## DATA SHEET FOR RESEARCH SCHOLARS

- 1. Name of the Scholar: Sunit Gaurav Mohanty
- 2. Gender: Male
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- 9. Funding Agency:
- 10. Date of commencement of Fellowship:
- 11. Period of Fellowship:

12. Title of Research Work: Spatiotemporal analysis of urban heat island for thermal comfort using computational fluid dynamics, case study of Bhubaneswar.

- 13. Name of the Guide: Dr. Sanjaya Kumar Pattanayak
- 14. Registration Number: 08-ENVSC-31.07.2021
- 15. A Brief Abstract of your Research Work :

Urban and suburban areas have long been observed to have heat islands, where air and surface temperatures are hotter than in their rural surroundings. Heat islands can contribute to a range of environmental, energy, economic, and human health impacts such as increase demand for air conditioning to cool buildings, electricity typically rely on fossil fuel power plants to meet much of this demand, which in turn leads to an increase in air pollutant and greenhouse gas emissions, heat islands contribute to higher daytime temperatures, reduced night time cooling, and higher air-pollution levels, contribute to heat-related deaths and heat-related illnesses such as general discomfort, respiratory difficulties, heat cramps, heat exhaustion, and non-fatal heat stroke, High temperatures of pavement and rooftop surfaces can heat up storm water runoff, which drains into storm sewers and raises water temperatures as it is released into streams, rivers, ponds, and lakes etc. Indian cities developing their Climate Resilient City Action Plans (CRCAPs), heatwave management plan and launch of Climate Smart Cities Assessment Framework (CSCAF), etc. the Land Surface Temperature supervision can allow cities to create adaptive policy frameworks to combat climate change. The capital city of Odisha, Bhubaneswar, recorded the highest temperature in the country several times by becoming the hottest spot in the country with rise in temperature as high as 44 degrees Celsius. There is a significant UHI effect over the core urban area and surrounding regions are noticed and the relative humidity inside the urban core found to be declining, which indicates a drier near-surface atmosphere. The present study is an attempt to study the urban heat island intensity by use of remote sensing (MODIS and LANDSAT 9), GIS (ArcGIS 10.5) and meteorological data by measuring the land surface temperature and air temperature for the city of Bhubaneswar and to identify the regions acting as thermal hotspots and coldspots as compared to rural surrounding. The land surface temperature and its relation with the change of biophysical characteristics of the city for a timeframe will give a better idea of the rate of urbanization and development with the loss of green cover within the city core. Identification of the thermal heat stress levels within the city and its effect on the population by studying the the flow pattern of wind in the urban canopy by combination of GIS and computational fluid dynamics (Ansys Fluent - Release 2020 R1).

- 16. Status of Research Work:
  - a) Writing the Synopsis
  - b) Review of Literature



✓ ✓ ✓

- c) Data Collection
- Data Analysis d)
- e) Writing the Draft Thesis

17. Do you have your profile in the following research networks?

- a) Google Scholar
- b) **Research Gate**
- c) Academia
- 18. Do you access the following e-resources subscribed by the university
  - a) E-sodh Sindhu from INFLIBNET
  - b) ProQuest
- $\checkmark$ ✓
- 19. Number of Papers published in referred journals with ISSN: 01 (2455-1457)
- 20. Mention any two of your best publications in APA standard:
  - a) Mohanty, S. G., Nayak, M., & Singh, S. Feasibility study of Machine Learning based Renewable **Energy Applications.**

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Countersigned by the Research Supervisor

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Pattomayak

Countersigned by Head