

## **Effect of Urban Agglomeration on Carbon Sequestration Potential of Thrissur District in Western Coast of India**

**Ajeena Hussain Z<sup>1</sup>, Abin Varghese<sup>2\*</sup>, Ancy Joseph<sup>3</sup>,  
Sajeer P<sup>4</sup> and Baiju K R<sup>5</sup>**

**Abstract :** *Urbanization has a great impact on the carbon sequestration potential of natural land. The relation between Land Expansion Intensity (LEI) and carbon sequestration was correlated to comprehend the influence of urbanization on carbon sequestration potential. The methodology was based on the land use land cover map from the Landsat series, MOD13A3 data, and climatic data. The improved Carnegie-Ames-Stanford Approach (CASA) model and linear regression model were applied. The correlation between LEI and carbon sequestration was - 0.96 and depicts a negative relation. The assessment of Spatio-temporal correlation analysis reveals that there is a loss of carbon while transforming natural land for urbanization.*

**Key Words:** *carbon sequestration, land expansion intensity (LEI), urbanization, carnegie-Ames-Stanford Approach (CASA), net primary productivity (NPP).*

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## **Protection of the Rights of Nature in Nigeria as an Exemplary Climate Change Adaptation Model**

**Christian Sopuruchi<sup>1</sup>**

**Abstract :** *The movement to recognize the legal personality of nature is presently gaining international momentum. Activists have advocated for the legal personality of rivers, trees and other objects occurring in nature which are usually not contemplated by the legal system as deserving of legal personhood. These are radical steps aimed at protecting these important features of our ecosystem. Critics of this movement insist that extending legal personhood to nature is an aberration, an unserious effort in the task to bring about an ecologically balanced world. However, there is little thought given to the legal personality of companies and other immaterial legal persons that today's legal system recognizes. The recent efforts in the United State to provide Lake Erie with rights (Pallotta, 2020) have failed leading to calls that these demands to protect the rights of nature are impractical and impossible. While these efforts in the United States of America have failed, there is a particular region of the world where this is possible.*

*Nigeria is home to a diverse community of people who have had to bear the brunt of a changing world climate. The West African region in which Nigeria is located has been ravaged by serious climate crises caused by anthropogenic activities. This research will be analyzing the nature of legal rights ascribed to nature, the state of the argument today and the legal protection provided to nature in the traditional religions present in Nigeria today. A central argument in this paper is that the nature of traditional conservation methods in Nigeria today reflect a radical method for climate protection that is needed in the world today. Nigeria is populated by a significant population of animists and traditionalists who because of their religion already anthropomorphize these objects in nature. Providing nature legal protection in Nigeria will not be groundbreaking as these already have traditional veneration. Nigeria is particularly focused on in this paper as the country with the most population in West Africa and as a country with a strong influence in the region that can influence neighbouring countries.*

**Key Words:** *rights, animals, nature, anthropocentric, Nigeria*

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## **Understanding Climate Change and its Interlinkage with People, Places, and Livelihood: A Case Study of Churu, Rajasthan**

**Kakali Deka<sup>1</sup>, Ujjawal Singh<sup>2</sup> and Sanskriti Shukla<sup>3</sup>**

**Abstract :** *The danger of global climate change has heightened the focus on understanding the impact on the environment, as well as natural and human-induced changes. Especially in developing countries like India, where half of the population is dependent on agriculture and 76 per cent of the population earns less than \$2 a day. These socio-economic characteristics alongside increasing urbanization have cumulatively made India one of the most vulnerable countries to climate change. In the western part of Rajasthan there lies the city of Churu, which made headlines as the mercury levels repeatedly crossed the dreaded 50°C mark in May-June 2020. Previously known as the gateway of the Thar desert, the city currently is one of the hottest cities in India for the last two years. About 72 percent of Churu's 2.5 million people live in rural areas. Like many parts of the rural Rajasthan, rain-fed agriculture and animal husbandry are the mainstay of the town's and surrounding areas economy. The alteration of rainfall patterns and gradually increasing temperature deeply affected the local communities economically and socially. Due to the extreme changes in temperature that resulted from them, many people would have to flee their homes and become environmental refugees. This will impact things like agricultural production, worker productivity, and access to clean water. This research aims to study the impact of climate change and its symbiotic relationship with a green cover and local communities. To achieve the aim, False Colour Classification (FCC), Normalized difference vegetation index (NDVI), and Supervised Classification tools are used in the Geographic Information system (GIS) to understand the gradual change in the city's built-up and green space area. The use of remote sensing techniques along with secondary resources is further done to analyse the area in terms of both its physical and social characteristics.*

**Key Words:** *climate change, Churu, GIS, land use, environmental refugees*

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## **Environmental Crisis, Climate Change and Climate Refugees in Alexis Wright's *The Swan Book***

**Sheetal Lalotra**

**Abstract :** *Over the past twenty years, there has been a significant increase in the global climate crisis and the deterioration of the environment. This growing concern has been explored in both fictional and non-fictional literature worldwide. Among the contemporary Australian writers who tackle the issue of environmental crisis and climate change is Alexis Wright. In her novel, "The Swan Book" published in 2013, Wright envisions a near future where the world has undergone drastic transformations as a result of human activities. "The Swan Book" portrays an apocalyptic world where individuals have migrated to regions that can sustain life, even under minimal conditions. The devastating climate crisis has left people without a state or a home, leading to an influx of climate refugees seeking shelter in Australia. This novel effectively demonstrates the interconnectedness between the environment and humanity, with the future symbolized by the arrival of black swans. Consequently, this narrative blurs the boundaries that traditionally separate nature and culture. This research paper aims to analyse the impact of environmental changes on individuals in Australia who have a deep connection with nature. It explores a dystopian future caused by environmental degradation, which has disrupted the harmonious relationship between humans and non-human entities that existed in pre-colonial times in Australia.*

**Key Words:** *Cli-Fi, climate apocalypse, ecological imperialism, environmental racism, climate refugees, and indigenous Australian literature*

## **Carbon Footprint of Printing Flight Tickets: A Study in the Indian Context**

**Anurag Piyamrao Wasnik<sup>1</sup> and Ishan Kumar Sarraf<sup>2</sup>**

**Abstract :** *The carbon emission from flight tickets, usually comprised of thermal receipts, is rising. Though considered at the bottom of the aviation sector's carbon emission pyramid, the tickets and boarding passes in the aviation sector made up of thermal papers have substantial environmental consequences. The study estimates the total carbon emissions from flight tickets in the Indian aviation sector. Briefly, it discusses the substitute and the efforts to reduce the use of thermal receipts in the industry. The total carbon emission from the physical tickets and boarding pass from the Indian airline sector in 2022 (till September) is estimated to be 142.99 tonnes, while total carbon emissions in the year 2021, 2020, 2019, and 2018 were estimated to be 90.51 tonnes, 239.78 tonnes, 238.76 tonnes, and 209.39 tonnes respectively. The study's findings will assist researchers in determining the environmental impact of physical flight tickets and identifying sustainable alternatives.*

**Key Words:** *Carbon footprint, thermal receipt, flight tickets, boarding pass, Indian aviation sector*

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## **Polarimetric SAR applications for Groundwater targeting: Case study for Durg District, Chhattisgarh**

**Riddhish Soni<sup>1</sup>, Divyang Soni, Karan Behar<sup>3</sup>, Anurag Piyamrao Wasnik<sup>4</sup>**

**Abstract :** *Groundwater is the primary requirement for agricultural operations and in a country like India, 89 per cent of groundwater is used for irrigation. Farmers in the Chhattisgarh state of India apply for loans to nationalized banks for availing borewell subsidies. Finding out the right source of underground clean water is a big challenge without a technology driven approach, and conventional methods rely on inaccurate, time consuming, costly and unscientific methods using twigs and coconuts for groundwater targeting. Hence, banks end up accumulating Non Performing Assets (NPA's) when a farmer ends up drilling a dry well. Unlike the developed countries, the application of systematic groundwater survey for aquifer source finding still remains a challenge in India.*

**Key Words:** *groundwater; radar; irrigation, non-invasive technique, elevation model*

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## **Assessing the Adequacy of Green Plantations along Indian National Highways: A Study on National Highway '48' in the Delhi Region**

**Anurag Piyamrao Wasnik<sup>1</sup> and Chancy Shah<sup>2</sup>**

**Abstract :** *The need for people and goods to travel develops in tandem with the human population, contributing to an increase in urban air pollution, particularly in developing countries. Pollutants produced by motor vehicle fuel combustion significantly influence pollution in metropolitan areas. Cities must use several effective measures to store carbon and reduce automobile pollution. Roadside plantations can contribute as an ecological factor that reduces the concentration of pollutants from vehicle emissions by directly absorbing carbon from vehicle emissions. Green corridors are being considered to assist India in meeting its voluntary carbon emission reduction promise, which is essential from both a climate mitigation and adaptation standpoint. Following adopting a "Green Highways Policy" in September 2015, the Ministry of Road Transport and Highways formed the National Green Highways Mission. This was done to minimize the adverse effects of car pollution, forest diversion, and tree cutting, on the one hand, and to the importance of the road network in economic growth, job creation, and poverty reduction. The Green Highways (Plantation, Transplantation, Beautification, and Maintenance) Policy, 2015 encompasses the country's National Highways intending to encourage corridor greening. Up to December 2021, 244.68 lakh plants have been planted under the scheme along 869 National Highways projects totaling 51,178 kilometers in length.*

*The paper aims to study the tree canopy density on the highways of India using the Maximum likelihood classifier machine learning model. The study area selected for the research is National Highway 48 in the Delhi region. The 65 km stretch of the NH48 was considered a Region of Interest (ROI) for this study .. The model's result shows a very low tree canopy cover of 15.04 km<sup>2</sup> in the region of interest. However, a few road segments are covered with a very high tree canopy of 8.57 km<sup>2</sup> . Forests are significant carbon sinks, but their area is diminishing owing to rising urbanization and a shift in emphasis toward infrastructural development. As India's infrastructure boom unfolds, green highways will take center stage in climate change mitigation.*

**Key Words:** *National Highways, Green Highways, satellite imaging, environment, sustainability, Delhi*

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## **Impact of the Tourism on Tribal Communities in Andhra Pradesh**

**Suresh Jagannadham<sup>1</sup>**

**Abstract :** *Tourism in India is important for the country's social, economic, and environmental aspects, which are growing rapidly. India is a variety of multicultural experiences. With a rich heritage and many of attractions, the country is among the most popular tourist destinations in the world. Travel and tourism are the largest service industry in India. Tourism provides financial encouragement for the development of many local crafts and cultures; thus, it has an effect on the income of the local artists. Tourism also helps to preserve, retain, and enrich our cultural heritages. Besides, tourism opens new vistas for multi-socio-cultural activities. With respect to India's tourism development, this paper examines the impact of tourism tribal communities in Andhra Pradesh.*

**Key Words:** *Tourism, Andhra Pradesh, tribal communities, indigenous people*

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