

# **QUALITATIVE ASSESSMENT OF ENVIRONMENTAL AWARENESS AMONG ADOLESCENTS: A SAMPLE STUDY**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

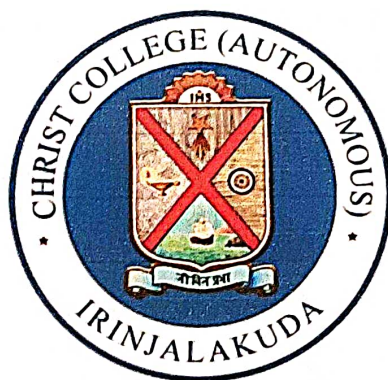
Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**AMITH M R**

**(REG. NO.: CCAWMES002)**

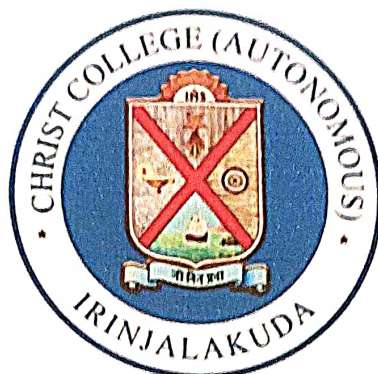


**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**2022-2024**

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EXAMINERS:

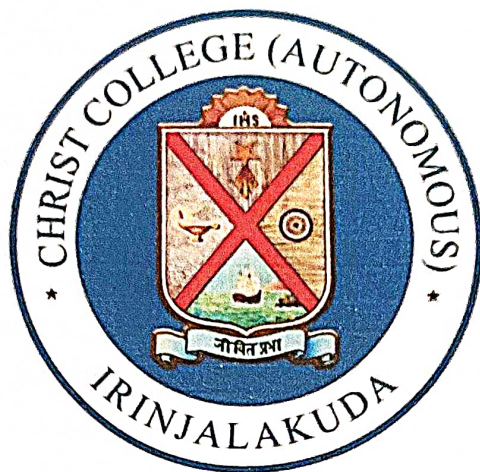
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**Dr Rekha V B**

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## DECLARATION

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Place: Irinjalakuda

Date: 12/06/2024



AMITH M R

CCAWMES002



## ACKNOWLEDGEMENT

I take this opportunity to express my heartiest gratitude to all, whose contribution to this project work can never be forgotten.

I would like to extend my profound sense of gratitude and whole souled appreciation to my supervisor Dr. Rekha V B [Assistant Professor, Department of Geology and Environmental science, Christ College (Autonomous) Irinjalakuda.] for her in-depth guidance, motivation and monumental suggestions throughout this research work. I wholeheartedly mark my thankfulness to Dr. Subin K Jose [Assistant Professor, Department of Geology and Environmental science, Christ College (Autonomous) Irinjalakuda.], Dr. Manju N J, [Assistant Professor, Department of Geology and Environmental science, Christ College (Autonomous) Irinjalakuda.] for their encouragement and path guiding. I sincerely acknowledge the inestimable sharing of knowledge and abetment provided by Ms. Archana M (Research Scholar, Department of Geology and Environmental science, Christ College (Autonomous) Irinjalakuda.) which have thrown light to this work. I am also thankful to Ms. Geethu Gopinath, [Assistant Professor, Department of Statistics, Christ College (Autonomous) Irinjalakuda] Ms. Malavika P, Ms. Indu Mohan, Ms. Akhila K S who have done some statistical guidance and technical expertise during this project. Finally I would like to thank all my classmates for providing support and motivation. No valuable words could match the unconditional love, knowledge and encouragement shared by my family and friends for driving up the confidence to complete this research. With all the immense gratitude I thank all who have helped me directly and indirectly for the successful completion of my dissertation.

AMITH M R

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## ABSTRACT

This study aimed to assess the environmental awareness levels among adolescents from a small sample in Kerala, India, through a qualitative approach. A sample of adolescents was surveyed using a 20-item questionnaire distributed through various online platforms, covering different dimensions of environmental science and related laws. The questionnaire scores served as a measure of individual environmental awareness. Study evaluated three primary objectives: respondents' overall environmental awareness, their knowledge of environmental laws, and their past actions toward environmental protection and maintenance. Results indicated that more than 70% of respondents exhibited satisfactory environmental awareness across all three objectives. Furthermore, the study investigated the influence of gender and age on environmental awareness levels. Statistical analyses revealed no significant age-related differences, with all three age groups demonstrating comparable environmental awareness scores. However, a slight gender disparity was observed, with females exhibiting slightly higher levels of environmental awareness compared to males. The study concludes by recommending various measures to enhance environmental awareness among adolescents and emphasizing the need for further research in this field, including larger sample sizes, quantitative studies, and the exploration of additional variables such as socioeconomic conditions. Overall, this qualitative assessment provides valuable insights into the environmental awareness landscape among adolescents from the sample in Kerala and highlights potential areas for future exploration and interventions.



**ASSESSMENT OF NON-BIODEGRADABLE WASTE MANAGEMENT  
STRATEGIES IN PANCHAYATHS OF KERALA, INDIA: A CASE STUDY**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**ANAMIKA E B**

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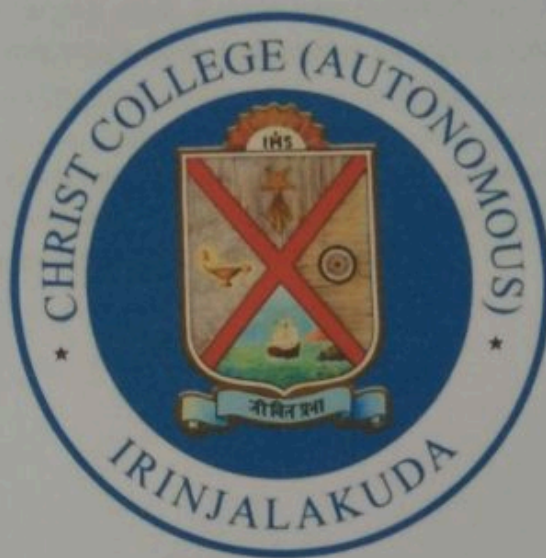
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ANAMIKA E B

## ABSTRACT

Non-biodegradable waste, comprising materials like plastics, metals, and glass, poses significant challenges for local self-government institutions (LSGIs) worldwide. Effective waste management strategies are essential to mitigate its enduring environmental impact and promote sustainable development. This study focuses on evaluating the non-biodegradable waste disposal, collection, segregation, and recycling procedures employed by the panchayaths of Vallachira, Paralam, and Cherpu in Kerala, India. The objective is to assess the existing programs, regulations, and infrastructure implemented by these LSGIs to manage non-biodegradable waste efficiently. Additionally, the study will investigate community involvement and awareness campaigns aimed at promoting proper waste disposal practices among citizens. By analyzing the advantages and disadvantages of current methods, the research aims to provide insights for improving waste management at the LSGI level. The findings of this study will be compiled into a comprehensive report, including actionable suggestions for environmentally friendly waste management techniques tailored to the unique requirements of Vallachira, Paralam, and Cherpu panchayaths. This information will be invaluable to legislators, environmentalists, and local officials working to enhance waste management practices and mitigate the adverse environmental impacts of non-biodegradable waste in these areas.

**SHORELINE CHANGE ASSESSMENT OF KADAPPURAM PANCHAYATH  
IN THRISSUR DISTRICT, KERALA**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**ARYA.S.KUMAR**

**(REG. NO.: CCAWMES004)**



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**2022-2024**



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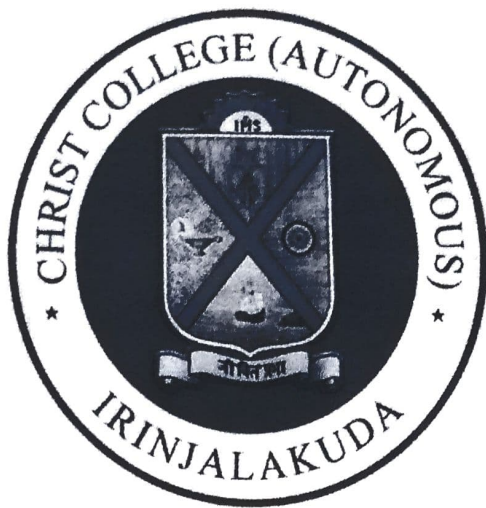
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Place: Irinjalakuda

Date: 14-06-2024



**ARYA.S.KUMAR**

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**PEOPLE AWARENESS AND PERCEPTIONS ON  
SUSTAINABLE HOUSEHOLD WASTE MANAGEMENT: A  
STUDY IN KAIPARAMBA PANCHAYAT, THRISSUR  
DISTRICT, KERALA**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**DRISYA M P**

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**Dr Subin K Jose**

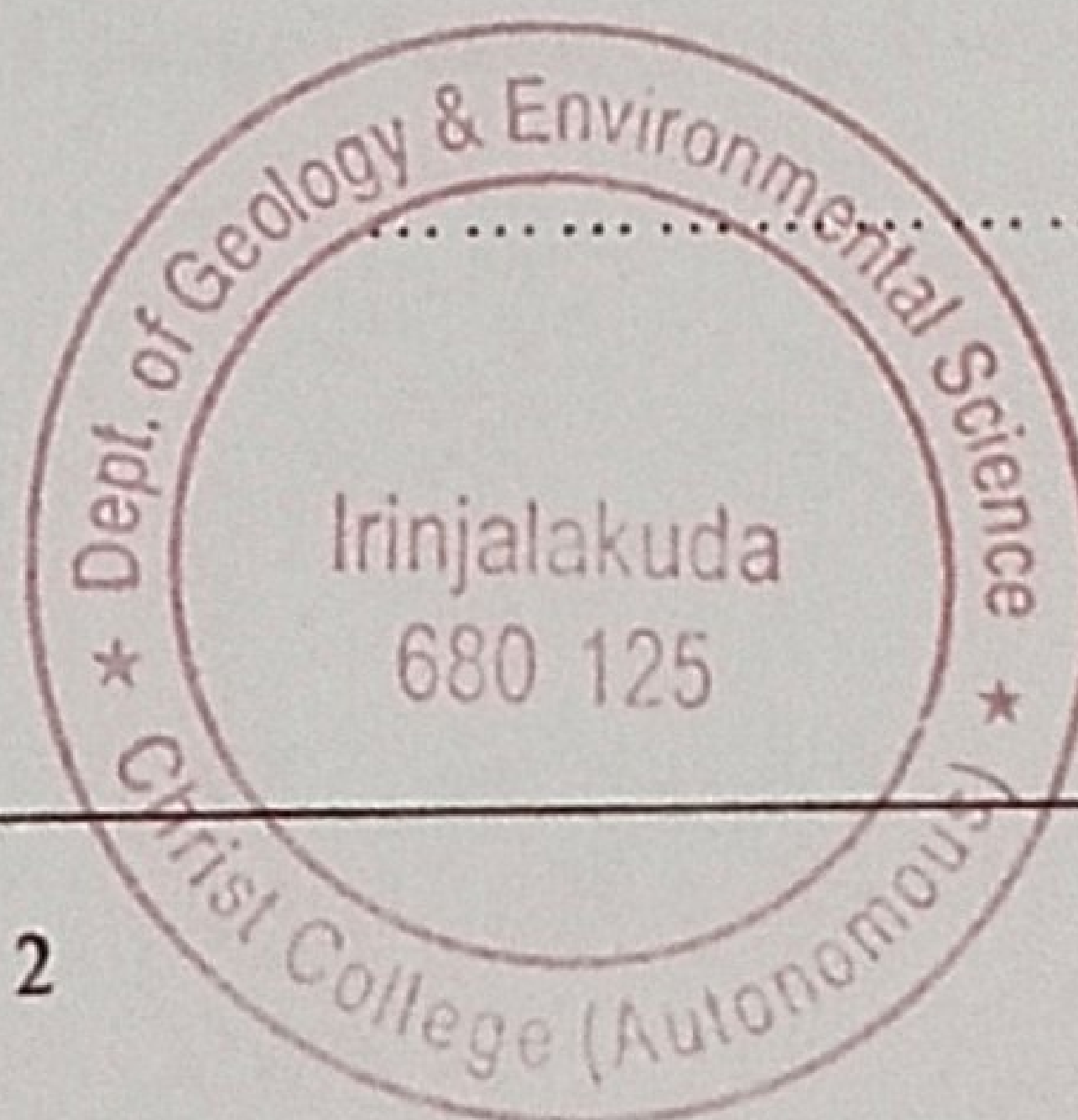
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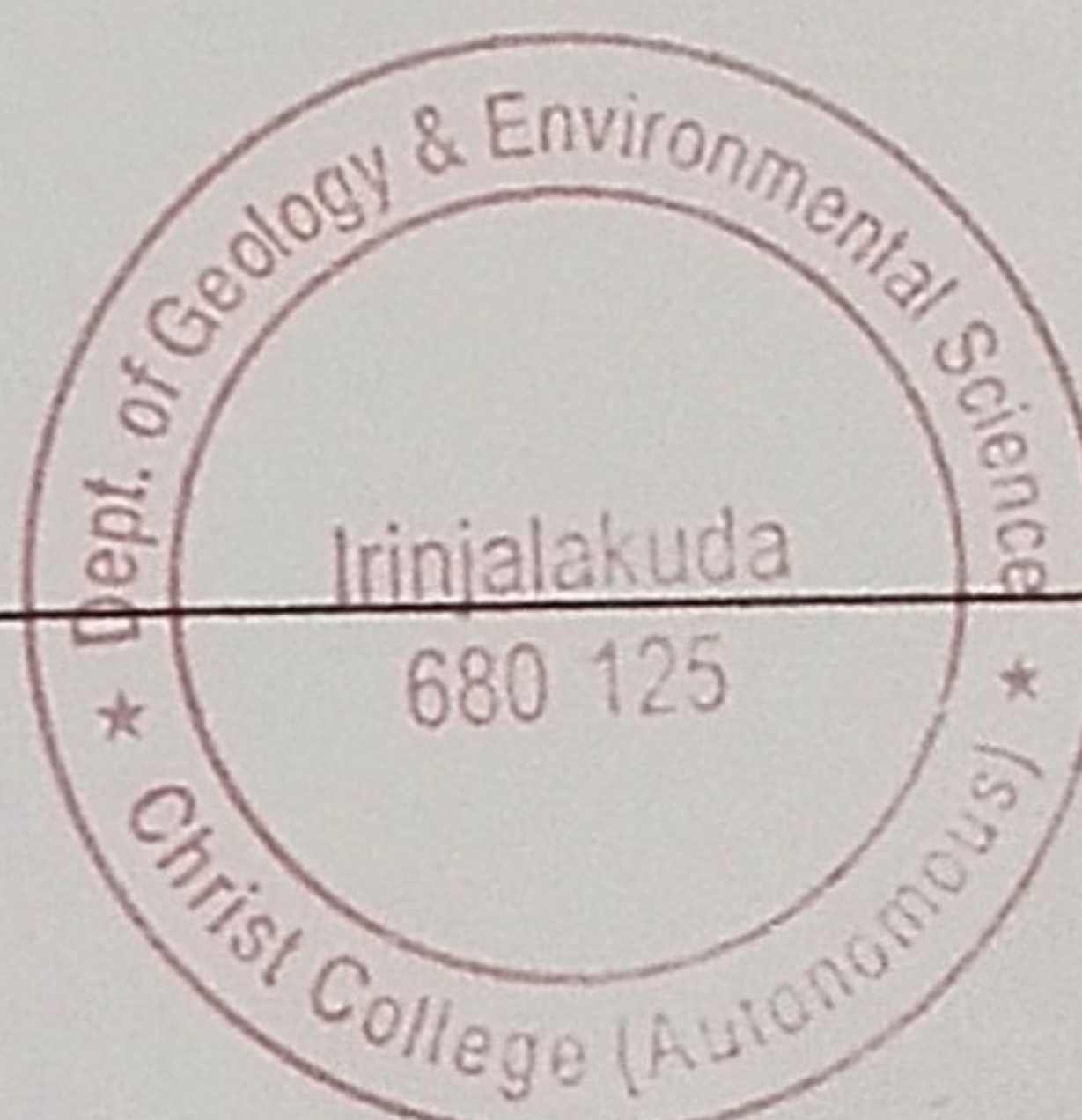
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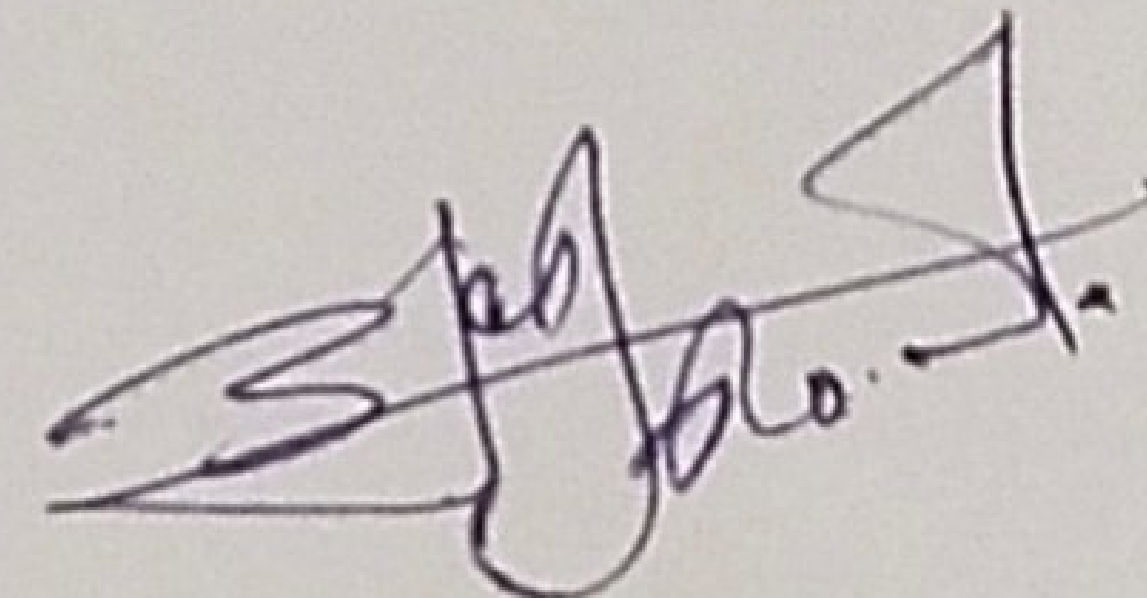


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Place: IRINJALAKUDA

Date: 12/06/24



DRISYA M P

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## **ACKNOWLEDGEMENT**

It is with great pleasure and respect to express my sincere gratitude to all those who have given advice and help for completing this project. I thank Almighty God, for all blessings that he has showered on me for completing this dissertation. I wish to express my utmost and profound gratitude to my super-visor guide Dr. Rekha V B (Assistant Professor, Department of Geology and Environmental science, Christ college (autonomous), Irinjalakuda) for her valuable guidance and support which made this project a reality. I would like to pay my deep sense of gratitude to Archana M (Research Scholar, Department of Geology and Environmental Science, Christ College (autonomous), Irinjalakuda) for her invaluable advice, encouragement, and compassion to me during my work. I would like to extend my sincere gratitude to Dr. Subin K Jose, assistant professor and head of department in the department of Geology and environmental science, Christ College (Autonomous), Irinjalakuda. It is an honour for me to express my gratitude and appreciation to my teachers, classmates and friends for their support and love throughout the process of my study. I reckon with love the virtuous support given by my family members for the successful completion of this work.

**DRISYA MP**



## **ABSTRACT**

The present study was conducted to understand the awareness and perceptions of people on sustainable household waste management in Kaiparamba panchayat in Thrissur district. The detailed survey was conducted during the month of September 2023 among the randomly selected households in the 5<sup>th</sup> ward of Kaiparamba panchayat with a self prepared questionnaire. The results showed that the socio-economic status of the households is generally not much better. 90% of people do not know about the amount of waste generated. The survey observed that people were unaware about sustainable waste treatment methods. About 80% of households generate close to 400 grams of non-biodegradable waste per week. It was found that plastic waste is the most problematic one among the non-biodegradable wastes. The survey found that 60% of households dispose their solid wastes including plastic wastes by burning. The study observed that service of Harithakarmasena not available regularly in the ward. The waste creates major problem just in case if it is not recycled properly. It creates serious issues on the environment as well as health hazard to the people surrounding the dump. The garbage generated causes financial loss as well as long term environmental damage. A detailed survey is conducted to understand the perception as well as awareness of the waste that every household generates. Therefore the present study suggests implementing awareness programme on waste management at ward and Panchayat level and also to strengthen the Harithakarmasena activities in the study area.



# **RAINFALL ANALYSIS USING PYTHON FOR COCHIN**

Dissertation submitted to the  
**UNIVERSITY OF CALICUT**  
in partial fulfilment of the requirements of the degree of  
Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by  
**FIDA FATHIMA S**  
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**Dr Subin K. Jose**

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EXAMINERS:

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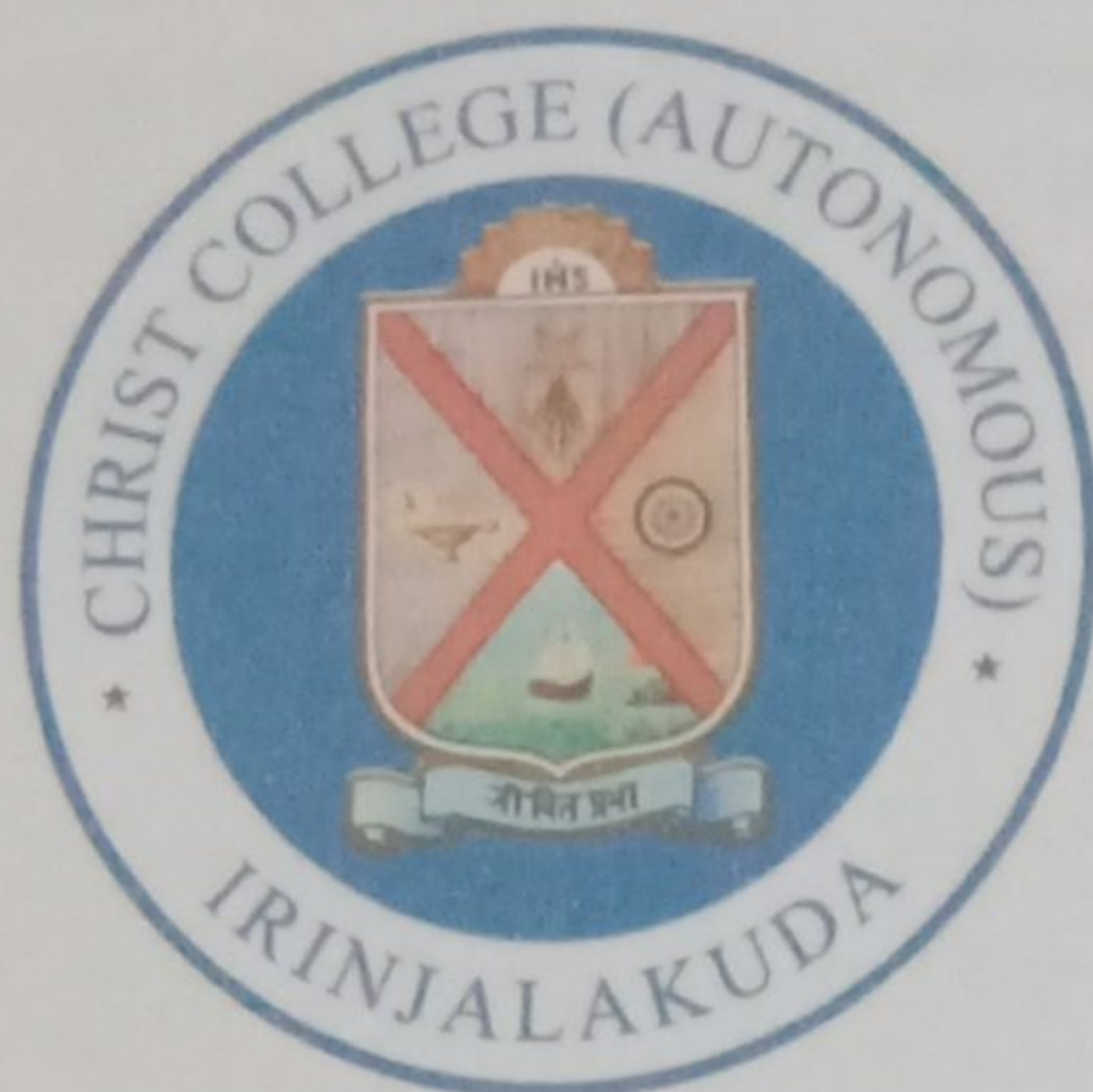
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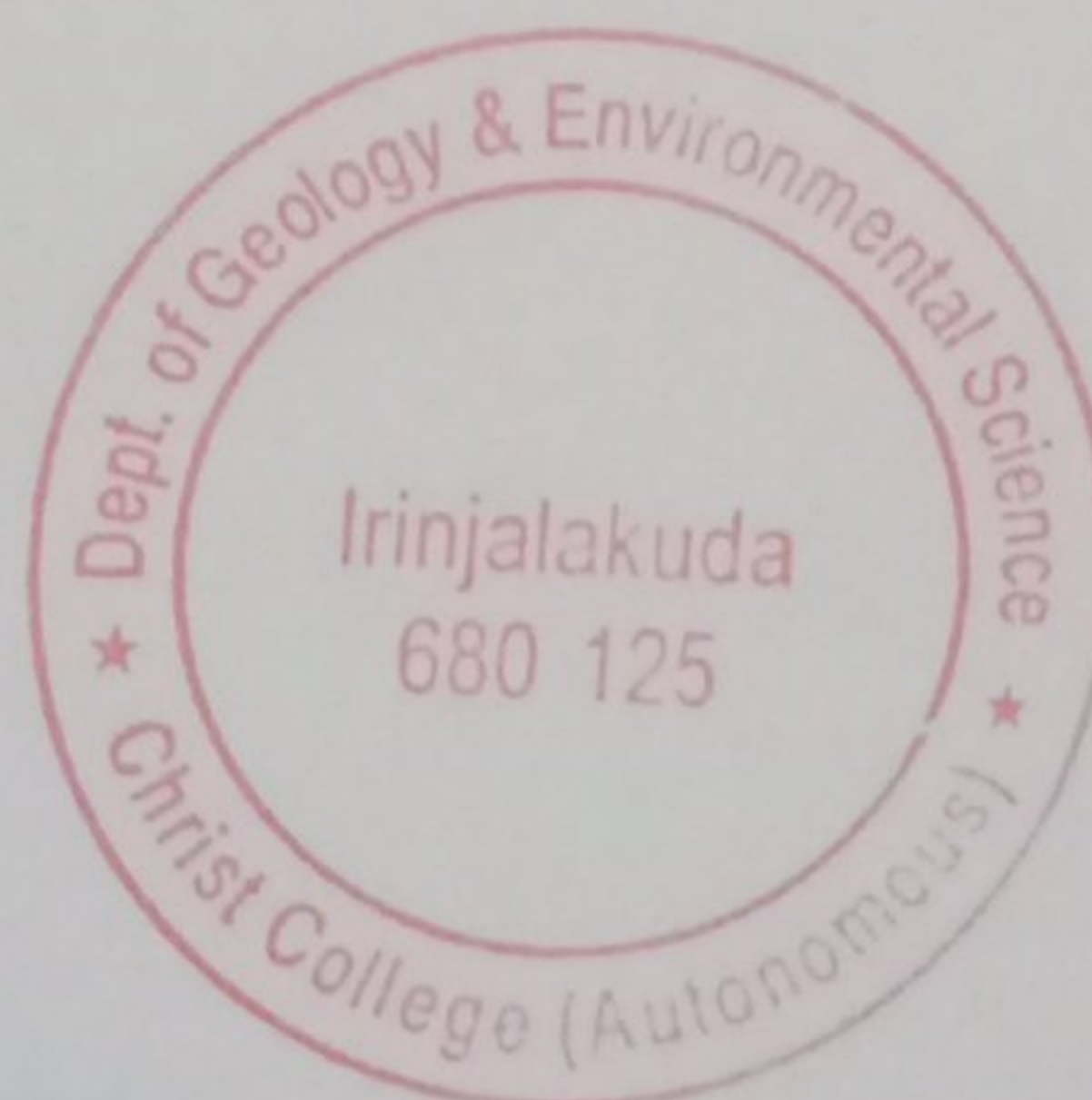


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**Dr REKHA V B**

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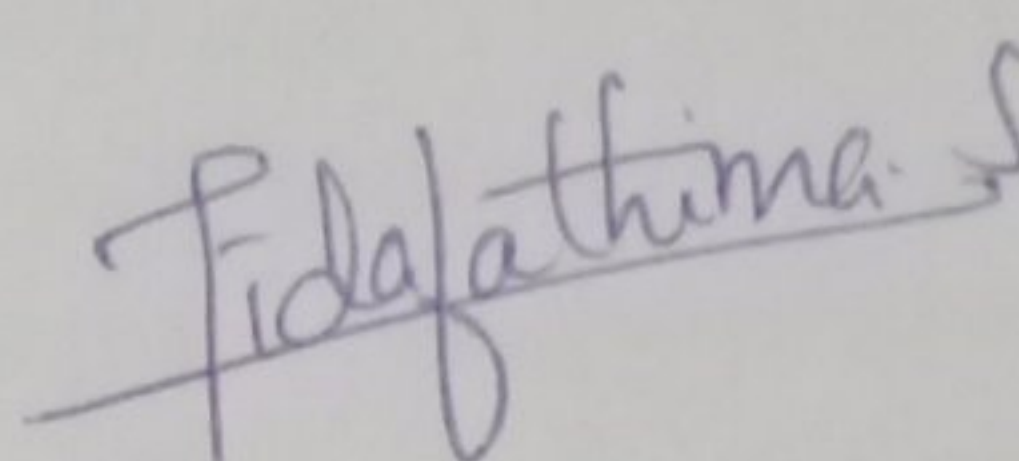




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**FIDA FATHIMA S**  
**CCAWMES006**



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FIDA FATHIMA S.



## ABSTRACT

This study was carried out in Kochi, Kerala from 1902 to 2010 on rainfall trend analysis. Python is used to complete the study. In order to obtain a trend of rainfall in the city for over a century, IMD data were collected, formatted and processed and analysed using Python. A comparison study is carried out with respect to the change in precipitation over the city. The city is prone to floods quickly, despite the advances made in infrastructure. The fluctuations in weather conditions are also caused by the activity of industry. The purpose of this study is to indicate a change in rainfall as a result of these reasons.

Another vitality is the use of technology tools that make the study easier and more precise. The data are less bulky and the interpretation is much simpler when presented in a graphical form.



**A COMPREHENSIVE STUDY ON TRADITIONAL AND  
CONTEMPORARY WATER  
CONSERVATION TECHNIQUES**

Dissertation submitted to the  
**UNIVERSITY OF CALICUT**  
in partial fulfilment of the requirements of the degree of  
Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by  
**GAYATHRI S.**  
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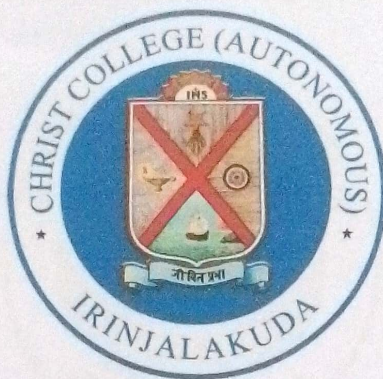
**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**2022-2024**



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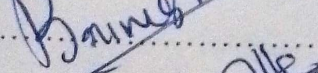

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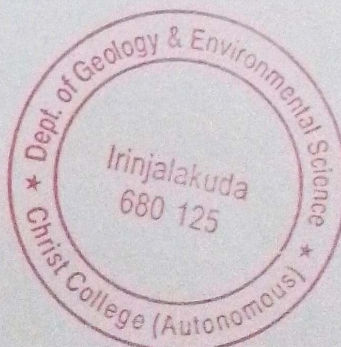
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CHRIST COLLEGE(AUTONOMOUS), IRINJALAKUDA



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This is to certify that the dissertation entitled “**A COMPREHENSIVE STUDY ON TRADITIONAL AND CONTEMPORARY WATER CONSERVATION METHODS**” is an authentic record of the work carried out by Ms. **GAYATHRI S** under the guidance of **Dr.REKHA V B**, Assistant Professor Department of Geology and Environmental science, CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA in partial requirement for the award of Master of Science in Environmental Science is submitted to the University of Calicut during the academic year 2022-2024.

**Dr REKHA V B**

Assistant Professor,  
Department of Geology &  
Environmental Science,  
Christ College(Autonomous), Irinjalakuda

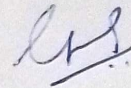




## DECLARATION

I hereby declare that the project work entitled “**A COMPREHENSIVE STUDY ON TRADITIONAL AND CONTEMPORARY WATER CONSERVATION METHODS**” submitted to University of Calicut in partial requirement for the award of Master of Science in Environmental Science, was carried out by me during the period of April 2023 to May 2024 under the guidance and supervision of **Dr. REKHA V. B** Assistant Professor Department of Geology and Environmental science CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA and no part thereof been presented before, for any other degree or diploma in any university.

Place: Irinjalakuda  
Date: 14.06.2024



**GAYATHRI S**  
**CCAWMES007**



## ACKNOWLEDGEMENT

It is with great pleasure and respect to express my sincere gratitude to all those who have given advice and help for completing this project. I thank Almighty God, for all blessings that he has showered on me for completing this dissertation. I wish to express my utmost and profound gratitude to my supervising guide Dr. Rekha V B (Assistant Professor, Department of Geology and Environmental science, Christ college (autonomous), Irinjalakuda) for her valuable guidance and support which made this project a reality. I would like to pay my deep sense of gratitude to Archana M (Research Scholar, Department of Geology and Environmental Science, Christ College (autonomous), Irinjalakuda) for her invaluable advice, encouragement, and compassion to me during my work. I would like to extend my sincere gratitude to Dr. Subin K Jose, Assistant Professor, and head of department in the department of geology and environmental science, Christ College (Autonomous), Irinjalakuda. It is an honor for me to express my gratitude and appreciation to my teachers, classmates and friends for their support and love throughout the process of my study. I reckon with love the virtuous support given by my family members for the successful completion of this work.

GAYATHRI S.



## ABSTRACT

Water is a vital and increasingly scarce resource, underscoring the importance of effective conservation strategies for sustainable development and environmental preservation. This study delves into both conventional and contemporary approaches to water conservation, emphasizing their individual strengths and the potential for exploring these techniques to tackle current water challenges. Conventional water conservation methods, deeply ingrained in cultural practices and local knowledge systems, have been utilized for generations by communities worldwide. Practices such as rainwater harvesting, traditional irrigation methods, and the construction of water storage facilities have played a crucial role in maintaining water resources and encouraging sustainable water management practices. Simultaneously, modern water conservation strategies have surfaced, capitalizing on technological progress and scientific insights. These encompass efficient irrigation systems, water recycling and reuse, installation of water-saving fixtures, and the adoption of advanced water management technologies. By merging the wisdom of traditional practices with the innovative capabilities of modern techniques, a holistic and all-encompassing approach to water conservation can be formulated. These fusion nurtures a deeper comprehension of the intricate connections between human societies and their natural surroundings, facilitating the creation of tailored solutions that cater to local needs and circumstances. The study underscores the significance of raising public awareness, promoting education, fostering community involvement, and engaging in collaborative endeavours with diverse stakeholders to achieve enduring water security and sustainability. Ultimately, the seamless integration of traditional and modern water conservation methods offers a promising route towards addressing the global water crisis and safeguarding the availability of this invaluable resource for both current and future generations.



**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE  
CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**



**CERTIFICATE**

This is to certify that dissertation entitled "**MICROBIAL INTERVENTION TO IMPROVE CN RATIO OF THE COMPOST**" submitted by **HARSHA K SURESH** in parial fulfillment of the requirement for the award of Master of Science in Environmental Science, Christ college (Autonomous), Irinjalakuda to the University of Calicut is a bonafide work carried out during the period of study under my guidance and supervision.

**DR.MANJU N.J.**

Project Guide

Dept. of Geology And Environmental Science,  
Christ College (Autonomous ), Irinjalakuda





**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE  
CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**



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**DR. SUBIN K JOSE**

Head Of the Department,

Dept. of Geology And Environmental Science,  
Christ College (Autonomous ), Irinjalakuda



Examiners:

1.   
2.   
3. ....



**MICROBIAL INTERVENTION TO IMPROVE CN RATIO OF THE COMPOST**

*Dissertation submitted to the University of Calicut, Thenjipalam in partial fulfillment of the requirements of the degree of*

**Master of Science in Environmental Science**

By

**HARSHA K SURESH**

(Register no:

CCAWMES008)

Under the Guidance of

**Dr. Manju N.J**

Assistant professor

Department of Geology and Environmental Science

Christ college Irinjalakuda

**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE**



**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

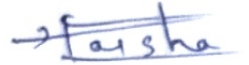
**2022-2024**



# DECLARATION

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Professor, Department of Geology and Environmental Science, Christ College  
nous) Irinjalakuda and no part there of been presented before, for any other degree o  
in any university.



Harsha K Sures

CCAWMES00



### ACKNOWLEDGEMENT

This is to express my sincere and heartfelt thanks to all those who have helped me to complete my project successfully. At the very outset, we thank God who showered his blessings upon me which enriched my thoughts, deeds and gave me health, strength and confidence to complete my work.

I wish to express my sincere thanks and gratitude to my project guide Dr. Manju N.J, Assistant professor , Department of Geology and Environmental Science, Christ college(Autonomous), Irinjalakuda for her guidance. Her advice and inspiration made it possible for me to have the confidence to undertake this project. I also express my sincere thanks to Ms. Shehanaz U , Research Scholar Department of Geology and Environmental science for her supervision in completing my project.

I am thankful to the Principal, Christ College Irinjalakuda. Finally I express my gratitude to my Family, teachers and friends for their encouragement.

Harsha K Suresh  
CCAWMES00

8



### ABSTRACT

Water pollution has escalated into a significant disaster, driven by urbanization and population growth. In this context, appropriate precautions and effective treatments are vital. Wastewater from dairies and slaughterhouses contains high levels of fats and proteins, which are difficult to biodegrade. Various pretreatment systems are used to remove oil and grease, preventing issues in the biological process and maintaining the efficiency. However, applying a pretreatment that hydrolyzes and dissolves lipids can enhance the biological degradation of fatty wastewater, speeding up the process. Naturally occurring microorganisms that use hydrocarbons as their sole carbon source and energy are effective agents for degrading oil spills. This study aimed to isolate and enrich lipolytic bacteria for bioremediation of oil or fat-containing wastewater.

We also tried the application of hydrolytic Bacteria for improving CN ratio of the biomineralized good earth from a municipal dump site. The Project was carried out from 21st March 2024 to 4th June 2024.



**SCOPING OF WATER QUALITY IN AN IRRIGATION FACILITY IN  
IRINJALAKKUDA FOR EFFECTIVE BIOREMEDIATION**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**MALAVIKA CHANDRAKUMAR**

**(REG. NO.: CCAWMES009)**



**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**2022-2024**



DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE

CHRIST COLLEGE(AUTONOMOUS), IRINJALAKUDA



CERTIFICATE

This is to certify that the dissertation entitled **“SCOPING OF WATER QUALITY IN AN IRRIGATION FACILITY IN IRINJALAKKUDA FOR EFFECTIVE BIOREMEDIATION ”** is an authentic record of the work carried out by Ms. **MALAVIKA CHANDRAKUMAR** under the guidance of **Dr. MANJU N.J.**, Assistant Professor Department of Geology and Environmental Science, CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA in partial requirement for the award of Master of Science in Environmental Science is submitted to the University of Calicut during the academic year 2022-2024.

  
**Dr Subin K Jose**

Head of Department of Geology & Environmental Science

Christ College (Autonomous), Irinjalakuda

EXAMINERS:

1 .....   
2 ..... 





DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE

CHRIST COLLEGE(AUTONOMOUS), IRINJALAKUDA



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**Dr MANJU N.J**

Department of Geology & Environmental Science

Christ College (Autonomous), Irinjalakuda





## DECLARATION

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Place: Irinjalakuda

Date: 14/06/24



**MALAVIKA CHANDRAKUMAR**

**CCAWMES009**



## **ACKNOWLEDGEMENT**

It is with great pleasure and respect to express my sincere gratitude to all those who have given advice and help for completing this project. I thank Almighty God, for all blessings that he has showered on me for completing this dissertation.

I wish to express my utmost and profound gratitude to my super-vising guide Dr. Manju N.J (Assistant Professor, Department of Geology and Environmental science, Christ college (autonomous), Irinjalakuda) for her valuable guidance and support which made this project a reality.

I would like to pay my deep sense of gratitude to Shahnaz U (Research Scholar, Department of Geology and Environmental Science, Christ College (autonomous), Irinjalakuda) for her invaluable advice, encouragement, and compassion to me during my work.

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**MALAVIKA CHANDRAKUMAR**



## **ABSTRACT**

Since they provide invaluable resources for the advancement and continuation of life, rivers consistently serve as the backbone of the country and civilization. Rivers in particular, which are used for irrigation and drinking, are an essential component of Indian culture. The most essential resource for life is water. However, human activity is causing this most valuable resource to decay.

Water quality of the region Irinjalakuda assessed by collecting samples from the an irrigation system. Three samples were collected from the water body with a distance of minimum of 500m distance between each collected area. For the analysis of physical, chemical and biological characteristics of the collected sample, various analysis has conducted that includes pH, TDS, EC, COD, alkalinity, total hardness etc. assuming the presence of heavy metals, the sample went through the analysis of five heavy metals which are copper, arsenic, lead, manganese and cadmium. This study aims to understand the condition of collected samples so that they can be subjected to the process called bioremediation. To analyse the extent of pollution level, comparison of obtained results to the BIS standard was carried out. For further study and understanding, comparison of obtained result with the data of water quality of Koratty panchayat has also been conducted.



DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE  
CHRIST COLLEGE(AUTONOMOUS), IRINJALAKUDA



**CERTIFICATE**

This is to certify that the dissertation entitled **“NURTURING ECO-CONSCIOUSNESS: INTEGRATING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL CURRICULUM”** is an authentic record of the work carried out by Ms. **MANEESH V M** under the guidance of **Dr.REKHA V B**, Assistant Professor Department of Geology and Environmental science, CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA in partial requirement for the award of Master of Science in Environmental Science is submitted to the University of Calicut during the academic year 2022-2024.

**Dr Rekha V B**

Department of Geology & Environmental Sciences

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**CHRIST COLLEGE(AUTONOMOUS), IRINJALAKUDA**



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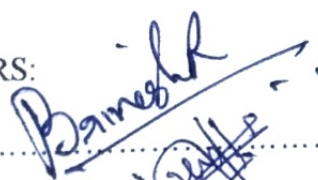

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**Dr Subin K Jose**

Head of Department of Geology & Environmental  
 Sciences

Christ College (Autonomous), Irinjalakuda

EXAMINERS:

1 .....   
 2 ..... 





**NURTURING ECO-CONSCIOUSNESS : INTEGRATING  
ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL  
CURRICULUM**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

in partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**MANEESH V M**

**(REG. NO.: CCAWMES010)**



**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**2022-2024**



## DECLARATION

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Place: **IRINJALAKUDA**

Date: **12/06/2024**



**MANEESH V M**

**CCAWMES010**



### ACKNOWLEDGEMENT

First and foremost, I am incredibly grateful to the divine force that I believe in, for being my constant companion throughout this journey, providing me with the strength, willpower, and motivation to complete this project successfully. I would like to express my sincere gratitude and appreciation to Dr. Rekha V B, Assistant Professor, Department of Geology and Environmental Science, for her invaluable guidance, unwavering support, and mentorship during the course of this project. Her expertise and insights were instrumental in shaping my work. My heartfelt thanks go to the dedicated teachers of NSLP School Madakkathara, Thrissur, who kindly facilitated my offline class interactions and provided me with the necessary support and cooperation. I am deeply indebted to the entire teaching and non-teaching staff of NSLP School Madakkathara for their constant encouragement, support, and for creating a conducive environment that enabled me to carry out my project work effectively. I extend my sincere gratitude to Archana M, Research Scholar, Department of Geology and Environmental Science, Christ College Autonomous, Irinjalakuda, whose meticulous feedback, constructive critiques, and insightful suggestions were invaluable in refining my work and helping me overcome any hurdles encountered along the way.

I am truly thankful to my family members and friends, whose unwavering belief in me, constant motivation, and valuable advice played a significant role in the successful completion of this project.

Finally, I would like to acknowledge and appreciate my own dedication, perseverance, and hard work, which ultimately made this achievement possible.

MANEESH V M



### ABSTRACT

Environmental awareness is a crucial aspect of Environmental Science education. It involves fostering an understanding and appreciation of the intricate relationship between humans and the natural environment. By cultivating environmental awareness from a young age, students develop a sense of responsibility towards protecting and preserving the Earth's resources. This study aims to evaluate the existing Environmental Science curriculum and pedagogical approaches for lower primary school students in Kerala, and to formulate an enhanced syllabus that effectively fosters environmental understanding and positive attitudes towards the environment. The research involves assessing the current level of environmental knowledge and perspectives among pupils at NSLP School Madakkathara in Thrissur district. The methodology employs a mixed-methods approach, utilizing questionnaires, classroom observations, and interactions with students and teachers to gather data. The existing Environmental Science syllabus is critically analyzed to identify its strengths, weaknesses, and areas for improvement. Based on the findings, a revised and integrated syllabus is developed for each grade level, incorporating hands-on activities, experiential learning, and innovative teaching strategies. The proposed syllabus is then implemented through offline classroom sessions, allowing for evaluation of its effectiveness and applicability. Continuous feedback from students and teachers is obtained to refine the syllabus further, ensuring its relevance and alignment with the developmental needs of the target age group. The study contributes to the field of environmental education by providing a tailored curriculum that addresses the specific challenges and opportunities within the local context. The findings and recommendations can inform policymakers and educators in enhancing environmental literacy and promoting sustainable practices among the younger generation.



**BIOVALORIZATION OF BIOMINED GOOD EARTH FROM A MUNICIPAL  
DUMP SITE**

*Dissertation submitted to the University of Calicut, Thenjipalam in partial  
fulfillment of the requirements of the degree of*

**Master of Science in Environmental Science**

Submitted by

**MINNU MOHAN**

(Register no: CCAWMES011)

Under the guidance of

**Dr.MANJU N.J**

Assistant Professor

Department of Geology and Environmental Science

Christ College Irinjalakuda



**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE,**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA,**

**2022-2024**



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CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**



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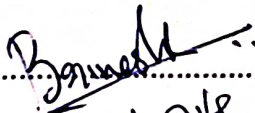
This is to certify that dissertation entitled **"Biovalorization of Biomined Good Earth from a Municipal Dump Site"** submitted by **Minnu Mohan** in partial fulfillment of the requirement for the award of master of Science in Environmental Science, Christ college (Autonomous), Irinjalakuda to the University of Calicut is a bonafide work carried out during the period of study.

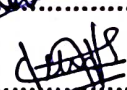
  
**DR.SUBIN K JOSE**

Head of the Department

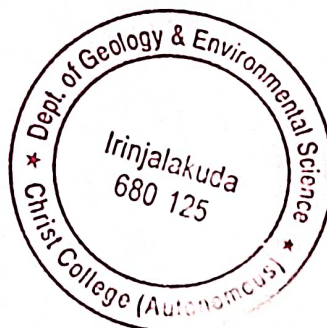
Department of Geology and Environmental Science,  
Christ College (Autonomous) Irinjalakuda

Examiners:

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**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**



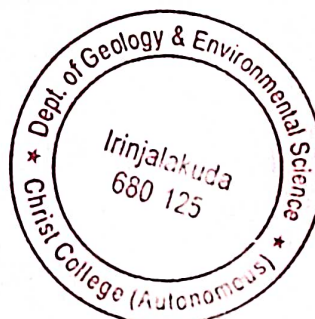
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**DR. MANJU N J**

**Project Guide**

**Department of Geology and Environmental Science,  
Christ College (Autonomous), Irinjalakuda**





## DECLARATION

I hereby declare that the project entitled “*Biovalorization of Biomined Good Earth from a Municipal Dump Site*” submitted for the partial fulfillment of the requirements for the award of degree in “Master of Science in Environmental science” to Department of environmental science, Christ College (Autonomous) Irinjalakuda, was carried out by me during the period from 21<sup>st</sup> March 2024 to 4<sup>th</sup> June 2024 under the supervision and guidance of Dr.Manju N J, Department of Environmental Science, Christ college autonomous Irinjalakuda. In keeping with the general practice of reporting scientific observations, due acknowledgements have been made wherever the work described is based on the findings of other investigators and no part of this report has been presented earlier for any degree or diploma of any other university.

June 2024  
  
MINNU MOHAN

MSc. Environmental science

Christ College (Autonomous), Irinjalakuda



## ACKNOWLEDGEMENT

Acknowledgement allows me to express my sincere and heartfelt thanks to all those who helped me to complete my project successfully. Before that, I bow in front of Almighty God who showered His abundant blessing upon me which enriched my thoughts, deeds and gave me health, strength and confidence to complete my work.

The satisfaction and euphoria of successful completion of any task would be incomplete without mentioning the people who made it possible whose constant guidance and encouragement crown our effort with success.

I would like to express my sincere appreciation and gratitude to Dr. Manju N. J, my research guide for the valuable guidance and encouragement throughout the course of this work. I express my sincere gratitude to Shehanaz U, Research Scholar, Department of environmental science, Christ College, Irinjalakuda for her valuable advice and support throughout this project work. I would like to extend my sincere gratitude to Dr. Subin K Jose, Head of the Department of environmental science, Christ College, Irinjalakuda.

I thank our Principal Dr. Fr. Jolly Andrews CMI for providing a helping hand throughout this project.

Finally I express my gratitude to my family, all my teachers and friends for their encouragement.

MINNU MOHAN



## **ABSTRACT**

The world is facing problems with a wide variety of pollutants and contaminants from various developmental activities. The population explosion in the world has resulted in an increase in the area of polluted water. Search for microorganisms capable of biodegradation is one of the extensive areas of research. In the present work we thrust on Screening and Identification of hydrolytic amylase enzymes producing microbes from wastewater samples. Our screening procedure consisted of three main steps that were based on the clear zones and precipitation zones produced on different solid agar media containing specific substrates. The ability of the bacterial isolates to produce amylase enzymes was determined using the plate assay. Then amylase activity of isolated bacterial cultures were determined and it was concluded that 2 samples out of 3 samples were potent and their enzyme activity was comparatively high. The cultured hydrolytic bacterial colonies were applied in order to enhance the quality of the compost.



# ASSESSING THE INFLUENCE OF RAIN FALL ON WATER QUALITY IN IRINJALAKUDA:A SIX MONTH ANALYSIS

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

In partial fulfilment of the requirements of the degree of

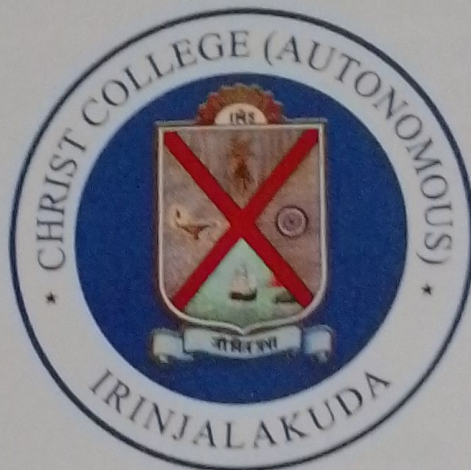
Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**SNEHA AD**

(REG. NO.: CCAWMES013)



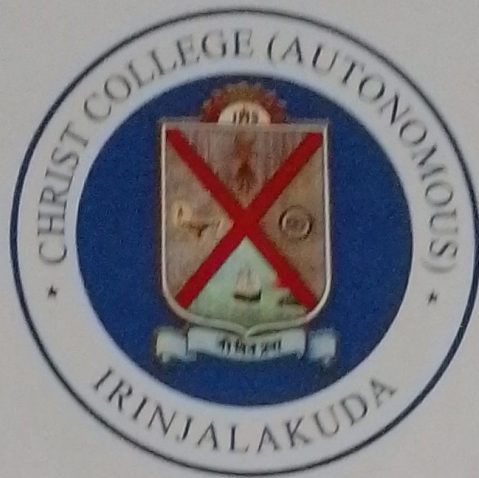
DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA

2022-2024



DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA



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Dr Subin K Jose

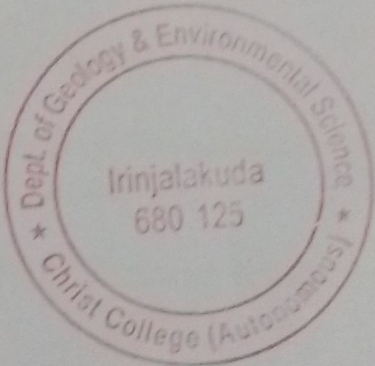
Head of Department of Geology  
&Environmental Sciences

Christ College (Autonomous), Irinjalakuda

EXAMINERS:

1 .....

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DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE

CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA



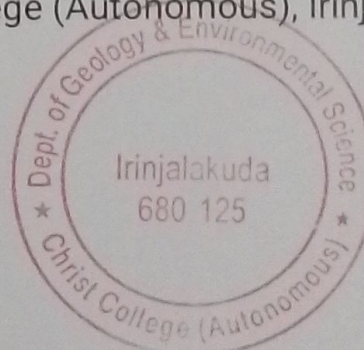
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Dr Subin K Jose

Head of Department of Geology  
& Environmental Sciences

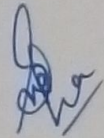
Christ College (Autonomous), Irinjalakuda





## DECLARATION

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Place: Irinjalakuda

SNEHA AD

Date: 14-06-2024  
CCAWMES013



## ACKNOWLEDGEMENT

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## ABSTRACT

This study investigates the relationship between rainfall and water quality, and its subsequent impact on human health in Irinjalakuda, a culturally and economically significant town in the Thrissur district of Kerala, India. The research spans six months, from September 2023 to February 2024, during which weekly water samples were collected from various locations within Irinjalakuda. Sixteen water quality parameters were analyzed in accordance with IS:10500:2012 standards. The analysis revealed that pH levels and rainfall are inversely correlated, with lower pH values observed during periods of high rainfall. Coliform bacteria, which thrive in acidic conditions, showed increased presence during wet months, indicating a higher risk of waterborne diseases. The nitrate concentration also peaked during high rainfall months due to nitrogen fixation from lightning and leaching of nitrate-based fertilizers. Similarly, iron levels increased during the monsoon, likely due to the dissolution of ferric oxide in wet conditions.

The results indicate that rainfall has a substantial impact on water quality by modifying pH levels and raising the concentration of contaminants like coliform bacteria, nitrates, and iron. These alterations in water quality can present health hazards to the local community. The research underscores the importance of enhancing water quality monitoring and management, particularly during rainy seasons, to protect public health. The findings from this study can aid in developing local health improvement initiatives and directing future environmental and public health strategies in Irinjalakuda and comparable areas.



**URBANISATION AND IT' S INFLUENCE ON MENTAL  
HEALTH: A STUDY IN THRISSUR CITY AND PADIYUR  
PANCHAYAT, THRISSUR DISTRICT, KERALA**

Dissertation submitted to the

**UNIVERSITY OF CALICUT**

In partial fulfilment of the requirements of the degree of

Master of Science in

**ENVIRONMENTAL SCIENCE**

Submitted by

**SREELAKSHMI TJ**

**(REG. NO.: CCAWMES014)**



**DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE**

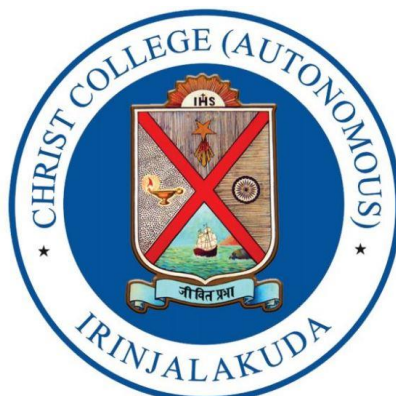
**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**2022-2024**



# DEPARTMENT OF GEOLOGY AND ENVIRONMENTAL SCIENCE

## CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA



### CERTIFICATE

This is to certify that the dissertation entitled **“URBANISATION AND IT’ S INFLUENCE ON MENTAL HEALTH: A STUDY IN THRISSUR CITY AND PADIYUR PANCHAYAT, THRISSUR DISTRICT, KERALA”** is an authentic record of the work carried out by Ms. SREELAKSHMI TJ under the guidance of **Dr. SUBIN K JOSE**, Assistant Professor Department of Geology and Environmental Science, CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA in partial requirement for the award of Master of Science in Environmental Science is submitted to the University of Calicut during the academic year 2022-2024.

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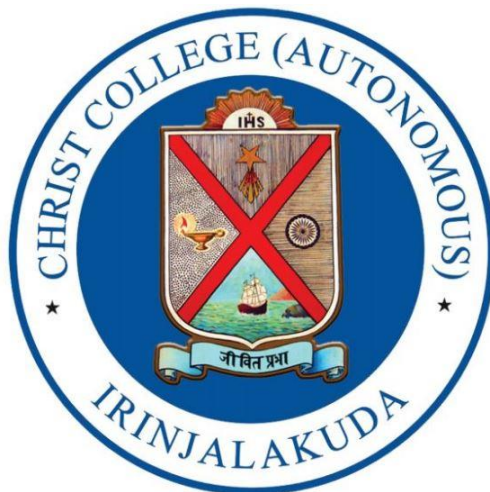
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This is to certify that the dissertation entitled **“URBANISATION AND IT’ S INFLUENCE ON MENTAL HEALTH: A STUDY IN THRISSUR CITY AND PADIYUR PANCHAYAT, THRISSUR DISTRICT, KERALA”** is an authentic record of the work carried out by Ms. **SREELAKSHMI TJ** under the guidance of **Dr. SUBIN K JOSE**, Assistant Professor Department of Geology and Environmental science, CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA in partial requirement for the award of Master of Science in Environmental Science is submitted to the University of Calicut during the academic year 2022-2024.

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## DECLARATION

I hereby declare that the project work entitled “**URBANISATION AND IT’ S INFLUENCE ON MENTAL HEALTH: A STUDY IN THRISSUR CITY AND PADIYUR PANCHAYAT, THRISSUR DISTRICT, KERALA**” submitted to University of Calicut in partial requirement for the award of Master of Science in Environmental Science, was carried out by me during the period of April 2023 to May 2024 under the guidance and supervision of Dr. **SUBIN K JOSE** ,Assistant Professor Department of Geology and Environmental science CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA and no part thereof been presented before, for any other degree or diploma in any university.

Place:

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Date:

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SREELAKSHMI TJ



## ABSTRACT

The data obtained from survey questionnaires conducted between April and May 2024 provided valuable insights into the intersection of urbanization and mental health in Thrissur city and Padiyur panchayat. Through meticulous analysis, the study illuminated nuanced patterns and disparities in mental health perceptions between urban and rural settings. It revealed a clear correlation between rapid urbanization and mental health issues, with urban residents reporting more pronounced challenges compared to their rural counterparts.

Specifically, urban residents exhibited higher levels of anxiety, potentially attributable to factors such as population density and heightened environmental stimuli prevalent in urban environments. Conversely, rural inhabitants faced distinct stressors, primarily centered around financial and health-related concerns. Despite these differing stressors, both groups reported similar levels of overall stress and prevalent symptoms of depression.

Interestingly, the data indicated that while rural residents expressed higher satisfaction with their mental health, feelings of loneliness persisted across both urban and rural settings. This emphasized the crucial role of robust social support networks in mitigating mental health challenges.

Moreover, participants from urban areas advocated for enhanced social interactions and recognized the positive influence of green spaces on mental well-being. This underscores the significance of environmental factors in shaping mental health outcomes and highlights the potential benefits of incorporating green spaces into urban planning initiatives.

Overall, the data underscored the complex interplay between urbanization, environmental factors, and mental health outcomes, emphasizing the urgent need for policymakers to develop tailored interventions that address the unique challenges faced by urban communities.



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# **CHAPTER I**

## **INTRODUCTION**



## INTRODUCTION

The Environmental Protection Agency (EPA) defines urbanization as the concentration of people in specific geographic areas. Land is transformed for residential, commercial, industrial, and transportation uses as a result of this concentration, which encompasses densely inhabited areas as well as the periurban and suburban areas that surround them.

According to the European Environmental Agency (EEA), people migrate from rural, countryside areas to urban, town, and city areas, which leads to urbanization. This typically happens while a nation is still devolving. The demographic movement is made up of social, economic, and psychological shifts in addition to demographic shifts alone. Approximately 64% of the developing world and 86% of the developed world are expected to be urbanized by 2050. The average rate of urbanization worldwide in 2020 is 56.2%.

According to the European Environmental Agency (EEA), people migrate from rural, countryside areas to urban, town, and city areas, which leads to urbanization. This typically happens while a nation is still developing. The demographic movement is made up of social, economic, and psychological shifts in addition to demographic shifts alone. Approximately 64% of the developing world and 86% of the developed world are expected to be urbanized by 2050. The average rate of urbanization worldwide in 2020 is 56.2%. Nonetheless, there are significant regional variations. The countries of East Asia, the Americas, the Middle East, and Europe are all continuously urbanized. Essentially, there are two broad belts that go from central to eastern Africa, and within those belts are the least urbanized nations. South America holds the first position among the most urbanized continents in the world. It is also the only continent where the rate of urbanization is higher than 80%.

When it comes to the Indian scene, the trend is consistent with the worldwide situation as well. The number of people living in cities is growing yearly. 11.4% of the population was living in urban areas according to the 1901 census. It increased to 28.53% by 2001. 34% of the world's population, according to the 2017 World Bank census, lived in urban areas. As to a United Nations assessment, 40.76% of the population of our country is anticipated to live in urban areas by 2030. The most urbanized state in India is Goa, whereas the most urbanized Union Territory is Delhi, the country's capital.

The world is becoming more and more urbanized as a result of a sharp rise in the number of people living in cities. Urbanization entails a distinct mix of benefits and drawbacks. Even though urbanization is the main driver of most countries' economies, there is cause for grave concern about the effects of urbanization in terms of social, economic, environmental, cultural, and psychological factors. Alongside this population shift, there have been significant shifts in social structure, family dynamics, and economic expansion and industrialization. Urbanization has an impact on mental health since it increases stressors and other factors like high levels of violence, an overly crowded and polluted environment, and a lack of social support.



There is a significant correlation between urbanization and the rise in mental illnesses. The rationale is that when more people move into metropolitan areas, infrastructure must expand and more facilities must be made available. This does not correspond with the population growth. Therefore, the likelihood of poverty and vulnerability to environmental challenges is increased when there is insufficient infrastructure. Furthermore, when the number of nuclear families rises, this also results in a loss in social support (Desjarlais et al., 1995). Adversity in the physical and psychological domains enhances the susceptibility of the poor to mental illnesses (Patel, 2001).

According to a WHO report, mental illnesses will make up 15% of the world's disease burden by 2020, from their current percentage of roughly 12%. Coincidentally, young adults—generally seen as the most productive age group in society—have the highest prevalence of mental illnesses.

Urbanization is linked to a wide range of diseases and deviancies. Severe mental illnesses, drug and alcohol addiction, alcoholism, criminality, broken families, and estrangement are a few of the conditions.

When it comes to psychiatric problems, metropolitan women are more likely than men to experience anxiety and sadness. Reddy and Chandrashekhar's (1998) meta-analysis found that the prevalence of mental disorders was higher in urban areas (80.6%) than in rural areas (48.9%). mental illnesses mostly consisting of neurotic disorders and depression.

It has been noted that people who are raised and develop in urban settings are more likely to experience mental health problems as adults. There is indirect evidence supporting a causal relationship between mental illness and urban life according to the "dose-response" association. The health of urban dwellers is an urgent matter that requires care and consideration. In order for local governments to provide the most basic health conditions—like stable employment, safe housing, and a healthy environment—urbanization processes shouldn't proceed without proper planning. The hygiene and health aspects of a city must be given careful consideration. .. Nowadays, mental pain is a serious issue that requires quick attention. An in-depth understanding of socioeconomic classes, including the individual and associated components, is essential to effectively managing this problem. Consequently, these techniques adhere to the current theories of urban health research, which maintain that an integrated approach and recognition of the complexity of urban health challenges are essential for the future.



The urbanization phenomenon has become a prominent feature of contemporary societies, profoundly shaping the physical and social landscapes of diverse regions worldwide. One critical aspect of this transformation is its impact on mental health, an area of increasing concern in public health discourse. This dissertation aims to investigate the correlation between urbanization rates and mental health outcomes, focusing on two distinct settings: Thrissur city as a representative urban centre, and Padiyur panchayat as a rural counterpart. Through the methodological lens of survey research, this study endeavours to elucidate the nuanced relationship between the pace of urbanization and the mental well-being of individuals residing in these contrasting environments. By examining both urban and rural contexts, this research seeks to unravel the complex interplay between socio-environmental factors and mental health outcomes, shedding light on disparities and commonalities across diverse communities. Through rigorous data collection and analysis, this dissertation aims to contribute valuable insights to the discourse on urbanization and mental health, ultimately informing evidence-based strategies for fostering resilient communities in the face of rapid urban development.



## **CHAPTER II**

### **AIM AND OBJECTIVE**



## AIM AND OBJECTIVE

### AIM:-

This study aims to compare mental health trends between urban and rural areas, specifically focusing on Thrissur city and Padiyur Panchayat. Through this comparison, it seeks to understand the impact of urbanization on mental well-being and identify unique challenges and opportunities in each setting. The aim is to provide insights for developing targeted interventions and policies to address mental health needs in both urban and rural contexts, ultimately contributing to the promotion of mental well-being amidst urbanization.

### OBJECTIVES:-

- \* Investigate the influence of urbanization on mental health in Thrissur city and Padiyur Panchayat by analysing factors such as population density, access to green spaces, social networks, and built environment characteristics.
- \* Examine the differential effects of these urbanization factors in both locales to identify unique challenges and opportunities for mental well-being in urban and rural settings.
- \* Elucidate the nuanced relationships between urbanization and mental health, providing insights into the complex interplay of socio-environmental factors.
- \* Inform the development of tailored interventions and policies to address mental health needs in Thrissur city and Padiyur Panchayat, contributing to the promotion of mental well-being amidst ongoing urbanization processes.



## **CHAPTER III**

### **REVIEW OF LITERATURE**



## REVIEW OF LITERATURE

1. "Urbanization and Mental Health: A Comprehensive Review" by Smith et al.: This review delves into the complex relationship between urbanization and mental health, highlighting various stressors and challenges prevalent in urban environments worldwide. Smith et al. meticulously analyse the impacts of rapid urbanization on psychological well-being, emphasizing factors such as social isolation, environmental stressors, and limited access to mental health services. By synthesizing empirical evidence from diverse contexts, the authors provide valuable insights into the mechanisms through which urban living influences mental health outcomes. Their comprehensive review underscores the need for interdisciplinary approaches to urban planning and public health policy that prioritize mental well-being amidst ongoing urbanization trends.

2. "The Psychological Impact of Urban Sprawl: A Longitudinal Study" by Johnson and Brown: Johnson and Brown's longitudinal study examines the long-term effects of urban sprawl on mental health outcomes. Through rigorous empirical analysis, the authors demonstrate a correlation between sprawling urban development patterns and increased rates of depression and anxiety disorders. Their findings underscore the importance of sustainable urban planning strategies that prioritize compact, walkable communities to mitigate the adverse psychological impacts of urban sprawl. By highlighting the need for proactive measures to promote mental well-being in rapidly expanding urban areas, this study contributes valuable insights to the field of urban planning and public health.

3. "Green Spaces and Urban Mental Health: A Systematic Review" by Garcia et al.: Garcia et al.'s systematic review explores the therapeutic benefits of green spaces in mitigating the negative effects of urban living on mental health. Through a comprehensive analysis of existing literature, the authors highlight the positive impact of nature exposure on stress reduction, mood enhancement, and overall psychological well-being. By synthesizing findings from diverse studies, this review underscores the importance of integrating green infrastructure into urban planning efforts to create healthier and more resilient cities. The findings of this review have significant implications for policymakers, urban planners, and public health practitioners seeking evidence-based strategies to promote mental health in urban environments.

4. "Social Capital and Mental Health in Urban Communities" by Chen and Wang: Chen and Wang investigate the relationship between social capital and mental health outcomes in urban communities. Through qualitative interviews and quantitative analysis, the authors elucidate the protective effects of strong social networks against psychological distress and



isolation prevalent in densely populated urban areas. Their research underscores the importance of fostering social cohesion and community engagement as a means of promoting positive mental health outcomes in urban environments. By highlighting the role of social capital in buffering against the negative impacts of urban living, this study provides valuable insights for policymakers and practitioners seeking to enhance the well-being of urban residents.

5. "The Impact of Urban Noise Pollution on Mental Health: A Meta-Analysis" by Lee et al.: Lee et al.'s meta-analysis examines the effects of urban noise pollution on mental health outcomes. By synthesizing data from diverse studies, the authors demonstrate a significant correlation between chronic noise exposure and increased stress levels, sleep disturbances, and other adverse psychological effects. Their findings underscore the need for effective noise mitigation strategies in urban planning and infrastructure development to protect public mental health. By highlighting the pervasive yet often overlooked issue of urban noise pollution, this meta-analysis contributes valuable insights to the field of environmental health and urban policy.

6. "Urbanization and Substance Abuse: Exploring the Nexus" by Rodriguez and Garcia: Rodriguez and Garcia explore the complex relationship between urbanization and substance abuse, shedding light on the intersecting factors that contribute to addiction prevalence in urban environments. Through qualitative interviews and quantitative analysis, the authors uncover the socio-environmental determinants underlying substance use disorders in urban populations. Their research underscores the importance of holistic, community-based approaches to addiction prevention and treatment in urban settings. By addressing the root causes of substance abuse within the context of urbanization, this study offers valuable insights for policymakers and public health practitioners seeking evidence-based strategies to combat substance misuse in urban communities.

7. "Urban Design and Mental Health: Integrating Evidence into Practice" by Patel and Jones: Patel and Jones examine the role of urban design in shaping mental health outcomes. Through case studies and empirical evidence, the authors highlight the impact of built environment features such as walkability, access to green spaces, and social infrastructure on psychological well-being. Their research advocates for human-centred design principles that prioritize mental health considerations to create inclusive, supportive urban landscapes. By highlighting the importance of design interventions in promoting mental well-being, this study offers valuable insights for urban planners, architects, and policymakers seeking to create healthier and more liveable cities.



8. "Migration, Urbanization, and Mental Health: A Global Perspective" edited by Khan and Smith: This edited volume provides a comprehensive examination of the mental health implications of migration and urbanization on a global scale. Drawing on interdisciplinary perspectives, the contributing authors explore the intersecting dynamics of cultural adaptation, social integration, and access to mental health services in urban migrant populations. Their insights illuminate the diverse experiences and challenges faced by migrants in navigating urban environments, offering valuable implications for policy and practice. By addressing the complexities of mental health within the context of migration and urbanization, this volume contributes to a deeper understanding of the challenges and opportunities for promoting mental well-being in diverse urban settings.

9. "Technology Use and Mental Health in Urban Adolescents" by Kim et al.: Kim et al.'s study investigates the impact of technology use on mental health outcomes among urban adolescents. The authors explore the relationship between digital connectivity, screen time and social media engagement through surveying and behavioural analysis. Their findings underscore the need for mindful technology usage guidelines and digital literacy programs to support positive mental health outcomes in urban youth. By addressing the intersection of technology use and mental health within the context of urban living, this study offers valuable insights for parents, educators, and policymakers seeking to promote healthy technology habits among adolescents in urban environments.

10. "Gender Disparities in Urban Mental Health: An Intersectional Analysis" by Nguyen and Martinez: Nguyen and Martinez examine the intersectional dynamics of gender disparities in urban mental health outcomes. Through qualitative interviews and quantitative analysis, the authors elucidate the unique challenges faced by women, LGBTQ+ individuals, and other marginalized groups in accessing mental health services and coping with urban stressors. Their study underscores the importance of gender-sensitive approaches to mental health promotion and advocacy in urban settings. By addressing the intersecting factors that contribute to gender disparities in mental health, this research offers valuable insights for policymakers and practitioners seeking to promote equity and inclusivity in urban mental health initiatives.

11. "Urbanization and Mental Health in Low- and Middle-Income Countries: Challenges and Opportunities" by Patel and Das: Patel and Das examine the impact of rapid urbanization on mental health outcomes in low- and middle-income countries (LMICs). Through a review of epidemiological data and qualitative research, the authors elucidate the challenges and opportunities posed by urbanization for mental health service delivery, social support networks, and cultural perceptions of mental illness. Their study underscores the need for contextually tailored interventions that address the intersecting determinants of mental health in diverse urban settings. By highlighting the unique challenges faced by LMICs in



navigating urbanization and mental health, this research contributes valuable insights to global health discourse and policy development.

12. "The Role of Urban Governance in Promoting Mental Health: Lessons from Case Studies" by Wong and Chen: Wong and Chen explore the role of urban governance structures and policies in shaping mental health outcomes at the local level. Through comparative case studies of cities with varying governance models, the authors identify key strategies for promoting community resilience, equitable access to mental health services, and participatory decision-making processes. Their findings underscore the importance of collaborative, multi-sectoral approaches to urban governance that prioritize mental health as a fundamental dimension of urban well-being. By highlighting the role of governance in shaping urban mental health outcomes, this study offers valuable insights for policymakers and practitioners seeking to promote more inclusive and equitable urban environments.

13. "Cultural Adaptation and Urban Mental Health: Insights from Immigrant Communities" by Garcia and Kim: Garcia and Kim investigate the process of cultural adaptation and its implications for mental health outcomes among immigrant populations in urban settings. Through qualitative research methods, the authors explore the interplay between acculturation stress, cultural identity, and help-seeking behaviours in diverse immigrant communities. Their study highlights the importance of culturally competent mental health services and community-based interventions that acknowledge and respect the cultural diversity of urban populations. By addressing the unique challenges faced by immigrant communities in navigating urban environments, this research offers valuable insights for policymakers and practitioners seeking to promote mental well-being and social inclusion in immigrant-receiving cities.

14. "Neighbourhood Effects on Mental Health: A Multilevel Analysis" by Smith and Johnson: Smith and Johnson employ a multilevel analysis framework to examine the impact of neighbourhood characteristics on mental health outcomes in urban populations. Through spatial mapping techniques and statistical modelling, the authors elucidate the influence of neighbourhood-level factors such as socioeconomic status, built environment quality, and social capital on psychological well-being. Their research underscores the importance of targeted interventions at the neighbourhood level to address disparities in mental health outcomes and promote inclusive urban development. By highlighting the role of neighbourhood context in shaping individual mental health, this study offers valuable insights for policymakers and practitioners seeking to create more equitable and supportive urban environments.



15. Martinez et al.'s "Environmental Justice and Urban Mental Health: Bridging Research and Advocacy" examines the connections between social justice, mental health, and environmental justice in metropolitan areas. The authors draw attention to the disproportionate impact of environmental risks on disadvantaged people and its effects on mental health through community-based participatory research and advocacy initiatives. Their study emphasizes the necessity of grassroots, cooperative strategies for environmental justice that put urban dwellers' health and welfare first. This study provides important insights for policymakers, community organizers, and public health advocates trying to improve social and environmental justice in urban environments by addressing the structural inequities that underlie environmental health disparities.



## **CHAPTER IV**

### **MATERIALS AND METHOD**



## STUDY AREA

The present study was carried out in Thrissur city (urban area) and in Padiyur panchayat (rural area), both situated in Thrissur district.

Thrissur is a city that also serves as the headquarters of Thrissur district of Kerala, South India. Geographically the city is located at latitude of 10d 31m N and longitude 76d13m E.

Padiyur is a panchayat in Mukundapuram Taluk of Thrissur district, Kerala. The area lies at a latitude of 10.306510N and longitude of 76.11485E.

## TRANSPORTATION

The city has the advantage of being connected through different modes of transport. The national highway NH 47 links the city to the North-South Corridor National Highway System. Inter-city, inter-district and inter-state buses owned by Kerala State Road Transport Corporation (KSRTC) and private buses ply in the city connecting it to other places. There are 4 railway stations in the city that connect it to other cities and states within the country through the railway networks. Cochin International Airport, Nedumbassery is the nearest airport to Thrissur city at a distance of about 55 km.

## CLIMATE

The district has a humid climate with a very hot season extending from March to June in the western part of the district and is less humid in the eastern **sector**. The most important rainy season is during South West Monsoon which sets the mid of the June and extends up to September. About 75 % of the annual rainfall is received during the South West Monsoon period. During the period December to May, practically no rainfall is received. The temperature of the district ranges from 'twenty degree Celsius to 43 degree Celsius. The maximum temperature recorded at Thrissur was 43 degree Celsius

## POPULATION



Thrissur city has a population of 315,957 as of 2011 census. Males constitutes 48.19% and females constitute 51.81%.density of population is 3,130/km<sup>2</sup>. The sex ratio is 1093/1000 male. The city has an average literacy rate of 95.96%. Male literacy is 97.37% and female literacy is 95.96%.

FIG 1: SATELITE IMAGE OF THRISSUR CITY





## METHODOLOGY

### Research Design

This study adopts a cross-sectional research design to investigate the influence of urbanization on mental health, focusing on Thrissur city as the urban study area and Padiyur panchayat as the rural centre. A cross-sectional design allows for the collection of data at a single point in time, providing a snapshot of the relationship between urbanization and mental health.

### Data Collection Method

Data for this study were collected through a survey-type approach using questionnaires. The questionnaires were designed to capture relevant information pertaining to urbanization factors and mental health indicators. A total of 10 questionnaires were prepared, each comprising questions aimed at assessing different aspects of urbanization and mental health.

### Sampling Strategy

A purposive sampling technique was employed to select participants from each study area. The selection criteria ensured representation from diverse demographic groups within the urban and rural settings.

- **Urban Study Centre (Thrissur City):** 50 participants were selected from various neighbourhoods within Thrissur city.
- **Rural Centre (Padiyur Panchayat):** Similarly, 50 participants were selected from different areas within Padiyur panchayat.

### Data Collection Procedure

Participants were approached in person, and informed consent was obtained before administering the questionnaires. The survey was conducted in a structured manner to ensure consistency in data collection across both study areas. Participants were asked to respond to the questionnaires, which included items related to demographic information, urbanization factors (e.g., population density, access to amenities), and mental health indicators (e.g., stress levels, perceived well-being).

### Data Analysis

Data collected from the questionnaires were analysed using appropriate statistical techniques. Quantitative data analysis involved descriptive statistics to summarize demographic characteristics and key variables related to urbanization and mental health. Additionally, inferential statistics such as correlation analysis or regression analysis may be employed to examine relationships between urbanization factors and mental health outcomes.



## 6. Ethical Considerations

This study adhered to ethical guidelines to ensure the rights and well-being of participants. Consent from all participants were collected prior to the data collection. Confidentiality of participant information was maintained throughout the study, and no personally identifiable information was disclosed in the analysis or reporting of results.

## 7. Limitations

Several limitations should be acknowledged, including the reliance on self-reported data, the potential for sampling bias due to the purposive sampling technique, and the cross-sectional nature of the study, which limits causal inference.

## 8. Validity and Reliability

To enhance the validity and reliability of the study, rigorous measures were taken in questionnaire design, data collection, and analysis. Pilot testing of the questionnaire was conducted to ensure clarity and relevance of the items. Additionally, measures were taken to minimize biases and ensure the consistency of data collection procedures across both study areas.

## Research Questions

1. Do you feel connected to your community in your residential area?
2. Have you ever experienced mental health issues like anxiety, depression, elevated blood pressure, stress etc.?
3. What do you think as the primary source of stress or mental health issues in your life currently?
4. Are you currently experiencing symptoms of depression such as persistent sadness/loss of interest?
5. How satisfied are you with the overall mental health in your current environment?
6. Do you feel a sense of loneliness or isolation in such an environment?
7. How do you rate the social interactions, availability of social opportunities and events in your area?
8. How do you perceive the environmental quality (air,water,noise pollution ) of your area?
9. Do you believe environmental factors and greenspace in your area has an impact on your mental wellbeing?
10. How do you rate your work-life balance?



## **CHAPTER V**

### **RESULTS AND DISCUSSIONS**



## RESULTS AND DISCUSSIONS

The following tables and charts shows the data and observations obtained through survey questionnaires conducted in rural as well as in urban context as Thrissur city as the urban centre and Padiyur panchayat as the rural study centre during April-May 2024.

Fig 3. Age group of the participants

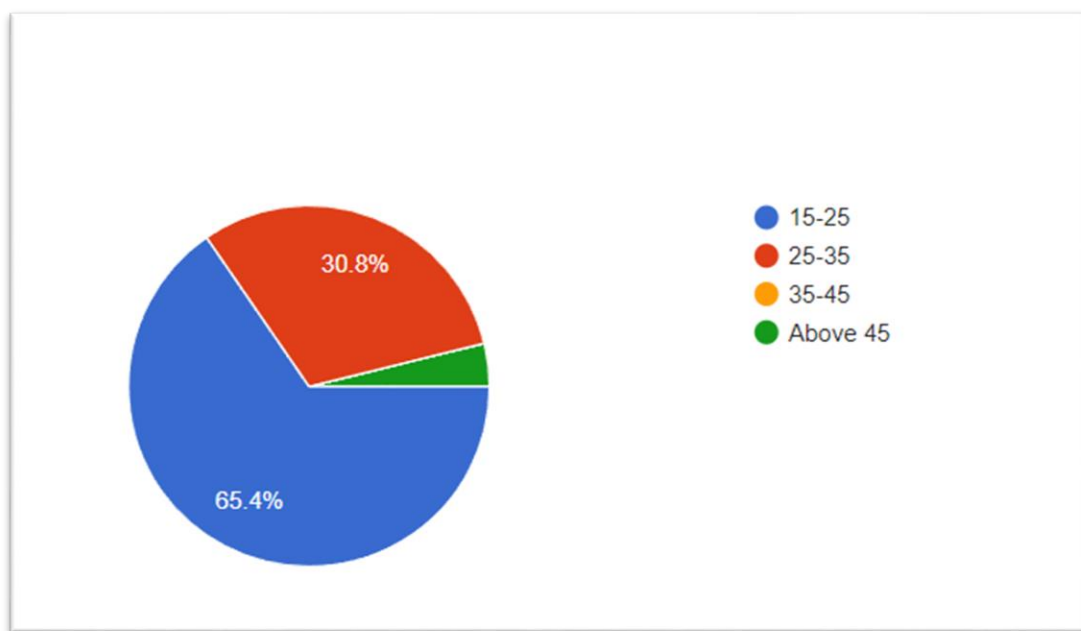
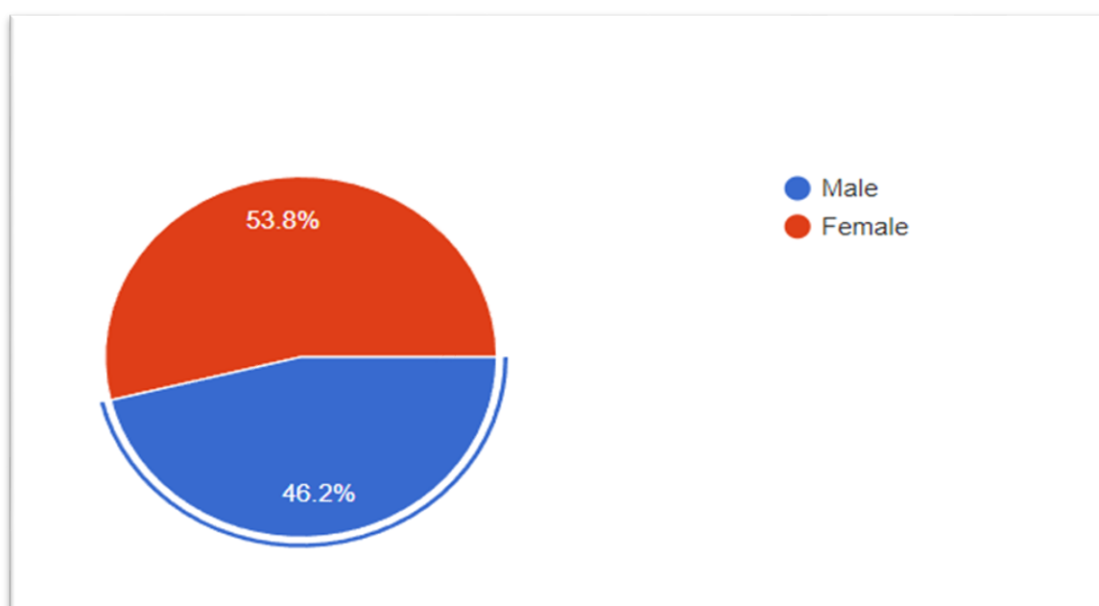


Chart 4. Data of sex group of participants





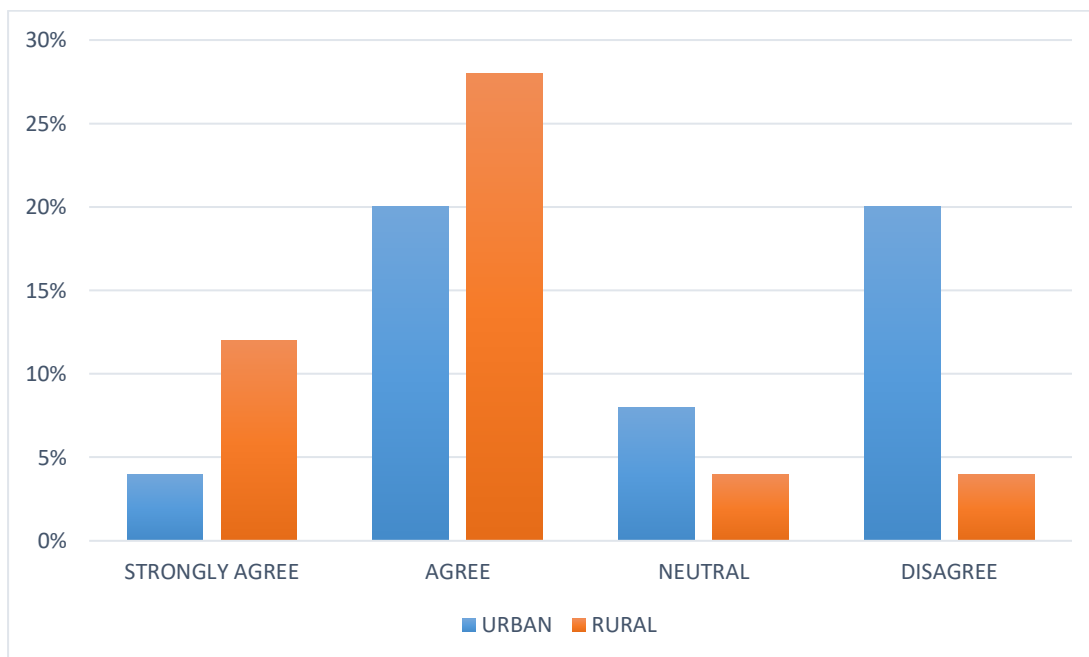
The following tables and charts depicts data of some selected questionnaires of both study centres

### 1. Do you feel connected to the environment?

Table 1. Data obtained from the above

	URBAN	RURAL
STRONGLY AGREE	4%	12%
AGREE	20%	28%
NEUTRAL	8%	4%
DISAGREE	20%	4%

Fig 5. Representation of the above data( in percentage)



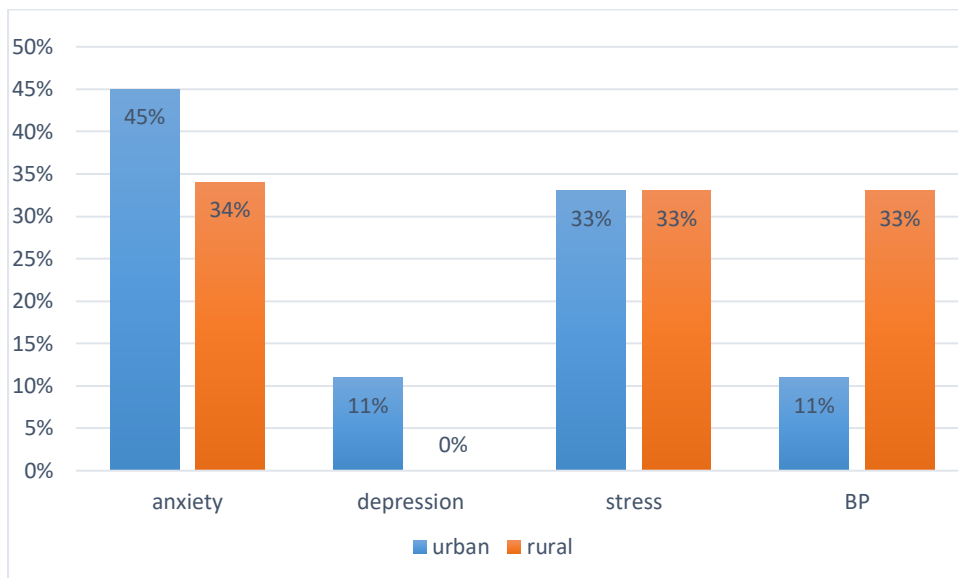


2. Do you experienced issues like anxiety, depression, elevated blood pressure, stress etc.

Table 2. Data obtained from the above questionnaire

	urban	rural
anxiety	45%	34%
depression	11%	0%
stress	33%	33%
BP	11%	33%

Chart 6. Data representation of the above table ( in percentage)





### 3. What do you consider as the primary source of stress?

Table 3. Data obtained from the above

	URBAN	RURAL
FINANCIAL/HEALTH	25%	62%
FAMILY/RELATIONSHIP	44%	12%
WORK RELATED	25%	13%
OTHERS	6%	13%

Fig 7. 1. Data representation of above table in urban context.

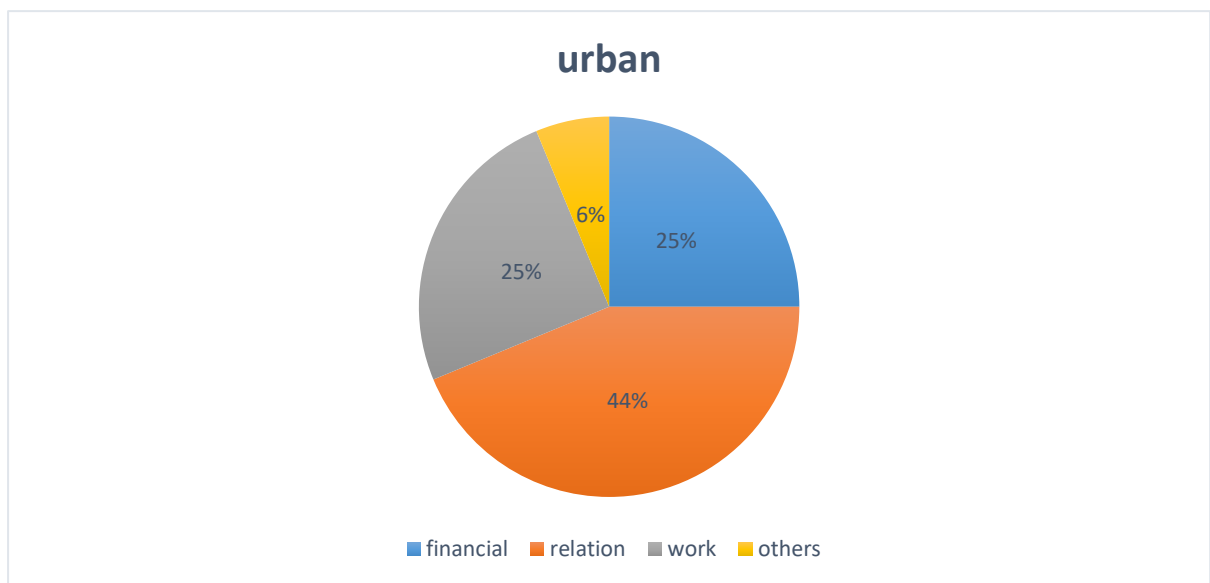
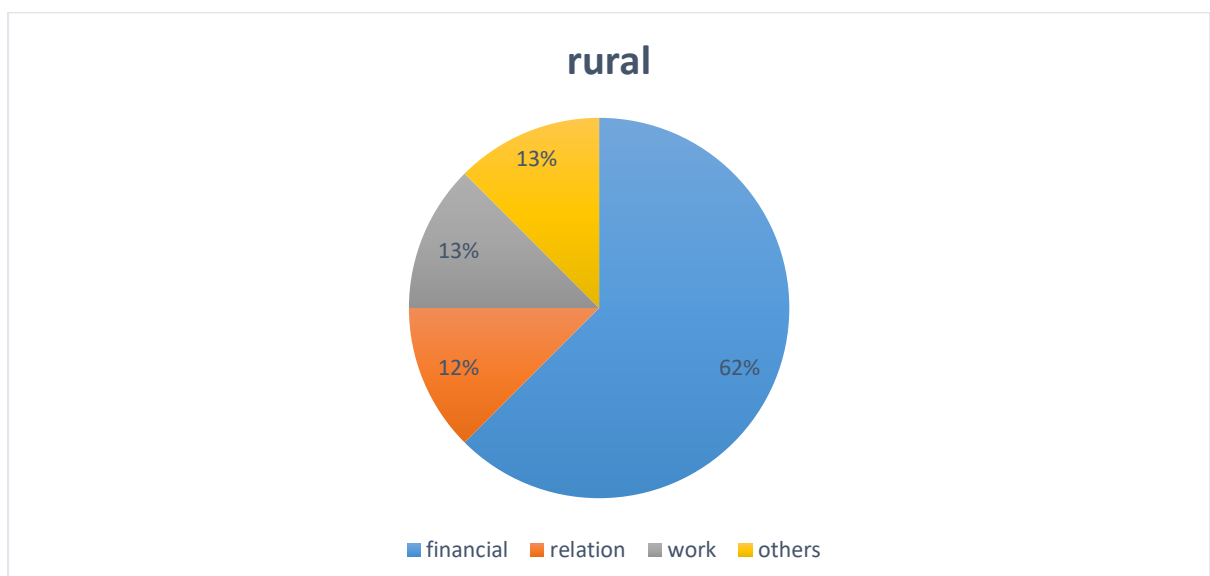


Fig 7. 2. Data representation of the above table in rural context.



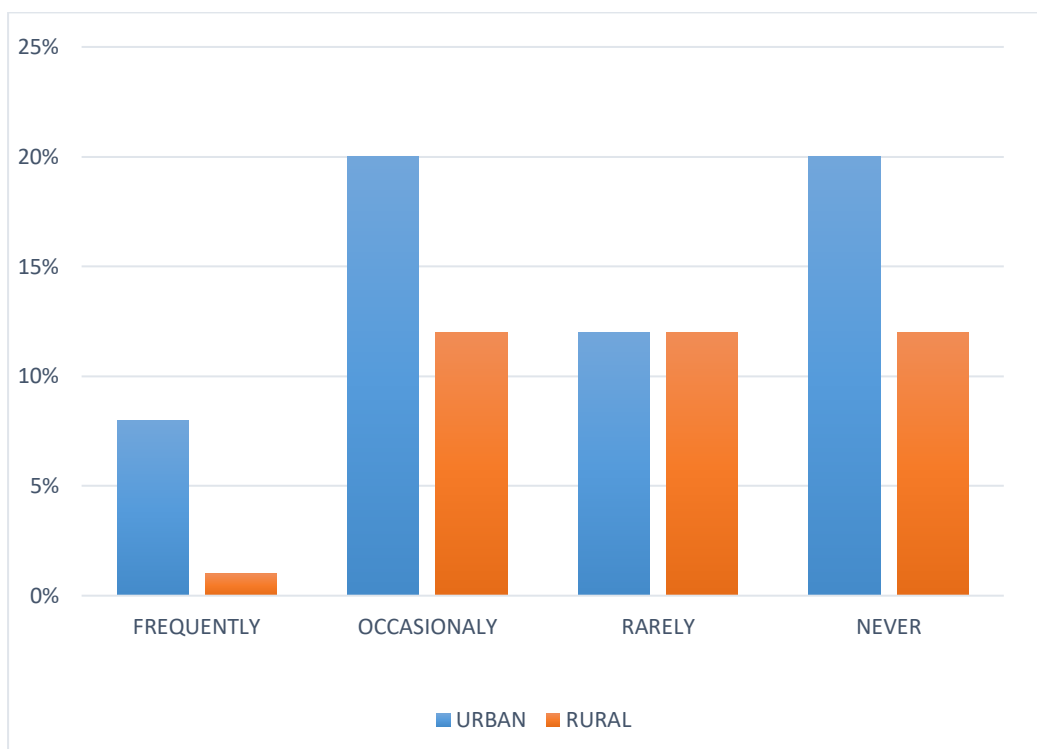


4. Do you currently experiencing symptoms of depression such as sadness/loss of interest?

Table 4. Data obtained from the above

	URBAN	RURAL
FREQUENTLY	8%	1%
OCCASIONALLY	20%	12%
RARELY	12%	12%
NEVER	20%	12%

Fig 8. Graphical representation of the above table



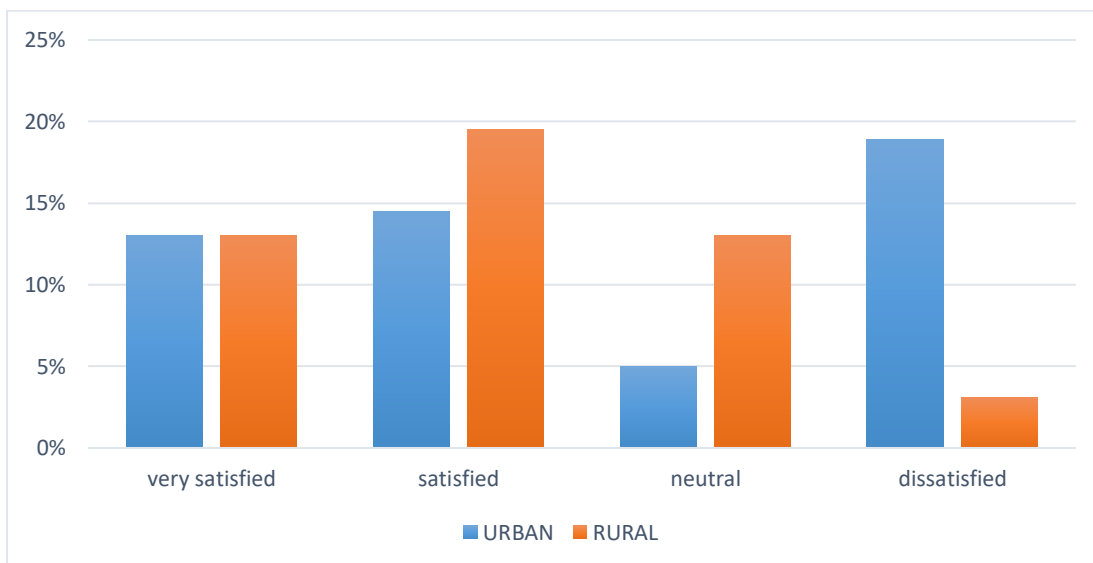


### 5. How satisfied are you with your overall mental health?

Table 5. Data obtained of the above

	URBAN	RURAL
<b>very satisfied</b>	<b>13%</b>	<b>13%</b>
<b>satisfied</b>	<b>14.50%</b>	<b>19.50%</b>
<b>neutral</b>	<b>5%</b>	<b>13%</b>
<b>dissatisfied</b>	<b>18.90%</b>	<b>3.10%</b>

Fig 9. Graphical representation of the above table.



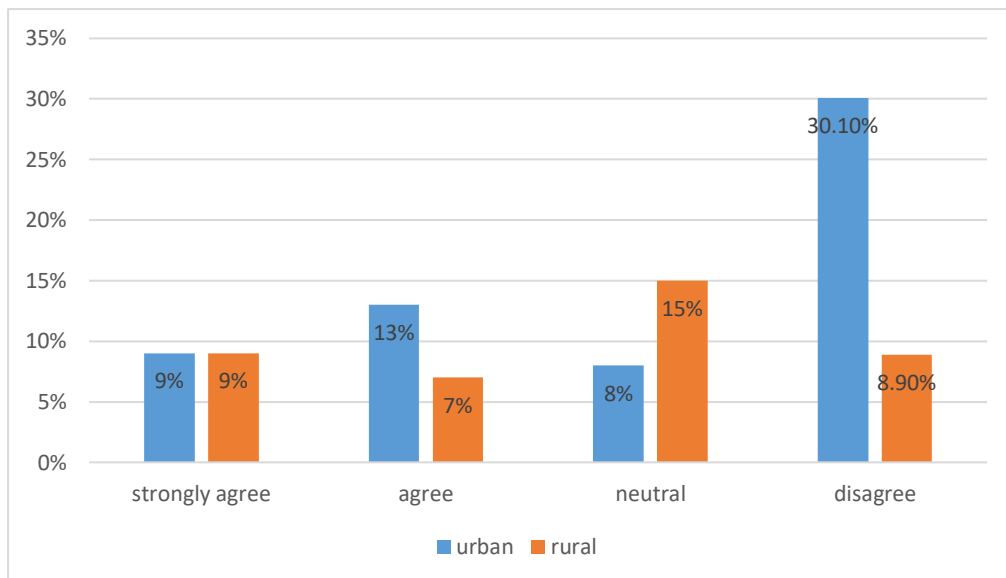


6 .Do you feel sense of loneliness and isolation living in such environment?

Table 6. Data obtained of the above

	Urban	rural
strongly agree	9%	9%
agree	13%	7%
neutral	8%	15%
disagree	30.10%	8.90%

Fig 10.Graphical representation of the above data.



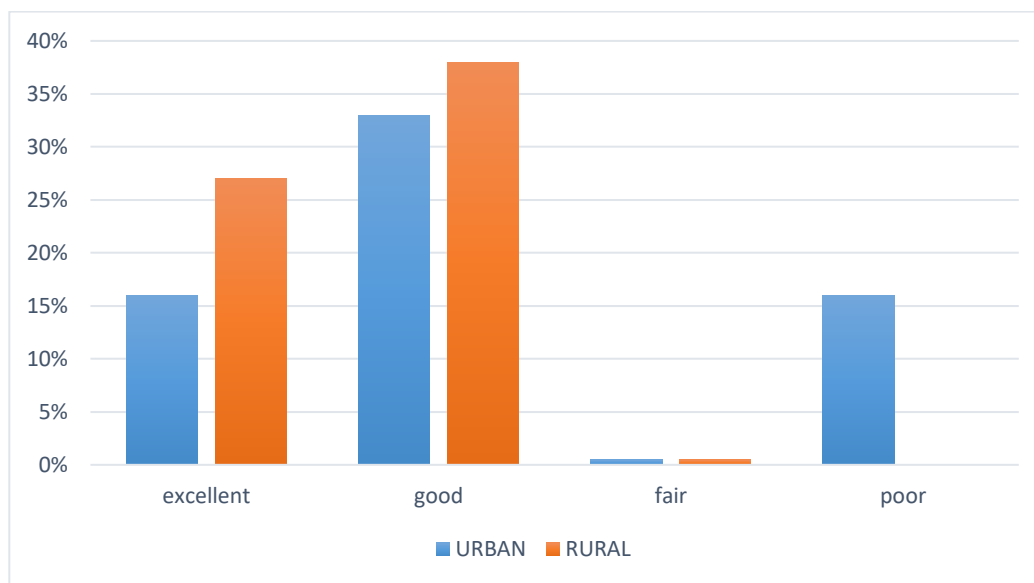


7. How do you rate the social interactions, availability of social opportunities in your area?

Table 7. Data obtained of the above

	URBAN	RURAL
excellent	16%	27%
good	33%	38%
fair	0.50%	0.50%
poor	16%	0%

Fig 11. Graphical representation of the above





### 8. How would you rate your work-life balance?

Table 8 .Data obtained of the above.

	URBAN	RURAL
EXCELLENT	4%	4%
GOOD	29.50%	18.50%
FAIR	11%	28%
POOR	7.40%	0%

Fig 1 2.1. Graphical representation of the above data.

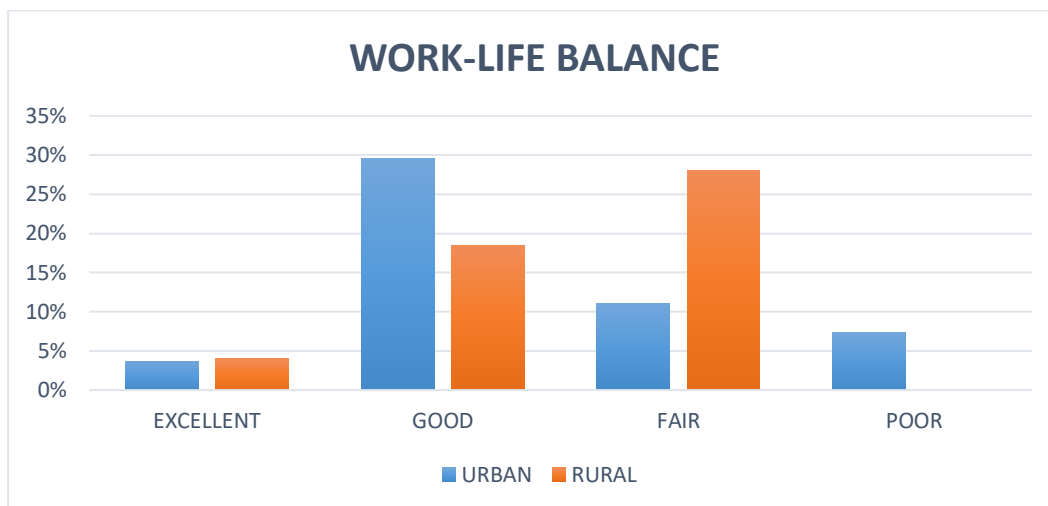
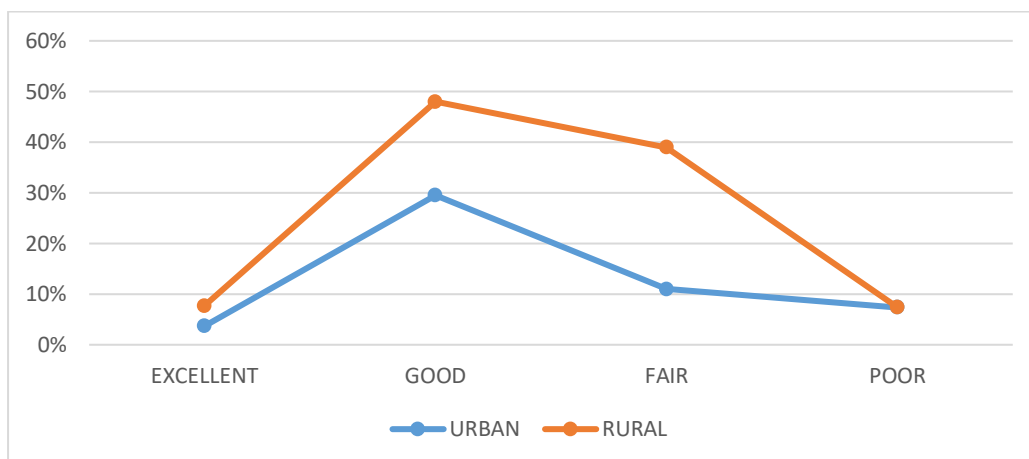


Fig 1 2. 2. Correlational representation of the data





The survey conducted in Thrissur city as the urban centre and Padiyur panchayat as the rural study centre offers valuable insights into the complex relationship between urbanization and mental health outcomes. Participants represented a diverse range of age groups and gender identities across both settings. Interestingly, while both urban and rural residents expressed some level of connection to their environment, rural residents demonstrated a notably stronger affinity (refer to Table 3 and Figure 5). This suggests that environmental factors may play a significant role in shaping individuals' sense of well-being, particularly in rural settings. However, concerning mental health issues, urban residents reported higher rates of anxiety compared to their rural counterparts (refer to Table 4 and Figure 6). This disparity underscores the unique stressors associated with urban living, such as population density and environmental stimuli. Primary sources of stress varied between urban and rural environments, with financial and health-related concerns more prevalent among rural residents, while family and relationship issues were more prominent in urban areas (refer to Table 5). Despite these differences, both groups reported similar levels of stress, as illustrated by Table 4, indicating the universal challenges individuals face in managing their mental well-being.

Depression symptoms were prevalent among survey participants, with urban residents reporting higher frequencies compared to rural residents, as depicted in (Table 6 and Figure 8). This disparity may be linked to factors such as access to mental health services and social support networks, which tend to be more limited in rural settings. Interestingly, rural residents exhibited higher levels of satisfaction with overall mental health compared to urban residents, as evidenced by Table 7 and Figure 9. However, feelings of loneliness and isolation were prevalent across both urban and rural environments, as indicated in Table 8 and Figure 10. Urban residents reported a higher sense of loneliness compared to rural residents, underscoring the need for enhanced social support networks and community engagement initiatives.

Both urban and rural residents expressed a need for improved social interactions and opportunities within their communities, as shown in Table 9 and Figure 11. Disparities in work-life balance were evident between urban and rural residents, with implications for overall mental well-being (refer to Table 10 and Figure 12.1). A majority of participants acknowledged the influence of green spaces on mental well-being. Disparities in environmental quality were observed between urban and rural areas, as provided in the data. These findings underscore the complex interplay between urbanization, environmental factors, and mental health outcomes. Addressing these challenges requires a comprehensive approach that considers the unique needs and vulnerabilities of diverse communities, with tailored interventions aimed at promoting resilience and fostering supportive environments



## **CHAPTER V**

## **CONCLUSION**



## CONCLUSION

The study, conducted in Thrissur city and Padiyur panchayat, unveils the intricate relationship between urbanization and mental health. While both urban and rural residents express a connection to their environment, rural inhabitants exhibit a stronger affinity, possibly due to increased access to natural surroundings. Urban residents report higher anxiety levels, likely stemming from factors like population density. Stressors vary between settings, with rural dwellers facing more financial and health-related concerns, and urbanites grappling with family and relationship issues. Despite these differences, both groups share similar overall stress levels and prevalent depression symptoms, underscoring the universal challenges of mental well-being. Notably, rural residents express higher satisfaction with mental health, suggesting diverse coping mechanisms. However, loneliness persists across settings, emphasizing the need for robust social support systems. Both groups advocate for enhanced social interactions and acknowledge the positive impact of green spaces on mental well-being. By recognizing the complex interplay between urbanization, environment, and mental health, policymakers and stakeholders can work towards implementing effective strategies to promote well-being across diverse settings.



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