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Analysis of England's Water Quality based on Statutory Reports

- By Sonam Chavan

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Introduction

Critical Environmental Concerns

➢ Impact on public health and ecosystems.

➢ Economic implications of water pollution.

England's Water Quality Standards

➢ Essential due to dense population and industrial activities.

➢ Importance of maintaining high standards.

Research Aims

➢ Comprehensive understanding of water quality and pollution.

➢ Examination of data from water companies and government sources

Analytical Approach

➢ Identification of key concerns and trend analysis.

➢ Assessment of pollution management effectiveness.

References: [1,2,7,8]

Motivation

Research Background

➢ Evolution of water service management in England

➢ Formation of Regional Water Authorities

Relevant Literature

➢ Treated wastewater and storm overflows

➢ Increasing pollution incidents and serious pollution cases

Addressing Challenges

➢ Pollution, outdated infrastructure, and increasing water demand

➢ DEFRA's Plan for Water addressing these challenges

Understanding Basic Principles

➢ Water Quality Importance

➢ Water Companies' Role

References: [2,3,4]

Objectives

Pollution Inventory Assessment

➢ Analyze pollution inventory data of year 2022

Pollution Incident Data Analysis

➢ Identify patterns, trends, and hotspots

➢ Examine Pollution Incident data spanning the last 23 years.

➢ Assess the severity and impact of incidents on water quality

Dashboard Development

➢ Build a comprehensive dashboard integrating data

➢ Visualize pollution incidents, water quality metrics, and trends.

➢ Provide an accessible and user-friendly interface for decision-makers.

References: [4,5,6]

Methodology

Data Collection

➢ Statutory reports, government databases, documentaries

Data Visualization

➢ Using Excel, R and shiny model for analysis

Test and Evaluation

➢ Usability and accessibility testing for visualizations

References: [5]

Methodology

Issues:

Legal Compliance

➢ Adherence to data privacy laws

➢ Compliance with environmental regulations

Professional Standards

➢ Accuracy and fairness in presenting findings

➢ Upholding journalistic standards

Ethical Considerations

➢ Ensuring informed consent in data collection

➢ Maintaining honesty and transparency in reporting

Risk Management

➢ Cross-referencing data for accuracy

➢ Regular software updates and maintenance

References: [2]

Progress and Achievements

Development Work

➢ Created a comprehensive analysis of water pollution incidents using a multi-faceted approach.

➢ Developed an interactive Shiny application incorporating map and two additional graphs to visualize data
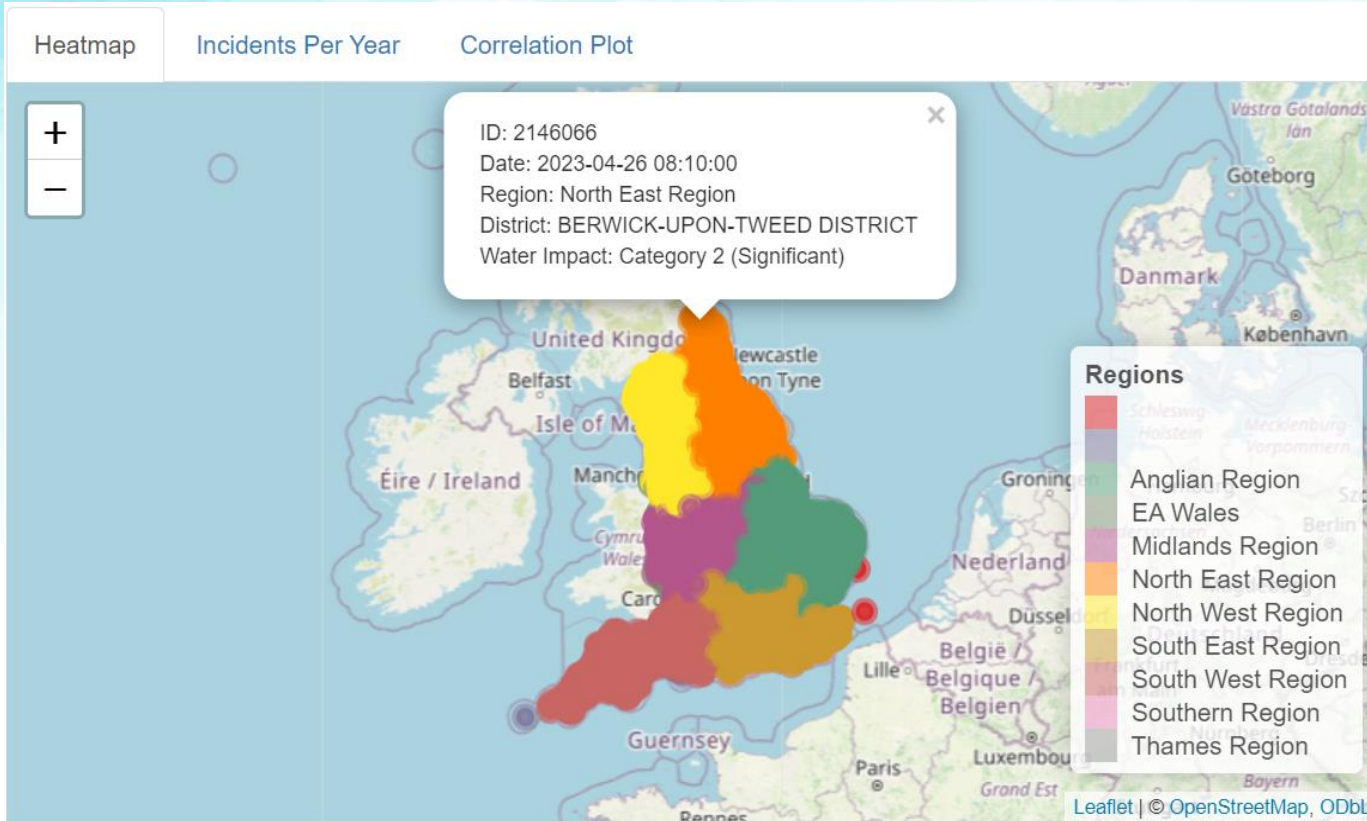
➢ Upholding journalistic standards

Results and Implications of Work

➢ Heatmap

➢ Incidents Per Year Graph

➢ Correlation Plot

Progress and Achievements

Follow the link to see the graph live . click here

Results and Implications of Work

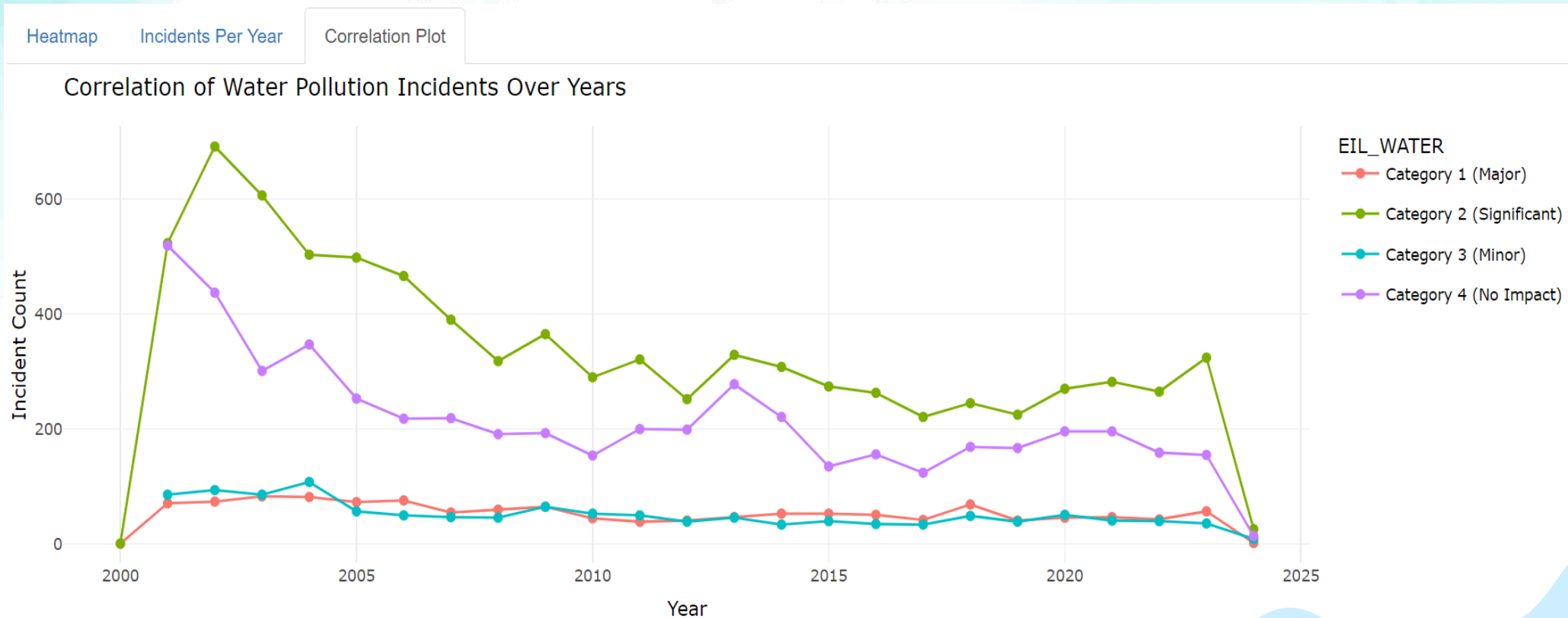➢ Heatmap: Displaying geographic distribution of pollution incidents provides insights into regional hotspots

Progress and Achievements

Results and Implications of Work

➤ Correlation Plot

Risk Analysis

Category	Details
Assets	Water Quality Data, Water Treatment Infrastructure, Environmental Reports
Threats	Pollution Incidents , Climate Change , Aging Infrastructure
Safeguards	Strict Regulatory Compliance (Environment Act 2021) , Regular Monitoring and Reporting
Vulnerabilities	Outdated Technology , Inconsistent Data Quality
Consequences	Deterioration of Water Quality , Public Health Risks , Legal Penalties and Fines

Critical Evaluation

Risk Owner	Risk	Likelihood	Severity	Score	Mitigation
Water Companies	Non-compliance with regulations	4	5	9	Implement stricter compliance checks and regular audits. Conduct training for staff on regulations.
Government	Ineffective policy implementation	3	4	7	Develop a robust monitoring framework. Engage stakeholders for feedback and improvement.
Researchers	Data privacy breaches (GDPR)	3	3	6	Use encrypted data storage and transfer methods. Regularly update and patch software. Implement strict access controls.
Environmental	Pollution incidents	4	5	9	Increase monitoring and rapid response teams. Invest in pollution control technologies.
Public Health	Contaminated water affecting health	3	5	8	Conduct regular water quality testing. Develop and enforce strict contamination control measures.
Technical Teams	Outdated infrastructure	4	4	8	Allocate budget for infrastructure modernization. Schedule phased upgrades and maintenance.
Policy Makers	Failure to meet sustainability goals	3	5	8	Develop and implement comprehensive sustainability policies. Monitor progress and adjust policies as needed.

(8-10) - High
(5-7) - Moderate
(1-4) - Low

Conclusion

- Current Challenges

- Water Companies' Role

- Research Focus

- Risk and Mitigation

References

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[12] Available at: channel 4 dispatches (2022) https://www.youtube.com/watch?v=ilhC5Ekp3eo

Thank you for your time