs in education. Implications of ICTs enhanced education for educational policy and planning, Infrastructure-related challenges in ICTs -enhanced education, the challenges related to financing are discussed.

Keywords: ICT, education, teaching, learning.

69. ICT driven education in India

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The private education market in India was estimated as \$40 billion in 2008 and will increase to \$68 billion by 2012. However, India continues to face challenges. Despite growing investment in education. 40% of the population is illiterate and only 15% of the students reach high school. Human Resource Development (HRD) Minister Kapil Sibal has said that India will have the most educated people by 2030, thereby stressing on the use of technology to spread education to dispossessed areas of the country. Sibal also came up with the idea of providing mobile phones to the teachers to check the problem of their absenteeism, saying the mobile phones will specify the exact place where the teacher is positioned at any given point of time, 1, 20,591 schools imparting elementary education in the country in 2005 had computers in place in school. Of the total (1, 20,591) schools that have computers, 74% are located in rural areas. Compared to 5.14% Government schools having computers, the percentage in case of schools under private managements is much higher at 30.52%. To mitigate the problems of faculty shortages, IITs are resorting to all sorts of innovative methods. They have started using technology heavily, to extend the reach of a particular class or a teacher to as many students as possible. With technology's help, they have even been able to squeeze in as many as 800 students in certain common courses without compromising guality. A text2teach project in the Philippines, which provides a way for teachers to request educational videos via text message, with the videos delivered to a television at the school via satellite is a pointer to us. The 3G mobile is becoming popular in India and we will soon have mobile TV. Some courses and this mode of education then will become a huge hit. If the project goes through, India would become one of the first countries after South Korea to use the mobile phones for education. Cell phones can support language lessons, display animations of medical and chemical processes, be used for polling and testing, and serve as the gateway to larger learning resources. It can be used to learn English; to study math, health and spelling; and to access live and archived university lectures. Prensky shares that the average cell phone now a days has more computing power than many of the computers of 10 years. The Indian telecommunication industry, with about 525 million mobile phone connections (Dec 2009), is the third largest telecommunication network in the world and the second largest in terms of number of wireless connections. The Indian telecom industry is one of the fastest growing in the world and is projected that India will have 'billion plus' mobile users by 2015. The total subscriber base for internet users in India is 81 million as of 2009. This shows the imperativeness and possibility of ICT in education. Keywords: Education, India, school, ICT, telecommunication network.

70. Customers' risk perceptions of electronic payment systems Ch. Seetha Ram

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Technological development has led to the gradual installation of various electronic fund transfer systems (EFTS) worldwide. While many other Western countries are still experimenting with a nationwide electronic fund transfer at point-of-sale (EFTPoS) system, Hong Kong was among the first in the world to introduce a single full scale operational EFTPoS system (commonly known as easy pay system in Hong Kong and the two terms will be used interchangeably in this article). The system is supported by all banks issuing automatic teller machine (ATM) cards in Hong Kong and is viewed as an alternative payment method to other conventional mode such as cash and credit card. The vendor of the EPS service asserts that the service provides potential benefits of more flexible, convenient, fast and secure services to the consumers. However, despite the huge amount of resources invested and the potential benefits, it does not guarantee that EFTPoS can follow the same success story of the ATMs in the territory. The adoption rate of EPS service by consumers as a substitute for cash and credit card payment is relatively slow. Currently, about 85% of retail purchases are paid by cash and

10% by credit cards. Only a few percent of potential EFTPoS users (i.e. ATM cardholders) have ever used the easy pay system (EPS) service. One reason for such low usage of EFTPoS is that consumers may perceive EFTPoS has a higher level of "risk" than other traditional payment methods. The objective of this study is to gain more insight into the reasons why ATM cardholders accept or reject EFTPoS and how they view the risk of EFTPoS when compared to credit cards and cash. Earlier related empirical studies on EFTS usage mainly focused on issues such as demographic and psychographic profile of ATM users and users' prior experience of using other new financial services and its relationship with EFTS adoption. Yet very few studies have reported on how customer motivations, fears and behaviours are associated with specific EFTS services such as EFTPoS. This study makes use of a concept in consumer behaviour and perceived risk to study the differences of consumers' risk perceptions among alternative payment methods. It also examines whether the amount of purchase has an effect on the level of perceived risk of alternative payment methods and whether users of EFTPoS perceive the risk of EFTPoS differently from non-users.

Keywords: Technological development, electronic fund transfer systems, psychographic profile.

71. Perceptions and opinions of home loan borrowers (With reference to selected districts in Andhra Pradesh) Ch. Seetha Ram

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Housing is one of the primary human needs and is next in importance to food and clothing. A house is not only a shatter to project the human being form vagaries of weather but also a work shop where human efforts are prepared for constructive role in future. Housing is however, a state subject and the central government would need an agency to propagate its policies regarding land, housing and legal regime. This study was conducted in the state of Andhra Pradesh to know the perceptions and opinions of home loan borrowers of sample Housing Finance Companies i.e. HDFC private company, LIC housing finance company, SBI Home Loans both public company during 2007-08. Further 200 home loan borrowers in five districts in Andhra Pradesh i.e. East Godavari, West Godavari, Visakhapatnam, Srikakulam and Vizianagarm. Which has branches or extension counter of sample HFCs, were randomly selected, Out of 200 sample respondents, 110 respondents (55%) were employed in various state ad central government department. 48 respondents (21%) were employed and engaged in various kinds of trade, business and profession. The data has been collected through questionnaire, interviewed and analyzed by using various statistical tools like percentage and Chi-square test. **Keywords:** Housing, finance company, home loans.

72. E-Learning, the next big name in education R. Sugaraj Samuel Dept. of Physics, Presidency College, Chennai-600 005, TN, India sugarajsamuel@yahoo.com

Information technology has invaded every activity of day to day the life of a common man. The one activity that happens throughout our life, consciously or sub-consciously is "*learning*". Learning happens by different processes depending upon the type of learning. This paper goes on to explain the three types of learning namely, knowledge-based learning, skill-based learning and attitude-based learning and how the technology enabled learning in other words e-learning can accommodate all these. This paper also analyses how e-learning can integrate the three styles of learning namely, auditory learning, visual learning and kinesthetic learning commonly found in individuals. This paper also brings out elaborately the benefits and drawbacks of e-learning in its present form to the learners as well as educators. Practicable suggestions are brought out in this paper to maximize the benefits and utilize them to the fullest extent. Though e-learning has come a long way, breaking many barriers to its present form, a series of challenges are still ahead for it to cater to the ever growing wide spectrum of beneficiaries. This paper not only brings out carefully these challenges but also the feasible mechanism to face these challenges.

Keywords: Information technology, knowledge-based learning, e-learning, kinesthetic learning.

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73. Promises and perils of information marketing in the digital environment

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In this context, digital marketing offers the organization to provide most cost-effective route to direct marketing and improves the services performance. This paper attempts to highlights the promises and perils of information marketing in the digital environment in relation to its products and services. It also outlines the need for marketing library services, barriers to marketing of products and briefly explains how technology is paving way in marketing library services and products in digital era. It also analyses the promises and perils in various channels of digital marketing. **Keywords:** Digital marketing, online marketing, internet marketing, cyber marketing.

74. IT based KM in Indian higher education system

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The quality of education being offered in institutions of Higher Education is a guestion being debated widely. With the growing cost of Higher Education in India, the question has become especially pertinent for all its stakeholders-students to policymakers alike. This paper attempts to look into IT based knowledge management as a techno-management tool for redressing their concerns. Various probable avenues are discussed where IT based knowledge management (KM) interventions could make an impact on the existing Indian Higher Education system during the past century, rapid development of an information society and growth in the quantity of accessible information was given considerable momentum with the development of information and communication technologies (ICT), which allow people to interact with each other and to share digital information relatively easily. An example of this is the Internet. For many people the information explosion has led to an overwhelming feeling of information overload. Internet searches for relevant information yield a growing number of results that are unrelated to the searched topic or are only marginally useful, while growing amounts of the information available are of poor quality. If information and knowledge are to be of practical value they must be effectively managed. This is particularly important in education and distance education (DE) where information plays such an important role in teaching and learning. KM is a response to these challenges, mostly seen in the business world and to some extent, in education.

Keywords: Information technology, knowledge management, Indian higher education.

75. Open source software (OSS) in computer application

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Open source is software (OSS) developed by uncoordinated but loosely collaborating programmers using freely distributed source code and the communications infrastructure of the Internet. There are literally hundreds, if not thousands, of open-source projects currently in existence and any Internet search engine will help us to identify the OSS. Though OSS is available for almost all branches of knowledge, the number of OSS for computer applications is steadily growing. In this context, this paper attempts to highlight the basics of OSS and profiles some of the important OSS available on the Internet which is useful for computer applications.

Keywords: Open source software, open-source projects, computer applications.

76. Open journal system (OJS): A panacea for problems associated with scholarly publishing

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Scholarly communication and publishing have had a long history, reaching back into Ancient Greece. The relationship between scholarship and scholarly publication has changed severely over the past centuries. When the scholarly publishing had been taken over by commercial publishers, an alarming degree of commercialization and proliferation of increasingly expensive journals of unproved value marketed to the scholarly world which resulted in a vicious cycle of increasing prices and decreasing distribution, straining library budgets, and leading to cancellations of journals. While the flow of scholarly

communication was at stake and eroding the academic mission, the advent of the Internet paved way for revival of scholarly publishing electronically. Electronic publishing is often considered to have six advantages over print viz., international reach, speed, additional capabilities, lower cost, new publishing opportunities and sustainability. However, electronic journal publishing is also not free from problems. While the e-journals are published by commercial publishers, again the subscription cost is a problem. In case of open access journals, the quality of the contents is a problem. Under the circumstances, Universities and R&D institutions of developing countries started realizing the publication of open access journals to disseminate their research findings and also to share their expertise. But, the cost of establishing the digital infrastructure, software procurement, cost to employ or outsource IT people for managing the e-journal publishing process, are the major barriers. In this context, the Open Journal Systems (OJS), an open source journal management and publishing system that has been developed and released by the Public Knowledge Project (PKP), became a panacea for the scholarly publishing problems of third world countries. Since it is a very user-friendly system, it has received enormous support from academic and research community across the globe and as on July, 2010 about 6600 journals are being published thro OJS which includes South America with 1537 titles, North America with 1343 titles, Europe with 961 titles, Asia with 678 titles, Africa with 429 titles and Oceania with 96 titles. The number of journals published using OJS is steadily increasing. This paper attempts to profile the features, requirements, present status and advantages of OJS and explore the possibilities of publishing more scientific journals by Indian Scientists.

Keywords: Open access journals, open journal systems, public knowledge project, electronic journals.

77. The need for educational leadership in India

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Given the importance of educational leadership, the development of effective leaders should not be left to chance. It should be a deliberate process designed to produce the best possible leadership for schools and colleges (Bush, 2009). In the developing countries, including India there is a widespread question around the quality of leadership in schools and colleges. Studies show that there is rarely any formal leadership training in our country. Are Indian educational institutions prepared to take on the very many changes that are taking place globally and thus nationally? Sapre (2000) had observed that the then existing model of educational administration in India was totally out of date and that it was hardly a point to debate on. Sapre (2000) also pinpointed that topics such as an integrated, systems approach to school management; concern for results; a reward system based on performance; interpersonal relationships based on autonomy and expertise; accountability to students, parents. and other recipients of educational services; flexibility in rules and operating procedures; and shared responsibility for change and growth were topics that found interest in staff development programs but was not reflected in reality. Nine years from such observations it is important to analyse the present situation. It is important for us to remember that it is only recently that the need to apply different management principles to education has been recognized (Sapre & Ranade, 2001). They have observed that most in-service education programmes for school administrators and teachers include leadership. But doubts over the programs' effectiveness perhaps remain. This is reflected in their inspection that the concern over moral and ethical values, in public as well as private life is near universal in India. The concerns over moral and ethical values, both which are accepted realms of leadership have not only perhaps eroded the quality of education but perhaps have resulted in greater unemployability among students. There is a general dissatisfaction among Indian employers with regards to graduates' skills (Gokuladas, 2010). It is important to analyse this and establish whether or not there is a link between leadership and employability of students. Sapre & Ranade (2001) feel that preparation and professional development programmes for school administrators need to stress the importance of a personal vision that translates into a passionate commitment to the 'greatest good for the greatest number'. Despite political and economic constraints, Indian Prime Minister Manmohan Singh has recently unveiled a rigorous plan to create 40 new universities, primarily in information technology, management, science education, and research (Neelakantan, 2007). National development and research studies indicate a very strong need in transformation of Indian higher education programs. But contrary to this need researchers have observed that our education system is lagging behind according to international standards. For eq, despite its sheer number of university and college graduates, not one Indian university ranked among the top 300 universities in the academic ranking of World universities from 2006-2008 (Chakrabarti, Bartning & Sengupta, 2009). Do the

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standards of Indian universities and colleges reflect a lacuna in its leaders? Chakrabarti *et al.* (2009) observe that faculty quality certainly play an important and dominant role in determining the standards of colleges. This leads us to think about the kind of role our educational leaders play in the development of faculty quality. Indian academic leaders have been accused of doing the 'same old thing' and that we have survived with a mediocre higher education system for decades (Tiwari, 2005). This paper aims to analyse the very many problems of the Indian higher education pertaining to leadership and attempts in contributing to fill the gap in this area of research simultaneously stressing the need for a more systematic approach in addressing the problem of higher education leadership in India. **Keywords:** Educational leadership, higher education, information technology, science education.

78. Is disaster management a myth or reality? - An Indian scenario S.Vijayalakshmi and R.Ambuja

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The disaster management and its various types are studied. The various phases like preparedness, prevention, risk reduction, mitigation, recovery and response of disaster management is discussed. Key players and the channels used in disaster warning are also viewed. GIS and networks in disaster recovery and the objectives of the national policies of disaster management are explained. As a result, it is between the myth and reality.

Keywords: Preparedness, mitigation, prevention, vulnerability, response.

79. Evaluation measures for mitigation of flood and pollution in small urban watershed: South Chennai

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This article presents an application of the Storm water management model (SWMM) in order to predict the pollution in rainy weather in a combined sewer system catchment in small urban watershed in South Chennai. Urban storm water management must address pluvial flooding and diffuse pollution at varying temporal and spatial scales of operation in order to identify appropriate mitigation and management options. The Case study analysis is done 1) to evaluate the runoff from small urban watershed. 2) To develop the pollutograph of small urban watershed and 3) to identify the Best Management Practice for Public Private Participation. This study demonstrates that the surface based approach provides a fundamental understanding of the main contributors to storm water pollutant load generated from urban catchments. This research investigates spatial variability of urban runoff quality parameters.

Keywords: Storm water management model, sewer system catchment.

80. Hypermedia: An effective knowledge management technique and teaching aid

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Increased economic, cultural, environmental, and social interdependencies indicate globalization towards which most of the countries are marching forward yet, the issues and strategies of global warming is looming large over the achievement of Globalization. Realization of the significance of the conservation and sustainability of global environment has triggered number of debates and discussions in various platforms, both at national and International levels. Conservation of global environment has serious implications on the entire human kind, and the gravity of this situation has been fully realized only by a section of the society. Ignorance in this matter is quite wide spread especially among illiterates and uneducated people. It is utmost responsibility of every country and every citizen to make people realize the gravity of the situation. This venture should start from the younger generation since they are the ones who are going to face the consequences of global warming seriously and they should spread the knowledge regarding the dire necessity of conservation of global environment. This article aims how ICT could be utilized effectively for knowledge management and in the education of future generation. ICT improves educational quality and basic learning process. ICT can be utilized

to manage the expertise knowledge in any domain effectively, which can make teaching more innovative for teachers. Similarly it improves the cognitive skills of the students and motivates the students to learn in a more positive manner. Expert systems, multimedia and hypermedia are some of the knowledge management tools which serve as effective teaching aids and interesting learning techniques of ICT. It has been vividly described how these techniques or tools could be utilized in KM and imparts education effectively by the authors of this article. To make this article more pragmatic rather than theoretical a short demo of hypermedia on environmental issues have been included which will be shown during the presentation.

Keywords: Social interdependencies, global warming, expert systems, multimedia.

81. Information and communication technologies (ICT) in education for development

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azh 11@vahoo.com The subject "Information Communication Technology" is a fast developing technology which is so

successful in capturing the attentions of Government's in E-governance, Technologists in content hosting, common people, Educationist in content creation, teaching tool and more with Students in using and benefiting from them. Information and communication technologies (ICT), refers to forms of technologies that are used to create, store, present, transmit, share, teach, learn or exchange information via digital electronic means. However, a major gap has always existed between affluent people living in developed societies with access to modern information technology and underprivileged people living in impoverished and rural communities in developing and least developed countries. Even today, an unequal adoption of technology excludes many from harvesting the fruits of the digital economy. ICT around the globe benefits interaction between teachers and students worldwide. Many higher education institutions and universities are using ICT to develop course materials, deliver and share the course content, lectures and presentations; facilitate communication among lecturers and students; conduct research; and provide administrative and management services. However, information on how ICT has been, and can be, used to enhance the design, delivery and management of higher education programmes is being in a nascent stage. In the near future, ICT shall become fundamental to the creation of qualified human resources is an accessible, effective and efficient higher education system, particularly when governments are counting on university graduates to be competitive in creating wealth for their respective countries. Universities are compelled to be innovative and lead by example in using cutting edge technology to meet these educational expectations. While there is agreement that ICT can be a powerful tool for advancing education efforts going forward, the challenge we face today is turning the potential of Information and Communication Technologies for Education (ICTE) into reality with results. This is a tremendous challenge, compounded by the realistic fears that if not used properly, ICT can increase existing social and economic inequalities, particularly if access and use of ICTE is not equally available to everyone. It is envisaged that a properly designed and implemented computing and communications have the potential to revolutionise education standards and improve learning as profoundly as information technology has transformed medicine, finance, manufacturing, and numerous other sectors of society. Education leadership, management and governance can also be improved through ICT by enhancing educational content development and supporting administrative processes in schools and other educational establishments. ICT in education projects are to be education-driven and not technology-driven. A vibrant education sector is fundamental for developing human capital within countries. With an active and transformative education policy and a supportive infrastructure, the development of a knowledge-based population can apply itself to sustained and equitable growth. ICT can play a vital role in increasing access to education as well as providing better quality education. A study conducted by the International Institute for Communication and Development (IICD) indicated that 80% of its participants felt more positive aware and felt empowered by their exposure to ICT in education. To summarise a long-term vision or Strategy for ICT in Education calls for a strong implementable ICT policy; which is sustainable and productivity-driven. Such a ICT implementation is achievable only with literates, critically thinking workforce and with the usage of right ICT tools' providing a path for transformation of the teachinglearning process and the way teachers and students, academicians gain access to knowledge and information. With the emerging new technologies, the teaching profession is evolving from an emphasis on teacher-centred, lecture-based instruction to student centred, interactive learning environments. Designing and implementing successful ICT-enabled teacher education programmes is the key to fundamental, wide-ranging educational reforms which are expected today.

Keywords: Information communication technology, leading-edge technology, educational reforms.

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82. Digital information management in Anna university library, Chennai: A study

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Presently we are living in digital world. The evidence is everywhere. Today digital world is connected with creating, sharing and using information in digital form because the right information available to the right person at the right time is the aim of any modern library service today. The latest estimates show that the total amount of information the world doubles every years this high rates of growth of information has made it impossible for any library professional to rely solely on manual or semimanual methods of information handling in order to achieve this goal. The digital library is an electronic library where the information is acquired stored and retrieved in digital form. Digital libraries do not mean libraries in the classical sense, but a network of multimedia system. A typical digital library is a media server connected to high speed networks. Unlike a conventional library where users were provided with physical materials from many sources, a digital library is a group of distributed repositories that users see as a single repository in a digital form. Digital library are managed with collections of digital objects. The e-documents in a digital library are accessible readily with multitude of user friendly attributes and proper methodology is adopted to ensure the persistence of such documents over time. A digital library is a group of distributed repositories that users see as a single repository in a digital form. A digital library can disseminate its information across a network and users can retrieve the available information management is the collection and management from one or more sources and the distribution of that information to one or more audiences. Management means the organization of and control over the structure, processing and delivery of information. As information storage shifted to electronic means, this became more and more difficult. By the late 1990s when information was regularly disseminated across computer networks and by other electronic means, network managers, in a sense, became information managers. With the latest tools available, information management has become a powerful resource and a large expense for many organizations. This paper presents an outline of Infrastructure facilities in the area of Information and communication technology. New technologies bring changes in libraries resulting in digital libraries. As a result of innovations in technology, many new interdisciplinary fields including ICT have emerged. All ICT is inclusive of the hardware and software, which is the first and foremost infrastructure to start with any digital library. ICT is the combination of hardware, software, networks, satellite links and other related components which helps people to access, analyze, create, exchange and use data, information and knowledge. It brings people from all places irrespective of caste, creed and distance to expand the range of the user's unique capabilities. Infrastructure facilities available in digital library at Anna University, Chennai have been discussed in this paper.

Keywords: Digital library, information management, infrastructure facilities.

83. ICT driven technology leads an knowledge grid in organizations S. Rachel Angela University Library, Anna University, Chennai-25, TN, India

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Knowledge grid is a new concept that has appeared worldwide in recent years. This paper describes the concept of the need for knowledge grid in organizations. It can also add new quality to the complex grid applications enriching the opportunities for organizations functionality and contents. Knowledge management is an important means by which organizations can better manage information and more importantly, knowledge. Unlike other techniques, knowledge management is not always easy to define because it encompasses a range of concepts, management tasks, technologies, and practices, all of which come under the umbrella of the management of knowledge. Knowledge is an understanding of information acquired by study, investigation, observation, or experience. Knowledge management is an important means by which organizations can better manage information and, more importantly, knowledge. Once created, knowledge can be articulated, shared, stored, and re-contextualized to yield options for the future. The knowledge process acts on informational needs. Knowledge transfer is an important aspect of knowledge management because knowledge once captured or obtained by an organization, must be able to be shared from and by persons and groups within the organization. This paper specifies the need for knowledge grid, grid information process and the required components

of the system the key concept of the grid information system is the ability to negotiate resource sharing arrangements among a set of participating organizations. The objective of the study can bring the goal of the within one common ICT environment has provided a common technological infrastructure to support the collective knowledge management.

Keywords: Knowledge grid, knowledge management, management tasks, knowledge management.

84. Reformation of teaching and learning process

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Higher education in India has achieved remarkable progress in terms of institutions, teacher's enrolment and teaching-learning infrastructure including disciplines; it was strongly felt by the government that there are a number of challenges that need to be addressed urgently. It has made changes with a view of achieving a sea change in the field of education in terms of this teaching learning process. The need of the hour seems to be adopting strategic teaching and strategic learning. Strategic teaching describes instructional processes that focus directly on fostering student thinking, but goes well beyond that. Strategic teaching and strategic learning are inexorably linked. A strategic teacher has an understanding of the variables of instruction and is aware of the cognitive requirements of learning. In such awareness, come a sense of timing and a style of management. The strategic teacher is one who: 1. Is a thinker and decision maker; 2. Possesses a rich knowledge base and 3. Is a modeler and a mediator of instruction. Variables of instruction refer to those factors that strategic teachers consider in order to develop instruction. The first and foremost criterion is that the teacher thoroughly know the content, the second criterion is that the teacher has a set of rules for classroom management that are understood and implemented, and the third criterion is that the teacher has the resourcefulness and knowledge to rehearse unfamiliar techniques, and more importantly, has the capacity to adjust any lesson plan to maintain academic focus. Many of these tasks are learned on-the-job. Strategic learning is, in effect, a highly probable outcome of effective strategic teaching. Reduced to its essentials, strategic learning in which students construct their own meanings, and in the process, become aware of their own thinking. Teach a man how to fish, and he is fed for a lifetime," is at the heart of the thinking about strategic teaching and learning. As a teacher, one must first learn "how to fish," and only then one will be able to teach the students to do the same.

Keywords: Teaching-learning process, Strategic learning, effective job.

85. Knowledge management through distance education

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Globalization means free movement of capital goods, technology, ideas and people. It is the process of integrating various economies of the world without creating any hindrances. In this era of globalization it is necessary to create an environment in which human race can sustain itself on this planet Earth with its various aspects like energy, environment, education, technological back up and governing policies. Education therefore becomes an important aspect for the human race to sustain itself in the global environment. Education is the foundation for a vibrant democracy, growth of productivity and generation of income and employment opportunities. Education in India today is provided by both the conventional mode i.e., in schools and colleges and through the distance mode. The provision of distance education is a major breakthrough in the development of human capital. Distance education is therefore an important means by which the human race would be able to sustain itself in this global environment. Distance Education is a generic term that includes the range of teaching, learning strategies variously described as home study or independent study. It is a highly welcome step in the direction of taking education to the door of those willing to acquire higher education but unable to do so owing to lack of resources or paucity of time. In India distance education opportunities at the university level have increased enormously. Many new developments and modern trends due to globalization are putting new pressures on the conventional education system, forcing many institutions to review and amend their existing policies and procedures. The enrollment rates in various distance education institutes have improved over the years. But to achieve the goal of one hundred percent literacy the nation should aim at establishment of more number of distance education centres and make it known and affordable to the rural masses. In this context the present paper attempts to trace

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the development of Distance Education in India., to enumerate the objectives of distance education, to highlight the strengths and weaknesses of distance education, to ascertain the choice of the sample group between conventional and distance education mode, to determine the factors influencing the choice of the mode and to suggest policy measures to improve the quality of distance education. **Keywords:** Globalization, vibrant democracy, distance education, learning strategies.

86. Major trends and issues in the field of distance education S. R. Sheeja

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Distance education has become an accepted and indispensable part of our educational system. Technological revolution and increasing need for skill up-gradation and retraining are the major reasons behind the unprecedented growth of distance education. As compared to traditional face-to-face classes, distance education offers more time and place utility to students. Moreover, the conventional stream of education cannot accommodate the entire student community making distance education programs more necessary. Moreover, within the student community, number of adult, female, and minority learners is increasing. Distance education brings knowledge to these types of learners who have not been served by traditional class room setting. More and more traditional universities are transforming themselves from single mode to dual mode universities. The role of faculty members in distance education requires some specialized skills and strategies. Rapid developments in the field of ICT have created challenges as well as new opportunities for the design and delivery of education through the distance mode. Lack of infrastructure and professional competency still remain as major barriers in the field distance learning.

Keywords: Distance education, technological revolution, student community, field distance learning.

87. Need of coastal resource management in Pulicat Lake - Challenges ahead

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Coastal zones are currently experiencing intense and sustained environmental pressures from a range of driving forces. Responsible agencies around the globe are seeking ways of better managing the causes and consequences of the environmental change process in coastal areas. The demands on the environment are raising serious concerns from environmentalists, stakeholders, coastal communities and researchers. Pulicat lake is the second largest lagoon in India has rich natural but at the same time very fragile ecosystem. This lagoon provides nursery and breeding grounds for many species of marine fauna and supports commercial fishing too. This article discusses the current status of the Pulicat lake biodiversity, the ecological crisis faced by the lake due to lake-mouth closure issues, siltation, shrinkage of the lake, pollution, over fishing, degradation and destruction of natural habitats in the environment. Further it focus on fishermen community socio-economic perspectives of their development towards livelihoods, social organization, literacy, fishing pattern, marketing outlet, income and involvement by NGO's etc. The healthier lake needs integrated policy approaches, which involve scientific disciplines to address the complexity of the interaction between the social and natural systems in the coastal and marine environment.

Keywords: Coastal zones, coastal communities, over fishing, marketing outlet, marine environment.

88. Empowerment of tribals through skill development

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The tribes as a specific group of the society have been drawing attention of researcher as well as local and global agencies of development over the past few decades. Despite the programmes imitated by the government exclusively for the tribals, the benefits have not trickled down to them. Therefore, how to make these services available to them or reach to the people at the bottom is an issue to be addressed. It is therefore important to direct economic and social policies to create an entitlement for the tribals for the improving the ownership of assets in the form of agricultural land, credit or capital for business, imparting entrepreneurial skills and educational level. When these are given to the tribal it enhances their capacity and provides them an opportunity to better their situation. Education and skill

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development is expected to increase employability and help them to get jobs in private sector and public sector. It is precisely for this reason the complimentary equal opportunity policy, (complimentary to the policy of general and economic empowerment) is developed, in the form of reservation to ensure them the due share in employment, education, selectively in capital for business and housing and water and other amenities, in addition to the policy of social and economic empowerment. The complementary nature of these two policies will ultimately help the historically discriminated groups to receive due share in economic and social progress. Tribes have suffered economic devastation due to ecological changes and the series of developmental programmes brought out for them has not resulted in improving their lot. There is an urgent need to iron out tribal problems and it requires a coordinated action of governmental NGO's and local people. With this background the current paper would touch upon select aspects of tribals and the need to develop them through enhancing education and skill. Every efforts should be made to utilize tribals own potentials and through concerted action development can be brought out.

Keywords: Tribals, skill development, economic empowerment, India.

89. Self efficacy among the students of biological sciences at Cuddalore district S. Ravikumar

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Today our society expects the integration of information technology into the daily practices including in the classroom obviously. Self-efficacy has been defined as individuals' attitude about their performance capabilities in a particular domain. Self-efficacy beliefs influence on the choices individuals make and the courses of action they trail. An individual's sense of self-efficacy is also related to achievement goals, attributions, self-regulation and option. Measurement of technology efficacy using appropriate instruments may provide a useful indicator of the effects of students initiatives intended to better technology use. From this perspective, students are capable of influencing their own motivation and performance according to a model of triadic reciprocality in which personal determinants such as self-efficacy; environmental conditions and action are mutually interactive influences. Students should possess technology efficacy first of all to meet out the demands of the upcoming society without which the art of education would never attain its completeness in the present society. Undoubtedly, it is the need of the hour that the students at under graduate level are expected to update their knowledge and equipmentation skills. Henceforth, the investigator decided to conduct a study pertaining to this area. The problem selected for the study is stated as self-efficacy among the students of biological sciences at Cuddalore district.

Keywords: Information technology, self-efficacy, self-regulation.

90. Why knowledge management-A descriptive analysis

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Knowledge involves the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others. Knowledge management (KM) comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizational processes or practice. Knowledge may be accessed at three stages: before, during, or after KM-related activities. Different organizations have tried various knowledge capture incentives, including making content submission mandatory and incorporating rewards into performance measurement plans. Considerable controversy exists over whether incentives work or not in this field and no consensus has emerged. Knowledge management is continually discovering what an organization knows–codifying tacit knowledge, data mining, and business intelligence; continually increasing what the organization knows–organizational learning and communities of practice, and continually organizing and disseminating explicit knowledge for use throughout the organization.

Keywords: Knowledge management, data mining, business intelligence.

91. E-learning Indian scenario: An overview

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The revenue earned worldwide from e-learning was \$6 billion in 2003. That's expected to rise to \$21 billion by 2008. Nasscom reports that Indian companies will get revenues of \$7 million to \$9 million by end-2005. As is apparent from the above figures, e-learning is slowly becoming popular in India. IT-enabled distance education can work efficiently only when it is simultaneously supported by e-publishing, which can enable learners to access information guickly and from anywhere. E-publishing and e-learning are inseparably linked to one another. The Indian Market has been slow in adapting to e-learning and the expected annual growth rate on the Indian e-learning Market is 20-25%. NIIT and TATA Interactive Systems were pioneers in the industry. But the steady growth in the e-learning market has attracted IT companies, pure players, KPOs, BPOs, and publishing houses such as ElementK, McGraw-Hill, Lionbridge, Skillsoft, IBM, and Oracle. These global companies have set up e-learning centers in India. This report provides a brief overview of the e-learning industry in India. E-learning permits the delivery of knowledge and information to learners at an accelerated pace, opening up new vistas of knowledge transfer. Early adopters are companies that have tried to supplement face-to-face meetings, demonstrations, training classes and lectures with this technology. "The adoption of e-learning in all spheres corporate, schools, universities, etc is low at present. The Indian market is not substantial when compared to the international market which is worth about \$6 billion to \$7 billion," says Harish Joshy, Vice-president of LionBridge technologies, an e-learning player. E-learning in India has been most successful in the corporate segment where it is seen as a means of achieving business goals and motivating employees.

Key words: e-learning, e-publishing, learning market, simulation systems, on line education.

92. Teaching and learning history through information and communication technologies Titty Elizabeth Phillips Dept. of History, Women's Christian College, Chennai, TN, India

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Globalization and technological change-processes that have accelerated in tandem over the past fifteen years-have created a new global economy "powered by technology, fueled by information and driven by knowledge." The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the half-life of information continues to shrink and access to information continues to grow exponentially, institutions cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, institutions must promote "learning to learn," i.e., the acquisition of knowledge and skills that make possible continuous learning over the lifetime. "The illiterate of the 21st century," according to futurist Alvin Toffler, "will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." History is a long-established discipline with a presence in most institutions of higher education. The territory of 'the past' offers maximum scope for exploration, and permits considerable diversity of ideological perspective and disciplinary practice. Moreover, as the practice of history has no single, dominating epistemology or methodology, how the history curriculum is delivered varies widely. As Jornadova (2000: 194) remarks, 'there is little consensus today about how to teach history at university level', and this diversity is regarded by practitioners as a sign of disciplinary vitality (History benchmarking group, 2000). Yet despite the variety evident within disciplinary practice, and its related ethos of individual autonomy, there exists a high degree of allegiance to the discipline, an intellectual and emotional attachment far stronger than that accorded to institution or academic department. The new technologies of the digital age have presented Higher education and educators with a perplexing mix of promise and problem. ICT has been promoted as the great hope of new education, the great liberator, the common currency of the 'knowledge age'. The reality has not quite matched up. As a teaching and learning tool-system, ICT has also created the greatest frustrations and the greatest disappointments. This is as true for the history classroom - real or virtual - as for any other. But it is also true to say that for history education ICT offers particular challenges and particular advantages. If we are to maximize the potential of new technology for improving teaching and learning in schools, we need to take account of the ways in which children learn when working with

computers, and the nature of the subject discipline being taught. What does it mean "to get better at History", and what specific advantages do particular ICT applications offer which will help pupils to make progress in History? How "useful computers are to a teacher" depends on what we are trying to achieve in a subject (Haydn, 2002). Amongst teachers of History in colleges however, it is now generally accepted that there is more to progression in History than the aggregation of substantive or "subject content" knowledge (simply "knowing more stuff" about the past). In the words of Norman Longworth (1981:19), to teach young people "to sort out the differences between essential and nonessential information, raw fact, prejudice, half truth and untruth, so that they know when they are being manipulated, by whom, and for what purpose." Helping young people to make intelligent judgements on the reliability of information from a range of media sources, in an era where they are faced with sophisticated techniques for the manipulation and distortion of information, is an important part of a historical education and education for citizenship. History teaching and learning not only offers opportunities to gain knowledge but also encourages students to develop ability to analyze and evaluate events, to think independently. One of the missions of History education today is to eliminate prejudices and keep positive communication between different countries, religions, and cultures.

Keywords: Globalization, educational institutions, citizenship, history education.

93. Efficiency of task based education and traditional teaching on self-regulated education

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The shift from behaviourism to cognitivism in educational physiology has replaced an increasing responsibility on learners for their own learning and self regulated learning has become a frequent area of educational research. In this context, the study conducted a Quasi-experiment to examine the efficiency of task-based learning (TBL) and traditional instructional approaches on various facets of students self regulated education, including motivation and learning strategies with help of MSLQ. Participants included 40 Periyar University PG students from 2 intact classes (TBL and Non-TBL) Instructed by the same environmental economics teacher. Non-TBL group with teacher-centred, text book-oriented traditional instruction; they taught the experimental group with task based learning in which students worked with ill-structured problems. Results revealed that TBL students had higher levels of intrinsic goal orientation, task value, use of elaboration learning strategies, critical thinking, metacognitive self-regulation, effort regulation and peer learning compared with control-group students. **Keywords**: Task based learning, problem based learning, motivated strategies learning questionnaire (MSLQ).

94. Safer building practices to deal with earthquakes: challenges and lessons learned from the South Asian countries

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Disaster is sudden, calamitous event bringing great damage, loss, destruction and devastation to life and property. Among the global trends of natural disasters, Asia is becoming increasingly vulnerable. The simple reasons are steep increase in population and urbanization, migration of people from rural to vulnerable urban areas, and possible impact of climate change. This being the scenario in developing countries especially in the South Asian region, which is more prone to natural disasters, the objective of the present research work was planned to be carried out on the importance of implementing safer building practices to deal with earthquakes. This paper focuses first of all on the construction practices followed in the disaster (earthquake) affected South Asian regions, to which safer and better building practices is recommended. Further an overview on the construction techniques and policy implications followed in the developed countries to manage with the natural disasters based upon their seismic zones is carried out. Based on this study, policy suggestions have been recommended to the governing and regulatory system of south Asian countries. Further it is conclude with the suggestion to make the seismic codes mandatory and for evolving and developing appropriate construction practices in order to deal with future natural disasters.

Keywords: Disaster, urbanization, earthquakes.

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95. Common property resources and land degradation in Tamil Nadu R. Unnamalai and D. Namasivayam Dept. of Economics Wing, DDE, Annamalai University, Annamalai Nagar, TN, India

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The main purpose of the present study is to estimate the changes that are taking place on wastelands in proportion to total geographical area in between these periods for the selected 10 districts in Tamil Nadu, as per the wastelands map prepared by national remote sensing agency (NRSA). The share of wasteland to the total geographical area has increased from 16.04% to 17.69% in 2000 for Tamil Nadu as a whole. The growth rate is the highest for barren rocky/stony waste/ sheet rock area at 6.44%. It means that this type of wasteland has increased at the rate of 6% from the base year to the current year. It is followed by degraded land under plantation crop at 3.85%, steep sloping area at 3.18% and land affected by salinity and alkalinity - coastal / inland at 1.44%. There is a marginal increase in growth rates of wastelands in the components of shifting cultivation area (0.13%) and underutilised / degraded notified forest lands (0.72%) in the state of Tamil Nadu in between the base and current years. However, the overall state average of growth rate is 0.04%. It implies that all categories of wastelands have increased at 0.04% percent from the base year to the current year. It could be reasoned out as population growth and technological change.

96. Music therapy

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'Music is the highest art and to those who understand, it is the highest worship' says Swamy Vivekananda. Music is a fascinating field. One of the God given gifts to the human race, the language of true sound. In 64 Kalas, Music is called Lalitha Kala and it is considered as Gandarva Vedam. It is called upa veda like Aayur veda etc. Nada Loludai Kruthi of Thyagaraja reads 'ganeshadi vara Mounulu upasichare'. This line means from gods to Sages and Siddhas are worshipping the Supreme God through Nada. Dhanvantri the Medicinal God of Hindu Mythology too has worshipped the God through music. Music not only influences people and enlightened personalities but also common public, beasts and plants alike. It believed that even a serpent could feel the charm of music. "Shisurveti Pashurveti veti gana rasam pani:" meaning that infact cow and the likes are captivated by the sound of music. Music is a language by itself and is capable of expressing subtle thoughts and refined ideas. Sublime ideas and delicate shades of feelings can be effectively portrayed through the medium of music. We find that music has a humanizing influence and it is a factor in the Music Therapy. Music is a proved and privileged accomplishment of a refined person. This research paper is about Musicology that is the most fascinating means of revealing culture, tradition and personality of the people from removable past. Music is believed to be born out of Sama Veda. Samaveda notes are in Karakarapriya and saint Thyagaraja describing in Nada Tanumanisam - Sama Veda saram and it is coming from 5 face of Parameshwara "s r g m p d n vara sapthawara" and this raga is called Chitaranjani.

Arohana	— s r g m p d n
Avarohana	— n d p m g r s

If we analyze the name being given to this raga, we come to know that it is made of two words Chitta + Ranjani. Chitta symbolizes Mind and Ranjani denotes liking towards anything. So, Chittaranjani on the whole is the raga that mind likes and thus makes it Calm. The bond between Music and medicine is very strong that the origin can be traced back to the one of the UpaVeda - Ayurveda; the Classical Tamil Works and Raga and Rasa Theory. Listening to music is one of the techniques that could be adopted to recover illness. It is even believed that musicians who practice nada yoga live a long life and are free from lung infections and heart diseases. Nada + yoga - Nada means music and Yoga denotes Abhyasam that is being performed repeatedly. Thyagaraja says 'Mooladharaja Nadhaloluda' meaning that the nada originates from Mooladhara. In Patanjali's yoga it is believed that the Kundalini begins from the area of Mooladhara. All the yogic practices centers around controlling the breath trough various measures. The same breath control is done unnoticing while singing. The ultimate result in both of the yoga keeps the body fit. Hence we can minimize the intake of medicine by practicing Nada Yoga. The rapid scientific advancement, technological development and socio economic condition

have influenced and necessity for listening to music has increased. The research paper speaks about the techniques to be adopted to cope up with the stress and various problems prevailing. **Keywords**: Musicology, music therpy, culture, personality, stress management.

97. Knowledge process outsourcing

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The outsourcing industry has been extensively researched in the past decade. Business process outsourcing (BPO) in particular has been the topic of many analyses. Over the past five years a new form of outsourcing has become popular and promises, as BPO once did, huge growth and profit potential. Knowledge process outsourcing (KPO) is the next step up the outsourcing value chain. While BPO provides extensive process expertise, KPO is emphasizes on business expertise. KPO indicates a major industry shift, away from execution of standardized processes to carrying out highly complex and customized processes that demand advanced analytical and technical skills as well as decisive judgment. KPO business entities provide typical domain-based processes, advanced analytical skills and business expertise, rather than just process expertise. KPO Industry is handling more amount of high skilled work other than the BPO Industry. While KPO derives its strength from the depth of knowledge, experience and judgment factor; BPO in contrast is more about size, volume and efficiency. According to a report of National Association of Software and Services Companies (NASSCOM), the Indian chamber of commerce that serves as an interface to the Indian Software industry, KPO is expected to reach USD 17 billion by 2010, of which USD 12 billion would be outsourced to India. Another report predicts that India will capture more than 70 percent of the KPO sector by 2010. Apart from India, countries such as Russia, China, the Czech Republic, Ireland, and Israel are also expected to join the KPO industry. Evalueserve says India provided \$3.5 billion of BPO and KPO (but non-IT) services in 2003 and is expected to grow at a CAGR of 36 per cent during 2004 to 2010. Hence, it is likely to earn \$30 billion in 2010 by providing these services. KPO services include: Investment research services (equity, fixed income and credit, and quantitative research), business research services, data analytics, market research services, valuation and fairness opinions, legal research services (also known as legal process outsourcing) and patent research services. KPO delivers high value to organizations by providing domain-based processes and business expertise rather than just process expertise. India is well equipped to meet this emerging sector's challenges and all set to be the global KPO hub. The main driver for outsourcing is cost reduction. Labour cost savings overseas are just too great to be ignored. In knowledge-intensive industries such as analytics and data mining services, research and development, and intellectual property research, companies can save significantly - as much as 40-50% - by offshoring work to low-wage countries. Destinations such as India, China and Russia are ideal for these services as they provide a large pool of engineers and even PhDs at a substantially lower cost. According to Boston Consulting Group, a typical annual salary for an Indian IT engineer is USD 5,000, and for a graduate with a masters degree in Business is USD 7,500 - about one tenth of their American equivalents. The cost differential between a PhD in the Sciences and Engineering in the US and in India (or in Russia) can range between USD 60,000 and USD 80,000, respectively. Besides India and Russia, countries such as the Philippines, Chile and Mexico are setting themselves up to provide high-end services at low-end prices as a way to boost employment and help their economies. Hence the increasing competition will drive prices even lower than the existing level. India alone produces 441, 000 technical graduates, nearly 2.3 million other graduates and more than 300, 000 postgraduates every year (London, 2006). A company can better control access to information and protect equipment when it is in house. In Knowledge Process Outsourcing this can include confidential company data, Intellectual Property and knowledge in general. This awkward situation can be avoided by choosing a partner with international security standards such as the ISO 27000 certification. A report by Evalueserve predicts that India will capture more than 70% of the KPO outsourcing sector by 2010. Apart from India, countries such as Russia, China, the Czech Republic, Ireland, and Israel are also expected to join the KPO industry. In the new knowledge economy, organizations around the globe are facing great challenges like the shortening of process-time for introducing products and services into the market and shortage of professionals in various knowledgeintensive high-skill sectors. The success of business process outsourcing sector has encouraged many global businesses to take a positive step in outsourcing their high-end knowledge work. In close

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scrutiny with the changing trends of outsourcing industry, we have equipped our highly professional team of Researchers, Statisticians, Mathematicians and seasoned professionals in accordance with the nature of the modern businesses.

Keywords: Outsourcing Industry, business process outsourcing, statisticians, India.

98. Challenges of higher education in India in the context of globalization R. Balaguru

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Higher education public forum (HEPF) is not-for-profit online service forum comprising of CEOs, prominent College and university presidents, and foundation leaders working to advance innovative solutions to nations' education challenges to enhance their competitiveness. HEPF brings together an extraordinary coalition of corporate, academic community to provide equal opportunities for education to all sections of the Society, more particularly to those which are financially weak. HEPF's role is mainly advisory in nature and philanthropic and supporting human rights and social responsibility. Today the role of ideas and innovation is deemed to be the most important contributor in the economic process. Hence, development and the use of human potential has become of pivotal importance in education, which is increasingly globalized. Looking from this perspective, we see that only a tiny fraction of the potential that human beings have is being utilized. On the other hand, there lies an ocean of talent waiting to be tapped. Take Silicon Valley, where ideas are converted into innovation and innovation into production. This chain reaction is the key to economic success. Creation and the accumulation of knowledge have become globalized. Talent, the key ingredient in this process, has become the subject of a fierce race on the global level. Talent is a Nature-given gift. But it must be groomed and educated to be productive. Student mobility around the globe is now taking place to a degree never before seen in history. More than 3 million students travel outside their home countries to study. This is a 57 percent increase over the past decade. This figure is projected to nearly triple, to 8 million, by 2025. In a competitive global marketplace, the recruitment of students who will be the scientists and inventors of tomorrow is fierce. Western universities offer many benefits to talented students from all around the world. At present, there are more than 160 campuses of Western universities in other parts of the world, mostly in the Middle East and Asia. This is an increase of 43 percent in just a few years. Some of the "newcomers" to the international competition, such as China and South Korea, and even Saudi Arabia, desire to create universities that can compete with toprated institutions in the United States and Europe. They have come to realize that universities are vital to innovation and economic growth. The growth of many private universities, the thirst of foreign universities to enter in Indian soil, change in the curriculum, science and technology, new educational policy and the new generation of people with awareness pose an altogether new picture about the great Indian dream of education to all. The numbers of private universities are on the rise and the much awaited foreign universities bill would add more educational players in the market to tap the burgeoning younger generation of India (40% of total population). The concern is about the quality, employability factor, and the actual and potential opportunities available. This new millennium has created a need for highly qualified faculty which is woefully inadequate. Above all, the urgent need is guality education based on morality and ethics to solve the evils of poverty, hunger, hatred and other socio- economic and political malice. Man power planning and human resource development must be based on the comparable international levels. We do not want to add to more clerical cadre, but the entrepreneurs who could provide more employment, the think - tanks to change the social evils, the men to uplift our country and scientists for the welfare of our society. Keywords: Doctoral programmes, foreign universities, political malice.

99. Digital knowledge management and information services in central institute of brackish water aquaculture: A case study

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The application of Information Technology (IT) plays a vital role in Library, Information and documentation knowledge resource centres and serves as a tool for knowledge management in information handling activities such as selection and acquisition, processing storage and retrieval and dissemination of information and development of information products etc. The application of IT in different types of libraries in India has gained sufficient momentum and it is of continuing interest to

the information professional in order to provide IT based services. The recent advancements in IT have changed the world scenario. This IT revolution has affected each and every aspects of human society and has opened new opportunities and challenges for all. The development has also imposed certain responsibilities and challenges on library and information professionals. In view of this, this present case study presents the digital knowledge management and information services in Central Institute of Brackishwater aquaculture. Discusses some of the challenges experienced by CIBA library in relation to acquisition, preservation of documents towards information provision in the library. Identifies some of the issues in relation to IT based information handling services. Highlights the measures/strategies for digital knowledge management towards challenges for information services in ICTs environment in library and information centres.

Keywords: Information Technology, digital knowledge management, library and information services.

100. Reforming education in teaching and learning process

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E-learning is a mind boggling explosion of information that is now available with lots of imagination and little efforts. With the implementation of collaborative tools this type of learning becomes a direct transformation of old teaching methodologies. It is available at a reasonable cost for any subject instantly which relieves pressure on both teacher and students. An overall view reveals that with the present development, on line coaching would explore a path that creates awareness among even the village people and emerge out with success. A periodical evaluation and workshops conducted to teachers would definitely bring a great impact on the quality of education. Teachers with more vears of experience and knowledge should be exposed to the recent developments in the curriculum of education, so that they impart knowledge to their followers through a new tool. Reforming as far as teachers are concerned is update and train them with the growing technology. Virtual class rooms are embodied with all the inventions of the present day technology which a normal class room cannot have. Sharing of knowledge more than introducing the modern techniques is important. Teachers should inculcate in students the habit of connecting learning to real life. A teacher's task begins with cultivating essentially the moral values in children. A teacher is a preceptor who orients the students towards the perspective as well as to have a perceptive view of life. Undoubtedly the present generation has an incredible knowledge despite their age. From the childhood if moral values are also fed with this knowledge, the progress and prospects of that would reach even the succeeding generation. Only teachers and teaching methodologies can do that. A good teacher is a one who can effectively analyse what is in the students mind. Though teacher training courses offer such value based education only a few follow it correctly. It is the practical approach towards the children that can effectively help in handling them in their way. Knowing the students psychology is an essential thing in moulding their life. The primary task of a teacher is to make the children like them. For the teachers to manifest good qualities in students they should inherently posses some which are morality based. A good teacher not only should have a good knowledge, but also the ability to convey his/her subject expertise quoting necessary examples connected to real life and current affairs. From the students point of view they come across so many pros and cons in life. The knowledge they acquire should help them in filtering out the unwanted and taking the right path towards the glorious life. Students should be given a practical oriented education. They should be taught and tested through knowledge based skills instead of examinations on a monotonous basis. Rather than forcing the children to take up a particular field of education, they should have different choices open to them. Higher education to the students must be purely merit oriented. This will reduce the unemployment problem and the flaws in the quality of education among the learners. As per the present trend every parent want their children to be engineers or doctors without analyzing what are they interested in and what are they good at. The educational society should bring out the prospects in each and every field of education whether it is literature, sports or cinema or music. It should bring out awareness among the people which will not only reduce the pressure and mental stress in children but also would give a sustained development in them in the future. If the present day condition prevails, in nearing future people can see 'Education for Sale' boards in most of the engineering colleges. To synchronise between learning and teaching coordination, responsive interaction and a pleasant atmosphere among both teachers and learners is essential. **Keywords**: Education, teaching, e-learning, virtual classroom.

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Global Environment and its Sustainability: Implications and Strategies - Part I. 7th Nov. 2010, RKM Vivekananda College, Mylapore, Chennai, India. Organized by: Indian Society for Education and Environment (isee)

101. Promotion of proactive environmental behaviour among school students through practical courses in B.Ed-DE programme

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Environmental pollution has become a worldwide problem. Environmental education (EE) is regarded as a permanent process in which individuals and the community gain awareness of their environment and acquire the knowledge, values, skills, experience and also the determination which will enable them to act individually and collectively to solve present and future environmental pollution and its problems. Environmental Education in Teacher Education plays a major role in changing the attitude towards environmental pollution and promoting Proactive Environmental Behavior of school students. So, the Practical Courses in B.Ed-DE programme can be used as a best tool for Environmental Education. Indian School Education System now has grown into one of the biggest system and having 7.7 lakhs of primary schools, 2.9 lakhs of of upper primary schools, 16.7 lakhs of high or higher secondary schools. Tamilnadu State emphasized the incorporation of Environment Education in textbooks, other instructional materials like teachers guide, test items workbooks and laboratory manuals. Activity books have also been developed to improve teaching/learning of environmental concepts given in the school curriculum. In Tamilnadu State, nearly 70.000 students are completing B.Ed course through 650 B.Ed colleges affiliated under Tamilnadu Teacher Education University; nearly 20,000 student- teachers are completing B.Ed course through distance mode. The B.Ed-DE comprises of total 48-credits in which theory 32-credits and practical 16-credits. The practical courses consists of School Based Activities (4 credits), Workshop Activities (4 credits) and Practice Teaching (8 credits). During Practical Courses. Student-teachers plays a significant role in forming, changing and establishing attitudes and values that are for the promotion of proactive environmental responsible behaviour among school students. Since 2004, Tamilnadu Open University is admitting 1000 student - teachers in 10 B.Ed Programme Study Centre (PSC). The author is a Biological science educator and acting as Incharge of a B.Ed Programme Study Centre (PSC), in which 100 student teachers are selected and trained in promotion of Proactive Environmental Behaviour through School Based Activities. The research paper discuss the status of Environmental Education in School and Teacher Education; Promotion of Proactive Environmental Behaviour with reference to school based activities and its educational implications.

Keywords: Proactive environmental behaviour, practical courses, school based activities.

102. Views of Swami Vivekananda on human values in modern education

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As a human being, every one is bounded up with some sort of humanness. Every one of us in the world is interested in take birth, bring up offspring and as an end meeting the death, leaving certain services to the society. A human being will be spoken of even after death only when he or she might have performed some services without selfishness. That type of services will be the basis for the creation of human values. In the present world, we are witnessing that numerous changes and developments which are coming up both in computer science and in science & technology. We find the progress only in terms of money values. If every one becomes self - centered then there could be no progress in the civilization. At the same time, we will not find a place for human value. In the modern days there is a greater impetuous towards higher education in the European lines. Every American woman has better education that can be conceived of by the majority of Hindu women. Why can't we have the same education? We must, says, Swami. Swami states that our religion does not prevent a woman being educated at all, but in some other foreign universities it is closed for women education. Swami states that the teacher's work must be simply out of love, one of pure love for mankind. The only medium through which, spiritual force can be transmitted as love. The student who wants know the truth must give up all desires for pain. Love, truth and unselfishness are not merely moral figures of speech, but they form our highest ideal. Because, in them lies such manifestation of power. Selfish work is slaves work; such work does not bring peace and bliss, it brings only material values rather than spiritual values. Whereas, unselfish work or self sacrificed service will bring the

real value in human beings which are considered as away from attachment. In modern education, human values are going going to be the high order of learning. These values are not static; the spiritual value is only permanent. For this, Swami insists to start from man-making education, imparting education for both the sexes, cultural development after having proper education and the co-operation between the student and teacher. In order to have an effective interaction between the students and the teacher, swami says, the teacher should come down to the level of students mind. **Keywords**: Softskill, education, human value.

103. The knowledge management and career development through the open and virtual universities with lifelong learning

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Virtual universities are the hypothetical universities where education is given by using online system through Information and communication technology (ICT). Whereas, open universities are the distance educational universities. Career can be developed and advanced by lifelong learning through open and virtual Universities for those employees who are unable to attain regular full time courses run by the regular Universities. Hence knowledge management and career development can be done through the open and virtual universities.

Keywords: Virtual Universities, hypothetical universities, career development.

104. A novel self-tuning PI controller for a STATCOM using ant colony optimization

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This paper proposes a fine tuning in the gain of the conventional proportional-integral controller using the Ant colony optimization (ACO). The technique is proposed for a static synchronous compensator (STATCOM) at all possible loading conditions. An efficient formula for the estimation of system load impedance using real-time measurements is derived. Based on the estimated system load, an ACO algorithm, which takes the promising solution from the priori information with a posteriori information about the structure of previously obtained good solutions in order to reach the optimized controller gains. To demonstrate the effectiveness of the proposed ACO fine-tuning for PI controller for a STATCOM, experimental results for a system under different loading conditions are presented. Results from the self-tuning PI controller are compared with those from the fixed-gain PI controllers. **Keywords:** Ant colony optimization (ACO), proportional-integral (PI) controller.

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TECHNOLOGY DEVELOPMENTS AND INTEGRATION

105. Environmental accountability for a sustainable Earth Dr. Sivanandi Rajadurai

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Environment is not "out there", it is the air we breathe, the water we drink and the places we live, work and play. The present society, intend on achieving influences and conveniences, has forgotten how precious nature is? It is our duty to bequeath a clean mother earth to nurture all living beings. Through voluntary action, each of us can join in building a productive land in harmony with nature. The vernal equinox calls on all mankind to recognize and respect Earth's beautiful systems of balance, between the presence of animals on land, the fish in the sea, the air, mankind, water, and land. Every individuals can now be trustees of earth, seeking in ecology, economics and ethics policies and decisions that will benefit people and planet. The objective is now the new rejuvenation of earth. We must rally and inspire a grand effort for earth, and an earth campaign that will eliminate poverty and pollution and bring new freedom, order and opportunity. Earth's atmosphere is 77% nitrogen, 21% oxygen with traces of argon, carbon dioxide and water. The tiny amount of carbon dioxide resident in the atmosphere at any time is important to maintain earth's surface temperature via green house effect. The green house effect raises an average surface temperature about 35°C above what it would otherwise be (from a frigid -21°C to a comfortable +14°C). Without green house effect, the ocean will freeze and life would be impossible. Increased concentration of CO₂ in the atmosphere and reduced levels of ozone layer in the upper layers are concerns of today. Since the earth wants to stay in thermal equilibrium (27°C), it must re-radiate the energy. If human activity increases the ability of the earth's atmosphere to absorb infrared radiation, this produces a net warming of the atmosphere over time. Anthropogenic global warming (AGW), a recent warming of the Earth's lower atmosphere as evidenced by the global mean temperature anomaly trend, is believed to be the result of an "enhanced greenhouse effect" mainly due to human-produced increases in atmospheric greenhouse gases. Carbon dioxide and other air pollution that is collected in the atmosphere, like a thick blanket, trap the sun's heat and cause the planet to warm up.

Climate change is a serious threat to everywhere. Slowing or even reversing the existing trend of global warming is the defining challenge of our ages. Warming of the climate system is unequivocal. Rate of global average sea level has risen from 1.8 mm/year to 3.1mm/year from 1961 to 1993. The reasons for sea level rise have been due to thermal expansion, melting glaciers and ice caps and the polar ice sheets. Projected sea level rise at the end of 21st century will be 18 to 59 cm. Climate change is part of the larger challenge of sustainable development. Unless we act now, our children will inherit a hotter world, dirtier air and water, more severe floods and droughts and more wildfires. Future changes in atmospheric composition and climate are inevitable with increases in temperature and some extreme events, and regional increases and decreases in precipitation, leading to an increased risks of floods and droughts. There are both beneficial and adverse effects of climate change, but the larger the changes and rate of change in climate, the more the adverse effects predominate with developing countries being the most vulnerable.

Automobiles, the second largest source, create nearly 1.5 billion tons of CO₂ annually. Technologies exist today to make cars that run cleaner and burn less gas, modernize power plants and generate electricity from non-polluting sources, and cut our electricity. Potential increase of about 2.5 to 10 degrees Fahrenheit per year is observed. The introduction of advanced emission control technology, led by the catalytic converter, sparked an automotive revolution that saw the beginning of a dramatic and continuing reduction in automobile pollution that is still progressing today. Since the late 1970s and 1980s, catalyst technology has improved and electronic controls and improved fuel delivery systems have been introduced. Vehicles equipped with these advanced control systems have reduced pollution by over three billion tons worldwide by reducing pollution from vehicles and power plants. Right away, we should put existing technologies for building cleaner cars and more modern electricity generators into widespread use. We can increase our reliance on renewable energy sources such as wind, sun and geothermal. Over a period of 33 years, automotive emissions have been reduced by up to 99%, while at the same time vehicles have become safer, more efficient, more powerful and far more durable.

There are many opportunities, including technological options, to reduce near-term emissions, but barriers to their deployment exist, and cost estimates vary greatly. Local, regional and global

environmental issues are inextricably linked and affect sustainable development - climate change, loss of biodiversity, stratospheric ozone depletion, desertification, freshwater availability and air quality are all inter-linked. The primary factors underlying most environmental and socio-economic issues are similar, i.e., economic growth, broad technological changes, life-style patterns and demographic shifts. The capacity of a country to adapt or mitigate can be enhanced when climate policies are integrated into national development policies - economic, social and environmental. Unless we, all humans on Earth become truly ecologically and socially sustainable, only a few of us (in person, or in our progeny) can hope to survive the current crises that humanity is facing.

We all can agree that we have only one Earth - a miracle planet teeming with life. With our amazing technology and awareness of earth's raw materials and natural resources we know that poverty and pollution, the breeding of crime and corruption, can quickly be eliminated. All that is needed is the will.

"Arise, Awake and Stop not Till the Goal is Reached" - Swami Vivekananda Keywords: Vernal equinox calls, climate change, economic growth, corruption.

106. Exploring the potential of stem cells in diabetes

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Diabetes mellitus is a debilitating metabolic disease characterized by severe hyperglycemia, caused by the progressive failure of the beta cells of the pancreas to produce insulin and could be either Type 1 diabetes (autoimmune destruction of the beta cells) or Type II diabetes (peripheral insulin resistance & insulin receptor defect). Prolonged exposure to hyperglycaemia increases the risk of micro and macrovascular complications underlining the pathophysiology of nephropathy, neuropathy, retinopathy and atherosclerosis. Islet regeneration is an important issue which is being addressed as an viable option in the management of diabetes to compensate the loss of the functional beta cells and also forms an attractive strategy for the control of diabetes. Edmonton Protocol has sparked new interest in transplantation of insulin producing cells isolated from cadavers, however, its clinical application is limited by the need for life long immunosuppression and the requirement of 2-4 donors per recipient. Recent promises of producing insulin secreting cells from the stem cells through their controlled differentiation have been notable. Stem cells such as embryonic stem cells (ESCs) and adult stem cells (ASCs) are potential source to produce large numbers of mature, functional islets considering their high proliferation, self renewal and regulated differentiation capacity. Although ESCs could differentiate into insulin producing cells, the possibility of teratoma formation, restrict their use for therapeutic application. Thus advantage could be taken based on the plasticity of ASCs which are able to expand and differentiate to ILCC using the combination of the growth factors and hormones shown in diabetic models. In addition, they are easy to isolate, wider distribution, less ethical issues, being more lineage specific and can be immortalization or multiplication in culture for a number of passages represent a promising system for beta cell mass expansion and tissue repair process. The newer approach of tissue engineering and stem cells have paved way in developing several strategies in the management cell based therapeutic approaches. The continued success of tissue engineering, and the eventual development of true human replacement parts, will grow from the convergence of engineering and basic research advances in tissue, matrix, growth factor, stem cell, and developmental biology, as well as materials science and bio informatics. Further, the technology of iPs has further explored the therapeutic applications of stem cells in the management of diabetes. **Keywords:** Diabetes mellitus, hyperglycaemia, tissue engineering.

107. Kaja balm- A unique ayurvedic pain reliever

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Ayurveda, a system of anicient Indian medicine, has assumed a greater importance in recent years due to the escalating cost of allopathic treatment as well as positive attitude of people towards "Green medicine". In Ayurvedic method of treatments, individuals are treated not only for the illness but also the root cause of the ailment. Thus helps in eastabilishing the total vitality of the human functioning.

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Many Ayurvedic formulations are obtained from the Natural treatment like flora of India. The main ingredients of this Kajah balm are Mentha sativa, Cinnamomum camphora, Mentha piperita etc. The chief constituent of this pain balm is Menthol (Mentha sativa) which is a covalent organic compound obtained from pepermint oils. It is a waxy crystaline clear substance white in colour. It acts as a short term relief of pain. It also acts as a decongestant from nasal blockages and para nasal uses. Menthol reacts in many ways like a normal secondary alcohol. It is oxidised to methone by oxidising agents such as chromic acid. Under some conditions the oxidation can further break open the ring. Menthol is easily dehydrated to give mainly 3-menthene, by the action of 2% sulfuric acid. PCI_e gives menthyl chloride. Menthol's ability to chemically trigger cold-sensitive receptors in the skin is responsible for the well known cooling sensation that it provokes when inhalated, eaten or applied to the skin. Menthol does not cause the actual drop in temperature. In this sense it is similar to capsaicin, the chemical responsible for the spicines of hot peppers. In order to maintain a standard quality product the selection of these raw materials are important. Transfer the ingredients of this palm into the boiler and stir well; wait until it reacher 80°C. The whole process to make this pain balm takes almost 4 hours again stir the impture for 15 min by then all the ingradients get blended well. The blended liquid is stored for 3 months period. Then the stored drum is taken for melting. When it becomes liquid, pour into the bottle and disposes it. This pain balm relives all types of headache, body pain etc. In view of its topical analgesic action, it is used to treat minor aches and pains such as muscle cramps, body pains, sprains, headachs and other similar conditions.

Keywords: Kaja balm, green medicine, pain reliever, herbal, Ayurvedic.

108. Biofertilizer arbuscular mycorrhizal fungi as biofertilizer for agriculture K. Amutha

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The arbuscular mycorrhizal fungi is the most obligate symbiotic endomycorrhizal type involved in agricultural systems and the most widespread plant root symbiosis. The fungi involved are known to promote plant growth and health by acting as biofertilizers, bio protectors and bioregulators. Arbuscular mycorrhizal fungi (AMF) are found in almost all important agricultural crop plants of the tropics, including woody plants, annual and perennial grasses and legumes. The mechanism of improved plant growth caused by mycorrhizal inoculation has been investigated by many workers. Biofertilizer has been identified as an alternative to chemical fertilizer to increase soil fertility and crop production in sustainable farming. Commercial use of AMF may be an alternative to rising agricultural energy and fertilizer costs. AMF association will able to increase crop yields while reducing fertilizer and energy inputs. Commercial uses of AMF are therefore currently restricted to situations where the natural populations of these fungi have been destroyed by chemicals, pesticides, insecticides, pollutants, electronic waste and natural disasters like tsunami etc., commercial production of AMF inoculum is presently being attempted at laboratory condition in India. AMF inoculum is produced by growing these fungi with suitable host plants under laboratory conditions. The inoculum may be the mixture of AMF associated host root bits and AMF spore mixtures, AMF hyphae and spores, axinic culture of AMF etc. Isolation of AMF spores from natural resources and predicting the most suitable, effective host plant for different environmental condition is important in the production of inoculum in large scale.

Keywords: Arbuscular mycorrhizal fungi, biofertilizer, tsunami.

109. A comparative analysis and effect of additive on biodiesel fueled diesel engine-A technical review

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The world is presently confronted with the twin crisis of fossil fuel depletion and environmental degradation. Scientists around the world have explored several alternative energy resources to meet the ever increasing energy needs. Various bio-fuel energy resources explored include biomass, biogas, primary alcohols, vegetable oils, biodiesel etc. The call for the use of biofuels which is being made by most governments following international energy policies is presently finding some resistance from car and components manufacturing companies, private users and local administrations. This opposition

makes it more difficult to reach the targets of increased shares of use of biofuels in internal combustion engines. One of the reasons for this resistance is a certain lack of knowledge about the effect of biofuels on engine emissions. But some of biofuels cause serious emission hazards and hence there is a need of additives to improve combustion parameters. Additives act like catalyst so that they aid combustion, control emission, control fuel quality during distribution and storage and reduce refiners operating cost. Investigations on reducing pollutants, in particular particulate matter and nitrogen oxides are critical to human health, welfare and continued prosperity. The addition of an oxygenating agent into fuel oil is one of the possible approaches for reducing this problem because of the obvious fuel oil constituent influences on engine emission characteristics. This paper collects and analyzes the body of work written mainly in scientific journals about diesel engine emissions when using biodiesel fuels.

Keywords: Compression ignition (CI) engine, biodiesel, additive, exhaust emission.

110. Cerium based inorganic ion exchanger as ecofriendly solid acid catalyst

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Inorganic ion exchangers are distinguished by their thermal stability, chemical resistivity, and resistance to high radiation fields and their selectivity to certain metal ions which are the properties the organic resins tend to lack. Amongst the synthetic inorganic ion exchangers, tetravalent metal acid (TMA) salts have emerged as promising advanced materials as they possess robust properties, good ion exchange characteristics. TMA salts with varying water content, composition, ion exchange capacity and crystallinity can be obtained by varying parameters such as stoichiometry, concentration of reagents used, temperature at which they are mixed, rate of addition, mode of mixing and pH. In the present study we report the applications of an inorganic ion exchanger Cerium Phosphomolybdate (CePMo) belonging to the class of TMA salt. The material possesses robust properties in terms of thermal and chemical stability. It was found to be stable in mineral acids and organic solvents but unstable in high concentration of bases. Strong peaks in the X-ray diffractogram confirmed the presence of nanocrystallites. Chemical analysis indicates the composition of CePMo to be in the ratio 1: 3/2: 10. FTIR shows a broad peak centered at 3500-3600 cm⁻¹ attributed to asymmetric and symmetric hydroxo and aquo O-H stretches. TG showed weight loss at 150°C due to removal of external water molecules and a continuous weight loss upto 400°C due to condensation of structural hydroxyl groups. The Na⁺ exchange capacity was found to be 7 megg¹ comparable to organic resins. The effect of heat on ion exchange capacity reveals that it decreases on heating. This may be due to the condensation of structural hydroxyl groups at higher temperatures. Distribution studies showed that the selectivity of the exchanger towards various metal ions was in the order $Co^{2+} > Pb^{2+} > Zn^{2+} > Mn^{2+} > Ba^{2+} > Ba^{2+} > Co^{2+}$ $Ni^{2+} > Sn^{2+} > Bi^{3+} > Zr^{4+} > Cu^{2+}$. Since the removal and recovery of metal ions is an area of current interest, as a case study the removal of lead from effluent is demonstrated. CePMo is quite efficient in the removal of lead as suggested by its percentage uptake over time: 20(5 min), 60(10 min), 68(15 min), 80(20 min), 95 (25 min.) indicating its use in environmental applications. Bronsted acidity of the material has been explored by selecting esterification as a model reaction wherein monoesters have been synthesized. Esterification of monoesters EA, PA, BA has been reported in the absence of catalyst and exhibit poor yields. Therefore a catalyst is a must for these reactions. In the present work when CePMo has been used as catalyst, the catalyst shows a high yield for PA (87%). The % yield of esters were in the order propyl acetate > butyl acetate > methyl acetate > ethyl acetate. The above results establish the primary use of CePMo as a potential solid acid catalyst. Further, CePMo as solid acid catalyst has the advantages of better activity, simple distillation of ester products, noncorrosive and no contamination. Moreover, the catalyst can be regenerated and reused. In general the material finds applications as a Bronsted acid catalyst and also in the treatment of waste water containing heavy metals.

Keywords: Cerium, ion exchanger, acid catalyst.

111. Assessment of effects on brain of albino rats after exposure to Semecarpus anacardium extract Part I: Effect on some biochemical parameters

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Semecarpus anacardium- a potent medicinal plant commonly found in tropical areas. It is popularly known as 'dhobi's marking nut', in Sanskrit called Bhallataka. It is well known for medicinal properties 56

and also has commercial importance. S. anacardium is commonly used in tribal communities of Maharashtra, Madhya Pradesh, and Andhra Pradesh for maintaining health. It is also used in ayurveda, siddha, unani and homeopathy treatments for various disorders. Kernel from nut is nutritious while the pericarp oil is used in treatment of asthama, digestive disorders if taken carefully and as per the suggestion of physicians. It was found to cure many diseases like asthama, rheumatism, piles etc. It was found to have anti-inflammatory, anti cancer properties. But literature gives caution about it use. Improper, irrelevant and indiscriminate use create many serious condition such as red patches on skin, rash, sensitivity to heat and sunlight. Pericarp oil is also used in commercial preparation of dyes and lubricants. For that huge amount of pericarp oil is needed, its extraction from nut is tedious, laborious process, for it large number of people from mostly rural areas are involved. During extraction they are exposed to pericarp oil, its fumes in nearby environment that create toxic effects like corrosive action, serious problems of skin, eves etc. in human/labour exposed to S. anacardium nut oil. No work was reported on toxicity caused by Semecarpus anacardium. Hence, in order to study toxic effects caused by S. anacardium pericarp oil, a systematic work was conducted in albino rats (wistar strain). Animals were exposed to S. anacardium extract (SAE) (50% w/v in ground nut as vehicle) orally along with diet. LD₅₀ was found 1 gm/ kg bwt. /d. Study was conducted at sub lethal SL and sub sub lethal levels. Results were compared with control group. SAE was found to cause adverse effects on digestive physiology and some haematological aspects of albino rat and was found to develop pathological conditions in albino rats. We present the effects of SAE on biochemical parameters total protein, glucose, glycogen, cholesterol and Mg content of brain in albino rat (Wistar strain). Nine groups of albino rat of either sex were orally treated with three sub lethal SL doses (i.e. 250, 500 & 750 mg/k bwt./d), one group was maintained as control. As compared to control a prominent and significant changes such as elevation in total protein content, decrease in glucose and glycogen, fall in chlolestrerol, prominently increased Mg content were found. These changes are correlated with severe tissue damage and adverse effects on biochemical parameters of brain leading to serious pathological condition and behavior of experimental albino rat. In order to avoid improper environmental conditions causing hazard, findings of the study compel us to think about method which provide safety as well as training to workers of involved in separation of kernel and extraction of pericap oil from Semecarpus anacardium nuts to avoid exposure.

Keywords: Semecarpus anacardium, brain, albino rat, biochemical parameters.

112. Spectroscopic study of the environment of a village, adjoining an industrial complex, Cuddalore district, TN, India

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The degradation of environment is a great concern of today. The industrial complexes add to the misery to a large extent. One such industrial complex is SIPCOT (State industrial promotion corporation of Tamil Nadu limited). The SIPCOT industries are playing an important role in the economic development of India. But, the effluents released by them produce a high degree of pollution in the soil, air and aquatic systems. The area of SIPCOT in the Cuddalore district has been declared as a "global toxic hotspot" by the environmentalists after a finding that the air in the area contained extremely high levels of nearly 22 toxic chemicals, including cancer causing ones. In this work, soil, water and plant (Calotropis gigantea linn.) were collected from various locations of Kudikadu village. Water samples are subjected to physico-chemical parameter analysis such as pH, EC, turbidity, TDS, TA, TH and minerals such as Ca, Mg, Iron total, free ammonia, nitrite, nitrate, chloride, fluoride, sulphate and phosphate. FT-IR has been used to identify the presence of various functional groups and to assign various vibrational frequencies in the soil and plant samples. An attempt has been made to assess the concentration of following trace elements Na, Mg, Al, Si, S, Cl, K, Ca, Mn, Fe, Cr, Co, Ni, Cu, Zn, As, Se, Pb and Cd in the soil as well as plant by SEM-EDS. Then, radioactivity study has been taken up in order to find the concentration of natural radio nuclides U²³⁸, Th²³² and K⁴⁰ in soil using gamma ray spectrometer. The study area of SIPCOT which houses many industries suffers from soil, water and air pollution. The plant calotropis gigantea linn. which has proved itself as a 'bio accumulator' behaves differently in different environment in polluted area.

Keywords: Environment, global toxic hotspot, Calotropis gigantea linn, bio accumulator.

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113. Relevance of anatomical techniques in resolving botanical identity of some root-drugs

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Resilience of belief in herbal system of medicine has spontaneously led to discover more and more herbals to meet with its ever increasing demand. Out of total quantum of herbals used in pharmaceutical industries, the root drugs constitute nearly 29% which is mostly procured from the herbal markets or from plant collectors. These sources of root drugs are obviously unreliable in terms of quality and genuineness of the drugs. Because, root-drugs, barring a few, do not possess any specific organoleptic character. This leads to vulnerability of adulteration, either intentionally or due to ignorance. The most reliable as well as simple way of managing the menace of adulteration of herbal drugs is microscopic analysis of the samples. Anatomical studies of fragmentary root-samples are quick, much economical and highly dependable. With the help of two selected species of plants, whose roots are claimed to possess high therapeutic potentials, it will be shown how the microscopic parameters can be utilized to diagnose the originals from the adulterants. The following two root-drugs are the subjects of the present study: *Boerhaavia diffusa* L. (Nyctaginaceae) (Purnova), *Hemidesmus indicus* (L) R.Br. (Nannari), *Decalepis hamilfonii* (Asclepiadaceae) (Mehali). Precise diagnostic protocols of microscopic profiles complemented with photomicrographs, of sectional views of the roots will be highlighted and the results will be discussed.

Keywords: Root-drugs, pharmaceutical industries, organoleptic characters, species of plants.

114. Comparative study of performance and emission of preheated vegetable oils as a fuel in CI engine-A review

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The concerns about clean environment and high oil prices driving forces for the research on alternative fuels. The research efforts directed towards improving the performance of CI engines using vegetable oil as fuel. However major disadvantage of vegetable oil is its viscosity, which in order of magnitude higher than that of mineral diesel. The effect of fuel inlet temperature on performance, emission and combustion characteristics of a diesel engine are study. In this study, a comprehensive and up-todate technical review of using preheated vegetable oils (either pure or as blends with fossil diesel) temperature range from 30°C-135°C and speed range between 1500-4000 rpm in CI engines, based on comparisons with standard diesel fuel, has been carried out. The properties of several vegetable oils, and the results of engine tests using them, engine performance and exhaust emissions are reviewed based on the literature. The review shows that a number of vegetable oils can be used satisfactorily in CI engines, without transesterification, by preheating the oil. Typical results shows that the engine performance was improved and the CO and smoke emissions were reduced using preheated vegetable oil. But cause higher NOx emissions. Moreover, the brake power increases slightly with the preheating oil. The literature results suggest that preheated vegetable oil can be used as a substitute for diesel fuel without any significant modification in expense of increased NOx emissions.

Keywords: Vegetable oil, compression ignition engine, preheating, performance characteristics.

115. Simulation and environmental assessment of compression ignition engine powered by neat biodiesels of different origin

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Performance parameters and exhaust emissions of a diesel engine powered by diesel fuel and a biodiesels, namely jatropha oil methylester (JME), cottonseed oil methylester (COME), rapeseed oil methylester (RME), soybean oil methylester (SME) and castor oil methylester (CAME) at full load have been investigated. The performance of an engine whose basic design parameters are known can be predicted with the assistance of simulation programs into the less time, cost and near value of actual. However, inadequate areas of the current model can guide future research because the effects

of design variables on engine performance can be determined before. Simulation program is usable to set for varies load, compression ratios, and engine sizes. In this study, thermodynamic cycle and performance analyses were simulated for various engine speeds ranging from 1000-3000 rpm with an increment of 100 rpm at full load and 17.5:1 constant compression ratio (CR) of a CI engine with 4 stroke, single cylinder and natural aspirated. Several parameters and emission were calculated namely; engine torque, brake mean effective pressure, brake power, specific fuel consumption and the thermal efficiency, NOx, CO_2 , this was carried out using DIESEL-RK Software. It was found that the engine offer lower thermal efficiency when it is powered by neat biodiesel, while it is higher for JME and minimum for SME. Further, it was found that both the thermal efficiency of the engine and the specific fuel consumption increases with the increase in speed of engine. The NOx emission was found higher for all fuels compared with diesel fuel, whereas it was seen that CO_2 emissions were higher for SME, RME, and COME and lower for JME and CAME.

Keywords: Compression ignition (CI), diesel-RK simulation, biodiesel, exhaust emission.

116. Studies on the mechanism of pathogenic stress of *Pythium aphanidermatum* (fungi) in the wet land medicinal plant *Acanthus ilicifolus* and its sustainability V. Parivuguna, K. Dhanya and Josy Elsa Philip

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The wet land plants are the biologically productive ecosystems on earth which are areas of marsh, peat land, the fragile interface between land and water they are the major conduct for energy flow in the ecosystem. Acanthus ilicifolus commonly known as 'sea holly' is a mangrove perennial herb, has many medicinal uses for, rheumatism, allergies, poison arrow wounds, kidney stones etc., every part of the plant has medicinal property, the whole plant for kidney stones, asthma, the decoction to treat dyspepsia, stem to treat abscess, leaves for neuralgia, snake bites and relives pain, purifies blood. Its bark is used to treat colds, seeds for abscess, roots as elixir, skin treatment, relives pain and fever and it is also used to treat paralysis of limbs, leucorrhoea and debility. In Greece, 2 BC, the Acanthus was a clear reference to life emerging from a grave. It has antioxidant, anti-inflammatory and hepatoprotective effect etc. As a breakthrough medicine, this indigenous Indian medicinal plant opens up a promising avenue in liver cancer chemoprevention with broader implications. So it is necessary to check the sustainability of this medicinal herb from the fungal pathogen, Pythium aphanidermatum, which is an aggressive water mold. Pythium commonly known as water mold is a genus of parasitic oomycete, whose population is highest in the winter and lowest in the spring. This generalistic and non specific host ranged saprophyte, survives for a long time on decaying plant, and is responsible for its pathogenic stress on the mangroves causing damping off. The medicinal mangrove, Acanthus ilicifolus was collected from the wetlands of Kerala state. It was grown in pot and hydroponic condition. The infection of leaf was done by disc infection method, observed for the morphological changes. The study was to screen the presence of isozymes from the leaf extracts. The total protein content was estimated by Lowry's method and further analyzed with SDS-PAGE and Native PAGE for detecting the stress tolerance protein. Isozyme of peroxidase and superoxide dismutase (SOD) was characterized. It was found that plants subjected to stress have altered morphological changes and metabolic activity to resist the stress. They are capable of producing constitutive and inducible defense mechanism either by enzymic and non enzymic mechanisms. Isozymes are produced profusely by stress induced plants to combat against oxidative, pathogenic and salinity stress. In SDS PAGE, the presence of extra protein band pattern of infected plants indicated that the plant has the ability to defend pathogenic stress enzymically which proves the theory of survival of fittest.

Keywords: Acanthus ilicifolus, Pythium aphanidermatum, Lowry's method, enzymic mechanisms, kidney stones, asthma.

117. Analysis of some recently excavated ancient potteries of Tamil Nadu, India by FT-IR spectroscopic technique

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In the present study, the pottery samples were collected from the recently excavated archaeological site named Melchittamur of Tamilnadu, India at different depths. The mineralogical composition of

the pottery was determined by FT-IR spectroscopic technique. The qualitative analyses are carried out to determine the major and minor constituent minerals present in the samples from the band position or location of the peaks. By comparing the observed frequencies with the available literature, the different types of inclusions were identified in the potsherds such as quartz, calcite, hematite, magnetite, kaolinite and, montmotliinte. The interpretation of results is made from the i.r. characteristics absorption bands. The mineralogical composition indicates the raw material, the firing temperature and firing conditions in the kiln (oxidizing or reducing atmosphere).

Keywords: Ancient pottery, mineral analysis, FT-IR technique.

118. Heavy metal tolerance of weed species and their accumulations by phytoextraction

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'Phytoremediation' an emerging technology that employs the use of higher plants for the cleanup of contaminated soils, waters and atmospheric pollutants. Growing plants can help to reduce heavy metals pollution. One of the strategies of phytoremediation is 'phytoextraction' i.e. uptake and accumulation of metals into plant shoots, which can then be harvested and removed from the site. Plants called hyperaccumulators are preferred for metal decontamination of soils because they take up 100 times the concentration of metals over other plants. It is important to use native plants to study metal accumulation because these plants are often better in terms of survival, growth and reproduction under environment. Recently, chelating agents have been used as decontaminants in metal-polluted soils facilitating phytoextraction. Early studies showed that application of synthetic metal chelates such as ethylenediamine tetraacetic acid (EDTA) to soils enhances Pb accumulation by plants. EDTA was particularly effective in facilitating the phytoextraction by plants of Cd, Cu, Ni, Pb and Zn. EDTA acts by complexing soluble metals present in soil solution. In view of diverse reports, an attempt was made to understand the plant-nutrient-chelate interaction in order to examine the heavy metal uptake. The ability of the invasive weed species Parthenium hysterophorus L. for the accumulation of the heavy metal Zn was studied in a greenhouse experiment. These studies were aimed at: identifying a metal tolerant species from natural vegetation, to assess the phytoextraction potential of the plant, to compare metal concentrations in 'above ground biomass' with that of roots and soils and to study their effect on growth and make comparison with metal amended soils treated with EDTA. The Zn accumulation by the test species significantly increased after the addition of 0.1 g/Kg of EDTA to the medium. An increase of metal uptake correlated with its concentrations. The metal uptake could affect the leaf pigments as it reduced with increase in metal exposures and time especially when EDTA treated. This could be due to the accumulation of Zn. The phosphorus levels were found to be low in higher uptakes of the plant. The BCFs of shoots and roots and TFs being greater than 1 which show the validity of the weed species for hyperaccumulation of the metal and can be a promising species of phytoextraction of heavy metals and remediation of metal contaminated soils which is economical and ecofriendly.

Keywords: Phytoremediation, phytoextraction, EDTA, Parthenium hysterophorus L., ecofriendly.

119. Biodegradation of ammonical nitrogen to nitrite

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The present study involves the biodegradation of ammonical nitrogen using *Nitrosomonas species* as nitrifying bacteria in the first stage of nitrification process. The effects of various parameters such as ammonium concentration, pH, effluent medium ratio and temperature on the nitrification process were studied with synthetic medium as well as industrial effluent from a local steel plant. The optimum values of the parameters for biodegradation were identified. This study serves as a basis for the development of cost effective biotreatment system for the removal of ammonium from industrial effluents.

Keywords: Ammonia, biodegradation, Nitrosonomonas, nitrification.

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120. Chromium induced changes in paddy varieties K. Sankgar Ganesh and P. Sundaramoorthy Dept. of Botany, Annamalai University, Annamalainagar - 608 002, TN, India ppsmoorthy@yahoo.com

Water is one of the most important components required for very existence of life. It was highly polluted by discharge of various industrial wastewaters. These industrial effluents contain a wide variety of organic and inorganic pollutants with heavy metals. Among heavy metals, chromium is considered to be more toxic to the aquatic organisms. It is mainly released from tannery industries. The heavy metal containing wastewater is disposed into nearby water bodies and makes them into polluted one. The polluted water is being used for irrigation. So the present investigation has been carried out to find the effect of various concentrations of chromium on germination, growth and yield of paddy varieties. Germination studies and field experiments were conducted with ten varieties of paddy irrigated with chromium solution. The morphological growth parameters such as root length, shoot length, total leaf area, fresh weight, dry weight and yield were taken into consideration for this varietal screening experiment. On the basis of the data obtained from germination studies and field experiment, the variety ASD 16 exhibited more tolerance to Cr than the rest of the varieties studied. **Keywords:** Industrial wastewater, heavy metals, chromium, germination.

121. Bioremediation of chromium polluted soil by biofertilizer

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Air, water and soil were pure in olden days. Now, they are highly contaminated by environmental pollution. Pollution of our environment is unavoidable with the growth of population and industries. Among the effluent discharging industries, tannery industry plays a major role in creating the water and soil pollution. Its discharged wastewater contains a variety of organic and inorganic pollutants with heavy metals. Chromium is one of the main constituents of tannery effluent. It has been reported that 2,000-3,000 tonnes of Cr disposed into Indian environment annually from tannery industry alone. The presence of excess amount of Cr in the irrigation water beyond the tolerant limit is unfit for irrigation. The continuous irrigation of Cr contaminated water degraded the soil quality and made them unfit for cultivation. In order to reclamation soil pollution, an attempt has been made to find the effect of biofertilizers (*Azospirillum*) on the growth and yield of paddy grown in Cr polluted soil. The increased growth and yield of paddy was recorded in chromium polluted soil mixed with biofertilizer than the control one.

Keywords: Biofertilizer, effluent discharging industries, tannery industry, chromium, Azospirillum.

122. Biofertilizer application-a boon for sustainable agriculture

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India is an agricultural country. Food is one of basic needs of human beings. It can be obtained only by agriculture. Human population is tremendously increased all over the world. Agricultural scientists are working hand to get higher yield by introducing high yield varieties by applying suitable fertilizers and employing the modern agro technology. Green revolution increased the food production to some extent. But, the continuous application of chemical fertilizers degraded the soil properties. Adverse effect of the chemical fertilizers has compelled the scientific community to look for an alternative fertilizer in the form of biofertilizers. Biofertilizers are cost- effective, eco- friendly and renewable sources of plant nutrients in sustainable agriculture system in India. Biofertilizer are living cells of different types of microorganisms, which have an ability to mobilize nutritionally important elements from non-usable to usable from. They improved the soil fertilizers awell as growth and yield of crops. So, an attempt has been made to find out the effect of *Rhizobium leguminosarum* on growth and yield of blackgram. Field experiments were also conducted and the results were discussed in this article. **Keywords:** Biofertilizer, agricultural scientists, green revolution, *Rhizobium leguminosarum*, blackgram.

123. Aerometric studies on fungal pollutants in the atmosphere of Chennai

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The air we inhale is heavily infested with a wide variety of biological particles in addition to organic substances such as gases, dust and smoke. Airborne fungal spores are known to be responsible for causing respiratory disorders, in addition to pathogenesis and toxigenesis. Vast industrialization and expansion of the city, in addition the increasing population adds more pollutants to the atmosphere. In order to know the quantity and quality of fungal pollutants in the atmosphere of Chennai the study was conducted. Altogether a total of 472 samples covering Chennai city was examined for the presence of atmospheric fungal pollutants. The air sample was carried out using 2 stage Andersen microbial viable sampler (Aerotech Laboratories, Inc. Phoenix, Arizona, USA) operated using a continuous duty vacuum pump (Zefon International, St. Petersberg, Florida, USA) which will provide a constant air flow. The sampler is operated at the flow rate of 25 l/min (1 ACFM) using a visi-float flow meter (Dwyer institute, Michigan, USA). The sampling sites include Chrompet, Guindy, Taramani, Perungudi, Central, Basin bridge, Broadway, Kilpauk and other parts of Chennai. The results on the type of fungal pollutants and their count on the atmospheric presence will be discussed in detail. **Keywords:** Airborne fungal spores, toxigenesis, Andersen microbial viable sampler, fungal pollutants.

124. Biopesticide: An expanding horizon for sustainable agriculture

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The demand for natural pesticides is rising steadily in all parts of the world. Public awareness about environment is increasing, while pollution and health hazards due to synthetic chemicals are growing. The total market for global and synthetic pesticides is valued at \$26.7 billion in 2005 and it is expected to decline at an annual average growth rate (AAGR) of 1.1% to 25.3 billion in 2010. While the overall market for pesticide is showing a decline, bio pesticides market is rapidly growing, increasing from \$ 672 million in 2005 to over \$1 billion in 2010, at an AAGR of 9.9%. These pesticides are seeing increased usage because they are environmentally friendly. Bio pesticides include microbial pesticides, plant - incorporated protectants and others, which include natural predators, entomopathogenic nematodes, and parasitoids. Bio pesticides offer several advantages that make them attractive to the environmentally conscious consumers. First and foremost, they are much safer than conventional pesticides which, often doled out in large quantities are hazardous and dangerous chemicals. Biopesticides are effective in smaller quantities and they decompose at much faster rate than synthetics, which minimizes their impact of environment. Finally bio pesticides can supplement the conventional pesticides used in Integrated Pest Management (IPM) programs. Bio pesticides currently has 2.5 % of the overall pesticides in the market, but it share of the market will increase to over 4.2% by 2010. Orchard crops with a 55% share, is the largest component of overall bio pesticides market. The striking feature of biopesticides is environment friendliness and easy biodegradability, thereby resulting in lower pesticide residues and largely avoiding pollution problems associated with chemical pesticides. Further, use of biopesticides as a component of Integrated Pest Management (IPM) programmes can greatly decrease the use of conventional (chemical) pesticides, while achieving almost the same level of crop yield. However, effective use of biopesticides demands greater awareness of pests' management by the end users. In terms of production and commercialization also biopesticides have an edge over chemical pesticides in terms of lower research expenditure, faster rate of product development as well as flexible registration process. However, some of the factors which have restricted the growth of biopesticides are: Low reliability because of low stability in effect; Target specificity which distracts farmers; Slow in action compared to synthetics; Shorter shelf life; Erratic availability of biopesticides in the market; Already established and strong market of chemical pesticides; Regulatory system favorable to chemical pesticides, and The gradual disappearance of multiple or mixed cropping, which is known to keep away the magic bullet-chemical pesticide.

Keywords: Biopesticide, sustainable agriculture, environment, pest management.

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125. Chromium bioaccumulation potential of *Hydrilla* **spp. from tannery effluent** P. Unnikannan, P. Sundaramoorthy, L. Baskaran and K. Sankar Ganesh Dept. of Botany, Annamalai University, Annamalainagar - 608 002, TN, India ppsmoorthy@yahoo.com

Heavy metals, constitutes an important substances of environmental pollution. They are often discharged by many industries, such as tannery, electroplating, textile and mining operations, which can be lead to contaminate many of our waterbodies. Due to the enormous number of pollutants, the physico-chemical and biological characteristics of water are changed. The most important features that distinguish heavy metal from other pollutants are the non-biodegradability. Nowadays, the tannery effluent is the most hazardous environment, because it has the toxic metal ion Cr. The oxidation of chromium is mainly done by the presence of high organic matter content Cr (VI) is highly toxic, and mutagenetic. It reduce the growth of plant and carcinogenic to the animals. The wastewater must be treated before being discharged by the industry. The physical and chemical treatments of polluted water are insufficient for water purification. Therefore biological approaches are employed since it is cheaper and effective. Rooted macrophytes may have the key role in remedy the aquatic environment by their soil binding roots. Hydrilla is a rooted macrophytes so as it is selected for the present experiment to know their potential to clean the polluted water. The study was carried out in outdoor condition with, different concentration (5, 10, 20, 30, 40 & 50 mg/l) of tannery effluent were prepared by using tap water and a control set was maintained with tap water alone. The experiment was carried out in a plastic container having 5 l of different concentrations of effluent 300 g of Hydrilla plants were allowed to grow in sunlight for a period of 12 days. At the end of the experiment, the plants samples were rinsed with tap water and used biochemical analysis, and also a part of the sample is dried. The acid digested samples were used for estimation of Cr concentration by using atomic absorption sepctrophotometer. The result showed that the chlorophyll and protein are gradually decreased while increasing the effluent concentration. Simultaneously the chromium uptake was increased. The physicochemical parameters of the biologically treated effluent show a significant reduction of pollutants. Keywords: Heavy metals, electroplating, Hydrilla, chlorophyll, effluent.

126. First order chemical reaction on isothermal vertical oscillating plate with variable mass diffusion

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Unsteady free convective flow of a viscous incompressible flow past an infinite isothermal vertical oscillating plate with variable mass diffusion is presented here, taking into account of the homogeneous chemical reaction of first-order. The plate temperature is raised to T_w and the concentration level near the plate is raised linearly with respect to time. An exact solution to the dimensionless governing equations has been obtained by the laplace transform method, when the plate is oscillating harmonically in its own plane. The effects of velocity and concentration are studied for different parameters like phase angle, chemical reaction parameter, Schmidt number and time are studied. It is observed that the velocity increases with decreasing phase angle angle ωt or chemical reaction parameter. **Keywords:** Chemical reaction, oscillating, vertical plate, heat and mass transfer.

127. Formulation and evaluation of polysaccharide based biopolymer-An ecofriendly alternative for synthetic polymer

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The Main objective of the present study was to develop polysaccharide based biopolymer films with similar properties comparable to synthetic polymer films using waste materials of plant origin, especially by the utilization of starch and pectin from plant source namely *Mangifera indica* (Mango kernel starch) and *Cyphomandra betacea* (Tree tomato pectin). To overcome the problems due to usage of plastics, to conserve non-renewable resources like petroleum, natural gas and coal, to maintain

ecological balance and to reduce pollution it is the need of the hour to develop ecofriendly biodegradable plastics that are made from renewable resources. An effort had been taken to develop a polysaccharide based polymer film and to study the filmogenicity and biodegradability of mango kernel starch-polyvinyl alcohol cross linked film. Mango kernel starch was isolated and evaluated for the physiochemical property and biodegradability of the prepared polysaccharide based film. The isolated starch showed a good physicochemical property and film forming property with polyvinyl alcohol and pectin. The developed polysaccharide based polymer film can be used as a substitute for synthetic polymer in pharmaceutical industry.

Keywords: Polysaccharide based polymer, mango kernel starch, tree tomato pectin, biodegradation.

128. Experimental investigation on performance and emission characteristics of diesel-JME diesel blends fueled DI diesel engine at optimum engine operating parameters

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In the present investigation, tests were carried out to determine engine performance, combustion and emissions of a naturally aspirated direct injection diesel engine fueled with diesel and Jatropha methyl ester and their blends (JME10, JME20 & JME30). Comparison of performance and emission was done for different values of compression ratio, injection pressure and injection timing to find best possible combination for operating engine with JME. It is found that the combined compression ratio of 19:1, injection pressure of 240 bar and injection timing of 27°bTDC increases the BTHE and reduces BSFC while having lower emissions. From the investigation, it is concluded that the both performance and emissions can considerably improved for methyl ester of Jatropha oil blended fuel JME20 compared to diesel.

Keywords: Diesel engine, injection timing, injection pressure, Jatropha oil methyl esters.

129. Microencapsulated nano-drugs for antibacterial finish in cotton fabrics D. Ravi and Asa Sudhakar

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An infection caused by antibiotic resistant bacteria is a growing concern in developing countries, in hospitals, environment and textile products. Health professionals can harbor many pathogens on their bodies, mainly on their hands, nostril surfaces and clothes. Microbial contamination of health care personnel uniforms can occur. The degree of contamination and extent of microbial survival may be crucial. The survival of nosocomial bacteria on hospital fabric and uniforms has been studied. All bacteria survived for a week or more. The extent of survival was dependent on the kind of bacteria associated with fabric. As textiles offer ideal conditions for the settling of microorganisms there is a great demand for antimicrobial finishes to avoid the microbial degradation of textile fibres. This study looked at the feasibility of utilizing two common antibacterial drugs and chemically converting them in order to obtain a reactive dye type molecule, which could be applied to cotton fabric with the goal of imparting the antibacterial properties of the antibiotic compounds to the fabric. The two compounds used were metronidazole and tinidazole which both possess bacteriostatic properties effective against a wide range of bacteria. In order to bind the reactive antibiotic to the cotton fabric reactive dye method and micro encapsulation method are used. And the antibacterial activity was quantitatively evaluated. The antibacterial effect durability was evaluated by using AATCC 124-1996 and AATCC -100 methods.

Keywords: Reactive dye method, micro encapsulation, tinidazole, metronidazole, wash fastness test.

130. The antimicrobial activity of medicinal plants-*Terminalia catappa* L. and *Phyllanthus emblica* L.

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The use of plants as remedies to treat various forms of an ailment has been a common practice all over the world, in various fields of medicine - Ayurveda, Siddha, Unani, Homeopathy and folk. The

root, bark, flower, fruit and seed of *P. emblica* are used for treatment of asthma, tuberculosis and cardiac diseases. The bark, leaf and fruits of *T. catappa* are used for the treatment of Asthma, diabetes and are used as constituents in cardiac tonic. The antimicrobial activity of aqueous extracts of leaves and stem of *P. emblica* and *T. catappa* along with the methanol extracts of the stems and leaves of *P. emblica* and *I. catappa* are evaluated for the antimicrobial activity on gram negative *Escherichia coli* and gram positive *Bacillus cereus* using antimicrobial disc diffusion method. Methanol, when used as solvent exhibited highest yield followed by water in all cases. The results (basing on the presence of zones of Inhibition) indicate that the aqueous and methanol extracts of *P. emblica* along with the methanol extracts of the stem of *P. emblica* had a considerable antimicrobial activity. The methanol extracts of the leaves of *T. catappa* had considerable level of antimicrobial activity. The methanol extracts of the leaves of *T. catappa* had considerable antimicrobial activity with *Escherichia coli* and leaves of *T. catappa* had considerable antimicrobial activity with *Escherichia coli* whereas, the aqueous extracts of the stems and leaves of *T. catappa* had considerable antimicrobial activity with *Escherichia coli* with *Bacillus cereus*.

Keywords: Tuberculosis, cardiac diseases, T. catappa, P. emblica, Escherichia coli.

131. Effect of dehydrated *Salacia prinoides* (Ekanayakam) on experimental mice and on human NIDDM subjects

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There is a worldwide interest and awareness towards naturopathy, since it is the only branch of medicine free from side effects. In South India wild shrubs from the family Celastraceae are shown to have hypoglycemic and hypolipidaemic effect. Salacia prinoides, commonly known as Ekanayakam (in Tamil - Koranthi) is one of the plant products used in ayurvedic medicine as a hypoglycemic agent. Nutrient analysis of dehydrated S. prinoides and a supplementation study was conducted. Supplementation study included both animal and human subjects. For the animal study the experimental research design was followed. The research design selected for the animal study was "After only with control" design. The root bark of S. prinoides was collected and was broken into pieces. The pieces were ground to a fine powder. The soya beans were collected from the local market and were ground into fine flour in a flour mill. The normal feed was given to the experimental albino mice. The supplementary feed was prepared using S. prinoides and soya flour in three different proportions, in pellet form. Depending on the proportion of combining dehydrated S. prinoides and soya flour the experimental albino mice were divided into three groups. Group I received pellets containing 50 percent of normal feed, 20 percent dehydrated S. prinoides and 30 percent soya flour. Group II received pellets containing 50 percent normal feed, 25 percent dehydrated S. prinoides and 25 percent soya flour. Group III received 50 percent of normal feed, 30 percent dehydrated S. prinoides and 20 percent sova flour. Group IV acted as control. Approximately 400 g of supplementary feed was fed to each experimental group (consisting of 16 experimental albino mice in each group) for a period of 30 days. Periodic clinical examination for deficiency disorders, illness, discharge from the eyes and mouth were conducted. The weights of the individual mice were monitored regularly. Biochemical analysis like blood glucose level, serum total protein levels, serum total cholesterol levels and serum urea levels were analyzed. Histopathological investigations were conducted on laboratory albino mice after supplementation and by sacrificing the albino mice to study the individual organs like liver, kidney and intestine. It was observed that dehydrated Salacia prinoides is rich in protein and fibre and comparable with other food stuffs like rice and wheat and it is low in fat content. Copper and magnesium were present in negligible amounts. There was significant decrease in body weight, mean blood glucose levels, mean total serum cholesterol levels and an increase in mean serum total protein levels and serum urea level of the experimental albino mice. Histopathological findings revealed that there was a mild impact on liver, kidney and intestine, the representative segments of liver, kidney and intestine showed mild changes in cell structure. For the human study, the root back of S. prinoides was collected and was broken into pieces in a saw machine and pieces were ground to a fine powder. Each day the recommended dosage was prescribed to be 5 grams and hence 6 (750 mg) and 1 (500 mg) capsules were utilized to fill 5 gram of dehydrated S. prinoides. The supplement was given in 3 divided doses/ day to NIDDM subjects for a period of 45 days. Purposive sampling technique was used to select 12 NIDDM subjects of which six subjects were given dehydrated S. prinoides (experimental group) while

the other six subjects served as control group. Anthropometric assessment (body weight and height) and biochemical parameters like fasting blood sugar, post prandial blood sugar, glycosylated hemoglobin, serum lipids and serum trace minerals like copper and magnesium were assessed before and after supplementation for both the groups. A reduction in body weight was observed among the experimental group subjects. There was significant reduction in fasting and post prandial blood sugar among the experimental group subjects. A significant reduction in serum triglycerides and LDL cholesterol was observed among the experimental group subjects. Thus it could be concluded that dehydrated *S. prinoides* was a hypoglycaemic and hypocholesterolaemic agent in short duration studies with minimal toxic effects.

Keywords: Food, diet, medicine, LDL cholesterol, human, Salacia prinoides.

132. Biomarker for environmental stress induced aestivation

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Fresh water snails are widely distributed in terrestrial habitats, typically in moist environments that facilitate animals for gaseous exchange and reduce desiccation. Such habitats do undergo frequent seasonal changes that impact animal life. To survive dry, hot seasons and scarcity of food conditions, snails innately enter a dormant state by closing the operculum and this process is called aestivation (summer sleep). As aestivation is a prolonged suspended animation, this physiological phenomenon is being characterized by decreased metabolic activity, elevation of carbon dioxide levels, acidosis, dehydration, etc. Factors leading to aestivation invariably display features of stress and hence it is of interest to understand and elucidate the role of Heat shock proteins during cellular stress response in an aestivating amphibious Indian apple snail, Pila globosa. Heat shock proteins are an evolutionary conserved family of proteins whose expression is up-regulated in response to a variety of different metabolic dysfunctions. Despite their designation as heat shock proteins (first discovered in salivary alands of Drosophila by Ritossa. 1962 after subjecting the larvae to heat stress) they are now commonly referred as "stress proteins" due to their up-regulated expression in response to varied stress conditions like high temperatures, low oxygen levels, organic and metal pollutants, pH variations etc. The role of heat shock proteins is to participate in protein assembly, secretion, trafficking, and prevention of protein degradation, coagulation and regulation of transcription factors. In the present study, the endemic organism Pila globosa whose distribution is mainly around equatorial & tropical regions of the world, is subjected to seasonal variations and in turn undergoes self-induced stress conditions of aestivation to evade long summer seasons of heat, low humidity, scarcity of green vegetation and low oxygen conditions. These factors are simulated in the laboratory conditions and the collected snails were acclimatized to the simulated conditions viz. the snails were kept in wooden containers (10 cms x 10 cms x10 cms) with a bed of filter papers, a heat source is provided by keeping a 10 W bulb covered with silver foil to ensure only heat is emanated and not the light. The boxes were covered with lid fixed with a thermometer and maintained a temperature of 35-37°C. After a period of two months the snails were collected, weighed & dissected in PBS buffer and the hepato-pancreas was isolated. This procedure was done in cold conditions and after a mild sonication and centrifugation of 14,000 rpm of the lysate, the supernatant was collected & analyzed for proteins on 10% SDS-PAGE gel. A prominent band around 40,000 Daltons was observed evidently. A 2D gel of pl range 4-10 was also done which showed a clear thick spot of over-expression with respect to the control sample. The 1D gel was analyzed by Immunoblotting with hsp40 antibody and detected through chemiluminiscence on x-ray film which confirmed hsp40 over-expression. Thus hsp40 is up-regulated during the period of aestivation among snails and the same could probably be used as a potential biomarker/bio-indicator to evaluate the stress related biological phenomena.

Key words: Bio-marker, 2D gel, immunoblotting, Pila globosa, Hsp 40, chemiluminiscence.

133. The effect of phase change material with solar still for augmented condensation- An experimental approach

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This paper presents the experimental results of a single slope solar still using with and without phase change material. The basin area of the still is 0.25 m² fabricated using galvanized iron sheet of 18

gauge thickness. The bottom and side of the basin are insulated by saw dust of thickness 0.005 m. The surface of the basin is painted black to absorb maximum solar radiation. The cover of the still is made up of 3 mm thick simple window glass, making an angle 17°. The small tank can be loaded with the PCM via a PVC pipe that will take care of the volume expansion of the PCM upon melting. The phase change material increases the heat storage capacity of the water in the basin. The performance of the still was analyzed by palmitic acid as a PCM on a typical summer days of Coimbatore (lat11°00' N, long 76°59'E), India. The solar radiation is transmitted through the glass cover and basin water is absorbed by the basin linear; hence temperature increases. Part of the thermal energy is transferred by convection at the basin water and the other will be transferred by conduction to the PCM to beneath of the basin linear. In higher order in temperatures, heat is first stored as a sensible heat till the PCM reached its melting point. By the time, the PCM starts melt and the heat will stored as a melted PCM as a sensible heat. Afternoon, when the solar radiation decreases, the still components cool down, the liquid PCM transfers heat in to the basin water until the PCM completely solidified. The heat energy gained by the PCM is utilized for the evaporation during evening as well as less sunshine hours. It helps to produce fresh water even after sun-set. The system temperature such as water (T_), air (T_{air}), inner cover (T_{in}) and outer cover (T_{out}) are measured by type-K thermocouples and digital thermometers. The humidity and wind velocity are also recorded during the study. The hourly output and instantaneous efficiency are also calculated. The fresh water is collected in an outlet nozzle. A PVC pipe is used to supply the brackish water through the inlet nozzle. The whole system is made vapor tight using rubber as a sealant, because it remains elastic for quite long time. The primary focus is on these technologies suitable for use in remote areas, due to increase the productivity of pure water from brackish water. The experimental work was carried out during the summer of the year 2010 at the solar energy laboratory on the campus of Sri Ramakrishna Mission Vidyalaya college of arts and science, at Coimbatore the data were collected continually after half hour intervals for testing. Thermocouples and a precision pyranometer were connected to a digital multimeter. The collected condensate was continuously drained through a flexible hose and stored in a measuring jar. After each scheduled time interval, the water distilled by the still was replaced by raw water so that the mass of the salivated water in the basin was always constant. A thermo cool sheet was put under the solar still to act as an insulating layer to reduce the heat losses to the ground. Keywords: Single slope solar still, phase change material, productivity.

134. Biodiversity of phytoplankton (Cyanobacteria) in dye effluent

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The phytoplankton community as primary producers has to play a significant role in the biotic and abitoic interactions of any aquatic ecosystem. Whenever a community is exposed to a pollutant, responses can occur because individuals acclimate to pollutant- caused changes. Selection can occur favouring resistant genotypes within a population and selection among species can result in changes in community structure. In order to study the biodiversity of phytoplankton in industrial dye effluents, the samples were collected from Noyyal River, Thirupur. The dye effluent selected as for the present study, because when these coloured effluents enter water bodies they may either upset the biological activity or cause water-borne disorders such as nausea, haemor-rhage, ulceration of skin and mucous membrane, dermatitis, perforation of nasal septum, severe irritation of respiratory tract or cancer (Shah *et al.* 1999). The physicochemical characteristics of the effluent were studied. In total 18 species of cyanobacteria were recorded in the effluent such as, *Oscillatoria* with 7 species was the dominant genus which was followed by *Phormidium* (5), *Lyngbya* (3), *Microcystis* (2) and *Synechococcus* with single species. The abundance of cyanobacteria in these effluents was due to favourable contents of oxidizable organic matter, rich calcium and abundant nutrients such as nitrates and phosphates with less dissolved oxygen.

Keywords: Phytoplankton, biodiversity, Cyanobacteria, Oscillatoria, Synechococcus.

135. *In vitro* effect of *Andrographis paniculata* on the motility and glutathione-s-transferase activity of *Haemonchus contortus*

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Haemonchus contortus are pathogenic nematode parasite occurring in the abomassum of sheep, goats and numerous other ruminants. Haemonchosis, the disease caused by this nematode is

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responsible for considerable economic losses worldwide. Haemonchus contortus modify the host defence mechanism by a major detoxification process involving glutathione-s-transferase (GST). The present investigation elicits the effects of chloroform extract of Andrographis paniculata (ApCE) on the activity of glutathione-s-transferase (GST) of H.contortus. H. contortus were collected from sheep slaughtered at Perambur slaughter house and maintained in Hedon-Fleig solution (pH-7). Chloroform extract of leaves of A. paniculata (ApCE) was prepared. The parasites were incubated in various concentrations of ApCE. The motility of the parasite was observed using light microscope at regular time interval. Based on the observation, five different sub-lethal concentrations (0.005%, 0.01%, 0.05%, 0.1% & 0.5%) were selected. GST was assessed following Habig et al. (1974). The data obtained in the present investigation were statistically analysed (ANOVA) using statistical software SPSS 16.0. The activity of GST decreased progressively in H. contortus. Maximum inhibition in the GST activity was observed in 0.5% concentration. GST are major detoxifying enzymes in helminths and may potentially neutralizing the toxins acting against them and may repair host-induced damage. ApCE induced decrease in the activity of GST in H. contortus. The decrease in GST could lead to accumulation of toxic metabolites like aldehydic products of lipid peroxidation, which ultimately kill the parasite. **Keywords:** Haemonchus contortus, glutathione-s-transferase (GST), nematode.

136. Effect of the nutrient composition on extracellular peroxidase enzyme production by *Lentinus kauffmanii* under submerged culture conditions

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An indigenous wood rotting edible *Lentinus* sp. was isolated from Keeriparai forest of Western Ghats and studied for extracellular peroxidase production. Peroxidases are major extracellular lignolytic enzymes involved in lignocellulosic degradation. Physical factors such as pH, temperature and nutritional factors such as carbon, nitrogen sources and amino acids were standardized for the growth and enzyme production of extracellular peroxidase by *Lentinus* sp. The optimum pH for both the biomass and peroxidase production was found to be pH 6.5. Of the different temperature (20°C, 25°C, 30°C, 35°C & 40°C) tested optimal peroxidase activity (44.595 ± 0.674 Uml⁻¹) was recorded at 25°C. Among the different carbon sources, lactose supported maximum peroxidase activity (53.516 ± 0.952 Uml⁻¹), while peptone supported the optimal activity (54.454 ± 0.454 Uml⁻¹) among the different nitrogen sources tested. Of the different amino acids tested, alanine (54.981 ± 0.776 Uml⁻¹) enhanced the maximum enzyme activity.

Keywords: Peroxidase, Lentinus, physiological regulation, alanine, enzyme activity.

137. Effect of sodium nitrate on carbothermal reduction of barite

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Barite is the only important indigenously mineral suitable for the manufacture of barium chemicals. It is one of the major mineral for export among non-metallic minerals. The demand of barite is mainly for paints, oil-well drilling, rubber, explosives etc. It is highly insoluble in water. Only the process of carbothermal reduction can initiate the reaction. Theoretically a pure sample of barite should yield barium sulphide to the extent of about 70% or so. But in most industrial reductive operations the extent of reduction seldom exceeds 50%. However this limit can be crossed by use of suitable reaction promoting catalysts. In the present investigation author had used sodium nitrate as a catalyst and it was found that it acted as a fairly strong catalyst for the carbothermal reduction of barite. Author had been choosen sodium nitrate purposefully as it is cheap in cost. For this sodium nitrate is mixed in the heterogeneous mixture of barite and steam coal thoroughly in different proportions. Carbothermal reduction of barite is carried out in a pit furnace under anaerobic conditions and the percentage of barium sulphide in the reduced barite was determined as per the standard procedures. By incorporation of sodium nitrate, yields of barium sulphide have been found to increase of the order of 60%. If the developed process is scaled up to commercial level then excellent business opportunity will be offered which may contribute a lot to the economy of the industry.

Keywords: Barite, carbothermal reduction, sodium nitrate, barium sulphide.

138. Digital curation: A sustainable alternative method

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Science is being transformed by change in information technology. Knowledge seekers and providers require a congenial atmosphere to make learning process livelier. Digital data preservation is the current trend. In this digital era, information on certain resources is reserved still in traditional format. Absence of safe procedure led to the survival of hazardous and unnatural curation techniques in museums all over the world. Digitalization of life resources is a better substitute and provides space for upgradation. Information on enormous number of specimens can be stored and shared with minimal space and maintenance. Our study examined the current practices and future needs of curation for better understanding of nature and its diversity.

Keywords: Digital curation, musuem specimens, data preservation.

139. Bioethanol: A CBP approach for the production of liquid biofuel from lignocellulose

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Worldwide every day we devour the energy equivalent of about 200 million barrels of oil, but much of this energy comes from conventional fossil fuels. New oil sources are dwindling, pollution and greenhouse gases threaten the Earth-yet energy demands will rise by 50% to 60% by 2030. Thus, we need to rapidly develop sustainable solutions to fuel our future. Every oil dependent country in general and developed nation in particular are looking towards biofuels to reduce the spiraling foreign oil import costs, and to mitigate pollution and global warming associated with the use of fossil fuels. Biofuels are fuels produced from biomass. Biofuels are renewable, can substitute fossil fuels, reduce fossil greenhouse gas emissions and they can be produced, where they are needed, to reduce the dependence on oil producing countries. Ethanol that is produced from plant material can be used as an additive in fuels and can reduce the greenhouse gas emissions, because it can be produced in a nearly carbon neutral way. If ethanol is produced from starchy material as today, the carbon balance is not very favorable and there is a conflict with food production. Therefore lignocellulosic biomass has been proposed as feedstock for ethanol production, but there are several problems related to the processing of it. Because of its recalcitrance cellulosic biomass is very difficult to degrade. Different strategies are available including separate enzymatic hydrolysis and fermentation (SHF), Simultaneous saccharification and fermentation (SSF), non-isothermal simultaneous saccharification and fermentation (NSSF), simultaneous saccharification and co-fermentation (SSCF) and consolidated bioprocessing (CBP). The Saccharum spontaneum (wild sugar cane) is the dominant source for ethanol production at present. In the present study, the Saccharum spontaneum was treated with concentrated sulfuric acid. By the treatment, the lignocelluloses lead to disruption of cell wall (cellulosic fraction). The pretreated cellulosic mass was subjected to enzymatic saccarification. The enzymes like endogluconases, exogluconases and beta glycosidase, which act upon carbohydrate fraction and which depolymerize into fermentable sugars. Then the fermentation of sugars by Trichoderma reesei was done. The culture was inoculated into ethanol production media and parametric optimization was done. The temperatures ranging from 20°C and 30°C the ethanol production was found to be increasing and after that, increasing temperature caused sudden decrease in ethanol yield. At pH 5.5, the ethanol production was found to be maximum. After pH 5.5, there was decrease in ethanol yield. The sugar glucose was produced the maximum amount ethanol followed by galactose and mannose. There was no ethanol production detected using cellobiose, xylose and trehalose. The maximum ethanol production was found at glucose concentration of 160 g/l and which produce 70 g/l of ethanol. Keywords: Enzymatic saccarification, Bioethanol, Saccharum spontaneum, Trichoderma reesei.

140. Optimization of extracellular laccase from agaricus heterocystis and their application in azo dye decolorization

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The extracellular enzyme from an indigenous edible *Agaricus heterocystis*, an African species belonging in the section Arvenses was studied for lignin degrading enzyme and its dye decolorization potential. Laccase is the extracellular copper containing glycoproteins which is capable of reducing the toxicity of phenolic compounds through a polymerization process. Physical and nutritional factors such as pH, temperature, carbon, nitrogen sources and metal ions for the optimal production of extracellular laccase by *Agaricus heterocystis* were standardized for the growth and enzyme production. The optimum pH for the both biomass and production laccase was found to be pH 5. Of the different temperature (20°C, 25°C, 30°C & 37°C) tested for the optimal laccase activity was at 30°C. Among the different carbon sources tested fructose supported maximum laccase activity, while ammonium sulphate supported the maximum activity among the different nitrogen sources tested. Of the different metal ions tested copper sulphate showing higher enzyme activity. Direct yellow and texperse red, the two azo dyes tested were decolourized up to 90% under submerged culture conditions, indicates their greater potential for the industrial application.

Keywords: Laccase, Agaricus heterocystis, azodyes.

141. Utilization of water hyacinth to improve soil fertility

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Weeds are the plants, which grow where they are not wanted. They grow in the fields where they compete with crops for water, soil nutrients, light and space and thus reduce crop yields. They also harbour insects, pests and microorganism. Invasive weed species infest river systems at an alarming rate, hampering river transport, fishing and water supply. Health risks are also a concern because of the reduction in the quality of drinking water and the density of the plants, which harbours snakes and Bilharzia carrying snails. About 200, 000 ha of water bodies throughout India are infested with water hyacinth and carry about 250 t/ha. Control measures for water hyacinth which use chemicals allow the plants to become part of the detritus and thus create a permanent sink for plant nutrients. Complete removal of the hyacinth with subsequent disposal in soil would alleviate this nuisance in affected waters, lower the nutrient content of these waters. The use of the decayed tissues of unwanted plants to provide nutrients for crops is a crude but effective way of exploiting weeds and is a simpler technique than any of the other alternatives available. The making of water hyacinth compost is "four times richer than farmyard manure and is less than the usual price of the latter." In this study, water hyacinth is treated with the soil borne lignocellulolytic fungal organisms such as Trichoderma viridae and Trichoderma harzianum separately to get nutrient rich hyacinth compost. The proximate composition of the hyacinth, initial physical properties and chemical composition of hyacinth, bacterial and fungal diversity in compost, post composting physical properties and chemical compositions were determined. The hyacinth fungal compost made by both the fungi was used as manure in Abelmoschus esculentus. The organic composts and chemical fertilizers were applied at the rate of 5 tons/hec and 40 kg/hec respectively. Growth parameters such as germination percentage, shoot length, number of leaves, number of flowers, number of fruits, and fertility coefficient were determined for every 15 d interval up to 90 d. Compost made by Trichoderma harzianum showed better growth (15.52+0.06 - shoot length within 15 d) when compared to compost by Trichoderma viridae (12.38+ 0.09 - shoot length within 15 d). Regarding the final nutritional value T. harzianum gives N (kg/Acre) is greater (95.00+ 5.57) than T. viridae (89.67+ 5.04) and all the other composition such as P₂O₅, K₂O₅, Ca, Mg were equal in both composts. Both the fungal composts of hyacinth showed better growth of Abelmoschus esculentus. The results of the field tests showed conclusively that water hyacinth is valuable manure when compared to chemical fertilizer.

Keywords: Weeds, Trichoderma viridae, Abelmoschus esculentus, hyacinth.

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142. Kinetics of polymerization of acrylonitrile initiated by the persulphate- Co^{2+} -ascorbic acid redox system in aqueous medium

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The kinetics of polymerization of the acrylonitrile monomer (M), initiated by the free radicals generated by the persulphate (PDS) - Co²⁺- ascorbic acid (AH) redox system was studied in aqueous medium under atmospheric oxygen in the temperature range of 26-40°C. The rate of polymerization was determined at various concentrations of monomer and initiators. The influence of varying [M], [PDS], [A H] and [Co²⁺] were examined. Dependence of the rate of polymerization on temperature and effect of organic solvents has also been studied. Energy of activation was computed using Arrhenius plots. A mechanism consistent with the experimental data was suggested. The chain termination step of the polymerization reaction was by mutual interaction of the free radicals. These methods are simple, pollution free and energy consumption is very less. Also these reactions conserve energy of wood, fuels and other natural minerals.

Keywords: Acrylonitrile monomer, polymerization, Arrhenius plots, energy consumption.

143. Digitization of clinical information in the health sector-impediments and solutions - An overview

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The commercial world of health sector hopes to capture the promised efficiencies of the knowledge management in order to gain competitive market advantage. The knowledge management is a tremendous asset and a unique advantage as this provides the organization with valuable, credible and insightful information about the explicit and tacit information at all levels. So, hospitals are involved in knowledge management by generating databases, links to website and portals for integrating explicit and tacit information. Thus the health sector is faced with challenge of massive cataloging of information and preservation. Information in the health care sector can be broadly classified into two streams. 1. Clinical data involving details about patients and their disease management. 2. Non-clinical data is essentially an administrative business process to run the organization in a profitable manner. Nonclinical data like billing, costing, inventory control and HR is similar to the comparable processes in other sectors like banking and manufacture and digitization to a certain extent has already been adopted in the health care industry. In contrast to this, digitization of clinical data has been so far guite resisted. A fully digitized information management system offers ease of entry, storage, retrieval and collation of huge volumes of data on a real time basis. This helps to achieve vast improvements in effectiveness and efficiency of the underlying business processes. With the recent huge advances in computing processing power and storage, sectors like manufacturing, banking and insurance have almost completely switched over to a fully digital paperless work process. Despite all these obvious advantages it is a fact that the health care sector has so far resisted all attempts at full digitization and is still stubbornly clinging to paper files for storing clinical records. This is mainly because of a few inherent peculiarities like the need of a high level of privacy, confidentiality and security while at the same time being easily and instantly accessible to a lot of care givers simultaneously in a real time basis. Also the levels of access to clinical data are determined depending on necessity. This paper offers an overview to the impediments to digitization of health care information and suggests a few solutions towards the creation of a fully paperless clinical record system. Replication of the ease and familiarity of a paper record into a computer based digital record satisfying all these diverse criteria is a massive challenge often requiring custom made solutions.

Keywords: Knowledge management, databases, clinical data, digitized information.

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144. Light and electron microscopic studies on the effect of Acacia arabica on Cotylophoron cotylophorum

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Cotylophoron cotylophorum is a gastrointestinal parasite, primarily occurring in the rumen of livestock. Paramphistomosis, the disease caused by this digenetic trematode is responsible for considerable economic losses. Clinical symptoms include anorexia, weight loss, diarrhea, dehydration and subsequently death. The effect of Acacia arabica on the surface topography and internal architecture of Cotylophoron cotylophorum was investigated. Cotylophoron cotylophorum were collected from the rumen of the infected sheep, autopsied in slaughterhouse at Perambur, Chennai. Adult live worms collected were washed thoroughly in physiological saline and maintained in vitro in Hedon-Fleig solution. The flukes were treated with various solvent extracts of bark of Acacia arabica at different concentrations. Efficacy of these extracts against Cotylophoron cotylophorum was assessed by observing its motility at regular time intervals. Motility of the flukes was guantitatively measured using Electronic micromotility meter (EMM). Structural analysis of the control and drug-treated flukes were carried out using light microscopy, scanning and transmission electron microscopy. On preliminary screening, ethanol extract of bark of Acacia arabica was highly effective, inhibiting the motility of the flukes. The percentage of motility inhibition was high when treated with 1 mgml⁻¹ concentration and was found to be 97.74% after 8 h of incubation. In light microscopic observation, severe vacuolization in the parenchyma and oral sucker are obvious. Lesions were also observed in testis. Scanning electron micrographs revealed tegumental folding and roughening of the tegument on the dorsal-surface of the drug-treated flukes. Appearance of crater was visualized in the dorso-lateral region. Ultra structure of the drug-treated flukes investigated by transmission electron microscopy showed necrosis in the parenchyma and ovary. Disruptions in the posterior sucker were also seen. The study suggests that ethanol extract of bark of Acacia arabica could be used as anthelmintic against Cotylophoron cotylophorum.

Keywords: Acacia arabica, Cotylophoron cotylophorum, parenchyma, posterior sucker.

145. In vitro effect of Punica granatum on glucose and glycogen content of Cotylophoron cotylophorum

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Paramphistomes are the parasites of ruminants which cause a disease called paramphistomosis. Paramphistomosis of domesticated ruminants causes considerable economic loss to the livestock industry in India. Punica granatum commonly known as pomegranate is used for more than 3000 years in traditional medicine. It is considered astringent, anthelmintic, laxative, diuretic, stomachic, cardiotonic and refrigerant. In the present investigation, the effect of Punica granatum on glucose and glycogen content of Cotylophoron cotylophorum was studied. The efficacy of P. granatum on glucose and glycogen content of C. cotylophorum were investigated. C. cotylophorum was collected from Perambur slaughter house, Chennai. The rind of Punica granatum was collected, shade dried and coarsely powdered. Successive solvent extraction was carried out by soaking the rind of P. granatum in hexane, chloroform, ethyl acetate and ethanol successively in an aspirator bottle for 48 h. The preliminary investigation on gross visual observation on the motility and viability of drug-treated parasites revealed that P. granatum ethanol extract (PgEE) was effective amongst all the extracts by causing 100% mortality in the parasites at 1, 3 and 5% concentrations after 8h of exposure. Based on the visual observation on the motility, five different sub-lethal concentrations - 0.05, 0.1, 0.5, 1 and 5 mgml⁻¹ were selected and subsequently the quantitative measurement of the mortality response of the drug-treated parasites showed that PgEE was highly effective, inhibiting the mortality of the parasites by 93.28% after 8h of exposure. P. granatum ethanol extract exhibited a significant decrease in the glucose and glycogen content of C. cotylophorum. The decrease in glucose and glycogen

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content of *C. cotylophorum* was dose and time dependant. The glucose content of the parasite was 83.84% and the glycogen content was 85.86% at 5 mgml⁻¹ concentration after 8h of exposure. Inhibition of glucose uptake results in the breakdown of stored glycogen. Glycogen is the sole energy source for the parasites. Reduction in glucose and glycogen content result in the reduce synthesis of energy rich molecule ATP. Energy crisis may reduce the motor activity of the parasite. Consequently, the energy deprived worms unable to retain themselves *in situ* get expelled from the host.

Keywords: Cotylophoron cotylophorum, Punica granatum, glucose, glycogen, green medicine.

146. Seed technology

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Seed technology deals with the methods of improving physical and genetical characteristics of seed. The various aspects of seed technology are seed production, seed processing, seed certification, seed testing, seed storage, seed biology, seed entomology, seed pathology and seed marketing. The objectives of seed technology are: Supply high quality seeds, means seeds of high yielding varieties, varieties with resistance to diseases and pests, to increase agricultural production by supply of quality seed, to assure rapid seed multiplication of desirable varieties, timely supply of seeds, i.e. well before the sowing season and supply of seeds at reasonable prices. Seed technology categories such principles considered during production and seed multiplication under two main headings: 1.Genetic principles and 2. Agronomic principles. The paper discusses the technology, its essential requirements, seed production, seed multiplication and seed dominancy.

Keywords: Seed technology, high quality seeds, seed dominancy.

147. Centrifuge modeling: viable technique for safety assessment of near surface disposal facilities by accelerated physical modeling

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Nuclear waste management is an emerging global issue which needs extensive involvement of all countries opting for civilian nuclear power in order to protect the man and environment for extended period of time. Substantial research work is in progress to ascertain the impact of such waste disposal into land, marine environment to ensure the ecological balance. Environmental geotechnology is an innovative approach to develop and implement suitable solutions to various geo-environmental problems. One among the various issues is the investigations on the radionuclides migration through man-made (Engineered barriers) and natural barrier (geo-environment) in near surface disposal facility (NSDF). This paper addresses the Centrifuge modeling technique, a simulation technique for the safety assessment of NSDF for low level radioactive wastes (LLW).

Keywords: Centrifuge modeling, radioactive waste, geo-environment.

148. Experimental studies on the performance of CI engine with tallow methyl ester (TME) as fuel for various blends of diesel and LPG

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Bio-diesel manufactured from vegetable oils, animal fats and used cooking oils is an alternative fuel for diesel engines. It offers many advantages such as renewable, energy efficient, non-toxic, sulfur free and bio-degradable, and also offers cleaner combustion and reduces global warming gas emissions. Experiments are conducted by fuelling the diesel engine with bio-diesel with LPG blends. The engine is properly modified to operate under dual fuel operation using LPG as the mixed fuel along with Diesel and TME as ignition source. The brake thermal efficiency of TME with LPG (2LPM) blend is increased at an average of 5%. HC emissions of TME with LPG (2LPM) blend is reduced by about at an average 21%. CO emissions of TME with LPG (2LPM) blends are reduced at an average of 33.6%. NOx emissions of TME with LPG (2LPM) blend are reduced at an average of 4.4%. Smoke opacity of TME with LPG (2LPM) blend is reduced at an average of 10%.

Keywords: Bio-diesel, diesel engines, cleaner combustion, global warming, smoke opacity.

149. Jatropha - A biofuel

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Biodiesel is described as a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats. It is oxygenated, essentially sulfur-free and biodegradable. The use of non-edible oils compared to edible oils is very significant because of the increase in demand for edible oils as food and they are too expensive as compared with diesel fuel. Methyl esters of Jatropha (MEJ) are one of the best alternative fuels for diesel engine. In this project combustion, performance and emission characteristics of blends of methyl esters of Jatropha will be studied by varying the injection pressure and injection timing using direct injected constant speed diesel engine. Performance characteristics such as brake thermal efficiency and brake specific fuel consumption at various loads will be calculated by varying injection pressure and injection timing. Karious blends of methyl esters of Jatropha are b20, b40, b60, b80, b100 and the results will be compared with diesel. Injection pressure will be from 200 to 250 bar .i.e.) 180 bar, 195 bar, 210 psi. Injection timing will be 33° btdc, 30° btdc, and 27° btdc.

Keywords: Biodiesel, mono-alkyl esters, non-edible oils, Jatropha, injection timing.

150. Developments and advancements in concentrating photo voltaic technology - An overview

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The power generation by concentrating photo voltaic technology is continuously playing a minor role in R&D of photovolatics for the last 25 years. Mainly because the photo voltaic industry is dominated by silicon based cells. These silicon cells are not an attractive option for CPV technology mainly because of theoretically achievable efficiency is relatively lower. Also in the elevated operating temperature the cell conversion efficiency detoriates/degrades rapidly. Initially CPV is not an attractive option mainly because of the need for optics and sun tracking. As the photovoltaic technology changes from bulk to thin film based and fabrication of III-V based solar cells proved higher efficiencies. The GaInP, GaAs, and Ge layers of triple-junction type solar cells were selected and used because of their collective ability to match band gap energies with the solar radiation spectra. GaInP, with band gap energy of 1.85 eV, absorbs the photons in the ultraviolet and visible part of the solar spectra. GaAs (E₂ = 1.42 eV) absorbs near-infrared light, and Ge absorbs all the lower photon energies in the infrared that are above 0.67 eV. This triple junction cell will absorb photons from the entire solar spectrum and use them efficiently. Hence, the record efficiency of 40% could be achieved. Concentrating solar power system can be sized for village power (10 kW) or grid-connected applications (up to 100 MW). Some systems use thermal storage during cloudy periods or at nights. Others can be combined with natural gas and the resulting hybrid power plants provide high-value power that can be supplied. These attributes, along with world record solar-to-electric conversion efficiencies, make concentrating solar power an attractive renewable energy option in the southwest and other sun-belt regions worldwide. There are four CPV technologies being promoted internationally. For each of these there exist various design variations or different configurations. The amount of power generated by a concentrating solar power plant depends on the amount of direct sunlight. Like concentrating photovoltaic concentrators, these technologies use only direct-beam sunlight, rather than diffuse solar radiation. Although the principle of generating electricity from solar power, existing solar cell technologies are too expensive to be used on an industrial scale. Further development of this technology is the development of tandem cells and multi-junction cells. In this overview presentation, advancements, current trends and practices pertaining to the harnessing and sourcing electrical energy using concentrator photovoltaic (CPV) technology concept through employing suitable tracking systems, different energy transfer media and other optical sub-systems will be discussed. **Keywords:** Photo voltaic technology, photovolatics, multi-junction cells, suitable tracking systems.

151. Development of a newer nanocrystalline yttrium doped LiMn₂O₄ cathode material for high performance Li-ion polymer battery

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A newer cubic spinel nanocrystalline LiY_y $Mn_{2-y}O_4$ (y=0, 10, 0.15, 0.20, 0.25) powders have been synthesized by a novel sol-gel thermolysis process. TG/DTA studies were carried out for the precursor sample to know the crystalline temperature of the product. The synthesized materials were structurally evaluated using X-ray diffraction studies. The surface morphology and the particle size of the synthesized products were confirmed by SEM and TEM analysis. Finally, the electrochemical charge/ discharge studies were carried out for the synthesized compounds by fabricating 2016 coin type electrochemical cell in the configuration of C/LiY_yMn_{2-y}O₄ employing Li⁺ ion conducting PAN based micro-porous polymer electrolyte.

Keywords: Cubic spinel nanocrystalline, X-ray diffraction studies, micro-porous polymer electrolyte.

152. Screening of rhizobacteria containing plant growth promoting (PGPR) traits from rhizosphere soils and their role in enhancing growth of pigeon pea M. Usha Rani¹, Arundhathi¹ and Gopal Reddy²

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Plant growth promoting rhizobacteria (PGPR) colonize plant roots and enhance plant growth by a wide variety of mechanisms. The use of PGPR is steadily increasing in agriculture and offers an attractive way to replace chemical fertilizers and pesticides and supplements. Here, we have isolated enumerated and characterized the PGPR from the rhizosphere soil of Pigeon pea for the enhancement of growth of pigeon pea. Rhizosphere soils were collected from different areas of Samalkot, Pithapuram, Peddapuram and Kakinada, 65 Isolates have been identified and characterized for their morphological. cultural, staining and biochemical characteristics of which 35 isolated have been selected for the screening of PGPR isolates. Sixteen isolates were successfully characterized for the PGPR traits like IAA production. Phosphous solubilization, enzyme productions like urease chitinase, amylase, cellulase, protease and beta1, 3 glucanase and have been assayed. The antagonistic nature of these strains towards fungi and bacteria were estimated by Siderophore estimation, ACC deaminase characterization, dual plate culture method and HCN production technique and the best of these is selected. These are further investigated for showing the PGPR traits in pigeon pea seedling emergence, increase of shoot length, root length, dry, matter production of shoot etc. Furthermore, PGPR isolates remarkably increased seed germination of pigeon pea. Among the sixteen isolates seven were found to be high IAA producing. Six were found to be efficient phosphate solubilizers, five isolates found to be good antagonistic towards pathogen soil fungi and eight isolates were found to be better in enzyme productions and thus may enhance the mineralization efficiency of soil. Three isolates were shown to be promising in IAA production, phosphate solubilization, antagonism towards fungi, and mineralizing capacity. Thus the present study suggests for the use of these isolates as inoculant biofertilizers might be beneficial for pigeon pea cultivation as they enhanced the growth and other growth parameters. Keywords: IAA, PGPR, phosphorus solubilization, enzyme productions, seed germination.

153. Fuzzy logic based model for monitoring air quality index

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This paper describes a fuzzy logic based monitoring system able to calculate air quality index (AQI). The air quality Index is a simple and generalized way to describe the air quality in China, Hong Kong, Malaysia and now in India. Indian air quality index (IND-AQI) is mainly a health related index with the descriptor words: "good (0-100)", "moderate (101-200)", "poor (201-300)", "very poor (301-400)", "severe (401-500)". State environment protection agency (SEPA) is responsible for measuring the level of air pollution in China. In China the AQI is based on the level of 5 atmospheric pollutants, namely sulfurdioxide (SO₂), nitrogen dioxide (NO₂), suspended particulates (PM₁₀), carbon monoxide (CO),

and ozone (O_3) measured at the monitoring stations throughout each city. An individual score is assigned to the level of each pollutant and the final AQI is the highest of those scores. Air quality measurement are commonly reported in terms of micrograms per cubic meter (μ gm/m³) or parts per million (ppm). The conventional method used linear interpolation for calculating AQI. We applied a real time fuzzy logic system with simulink to calculate AQI. This method gives satisfactory result and it is efficient to work under continuous working mode.

Keywords: fuzzy logic, air quality index, state environment protection agency, linear interpolation.

154. Bio-diesel: The alternative fuel for new era

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The economic development of any developing country depends on its self-reliance in energy needs. The current energy requirement of the country necessitates search for alternative sources for energy, which are renewable safe and non- polluting. The souring of alternative renewable resources also gains to most priority in view of uncertain suppliers and frequent like in price of crude oil in the international market. In recent times, the world has been confronted with an energy crisis due to depletion of resources and increased environmental problems. The situation has led to the search for an alternative fuel, which should be not only sustainable but also environment friendly. This alternative diesel fuel can be termed as bio-diesel. This fuel is biodegradable and non-toxic and has low emission profiles as compared to petroleum diesel. The study based on secondary data and the study aimed to attempt the environmental impact of bio-diesel and the cost of cultivation for Jetropha in Salem district Tamil Nadu.

Keywords: Bio-diesel, Jetropha, environmental impact, cost.

155. Genomic pool conversation

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Genomic pool, a complete set of unique alleles of a species or a population is to be conversed, for the future betterment of human race and plant race. The term gene pool as a whole refers to all the genes irrespective of a defective gene or beneficial gene of a population. Primary gene pool is a pool of genes from the same species where as secondary gene pool is from different species of a population. Gene pool of a population will consist of a large number of genes which will vary in their frequencies. Gene frequencies will remain constant from generation to generation in an infinitely large interbreeding population in which there is no selection, no non-random mating, no migration and mutation. (Hardy-Weinberg, 1908). The gene in a pool even though varies in the frequencies, the total set of genes must be conserved so as to genes must be conserved so as to restore the superior human race. To our discussion here we concentrate much on human gene pool conservation. **Keywords:** Genomic pool, non-random mating, mutation, human race.

156. Production of ethanol (fuel energy) using various carbon sources by Saccharomyces cerevisiae and Schizosaccharomyces pombae

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Ethanol has been used by human since prehistorical period as the intoxicating ingredient in alcoholic beverages in various forms. The ethanol is also used as a significant level with petrol in motor-fuel and fuel additive which is an alternative for replacement of fossil fuels. Since it is easily soluble in water in all proportions, it is used in perfumes, paints, tinctures and many more uses with suitable solvents. Alcohol from renewable biomass seems to be most attractive proposition for commercial production because of its relatively higher value. Approximately 80% of world's supply of alcohol is produced by fermentation of sugar and starch containing crops or by products from industries based on such crops residues. Hence the production of ethanol at maximum level from cheaper sources of raw material and control the cost is a challenging aspect. Therefore, the present study was concentrated

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on production of alcohol from five different carbohydrate sources such as molasses, orange juice, cane juice, rice, grapes and beetroot by using *Saccharomyces cerevisiae* and *Schizosaccharomyces pombae* which are the common yeast strains used mostly in industrial production. The experimental study shows that the biomass production declines progressively when the ethanol accumulates in the surrounding after the production of ethanol. The conversion of ethanol was thus achieved by batch fermentation process at optimum temperature and the internal pH of the fermentation medium at laboratory level. The separation and purification of alcohol was carried out by using simple distillation techniques and the ethanol yield percentage for the above five different carbon sources was compared and discussed in detail.

Keywords: Alcohol, carbonsources, Saccharomyce scerevisiae, Schizosaccharomyces pombe.

157. Determination of firing temperature of some anicent potteries of Tamil Nadu, India by FT-IR spectroscopic technique

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Archeological artifacts like potteries, bricks and tiles are of the earliest and most significant innovation of mankind. Shreds from pottery vessels are the most common artifacts found during excavation of archeological sites. The firing temperature of the ancient pottery provides basics for understanding many aspects of ancient technology such as manufacturing techniques and functional relationships between specific resource manufacturing combinations. The present work aims to identify the constituent of mineral present in the ancient potteries and also to estimate the firing temperatures study using FT-IR technique. Eight potsherds of different types obtained from the Government Museum, Chennai is subjected to the firing temperature analysis using FT-IR spectroscopic techniques. The FT-IR spectrum of the samples was recorded in the received state as well as refired state at room temperature. The mineral composition and firing condition are inferred from the FT-IR spectrum. To estimate the upper limit of firing temperature of pottery fragments, the specimens were refried at different temperatures and IR spectrum are recorded. The interpretation of results is made from the IR characteristics absorption bands. Results are discussed and the conclusion is drawn.

158. Screening for nattokinase enzyme Rajani Gopal Gad, S. Narendar Sivvaswamy and N. Sundar Shri Meera Biotech Pvt. Ltd., Chennai, TN, India nsivaswamy@gmail.com

Accumulation of fibrin in blood vessels usually results in thrombosis, which leads to myocardial infarction and other cardiovascular diseases. Intense research has led to the development of various drugs, such as, asparin to warfarin, streptokinase to urokinase, to dissolve the blood clot. However, these drugs are expensive and cause considerable side effects. For thrombolytic therapy, microbial fibrinolytic enzymes have recently attracted much attention. Nattokinase is a potent fibrinolytic enzyme, which belongs to the group of alkaline serine protease. Nattokinase was first derived from *Bacillus subtilis* var *natto*, isolated from traditional Japanese soybean food, Natto. This enzyme offers a completely natural means of preventing and dissolving blood clots. It closely resembles plasmin and actually enhances the production of plasmin. It is a potent cardiovascular drug and the enzyme activity is enhanced in the plasma for a longer half-life with oral administration. Compared with conventional clot dissolving drugs, Nattokinase has several advantages, such as, safety, convenience, oral administration, confirmed efficacy, prolonged effects, preventive effect, low cost and stability in gastrointestinal tract and these characters make Nattokinase a promising oral medicine for thrombolytic therapy. Nattokinase is truly a multidimensional nutrient supplement and can play a key role in treating

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hypertension and hypercoagulation. It has a 4-fold greater thrombus dissolving ability than plasmin and very efficiently initiates endogenous fibrinolysis by cleavage and inactivation of plasminogen activator inhibitor-1. This ultimately leads to efficient lysis of detrimental coagulation of blood in the body. Nattokinase not only dissolves blood clots but also degrades amyloid fibrils. This enzyme is classified under nutraceuticals and available as an OTC product. Best nattokinase, new nattokinase, nattokinase X-tra, nattozyme etc are some of the brand names available in the market. The product has huge export potential and therefore, detailed research work has been initiated by our company. In this research work, as a first step, massive isolation work was carried out in order to screen for Nattokinase producing microorganisms. Seventy cultures were isolated from various sources and preliminary plate assay method (hydrolysis of casein) was carried out. Out of these seventy cultures, thirty three were shortlisted, which were very much positive in the preliminary plate assay method. *Bacillus* sp., which exhibited high activity at pH 8.0 and above and at a temperature of 37°C, was selected for further studies. Further screening is in progress and details of the optimization and scale up studies would be discussed in the conference.

Keywords: Fibrin, nattokinase, fibrinolysis, Bacillus subtilis, plasminogen, nutraceuticals.

159. Pongamia glabra vent. as a biopesticide Susan George Dept. of Zoology, Sir Theagaraya College, Chennai, TN, India dr.susangeorge@yahoo.in

Biopesticides are pesticides of biological origin derived from animals, plants, bacteria, and certain minerals. Biopesticides are categorised into three major types: Microbial pesticides consist of a microorganism (e.g., bacterium, fungus & virus) as the active ingredient. Bacterial pesticides that have been in use largely are *Bacillus thuringienesis*, *Bacillus lentimorpus* and *Bacillus popilliae*. Fungal pesticides include *Metarhizium* sp., *Fusarium* sp., *Zoophthora* sp. and *Beauveria* sp.viral pesticides that are commonly used are granulosis virus, nuclear and cytoplasmic polyhedrosis virus. Nematodes are also used in controlling pest population plant-incorporated-protectants (PIPs) are pesticidal substances that plants produce from genetic material that has been added to the plant. For example the gene for *Bacillus thuringienesis* (Bt) pesticidal protein can be taken and can be reintroduced into the plant's own genetic material. Then the plant, instead of the Bt bacterium, manufactures the substance that destroys the pest. Biochemical pesticides are naturally occurring substances that affect insect pests in more than one way such as insect sex pheromones that interfere with mating and reproduction.

Keywords: Biopesticides, Bacillus thuringienesis, biochemical pesticides, pheromones, mating.

160. Design and fabrication of microbial fuel cell for generation of electricity

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Energy need has been increasing worldwide exponentially. At present global energy requirements are mostly dependent on the fossil fuels, which eventually lead to foreseeable depletion of limited fossil energy sources. Combustion of fossil fuels also has serious negative effect on the environment due to CO_2 emission. Concerns about climate change, increased global demand for the finite oil and natural gas reserves and energy security, are intensifying the search for alternatives to fossil fuels. Much attention is being paid on the usage of hydrogen (H₂) as an alternative fuel throughout the world. More recently, generation of electricity using microbial fuel cells (MFC) is seemingly gaining importance in the research. These two approaches of alternative fuel generation have numerous advantages–clean, efficient, renewable, and does not generate any toxic by product. Although, bio-hydrogen produced from anaerobic fermentation is considered as a viable alternative fuel and energy carrier of the future, storage, purification, low production rates and generation of energy (electricity) by using fuel cells are some of the inherent limitations. Alternatively, MFCs emerge as the best option for the complete recovery and facilitates *in situ* conversion of energy (bioelectricity). MFC is a biochemical-

catalyzed system which generates electrical energy through the oxidation of biodegradable organic matter in the presence of either fermentative bacteria or enzyme under mild reaction conditions (ambient temperature & pressure). The biocatalyst present in the anode chamber of fuel cell generates electrons (e) and protons (H⁺) and the potential between the respiratory system and electron acceptor generates electricity. Thus, bacterial energy is directly converted to electrical energy and to close the cycle, protons migrate through a proton exchange membrane (PEM) from anode to cathode. Since microorganisms act as a catalyst in the transfer of electrons from the substrate to the anode, the selection of a high-performing microbial culture (either pure or mixed) is of crucial importance in the MFCs. MFC design, effective assembly of membrane electrode for reducing the proton transfer resistance, enhancing cost effective turbulence for effective interaction of substrate with bacterial colony on anode and suspended bacteria, reducing the potential loss at anode, providing adequate surface area for the bacterial growth, improving the cathode reaction, selection of bacterial consortium were the parameters on which electricity generation potential in MFC depends. The present work deals with the designing and fabrication of two-chambered salt bridge microbial fuel cell with specific dimension. The efficiency of fabricated MFCs was checked by variation in current produced on different days of operation of MFC and effect of using dextrose in anodic chamber of MFC. The MFC was operated for 7 days with or without dextrose as carbon source. It was observed that while running MFC without dextrose the maximum current obtained was 13.68 µA and maximum voltage obtained was 146.8 mV. However while using 5% dextrose solution in the anodic-chamber the maximum current and voltage obtained was 170 µA and 216 mV respectively.

Keywords: Fossil fuels, microbial fuel cells, organic matter, proton transfer resistance, anodic-chamber.

161. Biocompost preparation from distillery wastes and its application to some selected plants

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Disposal of industrial wastes in India has become a major threat to hygiene environment, polluting water bodies and land area in and around the industries. These wastes can profitably be used for growth and development of crop plants and economic productivity. The distillery wastes like effluent, sludge, pressmud, biocompost contained required elements like P, Ca, Mg, K, Fe, Mn, etc. and beneficial microbes like *Rhizobia, Azotobacter,* Phosphobacteria and *Pseudomonas* which promote the growth of the plants. The growth of the plants thus grown using sludge/biocompost were gigantic, producing huge amount of above and below ground biomass and contained more chloroplast pigments and biomolecules as well. Such plants reached maturity early, producing more flowers and thereby higher economic yield. It is recommended that biocompost prepared from distillery wastes can be applied to agricultural fields, kitchen gardens and nursery and this incidentally leads to eradication of distillery pollutants in and around the sugarcane industries and distilleries.

Keywords: Infra red gas analyser, atomic absorption spectrophotometer, colony forming unit.

162. Cloning of a partial sequence of chalcone synthase gene from *Catharanthus roseus*

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Catharanthus roseus synthesizes more than hundred therapeutic alkaloids, including the powerful antineoplastic drugs, vinblastine and vincristine. These two bis-indole alkaloids are products of the terpenoid indole alkaloid (TIA) metabolic pathway. As they accumulate only in trace amounts, the major gene involved in the pathway, part of the chalcone synthase gene was cloned by PCR and were transformed into *Escherichia coli*. This can be used as a probe to clone the full length gene from the genomic DNA of *Catharanthus roseus*. Moreover since the step catalyzed by chalcone synthase is a rate limiting one, the gene cloned can be driven by a strong promoter to increase the rate of formation of the metabolic products and thereby increase the yield of the essential phyto-molecules. **Keywords:** *Catharanthus roseus*, antineoplastic drugs, chalcone synthase, *Escherichia coli*.

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163. Isolation, characterization and partial purification of a protease from Bacillus sp.

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Proteases are the single class of enzymes which occupy a pivotal position with respect to their application in industries. While 60% of the world's protease production is utilized by industries, the remaining 40% is utilized for processing a variety of food materials. In an attempt to isolate an efficient protease producer, soil sample from a local slaughter house was screened. The protease isolated from one of the Bacilli, had an optimum pH of 7 and temperature of 50°C. The maximum enzyme activity was 23.4 IU/ml. Further work is required to identify the sequence and later engineer it for its unique properties if it is found to be an unknown protease. **Keywords:** Proteases, Bacilli, slaughter house.

164. Isolation and characterization of glycohydrolases from sweet potato bacteria for the application in starch processing

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Starch is a branched polysaccharide of glucose. Usually the starch hydrolysis is restricted to the branched chains of the amylopectin molecules and further hydrolysis is stalled. In order to identify strains that could efficiently hydrolyse the completer starch molecules, seven strains of starch degradation bacteria were isolated from the soil sample around the SRM canteen campus and they were further checked for their amylopectin hydrolysing activities. Out of the seven strains isolated three strains effectively degraded dextrins whereas the remaining four strains hydrolysed amylopectin. Therefore we report the complete hydrolyzing property of the three strains of bacteria and their possible role in the food processing industries where complete degradation of starch is essential. **Keywords:** Starch, amylopectin, food processing industries.

165. Nanoparticle based drug delivery system: advantages and applications

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There has been a considerable research interest in the area of drug delivery using nanoparticles delivery systems. Nanostructured biomaterials have unique physicochemical properties such as ultra small and controllable size, large surface area to mass ratio, high reactivity and functionalizable structure. It alter and improve the pharmacokinetic and pharmacodynamic properties of various types of drug molecules that are capable of targeted delivery of both imaging agents and anticancer drugs and early detection of cancer lesions, determination of molecular signatures of the tumor by noninvasive imaging and, most importantly, molecular targeted cancer therapy. These properties can be applied on drug to overcoming some of the limitations in traditional therapeutics. They have been used in vivo to protect the drug entity in the systemic circulation, restrict access of the drug to the chosen sites and to deliver the drug at a controlled and sustained rate to the site of action, minimizes undesirable side effects of the drugs and allow for more efficient use of the drug. It should be present at appropriate concentrations at the target site, and it should not lose its activity or therapeutic efficacy while in circulation. Here, we review various aspects of nanoparticle formulation, characterization, effect of their characteristics and their applications in delivery of drug molecules, improving the targated delivery of therapeutic agents, the potential of nanomedicine, development of novel and more effective diagnostic and screening techniques to extend the limits of molecular diagnostics and challenges in synthesizing nanoparticle platforms for delivering various drugs.

Keywords: Drug delivery, microbes, liposomes, polymeric nanoparticles, lipid nanoparticles.

166. Callus induction and cell suspension culture studies on *Linum usitatissimum* for small scale production of alpha-linolenic acid

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Flax (also known as common flax or linseed) is a member of the genus Linum in the family Linaceae. Flax seeds come in two basic varieties, brown and yellow or golden, with most types having similar nutritional values and equal amounts of short-chain omega-3 fatty acids. Flax seeds produce a vegetable oil known as flaxseed oil or linseed oil. In vitro seed germination of Linum usitatissimum was carried out and the hypocotyl segments from the germinated plantlets were chosen for the present study. Callus induction of Linum usitatissimum was carried out in this study. Hypocotyl segments were selected as explant for in vitro callogenesis. Maximum primary callus was achieved on MS basal medium supplemented with BAP (0.6 mg/l) + IAA (0.07 mg/l), BAP (0.7 mg/l) + IBA (0.07 mg/l) and Kinetin (2.0 mg/l) + 2, 4-D (0.7 mg/l). Multiple shoots were induced from the callus developed from hypocotyl explants of Linum usitatissimum in MS medium supplemented with BAP (1.0 mg/l) + IAA (0.07 mg/l), BAP (0.7 mg/l) + IBA (0.07 mg/l) and maximum shoot length were observed in BAP (0.7 mg/l) + IAA (0.01 mg/l), BAP (0.8 mg/l) + IBA (0.11 mg/l) concentrations. The friable callus transferred to the liquid MS medium showed better initiation of cell differentiation and growth. The callus cells were found to obtain the stationary phase within 12 days and the cell growth curve was plotted. A comparative study of all the peaks and the absorbance range of all the samples tested with the commercially available authentic sample (OG-3), confirmed the presence of Alpha-linolenic acid. This study serves as a preliminary attempt to synthesize the Alpha-linolenic acid through plant tissue culture technique for sustainable management.

Keywords: Linseed, *Linum usitatissimum*, callus induction.

167. Plant growth promotion by rhizobacteria in the sand dunes of Chennai coast

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Plant growth promoting rhizobacteria (PGPR) are beneficial bacteria that colonize the plant roots and enhance the plant growth. The use of PGPR is steadily increasing in agriculture and offers an attractive way to replace chemical fertilizers, pesticides and supplements. Coastal sand dunes are the very least studied among the marine ecosystem and it has variety of microenvironments due to substrate mobility and physical processes. In the present study PGPR was isolated from 18 different rhizosphere soil samples of sand dune plants, belonging to the genus Ipomoea sp. which was collected from the Chennai Coast. For isolation of soil samples, Pour plate technique was followed. The rhizobacterial population was ranged from 4.4 X 10⁷ CFU/g to 7.5 X 10⁷ CFU/g. From that, morphologically different forty six strains of rhizobacteria were pure cultured and characterized. Among this forty six strains isolated, eighteen strains induced the production of indole acetic acid (IAA). These strains were screened for phosphate solubilizing activity, of which six strains showed maximum activity. Then these strains were screened for seed dermination. Of these, two strains showed remarkable increase in the seed germination of black gram and green gram. For plant growth promotion, three types of treatments namely, seed bacterization, soil drenching and mixed (seed + soil) were carried out to check the potential of these two strains. These two strains showed remarkable and significant increase in shoot length and root length. Keywords: PGPR, IAA, phosphate solubilisation, seed germination.

168. FTIR and FT-Raman spectral analysis of paclitaxel drugs

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Paclitaxel is an anti-leukemic, anti-tumor or in general an anti-neoplastic agent. It was first isolated from the bark of the pacific Yew tree, *Taxus breviofolia*. Paclitaxel drug is used to treat ovarian, breast

and lung cancers. Spectroscopic investigations on Pharmaceutical samples are of importance in present. Vibrational spectral studies of many pharmaceutical drugs are extensively studied by many scientists. However the vibrational spectral analysis of polymeric nanoparticle paclitaxel drug has not carried out before. The infrared spectrum of a compound is the superposition of the absorption bands of specific functional groups. As such, the infrared spectrum can be used as a fingerprint for identification of unknown in comparison with previously recorded reference spectra. An attempt has been made in this work to study the vibrations of the functional derivatives in polymeric nanoparticle Paclitaxel drug. By observing the position, shape and relative intensities of the vibration bands in FTIR and FT-Raman spectra of the drugs, a satisfactory vibration band assignments has been made. Fourier transform infrared (FTIR) analysis was conducted to verify the occurrence of chemical bonds between the pure paclitaxel drug, castor oil-solvent based Paclitaxel drug and polymeric nanoparticle Paclitaxel drug material and castor oil-solvent based Paclitaxel drug have almost the same chemical characteristics of the pure Paclitaxel drug. The study suggests that did not occur molecular interaction that could alter thse chemical structure of the drug.

Keywords: Paclitaxel, anti-leukemic, anti-tumor, anti-neoplastic, Taxus breviofolia.

169. Statins on hyperlipidemic patients - Spectral and clinical implications

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Elevated lipid level is suppose to be one of the main risk factors for atherosclerosis and subsequent cardiovascular disease. Therefore, lipid lowering is one of the major target in cardiovascular treatment and prevention. Methods of increasing good cholesterol or lowering cholesterol levels may include cholesterol reducing agents, such as Statins, Fibrates, Niacin (nicotinic acid) and Bile acid resins. Atorvastatin and Simvastatin are the lipid lowering agents, they lower the low density cholesterol by inhibiting the HMG-CoA reductase, which is otherwise known as 3-hydroxy-3-methyl-glutaryl coenzyme A. There have been few reports on the efficacy and safety of statins and the study objectives were to compare the efficacy of Atorvastatin and Simvastatin. Though investigations on the efficacy and safety of Atorvastatin and Simvastatin have been done by many, not much work is done on these statins spectroscopically. To access the lipid lowering effects of atorvastatin and simvastatin in patients, we perform a spectroscopic study using FTIR spectroscopy. We enrolled twenty hyperlipidemic patients of same age group and blood group in the present investigation. The FTIR spectra of blood sera of the patients were recorded before and after drug therapy over the region 4000- 400 cm⁻¹ on a PERKIN-ELMER Spectrum-One FTIR spectrometer. Some remarkable differences are elucidated in terms of spectral profiles. Both the statins were well tolerated and it is concluded from the results that Atorvastatin was more efficacious than simvastatin in modifying lipids in patients with hyperlipidemia and a high coronary heart disease risk.

Keywords: Lipids, hyperlipidemia, atherosclerosis, atorvastatin, simvastatin, efficacy of statins.

170. FTIR spectral analysis of veterinary vaccines on cattle

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Anthrax is a disease of mammals, including human, is caused by a spore-forming bacterium called Bacillus anthracis. Anthrax Spore Vaccine (ASV) is a glycerinated suspension of live spores of uncapsulated avirluent strain of Bacillus anthracis. ASV can be used to protect all species of animals viz, cattle, sheep, goat, horse, ass, elephant, pigs and camel. Foot and Mouth Disease (FMD) is an acute, highly contagious picornavirus infection of cloven hoofed animal. The virus exists as seven serotypes: A, O, C, Asia1, SAT I, SAT II, and SAT III. FMD monovalent vaccine is a liquid preparation containing any one type (O, A, C, ASIA-I) of FMD virus inactivated with formalin and adsorbed on buffered aluminium hydroxide gel. Two groups of five animals were vaccinated with ASV (bacterial) and FMDV (viral). Pre and post vaccinated sera samples of cattle were collected and tested using Fourier Transform Infra Red (FTIR) spectrometer. Spectroscopic method of blood analysis is an

alternate technique to the clinical method since they require fewer samples and provide more information. The variation in peaks was due to the change in protein and lipid levels in the animals due to introduce of antigens.

Keywords: Fourier Transform Infra Red (FTIR) spectrometer, anthrax spore vaccine, avirulent, antigen.

171. FTIR Spectroscopy study on obesity and weight management

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Obesity is an excess of body fat that frequently results in a significant impairment of health. Obesity result when the number of fat cells in person's body increases when a person gains weight, these fat cells first increase in size and latter in number. One pound of body fat represents about 3500 calories. It is a major medical problem today and contributes to 3,00,000 deaths yearly in our country alone. Obesity is a medical conditions diagnosis by a physician and is clinically defined by a measurement of weight relative to height called Body Mass Index (BMI). A person has overweight (pre-obese) when the BMI is between 25 Kg /m² and obese when it is greater than 30 Kg /m². BMI is a reliable indicator of total body fat, which is related to the risk of disease and death. The accumulation of excessive body fat resulting from chronic imbalance of energy whereby the intake of energy exceeds expenditure. It leads to increases the various disease particularly type two diabetes, heart disease, high blood pressure, stroke, few types of cancers, gallstone, liver diseases, osteoarthritis gout infertility, irregular menstruation in women Over weighted person are at increased health risk than normal persons. Evidence to support the view that some obese people eat little yet gain weight due to slow metabolism is limited, an average obese people have greater energy expenditure then their thin counter parts due to the energy required to maintain an increased body mass. The primary treatment for obesity is dieting and physical exercise. To supplement this or in case of failure anti obesity drugs may be taken to reduce the appetite or inhabit fat absorption. Some studies have found significant benefits in morality in certain populations with weight loss. The more effective treatment for obesity is bariatric surgery, however, due to its cost and the risk of complications researcher searching for other effective yet less invasive treatment. Though many researcher works have been carried out on obese people by various methods and not much work has been carried out using spectroscopic technique. The aim of the present work is to characterize blood samples of obese persons and compare the result with the healthy ones. The FTIR Spectral recordings were made and the absorbance values of some specific peaks were noted and calculated. The Internal ratio parameters were calculated and tabulated. Keywords: Obesity, bariatric surgery, internal ratio parameters.

172. Spectroscopic and statistical study of cancerous human breast tissues

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The breast pathological tissues are mainly composed of collagen; proline, valine, glycine and phenylamine are the main collagen's amino acids. The change of the cell from normal status to malignant status induces changes in the relative content of the biomolecules. Fourier transform infrared (FTIR) spectroscopy is sensitive to molecular structure. The infrared spectra of human breast tissues were recorded in the frequency range between 400 cm and 1100 cm. In this paper the Trend analysis plot is used for the analysis of FTIR spectrum of human breast tissues. The sensitivity of FTIR spectroscopy for biomolecular changes is used to classify benign and malignant breast tissues. The analysis is carried out for a collection of 43 samples which were histopathologically identified as normal, hyperplasia, fibro adenoma, ductal carcinoma and invasive ductal carcinoma tissues. The difference in the absorbance values for the various cancer grades and also the predictions of absorbance values for critical stages has been analysed using the Trend analysis. Thus it implies that FTIR spectroscopy is useful for the diagnosis of cancerous breast tissues.

Keywords: Breast, collagen, infrared spectra, ductal carcinoma, absorbance, cancerous tissues.

173. Bioaccumulation study of cypermethrin, pesticide treated fresh water field crab Spiralothelphusa hydrodroma

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The pesticides include insecticides, herbicides, fungicides, molluscides and nematicides and heavy metals like copper, zinc, arsenic, lead, cadmium, mercury etc. These pesticides are non-biodegradable and accumulate in the food chain. Mostly they are prone to affect the nervous system causing tumors in living organisms. They are not only neurotoxic but also affect other systems and have shown a high degree of impact on metabolism by altering the protein, carbohydrate and lipid. The fresh water field crab. Spiralothelphusa hydrodroma is an important human food source in parts of South India and the crab is constantly exposed to pesticides, which are used extensively to control agricultural pests. Evaluation of the toxic effect of cypermethrin on the experimental crab for the LC value was carried out. The fresh water field crabs were collected from, in and around the irrigating channels and paddy fields. The crabs were maintained in normal daylight illumination in the laboratory thereby providing normal acclimatization. The crabs were fed with uncooked oats. The water level was maintained carefully so that the crabs were partially immersed. Acute toxicity study was carried out to determine the potency of cypermethrin for static but renewal type of bioassay was adopted in the present investigation to estimate the LC₅₀ values. The cypermethrin, commercial grade was used as the test material since only commercial preparation is used in agriculture. The experiment was carried out to find the range of concentrations for confirmatory evaluation. The mortality was recorded for the crab at 24 hr, 48 hr, 72 hr and 96 hr exposure to cypermethrin. Chronic time course study on the effect of cypermethrin on the crab was conducted by exposing to two sublethal, safe concentrations for 20 days and 40 days. 1/3rd and 1/10th of the 96 hr LC₅₀ value represent higher and lower sublethal concentrations respectively. Hence lower and higher sublethal concentrations of the insecticide were arbitrarily used. At the end of the treatment period, the control and treated crabs were dissected and the ovary, spermatheca, hepatopancreas, muscle, gills, haemolymph, brain, thoracic ganglia and eyestalk were collected to analyse the nutritive value viz. protein, carbohydrate and lipid. Statistical analysis of one-way analysis of variance (ANOVA) have been performed. **Keywords:** Spiralothelphusa hydrodroma, spermatheca, hepatopancreas.

174. Exploitation of Plant fibres for sustainable development

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Fibres extracted from the various parts of green plants have enormous potential as sustainable resources for the present and future generation. These fibres could be used for cordage, paper-making and also in the textile industry. The bast fibres of jute, flax and hemp, epidermal hairs of cotton have been in use as fibre sources for a long time. The possibility of using other plants in the same context has been explored in the recent times and the possibility of improvement of these fibres to increase the realm of their usage has been attempted. The commonest method used in fibre quality improvement is the use of plant growth regulators which can also bring about an increase in the yield of fibres. The present investigation deals with fibre-yielding plants like *Abelmoschus esculentus, Hibiscus sabdariffa* and *Eucalyptus camuldulensis* which have been tested for fibre improvement by the use of plant growth regulators. The study of their dyeing behavior and tensile strength has been done and this will have a bearing on the usage of these fibres in the textile industry and in the making of paper, leading to sustainable development and saving of trees in the years to come.

Keywords: Cordage, paper- making, Abelmoschus esculentus, Hibiscus sabdariffa.

175. Harmful algal blooms in south east coast of India

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Monitoring the harmful algal blooms was carried out during 2008 to 2009 in Mandapam and Keelakarai coastal waters of Tamil Nadu, Southeast coast of India. In the month of October several fishes and 84

shellfishes were died due to *Noctiluca* blooms along these two areas. The present investigation the following species of phyto and zooplankton were found to be common; phytoplankton such as *Coscinodiscus* sp., *Skeletonema costatum*, *Bacillaria paradoxa*, *Thallassiothrix frauenfeldii*, *T. longisima*, *Leptocylindrus* sp., and zooplankton such as *Paracalanus parvus*, *Acrocalanus gracilis*, *Pseudodiaptomus serricautatus*, *Rhincalanus cornutus*, *R. nasutus*, *Euterpina acutifrons*, *Nannocalanus minor*, *Eucalanus attenuates*, *E. crassus*, fish larvae, fish eggs, *Barnacle nauplii*, *Bivalve larvae*, *Gastropod larvae*, *Copepod nauplii* and *Mysis larvae*. The hydrobiological parameters also analysed during bloom and after blooms; the dissolved oxygen (2.6 - 4.9 μml⁻¹) nutrients varied between nitrate (0.66-1.01 μml⁻¹) nitrite (0.11-0.21 μml⁻¹) phosphate (0.51-0.86 μml⁻¹) and silicate (0.81-4.2 μml⁻¹).

Keywords: Noctiluca, Barnacle nauplii, Bivalve larvae, Gastropod larvae, Copepod nauplii.

176. Bioactive metabolite produced by *Phomopsis* sp., an endophytic fungus in *Allamanda cathartica*

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Endophytes are microbial entities that live within living tissues of plants. In most cases their relationship with the host plant is symbiotic and probably mutualistic. Many are capable of synthesizing bio-active compounds that can be used by the plant for defense against fungi and bacteria. Some of these compounds have been proven useful for novel drug discovery. By encouraging the endophytes to grow outside the plant in nutrient rich media, it is possible to harvest the bio-active compounds that they produce. In the present investigation we are trying to isolate endophytic fungi from *Allamanda cathartica* (Apocynaceae). The secondary metabolite obtained from the endophytic fungi was found to inhibit the growth of human pathogenic bacteria. The compound was extracted with organic solvents and bioautogram was done to check compound's antibacterial activity. Thin layer chromatogram and various other spectroscopic analyses were done to identify the compound. The results were discussed in the paper.

Keywords: Endophytes, allamanda, apocynaceae, antibacterial activity, bioautogram, Phomopsis.

177. Analysis on cancer patient blood samples -A characterisation study

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Cancer is a generalization of many forms of the disease. Leukemia is a type of cancer that is generally found in the blood and bones, though it can spread to other organs as well. Leukemia is specific meaning that it is cancer of the blood cells. Leukemia is the cancer of the blood or bone marrow and is characterized by an abnormal proliferation of blood cells (normally the white blood cells). Acute lymphocytic leukemia (ALL) accounts for majority of the childhood leukemia. Leukemia is clinically and pathologically split into its Acute and Chronic form. Combining these two classification provide a total of four main categories namely, acute lymphocytic leukemia (ALL). Acute myelogenous leukemia (AML), chronic lymphocytic leukemia (CLL), chronic myelogenous leukemia (CML).ALL is the most common type of leukemia in young children between 3 and 12 years. The present study aims to characterize the blood samples of ALL patients with the healthy subjects using Fourier transform infrared (FTIR) spectroscopy technique. The internal standard ratios were calculated with the specific peaks. The comparison of the values show that the spectra are not similar when compared down to finer details.

Keywords: Cancer, Leukemia, chronic myelogenous leukemia.

178. Biosorption of Cr (VI) from aqueous solution and tannery effluent using pretreated biomass of *Termitomyces clypeatus*

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Chromium is a common pollutant in effluents from industries such as metallurgical, leather tanning, electroplating, dying, wood preservation and battery manufacturing. It is hazardous nonessential metal

that affects human physiology and accumulates in the food chain. Chromium is strong oxidizing agent capable of being absorbed through the skin and has carcinogenic, mutagenic and teratogeic potential, which result in tissue damage. Traditionally, these metals are removed by chemical precipitation, membrane process, reverse osmosis, ion exchange, liquid extraction and electro-dialysis. However these methods are non-economical and not very efficient to reduce the metal concentration to the level as required by environmental legislation. Furthermore, these processes have high energy or reagent requirements and generate toxic sludge that require additional careful disposal. At present emphasis is given to the utilization of biological adsorbents for the removal and recovery of heavy metal contaminants. Certain microorganisms can selectively accumulate heavy metal ions from aqueous systems such as waste water effluents from metallurgical and mining operations and play an important role in the regulation of environmental pollution and in the recovery of useful metals from nature. Fungi are fast growing; low cast (less nutrient requirement), has adaptability to natural environments, available as industrial/laboratory byproduct. The inactivated/ dead fungal biomass is of little use and can be a good source of biomaterial for biosorption process as it has no risk of contamination during biosorption process. Higher fungi (mushrooms) are abundantly available in nature and need to be exploited as low cost materials for their properties. The fungal species, Termitomyces clypeatus, used in this study is an edible verity of mushroom that is commonly found in near-surface system. Fungi are known to tolerate and detoxify metals by several mechanisms including passive accumulation processes which may include ion exchange, complexation, adsorption, extra and intracellular precipitation, valence transformation and also active uptake. The hexavalent chromium biosorption studies were carried out on aqueous solution and tannery effluent onto pretreated biomass of Termitomyces clypeatus. The biomass was pretreated by heat and reconditioned with different chemical agents to study biosorption of hexavalent chromium between pH 2-7. The heat treated biomass showed optimum Cr (VI) biosorption at pH 2.0 and there was a distinct increase (up to 98-100%) in Cr (VI) removal efficiency at pH 5 and 7 after reconditioning with acids (HCI, acetic, phosphoric and oxalic acids), calcium chloride, formaldehyde and ammonium persulfate. The idea of using biosorption process for Cr (VI) removal under weak acidic or neutral pH has great industrial applications for treatment of chromium-containing waste water for environmental protection with efficient, cost effective, eco-friendly manner as the fungus is of edible variety of mushroom and has no adverse social impact. The influences of different environmental parameters such as pH, biomass dose, initial Cr concentration, contact time, shake condition on biosorption by heat pretreated biomass were investigated. Maximum adsorption of Cr (VI) by the biomass was 38.11mgg⁻¹ at 500mgL⁻¹ initial concentration of chromium. Adsorption characteristics fitted well with Langmuir and Freundlich isotherms and kinetics parameters are evaluated. The role of functional groups involved in biosorption of Cr (VI) was analyzed by FTIR spectra. The functional groups amino, carboxylic, phosphate, sulfonyl and carbonyl were present on surface of heat treated T. clypeatus biomass. FTIR spectra showed a shift in the bands of amide, carboxyl, phosphate and sulfonate groups onto chromium adsorbed biomass. Immobilization of biomass within magnetic sodium/calcium alginate beads showed successful removal efficiency. Desorption studies showed 36.4% Cr recovery using 0.05N NaOH. The biomass showed multimetal (Ni, Fe, Cu, Zn, Co and Pb) removal (70-100% efficiency). Tannery effluents collected from a CETP of leather industry complex at Kolkata, India were characterized for physicochemical parameters and metal concentrations. The heat treated biomass was able to remove Cr up to 80.4% as well as Fe up to 45.21% from effluent without adjustment of pH. Thus the study offered an ecofriendly, easy to handle and efficient biosorbent for substantial decrease or complete removal of hexavalent chromium under weak acidic and neutral conditions that can solve one of challenges in industrial application of known biosorbents removing Cr (VI) only under strong acidic condition.

Keywords: Chromium, leather tanning, electroplating, biosorbents.

179. Purification and characterization of a thermo stable novel peroxidase from *Coprinopsis macrocephala* VKT-1

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Coprinopsis macrocephala VKT-1 (Accession number EU591956) isolated from Kodaikanal, Tamil Nadu was identified by conventional and molecular techniques. An extracellular thermo stable peroxidase from the fungus was purified using Sephadex G-100 gel filtration and DEAE cellulose ion exchange chromatography and characterized by pH, temperature, inhibitors, and metal ions. The

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purified peroxidase was subjected to decolourization of two textile azo dyes and confirmed by gel electrophoresis.

Keywords: Coprinopsis macrocephala, Sephadex G-100, peroxidase.

180. Effect of biological agents as part replacement of chemical fertilizers on groundnut cutlivation

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Field trials were conducted during the years 2009-2010, at a private farm in Puttaparthi, Anantapur District, India to study the effect of biologicals agents used in combination with recommended doses of NPK and organic Farm Yard Manure (FYM) on groundnut plants, *Arachis hypogea*. Commerical samples of BGA, *Azotobacter* and *Azospirillum* were employed in the study, both individually and in combination with each other. Each of these biological agent combinations were used along with NPK and FYM employed in the different ratios 1:3, 1:1 and 3:1. The use of biological agents as part replacement for chemical fertilizers has proved to be advantageous in all the crop parameters studied. While *Azospirillum* proved to be the best agent individually, combination of *Azospirillum* and *Azotobacter* has shown better yield than each of them used individually. However, the yield, protein and oil content of the crop were augmented almost twice by the addition of BGA to the mixture of *Azospirillum* and *Azotobacter*.

Keyword: Arachis hypogea, Azospirillum, yield, FYM, NPK, BGA.

181. An *in vivo* assay on the genoprotective effect of *Pisonia* leaf extract on the mutagenicity of two brands of rum in the somatic cells of *Allium cepa* L.

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Alcohol a powerful health hazard chemical was screened for genotoxicity. The genotoxicity and mutagenicity of two most commonly sold brands of rum was studied using the root meristem of *Allium cepa*. The parameters considered here were mitotic indices and mitotic anomalies. The differences in mitotic indices and mitotic anomalies for the different concentrations and durations of rum treatment was observed. Then the modulating effect of *Pisonia* leaf extract on the genotoxicity of the two rums was studied. Both the rums were genotoxic to the same extent and the genotoxicity of both the rums was duration dependent. The genoprotective nature of Pisonia is established in treatments with one of the rums used.

Keywords: Alcohol, genotoxicity, test, plant, cytogenetic, mutagenic, rum, health hazard.

182. Spectroscopic analysis of beach sediment of south east coast, Tamil Nadu, India

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Sediments are principal carriers of the trace elements in the hydrosphere. Sediment particles are made up of materials derived from rock, soil, biological and anthropogenic inputs. Sediment analysis is the prominent research to identify the pollution for the field of interest in the study area. In the present work an attempt has been made to study elemental composition of the beach sediment samples of South East Coast of Tamilnadu by SEM-EDAX technique and to infer any possible pollution based on the geo-chemical values. In this regard, the beach sediments were collected from six different locations namely Sethukarai (S1), Dhanushkodi (S2), Rameshwaram (S3), Mandapam,(S4), Devipattinam (S5) and Thondi(S6) and subjected to multi-elemental analysis by SEM-EDAX technique. The results are discussed and the conclusions are also drawn.

Keywords: Sediment, Multi-elemental analysis, SEM-EDAX technique.

183. Socioeconomic status and medicinal plants used by traditional healers in two remote villages of Thoothukudi district, Tamil Nadu, India

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Traditional medicine and ethnobotanical information play an important role in scientific research, as more than 80% of the world's population relies on traditional medicine for their primary healthcare needs. According to World Health Organization (WHO), Asian countries meet their basic needs from the products they manufacture and sell based on their traditional knowledge. Herbal drugs obtained from plants are proved to be much safer and cheaper. In this work, the herbal flora, socioeconomic status and the traditional knowledge of villagers on herbal medicine at Chockkanathapuram and Akkanayakkanpatti - two remote villages of Thoothukudi district was studied. Antibacterial properties of the most common plant against Staphylococcus aureus and E.coli were also studied. Using a questionnaire, the details about socio-economic conditions, common ailments and plants used for treatment were collected and these data were further processed. Socio-economic status of these villagers was below poverty line evident from the facts that most of them were Farmers and Labourers and even now they depend on firewood for cooking and the most common ailments were cold and cough. About 72 plants belonging to 32 families were recorded at Akkanayakkanpatti, and Chockkanathapuram villages. Of which 43 plants belonging to 25 families were used as remedial plants for 15 different kinds of diseases. Among the different plant parts, leaves were most commonly used in various forms like fresh leaves or paste or extracts or decoction or steam inhalation, etc., The crude ether extract of Aristolochia bracteolata leaf, loaded on paper disc was effective against S. aureus at 500 and 1000 ppm with an inhibition zone of 10 and 12 mm. The active indexes for these two concentrations were 0.42 and 0.5 respectively. The standard Streptomycin (10ig) antibiotic disc showed inhibitory zone of 24 mm. E. coli was resistant and no inhibitory zone was clearly seen. Keywords: Medicinal plant, ethnobotany, traditional healers, healthcare, India.

184. Studies on the effect of algal flora raised during vermicomposting on acclimatization of angiosperms

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Fresh water algal flora raised through cultures in Bold's basal medium during vermicomposting were applied to the selected angiosperms to study the synergistic effect of algal flora and vermicompost on acclimatization of angiosperms. This report is a pioneering work. Phaseolus aureus and Eleusine coracana were the selected angiosperms. After application of algal vermicompost mixture for required period the effect on germination percentage of seeds, the average shoot length, dry weight and amount of phosphorous present in the seedlings were studied. 25% vermicompost was found to be the best for germination of seeds of E. coracana. 25-50% vermicompost mixture was proved to be most suitable for germination of P. aureus. As far as shoot length was concerned, in both .the taxa there was maximum enhancement in 75% algae and vermicompost mixture. P. aureus and E. coracana showed maximum dry weight when treated with 75% algae and vermicompost mixture. When effect on Phosphorus was studied in 20 days old seedlings of P. aureus and E. coracana, maximum amount of phosphorus was found in the seedlings when 75% vermicompost mixture alone was applied. Recent development in the global level is the application of detrivorous epigeic earthworms for organic manure/ vermicompost production from biodegradable organic materials recovered from agricultural lands, agro-based industries and municipal solid waste. The present study is closely associated with earthworm microbe interaction. The quality of the manure or vermicompost depend on micro organisms associated with the process of decomposition.

Keywords: Algae, vermiculture, earthworm, vermicompost, manure, soil fertility, biodegradation.

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185. Partial purification and characterization of extracellular protease from *Pseudomans* spp.

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Pseudomonas species were isolated from various samples. On screening for extracellular protease production by gelatin cup assay, *Pseudomonas* isolated from meat (isolate 7) showed highest activity. Hence, extracellular protease produced by strain 7 was partially purified by ammonium sulphate precipitation and DEAE Cellulose column chromatography. The partially purified protease showed a single clear band on SDS-PAGE by utilizing gelatin as a substrate. The molecular weight of partially purified protease was ~40 kDa. The enzyme was inactivated by EDTA and mercaptoethanol. Hence the protease may be a metal ion dependent alkaline metallo protease. The enzyme exhibited maximum activity at pH 10 and showed maximum activity at 50°C. The pH and temperature stabilization of this enzyme makes it a suitable enzyme for industrial applications.

Keywords: Extracellular protease, DEAE Cellulose column chromatography, Pseudomonas.

186. Plant tissue culture - Agriculture and health of man

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Plant tissue culture refers to in vitro cultivation of plants, seeds, plant parts on nutrient media under aseptic conditions. This technique has developed to such a level that any plant species can be propagated in vitro through several methods, which has improved many crops with desirable characters include cereals, pulses, vegetables, fruits, spices, ornamentals, medicinal plants and forest trees, Plant tissue culture offers tremendous opportunities in plant propagation, plant improvement and production of plants with desirable agronomical features. Hence it is now possible to develop methods for virus free plant regeneration, salinity tolerance, herbicide resistance, disease resistance, frost resistance, incorporation of high protein content and genetically engineer plants for desirable traits. The role of plant tissue culture in meeting the ever increasing demand and requirements of man in the field of agriculture, forest, horticulture and medicine is highly impressive. Plants produce two types of metabolites i.e. primary and secondary metabolites (active principles), the former is essential for the growth and development of the plants, whereas the latter is important for man's health. The medicinal plants are those rich in secondary plant products (active principles) are termed medicinal; exert a profound physiological effect on man, curing many ailments and diseases of man. In vitro grown plant cells and tissues have been used extensively for the production of secondary metabolites, which are the source of various pharmaceutical and industrial products. Alkaloids, phenolics, steroids, terpenoids, lignins, tannins and essential oils are of immense medicinal importance. Crop plants play an important role in the human nutrition and health by providing carbohydrates, proteins, fats, minerals, vitamins, antioxidants, phytosterols and dietary fibers. Plants can be used to produce pharmaceutical proteins for immunization, enzyme therapy or as a precursor for any pharmaceutical products. Antibody production has been successfully demonstrated in potato, soya bean and tobacco. Transgenic plants can be used as bio-factories for producing pharmaceutical and industrial chemicals and raw materials. The ability of the plant cell cultures to catalyze transformation of a readily available or inexpensive precursor into a more valuable final product is being increasingly exploited - bio transformation; a small part of the molecule in the structure and composition is converted to industrially important chemicals by means of biological systems. The use of plant cell cultures for biotransformation requires the selection of cell types that express the enzymatic capabilities to catalyze the specific reaction of interest. The cell cultures are used to synthesize the desired end product; biotranformation of digitoxin into digoxin. Plant tissue cultures were used in achieving a specific biotransformation to produce a cardiovascular steroid digoxin or methyl digoxin from digitoxin of Digitalis lanata. Datura cell cultures possess ability to convert hydroquinone into aarbutin through glycosylation. Sucrose is extensively used as a sweetener in confectionery, jams, cakes, biscuits and various bakery products. Cell cultures of Stevia rebaudiana can convert steviol into steviobiocide and stevioside which are 100 times sweeter than cane sugar. Plant tissue culture plays a prominent role in the development of sustainable agriculture through micro-propagation, embryo culture, anther culture, protoplast culture, somatic hybridization and secondary metabolites. Thus plant tissue culture forms the core for health care of mankind.

Keywords: Plant tissue culture, health, agriculture.

187. Effect of metals on the release of extracellular proteins, carbohydrates and lipids of two algae

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Algae possess a wide range of potential cellular mechanism that may be involved in the detoxification of heavy metals and thus tolerant to metal stress. They are binding to cell wall and extracellular exudates due to metal toxicity. The loss of cellular exudates may lead to loss of nutrients in food chain levels as algae form the primary producer. Thus metal toxicity lessens the biomass amount in aquatic food chains. The present study revealed that two predominant algae from metal polluted sites were isolated and amended in BG., medium. The algae were amended in different concentration of metals such as Cd, Cr, Cu and Zn commonly prevalent in the metal polluted sites. The growth was inhibited in higher metal concentrations and metal interactions but in lower concentration the growth was as much as that of control. In metal interactions (ie) bimetallilic and trimetallilic treatments, copper and zinc showed antagonistic effect with other metals. These essential metals substituted toxic metals and hence improved the growth and pigment composition of algae due to their presence. In addition, in the absence of chelating agent EDTA, metals increased the toxicity. This was mainly due to the available free metal ions which enhanced toxicity in algae. Thus our laboratory studies reveal that microalgae tolerant to effluents especially Oscillatoria and Lyngbya could be effectively used as a tool for bioremediation. In the presence of chelating agent the metal toxicity is reduced and bioremediation was very effective. The biochemical analysis revealed that there was release of the extracellular exudates due to metal toxicity as external detoxification mechanism. Keywords: Algae, phytoremediation, heavy metal, pollution, environment.

188. Oyster cultivation in India- A sustainable model

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Mushrooms are known for their nutraceutical and therapeutic potential. There is a worldwide increase in mushroom consumption during the past decade. India, despite of its biodiversity does not feature in the list of leading mushroom producing countries, agricultural waste in India amounts to nearly 14.4 million tons every year. This waste is most often burnt in the fields. If 10 % of this waste is used for mushroom production, even with 50% biological efficiency, we can produce 72 lakh tons of fresh mushrooms. These mushrooms can be consumed or can be exported to many countries generating good revenue. Cultivation of mushrooms does not require cultivable land. For cultivation of the above mentioned amount of mushrooms, nearly 57.6 Hectares of unproductive land can be put into productive use. Mushroom production also does not require skilled labour, thereby can provide employment to nearly 43 lakh people every year. These people can be uneducated or even rural women. By utilizing the agricultural waste for producing mushrooms, nearly 144 tons of protein can be introduced into the food chain. This is of significance, especially in our country, where protein rich food is at scarce. Research is also being carried out on the utility of spent substrate after mushroom production. The spent substrate can generate nearly 50-60 tons of organic manure. The other uses of the spent substrate are generation of biogas, animal feed, bioremediation etc. The proposed model gives a brief outline of the sustainable oyster mushroom cultivation process highlighting the use of greener energies and latest technologies. The model also highlights the need and importance of mushroom cultivation in India. This model explains how many eco-friendly concepts using renewable energy sources like the use of solar heated water for substrate pasteurization, biogas generation, use of wind energy etc. can be integrated into mushroom production. Current research is being carried out at our labs in the field

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of utilization of solar energy for substrate pasteurization, use of spent substrates as bio-adsorbents, post harvesting technologies and use of mushrooms as functional foods. **Keywords**: Mushroom, fungi, cultivation, food, agricultural waste.

189. The study of callogenesis and morphogenesis in *Phyllanthus niruri* Linn. and *Stevia rebaudiana* (Bertoni) Hems. L.

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Phyllanthus niruri is a very well known ayurvedic plant used against janduice and other ailments since times immemorial. The morphogenic response of Phyllanthus niruri has been carried out in MS medium with BAP, IBA, NAA, Ad, 2.4-D, KN. The nodal explants treated with BAP showed good establishment and also the formation of multiple shoots up to 20 in 2 mg L⁻¹ than 3 mg L⁻¹. Nodal explants with IBA treatment revealed good establishment and also produced multiple shoots around 15-16 in 3 mg L⁻¹ than 2 mg L⁻¹. The nodal explants in the treatments of BAP + KN and IBA + KN revealed good organogenesis in MS medium. The combination of NAA + KN and 2,4-D + KN revealed significant callogenesis. In the treatment of NAA 2 mg L⁻¹, 3 mg L⁻¹ explants resulted in callus formation and few shoots. Ad treatment showed good shoot and root as well as callus. Apical meristem was also tried with BAP, IBA, NAA and Ad. In BAP and IBA (2 mg L⁻¹ and 3 mg L⁻¹) treatment multiple shoots were observed with little callus, whereas the treatment of Ad (2 mg L⁻¹ and 3 mg L⁻¹) produced shoots, roots and also callus. Nodal explants and apical meristem /terminal bud in MS medium with coconut milk exhibited good shoot, good root growth and formation of some amount of callus in 10 ml L-1 than 5 ml L⁻¹. Stevia is a natural sweetener and medicinal plant. It is a perennial herb with a slender shoot. In vitro culture of Stevia was carried out in MS medium fortified with BAP, NAA, NOA, Ad and 2, 4- D. Among these plant growth regulators, the nodal explants revealed good results with BAP and NAA 2 mg L⁻¹ for establishment. For multiplication MS medium containing BAP 2 mg L⁻¹ showed the formation of multiple shoots up to 10. When these shootlets were sub cultured in the same medium good numbers of multiple shoots were observed to the extent of 50 - 70. As time progressed, the number of multiple shoots also increased starting from 10 to 70 in 15 to 60 day's time. Rooting medium with IBA (2 mg, 1.5 mg and 1 mg L⁻¹) developed bulbous callus at the base of the explant in the medium. When these shootlets were sub-cultured in MS basal medium without any hormone, formation of roots was observed within one week without any callus formation. The roots grew up to 10 cm by 15 days time. Medium with IAA 1 mg L⁻¹ developed few roots which are longer in length than the treatment with IBA. Activated charcoal resulted in the production of thin long roots without callus formation. However the root morphology differed substantially from the normal rooting. In the treatment of IBA + NAA shoots responded well measuring up to 16 cm and they produced few roots. For rooting, MS basal medium without any hormone was found to be ideal. Activated charcoal treatment would be the next followed by IAA and IBA.

Keywords: Stevia, phyllanthus, plant, ayurvedic, herbal.

190. In vitro morphogenetic studies on Adhatoda vasica Nees

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Adhatoda vasica is an indigenous shrub of India used in various schools of medicine since ages. The plant material is used against a broad spectrum of diseases, particularly the pulmonary ailments. The *in vitro* morphogenetic response of nodal explants of *Adhatoda vasica* was studied with MS medium fortified with Plant Growth Regulators via. Auxins: IAA, NAA, IBA, 2, 4-D; Cytokinins: BAP, Ad and KN, individually and together at various concentrations. The effect of different concentrations of BAP showed establishment, and among all the concentrations 1 mg L⁻¹ and 2 mg L⁻¹ showed better response. The effect of NAA 0.05 mg L⁻¹ showed better establishment than 0.1 mg L⁻¹. Callus growth was also obtained with this treatment. Kn showed a significant morphogenetic response in the establishment and proliferation of shoots. Combination treatments for establishment of the nodal explants revealed good results. Especially NAA 0.05 mg L⁻¹ and BAP 0.1 mg L⁻¹; NAA 0.05 mg L⁻¹ + BAP 0.1 mg L⁻¹ + Kn 0.1 mg L⁻¹, BAP 0.2 mg L⁻¹ + NAA 0.1 mg L⁻¹, showed better results over the other combinations. On

sub culturing the explants in the multiplication medium containing BAP 0.4 mg L⁻¹ + NAA 0.1 mg L⁻¹ and NAA 0.05 mg/L + BAP 1.0 mg/L produced multiple shoots up to 9. The elongation was obtained in the medium with BAP 0.6 mg L⁻¹, measuring 6 cm, which was transferred to rooting medium with IBA 0.5 mg L⁻¹. While the combination of NAA 0.05 mg L⁻¹ + Kn 1.0 mg L⁻¹ showed significant elongation of leaves and petioles. In vitro rooting was observed with different concentrations of IBA. Among all the concentrations used 0.5 mg L⁻¹ alone showed significant root induction, proliferation, and elongation. Rooted shootlets were transferred for hardening in plastic pots containing the mixture of sand, soil and vermin compost in the ratio of 1:1:1 provided with Knops solution. These pots were placed in the plant growth chamber with temperature of 23° C and Humidity 85%. Callogenesis was observed with 2, 4-D, KN, NAA, BAP and GA, in combinations. NAA 0.05 mg L⁻¹ and BAP 0.1 mg L⁻¹; NAA 0.05 mg L⁻¹ + BAP 0.1 mg L⁻¹ + Kn; NAA 0.05 mg L⁻¹ + BAP 1.0 mg L⁻¹; 2, 4- D 1 mg L⁻¹ showed significant callus initiation and proliferation than other concentrations used. The results revealed that BAP was ideal for good establishment individually and also in combination with NAA and KN. BAP in combination with NAA was found effective for multiplication. Individual treatment of BAP elicited good elongation. IBA was found to induce the initiation and proliferation of roots.

Keywords: Adhatoda vasica, medicinal plant, tissue culture.

191. Biodiversity studies of Aegle marmelos (Linn.) Correa in Sri Sathya Sai taluk of Ananthapur district

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Aegle marmelos is an ancient sacred tree of India, belonging to family Rutaceae. It is one of the most important medicinal plants with innumerable medicinal traits. The tree has been exploited to such a great extent in the past, that now the tree is listed as a threatened species in the Red Data Book. Sri Sathya Sai Taluk, situated to the south of Ananthapur town has got plenty of Aegle marmelos trees growing wildly in five well defined reserve forest regions of this area. Seven Aeale marmelos populations were identified covering all corners of this unexplored region for finding how much diversity is prevailing among them. About 60 mature trees were identified and studied in detail their macro and micro morphological characters before selecting 40 trees for finding DNA polymorphism using RAPD (Random Amplified polymorphic DNA) molecular marker technique. Genomic DNA was extracted from lyophilized tender leaf material of identified 40 trees using Doyle and Doyle (1990) modified method. A total of 15 random decamer primers were used for RAPD assay of which ten provided clear, reproducible and unambiguous band pattern. In total 107 amplicons were scored from these studies providing an average of 9.72 bands per primer. Out of these 107 bands, 72 proved to be polymorphic (67.29%) and hence proved informative. OPN 5 with 88.89% polymorphism proved to be the efficient one out of all the primers followed by G1 with 84.62% and OPN 8 with 83.3%. The binary matrix generated using the information of bands scored helped in calculating Jaccard's similarity coefficient. This similarity index was then used to construct phenograms based on Unweighed Pair Group Method of Arithmetic Averages (UPGMA) using NTSYS-pc programme. The phonograms obtained thus indicate that genotypes among populations have variations but not that far related as they appear from their morphological traits studies. In addition to these studies all the trees fruit polysaccharides contents were estimated in order to assess their nutraceutical potential. Elite trees were identified by comparing all the results and efforts were made to develop true to type plants using tissue culture techniques. Two elite Aegle marmelos trees were identified and explant materials obtained from them were used in studying their responses on MS media supplemented with different auxins and cytokinins. Out of all the explants used Nodal Segments proved to be good explant material for both Callogenesis and morphogenesis. Leaf explants and floral parts also responded in the form of callus tissue. In the establishment stage MS media supplemented with individual phytohormone treatments of Ad (2. 6. 9 mg/L), AS (2 mg/L), BAP (2, 3, 6mg/L), KN (2, 4, 6ml/L), NAA (2, 3, 6ml/L), IBA (3 mg/L), 2,4-D (2, 3,6 mg/L), DPU (2 mg/L), Picloram (2mg/L) and MS media supplemented with phytohormone combinations of KN (2mg/L) + NAA (1mg/L), Ad (2mg/L) + NAA (1mg/L), BAP (2mg/L) + NOA (1mg/ L), BAP (2mg/L) + NAA (1mg/L), Ad(2mg/L) + IBA (1mg/L), AS (2mg/L) + IBA (1mg/L) all proved to be good. In the Multiplication stage MS media in combination with phytohormones BAP (2mg/L) + NOA (1mg/L), BAP (2mg/L) + NAA (1mg/L), KN (2mg/L) + NAA (1mg/L), Ad (2mg/L) + NAA (1mg/L) and Ad(2mg/L) + IBA (1mg/L) resulted in multiple shoots formation and high frequency regeneration of

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shoots from callus tissue obtained from different kinds of explant material. Coconut Milk as growth adjuvant in complete absence of phytohormones also proved best for this purpose. For Elongation MS media treatments with phytohormone combinations of KN (2mg/L) + NAA (1mg/L), Ad (2mg/L) + NAA (1mg/L), Ad (2mg/L) + IBA (1mg/L) provided good results. For rooting purpose ½ Strength MS medium containing 4 mg/L IBA and ½ Strength MS basal medium containing 2 mg/L IBA proved to be the best in obtaining complete plant let.

Keywords: Biodiversity, Aegle marmelos, sacred tree, herbal, medicinal plant.

192. Annona squamosa leaves as source of potent antioxidants

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Free radicals have been implicated in the etiology of several major human ailments, including cancer, cardiovascular diseases, neural disorders, diabetes and arthritis. The control of free radicals is today one of the most intensively investigated medical research topics. Many antioxidants are being used to neutralize the free radicals and their actions. However recent studies revealed that the use of synthetic antioxidants may lead to various side effects and may even cause death. Nature has been a source of medicinal agents for thousands of years and many plants have been used for centuries as remedies for human diseases. Plants are also susceptible to damage caused by active oxygen and develop numerous antioxidant defense systems resulting in formation of potent antioxidants. Many aromatic, medicinal and spice plants contain compounds that possess confirmed strong antioxidative components. Also the usage of antioxidants, which occur naturally, and from other biological materials has considerable interest due to their presumed safety, nutritional and therapeutic value. Most of the antioxidant compounds in a typical diet are derived from plant sources and search for new sources of natural antioxidants has increased dramatically in various elds. Annona squamosa, belongs to the plant family Annonacea and is used in Indian traditional medicine. All parts of the plant possess several medicinal properties which are used to treat several diseases such as diabetes, liver disorders, diarrhea, dysentery, cardiac problems, epilepsy, fever, malignant tumors, ulcers and hemorrhage. In the present study, antioxidant potential of the methanolic extracts of fresh and dry leaves of A. squamosa has been evaluated by DPPH radical scavenging, ferric reducing antioxidant power (FRAP), ferrous ion chelating (FIC) activity, reducing power and superoxide scavenging assays. The DPPH radical scavenging activity assay was carried out to know the antioxidant potential of the leaf extracts to act as free radical scavengers and the methanolic extracts of both fresh and dry leaves showed scavenging effect with increased concentration. Fresh leaves showed highest percent (90%) of radical scavenging activity than dry leaves (87%) at a concentration of 0.6 mg/ml. The ability of the antioxidant compounds present in the tested extracts to reduce ferric (III) to ferrous (II) by a redox-linked colorimetric reaction involving single electron transfer was determined by FRAP. Dry leaves had the highest ability to reduce Fe³⁺ and the methanolic extracts showed increasing FRAP with increased concentration. The ferrous ion chelating (FIC) assay was used to evaluate the binding of antioxidant components to metal ions and the chelating effects of methanolic extracts of the leaves on ferrous ions increased with increasing concentrations. Dry leaves exhibited higher chelating ability of 25% whereas fresh leaves exhibited lower chelating ability of 20% at the highest extract concentration of 10 mg/ml. Reducing power of the extracts increased with increasing extract concentration showing that the antioxidant power is concentration dependent. Fresh leaves exhibited more reducing power than dry leaves. Superoxide radical scavenging assay showed fresh leaves to be having higher superoxide radical scavenging effect than dry leaves. At 6 mg/ml extract concentration, the superoxide scavenging effect was 93% for fresh leaves and 68% for dry leaves. The total phenolic content (TPC) expressed in terms of Gallic acid equivalents (1 mg/ml) was observed to be more in fresh leaves than dry leaves. The total flavonoid content (TFC) expressed in terms of Quercitin equivalents (1 ig/ml) was observed to be more in dry leaves than fresh leaves. All the assays were carried out wrt various antioxidant standards and it was observed that the antioxidant activity of the extracts is concentration dependent. It was evident from the current study that both fresh and dry leaves can be a good source of natural antioxidant compounds. Fresh leaves exhibited the same trend wrt their superoxide scavenging and reducing power abilities which may be attributed to their total phenolic content. The results of the present work are very useful to carry out further research on the leaves of A. squamosa to identify, isolate and characterize the bioactive compounds which are responsible for the antioxidant property for industrial and pharmaceutical applications.

Keywords: Freeradical, antioxidant, plant, Annona, leaf.

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193. Anatomical and phytochemical studies on the extracts of *Enicostemma littorale* blume

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Enicostemma littorale belonging to the family Gentianaceal is used as one of the ingredients in various ayurvedic formulations to produce antihyperglycemic activity. It has been also used in folk medicine for treatment of diabetes mellitus. The plant posses stimulant, astringent, diuretic and anthelminitic properties, It has been treated as a remedy for stomach ache and laxative, blood purifier in dropsy, rheumatism, abdominal ulcers, hernia, swelling, itches and insect poisoning. It is also valuated for hepato protective property. The present study was persued using leaf and root extracts of *Enicostemma littorale*. Anatomical studies were carried out for the mieroseopie features of lateral vein, lamina, internal, nodal region and roots phytochemical studies were undertaken for preliminary qualitative phytochemical screening and quantitative analysis. The results of quantitative analysis showed the presence of alkaloids, terpenoids, steroids, tannins, *Saponins anthraquinones*, phenols, proteins, carbohydrates glycosides and phytosterols in appreciable amount. These might serve as a tool for quality assessment of the drug in future. Further phytochemical studies might also supplement the anatomical feature to estimate the parity of the drug.

Keywords: Enicostemma littorale, drug, folk medicine.

194. Effect of bioremediation on some industrial effluents in Chennai

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It is universal fact that industrial growth is of paramount importance for the economic development of a country. But at the same time, we forget about how much damage is caused due to this development to our environment. So it is our duty to protect environment from such damages. With this concept in mind, the present investigation was undertaken to perform a bioremediation strategy. Effluents from three different industries in Chennai were collected and chemical analysis was made. One of the industrial effluents had heavy metals such as nicked, copper, lead and cadmium. Nickel was found in the higher concentration when compared to other metals. The growth of two species of green algae namely Chlorella vulgaris and Scenedesmus bijugatus also were noticed in the selected effluent. From the bioassay conducted C. vulgaris was found to be most tolerant to the electroplating industry's effluent, while S. bijugatus was totally inhibited even at a lower concentration. The moderately higher concentration of electroplating industry's effluent supported the growth of S. bijugatus where as extreme concentrations inhibited thereby reducing the growth. Findings from this study may display the alga C. vulgaris as bio-indicator of a particular heavy metal. Nickel and could perhaps be used to clean up that metal from polluted water. The importance of treatment of chemical industry's effluent is emphasized due to the algicidal effect of the treated effluent on majority of the species. Keywords: Alagae, bioremediation, indicator, metal, contamination, pollution, environment.

195. Immunogenicity of vaccine by using natural polymer as an adjuvant L. Nirmala

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Immungenicity is refers to "any substance that can induce immune response either humoral (B lymphocyte secreting antibody) or A cell medicated (T lymphocyte) or both" Many of the newer antigens are small or generally weak imunogens. The small polypeptide (<10K Da) and nonproteins antigens usually need to be conjugated to a large immunogenic carrier to become good imunogens. Theses as well as most other proteins antigens need to be administered with an adjuvants to assure a high quality, high quantity, memory stimulated antibody response. In the past few years, a number of adjuvants have become most popularly used due to be reduced toxicity in nature. Adjuvants are functionally defined components added to vaccine formulation that enhance the immunogenicity of antigen. Adjuvant act a 'Window of Immunogenicity' This range, may differ from antigen to antigen and from species to species. They do form stable linkage with the immunogenic they elicit subsequent response to haptens. Vaccines are considered by many to be one of most successful medical interventions against infectious disease. But many significant obstacles' remain, such as improving

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suboptimal vaccines developing new ones against diseases for which no vaccines yet exist and responding rapidly to newly emerging pathogens. In designing vaccines several key elements are required. First, an antigen is required against which a memory immune response is targeted. Secondly, stimulation of the innate immune systems is now known to have an important role in the evolution the adaptive immune response.

Keywords: Immungenicity, T lymphocyte, vaccine formulation, infectious disease, immune response.

196. Production of bio-plastics from industrial waste based media

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Plastics are essential components in modern life because of many desirable properties such as durability and ease of use. As they are non biodegradable, they are getting accumulated in the environment and cause several problems. Plastics in the environment is been regarded as more of an aesthetic nuisance than a hazard because the material is biologically inert. A biodegradable plastic is the need of the modern world. Such a product is Poly-â-Hydroxybutyrate (PHB) which has similar molecular structure and physical properties like polypropylene and it is easily biodegradable. Hence we planned a study on the production of PHB from Ralstonia Eutropha using synthetic medium along with various industrial wastes such as sesame oil waste, coconut oil waste, diary waste, pharmaceutical waste, molasses, corn waste and baggasse as a sole carbon source. The structural and dyanamic properties of PHB were analyzed using Infrared and NMR spectrophotometer. The PHB production was maximum in the synthetic medium when compared with the industrial waste based media (sesame oil waste) (21.8 μg/5 ml Vs 21.6 μg/5 ml, p<0.01). Among industrial waste based media, sesame oil waste based media showed maximum production of PHB and pharmaceutical waste based media showed minimum production of PHB compared to other media. From this it is concluded that PHB production can be minimized by using the industrial waste based media and by doing the same the use of petroleum derived plastics can be minimized which can lead to a "Plastic Pollution Free" earth. Keywords: Plastics, Ralstonia Eutropha, sesame oil waste.

197. Studies on serum lipids, lipoproteins and high sensitive C-Reactive protein in Type 2 Diabetes in north Chennai

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Background: The aim of the study was to determine the Studies on Serum Lipid profile and C-Reactive protein in Type 2 Diabetes in north Chennai.

Methods: 300 blood samples were collected from patients in JPM Laboratory and grouped into diabetic (150), non diabetic (150). Collected questionnaires like age, sex, height, weight, food habits, obesity, Blood pressure, family history, alcohol and smoking habits. Systolic and Diastolic blood pressure was measured sphygmomanometer. Body Mass index was calculated. Biochemical analyses were done by Semi Autoanalyser (RA 50). hs-CRP levels were measured with Elisa Reader (Star Fax 325).

Results: The lipid level was significantly higher in diabetic compared with non diabetic, total cholesterol mean \pm SD 209.57 \pm 26.56(P<0.001), triglycerides mean \pm SD 184.78 \pm 49.10(P<0.001), serum LDL mean \pm SD 165.27 \pm 29.43(P<0.001), decrease in serum HDL mean \pm SD 42.30 \pm 7.12(P<0.001), Regression analysis revealed obese to be strongly associated with diabetes, BMI mean \pm SD 26.93-3.10(P<0.001). hs-CRP increased in obese mean \pm SD 6.71 \pm 2.78 (P<0.001). Lipid elevated in hypertensive with diabetes total cholesterol mean \pm SD 211.61 \pm 26.21(P<0.001) and compared with non diabetic.

Conclusions: Lipid level increased in diabetes, obese and hypertensive subjects. Higher in female, than male. hs-CRP strongly associated in obese with diabetes. All risk factors were found to promote the development of type 2 diabetes.

Abbreviation: hs-CRP, high sensitivity C-reactive protein; TGL, Triglycerides; HDL, high density lipoprotein; LDL, low density lipoprotein; VLDL, very low density lipoprotein; BMI, body mass index; CAD, coronary artery disease; WHO, world health organization; ESR, erythrocyte sedimentation rate; BP, blood pressure.

Keywords: Lipid profile, lipoprotein C-reactive protein, Type 2 diabetes, obese, hypertension.

198. PLC based SO₂ emission reduction in coal fired boilers using wet scrubber D. Sailendar kumar

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Sulfur in coal is converted to sulfur dioxide during combustion. SO_2 is a precursor to acid rain which is one of the most widespread forms of pollution worldwide. To minimize the adverse impacts of SO2 emissions on the environment, many flue gas desulphurization (FGD) systems have been developed over the past few decades for the control and abatement of SO_2 emissions by coal-fired boilers of industrial processes and power plants. In the present work, hydrogen peroxide-based flue gas desulphurization [FGD] is developed. H_2O is oxidized to form hydrogen peroxide. After oxidation, hydrogen peroxide passed on through the spray tower of scrubber. It scrubs the SO_2 gas to form the gas phase sulfuric acid (H_2SO_4) The clean gas exits at the top of the scrubber and stored in stacks and the sulfuric acid is collected in the bottom section from where it is cooled and sent to storage. The flow rate of H_2O_2 cannot be controlled and it can vary the pH value. The aim of this approach is to control the flow rate and pH value, design a redundant programmable logic controller (PLC), and the control parameters are tuned based on responses from by product H_2SO_4 . This method can provide predictions of the absorption performances of wet hydrogen peroxide-based flue gas desulphurization and appears to be really helpful to design scrubbers for SO_2 abatement.

Keywords: Hydrogen peroxide, sulfur dioxide absorption, programmable logic controllers.

199. Collagenolytic activity of serine protease of Perionyx excavatus

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Proteolytic enzymes or proteases catalyze the cleavage of peptide bonds in proteins. Peptide bond cleavage is one of the most frequent enzymatic modifications of proteins; recent studies of proteolytic enzymes have focused on the regulatory roles in the variety of physiological processes. Proteases, proteinases or peptidases describe the same group of enzymes that catalyze the hydrolysis of covalent peptidic bonds (In the case of Serine protease the mechanism is based on the nucleophilic attack of the targeted peptidic bond by a serine). Earthworms secrete proteases, which degrade casein, gelatin. collagen and fibrin and the lyophilized powder of earthworms have long been used for anti-pyretic and diuretic purpose in Chinese medicine under the name "Jiryu". In this review, we describe the characterization of earthworm serine protease (Perionyx excavatus) to clarify the protein structure and function with emphasis on application of the catalytic functions of the enzymes for therapeutics, synthesis of useful compounds, and degradation of organic waste products. Proteases are the major enzymes finding extensive application in leather sector. So far, a number of plant and bacterial sources of this enzyme has been explored and only limited reports are found on serine protease and its use. Hence, in the present study, serine protease from an invertebrate source was studied extensively starting from extraction, purification and characterization. In vitro studies on Collagenolytic activity of this enzyme was also carried out using Type I collagen. Hydrolysis of collagen using serine protease was characterized by the collagenolytic activity. The amount of hydroxyl proline released (µg/ml) on untanned and tanned leather was monitored. This shows that the amount collagen has been hydrolyed. Zymographic analysis was also carried out by using Collagen as substrate. The results are discussed. Keywords: Collagen, protease, earthworm, leather, Perionyx excavates.

200. FTIR analysis of two varieties of sesame samples leaf, stem, root and seed for variation in its contents

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Sesame (Sesamum indicum L.) is an annual self pollinating plant and is one of the world's most important oilseed crops. Sesame oil is commonly used as antioxidant. India is one of the major sesame

producers in the world. Sesame is grown primarily for oil rich seeds which consist of high amount of antioxidant and anti - cancer properties. The work in this study was carried out to assess the variation of different part like leaf, stem, root and seed of two different varieties VRI - 1 and VRI - 2 of sesame grown at virudhachalam district, Tamilnadu. Fourier transform infrared spectroscopy in conjunction with principal component analyses was used to monitor the plant culture due to a habituation program and to find any differences in comparison of two varieties. Frequency assignment of the most significant bands of the IR spectrum of sesame samples are ~2927cm⁻¹, 2854 cm⁻¹, 1650 cm⁻¹, 1242 cm⁻¹ and 723 cm⁻¹. An attempt has been made to find any significant variation among two different varieties using chemometric analysis and was compared with FTIR spectrum. The observed findings supported with the available literature and the conclusions drawn are presented.

Keywords: Sesame, sesamol; FTIR; α-tocopherol.

201. Studies on antimicrobial activities in Cassia fistula L.

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Cassia fistula (Family- Caesalpinaceae, Tamil name- Sarakondrai) is one of the most beautiful and medicinal trees of India. This Cassia fistula plays an important role in avurveda, siddha and unani as a mild laxative, good in liver disease, intestinal ulceration, externally as a paste to resolve, as gargle, useful in chest diseases of children. The antimicrobial activity methanol, chloroform and petroleum ether extracts of leaf and flowers of C. fistula was tested. The fungal isolates tested include: Epidermatophytes, Microsporum gypseum and Trichophyton mentagrophytes and the Bacterial isolates tested include: Escherichia coli. Well diffusion method were carried out to assess the antimicrobial activity. Fresh leaves and flowers of C. fistula were collected from Ambattur on July 2010. The leaves and flowers were shade dried and powdered. They were extracted using different solvents such as by methanol, chloroform and petroleum ether by soxhlet apparatus. The zone of inhibition was measured and tabulated.

Keywords: Cassia fistula, Microsporum gypseum, Trichophyton mentagrophytes.

202. Comparison of photodynamic activities of TiO₂ & Au@TiO₂ core - Shell nanoparticles in human ervthrocvtes

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TiO_o nanoparticles were prepared by the hydrolysis of titanium (IV) isopropoxide in the presence of ultrasonic waves and Au@TiO core-shell type nanoparticles were prepared by one pot simultaneous reduction of HAuCI, and hydrolysis of Ti (IV) isopropoxide. They were characterized by absorption and fluorescence spectroscopy, XRD and HR-TEM techniques. The XRD patterns of TiO, nanoparticles revealed exclusive formation of anatase without contamination by rutile form. The X-ray diffraction patterns of Au@TiO, core shell nanoparticles shows peaks corresponding to anatase TiO, and the noble metal (Au). High resolution transmission electron microscopic measurements of TiO, nanoparticles revealed their size below 10 nm. The HR-TEM images of Au@TiO, illustrates the formation of nearly spherical core-noble metal particles (Au), all of them appear to have TiO, shell. The boundary between core (Au) and shell (TiO₂) is very much distinct. The size of the core-shell nanoparticles was found to be around 50 nm. Since the catalytic properties of the oxide surfaces modified with the metal core especially photocatalysis is an important aspect and considering the fact that erythrocytes serve as model cells to the molecular mechanism of PDT, the photohemolysis was studied using TiO, and Au@TiO, nanoparticles. Their photodynamic activities were compared. A 0.5% hematocrit suspension was prepared in PBS and the photohemolysis was carried out using the synthesized nano-photosensitizers, irradiating the sample with light from Xenon source filtered at 515 nm with 20 nm band pass filter in the case of Au@TiO, and 445 nm in the case of TiO, nanoparticles. The mechanism of photodynamic activity was studied using scavengers such as NaŃ, and GSH. In the present study the photo killing effect was correlated with the concentration of nano-photosensitizer and light dose. The photohemolysis induced by both TiO, NPs and Au@TiO, core shell particles reveals that the percent hemolysis increased with the increase in concentration and light dose. When

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the concentration is increased from 50 g/ml to 150 g/ml and light dose from 7.2J/cm² to 21.5 J/cm², 100% hemolysis was achieved in the case of Au@TiO₂ nanoparticles. The study of effect of scavengers, GSH and NaN₃ showed the formation of considerable amount of superoxide anion and singlet oxygen that caused cell death. The role of scavengers showed that the photohemolysis by both TiO₂ and Au@TiO₂ nanoparticles favour both Type-I and Type-II mechanisms among which Type-I mechanism predominates with TiO₂ and Type-II predominates in the case of Au@TiO₂. The detailed mechanism has been discussed. The unexposed TiO₂ and Au@TiO₂ nanoparticles were found to be non-toxic towards red blood cells. Both TiO₂ and Au@TiO₂ nano-photosensitizers being non-toxic, serves as proper substitutes for the classical photosensitizers (organic dyes).Comparing the photodynamic activities of the above said nanophotosensitizers, Au@TiO₂ appears to be the better sensitizer since 100% hemolysis can be achieved and also the mechanism follows Type-II which is preferred in Photodynamic cancer therapy.

Keywords: TiO, nanoparticles, XRD, HR-TEM, anatase.

203. Stochastic modelling of annual rainfall at Tamil Nadu

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Rainfall is a phenomenon, which directly or indirectly affects all the sectors like agriculture, insurance, industry and other allied fields. Prediction of rainfall has remained an unsolved problem till now. One of the statistical techniques is the Markov chain used to predict precipitation on short term, at meteorological stations. This paper deals with the variations of annual rainfall in Tamil Nadu based on Markov Chain models. For this purpose, we derived annual rainfall from 1901 to 2000 and frequency distribution table is formed. The class interval is treated as states and transition probability matrix is formed. The uniform random states are also formed by generating uniform random number. The return period of the annual rainfall of Tamil Nadu for the period 1901 to 1930 is also calculated for estimating the maximum amount of future rainfall.

Keywords: Markov chain, frequency distribution, random number, return period.

GLOBAL ISSUES AND POLICIES INFLUENCING THE SUSTAINABLE DEVELOPMENT

204. Comprehensive utilization of concentrated brine from seawater desalination A. Abdul Rahaman, G.Victor Raiamanickam and V. Kalia Murthi

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Tamil Nadu government has installed desalination plant at a cost of Rs 600 crores at Meenjur, near North Chennai catering to the need of people supplying mineral water for drinking. The plant takes 230 mld of sea water as raw material and produces 100 mld mineral water and the rest is directly discharged into sea. The present study is on the utilization of the effluent containing concentrated brine from sea water desalination plant on a small scale.

Specific objectives:

Sea water → Drinking water (100 mld) 35 ppt

↓ Desalination - 124 mld ↓ R.O. rejects 60 to 70 ppt

Inorganic Salts Production

- 1. Calcium Salts
- 2. Sodium
- 3. Potassium
- 4. Lithium
- 5. Magnesium

Organic Material Production

- 1. Dunaliella culture for beta carotene production
- 2. Artemia biomass and cysts production for brine treatment and aquaculture
- 3. Halo bacteria production for quality and quantity Salt

Advantages:

- · High volume, stable concentration of concentrated sea water free from organic materials.
- Major minor and trace elements in balanced condition helps to culture brine alga and brine shrimp.
- Concentrated brine discharged by the desalination plant is rich in sodium, potassium, bromine, Magnesium and lithium most of which are rare mineral resources on the land.
- Concentration of these chemicals in the brine is twice the concentration of sea water.
- To extract equivalent resources, the brine needed is only half of the sea water, which can reduce the cost significantly.
- The equipment of intake and chlorine disinfection of sea water is omitted. It saves investments.
- Temperature and flow rate is stable; it will facilitate the stable operation of the resource extraction.
- Chemical resources can be extracted fully and zero emission is assured.
- With the concentrated brine as raw material, more brine is saved.
- Extracting potassium is economical.

Short coming:

- Large number of organism is produced by natural solar evaporation. These organisms play an important role in biological management of salt production.
- Brine leakage is prevented because of the biological mats formed by benthic organisms.
- The ecological balance is destroyed pertaining to the organisms such as *Artemia*, and halophilic bacteria.
- The paper brings out the socio-techno-commercial implications on the utilization of desaline plant effluent for productive purposes.

Keywords: Desalination, salt, water, socio-techno-commercial implications.

205. Cyber crimes

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Computers, mobile phones and the internet have become part of our life. As most human activities are part of computer and mobile networks, many traditional crimes have also changed their modus operandi and certain new crimes have come into existence. Most of these instruments permit their users a high degree of privacy. The technology does not distinguish between use and misuse, cyber criminals enjoys privacy too. The internet is a global medium whiles laws are mostly local. This makes investigation agencies difficult to find jurisdiction when a cyber crime originated out from a different country. Computer crime or cyber crime refers to any crime that involves a computer and a network, where the computers may or may not have played an instrumental part in the commission of a crime. Net crime refers, more precisely, to criminal exploitation of the Internet. Issues surrounding this type of crime have become high-profile, particularly those surrounding hacking, copyright infringement, child pornography, and child grooming. There are also problems of privacy when confidential information is lost or intercepted, lawfully or otherwise. Computer crime encompasses a broad range of potentially illegal activities.

Keywords: Mobile phones, cyber criminals, net crime, copyright infringement.

206. Tribal empowerment issues and challenges in Tamil Nadu

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The tribal population in India is 84.51 million, which constitute 8.14% of total population. There are about 449 tribes and sub-tribes in different parts of India. Tamil Nadu has 6, 51,321 tribal population as per 2001 census which constitute 1.04% of the total population. There are 36 tribes and sub-tribes in Tamil Nadu. The concept of tribal empowerment and skill development is increasingly important debate. India has a large population of scheduled caste. They are identified to be the most exploited class for obvious reason of socio-economic inequalities. Perhaps it can be stated that object of poverty, stark ignorance and blatant illiteracy has affected their demand for social justice. Basically, most of the tribal's faced some of the problems, like techno economic problem, ecological problem, health problem, demographic problems, socio-economic problems and social control and law problems. There were many studies conducted in the area of tribal empowerment. But these studies could not show clearly what are factor mainly influenced and affecting tribal empowerment and skill development. The vital objective of the present study is to fill up this gab.

Keywords: Census, empowerment, ecological problem, demographic problems.

207. Global issues and policies influencing sustainable development (global warming/green house effect)

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"Global warming" is a threat that leaves mother earth crying with excruciating pain. This hurts our planet in every single way and its changes could leave us all in sorrow and dismay. We need to stop it now so the temperature doesn't rise or else people, plants, and animals would be in demise. Changes in temperature have occurred due to the depleting ozone layer. Mother nature can't do it all so it's time to give her some respite and try and do our bit. Our planet earth is precious and can't be replaced. We need to act now or our home would be defaced. The paper primarily addresses in unison the correlation that exists between environment, development and sustainable development. It further goes on to articulately explaining the human-generated increases in greenhouse gas concentrations that have combined with the natural forces to cause unprecedented warming across the world in the 20th century. It depicts the significant phenomenon of global warming - a resultant effect of greenhouse gas emissions, that could lead to significant changes in the earth's natural environment. Anthropogenic factors form a crucial ingredient towards altering earth's climate. A significant fraction of fossil fuels being consumed by Mankind at an alarming rate has contributed substantially to carbon dioxide

emissions in the atmosphere. These carbon suspensions have proved detrimental and are likely to impair our livelihood and health, biodiversity, agriculture, food security, forest diversity and dynamics and the whole of the ecosystem in the long run. The paper proposes to put forth the necessity of having an overall long term understanding of our environment's structure and function in the face of a global change strongly emphasizing via case studies the devastating impacts global warming and climate change hold on India. Strengthening cross country co-operation develops the critical mass of human capacity and techniques for monitoring and understanding the real essence of climate change and conserving the natural resources and surroundings that fall prev to the effects of global change. Among the key components that require special attention and governance are the climate, global food security, the protection of natural resources, and the supply of sustainable energy for attainment of sustainable development. The paper focuses on highlighting these newfangled challenges and the influences that climate change exerts on sustainable development especially in developing countries like India. It aims to understand the importance of sustainable development for mitigating anthropogenic greenhouse gas emissions. The paper also provides a mathematical framework for the short-run weather fluctuations and the long-term climatic changes that occur in the Indian agrarian sector. Mitigation measures in agriculture and forestry, when sternly adopted, could turn out to be instrumental in attaining climate-mitigation goals in an efficient manner, thereby contributing to sustainable development and in becoming a major driver of growth. A thorough integrated, economic and environmental assessment of the economic and sustainable potentials of these measures must be carried out. A multifaceted approach across different scales or sectors to guarantee robustness and consistency in the assessment of sustainability will facilitate the validation of aggregate results on one hand and, on the other, will help illustrate behavioral change at the micro level that the policies seek to influence. It is in this context that the paper renders workable strategies with a view to successfully tackle influences of climate change on key sectors. India is a large developing economy possessing a significant stake in scientific advancements and international understanding in promoting mitigation and adaptation. This requires improved scientific understanding, capacity building, networking and broad consultation processes. Meticulous adoption of the requisite goals would help not only India but other nations as well to attain and maintain sustainable national development. The achievement of these targets would accrue a double dividend in terms of added climate change benefits. The cascading effects of sustainable development would reduce emissions and moderate the adverse impacts of climate change, and thereby alleviate the resulting loss in welfare paving way for well-being to set in for sempiternal generations.

Keywords: Global warming, green house effect, environment, climate change.

208. Economics of clean development mechanism (CDM) and carbon trading in India Leela Bhaskar and Supreena Narayanan

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Green house gas removal policy design is increasingly difficult because GHG emissions result from nearly all modern human activities and that involves every sector of the economy, habit and human choice as well. This paper analyses in detail the clean development mechanism (CDM) and carbon trading in India. Individuals deal to make decisions every day that control the amount of green house gases that come into the atmosphere. The role of Kyoto protocol is analysed in the role of carbon trading in India. This paper analyses CDM project types such as energy efficiency projects, transport, methane recovery and agriculture as well as the favouring points concerning carbon trading in India and the CDM potential in India and way ahead. In India it has been observed with reference to CDM that: a) India - high potential of carbon credits. b) India can capture 10% of global CDM market. c) Annual revenue estimated range from US\$10 million to 330 million. d) Wide spectrum of projects with different sizes. This paper uses a descriptive methodology and use of statistical information including tables, charts and diagrams to analyse the cleaning development mechanism and carbon trading status in India. If the control and stable climate is one objective among the many to which society aspires, then economics is a tool well-suited to understand how those decisions are made and how efficient and effective outcomes can be reached. Through India's giant ongoing projects in India and other projects on non-convention energy sources, a new phase of development is still to be observed, moderate start of which has already begun to regulate carbon trading in India.

Keywords: Carbon trading, clean development mechanism, green house gases, Kyoto protocol.

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209. Study on concrete using waste materials by partial replacement of aggregates to reduce global warming gases

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The climate change due to global warming, one of the greatest environmental issues has become a major concern during last decade. The global warming is caused by the emission of green house gases such as CO₂ into the atmosphere by human activities. The green house gases are released during cement manufacturing processes, steel manufacturing process, etc. In order to reduce the amount of green house gases; an attempt has been made to reuse the waste materials along with concrete in construction industries. In recent years, attempts to increase the utilization of fly ash. guarry dust, steel slag and construction and demolition (C&D) debris to partially replace the use of fine aggregate and coarse aggregate in concrete are gathering momentum. This paper presents information on fly ash, steel slag and quarry dust based concrete, material and the mixture proportions, the manufacturing process, and the influence of various parameters on the properties of fresh and hardened concrete with plain concrete and partial replacement of fine aggregate by fly-ash and guarry dust and coarse aggregate by steel slag and C&D debris concrete. The column specimens were tested under axial compression to investigate the effects of waste materials. Since the materials used were locally available waste materials, a detailed characterization was planned. In this paper, an attempt was made to utilize the waste materials by effectively recycling and filling in steel tubular square columns with recycled aggregate concrete instead of conventional concrete. An empirical equation for calculating the design load carrying capacity of the composite column was developed using the experimental results. The test results were compared with the international codes and new theoretical models were suggested for the design. Hence this research is all the more relevant in the present situation and very useful to have a safe and economical structure. In this paper experimental and analytical investigations were carried out to study the strength and behaviour of CFST columns over the entire range of loading. The ultimate loads and behaviour of CFST were compared with those of the hollow steel tube columns. From these elaborative experimental and analytical investigations that were done, it is concluded that out of all the waste materials used, the contribution of C&D debris and quarry dust are significant. The remaining materials that include fly-ash and steel slag are reasonably contributed in the performance enhancement under axial loading conditions. Finally, it is concluded that materials recovered from various waste stream are suitable to be used as secondary aggregates in concrete. The advantage of using such waste materials provides generally a low cost construction than using virgin aggregates and the elimination of the need for waste disposal in landfills. Utilization of these waste materials in concrete leads to an effective solid waste management technique and will also be cost effective. The exploitation of available natural resources and raw materials required for the construction industries can also be reduced which in turn reduces the release of green house gases which causes global warming.

Keywords: Fly ash, recycled aggregate concrete, steel slag, waste management, global warming.

210. Sectoral effects of climate change; it's implications on employment

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Climate has played significant role in the economic development of India. Many sectors of the economy are climate sensitive. Since the emergence of the threat of climate change, which has origins in anthropogenic activities, the implementation and impacts of the projected change is engaging the attention of planners, governments, and politicians worldwide. The major causes of this due to multiplication of extreme weather events, such as draught, floods, heat and cold waves. It has several consequences which are aggravated to desertification and erosion processes as well as irreversible changes in ecosystems and the loss of biodiversity all these consequences are called threat to all living organism. Climate change and subsequent changes in the environment will have significant effect on all aspects of our lives: food and water supplies, the patterns and influence zones of diseases,

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and also the way we produce and consume, as far as these are at the genesis of climate change. This paper presents the potential effects of climate change in different sectoral activities according to the information gathered from literature review. It will certainly also have effects on employment which we will analyse in this paper. It has been prepared on the basis of secondary information and observatory note by the authors.

Keywords: Climate change, sectoral change, employment, greenhouse gases, carbon emission, adaptation, mitigation.

211. Status of tribes in India-Problems and challenges

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In India 8% of the population belongs to schedule tribe. But majority of them live in scattered habitations located in interior, remote and inaccessible hilly and forest areas of the country. Tribal peoples are economically backward and oppressed by the landlords and rural people over a period of time. Therefore, the government must take efforts in order to improve the life of tribes. The literacy rate for STs is 38.41% compared to 54.51% for the total population and 45.20% for SCs. The 2001 Census data reveals that around half the ST population is in the workforce and also reveals 7.65% of STs are cultivators, 11.86% are agricultural laborers and 4.7 are in household industry. The Schedule tribes also have very low monthly per capita expenditure compared with the rest of the population. Since the tribal people treated land as a common resource, they rarely had land titles, and thus, lost their lands to outsiders when exploitation of forest resources began to take place on a significant scale. Dhebar commission report 1961 reveals that "the forest is a well loved home, livelihood, and very existence to a vast number of the tribal people. Forests and tribes are closely related as the former provides livelihood and income to the latter. Unfortunately, the present day forest conservation laws have denied tribes a just share from the forests. The present paper makes an attempt to study the status of tribes in India and their problems and challenges.

Keywords: Schedule tribe, agricultural laborers, Dhebar commission report.

212. The awareness of concepts of education for sustainable development among student teachers of different Universities in Kerala

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The World Commission on Environment and Development (1987) in their report 'Our Common Future' defined sustainable development as "Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs". Education systems throughout the world should play an important role in promoting the knowledge, skills and values among youth and adults who would help to shape a sustainable future for all. The goal of the United Nations Decade of Education for Sustainable Development (UNDESD, 2005-2014), for which UNESCO is the lead agency, is expected to integrate the principles, values, and practices of sustainable development into all aspects of education and learning including teacher education. In this context it is the basic necessity of the society that teacher education should adopt a curriculum and organise programmes for a sustainable lifestyle. In operational terms the children at the school have to be made aware of the threat to their life and that of other species because of the environmental degradation, and social inequality and poverty caused by the attitude and conduct of their elders. The contents related to Education for Sustainable Development in the existing curriculum in all the universities of Kerala, are limited to a few concepts of environmental education and do not include other dimensions of Education for Sustainable Development. The investigator being a teacher educator decided to conduct a study regarding this aspect, by investigating the awareness of student teachers on the concepts of Education for Sustainable Development. The objectives of the study were to assess the awareness and knowledge of student teachers towards the concepts of Education for Sustainable Development and to suggest and recommend strategies for improvement of the existing curriculum towards Education for Sustainable Development. The study used the descriptive study design. The study targeted 1000 student teachers in the regular secondary teacher education programmes in the colleges of education. Education for Sustainable Development being inter disciplinary, the sample population consisted of students selected from various optional subjects from different types of

institutions including government, aided, unaided and university centers using stratified random sampling. The student sample was selected from twenty one colleges from four Universities of Kerala, five colleges each from Kerala, MG, Calicut and six colleges from Kannur University. Forty to sixty students were selected from each college proportionate to the total strength of students. In order to collect data regarding awareness, knowledge, attitude and practices about Education for Sustainable Development from the student sample, a well structured questionnaire was used. The researcher distributed questionnaire to 1000 students. Response was obtained from 920 student teachers. Qualitative and appropriate statistical procedures were used to analyze the data. The data were categorized into homogeneous groups, coded and information was analyzed into frequencies and percentages using Statistical Package for Social Sciences. Analysis of the data revealed that majority of student teachers does not have adequate awareness and knowledge regarding Sustainable Development. Stream wise analysis of the responses of student teachers revealed that the performances of three groups are almost in the same pattern and in general there is no significant difference between the groups namely Science, Arts and Language regarding their awareness on Education for Sustainable Development. Great majority of student teachers agree that the present curriculum needs to be reoriented with the concepts of Education for Sustainable Development. The present environmental education curriculum deals only with environmental aspects and it fails to address the associated aspects of society and economy. In short, majority of the content of the present environment education curriculum deals with the physical and biological aspects of the environment and practically it remains as an ecological study. Hence except Natural Science Optional, majority of the students from other optional subjects may neglect this area, whereas Education for Sustainable Development is interdisciplinary, which covers all related aspects of the society and economy with an integrated approach makes it a holistic one, so that it is equally applicable and beneficial for all, resulting in better understanding and outcomes. Environmental Education highlights the concepts and problems of environment, whereas Education for Sustainable Development highlights both problems and problem solving with an integrated approach. Inclusion of new concepts in the curriculum should be based on the criteria of its merit, significance and quality with regard to the present and future generation. In this context, inclusion of concepts of sustainable development in education becomes priority of priorities.

Keywords: Education, environment, curriculum, learning, University, Kerala, India

213. Climatic change-A future heat stroke

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Green house gases such as carbon dioxide, water vapor, methane and nitrous oxide trap the heat from the infra red radiations of the sun and heat up the earth's atmosphere. This has caused a rise in mean temperature of the earth's atmosphere and leads to major climatic change, causing global warming. The cause for the today's climatic change cannot be described without explaining the greenhouse effect. Even though burning of fossil fuels in thermal power plants is the main source of producing green house gases, air pollution caused due to soot and diesel exhaust from road vehicles and industries is a greater contributor to global warming. It has been pointed out globally that China and India are the major culprits, as they rely on burning of wood and cow dung in household cooking and use coal for heating their homes. Together, they account for between 25-35% of black carbon emissions. This paper concentrates on the report of the intergovernmental panel on climate change (IPCC) that set forth conclusions about the causes and effects of global warming as well as the costs and benefits of solving the problem. This paper speaks about the most ambitious plan, which would stabilize the level of greenhouse gases by 2030. This paper also analyzes the decisions made in Kyoto protocol.

Keywords: Green house gases, global warming, cow dung, intergovernmental panel, climate change.

214. Global warming-Green house effect

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Global warming refers to an average increase in the earth's temperature, which in turn courses in climate, contribution of green house gases to floral warming, carbon dioxide, methane, chloro-fluro-carbon (CFCs) and nitrous oxides act like a green house, warming the earth surface. The rise in earth's temperature due to increase in carbon dioxide emission has been speculated since 1800's

and its effect has been analysed for almost a century. The foremost cause for transformation of global environment is the ever increasing number of human beings since 1990, the number of people has more than tripled. According to UN projection, the global population increased from 205 million-5 billion in less than four decades (i.e.) from 1950-1990 and is expected to reach 10 billion by the end of next century. The present increase in population in just 1-50 years equals to total increase in the world's population from the time human species first emerged until the middle of this century. Though the phenomenon is explain by; demographers through their theory of demography transition, the fact remains that there has been population explosion within 50 years are over the globe, causing tremendous strain on the resources of the earth and pollution of the biosphere. Climate changes affect everyone. But the worst hit will be hundreds of millions of small scale farmers, fishers and forest dependent people who are already vulnerable and food insecure. By affecting the availability of land, water and bio-diversity and the price of food, the rising demand for bio fuels, produced from food crops also has an impact on the poor. Developing countries on the other hand account for only 1.29 billion tones of CO, emission by 1985 and projected increase for 2005 in 5.47 billion tons of carbon oxide and its projected increase up to 12.18 billion tones by 2025. The CO₂ emissions are projected to increase by 2.6% annually. USA is the largest contributor accounting for nearly 18%. Data for 1985 suggests that the developed countries contribution to CO₂ emission was 3.95 billion tones and this is expected to rise to 6.71 billion tones by 2025.

Keywords: Climate change, green house effect, demography transition, bio fuels, bio-diversity.

215. Global warming and green house effect

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Global warming is when the earth heats up (the temperature rises). It happens when greenhouse gases (carbon dioxide, water vapor, nitrous oxide & methane) trap heat and light from the sun in the earth's atmosphere, which increases the temperature. This hurts many people, animals, and plants. Many cannot take the change, so they die. The greenhouse effect is when the temperature rises because the sun's heat and light is trapped in the earth's atmosphere. This is like when heat is trapped in a car. On a very hot day, the car gets hotter when it is out in the parking lot. This is because the heat and light from the sun can get into the car, by going through the windows, but it can't get back out. This is what the greenhouse effect does to the earth. The heat and light can get through the atmosphere, but it can't get out. As a result, the temperature rises. Greenhouse gasses are gasses are in the earth's atmosphere will trap too much heat and the earth will get too hot. As a result people, animals, and plants would die because the heat would be too strong. As a result of global warming there are so many changes that are taking place in and around the atmosphere and the earth surfaces. This paper gives a clear picture about the changes that the earth surface shows with respect to global warming

Keywords: Global warming, green house effect and gases.

216. Life cycle assessment (LCA) as a tool for sustainability

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Uncontrolled growth of population leads to water and sanitation problems in developing countries. Sustainable growth in urban area is an important issue. Sustainability is measured in different methods and Life cycle assessment is one among them. Life cycle assessment is tools for assessing the product from entire process from curdle to grave. This LCA tool could also be used for assessing the sustainability of product or process. This paper deals with global environmental assessment of waste treatment processes using life cycle assessment (LCA) for sustainability to improve awareness and global environment.

Keywords: Water pollution, wastewater, treatment, sustainability, life cycle assessment.

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217. Waste management and carbon trading potentials

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Rapid growth of population and urbanization leads to more generation of liquid and solid waste, which leads to pollution of water bodies and contamination of land and ground water. In order to reduce pollution due to municipal solid waste, different solid waste treatment and management practices such as composting, biomethanisation, landfill and incineration and pyrolysis employed are compared from sustainability point of view. The main objective of this paper is to suggest sustainable solid waste management practices for urban areas and also provide potential of carbon trading in waste management sector.

Keywords: Water pollution, solid waste, sustainability and urbanization, carbon trading.

218. The contour of bioterrorism that runs in the vein of every nation

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The theory of evaluation holds the view that humanity promotes the universal life force. Humanity stands at the pinnacle of the process of material, chemical and biological evolution that has been taking place for more than 100 million years, ever since the origin of universe. Through their understanding of the dynamics of the universe and the interrelationship of life and its environment, human beings accept the task of contributing to the value of life force. Human beings have learnt to live in diverse ways based on different types of values but fail to control egoism and greed that harm others and destroy the ecological balance. Emerging trends due to scientific and technological development considerably contribute to the horror of life. The world at present is saturated with diverse threats in various shapes from many sides. The biological threat or bio-terrorism is not limited to the particular point of time and space. The magnitude of animosity kindles the individual and the nations to go for such a terrible weapon to wipe out the trace of life from this wonderful planet - the only planet where life is possible. The history of bio-terrorism goes back as far as human warfare in which people would use germs and disease. Biological diseases are those most likely to do the most damage. They include anthras (Bacillus anthracs), botulism, the plague, smallpox and tularemia and so on. While the atomic threat and the threat from natural calamities go hand in hand bioterrorism is the most heinous of all other threats. At this point of time it is highly imperative to have an apprehension of its devastating effects and find means to check the impending disaster. The scope of this paper is to highlight how bioterrorism -a thread to the living beings in the universe deliberately caused by the release of poisonous virus and bacteria in the atmosphere. It is threat resulting from the perverse thinking of man who is out to destroy his fellow human beings. To have a better understanding, the paper proposes to elucidate the contours of bioterrorism with special reference to the play Pillars of Society by the Irish writer Henrick Ibsen.

Keywords: Humanity, biological evolution, terrorism, bioterrorism.

219. Health insurance and health care management

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Health is the central theme of any society. Health care market, like any other market, has both demand and supply sides. On the demand side of the health care system the consumers (the patients) demand proper health services from the health care system. The demand for the health care is unpredictable. The demand for health care is influenced by various factors; Hd = f(P, H, Y, T). Where, Hd = Demandfor Health Care Services, P = Price for Health care services, H = Availability of Hospital services, Y = Income, T = Taste and Preferences. From the suppliers' side health care provision is based on the Health Care Provider's (Hospitals, Doctors, Types of medicine, Preventive, Curative and lifelong management of the diseases. Indian public health care system suffers from inadequate funding and accessibility. This leads to the growth of the private health care system. India is becoming the most privatized health care market in the world even though 260 millions of people live below the poverty

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line. Public health care system in India has always been an insignificant player in the provision of medical care. Therefore, the private sector providers have become the main players in the medical care market. Increased cost of health care services, particularly hospitalization, has become beyond the reach of the poor masses. But the public are trying to get medical services from the private health care system because of the poor quality of the medical services offered by the public sector. Health Insurance is the mechanism of pooling resources and sharing risk or uncertainties among many people. It ensures equity and it is based on contributory arrangements. Health Insurance aims at reducing and minimizing the financial burden of the people. Health insurance means 'an individual or group purchasing health care coverage in advance by paying a fee called 'premium.' In its broader sense, it would be any arrangement that helps to defer, delay, reduce or altogether avoid payment for health care incurred by individuals. Health Insurance, like any other risk-sharing arrangement is useful. When the illness or injury is to be insured, it is unpredictable and the cost of its occurrence is high. In certain cases, medical care can be very expensive. Health Insurance Schemes are acquired to meet this costly medical care. It is one of the best ways of financing health are especially hospital (medical) care. Health insurance aims to protect the welfare of individuals who fall seriously ill, by pooling financial contributions from many people. Health insurance plans can cover hospital expenses of those experiencing catastrophic events, such as near-fatal illness or injury, without access to such insurance; many people are unable to obtain treatment or must incur debts to pay hospital bills. The health insurance market in India is very limited covering about 10% of the total population. The schemes are: 1) Voluntary health insurance schemes or private-for-profit schemes; 2) Employer-based Schemes; 3) Insurance offered by NGOs / Community based health insurance; and 4) Mandatory health insurance schemes or government run schemes. Indian Health Care System has multiple systems of health structure of medicines. It comprises of both public and private delivery stems. The private sector is the dominant sector with nearly 60 to 70 % of out-patient care provided by them. Around 24 % of all hospitalized people in India in a year are below the poverty line due to hospitalization (World Bank 2002). Large proportions of people borrow money or sell assets to pay for hospitalization (World Bank 2002). According to National Health Account for the year 2001-02, the total health expenditure was 4.6 % of GDP. Out of this, public health expenditure was only 0.94 % of GDP while private health expenditure accounted for 3.58 % of GDP. Private expenditure or out of pocket expenses contributed nearly 94 % and the government expenditure on health was only 3.5 % in the year 2005. Due to the poor governmental expenditure on health, high health care costs and increased demand for health care services and poor access to quality health care, health insurance plays an important role in financing for health care in India.

Keywords: Health care, insurance, management.

220. Patenting Indian medicinal plants and products

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India possess rich heritage of valuable fauna and hence has been considered as a 'treasure house' of valuable medicinal and aromatic plant species. The ministry of environment and forests, government of India have identified and documented over 9,500 plant species considering their importance in the pharmaceutical industry. Out of these, about 65 plants have large and consistent demand in world trade. Use of plants as a source of medicine has been inherited and is an important component of the health care system in India. India has 16 Agro climatic zones, 45,000 diverse plant species out of which 15,000 are medicinal plants. The Indian systems of medicine have identified 1500 medicinal plants, of which 500 species are mostly used in the preparation of drugs. The Indian systems of medicine, particularly ayurveda, siddha, unani and homoeopathy medicine largely use plant base materials, minerals, metals, marine and products of animal origin. Our ancient texts had documented medicinal uses of a large number of plants. These plants are being used for preparation of medicines for centuries. A new trend has, however, been noticed that foreign countries have exposed interest in medicinal plants accessible in India and well documented in our books signifying the formulation in which they are used. A number of medicinal plants and their uses have been patented by foreign countries. There has been condemnation by the people on this mounting trend of patenting of our medicinal plants and their uses. Some of the well-known plants Kala Zeera, Amaltas, Indian Mustared, Karela, Brinjal, Neem, Gudmar etc. have patents. A number of the patents have been effectively

contested by India. India is behind the rest of the world in patents both quantitatively and qualitatively, even when comparison is made with neighborhood country- China. The persistent illiteracy and confusion about patents is a serious matter. Our pool of knowledge that is protected by patents, even in areas where we have a competitive advantage is rather poor. Take the area of herbal products, where so much emotion has been raised. The number of herbal patents (1995-1998) was 1889, out of which China had a share of 889 and the Indian share was next to nothing. This paper explores the need to document the indigenous knowledge related to Indian herbs and plants and their medicinal and other uses and convert it into easily navigable computerize data base for easy access and to secure patenting rights; to discourage other countries for patenting Indian heritage. **Keywords:** Fauna, treasure house, herbal products, herbal patents, patenting Indian heritage.

221. Ethical essence in ethinic society

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Bioethics refers to the study of moral aspects of health care and life sciences. Bioethics represents advancements in life support systems, reproductive technologies and patient's 'right to know' movement. Bioethics focuses on four major areas of concern; they are death and dying, behavior control, science and technology and family planning. Euthanasia (Death and Dying): is a current concept that is highly controversial. There are four types of euthanasia. They are active, passive, voluntary, and involuntary. Active euthanasia is when a doctor ends a patient's life by administering a lethal injection. On the other hand, passive euthanasia is when a doctor withdraws the patient's life support system or does not carry out any treatment. Voluntary euthanasia means a patient's desire to end his life and it is his clear decision to die, while involuntary euthanasia does not involve the patient decision but made by a third person (Doctor recommended or a family member) because he is no longer capable to make such a decision. Euthanasia to be only practiced when no other method works and should be the last resort were people to go when nothing else helps and must not be abused at any cause. With our current lack of understanding of the human body, and the fact that we do not have the resources to keep everyone alive, it's believed that the option should be allowed. However it should not be used on the healthy or on those who are different for any reason by any one as Human life is highly valuable. Advances in science, medicine and technology holds promises for an improved health and wellbeing, but may also devaluate human life and human dignity. For examples in the case of Genetic engineering, cloning, transhumanism, bioweapons and family planning are some of the new advancements in science that need to be evaluated with both scientific and ethical frame work. Genetic engineering: One of the biggest ethical concerns about genetic engineering is that, by editing the genetic makeup of living things we are playing with creatures made by the almighty. Do we have the right to play around with the DNA of plants and animals simply to benefit ourselves? Or Do we have the right to alter and enhance ourselves? GMFs are not marked as such, and are put into the normal food supply. Some people find this to be unethical because people have the right to know what they are purchase and eat. After all consumers have the right to know the nutritional value of their food and whether they are GMF are not.

Cloning: Cloning in animals is somewhat controversial, because of the wastefulness of the procedure and because some of the products of cloning suffer from heath problems but Cloning in humans are extremely controversial. Some of the ethical problems with cloning are the issues of identity, privacy, psychological effects, physical safety for the clone, cost etc. But this argument sides in favor of human reproductive cloning, which helps people who cannot reproduce sexually, be allowed so that they can have genetic children. *Transhumanism*: Transhumanists engage in interdisciplinary approaches to understanding and evaluating possibilities for overcoming biological limitations. Human enhancement could take many forms, but in general genetic engineering, cybernetics, nanotechnology, and pharmaceuticals are most often cited ways to enhance the human race. To a transhumanists this is seen as the next phase of human evolution. The ethical concerns here are massive, and involve deep philosophical questions. Like what does it mean to be human? And if we use technology to enhance ourselves are we somehow dehumanizing ourselves? Or is this simply the next step in our evolution? *Bio Weapons of mass destruction*: A code of ethics is needed because the power of science to result in harm, if it is not well governed, has grown vastly. Society has entrusted scientists and scientific
institutions to show respect for life, in particular human life. Safeguards are needed to ensure fulfillment of that trust, more specifically to ensure that science is not used in the cause of bioterrorism or biowarfare. Abortion: Pregnancy should not be simply terminated as if it was something impersonal and problematic and it cannot be without physical and emotional consequences. A child in the womb is a distinct, developing, whole human being, and each time a mother decides or a father pressures to end such a life it is a profound tragedy. Abortion harms the mother and deprives society of the gift of new born. Women's Health: Women deserve to be fully informed before making decisions regarding their reproductive and maternal health. Maternal health is improved when women are fully informed about risk factors, prenatal developmental care, pregnancy outcomes, including the physical and psychological effects of both medical and surgical abortions. Thus bioethics - a future to orderly life. Keywords: Bioethics, Euthanasia, hormonal drugs.

222. Religious agencies, sweet shops and lower class group vendors as role model in awareness building with respect to growing urbanization

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Since 1970s, the Chipko movement, deforestation, peaceful methods of protest and slogan "ecology is permanent economy" has made a remarkable impact on environment in rural and urban settings in India. With many intellectuals, organizations, government policy and conferences working towards sustainability and organic farming has definitely making progress but in slow pace. India opened up world trade a decade ago that is just hitting its stride growing the economy fast enough to lift millions of people out of poverty. However, growth based on carbon-intensive fuels like coal and oil is already clogging urban air and undermining improvements in health and welfare. In addition, increase in carbon emissions adds up to rising global warming and possibility of making things much worse. On the other hand, China has just opened for world trade with a caution to save health and environment. In this background, it is relevant to make observational study on 'non-use of Plastic Polythene bags by 'Religious agencies, Sweet Shops and lower class group vendors as 'Role model' in awareness building with respect to growing urbanization'. India being a vast country with varied community people living and practicing respective cultural and traditional rituals-Plastic bags comes handy to suit in all walks of life. As it has become a habitual practice to be depended on plastic polythene bags and without which the life does not exist. Policy formulated on 'Ban on use of plastic bags' is imposed. Nevertheless, in reality street vendors to a well to do executives have become dependent on this product 'plastic'. Much awareness on plastic and plastic related products is being made, yet the uses of plastic bags are increasing day by day. The major problem arises when it is disposed in garbage, littered on roadsides, lakes, nallas and in open areas. It is a major bothering environmental problem of urban cities in India. Just a 'ban on use' does not help unless ban is imposed on ones practice or habit. Dependency on plastic bags is more or less like addicted to the use of plastic bags. In the process, the environment is getting damaged leading various problems like water pollution, overflow of garbage, littering on roadside, nallas logging and in turn, giving rise to various mosquito and other insect breed affecting the health of one and all, particularly the children. Working with the poorer sections of people has helped to realize that lack of awareness is creating deficiencies in social actions, leading to deterioration of the Environment. During my previous work and present research work I have come to this understanding that, no doubt awareness campaigns and workshops on ecological concerns helps in sensitizing people about the issue and pursues a handful to proceed further to tackle with same or to take up preventive measures. In practice and reality, the main objective to bring a wholesome change or practice is affected. It again remains concentrated only among upper class or elite group. On the other hand, common mass belonging to low-income groups, lower strata those who residing in slum settlements are the real victims, who remain as an ignorant and innocent common mass. The awareness is needed here to strengthen them to give up the practicing habitual practice and adopt to live without it for better environment and better living. This paper focuses on environmental management through reformation in practice and attitude. The paper focuses on the observation made on some of the religious agencies of a popular sweet shop and vendor community of Hyderabad city as role model in helping in conservation of urban environment. Keywords: Chipko movement, deforestation, burning environmental issues, vendor community.

Mylapore, Chennai, India. Organized by: Indian Society for Education and Environment (isee)

223. A critical view on the impact of constitution of India as internal regulatory mechanism for environmental issues and policies

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The judiciary has viewed the human rights on one hand and the environmental protection on the other hand as the two faces of the same coin. In modern India, environmental Jurisprudence has gone a long way in acquiring a very seminal importance leaving behind the engraved British Juristic notions as out dated and insufficient. The damage caused to environment by poisonous gases and emissions, industrial effluents, plastic waste, exploitation of natural resources like soil, forests, water supplemented by other equally important factors like poverty, growing population, health hazards, degeneration in quality of life have acquired alarming proportions which cry for a new environmental ethic order and justice in Indian society. Regrettably in India, the initial phase of judicial response to the problems of environment has been of insensitivity and apathy towards Environmental issues and problems. The judiciary as a guardian of fundamental right has protected the right of each individual in relation to environment under Art. 21 of the constitution of India. A constitution is a set of laws that a set of people have made and agreed upon for government. These rules together make up, i.e. constitute, what the entity is. The term constitution can be applied to any overall system of law that defines the functioning of a government, including the development of modern codified environment law. An attempt has been made to analyze how some of the articles in constitution of India and the relative judgments have contributed to the enrichment of environmental jurisprudence and to the development of environmental policies. The analysis seeks the specific content of each judgment and draws a broader picture from part third of the constitution of India for the protection and development of environment policies.

Keywords: Constitution of India, environmental jurisprudence, environment law, environment policies.

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Global warming is a great concern over ecological imbalance including climate change, higher sea level- polar icecaps melting, impact on water resources and natural disaster, impact on agriculture, warmer waters and more hurricanes, spread of disease, increased probability and intensity of droughts and heat waves, ocean acidification, glacier retreat and disappearance, oxygen depletion and temperature rise. Some suggested measures are: consider alternate sources of transportation, monitor your energy consumption, change out your existing light bulbs- use compact fluorescents or solar lighting outdoors, reuse and recycle your plastic bags and containers, buy recycled products whenever possible, look at how your purchases are packaged, tend your own garden, take your own food or drinks with you, support businesses that are committed to the environment, keep your vehicle properly maintained and eat less meat. On Aug 2009 India and China have agreed to set up a joint expert committee working group on the environment which would explore how the two countries combat global warming through reforestation.

Keywords: Ecological imbalance, global warming, reforestation.

225. Dawn of a new era in energy harnessing world energy and population-planning towards a sustainable development

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Fossil fuels have made possible a standard of living unparalleled in history, yet our planet must now face the consequences of their abundant use. Global warming, pollution, and political Instability continue to increase as worldwide reserves dwindle. International competition for decreasing resources and supplies is linked to steadily increasing costs. Throughout history, the expansion of human population has been supported by a steady growth in the use of high-quality exosomatic energy. The operation of

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present industrial civilization is wholly dependent on access to a large amount of energy of various types. If the availability of this energy were to decline significantly it could have serious repercussions for the civilization it supports. This paper presents production models for the various energy sources in use and their evolution out in the year 2100. Thus, providing the full energy picture that emerges which is translated into a population model based on an estimate of changing average per-capita energy consumption over the century. The analysis in this paper is supported by a model of trends in energy production and various new alternative fuels and efficiency enhancement methods. Various alternative energy sources projected are water, bio-fuel, hydrogen (fuel cell), solar, wind, wave, electosomagneto, natural gas, geothermal, oil sands etc. This model is based on present data of actual energy production, connected to projections that are drawn from the thinking of various expert energy analysts. Assessing the probable contribution of alternative fuels to the future energy is one of the most difficult balancing acts encountered in the construction of this model as the whole renewable energy industry is still in its infancy. At the moment, it shows very little impact but enormous promise. While the global contribution is still minor (at the moment renewable technologies supply less than 1% of the world's total energy needs) its growth rate is exceptional. For example, the wind energy has a growth rate of about 45% in the last decade. The key factors covered in developing this model are the probable long-term growth rate of renewable energy over the next 50 years, and the amount of energy it will ultimately contribute for sustainability. Precisely the paper presented covers all the aspects of the energy crisis with respect to the population growth and hence aims at providing a plausible solution to energy management for a sustainable development. Keywords: Fossil fuels, global warming, pollution, bio-fuel, renewable energy.

226. Global warming/green house effect

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Majority of the scientists agree that our globe is undergoing major climate change. They also agree that the level of carbondioxide in the atmosphere is rising significantly. The temperature of the globe has fluctuated since the very beginning of our planet. The problem is not just the fact that it is warming, but the rate at which it is warming. The ten warmest years since global temperature has been measured, all occur within the last 12 year period between 1997-2008. The greenhouse gases like carbondioxide are the most prominent one in the earth's atmosphere which is recycled through the atmosphere by the process photosynthesis. By 1996 carbon dioxide world emissions increased by 2.8%. Though the greenhouse effect is an essential environmental pre-requisite for life on earth, there seems to be too much of a good thing. The problem begins when human activities distort and accelerate the natural process by creating more greenhouse gases in the atmosphere than are necessary to warm the planet to an ideal temperature. The other greenhouse gases are neon, nitrous oxide, and ozone, methane, helium and carbondioxide. Some of the main reasons for these greenhouse gases are as follows: 1 .Burning natural gas, coal and oil. 2. Increase in the vehicles also lead to emissions of greenhouse gases (GHG). 3. Factories producing long lasting industrial gases. 4. Deforestation also contributes towards increase in global warming. 5. Population growth leads to more of transportation and using energy which contribute to more greenhouse gases to enter the atmosphere. The main routes to survive from the greenhouse threat are energy efficiency, renewable forms of energy production less greenhouse-gas-intensive agriculture, stopping deforestation and reforestation. It is observed that 50% of present energy use could be saved through changes that are available through existing technology. Energy-efficiency technology would be upgraded in residential and commercial water heaters, commercial lighting, commercial cooking, refrigeration and appliances. Industrial energy efficiency would be upgraded through the use of co-generation, fuel switching, and new technology. Organic farming techniques are already rapidly spreading for economic, health and environmental reasons which can simultaneously reduce biotic CO₂, N₂0 [nitrous oxide] and CH₄ [methane] emissions, directly from farmland, and indeed can reverse the CO₂ emissions.

Keywords: Climate change, Organic farming techniques, fuel-saving technologies.

227. Global warming/green house effect

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The world 'environment' is derived from an old French word "environ", which means "surroundings" or "encircle" or "natural world". According to the encyclopedia britannica, environment means the entire range of external influence acting on an organism, physical, biological and other organisms. Environment is the sum of all social, physical, chemical, biological or economical factors, which constitute the surroundings of man to both his creator and moulders of environment. This paper is going to discuss about global warming and green house effect and suggest the way to control global warming and the steps to be taken to reduce the temperature of the earth. The produced CO_2 from industries and from several other sources is to be sent through separate pipe lines to glass chambers kept in open atmosphere and sunlight is to be supplied to it. When chlorophyll pigments are supplied through plant sources or through algae that survive in anaerobic conditions to the glass chamber, the incoming CO_2 will get converted into oxygen due to photosynthesis. The outgoing oxygen can be collected through outlets and can be used in hospitals and several other places. In this way we can control the level of CO_2 in atmosphere and thus reducing global warming.

Keywords: Environment, encyclopedia britannica, global warming, green house effect.

228. Climate change and health hazardous

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Climate change refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and or the variability of its properties and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. Change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. According to the United Nations industrial development organization (UNIDO), climate change is likely to have a greater impact on India compared to other countries similarly positioned, on account of the unique combination of its geography, diverse population characteristics and extremely high carbon-related energy dependence. Climate change is bound to affect the basic requirements for maintaining health - clean air and water, sufficient food, adequate shelter, and freedom from disease given the already high level of poverty, low nutritional levels and poor public health infrastructure in the country. India is a large developing country of subcontinental proportions home to 1.1 billion people or 17% of the world's population. A large proportion of this population continues to live in rural areas and depends heavily on climate-sensitive sectors such as agriculture, fisheries and forestry for its livelihood. With rapid economic growth, however, the demand for goods, services and energy has soared and large shortfalls are emerging. The government estimates that the rate of growth of energy demand will be 5.2% each year if it is to provide energy to all citizens. It is said that India is a rich country with a lot of poor people.

Keywords: Climate change, human activity, global atmosphere, sub-continental proportions.

229. A case study on the impact of stone crushing industry on environment and sustainable development of the labour in Andhra Pradesh, India B. Srinivasa Rao

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Rapid economic growth and the resulting changes in consumption patterns are drastically changing the nature and scale of impact on the environment and natural resources, thus testing the carrying capacity of the natural ecosystems upon which much of the economic growth depends. There is a

need to move towards sustainable development to meet the needs of the present without compromising the ability of future generations to meet their own needs. The term environment implies all the external factors - living and non-living, material and non-material, which surround human beings. The basic three component of the environment are: Physical environment consisting of water, soil, air, etc. Biological environment includes plant and animal life. Social environment includes customs, culture, habits, income, occupation, economic activities etc. Thus a balance between these three will make the environment a healthy one. A sustainable and fair development also needs the extension of labour rights and environmental protection, since the social environment has a very important role in the growth process. The current model of development is socially unfair and environmentally unsustainable, as exclude a large portion of the world's population, increase the economic disparities, puts pressure on workers' rights and conditions, and is environmentally depredator. There is no possibility to eradicate poverty in the world and to reach social justice by thinking of extending the current productive model that has brought welfare to the developed countries. It is simply environmentally unsustainable. This means the world must and will change. It also means that our production and consumption models shall undergo a deep transformation. Understanding these changes and its consequences for workers and their communities is one of the major challenges that trade union movement needs to address. The creation of decent and environmentally responsible jobs is the only way to guarantee the livelihoods of the millions of workers that live today in this planet. Integrating the environmental dimension in the social agendas is a real challenge but also a necessity that must be faced by the societies and the governments too. To advance towards the trade unionism of the 21st century, trade unions must integrate the environment in their policies. Otherwise one can't ensure social coherence as a social movement, and to guarantee to devise and elaborate an economic development based on justice. Keywords: Rapid economic growth, natural ecosystems, labour rights, social movement.

230. Population and energy demand

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The population problem isn't just a matter of the number of people. But their requirement- food, fresh water, wood, minerals, and energy for the day to day life, is the serious concern for the government. Life support activities such as producing food, pumping groundwater, harvesting wood, mining minerals, and burning fuel deplete our resource base and ends in pollution and ecological imbalances. The critical indicator of environmental impact is the measure of our energy consumption, of course, energy consumption keeps the economy on move. Energy consumption especially per- capita power consumption, oil consumption may indicate the standard of living of the people in a country. But it is not necessary to compare these indices with the indices of U.S.A. Why are we focusing on the United States? Because Americans make up only 5% of the world's population and yet consume 20% of its energy! That's really extravagant. The purpose of this exercise isn't to blame people in rich countries for wasting energy, because for the most part they don't know why they're doing it. It's not to say each person in a poor country is as poor as every other person in that country, because there are rich and poor people in every country. And it's not to imply that all we need to do is consume less energy and everything will be OK. The point is that the population problem isn't just something "over there" in "those poor countries," where they may be having more children. From a consumption perspective, the developed countries have a bigger problem of population growth problem than the developing countries! Population and energy - efficiency improvements retard the growth in energy generation and electricity consumption, saves consumers money and reduce capital expenses for energy infrastructure. Moreover it reduces the local environmental impacts, electricity has a peculiar characteristics that it cannot be economically stored in large qualities. There fore its generation and consumption need to be matched at all times. Generating and transmission networks have therefore been built to deal with the maximum peak load rather than average load. Increased use of energy efficient appliances can reduce power consumption in residential sector.

Keywords: Population, energy demand, environment, U.S.A, India.

231. Global issues and polices influencing sustainable development Chitra Leslie

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Human activities have caused the warming of the global climate over the last 150 years, accompanied by retreating alpine glacises, rising sea levels and shifting climate zones, scientists believe that global

warming will lead to changes in wind patterns, precipitation and frequency and type of severe weather events. This in turn could have significant environmental and economic consequences. The heat caused by infrared radiation is absorbed by "green house gases' such as water vapour, CO_a, ozone and methane which slows its escape from the atmosphere. Although green house gases make up only about 1% of the earth's atmosphere they regulate our climate by trapping heat and holding it in a kind of warm air blanket that surrounds the planet. This phenomenon is what scientist call the 'Green House Effect' without it the average temperature on earth would be colder by approximately 30 degrees celcius, far too cold to sustain our current ecosystem. The problems begin when human activities distort and accelerate the natural process by creating more green house gases is the atmosphere than are necessary to warm the planet to an ideal temperature. Burning natural gas, coal and oil including gasoline, for automobile engines raises the level of carbondioxide in the atmosphere some farming practices of land - use changes increase the level of methane and nitrous oxide. Trees use carbondioxide and give off oxygen in its place which helps to create the Optimal balance of gases in the atmosphere as more forest are logged for timber or cut down to make way for farming. However there are fewer trees to perform this critical function. Currently, carbondioxide account for more than 60 % of the enhanced green house effect caused by the increase of greenhouse gases. Many nations, communities and individuals are taking action now to reduce green house gas emission and slow global warming by reducing dependence on fossil fuels increasing the use of renewable energy, expanding forests and making lifestyle choices that help sustain the eavonment. This paper focuses on the Indian government policies and also gives suggestions which could be adopted to reduce global warming and lead to sustainable development.

Keywords: Global warming, compact florescent light, vector borne diseases.

232. Is India missing out on one of the greatest biodiversity discoveries?

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As scientists working at University of Guelph, we have had the opportunity to interact with DNA barcoders from around the world. However, recently, an interaction with an agriculture scientist from India and, a visit to India by one of us has revealed a lack of awareness by plant scientists to this new technique. In India, and perhaps elsewhere, there is emerging confusion among agriculture/botany/ plant researchers concerning DNA barcoding and DNA fingerprinting. This misunderstanding cannot be ignored given the enormous wealth of biodiversity that India possesses. Here, we aim to distinguish these two genetic tools in as simple terms as possible. Barcoding refers to the use of DNA to identify and distinguish species, whereas fingerprinting is used to characterize individuals or populations. What is the relation between species and populations? In very simple terms, a collection of populations forms a species. (For example, present day humans belong to one species, Homo sapiens, which is composed of various populations such as African, American, Chinese, Indian etc.). In genetic terms, chromosome set (genome) of all the populations of a species are almost identical scattered with very few variable regions. If one has to distinguish populations, only variable regions are amplified because all other genomic regions of the populations are identical. This is what DNA fingerprinting does. Fingerprinting markers like microsatellites target these variable regions across the genome. However, barcoding is used to distinguish species not populations. In barcoding, those regions of the genome that are not variable between populations but variable between species are amplified. Here is an example: There are two families with surnames Physics and Biology, respectively. The Physics family has four members; Albert, Issac, Marie and Subramanyan are their first names. The Biology family has five members and their first names are Barbara, Charles, Francis, James and Rosalind. It is not possible to distinguish each member of the family using their surname as it is common for all of them; however, the surname is the most convenient way to distinguish between the two families. By analogy, barcoding is comparable to the surname and fingerprinting is akin to the first name. In barcoding, DNA regions that are common among populations, but variable between species, are highlighted (amplified). Furthermore, in barcoding the same regions of DNA are applied to all species and hence universal primers are required. In fingerprinting, the different segment of DNA may be used for each species, depending on which one has the most information. Also, in barcoding a query sequence is searched against the library or database of reference sequences using search algorithms like BLAST in barcoding. As a result, enormous datasets of sequences are built and stored on the web for worldwide access which in turn means involvement of huge computational power.

Keywords: DNA barcoders, DNA fingerprinting, Homo sapiens, barcoding, computational power.

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233. Child health care and health care investment P. C. Sreelatha

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This study seeks to analyze child health care in Tamil Nadu Important aspects like nutritional services, child health care service, rural health services are highlighted. One of the major health indicators infant mortality rate is also emphasized. Investment on health is investment on human capital. The development of human resources helps to increase efficiency and productivity. An investment in child is indeed an investment in nation's future. A healthy and educated child of today is active and intelligent citizen of tomorrow. Child health and health care are two vital requirements for the development of a healthy nation. Child health care services play a very important role in our country. It promotes all round growth and development of every child. Therefore child health care development is an integral part to overall socio-economic development.

Keywords: Nutritional services, infant mortality, socio-economic development.

234. Global warming: A cause for concern in India C. Dhandapani

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Global warming is an average increase in the temperature of the atmosphere near the earth's surface and in the troposphere. In common language, 'global warming' refers to the warming that can occur as a result of increased emissions of green house gases from human activities. Green House Gas is the primary cause of global warming. The intergovernmental panel scientists found that the burning of fossil fuels some agricultural practices and changes in land use have been generating green house gases like carbon dioxide, methane and nitrous oxide that trap heat and produce global warming. Global warming has disastrous impacts on global climate, human and animal life. The adverse impacts may range from unusually warm summers, warm winters, erratic rainfall, increasing incidences of floods and hurricanes, rising sea levels threatening coastal areas, droughts, water scarcity and poor crop yields. Worldwide it is agreed that one of the greatest challenges to sustainable development in the 21st century is global warming. Global warming would not only lead to loss of life and property, but also might cause a major reshuffle in flora, fauna and cropping pattern in India. Global warming poses a serious threat to development and poverty reduction in the poorest and most vulnerable regions of the world. Most of India's poor live in rural areas that are directly dependent on climate sensitive resources such as agriculture, forests, and river water. India's diversity of topography-mountains, rivers, forests, deserts, coastlines- means that climate change would affect different regions in different ways. India has the world's second largest population and is the third largest emitter of CO₂ after USA and China according to United Nations environment programme. This article deals the global warming in four sections. Section I brief the introduction, theories, and causes for global warming. Section II analyses the impacts of global warming. Section III elucidates the international efforts to control global warming and Section IV gives the suggestions to mitigate the problem of global warming. Keywords: Global warming, green house gas, topography-mountains.

235. Empowering tribals and their skill developments an assessment of tribal welfare programmes in India

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The paper attempts to examine two aspects, namely, the economic and health status of tribes and opportunities in skill development given by government and non-governmental agencies in India. Tribes face problems like irregular income, debt, malnutrition, lack of safe drinking water, sanitation facilities and infrastructure facilities. It is observed that literacy rates and health status are less compared to other communities. Human development index is less and human poverty index is more in ST communities. Government has implemented many schemes to improve education, medical facilities, credit facilities and empowerment through skill development. Corporates, NGOs and individuals had played remarkable role in helping the ST communities. Availability of nutritious meals, health and sanitation, availability of safe drinking water, infrastructure facilities, communication and adequate financial help are the priority areas which need to be addressed in future.

Keywords: Skill development, human development index, sanitation, safe drinking water.

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236. An economic study of carbon trade and its application in India P. Mathumathi

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Climate change is the biggest challenge that we face in the world today. Climate change and carbon trade are the recent concepts on which there are so many regulations and adaptation. Global warming has already driven up mean sea levels by 110-20 centimetres during the last 100 years, and this is forecast to rise by up to another 88 centimetres by 2100. The Nobel Peace Prize, jointly shared by climate change activist and former US Vice President Al Gore and the Intergovernmental Panel on Climate Change (IPCC), has only underscored the need to control global warming, which if left unchecked, could cause the biggest catastrophe mankind has ever witnessed. At this juncture, the concept Carbon trading is one of the ways countries can meet their obligations under the Kyoto Protocol to reduce carbon emissions and thereby mitigate global warming. This is a unique trading system upon by more than 170 countries in a bid to save our environment from further degradation. It is based on the premise that those who continue to pollute the environment should pay for their sins to those who make efforts to save it. If you undertake a project to reduce pollution levels, you become eligible for selling the amount of greenhouse gas emissions saved as carbon credits. One credit equals to one ton of CO₂ emission saved. Carbon credits are traded in the international market. Credits earned through the Clean Development Mechanism are called Carbon Emission Reduction (CER) units. The process requires approval of the host country and registration with the UN Executive Board. The CDM is time consuming and expensive compared to another process which generates Voluntary Emission Reduction (VER) units. VERs is tradable at climate exchanges like the Chicago Climate Exchange or sold directly to end buyers. VERs has a much lower market value than CERs. Payments in the carbon market are made in the form of cash, equity, debt, convertible debt or warrants. Some parties pay in-kind, providing technologies to curb emissions. With regards to the working of carbon credit, it is a central authority fixes the limit of the amount of the pollutant that can be emitted into the environment. Now this limit becomes the permit of pollutants allowed into the environment. This permit is devised into several smaller units and distributed to several companies in the form of permit or credit or allowance. This permit or credit or allowances gives licenses to emit a fix amount of pollutant into the environment. Now if a company, say SRF, is able to exit only eight units of greenhouse gases out of 10 units allotted to it, then SRF will be having two units of emission as 'credit outstanding' in its 'pollution' account. On the other side, if a company says MRF emits 12 units allotted to it thenMRF will be having two units of 'debit balance' in its pollution account. Now SRF will be able to transfer its two 'credit balance' to two debit balance account of MRF. So both the companies' pollution account will be matched and the environment also to digest certain scientifically fixed amount of pollutants. This transfer from SRF to MRF will be for some monetary consideration and hence it is referred as carbon trading. Carbon credit, as defined by Kyoto protocol, is one metric tone of carbon emitted by burning of fossil fuels. The GWP (Global Warming Potential) factors are used to convert each of the five gases (like methane, for example) that are not CO, into tones of CO, equivalent (CO, E), which is the standard of trading. To bring the buyers and sellers of carbon trading on one platform and to augment the process of carbon trading, carbon credits are traded at CO₂ E exchange in Britain, CDM (Clean Development Mechanism) exchange in Europe. In India recently, MCE (Multi Commodity Exchange) has announced carbon trading exchange with license agreement from Chicago climate exchange. Like the usual stock exchange, carbon credit has all spot transactions, forward settlement and options of trading. Prices of credit trading vary and some time back was in the range of Euro six to Euro 12 per tonne of CO₂. An estimate suggests that in 2004, 107 million tonnes of CO₂ were exchanged through carbon trading worldwide. There is a steep penalty to the tune of Euro 40 per tonne to the companies emitting more than their quota. So companies that are having huge carbon credit can sell these to companies that are deficient in carbon credit or that have exhausted their quota for huge prices. But the costs are no doubt high for construction of Green Buildings but the overall lifecycle operating cost of operating green building is comparatively lower than the regular buildings. Coupled with earnings from Carbon Credits, the investment should be every penny worth lit. Almost all industrialised countries are huge buyer of carbon credit and all developing countries, where industrialisation has not reached its peak, are supplier of carbon credit. Japan is the largest buyer of carbon credit while India and Brazil are amongst the largest suppliers of carbon credit. Being a developing country, India is exempted from the requirement of adherence to Kyoto protocol. India, however, can sell the carbon credits to the developed countries. Like many other concepts this

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carbon concept is also subject to lot of criticisms. Even in India, is the largest beneficiary of carbon trading and carbon credits, she does not have a proper policy for trading of carbons in the market. Still this concept needs a regularised global policy to rescue the earth from the burning heat. This paper analyses the emerging concept of carbon trading in the global level and its special references to India.

Keywords: Carbon trading, Global warming, Kyoto protocol.

237. Export and import pattern of medicinal plants in India M. Ramesh kumar and D. Janagam

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Medicinal plants also play an important role in the lives of rural people in India with few health facilities. The plants that possess therapeutic properties or exert beneficial pharmacological effects on the animal body are generally designated as "Medicinal Plants". Although there are no apparent morphological characteristics in the medicinal plants growing with them, yet they possess some special gualities or virtues that make them medicinally important. It has now been established that the plants which naturally synthesis and accumulate some secondary metabolites possess medicinal properties. They play a significant role in providing primary health care services to rural India. They serve as therapeutic agents as well as important raw materials for the manufacture of traditional and modern medicine. Substantial amount of foreign exchange can be earned by exporting medicinal plants to other countries. In India there are 880 medicinal plants species involved in all India trade. Of this, 48 species are exported and about 42 spices are imported. Another survey conducted by the Ministry of Environment and Forests. Government of India, reveals that there are over 8000 species of medicinal plants grown in the country. About 70% of these plants are found in the tropical forest; spread across the Western and Eastern Ghats. The Export-Import Bank of India, in its report for the year 1997, puts medicinal plants related trade in India at \$.5.5 billion and the same is growing rapidly. According to WHO, the international market of herbal products is around \$6.2 billion, which is poised to grow to \$5 trillion by the year 2050. Unfortunately, India's share in the global medicinal plants related export trade is just 0.5%. The export of Medicinal plants is Rs.33453.23 lakhs during 1991-92 to 2002-2003. Its overall trend has been increased in 0.21%. And the average Import of Rs.2827.01 lakhs. Also its trend has been increased in 0.39%.

Keywords: Medicinal plants, herbs, green-plants.

238. Coastal resources: Need for sustenance and alternative approaches for sustainability

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The salt water marshes and estuaries are facing serious amendment due to population, pollution and devastating effects such as destructive fishing etc, which leads to the extinct of many a rare species of aquatic lives. In a mining operation, as we are moving coastal or sea bed materials, all of the environmental problems associated with dredging and filling apply. Problems also exist in the offshore bulk material mining. The fishery industries flourish along the costal line. This poses great threat when there is bulk devastating fishing resulting in the extinction of many a species of fishes. Damage to coral communities is also caused by careless divers and by boat anchors. The major requirement for the coastal resource management and their conservation is coordinating with all the organizations or institutions which work for the marine resources conservation, coastal and marine biodiversity conservation and other marine social welfare communities. Marine conservation rely on a combination of scientific principles derived from oceanography, marine biology and fisheries science, as well as on the human factors such as demand for marine resources and marine law, policy and economics in order to determine how to protect and conserve marine species and ecosystems. The current paper discusses the need for the sustenance of the marine resources and the threats posed on these resources. The alternate approaches towards the coastal resources conservation are also suggested. Keywords: Coastal line, oceanography, marine biology.

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239. Causes and effects of global warming

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Global warming is defined as the increase of the average temperature on Earth. As the Earth is getting hotter, disasters like hurricanes, droughts and floods are getting more frequent. Over the last 100 years, the average air temperature near the Earth's surface has risen by a little less than 1 degree Celsius or 1.3 degrees Fahrenheit. Deforestation increases the severity of global warming. The ocean is a huge carbon sink, holding about 50 times as much carbon as the atmosphere. The oceans are no longer able to store carbon as they have in the past. Burning fossil fuels such as natural gas, coal, oil and gasoline raises the level of carbon dioxide in the atmosphere, and carbon dioxide is a major contributor to the greenhouse effect and global warming. The climate change would increase the number of people suffering from death, disease and injury from heatwaves, floods, storms and droughts. Floods are low-probability, high-impact events that can overwhelm physical infrastructure and human communities. Major storm and flood disasters have occurred in the last two decades. One can help to reduce the demand for fossil fuels, which in turn reduces global warming, by using energy more wisely.

Keywords: Global warming, fossil fuels, methane.

240. A new dimension of urban poverty: A comprehensive study of poor in Chennai city

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The Indian economy is one of the fastest growing economies and is the 12th largest in terms of the market exchange rate at \$1,242 billion (India, GDP). The biggest boon to the economy has come in the shape of outsourcing. Its English speaking population has been instrumental in making India a preferred destination for information technology products as well as business process outsourcing. However, poverty still remains a major concern besides disparity in income. Though India boasts of a high economic growth, there is still large scale poverty prevails in India. Out of its total population of more than 1 billion, 350 to 400 million people are living below the poverty line. Nearly 75% of the poor people are in rural areas, most of them are daily wagers, landless laborers and self employed house holders. There are a number of reasons for poverty in India. Poverty in India can be classified into two categories namely rural poverty and urban poverty. Poverty in India is widespread with the nation estimated to have a third of the world's poor. According to the criterion used by the Planning Commission of India, 27.5% of the population was living below the poverty line in 2004-2005, down from 51.3% in 1977-1978, and 36% in 1993-1994. According to the a 2005 World Bank estimate, 42% of India's falls below the international poverty line of \$1.25 a day (PPP, in nominal terms Rs. 21.6 a day in urban areas and Rs 14.3 in rural areas); having reduced from 60% in 1980. The percentage of population below poverty line in the country has gone down from 55% in 1973-74 to 27.5% in 2004-05. For urban areas the percentage of poor has reduced from 49% in 1973-74 to 25.7% in 2004-05. Chennai has done reasonably well in comparison to other cities that have a population in excess of a million. Most recent estimates indicate that nearly one-third of the city's population living in slums. The frequent failure of monsoons led to mass influx of agricultural labourers from the adjoining districts of the state to the city of Chennai. This is substantiated by the fact that up to 1961 there were 7008 immigrated families in the slums where as in the year 2001, 1205725 slums are engaged in the city. The Tamil Nadu Slum Clearance Board is engaged in the welfare task of clearing the slums with hutments within the city and for providing shelter for the downtrodden and economically weaker sections of the society by putting up pacca tenemental blocks. Chennai's urban poverty rate, which stands at 8.7 per cent, is one of the lowest in the country. To provide a comparison, Coimbatore stands at 21.9 per cent and Madurai stands at 17 per cent, while the national average is 27 per cent. Climate change is a serious issue facing the world and its consequences on cities is likely to be severe. The Government of India estimates that India will achieve 38% urbanisation by 2026. Unless this massive growth is planned and made sustainable, the costs will be enormous, particularly for the urban poor. Urban poverty, as a proportion of total poverty in India, has doubled from 15% in the early 1960s to nearly 30% in 2004/ 05. The urban poor are the most vulnerable to current climate variability, such as regular floods and water shortages. Investments in new city infrastructure offer a tremendous opportunity to build sustainable and resilient cities using less energy and water. Poverty is one of the main issues, attracting the attention of sociologists and economists. It indicates a condition in which a person fails to maintain 118

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a living standard adequate for a comfortable lifestyle. There is a Public Distribution System, which has been effective to some extent. Other programs include the integrated rural development program, Jawahar rozgar yojana and the training rural youth for self employment (TRYSEM), and other ongoing initiatives. The government has planned and implemented poverty eradication programs, but the benefits of these programs are yet to bear fruits.

Keywords: English speaking population, poverty, poverty eradication programs.

241. Prospects of health insurance in India

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There is a forecast on the new health challenges likely to emerge in India over the next few decades. World Bank report (World Bank, 2000) has provided a possible scenario of the burden of disease for India in the year 2020. Health insurance was first introduced in India in 1987 and was mainly shared by government organizations under the GIC, viz., National Insurance Corporation, oriental Insurance Corporation, United India Insurance Corporation, and National India Assurance Corporation. There existed several mediclaim policies, but unfortunately, mediclaim policies were inadequate to the needs of the insured and suffered from certain shortcomings, which is why they have not been very popular. First, it is a hospitalization policy which does not cover outpatient expenses and reimbursements are made only in the event of hospitalization, although really speaking, not all afflictions require hospitalization. Second, it does not provide direct payment to the hospitals and also makes post facto reimbursement of expenses. The policy holder has first to settle the hospital bills, then prefer a claim with the insurer, and then wait till it is approved. Often, the claim is not settled in full, depending on the views of the panel of doctors appointed by the insurers. Third, there are no tie-ups with good hospitals. The policyholder is often pushed to sub-standard hospitals to minimise expenses. Fourth, the scheme also does not cover disability arising out of illness, nor does it cover loss of earnings due to such disability. These aspects require to be looked into, so that the consumer will really receive the benefits that he is looking for. Fifth, the health insurance policies are not in the direction of savings. The payment towards a policy will not yield any returns after its expiry. Returns are only in the nature of claims made during the policy period. Sixth, all the above are characteristics of a short- term policy. The past and the current aspects of health insurance in India suggest that private health insurance is vital for the people of India citing the reasons of: first, inability of the government to fund for health care; and second, the skyrocketing costs of private health care; and that only a hand full of people are covered under some form of health insurance in India, the gap being the application of the concept of health insurance with a long-term perspective simultaneously keeping in mind the psychology of consumption and saving in India.

Keywords: Halth insurance, policy holders, skyrocketing costs.

242. Recent trends in cyanobacterial research

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Cyanobacterial research in the past decade has been at molecular level in every aspect of the organism. The strong classical taxonomy is now being supplemented with molecular analysis of the DNA using a variety of tools like STRR, LTRR, RAPD, RFLP, HIP, sequnce of 16S r RNA and others. A molecular genus named *Sprirestes* has been described. Complete genome sequencing has been done for over a dozen strains of cyanobacteria. Studies on the genetics of nitrogen fixation and the studies on the enzyme nitrogenase has culminated in the development of *nif* gene probes to locate the nitrogen fixing ability of organisms. Cyanobacterial utility was found to be their potential as biofertilizers and a rich source of single-cell proteins. Four to five decades of serious research in these two areas has brought out light the answers several questions raised earlier. Cyanobacteria have been found to be a good source of ultra-fine chemical like restriction enzymes. Certain strains are with a rich content of anti-oxidants. Superoxide dismutase is one of the enzymes known to be a good scavenger of active oxygen radicals abundantly present in cyanobacteria. We have reports on the anti-cancer and anti-HIV compounds from cyanobacteria. Marine cyanobacteria are considered to be less utilized for their biotechnological efficiency though are a good source of active compounds. I will discuss all these aspects with suitable presentations.

Keywords: Cyanaobacteria, Sprirestes, restriction enzymes.

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ENERGY MANAGEMENT

1. Population growth and energy demand Shrimathy Ramalingam

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The demographics of India are remarkably diverse. India is the second most populous country in the world, with over 1.18 billion people (estimate for April 2010), more than a sixth of the world's population. Already containing 17.31% of the world's population, India is projected to be the world's most populous country by 2025, surpassing China, its population exceeding 1.6 billion people by 2050. However, India has an astonishing demographic dividend where more than 50% of its population is below the age of 25 and more than 65% hovers below the age of 35. It is expected that in 2020 the average age of an Indian will be 29 years, compared to 37 for China and 48 for Japan; and, by 2030, India's dependency ratio should be just over 0.4. India has more than 2,000 ethnic groups, and every major religion is represented as are four major families of languages (Indo-European, Dravidian, Austro Asiatic, and Tibeto-Burma languages) as well as a language isolate (the Nihali language spoken in parts of Maharashtra). Further complexity is lent by the great variation that occurs across this population on social parameters such as income and education. Only the continent of Africa exceeds the linguistic. genetic and cultural diversity of the nation of India. However, resource augmentation and growth in energy supply have failed to meet the ever-increasing demands exerted by the multiplying population. rapid urbanisation and progressing economy. Hence, serious energy shortages continue to plague India, forcing it to rely heavily on imports. Commercial primary energy consumption in India has grown by about 700% in the last four decades. The per capita consumption is in the region of 400 KWH per annum. Driven by the rising population, expanding economy and a quest for improved quality of life, energy usage in India is expected to grow at an exponential rate. Despite the overall increase in energy demand, per capita energy consumption in India is still very low, compared to other developing countries. Today, India has one of the highest potentials for the effective use of renewable energy. A land of abundant sunlight and forests, the country needs to explore its solar energy capacity and also biofuels to meet the growing demand for renewable energy sources. India would need to focus more on wind energy and seawater energy (India has an enviable, long coastline), to secure the future of its citizens who are becoming petrol-guzzlers like the West. The wind energy sector needs better approach and only now states like Tamil Nadu are taking baby steps to exploit this boon of Nature. Though atomic energy is clean energy, it is being viewed as a double-edged sword. But it can be a wonderful source of energy with the right planning and management by the country.

Keywords: Demographics, petrol-guzzlers, wind energy, atomic energy.

2. Population growth and energy demand

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The fertility rate for women and the related population growth rate for numerous developing (transitional) countries show a downward trend with increasing annual per capita energy use. On the assumption that such trends will continue, estimates are made for some simple cases of the energy demands required to stabilize the world's population in the period 2100 to 2150. An assessment is made of how these energy demands might be met, capitalizing as much as possible on the indigenous energy resources for each of the ten major regions of the world. Consideration is also given to the potential need to limit carbon emissions because of global-warming concerns. India, with a population of slightly more than one billion people living in 25 states, is the second most populous country in the world, behind China. After about 2050, it is predicted that energy demand will continue to increase, even with further efficiency improvements, to around 27 000 to 11 000 more by the year 2100. At this level of energy use, it is expected that conventional sources of oil and gas will have been depleted, there will be an increasing number of countries without significant fossil resources and, in the fossil area, demand for coal and unconventional fossil resources will be increased. The study highlights the crucial nature of energy-efficiency improvements and the need to use all energy sources if the world is to find a sustainable future with a much improved standard of living in the developing world.

Keywords: Indigenous energy resources, global-warming concerns, energy-efficiency improvements.

3. Testing of small wind turbines/aerogenerators

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In Indian context, if small wind turbines/aerogenerators have to contribute substantially in the next decade then we must evolve designs with reasonable economic parameters relevant for low and moderate wind speeds prevalent in our country and adopt suitable type testing procedures in order to verify the engineering integrity, safety philosophy and quality assurance in line with the IEC standards so as to mitigate the customers / developers risk for under performance. The paper attempts in describing the type testing methodologies that have been standardized by C-WET suiting to the Indian climatological conditions and wind regimes with an objective to improve the power performance of the small wind turbines/aerogenerators which will help common man in electrifying the remote rural villages. **Keywords:** Small wind turbine, aerogenerator, type testing.

4. Biotechnology of Indian solar salt works

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Hyper saline water was thought to be lifeless but recent study shows that it contains primary producers, consumers and decomposers. It also acts as purifying systems towards undesirable bacteria. The brine evaporation is now considered a biotechnological process which is related to the halophilic bacteria. In Indian solar salt works, distribution of microorganisms their species density and biomass in relation to abiotic factors were studied. A comparatively large number and high abundance of species have been recorded in low salinities (34,500 cells/ml). It is found as salinity increases, the species diversity decreases, while population of hyper saline species flourishes (118 cells/ml). In the final stages only 2 or 3 brine algal species one brine shrimp Artemia establish themselves at the high salinity (Rahaman et al 1993). It is known that the halophilic bacteria which grow on the metabolites produced by Artemia assured red coloration to the brine in the crystallizers enhancing the quick evaporation of brine has been validated by experiments in the lab. Lab study: Salt samples were taken from Friends salt works at Gandhidham, Gujarat India. The objective of the work is to isolate, identify and characterize halophilic bacteria according to the method described by Dussault and Lachance, 1952. The role of halophilic in the biomineralisation of salt has been studied by performing experiments in an identical situation. The halophilic isolated used for the process of biomineralisation and compared with the salt as nucleating agent and the control. The experiments were exposed to solar radiation for evaporation and precipitation. It is confirmed that extreme halophilic are not able to survive to brine concentration of less than 15% even for a short period. Thus proposed standardization maintains salinity about 16.7% salts in all stages of operating protocol. It is inferred that the presence of halophilic increases the salt quality and accelerates the rate of evaporation by heat absorption from solar radiation. The result of the study is implemented under field conditions. Field study: The solar salt works in India and Kenya were taken and hydro biological conditions were assessed and the lab result was implemented. Indian conditions: The bore well water being saline 14% and devoid of any biological organisms. Chicken manure was used and feed for Artemia was developed. Imported Artemia cysts were hatched and sub adults of Artemia were inoculated and biomass was produced. After assessing Artemia biomass in the water spread area it was subjected for halo bacteria production. Krystalline salt works, Kenya: Natural sea brine with Artemia population was biologically managed; the bloom of halophilic are also recorded with very pure brine a characteristic feature in the pre crystallizer. The paper deals on the mass management of key microorganisms under field condition and the role played by halobacteria in salt precipitation in its quality and quantity is discussed. Keywords: Artemia, halophiles, salt precipitation.

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ENVIRONMENTAL MANAGEMENT

5. Urban health in Chennai city

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The urban population in Chennai city is expected to increase tremendously by 2030. Currently, its sizable urban population lives in slum areas indicating the worsening living conditions and increasing poverty in the city. This makes tremendous impact on health conditions of urban poor and the slum dwellers. The present study provides spatial-information on an extent of poverty by slum/non-slum residence according to the census; demographic and socio-economic characteristics of slum/non-slum residents and the urban poor; household living conditions; health and health care for the Chennai City. The perceptional studies have also been adopted for the future planning of urban health/living conditions.

Keywords: Urban population, Slum population, non-slum population, urban poverty, urban health.

6. Island's eco tourism: a case study of Andaman islands, India

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A pristine world of silver sands, clear blue seas, coral reefs, swaying palms, tropical forests, volcanic mountains and a gently undulating landscape is what the Andaman and Nicobar Islands are all about. The Islands comprising of 572 islands/islets, extend over an area of 8,249 km². Located between 6° 45" N and 13° 41" N latitudes and 92° 12" E and 93° 57" E longitudes, the islands offer exciting ecotourism products with natural and cultural settings. The present study dealt with tourism products, what attract tourists to the Andaman and Nicobar Islands, preferences and choices among the touristic places and products. The scope of the present research work includes the assessment of positive and negative impacts of ecotourism in the Andaman's as perceived by the domestic and international tourists. It provides suggestions and recommendations on the basis of the analysis of field data on the tourist profiles, tourism products and tourism infrastructure. Furthermore, on the basis of the outcome of this research; the research has suggested to the tourism planners and administrators suitable proposals for the development of ecotourism in the Andaman's. More than 60% of the tourists have informed that they received information about the Andaman and Nicobar Islands from their friends and relatives. The age composition of the tourists indicates that 57% of the tourists were in the age group of 31 to 50 years and 92% of the tourists were highly educated and none of the respondents in the sample was illiterate. The occupational structure of the tourists was found mixed, 70% of the total tourists comprised of technicians, government servants, private sector employees, students and teachers. Occupation wise, money spent by the tourists indicates that the government sector tourists earned a mean monthly income of about '28,000 and spent an average of '72, 000 on their tour. Further, their sources of funding for the tour came from the leave travel concessions (LTC) schemes. According to the scores given by the visitors, for the natural tourism products, landscapes topped with 93.4% of the visitors, beaches with 90.5% and scenery with 88.9%, reserved forests with 86.8% and limestone caves with 68%. Similarly, the cultural and historical tourism products scored good scores from 82.2% for the natural history, historical sites from 81.89%, and museums from 74.7% and heritage sites from 72.4%. This clearly indicates that the Andaman's have abundant natural beauty with a rich cultural heritage to become an ecotouristic destination.

Keywords: Ecotourism, tourism industry, tourism products, islands.

7. Coastal resource management

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This article highlights some salient ecological features of Indian coastal resources and management plan. Coastal zone of India has diverse ecosystems like mangroves, corals, beaches, wetlands, estuaries, lagoons and backwaters harboring many ecologically and economically important fauna

and flora and also serves as a barrier against many destructive natural hazards. Indian seas are witnessing increased anthropogenic activities like marine fishing, off-shore oil and gas, marine transport, dumping ground for waste disposals, etc all of which have been bringing about changes in the coastal environment. Increasing stress due to development of industries, trade and commerce, tourism and resultant human population growth and migration towards coastal cities and urban centers pose a serious threat to the to the health of these coastal ecosystems and to lives and livelihoods of coastal communities. The industrial development of coast has resulted in degradation of coastal ecosystems and diminishing the living resources of exclusive economic zone (EEZ) in the form of coastal and marine biodiversity and productivity. Municipal sewage, land use, tourism, maritime transport, offshore oil exploration and production, dumping at sea degrade the marine environment. Felling of mangroves and clearing of forests increase the sedimentation rate affecting the live coral and species diversity. Mangroves are a crucial component deserving high priority in any coastal zone management plan as they are degraded and destroyed due to conversion into agriculture, aguaculture and industrial land. Fishery and fishery resources are another major component in coastal resource management. Preliminary efforts to develop a model coastal zone plan in three different stretches refined our skills to expand the plan at country level. As a result, an exhaustive management plan is being implemented at three different coastal states of the country. It is strongly hoped that many maladies afflicting coastal environment could be effectively addressed by formulating and actively adopting an all encompassing and exhaustive coastal zone management plan. Options to tide over this persistent issue is being debated at national and even international levels and some suggestions consistently made by public interest groups and NGOs includes: Earmarking exclusive zone for fishery, mangroves and other coastal biodiversity and for settlement for fishing communities. All fishery development recommendations suggest that Integrating fishing community with the ongoing development could be initiated to reverse their poverty. It could be done only through long term planning to enhance their special skills which will make them employable and eventually integrate them with the ongoing developmental process. It is also to be remembered that downslide in economic returns of fishing sector is a global phenomenon and Indian fishermen are no exception to this. It is strongly hoped that many maladies afflicting coastal environment could be effectively addressed by formulating and actively adopting an all encompassing and exhaustive coastal resource management plan. Keywords: Coastal resources, industries, fishing communities, mangroves.

8. Estimating the economic benefits of improved Cauvery river water quality:A case study

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The increased level of environmental pollution from human and economic activates in developing countries in particular has resulted in affecting the sustainable development of these countries both at the micro level as well as at the macro level. The impact of the 'unsustainable nature' of the economic activates in developing countries has been realized in terms of 'false net domestic product' (NDP) which could not be consumed by the individuals in these countries. Having realized the importance of addressing the environmental issues, many developing countries have adopted developmental policies aiming at achieving sustainability in various sectors. This has resulted in transfer of enormous amount of scarce financial resources towards environmental mitigating measures such as industrial pollution control, etc. These scarce financial resources have opportunity cost especially in financially starved developing countries for implementing various other socio-economic goals such as poverty reduction. This being the case, one has to estimate the amount of economic benefits generated by these environmental mitigation measures so as to see whether the investment in these measures is economically justified. However, one of the problems that a decision - maker frequently encounters with is nothing but estimating the economic benefits in terms of monetary units. The 'non - market' nature of many of the environmental benefits, existence of complex socio-economic conditions, inadequate institutional set-up, inefficient economic valuation exercise more difficult. Nevertheless, a considerable amount of progress has been achieved in the area of 'economic valuation of environmental benefits in developing countries'. This paper focuses on the economic valuation of environmental benefits derived from an environmental mitigation measure, especially in a developing country context. It should be noted that the Union Government of India has undertaken several pollution control measures, under the River Action Programme (RAP), to improve upon the water quality in some of

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the major rivers in India, which have been already polluted considerably. These measures are implemented through the respective state governments. As part of the RAP, the State of Tamil Nadu has undertaken measures to control urban sewage that pollutes the water in the largest and economically important river called River Cauvery. An estimated budget of Rs. 243 crores (for the year 2000-2001) has been earmarked for the task of controlling urban sewage from various major cities like Tiruchirapalli, Tanjore, etc. Now the question is: what would be the economic benefit that would be generated through the proposed urban sewage control programme in the Cauvery basin? To address this question, we would take up the economic valuation exercise. It would be noted that there are different kinds of valuation methods such as hedonic pricing method, contingent valuation method, etc., that are being employed in non-market valuation. Though the contingent valuation method (CVM) is criticized in the sense that the result derived through this method are not valid and reliable, considerable amount of empirical studies have demonstrated that this method is more promising method to estimate the non-market values in developing countries. We propose to use the CVM because it is found to be highly flexible in developing country context and is capable of eliciting useful information that could be used for decision making purpose. We propose to select one urban area in the downstream of the river (where the improved benefits would be realized by the users) and conduct primary survey among the selected sample households. Using CVM, the information regarding the general socio-economic-demographic characteristics of the households, their general environmental awareness, their perception about the propose wastewater treatment scheme, their willingness-to-pay (WTP) for the scheme, etc., Using appropriate statistical technique, we could determine the level of WTP value (i.e. the benefits), factors influencing WTP value, etc., The results would be used for deriving major policy conclusions that are manifold.

Keywords: Unsustainable nature, environmental mitigating, urban sewage, wastewater treatment.

9. Coastal aquaculture: an alternative path to economic growth of Nagapattinam district of Tamil Nadu, India challenges and opportunities

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Aquaculture is the farming of water area like agriculture, the farming of land area in order to produces selected species of aquatic organisms and plants for human utilization. In recent years, there is a global awareness for increased fish production through aquaculture which contribute much to the India's foreign exchange. In the part, India was predominantly an agrarian economy and at present, Aquaculture emerged as a popular rural enterprise in generating income and creating employment. As aquaculture is the financially risky business and is determined by factors like weather, crop prices, crop pests and diseases, interest rates and the global market. Today aquaculture especially in India has offered tremendous market potential. Aquaculture with shrimp farming has become more popular in India as a solution to the problem of low income coastal farmers leading to the rapid expansion of this industry in the rural areas. It is guite obvious that is has several advantages like highs yield in a small volume of water and increased efficiency of the utilization of coastal area. But at the same time it has negative impact such as reduction of availability of agricultural land, impact on soil, coastal ecosystem, water quality and outbreak of diseases. This paper discusses with the challenges and opportunities of aquaculture in Tamil Nadu, especially the Nagapattinam district which is situated at the tail end of the River Cauvery irrigation system where prospects of cropping have been disappointing and dull due to inadequate and untimely water supply. Hence the farmers have shifted to an alternative use of their land for aquaculture.

Keywords: Aquaculture, global awareness, agrarian economy, shrimp farming, coastal ecosystem.

10. Environmental and economic implications of ballast water management - A study with special reference to ports of Mumbai and JNPT

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Ballast is any material used as weight to balance an object. One example is the sandbags carried on conventional hot-air balloons, which can be discarded to lighten the balloon's load, allowing it to

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ascend. Ballast water is therefore water carried by ships to ensure stability, trim and structural integrity. Ballast water discharges by ships can have a negative impact on the marine environment. Cruise ships, large tankers, and bulk cargo carriers use a huge amount of ballast water, which is often taken on in the coastal waters in one region after ships discharge wastewater or unload cargo, and discharged at the next port of call, wherever more cargo is loaded. Ballast water discharge typically contains a variety of biological materials, including plants, animals, viruses, and bacteria. These materials often include non-native, nuisance, exotic species that can cause extensive ecological and economic damage to aquatic ecosystems. Ballast water is absolutely essential to the safe and efficient operation of modern shipping, providing balance and stability to un-laden ships. However, it may also pose a serious ecological, economic and health threat. Ships have carried solid ballast, in the form of rocks, sand or metal, for thousands of years. In modern times, ships use water as ballast. It is much easier to load on and off a ship, and is therefore more efficient and economical than solid ballast. When a ship is empty of cargo, it fills with ballast water. When it loads cargo, the ballast water is discharged. There are thousands of marine species that may be carried in ships' ballast water; basically anything that is small enough to pass through a ships' ballast water intake ports and pumps. These include bacteria and other microbes, small invertebrates and the eggs, cysts and larvae of various species. The problem is compounded by the fact that virtually all marine species have life cycles that include a planktonic stage or stages. Even species in which the adults are unlikely to be taken on in ballast water, for example because they are too large or live attached to the sea bed, may be transferred in ballast during their planktonic phase. Over the past millennium, marine species have dispersed throughout the oceans by natural means, carried on currents and attached to floating logs and debris. Natural barriers, such as temperature and land masses, have prevented many species from dispersing into certain areas. This has resulted in the natural patterns of biogeography observed in the oceans today. An increasing number of port states worldwide require that vessels arriving in their waters should submit reports regarding their water ballast practice. The background for this is problems experienced with harmful aquatic organisms spreading from one area to another through a ships ballast water system. Ballast water exchange at open sea is deemed as an effective way of prohibiting transfer of harmful aquatic organisms and pathogens to the arrival port. Port states having requirements to ballast water management, will most often implicitly require a "Ballast water management plan" to be carried on-board. Having such a plan will also give the following advantages: The plan gives information to the master regarding the requirements to water ballast reporting to different port authorities Delay in ports may be avoided, if a proper ballast water management routine can be documented to the port authorities. Therefore this paper tries to bring out the significance of ballast water handling with respect to its environmental and economic implications and focuses in particular on the highly polluted ports like Mumbai and JNPT on the west coast of India.

Keywords: Ballast, economic damage, planktonic stage, biogeography, arrival port.

KNOWLEDGE MANAGEMENT

11. Knowledge management

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ICT is regarded vital transformational tools which, when used appropriately, promote the shift to a learner-centered environment. The use of ICT accelerates teaching and learning goals, particularly in the context of a developing world. In the realm of education, these techniques extend well beyond a conventional computer connected to a network to tools that embody a whole bunch of new technologies. including human language techniques, smart devices (broadcasting techniques), digital applications. wireless and handheld devices, merging media devices and high-performance computing concepts and facilities. In the case of developing economies, however, education has been regarded as a means to social mobility and financial self sufficiency. India, like any other knowledge economy, depends on the development of its educational sector. Higher education drives the competitiveness and employment generation in India. The overall state of higher education in the country requires considerable improvement for there exists several socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education. The effective use of ICTs for the purpose of education in India has generated enough potential to bridge the digital divide. ICT increases the flexibility of delivery of education so that learners can access knowledge anytime, anywhere. It influences the way students are taught and the way they learn, for the processes are more learners driven than teacher-driven. Collaboration and networking are important aspects of pedagogy. The real power of ICT comes from new ways of communicating beyond the four walls of the classroom and by assessing information from worldwide sources. The implications for teachers, as they assist their students in collaborating with other learning groups and using networks to research assignment topics, is that they cease to be the main source of knowledge in the classroom. Instead, teachers' roles change from being "a sage on the stage" to becoming "a guide on the side". Teachers need to accommodate a philosophical shift in their approach to teaching. Through collaboration and networking, professional teachers promote democratic learning within the classroom and draw upon expertise both locally and globally. Although, changes in the curriculum do support fundamental economic and social transformation in a society however such transformations require new kinds of skills, capabilities and attitudes, which can be developed only by integrating ICT in education. ICT can affect the delivery of education and enable wider access at the same time. Successful implementation of ICTs, to lead a change is more about influencing and empowering teachers and supporting them in their engagement with students in learning. ICT enabled education could ultimately lead to democratization of education in India.

Keywords: ICT, education, broadcasting techniques, India.

12. Webometric analysis of agricultural universities in India S. Kothainayaki¹and S. Gopalakrishnan² ¹University Library, Anna University Chennai, TN, India ²Library, MIT Campus, Anna University Chennai, TN, India

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"India lives in its villages" declared Mahatma Gandhi at the beginning of the 20th century. The century witnessed radical developments in science and technology and these developments had an impact on the social and economic changes that took place in the world. Such changes gradually influence the day to day life of people at the grassroots levels. Agriculture related science and technology had a major impact. Agricultural education and extension have been geared to harness the modern science and technology for higher productivity and production. The agricultural education in India is faced with one of the biggest challenges. It has to identify its role in equipping the human resources for enhanced agricultural productivity and sustainable use of natural resources. Agricultural colleges and universities were initially assigned to disseminating scientific knowledge and skills to the farming community and to train them to use such skills for better output. The education division of ICAR undertakes planning, development, coordination and quality assurance in higher agricultural education in the country. It also strives for maintaining and upgrading quality and relevance of higher agricultural education through

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partnership and efforts of the components of the ICAR. For this study, all the agricultural universities in India listed in the ICAR website, which offers agriculture or agriculture and veterinary are examined and are included in the study. The importance of Agricultural Universities have increased tremendously in the recent years as the growth of the agricultural sector has seen a sharp decline for over a decade now. It has not been able to keep pace with the other sectors of the Indian economy although nearly 60% workforce is engaged with agriculture in India. The contribution of agriculture to the Gross Domestic Product (GDP) of the country's economy has been below 25% in the recent years. At such a juncture, people involved with Agricultural Universities and other research organizations will have to come up with innovative ideas for dealing with the challenges that the sector is currently facing. India has a very strong agricultural education system in the country consisting of fifty-four Agricultural Universities in India. Out of these forty-three are State Agricultural Universities (SAUs), two are Central Agricultural Universities, five are deemed universities and four are central universities with agriculture faculty. All these Universities are members of the Indian Agricultural Universities Association (IAUA). It was established primarily to promote agricultural research and education in the country. The SAUs are spread over the entire country and cater to HRD in agriculture and allied fields in different agroclimatic regions. The SAUs are major partners in the growth & development of Agricultural Research and Education under National Agricultural Research System. The Deemed Universities are Indian Agricultural Research Institute (IARI), given the status of Deemed University in 1958, Indian Veterinary Research Institute (IVRI), Izzatnagar (U.P.), National Dairy Research Institute (NDRI), Karnal, Central Institute of Fisheries Education (CIFE), Mumbai and Sam Higginbottom Institute of Agriculture, Technology & Sciences (Formerly Allahabad Agricultural Institute), Allahabad cater to quality education in animal sciences, dairy & fishery sectors respectively. The World Wide Web has now become one of the main sources of information on academic and research activities, and therefore it is an excellent platform to test new methods of evaluating webometric activities. Webometrics is a quantitative study of web-related phenomena. Quantitative studies of the web have been named as webometrics by Almind and Ingwersen. Webometric analysis on University websites have been carried out using the Web Impact Factors (WIFs) for Iranian, Australasian Universities, and using hyperlink patterns in Canadian Universities and Nigerian Universities. In this context, it is logical to investigate measures of the eectiveness of Agricultural Universities' Web sites in India, both to study the communication activity that they represent and to build useful evaluation metrics. Several studies have been done in this area, prominent among those are Li et al. found that academic websites are more mature than the other domains in the World Wide Web. Mike Thelwall pointed that a high Web impact or online impact for a document indicates that it might contain information that may be useful for visitors to the source documents of the links. But this is not always the same. Heimeriks et al. found that for academic pages, high Web impact may not reveal something about the documents, but also about their owners: both of the document that includes the link and the linked-to document. Other relevant studies are conducted to check the motivation of link creation in Israeli Universities. It is also found that Inlinks (Backlinks) are similar to citations in scientific e-articles and in links are fair quantitative tools for ranking, evaluating, categorizing and comparing websites. Ingwersen proposed a set of new measurements for measuring the online impact of areas of the web, including University websites. The best of these, the Web Impact Factor (WIF), was designed to measure the average online impact of a set of Web pages by counting the in-linking pages outside the set in question, and then dividing by the number of pages inside the set. This paper aims to evaluate agricultural university websites in India using webometrics study. The main objective of this study is to study the various webometric factors like Alexa traffic rank statistics, Google page rank, calculating rich files, are considered for evaluation and network diagrams showing the link structures between the web nodes is also presented. Keywords: Agricultural colleges, national education commission, web impact factor.

13. E-resources of Anna university library, Chennai-600025: An insight

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Academic libraries have become new actors in the process of learning. Libraries are reshaping its services; special mention about electronic references, full-text data access, Web resources, that are integral part of university education in the electronic environment. The future of research lies precisely here, at the nexus of the scholar and e-resources. Therefore, the challenge for librarians and information professionals will be to devise the most effective and efficient ways to assist in this process. Electronic

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resources consists of the following areas: the digital library, software and hardware developments, library networking and automation - integrated library systems, OPACs, user interfaces-web usability, internet access and use, E-books, E-iournals, online learning, E-databases, E-theses and dissertations, E-alerts, E-document service and social networking. Among these, e-journals is of prime importance because it covers scholarly communication and it consists of ever increasing number of subject fields. E-Journal services are available at 24x7, and it is also very useful for physically challenged students because they can access on their places. Also, e-journals are updated periodically. It is a bond tool for information seekers. Through the services like intranet, internet and Wi-Fi connectivity, users can access e-resources within the campus. E-resources reduce the publication time. It also saves shelf space. In a networked environment, the ability to monitor usage of e-journals is complex and time consuming. Most e-journals are accessible from servers maintained and controlled by publishers and the aggregators. The libraries need timely, reliable, comparable and consistent statistics of the usage of e-journals which can facilitate analysis of the use of the e-resources. Today different consortia models have emerged in India for accessing e-resources in variety of forms depending upon sources of funding and participants affiliations. The present trend in building library collection and serving the users with the application of information Technology (IT) certainly leads to a new concept of Hybrid Library and Information Centers (HYLIC) of today and tomorrow. For satisfying this service, Indian Government support through UGC- INFONET Consortium and INDEST-AICTE Consortium. It is an open-ended proposition which welcomes other institutions to join it on their resource sharing benefits and also gave highly discounted rates of subscription and better term of agreement with the publisher. A library consortium formation can be local, regional, state, national and inter-institutional level. Various factors should be taken for consideration for an effective functioning of a successful consortia, like resources identification on the basis of usage and usability. long-run planning of the technology infrastructure, access to back fields of periodicals, copyright and licensing, archival issue, price issue...etc. but not least, designing and launching a library consortium should be a long-term sustenance and robust model towards achieving the above goals. Shared subscription or consortia-based subscription to electronic resources through consortia of libraries, on the one hand, permits successful deployment and desktop access to electronic resources at highly discounted rates. On the other hand, it meets with the increasing pressures of diminishing budget, increased user's demand and rising cost of journals. The library consortia, on the basis of sheer strength of number of institutions, offer healthy business growth opportunities to the electronic publishers and thus attract the best possible price and terms agreement. With this welcome change, the libraries all over the world are forming consortia of all types and at all levels with an objective to take advantage of current global network to promote better, faster and more cost-effective ways of providing electronic information resources to the information seekers. The perceptions that electronic journals are of lower quality than the print is another problem that may be diminishing as a high percent-age of peer-reviewed journals are being digitized. The introduction of e-resources in the mainstream of the learning culture in universities has exposed users to more resources of information than ever before. Undoubtedly, this paradigm shift from the print to e-journals has made an invaluable source of current information. The consortia facilities the libraries to get the benefit of wider access to electronic resources at affordable cost and at the best term of licenses. This paper briefly discusses the concept, need, factors, advantages, and disadvantages of library consortia and also covers various models and the benefits of e-journals consortia. The hardship and the reality of collection building at the University Library have been lucidly dealt with in this article.

Keywords: Academic libraries, E-books, E-journals, online learning, E-databases.

14. Impact of tsunami on livelihood, health and adaptive capacity of fishermen in Tamil Nadu: An ex-post study

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Fishery is a source of livelihood to more than 8, 53,000 people in Tamil Nadu. They are the heterogeneous people with different religion and castes. Sea fishing has maritime heritage and it is a source of livelihood to these people from the days of immemorial. Fishery resources manifest it in several forms which include weather and oceanic conditions and stock of species. The oceans surrounding India have the best-developed fisheries. But coastal resources in these oceans are under stress in many ways. Adding to these, the marine fishery sector faces the vagaries of nature enkindled

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by the climatic changes. Further, capital intensive nature of the industry, uncertain market demand, over exploitation of the resource, unemployment, inequality in income, poverty, and indebtedness are the major drawbacks persists in this industry. Employment in fishery is seasonal and hence income is capricious. The rest of the period they are unemployed and hence they borrow from money lenders and industrialists for their survival. Fishing economy is backward due to socio-economic, institutional and technological factors. Adding to these problems of the fishermen in the coastal areas of Tamil Nadu was cruelly hit by a deadly tsunami on 26.12.2004. The killer wave killed several thousand people, washed away villages, destroyed their houses, fishing equipments and their infrastructure at large. The impact of the tsunami on marine fishery directly affected the livelihood, health and environment of the fishermen. The direct cost of tsunami to their economy was the replacement costs. The direct losses crop up from the lost opportunities to produce and damage to their establishments. Indirect as well as induced losses occur when people and businesses in the damaged areas become incapable to work or generate income as a result of the tsunami. Indirect losses also go off to the suppliers whose products and services are not purchased by firms and households affected by the tsunami. Moreover, economic activities bring to a halt by the tsunami within the inundation zone. In this paper, an attempt is made to study the impact of Tsunami on livelihood, health and the adaptive capacity of fishermen in Tamil Nadu. Keywords: Fishery, fishing economy, tsunami.

15. Memory and artificial intelligence

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In the contemporary world Information technology, robots, cybernetics, internet and computer science have an impact on various aspects of human life. We cannot ignore the fact that there are various sources of knowledge like perception, inference, comparison, testimony and memory. Artificial intelligence also is one of the sources of knowledge and it is a substitute for memory as a source of knowledge. Human memory is natural and it is caused by brain which in turn is dependent upon bio chemical energy for its function, whereas the digital memory is programmed and is dependent upon electrical energy. The memory platform is global and cohesive of all memories available on computers in network. It springs forth from the physicality of the internet. The arrival of World Wide Web has made information technology much more useful for modern man. Man encounters ethical and religious problems in his everyday life. The problems of Free Will, other minds and personhood are relevant to his life. The degree of Agency which is related to free will is not found in artificial intelligence. The degree of Agency is highest compared to dog programmed to bark. Though intelligent devices exhibit all kinds of behaviour that make them look like agents, they are not actually agents. Digital systems cannot be agents, because they are deterministic while humans are agents who are non deterministic. The effects caused by humans have no predictability. They are not programmed like robotic digital systems. So, humans are considered to be potential agents. The memory of an individual is based on his own self and the memory of the computer is based upon artificial intelligence. The memory attributed to Internet World Wide Web is fragmented and fluid. One's memory knowledge as a source of knowledge is personal, unified and authoritative whereas the memory of artificial intelligence is world memory, impersonal, uncertain, fragmented, decentralized and commodified. Apart from that, a person in the modern IT World has to control his net-surfing in order to have a study-self. Artificial Intelligence is the computational part of the ability to achieve goals in the world. There are different degrees of intelligence that we could find in humans and animals. Intelligence is considered to be one of the cognitive factors of the mind. According to Knight Psychology, Intelligence is acts as the capacity to remember. He points out some group abilities like verbal ability, numerical ability, mechanical ability, logical ability, etc., Knight rightly points out that intelligence acts a capacity to remember. Artificial intelligence is the branch of science; it deals with helping machines and finds solutions to complex problems in a more human like fashion.

Keywords: robots, cybernetics, internet, digital systems, net-surfing, artificial intelligence.

16. E-learning and e-publishing in information management R. Pandian and G. Krishnamoorthy University Librarian, Anna University, Chennai 600025, TN, India pandi1958@rediffmail.com

This paper is aimed at Library and Information workers or those involved in online learning and training: this may be with their customers or colleagues. Information workers are increasingly involved in the

whole business E-learning and teaching, from designing and developing materials and programmes through to supporting individual and group learning using virtual learning environments. E-learning is becoming an increasingly important approach to user education, information literacy and also staff development. In addition, the paper will be of interest and relevance to those with a responsibility and /or interest in staff development such as managers or supervisors of staff, staff development or personnel officers, trainers or consultants or other change agents. They may be employed in library and information work in the public, private or voluntary sectors. The cost of producing e-publications is drastically low when compared to conventional book publishing. Another important advantage of eresources or e-publishing is it provides multiple accesses of documents. This paper is based on information and knowledge obtained and developed from 1) The author's experiences as an e-tutor to information service staff and also other learners, 2) Experiences as an online student in the context of a M.Ed. in Networked collaborative learning at the university, 3) Visits (both real and virtual) to a wide range of library and information services e -learning provision and 4) Professional networks and conferences and also the literature. The paper also briefs about a range of e-learning examples and case studies, and these are meant to demonstrate current practice a wide range of library and information units from small ones operating on a minute budget through large academic information services with access to sophisticated virtual learning environments.

Keywords: E-publications, E-learning, virtual learning environments, voluntary sectors.

17. Information diffusion in India

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This paper processes and appropriation of ICT in human development in India. The diffusion of ICTs across India is so far been modest. Since independence, India has made tremendous progress in expanding the communications infrastructure of radio and television. The broad socio-economic impact of expansion in ICT sector has been lesser than expected. An alternative evaluation methodology is proposed on the foundation of the capability approach to overcome such methodological drawbacks. Project evaluation indicators are developed based upon four criteria: a) Local community's access to information from formal state, market and civil society organizations, b) Local community's ability to process and evaluate information, c) Capacity of local communities in assimilates information in their own lives and produce information for others and d) Local community's ability to advocate for local knowledge in public spheres. Projects demonstrate that they are lacking appropriate governance, human, services and technological capacities for delivering two local communities. Despite the tremendous growth in telecommunication network, rural India is yet to witness a robust and seamless voice and data connectivity. Evolution of wireless network protocols provides an opportunity to create community based, bottom-up Internet infrastructure at the village levels. Prominent among such network standards is Wi-Fi. The issue of electricity and connectivity is remaining a challenge primarily for the government and the private sector that are in the process of rolling out ICT's throughout the country. It is recommended that appropriate political, regulatory and governance mechanism be created that facilitates growth of shared ICT Infrastructure in local communities. A concrete action plan needs to be put in place to upgrade and modernize the technology being used by these forces to ensure efficient and optimal utilization of spectrum and release the surplus resource available for use by civilian purposes. Necessary funds would have to be made available for this purpose. Spectrum pricing also needs to ensure the introduction and promotion of spectrum efficient technology.

Keywords: Socio-economic impact, governance mechanism, spectrum pricing.

18. ICT policies programmes and implementation by the Japan Korean and Indian government in education

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In India it has been observed that there is an active promotion of the use of information and communication technologies (ICTs) in education in the formal education sector today, as it has in the non-formal sector for more than 40 years. Today, the country's decision-makers, at both the central and state levels, have chosen to explore the use of newer computer and Internet based ICTs for

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education, along with broadcast ICTs, and has been promoting the use of open and distance learning for both the formal and non-formal education sectors. The launch of a dedicated broadcast education satellite, EDUSAT, is scheduled for early 2004, with capacity for specialized educational channels and up to 5000 FM community broadcasting stations for use by educational institutions. This infrastructure will be available to all sectors of education, but primarily to publicly funded and implementing agencies that will be responsible for transmission and programming for their defined audiences. For instance, a state government will be able to use the channel capacity for governance, an open school for transmission of its own programmes, agricultural agencies for agricultural extension, etc. This paper analyses the role of ICT and implementation in Japan and Korea as well as the development and strategies of ICT in India inclusive of Broadcast technologies and Digital Technologies. Middle-level managers, both in the public service and the NGO sector, need to understand the pedagogy of learning through ICT and the management models that are required. India has the policy and technology to implement both small and large ICT interventions in education. What is missing and what fails is in the translation of policy and technology into good practice. **Keywords:** ICT, broadcast technologies, broadcast education satellite, broadcast technologies.

19. Internet use by the faculty, research scholars and pg students of Gulbarga university, Gulbarga

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This study is designed to investigate the patterns of Internet use by the faculty including purpose for use, its impact on teaching and research, internet resources that they use, and the problems faced while using the internet. A questionnaire, export-reviewed and pilot-tested, was used to collect data from the faculty from 27 departments. Gulbarga University has improved its IT infrastructure, including providing distance access, and to provide formal training in the use of Internet resources. This is the first comprehensive study of the use of the internet by the Gulbarga University faculty members. Its findings should help Gulbarga University in its plans and programmes to relating to e-learning and strengthen pertinent resources and services of its libraries.

Keywords: Internet, e-resources, e-learning, university library.

20. Embedding environmental education in school: Strategies and implication

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Preparing human resource to live with nature is the key factor for mankind to sustain on this Earth. This paper presents a novel approach and strategies to implement the concept of environmental education in the existing school system. Motivation, identification, training, encouragement and appreciation are the integral part in the approach. The paper suggests the need to involve educational institutions, teachers and students to work towards the environment. The program can be initiated with the volunteering role players. Opportunities will be given for the teachers and students to exhibit their talents on environment by varied means viz. participation in guiz program, writing articles, imparting training, project study, dramatic learning, tree plantation, eco-friendly technology development and its use. A meter of appreciation and incentives need to be established and the performance of volunteering role payers need to be assessed to a graded level and in a hierarchical order. An environmental accreditation need to be put in place for learners, teachers and practicing educational institutions. The fabric of the environment will be stronger if only the linkage among the three active players is strengthened. Identification, award, training, support and reward are the essential components while inculcating the environmental health in the minds and deeds of the future citizens. Igniting the whole process on voluntary basis will yield positive results. The success of linking the schools, teachers and students for the cause of environmental sustainability lies in the active participation of NGOs, research and training institutes of government and aided centres and funding agencies.

Keywords: Environmental education, educational institutions, tree plantation, eco-friendly technology.

21. E-learning: A new dimension in LIS education

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The recent advancements in IT have changed the world scenario. This IT revolution has affected each and every aspect of human society and has opened new opportunities and challenges for all and particularly a new dimension in e-learning. The e-learning is an advanced system for learning through information communication technologies (ICTs). The ICTs serve as a source of innovative knowledge indicators on education including the field of library and information science. The ICTs are becoming popular in library and information system and services in the present knowledge based society for learning and teaching in academic and R&D carrier development. The ICTs enable the IT professionals including the library and information science for IT based information handling product and services towards organizational development. In view of this, the present paper presents e-learning and new dimensions in LIS education. The paper theme related concepts are analysed and discussed. Keywords: E-learning, information communication technologies, IT based information.

22. Information and communication technologies on environmental sustainability Hemant Khandai¹, Saumitra Mandal² and Shabnam Khan³

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The information and communication technologies (ICTs) have a profound impact on economy and environment. The performance improvement in ICT leads to increased consumption of ICT products and services, which has numerous environmental implications on different levels. There are three levels of environmental impacts from ICT: first, The direct impact on the environment is due to the production of ICT infrastructure and devices and electricity consumptions of ICT hardware and electronic waste disposal the second impact is the effect of ICT on the structure of economy, production processes ,products and distribution system . The third impact on the environment through stimulation of more consumption and higher economic growth by ICT. The paper illustrates the complexity of the environmental impacts and stresses the decisive role of human behavior in determining their significance. Today we are placing large expectations on ICT But we need to be aware about its potential environmental implications in the complex socioeconomic system of today. Huge investments are being made into the sector with large expectations for economic growth and environmental improvements, but neglecting the issue of 'rebound effect' causes a risk of misallocation of funds. Having more information on effects and causes will help us to do future development with a balance between economic growth and environmental quality.

Keywords: Information and communication technologies, consumption, rebound effect.

23. Impact of information and communication technologies (ICTS) on curriculum reformation and human resource towards sustainable development in education: A study

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ICTs play a vital role for information access, dissemination and to acquire knowledge in education technology innovations in relation to curriculum reformation and human resource towards sustainable development in education. Access to education technology information communication resources are very beneficial to teachers, student community knowledge managers in academic and R&D institutions, administrators and R&D workers in industrial management for knowledge organization management(KOM) to integrate technology innovations and its use in their respective fields on development perspectives in general and an efficient implementation of ICT depends basically on the skills of teaching staff to integrate ICT in learning in particular towards sustainable development in education. In view of this, the present paper theme related concepts analyzed and discussed. Keywords: Information communication technologies (ICTs), curriculum reformation, human resources.

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24. Impact of information and communication technologies (ICTS) on environmental management towards sustainable development in leather industry: A study

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Information and communication technologies (ICTs) play a vital role in library, information and documentation knowledge resource centers for information access, dissemination and to acquire knowledge in science and technology innovations in environmental management towards sustainable development in leather industry. Access to environmental technology information and communication resources are very beneficial to the tannery workers, scientists and technologists for water management, tanning process techniques in raw hides and skins, treatment and disposal of effluents. sludge and solid waste. In view of this, the present paper presents the impact of ICTs on environmental management towards sustainable development in leather industry. Based on the impact of ICTs on organizational, social and economic relation, the ICTs play vital role and serve as a tool for knowledge indicators on knowledge organization management (KOM) for environmental pollution related e-knowledge dissemination and access for environmental degradation, improve the working conditions for the workers and reduce health hazards for the leather industries area related inhabitants. The effective e- scientific communications are essential for environmental technology and water management conceptual analysis and decision making support to formulate environmental management strategy on policy measures and environmental issues for pollution free management in leather industry. Highlights the stakeholders/the state and central government organizations, govt. agencies, NGO's, Universities, civil society, policy makers, research communities and association's role and responsibilities for formal and informal dissemination of knowledge for facilitating and implementing policies and measures for environmental management in leather industry. The stakeholder's role is also very important to implement the IT policy on rural development in general and environmental planning strategies for pollution and leather environmental auditing for sustainable urban and rural enterprises (PLEASURE) in leather and allied industries in particular towards rural community development. Outlines the information scientist's effective role in content analysis and content management for environmental management related knowledge dissemination and access to the leather information user community in relation to sustainable development. Emphasizes the need for knowledge access and sharing initiatives for rural areas organization (KASIRAO) on knowledge sharing value for collective actions/ network approaches for environmental management in rural leather and allied industries towards sustainable development. The author highlights the key issues in relation to ICTs knowledge resources in a development context. Provides the guidelines for issues to consider in developing ICTs policies and implementation strategies for regional, national and international development and sustainable development for the leather community people for good health. livelihoods, poverty eradication and to access with useful information and communication sources for socio, economic and cultural development in the present knowledge based society. Keywords: ICT, environmental management, leather industry.

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TECHNOLOGY DEVELOPMENTS AND INTEGRATION

25. Therapeutic potential of *Agaricus bisporus* mushrooms Annamalai Panneerselvam and Muthuchamy Prabakaran PG and Research Dept. of Botany and Microbiology, A.V.V.M Sri Pushpam College (Auto), Poondi - 613 503, Thanjavur, TN, India panneer_1959@yahoo.com

Mushrooms are an important natural source of food and medicines. Traditional aboriginals knew the medicinal importance of edible and wild mushrooms and these are now being screened for their bioactivity in various ailments. Mushrooms must produce and secrete antiviral, antibacterial, and antifungal compounds to survive in the wild against competing or pathogenic organisms. A wide range of activities including antifungal, antioxidant and cytotoxicity are reported in mushrooms. In developing countries like India mushroom progress is a boon in the field of food, medicine and in generating employment. The alternative systems of medicine utilize the curative properties of mushrooms. The main areas of medicinal studies include anticancer (Cervical cancer cell line) and antifungal activity. The medicinal and bioactive commercial potential of bioactive substances derived from higher Basidiomycetes mushrooms (Agaricus bisporus) and its proprietary biotechnology process (ssf fermentations) in order to produce a new dietary supplements and at a later stage, new pharmaceutical products, have been exploited by using antifungal, identification of various functional groups by TLC, UV, FT-IR and the anti-proliferative properties of the chemical compounds were predetermined using as MTT assay. The IC_{50} value was used as a parameter for cytotoxicity. The anti-proliferative properties of chemical compounds could then be evaluated by colorimetric method using ELISA reader while the apoptogenic effects were determined through observing typical fluorescence morphological changes of apoptosis. The mechanism of action of various secondary metabolites isolated from medicinal and wild mushrooms is yet to be elucidated. Keywords: Mushrooms, Agaricus bisporus, ELISA reader.

26. Determination of biological metabolites and cytotoxicity activity of *Phormidium* species

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Cvanobacterial blooms have a wide range of social, environmental and economic impacts. Cyanobacterial metabolites which are cytotoxic to other algae are of special interest. On the other hand, such compounds could be helpful in combating algae blooms or in the development of environmental friendly as well as tributilin free antifouling parts of ships. The knowledge about such compounds has a beneficial effect on a better understanding if interactions between competing organisms of the same habitat. Furthermore, cyanobacterial biogenic particularly cytotoxic compounds could provide leads for further development of new therapeutic agents for a variety of diseases and for the development of new antibiotics. Today, infections are the main cause of death in developing countries and worldwide they hold the second position after heart diseases. Because of the growing bacterial resistance against commercial standard and reverse antibiotics, the search for the new active substances against hospital based MRSA strains, gram positive and gram negative bacterial pathogens is of increasing importance. Recently we investigated and screened the extracts from cyanobacterial mass with organic solvents for their biological activity in various in-vitro test systems. The elucidation of the structure of natural product with high biological activity is both stimulating and challenging. The first step in structure elucidation is to ascertain what the skeleton of the molecule is and this can often to be narrowed down by reference to phytochemical literature on related genera of Phormidium species. Knowledge on biosynthesis of secondary metabolites in very helpful in deducing the most logical substitution patterns are the basis structural molecule is established. The spectral data, such as H-NMR, FT-IR, ultraviolet (UV) and mass spectra (GC-MS) are determined. Keywords: Cyanobacterial, tributilin, phytochemical, *Phormidium*, ultraviolet, mass spectra.

27. Purification and characterization of an extracellular protease and Xylanase enzymes

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Enzymes are among the most important products obtained for human needs through microbial sources. A large number of industrial processes in the areas of industrial environmental, chemical food and pharmaceutical biotechnology utilize enzymes at some stage or the other current developments in biotechnology are vielding new applications for enzymes. A large number of microorganisms including bacteria, yeast and fungi produce different groups of enzymes proteases are present in leukocytes, celestas and play several different roles in metabolic control. Proteases determine the life time of other proteins playing important physiological role like hormones, antibodies or other enzymes. This is one of fastest "switching off" regulatory mechanism in physiology of an organism. They are also used in field of agriculture, medicine and food industry. Proteolytic enzymes are the most important industrial enzymes, representing. White rot fungi are important in industrial enzymes productions, since they are able to synthesis and secrete large amount extra cellular proteins. In the present study the Penicillium ianthinellum and Neurospora crassa was isolated from marine soil of South Andaman Islands. The isolated strain of P. janthinellum was found to be a potential producer of protease and Xylanase than N. crassa. The optimum pH for the activity of protease in both species was 6.5 and the optimum temperature was found to be 30°C. The molecular mass of protease was determined by SDS-PAGE and their molecular weight was detected as 39 KDa.

Keywords: Pharmaceutical biotechnology, leukocytes, Proteases, Penicillium janthinellum.

28. Assessment of effects on brain of albino rats after exposure to Semecarpus anacardium extract Part II: Effect on activity of some enzymes C.V. Choudhari¹ and P. B. Deshmukh² ¹Dept. Chemistry, ²Dept. Zoology, N.E.S.'s Science College, Nanded (M.S), India chhayachoudhari@yahoo.co.in

Semecarpus anacardium, a potent medicinal plant, is commonly found in tropical areas. It is popularly known as 'dhobi's marking nut'; in sanskrit called Bhallataka/angnimukh. It is well known for medicinal and commercial importance. S. anacardium is commonly used in tribal communities of Maharashtra, Madhya Pradesh, and Andhra Pradesh for maintaining health and immunity. For this a large number of people from mostly rural areas is involved to extract the needed oil from its pericarp. During extraction, workers are exposed to pericarp oil, its fumes in nearby environment that create ille-ffects like corrosive action, serious problems of skin, eves etc. No work was reported on toxicity caused by S. anacardium. Hence, in order to assess adverse effects of S. anacardium pericarp oil, a systematic work was conducted in albino rats (wistar strain). Animals were exposed to S. anacardium extract (SAE) (50% w/v in ground nut as vehicle) orally along with diet. LD₅₀ was found 1gm/ kg b.wt./day. Study was conducted at sub lethal SL levels. Results were compared with control group. SAE caused adverse effects on digestive physiology and some haematological aspects of albino rat and developed pathological conditions in albino rats. We also assessed the effects of SAE on activity of some enzymes GOT, GPT, SDH, LDH, AChE in brain of albino rat (Wistar strain). Nine groups of albino rat of either sex were orally treated with three sub lethal SL doses (i.e. 250, 500, 750 mg/ k.b.wt/ day), one group of each sex was maintained as control. As compared to control a prominent and significant changes of increased GOT, GPT, SDH, LDH as well as AChE activity. These changes are correlated with severe adverse effects on brain enzymes leading to serious pathological condition like tissue damage, necrosis in experimental albino rat. It also reflects disturbed brain functioning in exposed rats. Thus in order to avoid improper environmental conditions causing hazard, findings of the study compel us to think about method which provide safety as well as safe environmental education/training to workers/ users of involved in separation of kernel and extraction of pericap oil from Semecarpus anacardium nuts to avoid exposure and to users.

Keywords: Semecarpus anacardium, brain, albino rat, enzymes, environment safety.

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29. Scientometric profile of nanobiotechnology

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Nanobiotechnology is the convergence of engineering and molecular biology that is leading to development at the atomic, molecular or macromolecular size range to create and use structures, devices and systems that have novel properties. The true promise of nanotechnology lies in the ability to manipulate materials on the same unimaginably small scale used by nature. On the commercial front, nanotechnology has enhanced every field in science, engineering, and technology; a phenomenal advantage, thus giving high efficiency and profitability. Nanobiotechnology is the branch of nanotechnology with biological and biochemical applications or uses. Nanobiotechnology is that branch of one, which deals with the study and application of biological and biochemical activities from elements of nature of fabricate new devices like biosensors. Nanotechnology is often used to describe the overlapping multidisciplinary activities associated with biosensors-particularly where photonics, chemistry, biology, biophysics, nanomedicine and engineering converge. Scientometric studies are suitable for evaluating the scientific achievements of individual subjects, people, country, etc. The major areas of Scientometric study is determined statistics of literature relating to the country of origin. subject and common language distribution document as well as their incidences. Scientometric studies also derive the subject relationship which suggest desirable general pattern of service coverage. Further it also provides structure of knowledge and pattern of communication. Analysis of the size and growth of literature can identify the developing and declaiming areas over a time and trend of growth literature.

Keywords: Nanobiotechnology, biosensors, scientometric study.

30. Safety and control measures of fatty acids used in the bakery and deep fried products

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Fats available to the baker have been chemically hardened by hydrogenation. Fats are often used in bakery products due to their moisture content, calorific value, improved flavor, non sticky property and texture; these fatty oils were used as bakery ingredients to improve mouth feel and palatability of the finished foods. The hydrogenation process are susceptible to formation of trans fatty acids which on consumption in excess results in an increase of plasma low density lipoprotein (LDL) which leads to coronary heart disease. The goal of partial hydrogenation is to add hydrogen atoms to unsaturated fats making them more saturated. More saturated fats have a higher melting point making them attractive for baking and extending their shelf-life. The present study shows the safety and nutritional measures of selected bakery products with the estimation of fats used in them and quality analysis of deep fried product and the fatty oils used for their preparation. Bakery products are important part of a balanced diet and a wide variety of baked products are found on the supermarket shelves. The fats present in these baked products (or) the fats used for preparing baked products do not remain the same as we get from the market, some physical and chemical changes takes place in the fats after heating/ processing and consumption. The normal range of baking temperature is from 185°C-200°C. The most frequent faults in oven technique and baking procedure are insufficient over heat, excessive oven heat, too much steam, not enough steam high pressure steam, improper heat distribution and incorrect pan spacing. The physical and chemical properties of fat molecule are important for many forms of life, which serves the structural and metabolic functions; fats are important part of most heterotrophy. Vitamin A, D, E & K are fat soluble they can only be absorbed, digested and transported in conjugation with fats. By bonding with triglycerides fats are broken down in the body to release glycerol and free fatty acids. The glycerol can be converted to glucose by the liver and thus used as a source of energy. A large body of scientific evidence supports including a higher proportion of good unsaturated fat and less bad saturated and trans fat in the diet in order to lower the risk of chronic diseases. Many manufacturers have made or are now working to make trans fat-free solutions for their products. Food manufacturers are required to list the amount of trans fat per serving on the

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Nutrition Facts Label of food products. This ruling will enable consumers to choose foods free of *trans* fatty acids. "*Trans* fat intake could also be reduced if food manufacturers and restaurants choose to use alternatives to partially hydrogenated oils"

Keywords: Hydrogenation, trans fatty acids, LDL cholesterol, heart disease.

31. Organic and conventional foods

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The fundamental basis of many ecological farming systems is "Healthy soil equals healthy food equals healthy people". India is the cradle of the greatest diversities of both wild and cultivated crops. During the Vedic period. India brought out 4, 00,000 varieties of rice which has slowly but steadily reduced to 2, 00, 000. Even with this reduced number, if a man were to eat one rice variety everyday of his life, he would live for 500 years. India cultivates only 400 rice varieties. This is a result of green revolution, which has diminished and destroyed our indigenous knowledge of agriculture. This alarming rate of ecological and bio-diverse destruction has now been recognized in the agricultural sector and the need for conservation is acknowledged by the farmers in different states through organic farming. Organic farming is also known as Eco farming, biological farming, bio-dynamic farming or macro biotic agriculture. It is a holistic form of agriculture, incorporating modern science based methods of production as well as ancient knowledge. Organic farming is very much native to our country. The farmers of India and China are known as "Farmers of Forty centuries" and it is organic farming that sustained them. The basic principle in organic farming is that any nutrient supplied to plants should be assimilated by micro organisms before they are dissolved in water for easy uptake by the plants. Chemicals were considered a breakthrough in agricultural production when they made an entry into India in the name of green revolution during the 1960's due to population explosion. Chemical fertilizers are responsible for deterioration of soil fertility, destruction of beneficial soil organisms such as earthworms, bacteria and micro anthropods. Thus this study was conducted with the following objectives. i) To compare the nutrients present in selected organic and conventional foods. li) To visualize the qualitative difference in selected organic and conventional foods with holistic analytical techniques. iii) To compare the acceptability of organic and conventional foods in color and appearance, texture, flavor, taste and percentage acceptability using standardized recipes. The study design utilized for this purpose is descriptive research design - ex post facto in nature. The experimental design adopted for the study was completely randomized experimental research design. The organic and conventional foods selected for the study are raw rice, basmati rice, rice flakes, wheat flour, ragi flour, bajra, whole green gram, green gram dhal, red gram dhal, Bengal gram dhal, black gram dhal, karamani, soya bean, rajmah, ground nut, cashew nut, almonds, dry grapes, jaggery and sugar. In order to assess the acceptability of both organic and conventional foods, traditional Indian recipes like rice flakes payasam, chapathi, ragi kanji, bajra roti, whole green gram sundal, pongal, dhal rice, masal vadai, medu vadai, karamani sundal, rajmah sundal, raw steamed groundnut sundal, cashew nut, raw almonds, raw dry grapes, sweet pongal and lemon juice were selected. The acceptability was assessed in terms of color an appearance, texture, flavor rand taste. In all the recipes the basic ingredient was either organic or conventional but the other ingredients were conventional in nature. A score card was used during evaluation. It was observed that there were differences between the nutrient content of organic and conventional foods. For example in basmati rice, the moisture, fat, protein, crude fibre, sodium and iron content of basmati rice was high compared to conventional basmati rice whereas the minerals like potassium, calcium and carbohydrates were low in organic basmati rice. On holistic analysis using circular paper chromatography, there was a difference in the chromas of organic foods compared to conventional foods in terms of concentric rings, spokes, color (pink) and holes. The chromatographic study clearly showed that the quality of organic foods were superior compared to conventional foods. It was also observed that though there was no big difference between the mean scores of organic and conventional foods, there were significant differences between the sensory characteristics of some recipes. Thus it could be concluded that the organic foods selected for the study showed a significant difference in their nutritional quality and acceptability as compared to conventional foods.

Keywords: Ecological farming, green revolution, chemical fertilizers, nutritional quality.

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32. Indirect organogenesis in *Cyamopsis tetragonoloba* (L.) Taub using leaf explant T. Gouthaman and C.K. Hindumathy Dept. of Bioscience, Vinayaka Mission Kirupananda Variyar Engineering College,

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Cvamopsis tetragonoloba (cluster bean or guar) of the family Fabaceae is a multipurpose crop adapted well to arid/semiarid soils and preferring hot dry climatic conditions. It is a native of India and is grown principally for its green leafy fodder and pods that are used as food and feed besides as a soilenriching crop legume. Guar as a legume also helps to increase soil fertility, fixing atmospheric nitrogen for its own need and also acts as green manure for subsequent crop(s). Various industrial applications of guar powder are food, pet food, nutritional products and pharmaceuticals, personal care products, household products, paints, textiles and carpets, mining and flocculation, oils, gas and other deep well operations, manufacture of paper, building and construction products, explosives, foundries and ceramics, industrial cleaners and related formulations, agricultural formulations and applications. However, the productivity of guar gum remained torpid by and large, since in the last two decades due to erratic rainfall and its distribution in cultivated areas, considerably affecting guar productivity and its overall yield. Tissue culture techniques could play an important role in the multiplication of their elite cones and possibly their germplasm conservation. The growing industrially needs can be catered by going to this technique. The present study reports the in vitro production of C. tetragonoloba via indirect organogenesis. The leaf explants produced calli on MS medium fortified with 2, 4-D (2 mg/l). The maximum number of shoots (40/explant) was obtained on MS medium fortified with BA (2 mg/l) and elongation was obtained in the same media combination after subsequent subculture. The elongated shoots were transferred for rooting on MS medium supplemented with IAA (1.5 mg/l). The rooted shoots were hardened and transferred to the field.

Keywords: Cyamopsis tetragonoloba, soil-enriching, germplasm, calli, MS medium.

33. Biodegradation of silk industry effluent by *Pseudomonas fluorescens* and its effect on different vegetable plants

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Industrialization is vital to a nation's economy because it serves as a vehicle for development. However there are associated problems resulting from the Industrial waste products into the environment. Many of these products are problematic because of persistence (low degradability) and/or toxicity. The textile industry accounts for two-thirds of the total dyestuff market. During the dyeing process, approximately 10-15% of the dyes used are released into the wastewater. The presence of these dyes in the aqueous ecosystem leads to serious environmental and health concerns. The available methods used for removal of these are very expensive. The ubiquitous nature of bacteria makes invaluable tools in effluents bio-treatment. Microbial decolourization and degradation is an environment friendly and cost-competitive alternative to chemical decomposition process. Moreover decolourization and degradation can also detoxify the effluent efficiently without leaving any residues. In the present work the efficacy of *Pseudomonas fluorescens* was tested against textile industrial effluent and mainly concentrated on napthol. The effect of degradation of effluent was also studied on growth of certain vegetable plants like Mustard, Chilli, Tomato, Pea and also biochemical changes associated with degradation is also observed. The amount of napthol degradation of textile effluent is also checked through HPLC.

Keywords: Industrialization, total dyestuff market, cost-competitive, bio-treatment.

34. Comparison of the antioxidant and antimicrobial activities of selected Indian medicinal plants with the poly ortho amino phenol and its nano compounds

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The cells are constantly exposed to potentially harmful load of oxidants, leading to various free radicals induced noxious effects. These include oxidation of nucleic acids, proteins, lipids and carbohydrates which may subsequently determine mutagenesis and diseases related to DNA damage. This imbalance leads to oxidative stress involving aging and various diseases like stroke, diabetes, cancer and neuro ______ 143

generative diseases like Alzheimer's and Parkinsonism. The balance between antioxidation and oxidation is believed to be a critical concept for maintaining a healthy biological system. Traditional medicine in many countries plays an important role in maintaining people's health. Most of the populations in developing countries depend directly on the plants for their medicinal requirements. Recently there has been an interest in the therapeutic potential of medicinal plants as antioxidants in reducing free radicals. The aim of this study was to compare the antioxidant and antimicrobial activities of leaves of selected Indian Medicinal plants like Agave americana. Passiflora foetidia. Morinda pubescens and Achyranthes aspera, with the synthesized polymers like Poly amino phenol and poly amino phenol nano compounds using DPPH assay. The antioxidant activity was measured for zero minute and thirty minutes with the concentration of 500ig/ml. for the plant extracts, polymer and the polymer nano compounds using L-Ascorbic acid as a standard. All the plant extract and the polymer showed different activities. The antioxidant and antimicrobial activity increases as the concentration of the plant extract and the polymer. The results clearly indicate that the antioxidant activity of A. americana. P. foetidia and A.aspera were highest in the methanolic extract when compared to Chloroform and n-hexane. M. pubescens showed the highest antioxidant activity of 92% after 30 min in hexane plant extract. The antioxidant activity of the plant product in different solvents was higher than the synthesized polymer and the polymer nano compounds at the same concentration. The radical scavenging activities of the polymer nano compounds were higher than the polymer. This may be because of the low surface area due to its reduced size with the addition of the surfactant SDS. The antioxidant activity of the polymer and the polymer nano compounds were highest at the higher concentration and in prolonged time. The methanolic extracts of leaves and roots of A. americana were screened for the seven human pathogenic microorganisms like Escherichia coli, Klebsiella pneumonia. Salmonella typhi, Shigella sonnei, Bacillus cereus, Salmonella paratyphi and Staphylococcus auereis. At a concentration of 50ìg/ml the plant extract and the polymer displayed various degrees of activity in agar well diffusion technique. The diameter of zones of inhibition varied according to the bacterial strains both for the plant products and for the polymer compounds. The diameter of the inhibition zone against the bacterial strains increased as the concentration of the plant extract increased. The inhibition zone was highest for the root of Agave americana against S. paratyphi with the inhibition zone of 15 mm and it showed good inhibition against Salmonella typhi, Shigella sonnei, B. cereus and K. pneumonia whose inhibition zones were 8 and 9. The inhibition zone for the leaves of Agave american for all the bacterial strains varied from 6 to 11 except for B. cereus and S. auereis. The antimicrobial activity was greater for the polymer and its nano compounds when compared the plant extract. The study which was conducted against two bacterial stains like B. cereus and P.fluorescence showed higher inhibition zone increased to 12 mm and the inhibition zone again found to increase for the polymer nano compounds. The inhibition zone increased from 12mm to 14mm. The activity increased as the concentration increased and for the prolonged time of 48 hrs. The natural products like plant extracts and the synthesized polymer and its nano compounds are effective scavengers of stable DPPH free radical and they can be acted against different bacterial stains. This antioxidant and antimicrobial property of the plant extract, polymers and its nano compounds may be beneficial, particularly in situations in which disease states may lead to excessive levels of free radical species and the diseases causing microbes.

Keywords: DPPH assay, antioxidant, antimicrobial, poly ortho amino phenol, bacterial strains.

35. Prospects and perspectives of solid waste management and vermicomposting in Auxilium college campus, Tamil Nadu, India

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Due to the burning of solid wastes and the disposal of the industrial and chemical liquid wastes the environment is polluted and it affects the atmosphere leading to the ozone layer depletion and global warming. The organic waste when properly managed can be turned into organic compost and fragmented rapidly by earth worms resulting in a stable vermicompost which has potential, high economical value as a soil conditioner for plant growth. The aim of this study is to analyze the harmful effects of solid waste and to propose and to undertake the project on solid waste management and vermicomposting in Auxilium College Campus, Vellore, Tamil Nadu, India. The college campus has sprawling greenery with rich flora and fauna of 100 acres with the population of more than 7,000. In the past, waste especially physical discharges were collected in small pits, dustbins etc and these

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materials were dumped in the remote areas of the campus and burnt. This caused ill health and respiratory problems to the people inside the campus and the neighborhood. In order to enhance the quality of the environment in the campus, the project on solid management and vermicompost was started in 2008. A survey was adopted to study the proposed amount of garbage accurately and to design the methodology of the implementation of the project. An awareness programme was organized at different levels on different days. The economically poor women were selected and they were given a training programme for fifteen days by a nongovernmental environmental organization (NGO). The trained people put their heart and soul in carrying out the project. The steps executed are: Primary, secondary and tertiary segregation. The primary segregation is done to a certain extent at the collection point as the students themselves are trained to dispose organic and inorganic waste separately in different dust bins. The employed women collect these wastes in tricycle meant for it and take it to the project site. The secondary segregation is done by the workers. The organic wastes are segregated in to vegetable / fruit peel waste, coconut shells, egg shells, lemon orange peels, non-vegetarian wastes and the rest to be converted in to compost. The vegetable and fruit waste are used as a cattle feed. The coconut shells are used as a fuel in the college canteen. The fibers are used as raw material for vermicomposting. The egg shells which are rich in calcium is dried and powdered and used as manure. The lemon and orange peel are used for cleaning purposes. The organic waste is converted into organic manure. The tertiary segregation consists of collection of inorganic waste and dividing in to recycling and non recycling waste. An average of 10 tonnes of inorganic waste and 15 tonnes of organic waste are collected per day from the campus. The earthworms are selected for vermicomposting. Vermi beds are prepared according to the standard procedure. Depending upon the size of the tank and the number of worms the composting time varies. The maintenance of bedding materials, the appropriate moisture content, suitable temperature, pH, selection of the right type of the worm species and the cover of the feed materials are followed meticulously. The resulting vermicompost found to contain 5 times more nitrogen, seven times more phosphorous, eleven times more potassium, two times more magnesium and calcium. The organic manure and the vermicompost are marketed in the campus and it is used for cultivation of the crops and for the gardens in the college campus. The atmosphere of the campus is pollution free devoid of littering and burning. The implementation of the project has stressed the importance of solid waste management and its positive impacts on health and hygiene. The income generated is made use for the self sustenance and for the development of the project. This step undertaken by the Department of Chemistry, Auxilium College is a great contribution to the prevention of the environmental pollution and global warming. This project is also follows the environmental policy "Reduce, Reuse and Recycle".

Keywords: Auxilium college, solid waste, vermicompost, organic manure, earthworm.

36. Effect of increasing the fuel injection pressure on the performance of Mahua oil fuelled diesel engine

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The compression ignition engine is the major prime-mover for the surface transport in many developing countries. Diesel fuel is the most preferable fuel for compression ignition engines. The ever-increasing price of diesel fuel and increase in the population of diesel fuelled automobiles forced researchers to find suitable alternative fuels for diesel. Among the various alternative fuels, vegetable oils have played an important role as fuel for more than 70 years in many countries. Vegetable oil is derived from renewable source: it is a environmental friendly and nontoxic resource. The use of vegetable oils can effectively substitute diesel fuel and help to reduce the import of petroleum crude. Besides, it also creates huge rural employment. Dr. Rudolf Diesel developed the compression ignition engine in 1895 and hence the compression ignition engine owes the popular name diesel engine. He had demonstrated the working of his engine by running it with peanut oil at the world exhibition held at Paris in 1900. Rudolf Diesel was the pioneer to use vegetable oil as the fuel in diesel engine. Even though Rudolf diesel demonstrated peanut oil as fuel in his engine, vegetable oils has gained only less popularity due to the availability of cheaper petroleum fuels at that time. Vegetable oils have high viscosity and low volatility resulting in heavy smoke emission, carbon build up and seizure of fuel system. The high viscosity and poor volatility characteristics affects the atomization, evaporation and air-fuel mixture formation characteristics, causing severe carbon deposits on the cylinder head, piston, piston rings, injector nozzle, intake and exhaust valves. Vegetable oils need to be formulated to a

more engine friendly form. Several studies have been conducted by modifying the neat vegetable oil; i) processed vegetable oils, ii) micro-emulsions iii) preheated vegetable oils, iv) vegetable oils diluted with diesel oil or ethanol v) esters of vegetable oil (biodiesel). Increasing the injection pressure contribute largely to reduce smoke emissions and improve engine performance. In the present work, neat mahua oil (without any modification in its fuel properties) was used as a fuel in a direct injection diesel engine. Mahua oil is a non-edible vegetable oil. Mahua oil is obtained from the seeds of mahua tree. Madhuca indica is the botanical name of mahua tree which is known as mowrah in Hindi, Illuppai in Tamil and butter tree in English. The physical properties of mahua oil indicate that the viscosity is nearly 8 times higher than diesel and calorific value is 15% of lower than that of diesel. Neat mahua oil was injected directly into the combustion chamber of the engine without changing the injection timing. Later the test was conducted by varying the fuel injection pressure to effectively utilise neat mahua oil. The manufacturer recommended injection pressure of the experimental diesel engine was 185 bar. Combustion, performance and emission tests were conducted out in a naturally aspirated, single cylinder, water-cooled, direct injection diesel engine with fuel injection pressures of 185 bar, 200 bar, 250 bar, 300 bar, 350 bar and 400 bar. The injector pressure was set in a nozzle pressure tester. The fuel injection pump element was modified above 300 bar pressure. The combustion parameters such as cylinder pressure and net heat release rate were investigated using a pressure transducer, charge amplifier and data acquisition card in the engine experimental test rig. The net heat release rate was found at different injection pressures. Performance parameters such as brake specific energy consumption, brake thermal efficiency and emission parameters such as NO_v, CO, HC and smoke density were evaluated at different injection pressures. It was found that the maximum heat release during the premixed phase for mahua oil injected at 350 bar was higher than diesel and mahua oil. The heat release rate was maximum in the case of mahua oil injected at 350 bar than neat mahua oil. The engine performance and smoke emission had significantly improved with increase in injection pressure. At higher injection pressures the NO_v concentration increased; however it was lower than pure diesel operation. It was found that the brake thermal efficiency for mahua oil at 350 bar injection pressure was 23.9%, whereas for diesel, it was 25.8% and for neat mahua oil it was 20.9%. The smoke density for mahua oil injected at 350 bar pressure was 2.2 BSN.

Keywords: Compression ignition engines, diesel fuel, mahua oil, injection pressure, smoke density.

37. Effect of textile mill effluent on growth of Vigna unguiculata and Pisum sativum seedlings

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The aim of the presented research work was to determine the effects and suitability of textile mill effluent at different concentrations (0, 20,40,60,80 and 100%) for irrigation purposes. Effluent sample collected from Solapur Industrial area and physico-chemical parameters of these samples were analyzed. The seed varieties of *Vigna unguiculata* (Cowpea) and *Pisum sativum* (pea) were selected to grow in this effluent. These varieties grow abundantly in study area and are very demanding species for food purposes. The textile mill effluent did not show any inhibitory effect on seed germination at lower concentration. With the increase in effluent concentration, growth of seedlings was found more affected. Effect of textile mill effluent on various parameters of seedlings such as Seed Germination, Mean Root Length of germinated seedlings, Plumule germination, Mean Plumule Length of germinated seedlings, Disease (Fungus) causes in germinated seedlings and other morphological characters are studied.

Keywords: Seed germination, textile mill effluent, growth, seedlings.

38. Indigenous marine algae-source for antioxidants

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Most organisms have evolved antioxidant defense and repair systems to protect them against oxidative damage; however, these systems are insufficient to prevent the damage entirely. In order to prevent the oxidative damage by ROS, many diseases have been treated with antioxidants. However recent studies revealed that the use of synthetic antioxidants may impart dangerous side effects and may

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even cause death. The control of free radicals is today one of the most intensively investigated medical research topics. The usage of antioxidants, which occur naturally, and from other biological materials has attracted considerable interest due to their presumed safety, nutritional and therapeutic value. Recent studies have demonstrated algae to be a rich source of antioxidant compounds. Macro algae belonging to 217 genera and 844 species harbor along the Indian coast line and seawaters. Red, brown and green algae are the three most important algae groups which occur along the coast line and a number of investigations have been carried out by the pharmaceutical industries to study the impact of seaweeds on human health as they are consumed as food in many East Asian countries. Algae are being used as alternative medicines for stimulating the immune system, treating anemia, goiters, cancer, tumors, respiratory ailments, skin infections, fatigue, obesity and toxicity. Many compounds have been isolated and identified from the crude extracts of various algae species which showed promising biological activities. Algae are also being used as fertilizer, as pigments for dyes and in pollution control. Many marine algae have been a source of polysaccharides, dietary fibre, minerals, proteins, lipids, fatty acids. Micro nutrients such as vitamin B12, vitamin C, vitamin E, polyphenols, carotenoids present in the algae act as a source of natural antioxidants. Many algal species are being explored for their antioxidant potential so that they can be utilized as an alternative medicine in treatment of various diseases caused by free radicals. In the present study, antioxidant potential of the methanolic extracts of four red algae species namely Halymenia floresia, Kappaphycus alvarezzi, Gracilaria corticata and Gracilaria edulis has been evaluated by DPPH radical scavenging, ferric reducing antioxidant power (FRAP), ferrous ion chelating (FIC) activity, reducing power and superoxide scavenging assays. The DPPH radical scavenging activity assay was carried out to know the antioxidant potential of the seaweed extracts to act as free radical scavengers and all the methanolic extracts of the algae showed increasing scavenging effect with increased concentration. Gracilaria corticata showed highest percent (45%) of radical scavenging activity followed by Halvmenia floresia (28%), G. edulis (11%) and K. alvarezii (9%) at a concentration of 6 mg/ml. The ability of the antioxidant compounds present in the tested extracts to reduce ferric (III) to ferrous (II) by a redox-linked colorimetric reaction involving single electron transfer was determined by FRAP. G. corticata had the highest ability to reduce Fe³⁺ and all the methanolic extracts of algae showed increasing FRAP with increased concentration. The FRAP values measured as absorbance at 595 nm were in the range of 0.19 - 0.49 at 20 mg/ml concentration. The ferrous ion chelating (FIC) assay was used to evaluate the binding of antioxidant components to metal ions and the chelating effects of methanolic extracts of the algae on ferrous ions increased with increasing concentrations. G. edulis exhibited highest chelating ability whereas Gracilaria corticata exhibited lowest chelating ability at the highest extract concentration of 20 mg/ml. Reducing power of all the algae extracts increased with increasing extract concentration showing that the antioxidant power is concentration dependent and all the extracts showed absorbance value less than 1 at 700 nm of 15 mg/ml extract concentrations, G. corticata exhibited highest reducing power ability whereas H. floresia exhibited the lowest reducing power ability. Superoxide radical scavenging assay showed G. corticata to be having the highest superoxide radical scavenging effect followed by G. edulis, K. alvarezii and H. floresia. At 20 mg/ml extract concentration, the superoxide scavenging effect ranged from 84 - 62%. The total phenolic content (TPC) expressed in terms of Gallic acid equivalents (1 mg/ml) and total flavonoid content (TFC) expressed in terms of Quercitin equivalents (1 ig/ml) were found to be more in G. corticata, followed by G. edulis, H. floresia and K. alvarezii. All the assays were carried out wrt various antioxidant standards and it was observed that the antioxidant activity of the algae extracts is concentration dependent. It was evident from the current study that all the four algae species exhibited moderate to high antioxidant activities and can be a good source of natural antioxidant compounds. All the four algae species exhibited the same trend wrt their superoxide scavenging and reducing power abilities which may be attributed to their total phenolic content. G. corticata had highest antioxidant potential and the results of the present work are very useful to carry out further research to identify, isolate and characterize the bioactive compound which is responsible for its high antioxidant property for industrial and pharmaceutical applications. Keywords: Reactive oxygen species, Alzheimer's, Parkinson's diseases, Gracilaria corticata.

39. Quantification of DNA in selected sea weeds of Chennai using Nano vue Spectrophotometer

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It is for the first time an attempt has been made to isolate pure nuclear DNA in the red alga *Bryocladia thwaitesii* (Harvey ex. J. Agardh) Detoni and it has been compared with a green alga

Ulva covelongenesis V. Krishnamurthy & H. Joshi from Covelong Chennai, Tamil Nadu. Best method of isolation of DNA in these sea weeds has been identified (Remi A. Wattier et al (2000) modification of Dellaporta et al (1983). Quantification analysis (purity and concentration) was made using Nano vue UV Spectrophotometer as a pioneering effort in *B. thwaitesii* and *U. covelongenesis*. Qualitative analysis of DNA was also performed in these two species of algae by agarose gel electrophoresis. Purity, quantity and yield of DNA were found to on the higher side in these two taxa. Nano vue UV Spectrophotometer used in the present study is for reliable measurement to check purity and concentration of DNA with OD range 260:280 ratio, which might reveal satisfactory DNA purity for PCR based applications also and would be a great research tool for restriction endonuclease based (RE) studies. The DNA isolation protocol identified in the present investigation in these seaweeds would become well suited for PCR amplification and genomic library construction. **Keywords:** *Bryocladia thwaitesii, Ulva covelongenesis*, endonuclease, seaweeds.

40. Studies on the effect of farmyard manure, poultry excreta and neem cake incorporated in diluted distillery effluent on nematode control and vegetable growth Nirmala Nataraian

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Tomato is considered as important commercial and dietary vegetable crop. Currently the tomato has a higher consumption rate in more developed countries and is often referred to as a luxury crop. Lycopene is a very powerful antioxidant which can help prevent the development of many forms of cancer. Agricultural soil harbor a large number of plant pathogenic organisms of which plant parasitic nematodes are considerable important. In general, the most widespread and economically important nematode species include the root-knot nematode. Meloidogyne spp. Biological control of nematodes is an alternative strategy for the management of plant parasitic nematodes especially in the modern era where usage of chemicals has been almost abandoned. Many different types of amendments and composted materials have been applied to soil to suppress populations of plant parasitic nematode and improve crop yield and plant health. Animal manures, poultry litter, and disk-incorporated cover crop residues are typical examples of soil amendments used in agriculture to improve soil quality and as a means for enhancing biocontrol potential of soil. Some amendments which contain chitin and inorganic fertilizers that release ammoniacal nitrogen into soil suppress nematode populations directly and enhance the selective growth of microbial antagonists of nematodes. The distillery effluent application improves the soil fertility and health and support good plant growth leading to saving of fertilizers. The only problem with distillery effluent is excessive Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and electrical conductivity. These problems could be overcome by proper dilution. A pot culture experiment was conducted in greenhouse to individuate a strategy for the control of root-knot nematode Meloidoavne incognita (Kofoid and White) Chitwood on tomato. Pure culture of *M.incognita* was raised from single egg mass progeny and maintained on tomato seedlings. Totally there were four treatments with three replications each. Treatment (T1) with farmyard manure (FYM), treatment (T2) with guvana, treatment (T3) with neemcake and treatment (T4) control with only nematodes. Three kg solarized soil was filled in an earthen pots of five kg capacity. In T1 pots one kg of FYM, in T2 pots one kg of poultry excreta and T3 pots one kg of neemcake was added. These mixtures were left for decomposition for fifteen days. Fifteen days old tomato seedlings were transplanted two in each pot and watered regularly. These plants were thinned to one after 10 days. A week after transplantation, pots were inoculated with larval suspension of second stage juvenile of M. incognita. To each pot 4000 larvae (1 larva/g of soil) was added. 2.5% diluted effluent was found to be appropriate as an organic nematicide in reducing nematode population. First effluent irrigation was given 10 days after transplantation (DAT). Effluent irrigation was given once in a week and totally six effluent irrigations were given. Experiments were terminated at the end of 10th week. The plant parameters such root length, shoot length, root fresh weight and dry weight, shoots fresh weight and dry weight were measured and recorded. Reproductive parameters of *M. incognita* such as number of females, number of galls, number of egg masses, number of eggs per egg mass and root knot index were calculated and recorded. Among all the treatments only neem cake (T3) showed increased shoot length, shoot fresh weight, root length and root fresh weight. The neem cake significantly decreased numbers of free-living nematodes compared to controls; however, numbers increased in the cattle-manure-treated pots. This is followed by T2, treatment with poultry excreta. Post harvest

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soil analysis revealed the increase in number of soil microbes in all the treatments. The lowest number of soil microbes was recorded in control. The results indicated that the distillery effluent after proper dilution could be used as liquid fertilizer. As it is rich in organic amendments it enriches the soil and promotes plant growth, yield and also controls plant parasitic nematodes by favoring multiplication of saprophytic nematodes. Since neem is known to contain several chemicals (e.g. azadirachtin, nimbocinol, nimbin, etc.), that have been reported to have nematicidal properties. So TDE with proper dilution along with neem cake could be suggested for controlling nematodes in an eco-friendly way. **Keywords**: *M. incognita*, treated distillery effluent, farmyard manure, neem cake, poultry excreta.

41. Silver nanoparticles: A new generation of antimicrobials

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Over the past decade, there has been a strong push towards the development of silver-containing materials for commercial use that exhibit antimicrobial or bactericidal properties. The antiseptic properties of silver have been known for 30,000 years. Silver is one of the most universal antimicrobial substances. Nanotechnology enables us to expand the surface area of silver particles markedly. Therefore the antimicrobial activities and mechanisms of silver nanoparticles for several pathogenic bacteria were investigated. The present study summarises the physical and chemical characteristics of silver as a nanomaterial describing the antimicrobial mechanism of silver nanoparticle and its efficiency when coated on polyurethane foam. The study is concerned with the safety considerations of nano-silver and its requirements for the commercialization of antibacterial nanomaterials. The concentration of the silver nanoparticle is found to be 100 µg /ml and the size of the nanoparticle is 30-50 nm when observed under Transmission electron microscopy (TEM). Polyurethane foam was pretreated with the silver nanoparticle solution and incubated at 30 °C for 24 hrs. The precoated polyurethane foam was then tested against the test organisms. NCCLS method was performed with varying concentrations from 5 µg/ml to 50 µg/ml to determine the antimicrobial activity against Escherichia coli ATCC 25922, Staphylococcus aureus ATCC 25923, Klebsiella pneumonia ATCC 10872, Pseudomonas aeruginosa ATCC 27853, Antibiotic Resistance Human pathogen (HBA), Micrococcus luteus. Gradual decrease of growth of test organisms was observed from 5 µg/ml to 25 µg/ml concentration. In broth dilution technique, the prediction of bacterial growth was determined for 24 hours with one hour interval period. Silver nanoparticles inhibit the growth of Escherichia coli ATCC 25922, Antibiotic Resistance Human pathogen (HBA), M. luteus at 5, 7 and 8 hrs respectively. Clear zone was obtained indicating its potential antibacterial activity. The silver nanotechnology confirmed the bactericidal effect of silver impregnated materials, has open new corridors for new and improved antimicrobial medical and consumer products.

Keywords: Silver-containing materials, antimicrobial or bactericidal properties, Staphylococcus aureus.

42. Textile industry effluent induced changes in growth behaviour of blackgram varieties

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Textile dye industry plays a major role in promoting the economy of our country. It is one of the major water consuming and high polluting industries in India. Coimbatore a big city in Tamil Nadu is called Monster of India because of the establishment of textile industries in that area. Tirupur, a small town, near coimbatore, has nearly 850 textiles produced a variety of coloured banians, T-shirts and readymade dresses for the growing population. It earns a considerable amount of money through foreign exchange. On the other hand, it creates a lot of environmental problems *i.e.*, water and soil pollution. The treated or partially treated wastewater discharged into nearby river called Noyyal and finally it reached a small dam from which it is released for irrigation. So the present research work has been carried out to find the effect of different concentrations of textile dye industry effluent on germination behaviour of ten varieties of blackgram. Seed germination percentage, seedling length and dry weight of seedlings were taken into consideration for this experiment. All these parameters

increased at lower concentration of effluent (up to 10%). However, the higher concentration (25 & 50%) reduced the above mentioned parameters. On the basis of the data obtained from germination studies, the variety T_9 is found to be tolerant for effluent treatment than the other varieties tested. It was confirmed by conducting field experiments.

Keywords: Textile dye, soil pollution, noyyal, seed germination.

43. Application of chemical fertilizers and agriculture sustainability in Tamil Nadu-Myths and realities

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Chemical fertilizers are one of the key inputs which contribute to the increase in agricultural production. In recent times more chemicals are dumped into the soil which results in deleterious and myriad effects on soil environment. The green revolution technology has also forced the farmer to the intensive use of inputs tike exotic variety of seeds, chemical fertilizers, modern irrigations, pesticides etc. The application of chemical fertilizers may be profitable in the short run, but in the long run it fails to produce the desired results. Chemical fertilizers are more expensive and increase the production cost which is unbearable for the small and marginal farmers. Continuous and excess use of chemical fertilizers leads to loss of organic humus, deterioration of the fertility of the soil and a decrease in the porosity. It is harmful to the environment and spoils many beneficial micro organisms, animals, insets and birds which are helpful to the farmers. It is also a problem in occupations setting particularly among small population where men, women and children are work and live in close proximity to fields. Imbalanced and improper use of chemical fertilizers leads to toxin in the human body, animals and cattle: destruction of worms and insects which helps farmers; destruction of algae which is used as a green manure; deterioration of the fertility of the soil, ecological imbalance etc. It is found that two thirds of death occurs due to inappropriate use of chemical fertilizer. It is true threat chemical fertilizers proves to be an effective input by showing a great hike in agriculture production and but also creating self sufficiency in food grain production but of the increased food grains in India 40% is attributed to chemical fertilizers. In this juncture, at the outset this paper analyses about the positive effects of chemical fertilizer in the short run and also examines the health hazards in the long run. Necessary secondary data are collected to explicit the positive and evil effects of chemical fertilizer. Keywords: Chemical fertilizers, agricultural production, ecological imbalance.

44. Nutrition education-As an interventional strategy of obesity

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Adolescent obesity is an emerging problem in Indian adolescents and it may be major contributors to the adult obesity epidemic. Nutrition education is one of the methods through which awareness can be created in the public to implement intervention measures and modify their dietary pattern. The objective of the study is to impart nutrition education to the obese adolescents in order to improve their dietary habits and to know the effect of nutrition education. The study is based on cross sectional evaluation of anthropometric parameters in Salem school adolescents (11-15 years). Subjects: 533 adolescents (297 boys, 236 girls). Subjects underwent assessment of height and weight and calculation of BMI. Adolescents were classified as normal, overweight and obese as per James et al classification. The nutrition education was imparted to overweight and obese adolescents by using software and MS-Powerpoint twice for a period of one month. The scores gained by the adolescents before and after nutrition education were collected, the quantum improvement was calculated and the effect of nutrition education was analyzed using paired sample't' test. Out of 533 adolescents, 13.5 percent of them were obese. Majority of the obese adolescents had knowledge about protein and vitamin rich foods and only minimum percent (33.83) of them had knowledge about fibre rich foods. The selected obese adolescents secured low scores (5) before nutrition education and their mean score was significantly increased (13) after education. The quantum improvement was 2.6 times. This study concluded that nutrition education may be an important component of effective intervention to enhance weight loss and the prevention of weight regain.

Keywords: Adolescent obesity, nutrition education, quantum improvement.

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45. Glycaemic index of *Stevia* product and its efficacy on blood glucose level in type 2 diabetes

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Stevia, a fantastic zero calorie sweetener, an incredible internal medicine, also products made from whole leaf concentrate have extra ordinary health benefits. The GI of foods has potential implications for the prevention and treatment of major chronic diseases, including diabetes, CHD and obesity. The objectives of the study were to determine the glycaemic index of chappathi with stevia leaf powder and to find out the therapeutic efficacy of chappathi with stevia extract on blood glucose level of women with Type 2 diabetes. Six women with diabetes were selected for determining glycaemic index of chappathi with stevia extract. The reference food (glucose), control food (chappathi) and test food (2 g% stevia incorporated chappathi) were given to each of the women on first, second and third day respectively. Blood glucose levels were read by Glucometre for every 30 min. until a period of 2 hours. Glycaemic index was calculated by incremental area under curve method. Six type 2 diabetic women were selected randomly from thirty newly diagnosed diabetic women and the selected women consumed chappathi prepared with stevia leaf powder (2 g%) daily for breakfast. Supplementation period was 30 days (31-60 days). The effect of stevia was tested at pre test (1-30 days) and post test design (61-90 days). The glycaemic index of control and test food was 71 and 62 respectively. Mean significant reduction was found in fasting (104 to 87.5 mg/dl) and post prandial (250 to 183 mg/dl) blood glucose concentration of type 2 diabetic women after 30 days of supplementation of 2 g stevia, moreover significant (P<0.05) increment was observed in mean fasting (87.5 to 93.2 mg/dl) and post prandial (183.1 to 199.5 mg/dl) blood glucose concentration after withdrawing stevia (60-90 days) from their daily diet. Hence it may be concluded that Stevia product had moderate glycaemic index and it reduces hyper glycaemia in type 2 diabetic women. Keywords: Stevia, glycaemic index, diabetics, blood glucose, supplementation.

46. Nutritional and phytochemical quality of homemade chocolates

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Cocoa is rich in polyphenolic compounds, predominantly procyanidin monomers, namely catechin and epicatechin, dimer, trimer, tetramer and up to tetradecamer chocolate is produced from cocoa tree (theobroma cocoa). It may be consumed as a beverage, syrup, flavouring or a coating or confection in itself. Nutritionally, chocolate is mainly an energy source, with only small amounts of nutrients, 50 g bar provides 265 kcal, which is 10% of an average man's daily energy requirement and 14% of women's. Cocoa a cash crop produced in Salem hill stations and homemade chocolates are produced locally and catered to the tourists who visit there. The present study aimed to assess the nutritional and medicinal quality of the cocoa based home made chocolates. The nutrients like carbohydrate, protein, fat, fibre, iron, calcium, potassium, magnesium were assessed using standard AOAC procedures in the standard as well developed chocolates. The secondary compounds and unique phytochemical of the cocoa based homemade chocolate was assessed in the highly accepted developed product and standard product using GC-MS and UV spectrophotometric methods. The nutrients like carbohydrate, fat and calcium content of standard homemade chocolate has shown reduction as the proportion increases like 50% (52.2, 42.6 & 38.2), 60% (16.2, 15.9 & 15.4) and 70% (7, 5.4 & 4) respectively. The other nutrients like protein, fiber, iron, potassium and magnesium contents increased as the proportion of cocoa powder increases than the standard homemade chocolate. The catechin content in standard was 5.2 mg whereas the developed product has 7.1 mg. Thus the developed product is nutritious and can be recommended in regular diets.

Keywords: Cocoa, polyphenolic compounds, procyanidin, catechin, homemade chocolate.

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47. Kinetics of polymerization of acrylonitrile initiated by the persulphate - co²⁺- ascorbic acid redox system in aqueous medium K. Shivakumar¹, M.S. Jayaprakash² and K. S. Rai³ ¹Dept. of Chemistry, PES Institute of Technology and Management, Shimoga-577 201, Karnataka, India. ²Sri Siddartha First Grade College, Tumkur-5770 006, Karnataka, India. ³Dept. of Polymer Science, Mysore University, Sir M.V. P.G. Centre, Mandya, Karnataka, India shivakuskur@gmail.com, kuskur@yahoo.com

The kinetics of polymerization of the acrylonitrile monomer (M), initiated by the free radicals generated by the persulphate (PDS) - Co²⁺- ascorbic acid (AH) redox system was studied in aqueous medium under atmospheric oxygen in the temperature range of 26-40°C. The rate of polymerization was determined at various concentrations of monomer and initiators. The influence of varying [M], [PDS], [A H] and [Co²⁺] were examined. Dependence of the rate of polymerization on temperature and effect of organic solvents have also been studied. Energy of activation was computed using Arrhenius plots. A mechanism consistent with the experimental data was suggested. The chain termination step of the polymerization reaction was by mutual interaction of the free radicals. These methods are simple, pollution free and energy consumption is very less. Also these reactions conserve energy of wood, fuels and other natural minerals.

Keywords: Acrylonitrile monomer, redox system, Arrhenius plots.

48. Eco-friendly prodigiosin pigment from native isolates *Serratia marcescens* and its application on textile fabrics

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Many artificial synthetic colorants, which have widely been used in foodstuff, dyestuff, cosmetic, textile and pharmaceutical manufacturing processes, comprise various hazardous effects. The total dye consumption of the textile industry worldwide is more than 10⁷ kg year¹. While in the textile industry, it is estimated that 10-15% of the dye is lost during the dyeing process and released with the effluent. To counter the ill effect of synthetic colorants, there is worldwide interest in process development for the production of pigments from natural sources. Thus, searching renewable and environmentally friendly resources for production of colorants is an urgent need. In the present study, the pigment, prodigiosin was extracted from native isolates *S. marcescens* MBB01, MBB02 and MBB05. The pigment was characterized by TLC, FT-IR and NMR analysis and applied to dye multifiber fabric. The dyed fabric was washed with 1% detergent solution to remove any physically absorbed colorant on the surface. Results indicated that acetate and acrylic fabrics were colored to a pretty deep shade, whereas cotton, nylon, polyester and wool showed light pink to light brown shades. This study plays a significant role in efficient utilization of natural pigment of microbial origin in the textile processing industry and thus reduces the usage of various synthetic dyes in the textile industry. **Keywords:** Artificial synthetic colorants, prodigiosin, *S. marcescens*.

GLOBAL ISSUES AND POLICIES INFLUENCING THE SUSTAINABLE DEVELOPMENT

49. Sustainable development: The role of institutions T. Chandramouli Dept. of Economics, RKM Vivekananda College, Chennai-4, TN, India Ialithtchandramouli@gmail.com

Sustainable development, in simple words means, development that takes place with less side effects on the environment. It means that it is not only the government, but also the role of civil society to foster to the needs of sustainable development. This paper makes an attempt to address the global issues under sustainable development and arrive at policy alternatives. Economies of today are more prone to the problem of externalities and hence a concerted action is necessary. Innovation and technological development should guide the activities towards sustainable growth so that the resources can be efficiently utilized. This paper highlights the various issues under sustainable development and more importantly calls for a greater role of various institutions in achieving the objectives. Besides the government, the role of private sector, banks (for financing clean technologies), education (for knowledge dissemination), local communities etc. are important so as to build up models towards sustainable development.

Keywords: Economy, environmental degradation, sustainable development, knowledge dissemination.

50. Potential of Sargassum for mankind

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Indian seawaters harbor 896 seaweeds among them the genus Sargassum alone contributes 78 taxa. Sargassum is being utilized for alginate production along with Turbinaria. Alginate is widely used for textile, paper, pharmaceutical and confectionary industries as gelling and stabilizing agent. In the present attempt S. wightii collected along the coast of Mandapam, Tamil Nadu was studied. Sargassum exhibits halplobiontic diploid type of life history - i.e. thallus of Sargassum is diploid, and reduction division takes place during gametogenesis. After the fusion of antherozoid and egg the zygote directly develops into Sargassum plant through repeated mitotic divisions. The arrangement of 'leaves' in Sargassum is alternate spiral. The air bladder, receptacle and lateral branches are developed at the axis of 'leaf'. Anatomical and histochemical studies made on different parts of Sargassum revealed the localization of different substances like alginic acid, fucoidin, cellulose, lipid, etc. Medullary cells of the 'stem' region embedded in a thick matrix. Transmission Electron Microscopic study exhibits the frequent peeling of out cell wall layers. This kind aspect facilitates the organisms to devoid any epiphytic organism. However the epiphytic load in the older regions indicates that the peeling of outer cell wall layers may not be frequent or absent. Perinuclear distribution of organelles such as mitochondria, Golgi apparatus, chloroplasts as well as physodes is also recorded. Physodes are known to contain phenolic substances which prevent the herbivores unlike green and red seaweeds. The cell wall polysaccharide, alginic acid samples obtained from different parts such as 'leaf', 'stem' and entire plants of seaweed at different seasons viz., pre-monsoon, monsoon, post-monsoon and summer were also fractionated into mannuronic acid (M block), guluronic acid (G block) and alternating sequences of mannuronic acid and guluronic acid (MG block) through differential pH. Among them the level of G block was always high than other two components. Further, the 'leaf' contain high level G block than the rest indicating its high flexible nature. Seaweeds are known to concentrate several folds of nutrients from ambient seawater. In time memorial, the nutrients in the land are being leached into seas and oceans through rivers etc. Thereby the levels of nutrients in the land are deceased while seas are increased. Seaweed as Seaweed Liquid Fertilizer/manure is one of the efficient methods of obtaining nutrients to the land. The level of sodium is always less than potassium is another added value. Apart from macro and micro nutrients the levels of auxin and cytokinin are of appreciable amounts. Therefore, Seaweed Liquid Fertilizer is an excellent package of macronutrients, micronutrients and plant growth regulators. Studies made on the early germinations stages, glass house and field trials made on green gram, tomato, paddy and Tagetus erecta revealed the significance of Sargassum wightii seaweed liquid fertilizer for their enhanced growth and yield. It also understood that 50% application of commercial inorganic fertilizer as per the recommended rate and 1% S. wightii

Seaweed Liquid Fertilizer supported the growth and yield as par with the plants applied with 100% recommended rate of commercial inorganic fertilizers indicating the potential of *S. wightii*. Attempts were also made from four different compounds isolated from *S. wightii* against plant pathogen, *Xanthomonas oryzae* pv. *oryzae* and human pathogens like *Pseudomonas, Vibrio* etc. They showed significant encouraging results. Further, field trial made on paddy infected with *X. oryzae pv. oryzae* when applied with crude methonolic extract could control the growth of pathogen suggesting the possible method of formulating biocide from *S. wightii*. In addition, after extracting of biocides from the seaweed did not much alter the yield and viscosity of alginates. Two of the isolated compounds from *S. wightii* were studied for their antioxidant and anti-cancer properties. The results suggest the possible inclusion of the compounds in drug development towards cancer. An attempt was also made to demonstrate the cultivation of *S. wightii* under two stage culture conditions i.e. i. under indoor to germinate the liberated oospores into gremlins and ii. under open sea cultivation. Among the different substrata used cement hollow block is recommended. Further attempts are being initiated to modify the cement blocks to with stand waves and tides.

Keywords: Sargassum, Turbinaria, histochemical studies, seaweed liquid fertilizer.

51. Impact of global warming on the insect pest status on plants S. S. Swaminathan

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Green house gases capture the heat radiation from the sun and maintain an average global temperature of 15°C in the lower most atmospheric layer, the troposphere, which supports the life of our planet. Increase in the concentrations of green house gases in the atmosphere due to anthropogenic, animal and microbial activities, creates an "enhanced global green house effect" in the recent time, causing "Global Warming". This phenomenon affects various climatic and natural processes that also include adverse changes in the insect pest status on the agricultural, horticultural and forest plants. Under the elevated ambient temperature and concentrations of green house gases like CO₂ the pest species exhibit increased longevity, growth rate, number of generations, herbivory, reproductive cycles, fecundity, population size and pesticide resistance. The plant's natural defense mechanism against insect attack, like producing the Jasmonic acid also decreases under raised green house effect. This induces over damage to plants by enhancing the longevity and fecundity of the pest species. Plants also shift their other chemical defense mechanisms from nitrogen base chemicals to carbon-based chemicals under high CO_2 environment. The high level of carbohydrate in relation to nitrogen in plants produced under elevated ambient CO_2 amount also accounts for over herbivory by the insects to satisfy their nitrogen requirement. Hence, increased status of insect pest besides necessitating costlier control measures definitely inflicts an irreversible damage to the plant lives of our planet. Keywords: Green house gases, global temperature, Jasmonic acid, plant lives.

52. WTO: Impact on Indian agriculture- Food security

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The formation of world trade organization has brought the trust and faith among the nations whom hitherto divided on different ideologies and stuck to their guns till they realize the folly on them. Though the underlying interest of each of them is diametric, all countries have come to conclusion that globalization is the only solution for the economic well-being. But the euphoria did not last long when some countries adopted liberalization as path to globalization, faltered to grow and compromised their social ethos. The hopes of hearing the unfortunate woes of less developed countries in an egalitarian forum evaporated when trade dialogues put forth by developed world were devoid of humanitarian approach. Trade and investment are means to an end and not ends in themselves. Therefore, strong support grew, even from India, for the suggestion made by Egypt that the Secretariat should carry out an in-depth and detailed evaluation of the effects of the UR on the trade of developing countries as a prerequisite to the initiation of the negotiations. India feels that such an evaluator study, which would obviously need to be carried out in consultation with other relevant international organization, would provide developing countries with a clearer picture of the effects of the UR on agriculture and would consequently help them to prepare for the future negotiation. Humanitarian and 'good for all' attitude in trade of all nature will only save the world from the ills now, suffer. The use of sixth sense is the need of the hour.

Keywords: World trade organization, globalization, humanitarian, sixth sense.

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53. Air pollution- A mathematical solution for car pooling M. Jeeva

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People must be aware of environmental problems that challenge mankind. Pollutions can be of many types. The most dangerous one is air pollution, as without breathing mankind cannot survive and the life will be very short if one breathes polluted air. This serious matter is studied in this paper and one of the remedies is discussed as the act of car pooling, which not only economical to the user as it saves fuel, it also reduces the air pollution to a greater extent. Network model in Operations Research has been adopted in an example to obtain the shortest route. And the famous Travelling Salesman Problem is also suggested to find solutions to such problems. The rules to be adopted for a successful carpooling and the uses are also discussed.

Keywords: Air pollution, network model, travelling salesman problem, carpooling, ride share carpool.

54. Green maritime transport and mitigating global warming

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Maritime activities have increased a lot owing to the new frontiers in science and technology; economic reforms carried out in most of the world countries the competition for entering into new markets and satisfying the needs of multitudes of customers all over the world. Nearly 90% of international cargo movements take place through the maritime trade. The recent inventions and innovations in science and technology have helped the safe shipping and the introduction of modern ferrying techniques, but without limitations. The emission of both GHG (Green House Gases) and non-GHG gases from the ships has a heavy impact on the health of the people, causing much disturbance to the climate. This leads to external diseconomies. Maritime activities lead to more than 30% of total emissions in the world and approximately 30% of land-based emissions, twice of aviation industry and more than the CO₂ produced by the German Economy. The anthropogenic activities result in more emission of carbon causing significant global warm. It is strongly felt that there is a need to reduce the GHG at the earliest to sustain the life and other environment. The International Maritime Organization has evolved policies to reduce the carbon, sulfur and nitrous oxide emissions. The oil spillage, fishing and dumping of wastes lead to more problems to the mankind and other living being in the ocean. The will to save the nature is what is required on the part of ship owners even though they have to spend a little on the use of emission mitigating techniques. If the superior technologies are adopted with a determination, 80% sulfur emissions and 90% NOx emissions will be reduced. As per Thematic Strategy, the cost of pollution abatement for European countries will be around 7.1 billion pound sterling per year. Various combinations of strategies should be used to reduce the emissions at low cost. This includes sea water scrubbing, lower sulfur content in residual oil, humid air engines for new built engines and government providing subsidy for purchasing environmental friendly engines. Further the carbon emissions may be brought down by replacing the old vessels with new ones, changes in the shipping operations, proper port and logistics management, using wind energy with the help of giant kites, trying alternative fuels (nuclear energy) and benchmarking on maritime management. It is said that wind energy will be a potent alternative to reduce the fuel cost by 10 to 30% on a single voyage. The one way to overcome the problem is to develop at a faster rate using people-friendly technology. Beckerman (1992) says that the surest way to improve our environment is to become the rich. This would create environment conscious citizens.

Keywords: Maritime transport, reducing carbon emissions, alternative methods, global warming.

55. Environmental issues-Noise pollution and its evil effects

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The present generation and the coming generations have to solve three grave problems, namely, population poverty and pollution if they have to survive. Pollution being the most dangerous problem likes cancer in which death is sure but slow. Environment pollution is assuming dangerous proportions

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all through the globe and India is not free from this poisonous disease. This is the gift of modern living, industrialization and urbanization. Unless timely action is taken we have a forbid and bleak future for the world. The purpose is to study the environmental issues related to noise pollution. General awareness towards the hazardous effects of noise pollution. Particularly, in our country the people generally lack consciousness of the ill effects which noise pollution creates ad how the society including them stands to beneficiary preventing generation and emission of noise pollution. The target area should be educational institutions and more particularly school. The young children of impressionable age should be motivated to desist from playing with firecrackers, use of high sound producing equipments and instruments on festivals, religious and social functions, family get-togethers and celebrations etc. which cause noise pollution.

Keywords: Pollution, modern living, industrialization, urbanization, firecrackers, noise pollution.

56. Health management through insurance in India and Thailand

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Health is a state of wellbeing of an individual free from all diseases. WHO's definition of health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, Health care is the prevention, treatment, and management of illness and the preservation of mental and physical well being through the services offered by the medical, nursing, and allied health professions. The health care system in India is characterized by multiple systems of medicine, mixed ownership patterns and different kinds of delivery structures. Public sector ownership is divided between central and state governments, municipal and panchayat governments. Public health facilities include teaching hospitals, secondary level hospitals, first-level referral hospitals (CHCs or rural hospitals), dispensaries; primary health centres (PHCs), sub-centres, and health posts. Also included are public facilities for selected occupational groups like organized work force (ESI), defence, government employees (CGHS), railways, post and telegraph and mines among others. The private sector (for profit and not for profit) is the dominant sector with 50 per cent of people seeking indoor care and around 60 to 70 per cent of those seeking ambulatory care (or outpatient care) from private health facilities. An analysis of financing of hospitalization shows that large proportion of people; especially those in the bottom four-income quintiles borrow money or sell assets to pay for hospitalization (World Bank, 2002). This situation exists in a scenario where health care is financed through general tax revenue, community financing, out of pocket payment and social and private health insurance schemes. During the last 50 years India has developed a large government health infrastructure with more than 150 medical colleges, 450 district hospitals, 3000 Community Health Centers, 20,000 Primary Health Care centers and 130,000 Sub-Heal Health Centers. In addition to this there are large number of private and NGO health facilities and practitioners scattered throughout the country. Over the past 50 years India has made considerable progress in improving its health status. According to the 2001 census, Death rate has reduced from 40 to 9 per thousand, infant mortality rate reduced from 161 to 71 per thousand live births and life expectancy increased from 31 to 63 years. However, many challenges remain and these are: life expectancy 4 years below world average, high incidence of communicable diseases, increasing incidence of non- communicable diseases, neglect of women's health, considerable regional variation and threat from environment degradation. It is estimated that at any given point of time 40 to 50 million people are on medication for major sickness in India. About 200 million workdays are lost annually due to sickness. Survey data indicate that about 60% people use private health providers for outpatient treatment while 60 % use government providers for in-door treatment. The average expenditure for care is 2-5 times more in private sector than in public sector. Given the above scenario exploring health-financing options becomes critical. Health Insurance is considered one of the financing mechanisms to overcome some of the problems of our system. Health insurance can be defined in very narrow sense where individual or group purchases in advance health coverage by paying a fee called "premium". But it can also be defined broadly by including all financing arrangements where consumers can avoid or reduce their expenditures at time of use of services. Health insurance is very well established in many countries. In this context the present study attempts to 1) To highlight the rationale for health insurance. 2) To enlist the various health insurance plans available in India and Thailand. 3) To enumerate the various factors to be considered while purchasing a health insurance policy. 4) To throw light on the present scenario of health insurance market in India. 5) To suggest several policy measures to improve the health insurance sector. The study

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being a purely descriptive one does not lend itself to any statistical analysis. It makes use of facts and information obtained from the health insurance companies in India and Thailand. India has limited experience of health insurance. Given that government has liberalized the insurance industry, health insurance is going to develop rapidly in future. The challenge is to see that it benefits the poor and the weak in terms of better coverage and health services at lower costs without the negative aspects of cost increase and over use of procedures and technology in provision of health care. **Keywords:** Social well-being, primary health centres, hospitalization, health insurance, health care.

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57. Environmental degradation of common property resources: Ennore creek as a case study

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Water is the essence of life and indispensable for man. As the inland water diminishes day by day, the boundless coastal water serves the promising source for making marine food and to cater the industrial need. Coastal water is a valuable natural endowment that needs to be managed for the present and future generations. Over 60% of the world population lives within 60km from the coast. Degradation of such common property resources affects some people more severely than others owing to the occupation, dependency and proximity. The coastal zone downslide in economic returns of fishing sector is a global phenomenon and Indian fishermen are no exception to this. Generally creeks and estuaries are the recipient of urban and industrial pollution thereby affecting the fish production, agricultural crop and degradation of mangroves. The main objective for this study is: 1) To study the socio economic profiles of the Ennore creek; 2) The importance of water pollution on the socio economic status of the household in Ennore creek; 3) Occupational pattern, income generation and the living conditions of the households of Ennore creek. The factors destroying the environmental health of the creek were found to be: Pollution either biologically or chemically comes through industrial effluent, domestic & community wastes and destruction of coastal biodiversity by thermal pollution released by power plants and coastal erosion caused by port constructions. Destruction of mangrove as natural fence further compounded the problem of low fish yield and soil erosion along the Ennore creek. The fisher folk are drifted to alternate occupation and those who stick to the fishing become economically marginalized due to low income and inflicted with various ailments because of coastal pollution. The study highlights Ennore creek as highly point polluted area. Most of the biodiversity components identified in this area have almost become extinct. The central pollution control board in collaboration with State pollution control board identified Manali and the Ennore industrial complex as the problem areas in the country. This area is mushroomed with number of industries such as EPTC, SPIC heavy chemicals, MRL, Madras petro chemicals, Kothari Limited, EID parry, MFL and other surrounded small scale industries. This study emphasizes the attention of the government and the industrialists to reduce the effluent discharges so that the benefits of the creek can be sustainable managed and the socio economic fabric of coastal wealth and the skill of fisher folk can be preserved for the sustainable coastal management.

Keywords: Coastal water, ennore creek, coastal management.

58. Sustainability of maritime economics-Some issues

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The process of globalization strengthens the world trade and distributes the world resources evenly. It gives huge boost to the development of infrastructure - road ways, air ways and water ways. Shipping industry plays major role in this regard. Globalization facilitates the activities of ship building, ship transport and ship breaking. In the recent part Marie time economics getting more prominent position in the global economic activities. Due to ever-growing international trade, the movement of cargo from one country to other becomes indispensable. As the shipping transport is cheapest mode of transportation among the different mode of transportation. Shipping transport becomes sin-quo-non in the post reform period. But all these activities directly or indirectly dismantle the eco-system. Shipping transport is detrimental to the eco-system as it pollutes the green environment. Therefore the researchers examine the consequences of shipping transport and also suggested a few remedial

measures for the same. Ship pollution refers to the pollution of air and water by shipping. It is a problem that has been posing an increasing threat to the world's oceans and waterways. It is expected that shipping traffic to and from the USA is projected to double by 2020. Because of increased traffic in ocean ports, pollution from ships also directly affects coastal areas. Ship pollution affects biodiversity, climate, food, and human health. Therefore it is right time to invent eco-friendly technology, for ship construction and ship breaking. World standard norms must be formulated to operate ships without polluting the ocean.

Keywords: Shipping industry, eco-system, shipping transport, eco-friendly technology.

59. Global environment and its sustainability-Economic and philosophical perspectives

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Most of us believed that the God has created the universe. He has created the sky first and then air from sky, fire from air, water from fire and the earth from water and then biotic and abiotic. The whole universe consists of biotic and abiotic. Abiotic consists of renewable and non-renewable resources. Among the biotic and abiotic human being is the highest creation. Human being with their thinking ability, intelligent, emotion and sentiment explore and exploit the universe for their comfort and advancement. In the name of science and technology and research man kills the emotion and the sentiment of the other creations in the universe. For their luxury life man invades the nature. There is a war going on between the man kind and biotic and abiotic in the name of economic development and industrialization. Man separates himself from the nature and the environment. He identifies himself as a separate entity. He forgets the fact that man is a part of nature and the universe. He is not different from the nature. He is part and parcel of the nature. Nature is not something outside to man. The same nature exists inside the man too. What we see outside is also present inside to us. Balanced food leads to healthy life. Nutrient deficiency imbalance the normally of the body subsequently he falls ill and suffer from various diseases. Human body is the biggest the chemical factory in the world. Imbalance inside the body leads to malfunction in the metabolism. Imbalance inside the body is caused by imbalance outside. The deficiency in you is the deficiency in the environment. Both are interrelated and mutually dependent. The ultimate fact is that man and the nature are one and the same. The One is in different forms and different names. Therefore, exploiting the nature is exploiting our own self. The act of invading nature is like digging a pit for oneself. It does not mean that man should keep mum and static. Man can work on nature; can cultivate the land, and build houses, factory and industry. You can extract oil and do mining work but there should be trade off point or optimum welfare which retains the sustainability of the environment. The trade off point or the optimum welfare is the attitude of giving back to the nature and sharing with others, one should love nature like loving others. When we don't love others definitely we won't love nature too. Whatever you take from the nature give it back in different a form that is plant a tree before you cut a tree. When you employee a person you pay salary in turn for his labour. Similarly when you work on the nature and the environment you pay their due share. When you fail to pay reasonable salary and exploit the labour one day they will protest and indulge in non co - operation. The same things are happening now, as we denied the due share to nature it retaliates and raise war against the mankind in the form of tsunami, global warming and climate change. Therefore, let us be content, love ourselves and others. Love the nature, take care of the environment and share with others for wealthy and healthy life.

Keywords: God, non-renewable resources, nutrient deficiency imbalance, labour, healthy life.

60. An analytical study on bioterrorism-Some issues and challenges K. Kalaiarasi Dept of economics, Ethiraj College for women, chennai, TN, India

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Biological agents can be spread through air, water or in food. Terrorist may use biological agents because they can be extremely difficult to detect and don't cause illness for several hours to several days. Some bioterrorism agents like the small pox virus can be spread from person to person and some like anthrax cannot. Bioterrorism is a weapon because biological agents are relatively easy and inexpensive to obtain or produce, can be easily disseminated and can cause wide spread fear and

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panic beyond the actual physical damage they can cause. Military leaders know that as a military asset, bioterrorism has some important limitations; it is difficult to employ a bio-weapon in a way that only the enemy is affected and not the friendly forces. Terrorist use and biological weapon mainly as a method of creating mass panic and disruption to the society. For instance a highly relevant pathogen in this contex foot- and-mouth virus which is capable of causing wide spread economic damage and public concern as witnessed in 2001 and 2007 in UK. In September 2001 Anthrax attack took place in US. Letters laced with infectious anthrax was delivering to news media offices and the US congress. The letters killed 5 people. The biological attack used for bioterrorism includes: Tularemia or rabbit fever which has a very low fatality rate if treated but severly incapacitate people: Anthrax is a noncontagious disease caused by Bacillus anthracis; Small pox is a highly contagious virus. It has a high mortality rate" 20-40%. Small pox was eradicated in the world in 1970 through vaccination program but virus samples are still available in Russian Labs; Botulinum toxin is the deadliest toxin known which causes death by respiratory failure and paralysis; Bubonic plague is a disease caused by Yersinia pestis bacterium. Rodents are the normal host of plaque and the disease is transmitted to humans by flea bites; Viral hemorrhagic fever, this has fatality rates ranging from 50-90%. No cure exists, but vaccines are in development. To conclude, it is said that government agencies should respond to bioterrorism incidents which will involve law enforcement, decontamination units and emergency medical units. It is the responsibility of every country to detect, identify and neutralize the threats and decontaminate victims exposed to bio-terror agents.

Keywords: Terrorism, murder, kidnapping, hostage situation, bioterrorism, anthrax.

61. Potential impacts of climate change on agriculture

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This study is primarily aimed at reviewing the impacts of climate change on Indian agricultural sustainability and poverty, where poverty and agriculture are both salient, and that climate change is likely to reduce agricultural yields significantly, and that this damage could be severe unless adaptation to higher temperatures is rapid and complete. The study also summarizes the existing literature on the causes and characteristics of expected climate changes in India over the coming years and discusses the ways in which these changes might affect the lives of the poor. The study also throws light on the nexus between agricultural productivity and poverty eradication. **Keywords:** Climate change, poverty, agricultural productivity.

62. The impact of growing population on the environmental aspects - A study

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Environmental issues have gained its prominence with the massive increase of human population which is constantly drawing its sustenance from the environment. Thus environmental stress and growing populations are the integrated problem of today. Therefore, awareness of environmental issues has become indispensable part of social upliftment and planning. The most challenging task which bewilders the society is how to put an end to the perilous state of alarming growth of population. Is it possible to completely stop world population growth during the next few decades? Yes, it is - if fertility, worldwide, would decline to 1.57 children per woman, the global population could stabilize at about 7.5 billion by 2025. This is the result of the 1996 UN low variant projections. This variant assumes a drastic drop of average fertility to a level of some 24% below replacement - in all countries worldwide. While such a steep decline, in fact, already happened in many European countries, it is rather unlikely that populous developing nations such as Pakistan, India, Indonesia or Nigeria - which greatly determine world population growth - would quickly follow this trend. The vital theme of urbanization is the increase in population in cities or towns over a period of time and led to an increase in diseases. More of the forest wealth is being destroyed to provide wood for housing and fuel. More than 99% of world food supply comes from land and less than 1% comes from water. The US, Canada, Britain, France, Germany, Japan, and Italy represent only 10% of global population but consume over 40% of earth's fossil fuel. Recently, India has become the third largest country to emit Carbon-dioxide into the atmosphere. According to World Bank and the UN nearly 1 to 2 billion people are malnourished and

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about 87% of the worlds fresh water is consumed for agriculture which is not recoverable. About 90% of the diseases occurring in developing countries result in non-availability of clean water. About 6 million deaths are caused by water borne diseases, worldwide. Fossil fuel is another resource that is used for food production. Nearly 80% of the world's fossil energy is used for fertilizers, irrigation to help maintain yields. The population has been maintained by different methods in different countries. Some of the examples are: China has developed 'One Child Policy' which has led to gender imbalance. Russia's birth rate was cut down by implementing abortions. Singapore has granted more foreign born citizenship to boost their population. While we feel that it is difficult to curtail population drastically over night or within a decade or so, it is necessary that we must have a sense of awareness among the citizens of a country, the importance of birth control, preservation of natural resources proper maintenance of environs, socially, psychologically and legally. Let our younger generations learn all these things from their rudimentary standards of education. Parallels, the available technologies need to be integrated to control pollution and the necessary laws need to be implemented diligently. With all the analytical features, if we want to draw a practical, workable and effective method of controlling the pollution of any nature, we have to create a wide sense of awareness among the citizens, urge the advernments to implement strict and lasting measures by framing necessary laws from time to time and impress upon the necessity of protecting the generation by including this subject in the syllabus for children in their school education. To sum up, we have to exhort ourselves for the betterment of the world and a happy living has to be established with our firm faith and courage. The purpose of living is to promote World Peace, Harmony and Mutual Concern. We shall develop a sense of universal responsibility caring and sharing for others and for future generations. Mahatma Gandhi said: "Be the change you wish to see in the world. And let us begin changing for the formations of another world of plenty and prosperity".

Keywords: Environment, population, pollution, policies, law, remedy.

63. Studies on the mechanism of pathogenic stress of *Pythium aphanidermatum* in the wetland medicinal plant *Acanthus ilicifolius* and its sustainability

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Acanthus ilicifolius commonly known as 'Sea Holly' is a mangrove perennial herb, has many medicinal uses for rheumatism, skin allergies, poison arrow wounds, kidney stones etc. Every part of plant has medicinal property, the whole plant for kidney stones, asthma, decoction to treat dyspepsia, stem to treat abscess, leaves for neuralgia, snake bites and relieves pain, purifies blood. Its bark is used to treat colds, seeds for abscess, roots as elixir, skin treatment, relieves pain & fever and it is also used to treat paralysis of limbs, leucorrhoea and debility. It also has antioxidant, anti inflammatory, hepato protective effect. As a breakthrough medicine, this indigenous Indian medicinal plant opens up a promising avenue in liver cancer chemoprevention with broader implications. So it is necessary to check the sustainability of this medicinal herb from the fungal pathogen, *Pythium aphanidermatum*, which is an aggressive water mold whose population is highest in winter and lowest in the spring. This generelistic and non-specific host ranged saprophyte, survives for a long time on decaying plant, and is responsible for its pathogenic stress on the mangroves causing damping off. The medicinal mangrove, Acanthus ilicifolius was collected from the wetlands of Kerala state. It was grown in pot and hydroponic condition. The leaf of the plant host was subjected to Disc infection method and screened for the presence of stress proteins- isozymes from the leaf extracts. The total protein content was estimated by Lowry's method and further analysed with SDS - PAGE and NATIVE PAGE for detecting the stress tolerance protein. Isozyme of peroxidase and superoxide dismutase (SOD) was characterized. It was found that plant subjected to stress had altered metabolic activity to resist the stress. Thus, the host medicinal plant is capable of producing constitutive and inducible defence mechanism either by enzymic and non enzymic. Generally, isozymes are produced profusely by stress induced plants to combat oxidative, pathogenic and salinity stress. In SDS PAGE, the presence of extra protein band of infected plants indicated that the herbal plant has the ability to defend pathogenic stress enzymically. Further experimental studies are warranted to relate the role of stress proteins with the efficacy of the herbal plant. Environmental degradation in terms biotic and abiotic stress can contribute to the metabolic and physiological functioning of green medicinal sources. Keywords: Green medicine, stress protein, Acanthus sp., Pythium sp.

64. ISEE' State of art on implications and strategies for a sustainable global environment

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ISEE (Indian Society for Education and Environment) conducted its first part of the conference titled *Global Environment and its Sustainability: Implications and Strategies (GESIS 2010 - PART-I)* in Chennai at R.K.M. Vivekananda College, Mylapore, Chennai, India on 7 November 2010.

The five themes identified are: *Energy Management, Environmental Management, Knowledge Management, Technology Development & Integration and Global Issues, Policies influencing the Sustainable Development.* This conference provided the platform to meet, share and identify the challenges and opportunities that underlie the vital issues of sustainability. Through the two parts of this conference with one already held in Chennai and the other to be held at BANGKOK, iSEE strives to contribute its mite for the cause of United Nations Decade of Education for Sustainable Development (2005 -14).

In the *Energy Management* the major emphasis was on population and energy consumption. The economic aspects of income generation with energy consumption taking into account the demand sides of the management, the novel approaches of energy generation using secondary effects of wind generated by moving objects and also enhancing power generation status through bio-diesel were highlighted by the participants.

The second theme on *Environmental Management* attracted research scholars to present their research findings on biological, botanical, physical and chemical aspects of land and coastal resources. Their findings highlighted the need for reducing the wastes generated (including e-wastes) and climatic changes.

The third theme on *Knowledge Management* stressed on the importance of information and communication technologies (ICT) including music therapy and living in harmony along with suggestions to improve the capabilities of universities and distance education centres in providing a sound base for knowledge generation and explosion.

The fourth theme on *Technology Development and Integration* covered all the interdisciplinary scientific studies similar to second theme with research findings focusing on the enabling environment towards global sustainability.

The fifth theme of *Global Issues & Policies influencing the Sustainable Development* covered the areas of interdisciplinary ethics from carbon trading, bio-piracy and cyber crimes and deduced the needed regulations, accountability and governance for a healthy and comfortable social effect. It was very interesting to note that in general all the themes brought about the importance of tribal knowledge improvement and safeguarding the natural resources as the main thrust areas for global implications and strategies towards sustainability of environment.

A notable emphasize has been emerged during the conference that would reflect the drift of research priority/ concern towards 1) Biofuel, ICT driven education and e-waste management than ever before. The limitations of the part - I conference in terms of institutional, constitutional and operational policies for an integrated global consensus and action will be projected through this paper which could be overcome in the second part of this conference.

Keywords: Energy, environmental management, knowledge management, technology development.

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65. Global warming

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"Global warming" refers to the effect of human activities on the climatic changes, particularly the burning of fossil fuels like coal, oil & gas, emissions from the vehicles, and large scale deforestation. Due to its negative impacts on communities including for instant substantial sea-level rise and on ecosystems, global warming is the most important environmental problem the world faces today. Adaptation to the inevitable impacts and mitigation to reduce their magnitude are both necessary. Another notable event connected to the Global warming is the missing of forest grooves. Deforestation probably impede with the fixation of CO₂ which otherwise stay in atmosphere in large amounts causing 'green house effect, Thus photosynthetic green cover becomes an essential organ of nature to condition the surroundings so that the Planetary life can thrive and reproduce. Scientist should integrate all know-hows such as tissue culture, biofertilizers, VAM inoculations, stress tolerant plant varieties to re-establish the plant canopy so that other dependent creatures can flourish again. This exercise will be the remedy for desertification, destructive typhoons, Tsunamy like situation and genetic erosions also.

Keywords: Global warming, plants, deforestation, green-house effect.

66. Effects of lifestyle on health

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The world is changing around us every second, so are our living patterns. The way we respond to this change to keep up with the pace has had and is having its impact on our health. Most diseases these days are caused not due to microbes, but due to our lifestyle. The lifestyle plays a major role in nurturing the diseases silently without our notice. We need to look into these issues as they have severe effect. *United Nations Millennium Development Goals to be achieved by 2015,* lay emphasis on the fact that health plays a pivot role in human development. This is substantiated by the fact that 3 out of 8 goals, 8 out of 18 targets and 18 out of 48 indicators are health related. The Standard of Living Index (SLI), proposed by WHO, provides a general guideline for evaluating the health impact based on occupation, income, environment, hygienic conditions and many other factors. The purpose of this paper is to discuss the lifestyle and its effect on health. The effects of different lifestyle on health investigated were based on the classification of the people in the society. In general, the non-communicable diseases and the communicable diseases are analyzed in depth. From this investigation the classification of the middle level, either to higher level or lower level, is attempted based on SLI and the environmental conditions.

Keywords: Health, lifestyle, environment, SLI.

67. The role of *iconowrite*[®] in school education

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Iconowrite is a unique art form, first of its kind for anybody who can read and write can eaily learn to express their inner voice through **Iconowrite**. While all the other art and word expressions allow the viewer to recognize the subject, **Iconowrite** alone distinctly makes the viewer get interested in the subject and also start reading about the subject by a clever use of unutilized space! It is one step above the usual picture or photography. It adds *knowledge* dimension to the subject bounded by the X axis, Y axis and probably the third axis. It sharpens the cognitive observation of the viewer and so its essentiality to education is obvious. It makes children and adults get interested to read about the subject and kindle their thought for further research also. This unique form of expression can be called as a **word art** or **words within words**. This is a boon to the economically weaker section of the student community. If the student knows to read and write that's enough. Simple tools like pencil, pens (of various colour inks) and paper are sufficient to bring out the **iconowrite artist** in him/ her with minimal training from the inventor. The student can in his/ her spare time create and market wonderful **Iconowrite images** to augment his/ her school expenses. The **iconowrite** image can be a solid- or

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pencil- bounded figures or unbounded ones which are positive filled or fully filled or reverse filled with knowledge matter. There are many variations like wavy lettering, solid figures with three dimensions and photographic outlines or shaded photographs. It can be taught in the following three levels namely, a) primary b) intermediate and c) advanced levels. Primary level is meant for children who have learnt writing (up to 5th standard). They can start enjoying writing when they are asked to write the repeat words in a figure bounded space than in an empty line. The intermediate level students (upto 12th standard) will take up concrete objects like natural scenes, sports, events, festivals, spiritual and personalities or characters (real or fictional) and *iconowrite* in their choice fill or boundary. The advanced level of this art form is defining a subject matter or project in its abstract form. For example the word "peace" at primary level will be written repeatedly inside a figure representing peace (like a dove). At intermediate level it is inside or around a concrete object (like round table conference, Dandi March, apostles of peace) information about peace is written and at the advanced level the student is given a project about peace which can be done in an abstract way leaving everything to his/ her imagination. *Iconowrite* cannot be ignored as a simple art exercise. It has a greater purpose in educational institutions because, it encourages the child to write and read what had been written. It motivates the child to write repeatedly and *understand* the word, its shape and its gualities also. It removes the element of boredom. Even though this art form can be typed or computer generated, only handwritten form is respected as having life by art connoisseurs and even the ordinary people. How can a mechanically generated art compete with a live art? Above all, this art form makes children utilize the newspapers, magazines, books, library, internet and other information media to represent their ideas in words, actions and images also. In short when they read they forget; when they see they remember and when they do they understand.

Keywords: Iconowrite, newspapers, magazines, books, library, internet.

68. An emerging aspects of mobile phone use influences urban health - In Chennai city

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Developments in the communication technology telecommunication are directly influences our life, they make our life easier and comfortable but also they change our habits. The mobile phone is a modern-day invention, which has managed to reach many parts of the world enabling telecommunications across areas where it was not possible before. It has led to concerns about health effects caused by exposure to the microwaves emitted by mobile phones and base stations. Although helped improve the quality of life in some sectors, concerns continue to be raised about potential adverse health impacts associated with their use. These range from cancer and headache and fatigue. We conducted a literature search to identify published papers on health effects of mobile phones, and an intensive search on the internet to collect data on the global use of mobile phones. In the year 2000, there were an estimated 500 million mobile phone users worldwide. Today, there are about 3.3 billion users. The use of mobile phones among young children and adolescents is also increasing. This causes may led to worry about the health hazards that may result from excessive cell phone use. Health-risk research has mainly focused on adults and on a single outcome, brain tumours. The present study provides spatial-information of the distribution of using mobile phones and their growth; demographic and socio-economic characteristics of mobile users and their urban health; Household health conditions: health and health care for the Chennai City. The perceptional studies have also been adopted for the future planning of urban health/living conditions.

Keywords: Urban population, telecommunication, mobile users, health hazard, urban health, urban health condition.

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