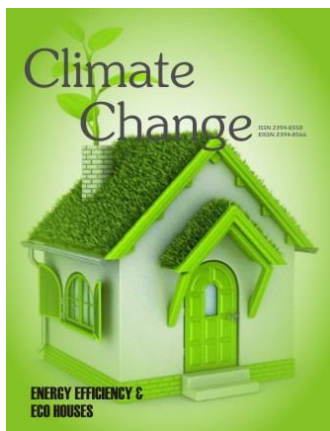


# Climate Change

## About the Cover



On one hand Pakistan is facing severe energy crises, and on the other the planet earth is going through global warming. The only solution for both is low carbon planning. The purpose of this dissertation is to show the benefit of low energy residential designs. This research has taken into account analysis of three case studies of eco houses designed with considerations of energy efficiency and traditional methods; which has been examined in regard with economy, material, and techniques. It is normally believed that closely controlled conditions equate with better comfort. Analysis of field surveys and adaptive comfort theories have made it clear that while closely controlled is one way of achieving comfort it is not the only way. It is a comparison of two types of houses. Firstly there is a complete analysis of an existing house in UET staff colony that adopts traditional methods of achieving comfort through energy consumption. On the other hand there is another house where comfort is accommodated through alternative means. The calculations are made on the basis of utility bills. The later house is an Eco-House design proposal for which creative design decisions are discussed in detail namely, selection of material, comfort levels, space utilization, and site development; according to the sun path diagrams. This Eco-House is based on precedent conducted studies. It is supposed to be within usual comfort limits by the use of shading and thermal mass to control the range of the temperature. The two prong strategy was devised for both the houses, separately. A comparative analysis of the radiation penetration through fenestrations for the two houses was conducted on two typical days. One is the longest day of the year i.e. 22<sup>nd</sup> of June and the other is the shortest day of the year i.e. 22<sup>nd</sup> of December. In closely controlled case firstly the analysis was made creating model based graphs of radiation statistics. And secondly for the same conditions ECOTECT software was used to study the sun path patterns and sunlight penetrations. The results obtained provide us the substance to statistically show the benefits of low energy designs. Moreover, the findings highlight an importance by providing an insight for the architects to pay attention towards as well as adopt the measures for designing low energy buildings (Ref: Javaria Manzoor Shaikh. Energy efficient House. *Climate Change*, 2015, 1(3), 222-236); (Image: <http://mouldandallergysolutions.com.au/wp-content/uploads/2014/01/eco-house.png>).

## LETTERS

### ENVIRONMENTAL CHANGE

#### Demographical Aspects of Environmental Damage and Climate Change

Sergei V. Jargin

Environmental damage and climate changes are influenced by human industrial activities, which are proportional to the population size. Of potentially grave consequence is the unplanned industrial development in the previously underdeveloped countries because environment protection is observed less rigorously there and especially due to the large scale of this process, proportional to the population size. Humankind can choose between reduction of the birth rate and raising the death rate by means of famine, epidemics or homicide, which have been a norm during the whole history and prehistory. The conclusion is that in order to prevent ecological and other catastrophes, the humankind should be unified. Nuclear energy, the only thinkable alternative to the fossil fuels, must be introduced globally under a strict central control. People must learn to trust each other. English should become official language all over the world. Labor, discipline, modesty and birth control are urgently needed to facilitate survival of the billions of people.

*Climate Change*, 2015, 1(3), 158-160

## CLIMATE ENGINEERING

#### Eco-friendly building materials for low cost construction in rural and urban areas

Angeline Mary M, Vigneshkumar C, Saravanamuthu K, Ponmalar N, Vijaya AM

Environmentally friendly building materials are those that make optimal use of resource, produce minimum waste and are safe for the environment and people. This paper includes the variety of building materials as developed and practiced in all countries. The materials included here indicate several options which have been developed in all countries and are being extensively utilized in the construction of low-cost building both in rural and urban areas.

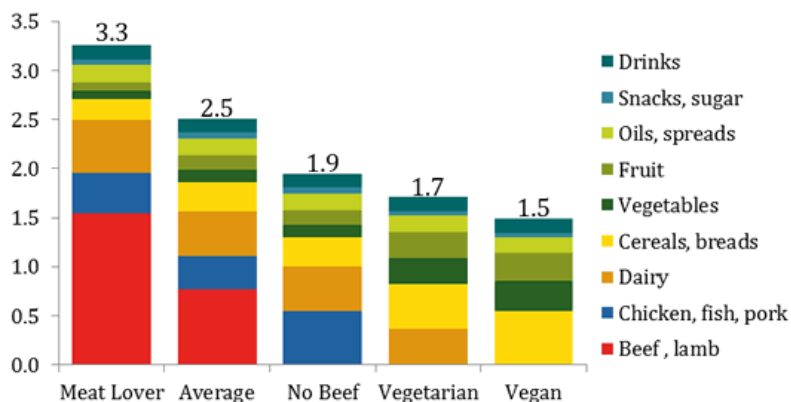
*Climate Change*, 2015, 1(3), 161-167

## PERSPECTIVE

### CARBON FOOTPRINTS

#### Food carbon footprints in Nigeria

Eludoyin OM



Reducing the contribution to the greenhouse gases through modification of lifestyles has been the recent focus of geoengineering and climate change discussion. However, many developing countries still have to face the challenge of ensuring food security, and increasing energy availability. This study is an expository review of the impact of food production and peoples' attitudes to food in the face of climate change. The main objective of the study was to examine the sources and dimensions of food carbon footprints, with a focus on Nigeria, and with the view of making recommendations for reduction of greenhouse gasses from food sources. The study argued the need for infrastructural and welfare improvement, and rural development to channel the focus of the people towards environmental preservation and sustenance.

*Climate Change*, 2015, 1(3), 168-173

## REVIEW

### CLIMATE OF ANTARCTICA Vs. BIODIVERSITY

#### Biodiversity of Larsemann Hills, Antarctica



Antarctica is the coldest, driest place and fifth-largest continent on this Earth and contains many unique geological, glaciological and biological features. The Larsemann Hills (69°20'S to 69°30'S Latitude., 75°55'E to 76°30'E Longitude) is located approximately halfway between Vest fold Hills and Amery Ice Shelf on South-eastern coast of Prydz Bay. Human activities in Larsemann Hills is promoted due to its coastal location, ice free landscape, Australian summer research base (Law base), Chinese research station (Zhongshan) and Russian research stations (Progress) were established within the area of 3 km from each other on eastern broknes. After that there was rapid infrastructure development in the area and further scientific research and the potential for tourist visits resulted in notable localised alteration of the environment, ultimately affect the biodiversity. The Antarctic environment / climate is highly susceptible to the impacts of human activities and has much less natural ability to recover from disturbance than the environment of other continents. These changes ultimately affect the environment and growth of organisms. Larsemann Hills represent the southernmost coastal oasis contains diverse flora and fauna. In flora - Mosses, Lichens and Algae were observed. Among algae mainly Cosmarium, Diatoms, Dinoflagellates and Cyanobacterial mats were observed from different water bodies and terrestrial habitats. As for as fauna is concerned breeding sea bird like Snow petrels, Wilson's Storm Petrel, South polar Skuas were found. Besides this, Seals, Adelie Penguin and Emperor Penguin were occasionally observed in Larsemann Hills area. However, very little is known about the terrestrial micro fauna. In lakes and streams species of protozoans, platyhelminths, rotifers, tardigrades, nematodes, arthropods, etc. have been reported.

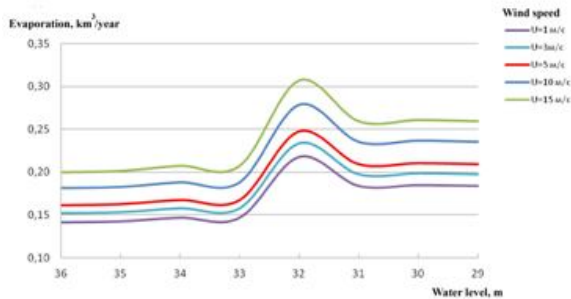
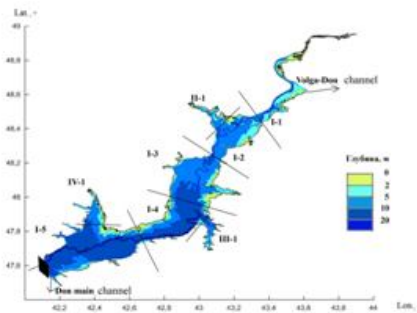
*Climate Change*, 2015, 1(3), 174-183

## RESEARCH

### HYDROLOGY

#### Estimate of possible hydrological regime change of Tsimlyansk reservoir in conditions of the climate warming

Grechushnikova MG, Edelshtein KK, Panin GN, Vyruchalkina TY, Solomonova IV



Results of calculation of hydrological characteristics changes of the Tsimlyansk Reservoir in case of predicted warming (water exchange, ice covered period, a mineralization of water, stratification of water body) are given at realization of the most adverse for water supply and water use scenario at reduction of an annual drain layer and a drain layer for flood period.

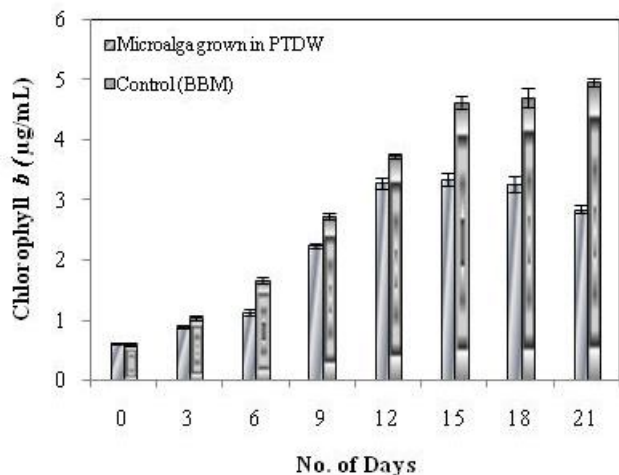
*Climate Change*, 2015, 1(3), 184-191

## ANALYSIS

### CLIMATE CHANGE PREVENTION

#### Phycoremediation of Tannery Dye Wastewater using Green Microalga: Bioremediation of Tannery Dye Wastewater

Shamshath Begum, Vedaraman N, Srinivasan SV, Rengasamy R, Kurinji Malar, Kavitha G, Vijayarani S



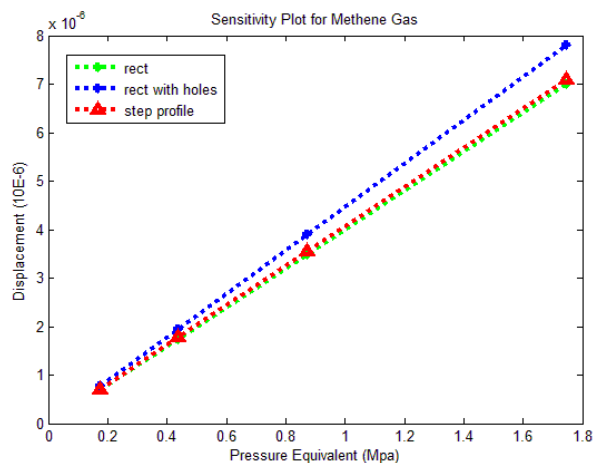
The present study is on the treatment of pretreated tannery dye wastewater (PTDW) by green microalga *Chlorella vulgaris*. The growth of *Chlorella vulgaris* in PTDW was assessed with the pigment content Chlorophyll *a* and Chlorophyll *b*. Maximum content of pigment Chlorophyll *a* and Chlorophyll *b* was found to be 6.5 µg/mL and 3.3 µg/mL respectively on 12<sup>th</sup> day. Colour, chemical oxygen demand (COD) and biological oxygen demand (BOD) removal efficiency was found to be 99 %, 88.5 % and 90.17 % respectively on the 3<sup>rd</sup> day of alga treatment. The confirmation of presence of functional groups based on the optimal growth period of *Chlorella vulgaris* was carried out using Fourier Transform Infrared Spectroscopy (FTIR). The morphology of *Chlorella vulgaris* was also examined by scanning electron microscope (SEM). The present investigation shows that colour, COD and BOD can be removed effectively and efficiently by microalga *Chlorella vulgaris*.

*Climate Change*, 2015, 1(3), 192-197

## CLIMATE TECHNOLOGY

#### A Cantilever Based MEMS Sensor for Detection of Greenhouse Gases

Nallathambi A, Shanmuganatham T



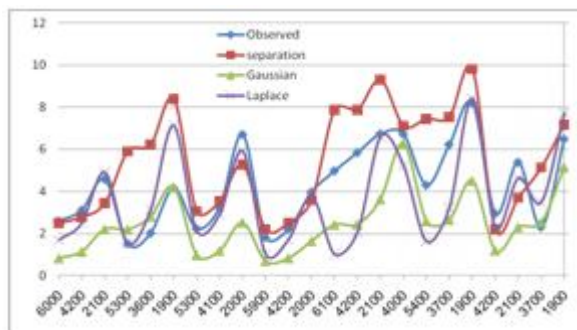
In the past two decades global warming was being caused by rising absorptions of greenhouse gases (GHG) composed by human activities. Greenhouse gases catch heat in the atmosphere, which makes the earth warmer. The effect of greenhouse gas is the process by which absorption of cantilever beam by gases in a planet's atmosphere warms its lower atmosphere and surface. The main aim of this paper is finding the essential conditions of the warming issues caused by different GHG which are rising at an undisciplined rate. This paper desire in decision out an approach to quantitatively evaluate the unsafe gas molecules. Analysts gases are absorbed by a sensitive ZnO layer deposited on the cantilever. A model has been developed to describe the dependence of the gas sensor on the thickness of the ZnO layer. The type of gravimetric sensor works by arresting the chemical in a absorbers compound, which is changes an overall group of the sensing aspect i.e. a cantilever, and its displacement. Hence, the cantilever sensing layer is being constructed using a selective layer on the surface area to carefully consume the unsafe gases. In this paper different geometry of cantilever beam such as rectangular type, rectangular beam with four repeating square holes and step profile which are designed and simulated using the finite element software INTELLISUITE 8.7. The simulation results show that the rectangular beam with four repeating square hole geometries have been the more deflection at same the displacement of the conventional beam and also increasing the sensitivity.

*Climate Change*, 2015, 1(3), 198-207

## AIR POLLUTION

### Calculated the ground level concentration by using the Laplace technique and compare them with other ways

Khaled SM Essa, Aziz N Mina, Hany S Hamdy, Ayman A khalifa



In this paper, the ground level concentration of air pollutants is obtained by using Laplace technique to solve the diffusion equation in two dimensions. Considering that both the wind speed and eddy diffusivity in z-direction are constant. Comparing between outcomes values with data measured at Copenhagen, Denmark, Gaussian model and also with separation of variables technique which have been calculated in previous paper.

*Climate Change*, 2015, 1(3), 208-216

## WATER QUALITY

### Simple correlation matrix among different physico-chemical parameters and physico-phycological parameters of pond water at Tribeni, Hooghly, West Bengal, India

Nilu Halder

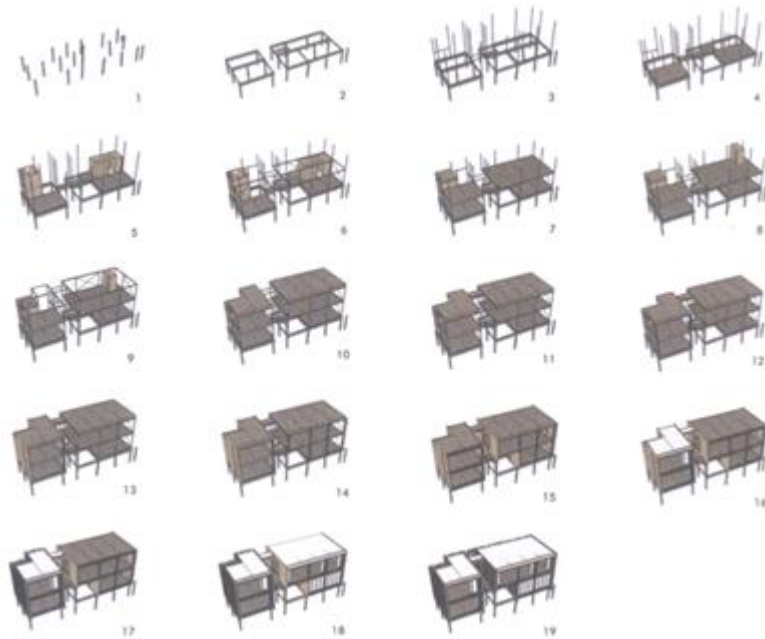
The statistical analyses of simple correlation coefficient ( $r$ ) between physico-chemical parameters [temperature, pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), nitrate-nitrogen ( $\text{NO}_3\text{-N}$ ), phosphate ( $\text{PO}_4^{3-}$ ), total suspended solids (TSS), total dissolved solids (TDS), sulphate ( $\text{SO}_4^{2-}$ ), salinity, total alkalinity, total hardness, chlorides (Cl) and turbidity] and physico-phycological parameters for a two consecutive years, 2009 and 2010 in a pond water at Tribeni in Hooghly district, West Bengal revealed that in this micro environmental niche the correlation values showed variability with respect to their significance and non significance level as well as with respect to positive or inverse correlationship.

*Climate Change*, 2015, 1(3), 217-221

## CLIMATE ENGINEERING

### Energy efficient House

Javaria Manzoor Shaikh



On one hand Pakistan is facing severe energy crises, and on the other the planet earth is going through global warming. The only solution for both is low carbon planning. The purpose of this dissertation is to show the benefit of low energy residential designs. This research has taken into account analysis of three case studies of eco houses designed with considerations of energy efficiency and traditional methods; which has been examined in regard with economy, material, and techniques. It is normally believed that closely controlled conditions equate with better comfort. Analysis of field surveys and adaptive comfort theories have made it clear that while closely controlled is one way of achieving comfort it is not the only way. It is a comparison of two types of houses. Firstly there is a complete analysis of an existing house in UET staff colony that adopts traditional methods of achieving comfort through energy consumption. On the other hand there is another house where comfort is accommodated through alternative means. The calculations are made on the basis of utility bills. The later house is an Eco-House design proposal for which creative design decisions are discussed in detail namely, selection of material, comfort levels, space utilization, and site development; according to the sun path diagrams. This Eco-House is based on precedent conducted studies. It is supposed to be within usual comfort limits by the use of shading and thermal mass to control the range of the temperature. The two prong strategy was devised for both the houses, separately. A comparative analysis of the radiation penetration through fenestrations for the two houses was conducted on two typical days. One is the longest day of the year i.e. 22<sup>nd</sup> of June and the other is the shortest day of the year i.e. 22<sup>nd</sup> of December. In closely controlled case firstly the analysis was made creating model based graphs of radiation statistics. And secondly for the same conditions ECOTECT software was used to study the sun path patterns and sunlight penetrations. The results obtained provide us the substance to statistically show the benefits of low energy designs. Moreover, the findings highlight an importance by providing an insight for the architects to pay attention towards as well as adopt the measures for designing low energy buildings.

*Climate Change*, 2015, 1(3), 222-236

## PLASTIC WASTES - MANAGEMENT

### Selection of suitable plastic waste disposal strategy in Madurai municipal solid waste management corporation using AHP method

Shafi Ibrahim MS, Ahamed Sheriff KM

The plastic wastes are growing rapidly. This wastes polluting the environment and produce many diseases to living things. Now-a-days many researches are going on to reduce the plastic waste impact on environment. In Tamilnadu Madurai Municipal Corporation is the second largest corporation next to Chennai Corporation. Municipal solid waste management is the challengeable one in the Madurai Corporation. Among these municipal wastes plastic waste disposal is the challengeable one because plastic wastes are non-biodegradable. There are many strategies available to dispose the wastes. The objective of this thesis is to reduce the plastic waste impact on the earth. The survey was taken in the Madurai to identify the non-biodegradable disposing techniques available. A survey questionnaire was prepared and circulated among the medium to higher priority faculty of municipal solid wastes corporation Madurai to identify the factors for disposing wastes. The analytical hierarchy process is a multi criteria decision making tool is used to determine the best strategy among the strategies. Based on the ranking order the best strategy was selected.

*Climate Change*, 2015, 1(3), 237-242

## CLIMATE CHANGE IMPACTS

### Effect of lead on certain haematological parameters of the fresh water fish *Oreochromis Mossambicus* (Peters)

Meena R, Indra N

Metal pollution today is the highest cause of concern in developing countries. The effects of sub-lethal concentration ( $1/10^{\text{th}}$  - 1.87ppm of the 96 hr Lc50) of lead acetate on the haematological parameters in the fresh water fish *Oreochromis mossambicus*. The Red blood corpuscles, Haemoglobin, Haematocrit, MCH and MCHC where as the showed an increase at all exposure periods. The decrease in RBC has led to an anaemic state while the increase in WBC count may play a part in the development of certain degree of tolerance during the stress condition imposed by the lead acetate. In conclusion, the changes observed indicate that haematological parameters can be used as an indicator of metal related stress in fish on exposed to elevate level of metals in the water due to climate change impacts.

*Climate Change*, 2015, 1(3), 243-248

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