BHARATHIDASAN UNIVERSITY

Tiruchirappalli- 620024,
Tamil Nadu, India

Programme

M.Sc., Environmental Science & Sustainable Management

Course Title:

Environmental Pollution & Toxicology(Core Choice)

Course Code: 25PGCC03

Unit-2

TRANS-BOUNDARY POLLUTANTS AND THE EMERGING ENVIRONMENTAL CONCERNS

By Dr. N.D. Shrinithivihahshini
Assoc.Professor
Department of Environmental Science& Management

Introduction

TRANS-BOUNDARY POLLUTANTS AND THE EMERGING ENVIRONMENTAL CONCERNS

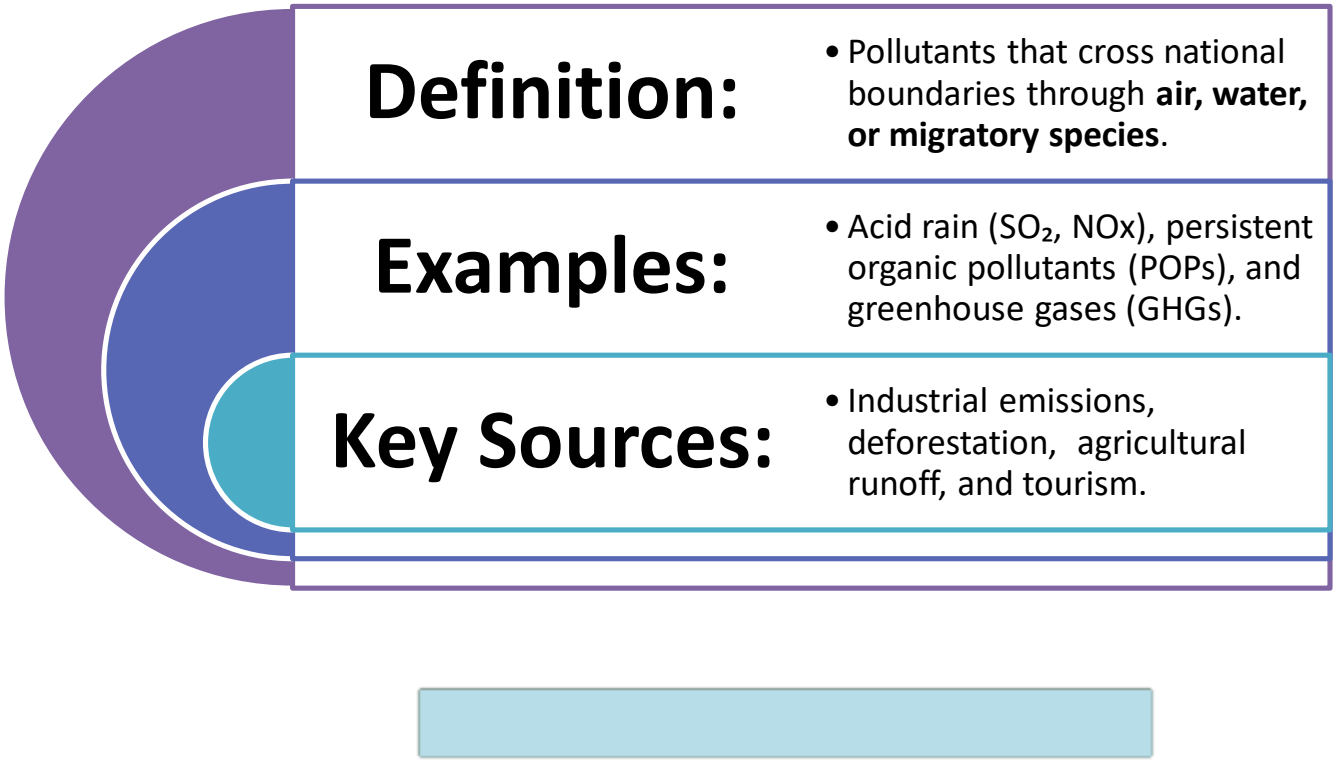
Overview of global and regional environmental Issues.

Key Topics covered

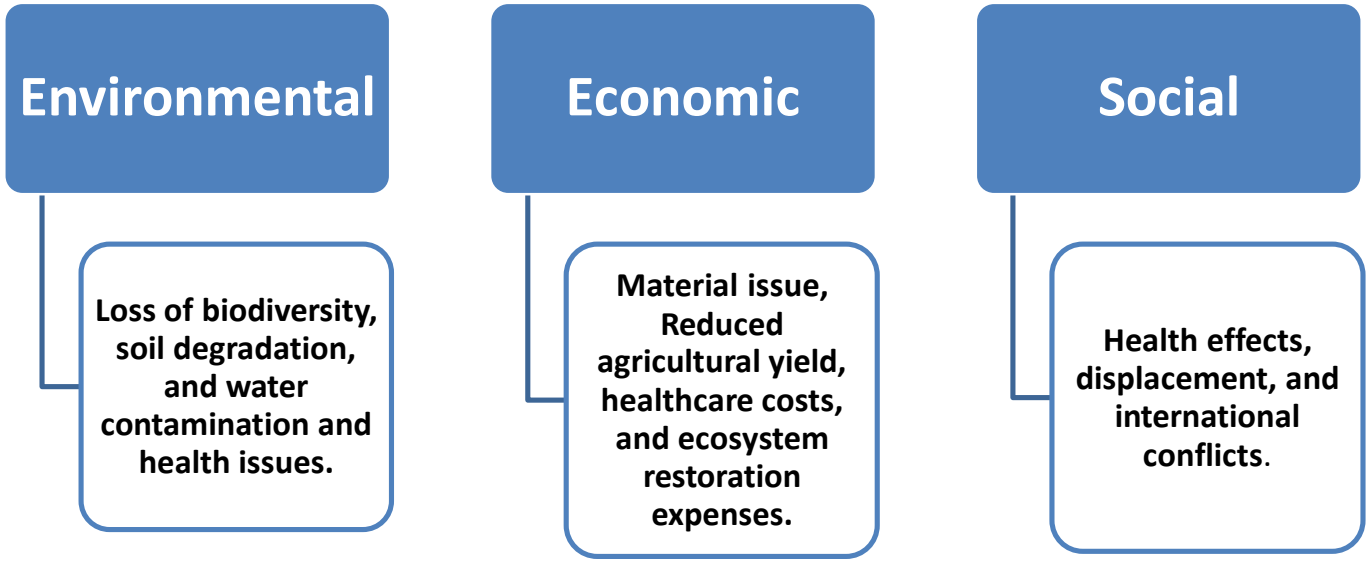
-Trans boundary pollutants, -CLRTAP and its significants,

Noise pollution, Micro plastics and legal measures.

TRANS-BOUNDARY POLLUTANTS



IMPACTS OF TRANS-BOUNDARY POLLUTION



Interactive Question

Interactive Question 1

Q: Why do transboundary pollutants require international cooperation for effective management?

NOISE POLLUTION

Noise Pollution

Definition

Unwanted or harmful sound levels that disrupt human and ecosystem health.

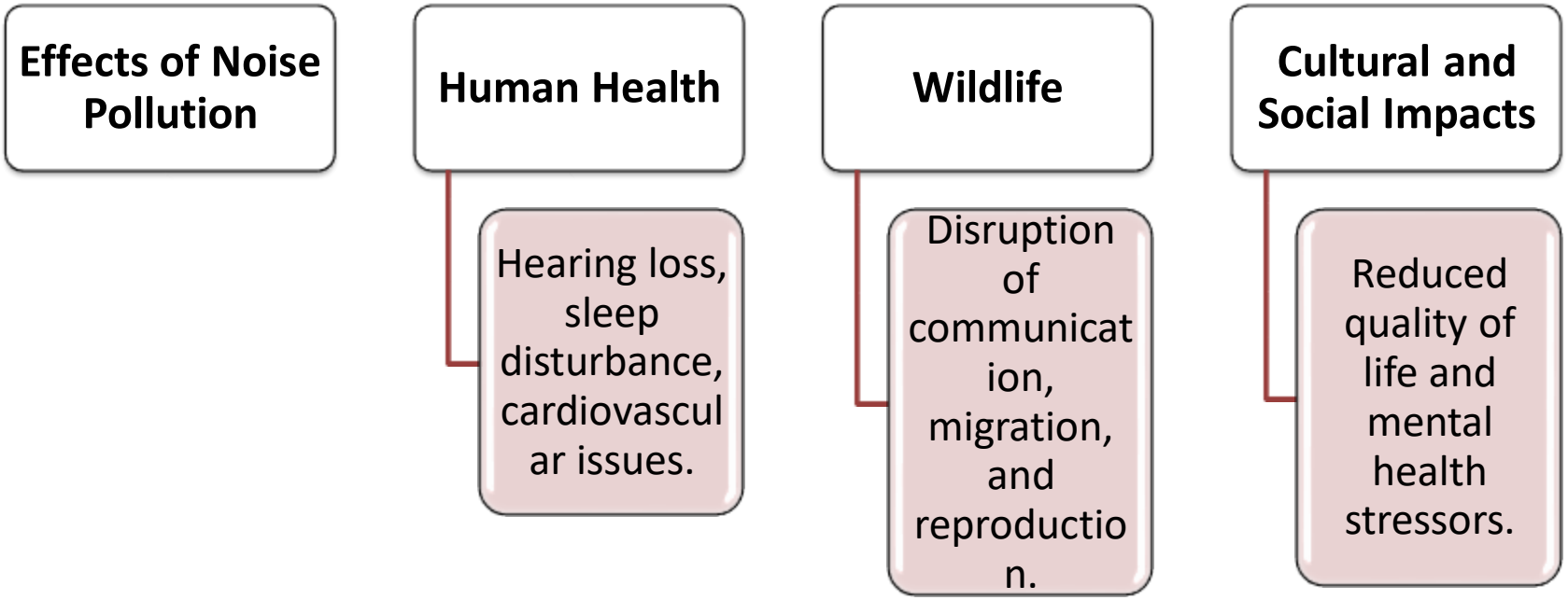
Sources

Traffic, Industrial Machinery, Construction, and urbanization.

Types

Continuous (e.g., road traffic) vs. intermittent (e.g., aircraft noise).

EFFECTS OF NOISE POLLUTION



STATUTORY REGULATIONS ON NOISE POLLUTION IN INDIA

Statutory Regulations on Noise Pollution in India

KEY LEGISLATION

- Environmental Protection Act (1986).
- Noise Pollution (Regulation and Control) Rules (2000).

NOISE STANDARDS

- Prescribed limits for industrial, commercial, residential, and silence zones.

CHALLENGES

- Urbanization, enforcement gaps, and public awareness.

MICROPLASTICS

Microplastic Pollution

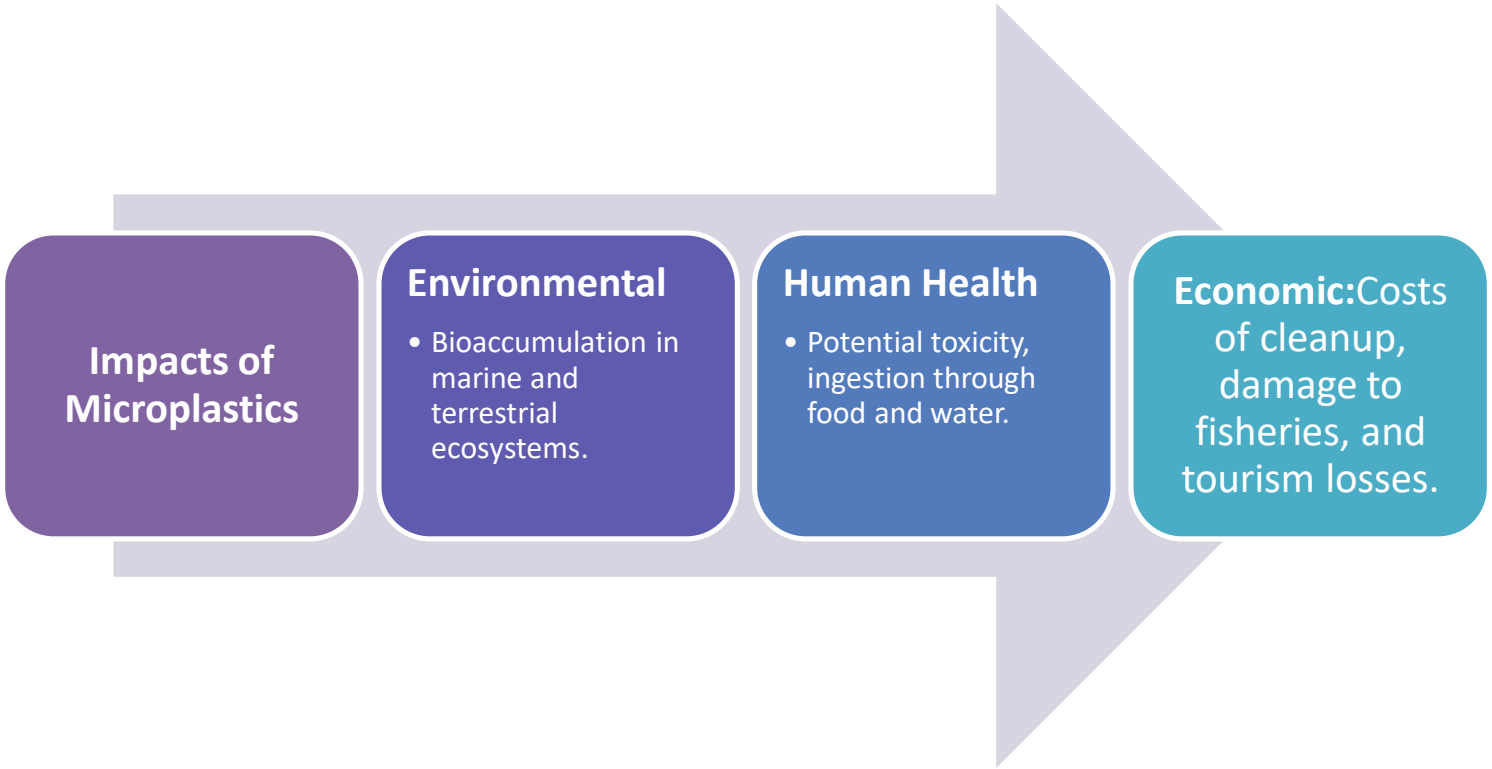
Definition

Plastic particles <5mm in size, originating from primary (e.g., microbeads) or secondary (e.g., broken down plastics) sources.

Key Sources

Single-use plastics, unprocessed wastes, tire wear, wastewater treatment plants.

MICROPLASTICS



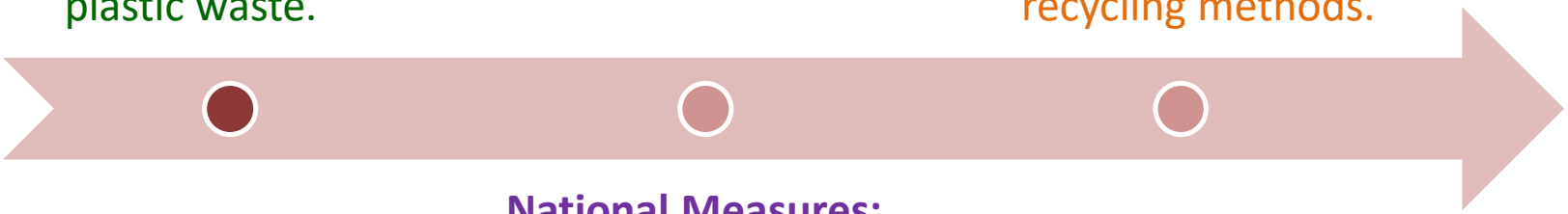
MEASURES FOR MICROPLASTIC POLLUTION

International Efforts:

- UN Plastics Treaty negotiations.
- Basel Convention amendments on plastic waste.

Technological Innovations:

- Advances in biodegradable materials and recycling methods.



National Measures:

- Plastic Waste Management Rules (India).
- Bans on single-use plastics in multiple countries.

Interactive Question 2

Interactive Question 2

Q: How do microplastics affect food safety and security in aquatic ecosystems?

CASE STUDY I

Case Study 1 – Acid Rain in Europe

Overview:

Acid deposition from sulfur and nitrogen oxides across European borders.

Impacts:

Damage to forests, lakes, and architectural heritage.

Policy Response:

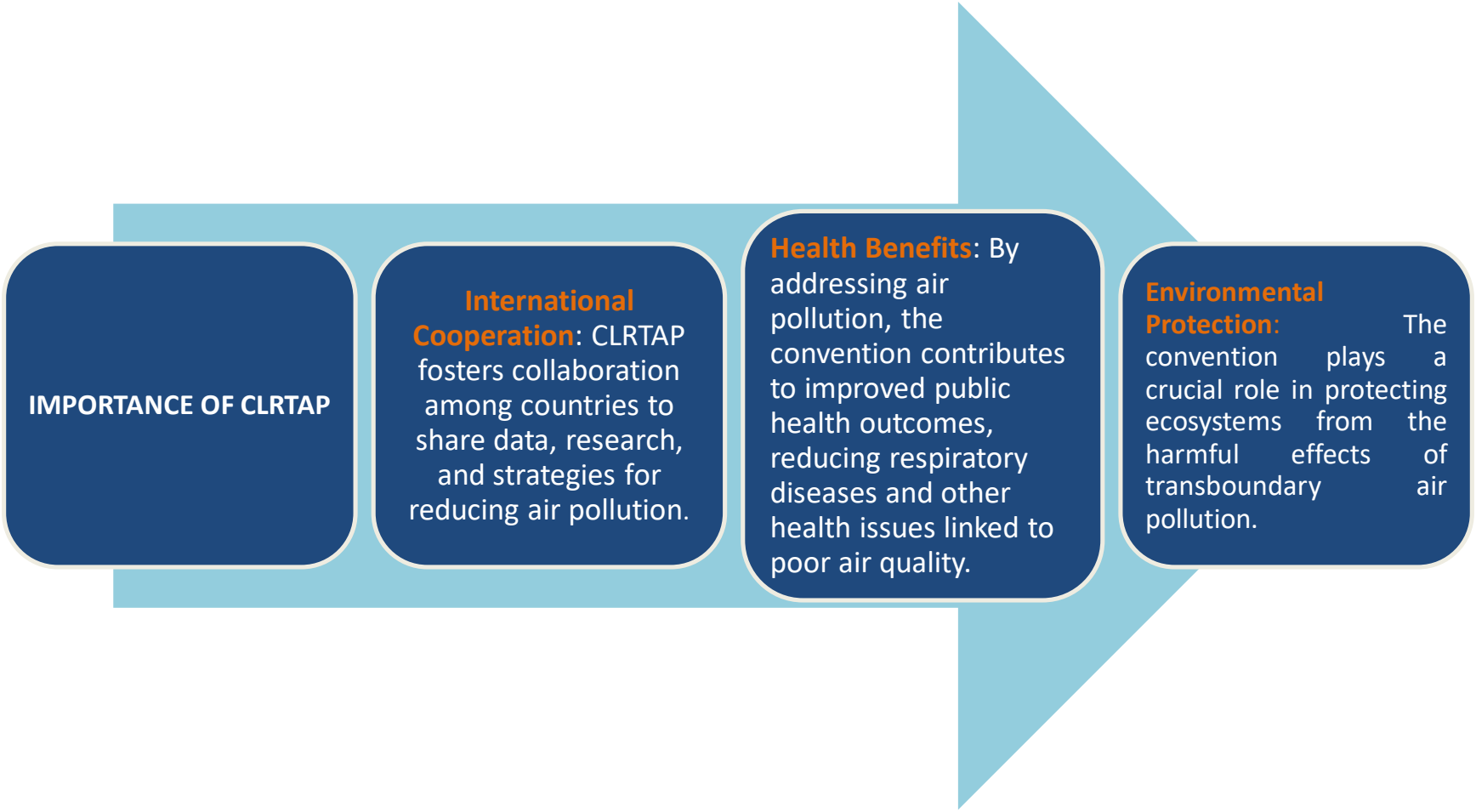
UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP).

The Convention on Long-Range Transboundary Air Pollution (CLRTAP) is a key international agreement established in 1979 to address transboundary air pollution, initially focusing on issues like acid rain. Its relevance to sustainable transportation lies in its efforts to reduce harmful emissions from various sources, including the transport sector.

CLRTAP


KEY OBJECTIVES
To reduce emissions of sulfur dioxide (SO2), nitrogen oxides (NOx), volatile organic compounds (VOCs), and particulate matter.
To promote cooperation among countries to tackle air pollution issues.
MAIN PROTOCOLS
1985 Sulphur Protocol: Focused on reducing sulfur emissions to combat acid rain.
1994 NOx Protocol: Aimed at reducing nitrogen oxides emissions, which contribute to ground-level ozone and acidification.
1998 VOCs Protocol: Targeted the reduction of volatile organic compounds, which are significant contributors to air pollution and smog.

CLRTAP


IMPORTANCE OF CLRTAP
International Cooperation: CLRTAP fosters collaboration among countries to share data, research, and strategies for reducing air pollution.
Health Benefits: By addressing air pollution, the convention contributes to improved public health outcomes, reducing respiratory diseases and other health issues linked to poor air quality.
Environmental Protection: The convention plays a crucial role in protecting ecosystems from the harmful effects of transboundary air pollution.

CLRTAP:CHALLENGES

Current Challenges

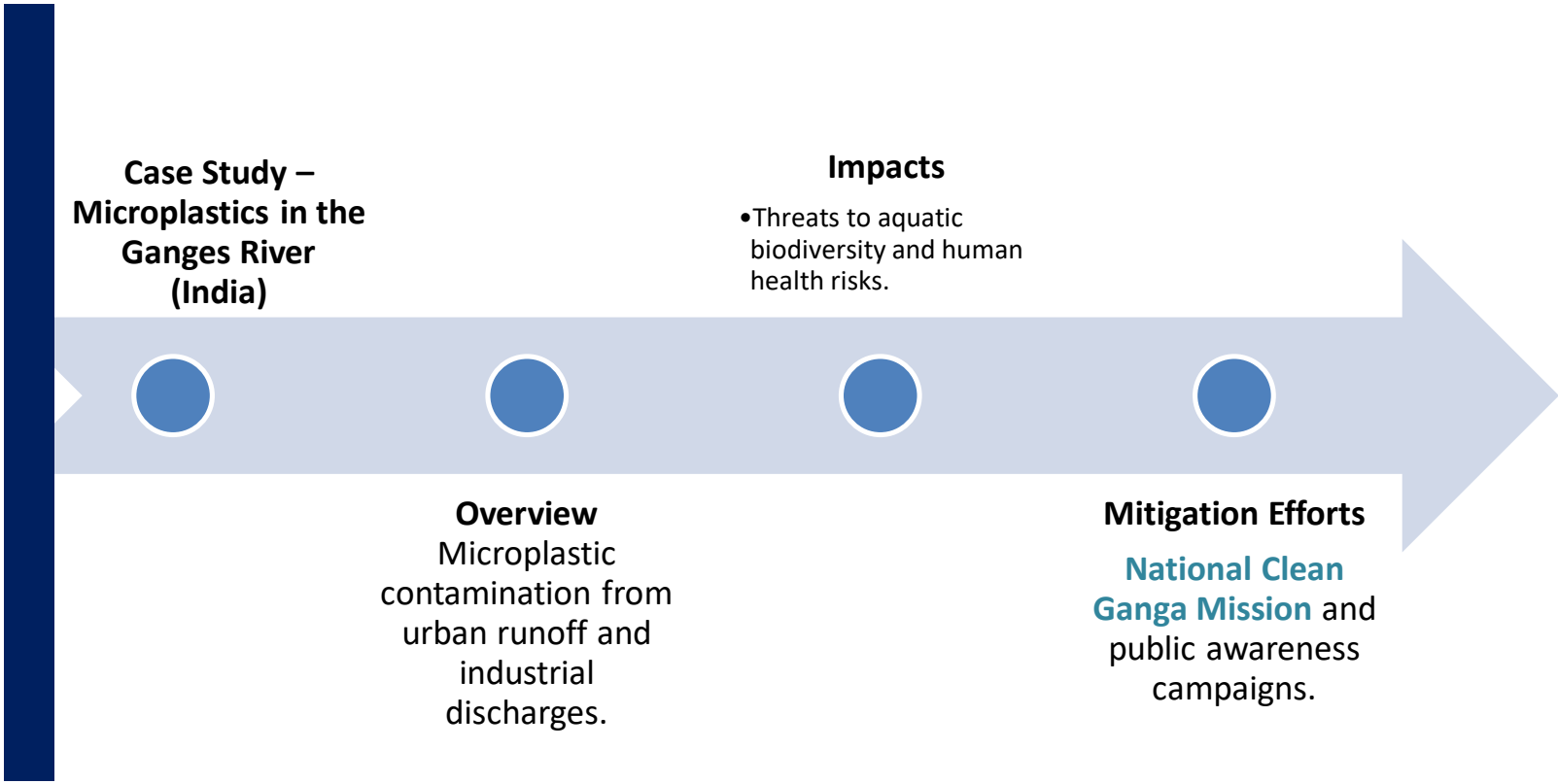
Implementation: Ensuring that all signatory countries adhere to their commitments remains a challenge.

Emerging Pollutants: New pollutants and changing environmental conditions require ongoing adaptation of strategies and protocols.

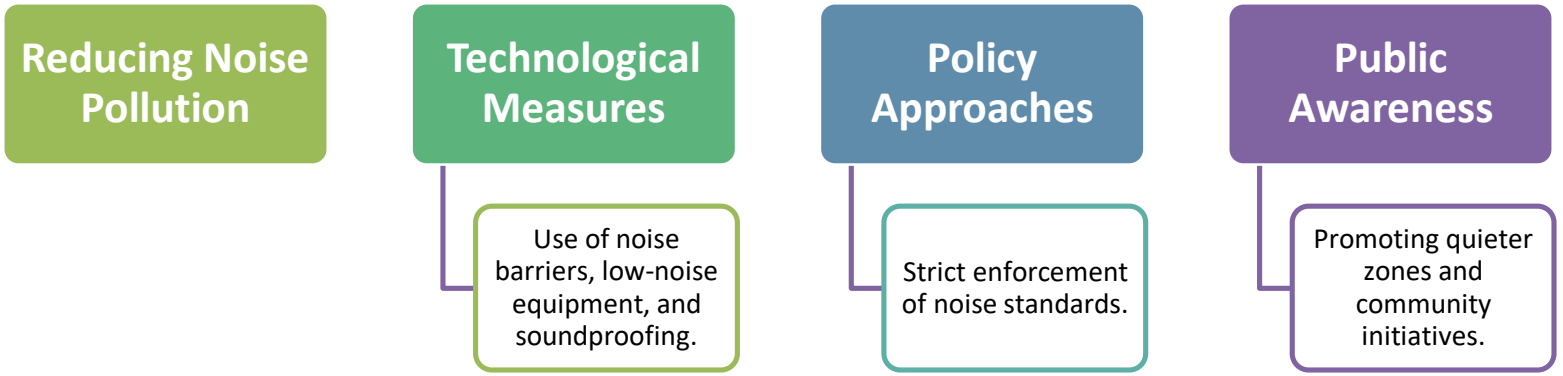
Climate Change: The intersection of air quality and climate change necessitates integrated approaches to address both issues simultaneously.

CLRTAP is a vital framework for international cooperation in combating air pollution that transcends borders. Its protocols and initiatives are essential for promoting cleaner air and a healthier environment across Europe and beyond.

CASE STUDY II



MANAGEMENT OF NOISE POLLUTION



TBP:MITIGATORY MEASURES

Mitigating Transboundary Pollution

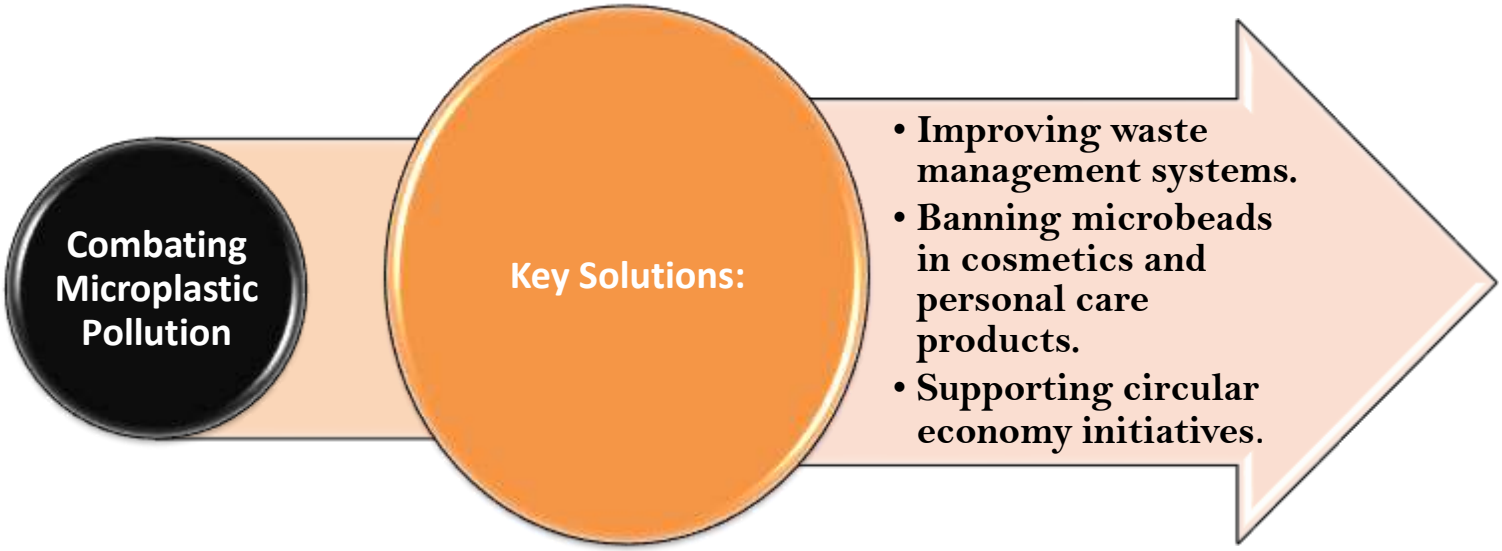
Strategies

- International treaties and agreements (e.g., Kyoto Protocol, Paris Agreement).
- Regional partnerships for resource sharing and monitoring.

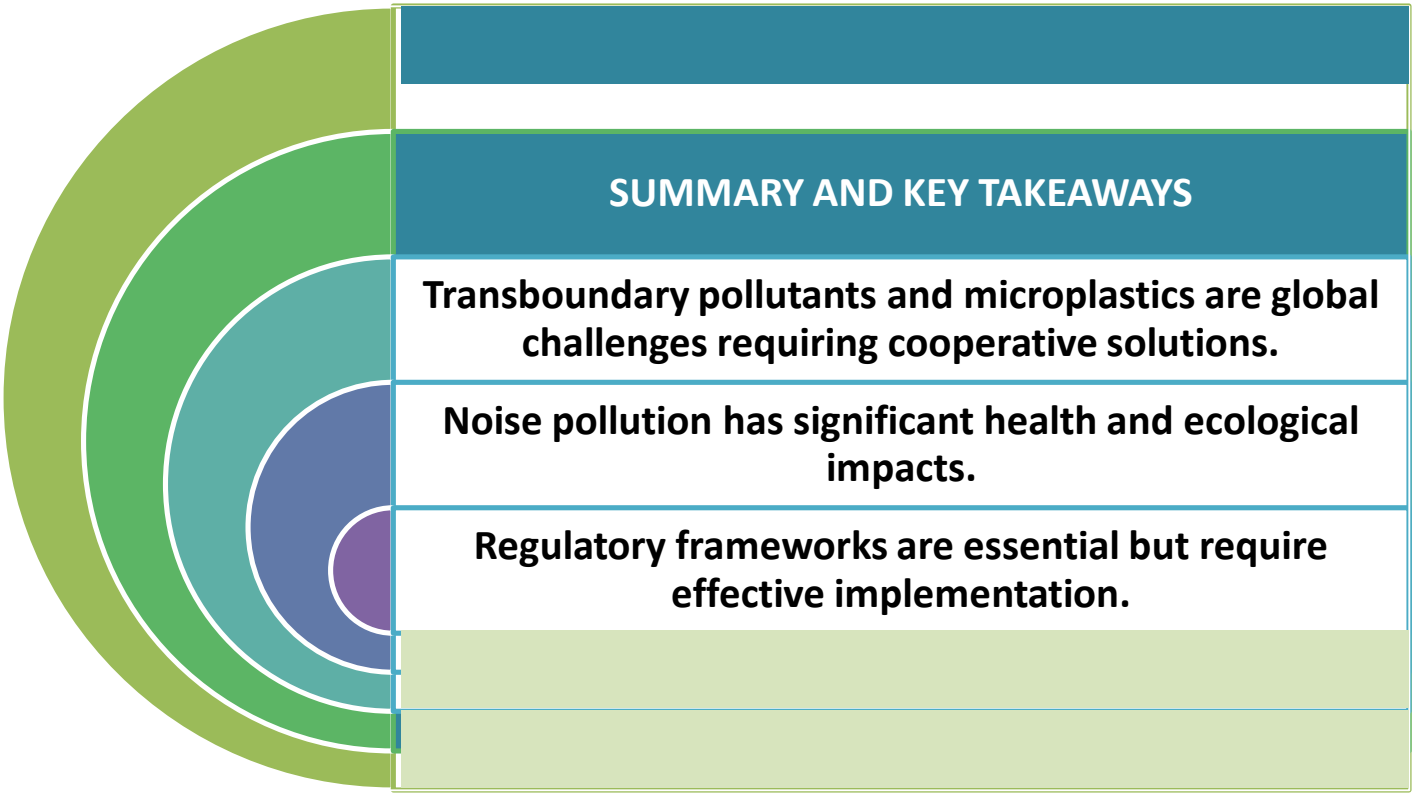
Case Example

- ASEAN haze agreement to combat forest fires.

PHYSIOLOGICAL EFFECTS OF POLLUTANTS



Summary & Key Takeaways



References

- **Books and Articles:**
  - "Environmental Noise Pollution" by Enda Murphy and Eoin King.
  - "Microplastic Contamination in Aquatic Environments" by Eddy Y. Zeng.
- **Reports and Guidelines:**
  - UNEP Report on Plastic Pollution.
  - CPCB Guidelines on Noise Pollution in India.
- **Websites:**
  - UN Environment Programme (UNEP).
  - Central Pollution Control Board (CPCB), India.

Copyright Notice!

This presentation is for educational purposes only. All materials, including text, images, and references, are the intellectual property of their respective copyright holders.

- **Unauthorized reproduction, distribution, or use of this presentation is prohibited.**
- Proper attribution is required for any external sources or materials referenced in this work.
- **Disclaimer:**
  The creator of this presentation does not claim ownership of copyrighted material used herein