MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

GOVERNMENT POLYTECHNIC KARAD

MICROPROJECT REPORT

PROGRAM: DIPLOMA IN COMPUTER ENGINEERING

COURSE: ENVIRONMENTAL STUDIES (22447)

CLASS:CO5I

TITLE: IMPACT OF TRANSPORTATION ON ENVIRONMENT

Roll no	Enrollment No	Student Name
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Guided By

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Department of Computer Engineering

Academic year 2022-23

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

Certificate of Completion

Of Microproject Assessment at the end of Semester

This is to certify that

Roll no	Enrollment No	Student Name
2232	2100100030	Manali Vishwas Ingale
2233	2100100031	Sayali Ramesh Yadav

Has successfully **Impact of Transportation on Environment** micro-project of ENVIRONMENTAL STUDIES (22447) in Fifth semester of Diploma in Computer Engineering from Government Polytechnic Karad Institute with Institute code (0010).

Prof. Mrs. K. K. Gaikwad	Prof. Mrs. S. B. Patil	Prof. Mr. R. K. Patil
Subject Teacher	Head of Department	Head of Institute

Seal of the Institute

ACKNOWLEGMENT

We take this opportunity to thank all those who have directly and indirectly inspired, directed and assisted us towards successfully completion of this project report.

We express our sincere thanks to Prof. R. K. Patil Principal of Government Polytechnic, Karad and the Head of Department Prof. Patil S.B, for having us allowed to submit this report as a part of our academic learning.

We express our sincere thanks to Prof. Mrs. K. K. Gaikwad Lecturer in Computer Engineering Government Polytechnic, Karad for encouragement throughout the project report and guideline in designing and working out this project. We are also grateful to team of '**Impact of Transportation on Environment'**

Place: Government Polytechnic, Karad.

Your sincerely,

2232- Manali Vishwas Ingale

2233- Sayali Ramesh Yadav

TITLE: Impact of Transportation on Environment

1.0 RATIONALE:

Transportation has a significant impact on the environment, especially in terms of air pollution and greenhouse gas emissions. These emissions contribute to climate change and can harm human health and ecosystems. It is important to find sustainable transportation solutions to reduce these negative effects. This contributes to air pollution, climate change, and negative effects on ecosystems. To mitigate these impacts, we can promote sustainable transportation options such as public transportation, cycling and walking.

Transportation sources release various pollutants, including nitrogen oxides (NOx), sulfur dioxide (SO2) and volatile organic compounds (VOCs). These pollutants can lead to poor air quality, smog formation, and health issues like respiratory diseases, cardiovascular problems, and premature mortality, especially

In densely populated urban areas. Unsustainable transportation practices compromise the ability of future generations to meet their needs. Addressing these issues is an ethical responsibility to ensure a habitable planet for future inhabitants.

2.0 AIM / BENEFITS OF THIS MICROPROJECT:

1. It can help identify areas of improvement and highlight the need for sustainable transportation alternatives.
2. Find alternative ways to improve Air Quality and Conserve Energy.
3. It enables us to understand the environmental challenges and develop effective strategies to mitigate them.
4. It can help to raise awareness and drive the implementation of sustainable transportation practices.

3.0 COURSE OUTCOMES:

b. Select alternative Energy resource for Engineering Practice.

c. Conserve Ecosystem and Biodiversity.

d. Apply techniques to reduce Environmental Pollution.

4.0 LITERATURE REVIEW:

Transportation, especially the use of fossil fuel-powered vehicles, contributes significantly to air pollution and greenhouse gas emissions. This pollution has detrimental effects on air quality, human health, and the environment. It can lead to respiratory problems, climate change, and ecosystem disruption.

To address these issues, it is important to explore cleaner alternatives like electric vehicles, invest in public transportation, and implement stricter emissions regulations. Additionally, promoting sustainable travel behaviors such as carpooling, cycling, and walking can help reduce the environmental impact of transportation. By adopting these measures, we can work towards creating a more sustainable and eco-friendly transportation system that minimizes its negative impact on the environment.

1.https://www.geographynotes.com/articles/5-major-environmental-impact-of-transport-development/249
2.https://archive.unescwa.org/environmental-degradation
3. https://transportgeography.org/contents/chapter4/transportation-and-environment/

5.0 PROPOSED METHODOLOGY:

- We have decided topic of microproject.
- We have collected information about various transportation ways and their impact on environment
- We have submitted proposal of microproject after completing work about proposal.
- We have worked on the project with proper discussion with team members.
- We have followed all the procedure to create report of the project.
- After successfully preparation of project, we have completed our final report along with presentation.

6.0 ACTUAL RESOURCES USED:

Sr. No	Name of resource	Specification	Qty
1.	Computer System	**Device Name:** LAPTOP-B0NR068H Processor AMD Ryzen5 5500U with Radeon Graphics 2.10 GHz **System Type:** 64-bit operating system, x64-based processor **Version:** 22H2	1
2.	Office S/W package	Microsoft word 2020	1

7.0 OUTPUT OF MICROPROJECT:

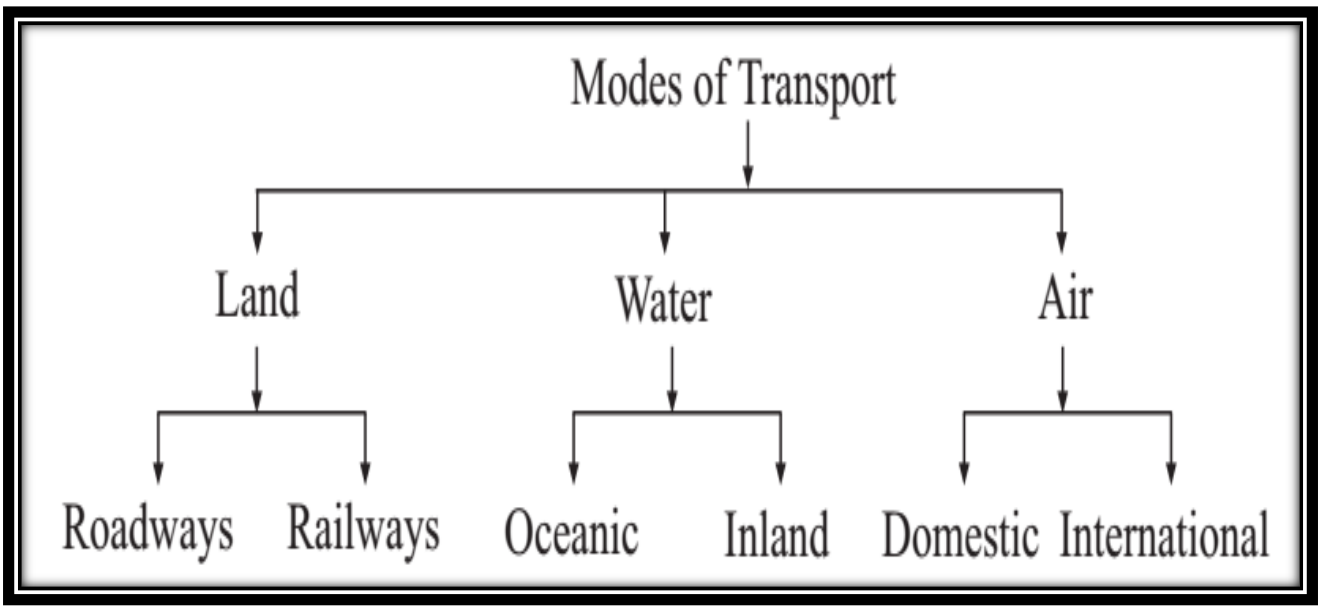
- **TRANSPORTATION:**

Transportation is essential for various purposes such as commuting, traveling, and delivering goods. It allows us to explore new places, connect with others, and access resources. However, it's important to consider the environmental impact and strive for sustainable transportation options whenever possible.

Transportation can have a significant impact on the environment. The burning of fossil fuels in vehicles releases greenhouse gases, contributing to climate change. Additionally, transportation infrastructure can disrupt ecosystems and contribute to air and noise pollution. It's important to promote sustainable transportation options to minimize these negative effects.

- **MODES OF TRANSPORTATION**

As we know that basically transport is possible through land, air or water, which are called the different modes of transport, but actually I want to point out in this paper the effect of transportation on environment so I have written brief information about the modes of transport too. The different modes of transport are air, water, and land transport, which includes Rails or railways, road and off-road transport. Other modes also exist, including pipelines, cable transport, and space transport. The modes of transportation broadly divided into the bellow flow:

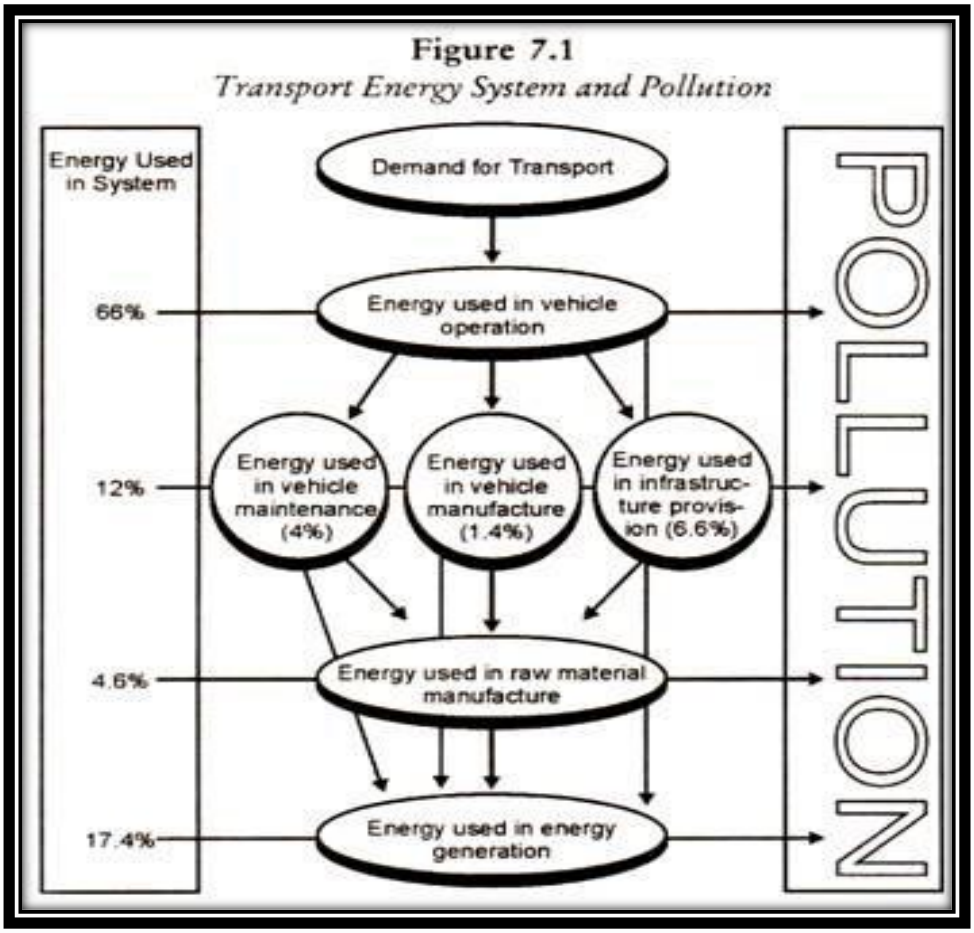


- **<u>Factors affected by transportation</u>**:

- **Energy Consumption**
- **Greenhouse Gas Emission**
- **Air Pollution**
- **Noise Pollution**
- **Land Consumption**
- **Ecological Degradation**

1.Energy Consumption in Transport and Environmental Pollution:

Transport requires energy mainly for vehicle operation and to some extent also for manufacturing of the vehicle. Following Figure depicts the transport energy system and pollution.



The energy consumption in transport sector is the main cause of pollution. There are significant differences in fuel efficiencies between various modes of transport, for example, consumption of energy in cars is more among urban transport modes. Although there has been a significant improvement in the fuel efficiency in cars and other automobiles. It is estimated that in developed countries like UK. The traffic increases up to 142 per cent predicted for the year 2025, the energy consumption will continue to increase substantially, in spite of fuel efficiency measures.

Solutions to Reduce the Energy Consumption:

1. Promote the use of public transportation to reduce the number of individual vehicles on the road.

2. Encourage carpooling and ridesharing to optimize travel routes and decrease the number of vehicles.

3. Invest in and promote the use of electric vehicles, which are more energy-efficient and produce fewer emissions.

4. Improve and expand infrastructure for walking and cycling to encourage active modes of transportation.

5. Implement traffic management strategies, such as intelligent transportation systems, to optimize traffic flow and reduce congestion.

6. Encourage telecommuting and flexible work arrangements to reduce the need for daily commuting.

7. Support the development of alternative fuels, such as biofuels and hydrogen, to reduce reliance on fossil fuels.

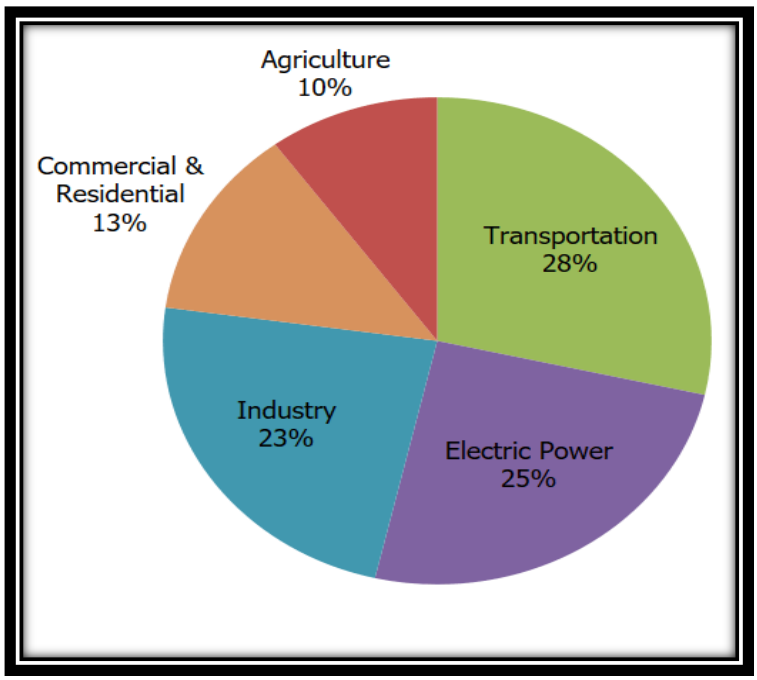
8. Promote eco-driving techniques, such as maintaining proper tire pressure and avoiding aggressive driving, to improve fuel efficiency.

9. Invest in research and development for innovative transportation technologies, such as autonomous vehicles and sustainable aviation.

10. Educate the public about the benefits of energy-efficient transportation and promote sustainable travel behaviours.

2.Greenhouse Gas Emission:

Emissions of greenhouse gases from combustion of fossil fuels are associated with the warming of the Earth's climate. Certain air pollutants, including black carbon, not only contribute to global warming, but are also suspected of having an immediate effect on regional climates. several gases that fit these criteria, and many of these occur naturally in Earth's atmosphere. These include **carbon dioxide**, **methane**, **water vapour**, and **nitrous oxide**. However, human activity is increasing the presence of some of these gases, as well as introducing synthetic compounds. Examples of human-made greenhouse gases include chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF6). India's transportation sector contributes about 10 per cent of total national greenhouse gas (GHG) emissions and road transportation contributes about 87 per cent of the total emissions in the sector.



Solutions to Reduce Green House Gas Emission through Transportation Choice

1.Bicycling and walking:

Bicycling and walking are the modes of transportation with the least production of carbon emissions from fossil fuels. Although the manufacturing of bicycles and bicycle parts does emit carbon dioxide and other pollutants, as does the production and transportation of the extra food bicyclists and pedestrians consume, the production of automobiles and other means of transportation release much more.

2.Use public transportation:

By using public transportation, you help reduce greenhouse gas emissions by reducing the time you spend in your car.

3.Think before you drive:

If you own more than one vehicle, use the less fuel-efficient one only when you can fill it with passengers. Driving a full minivan may be kinder to the environment than two midsize cars.

4.Avoid idling:

Turn off your vehicle when you aren't moving—unless you are in traffic or at a stop light, of course. You may have been told that turning off and then restarting an engine consumes more fuel than just leaving it running, in addition to the wear and tear of starting the engine. This is not true with modern fuel-injected engines.

5.Keep tires filled with Pressure:

You can reduce your carbon dioxide emissions by about 275 pounds per year by making sure your tires are filled to the recommended pressure. You will also save up to 5 percent on your gasoline expenses and your car will ride smoother.

3.Air Pollution

The potential negative impacts of transportation on environment can be listed as degradation of air quality, greenhouse gas emissions, increased threat of global climate change, degradation of water resources, noise and habitat loss and fragmentation .Transportation has a significant impact on air quality due to the emissions released by vehicles. When we burn fossil fuels like gasoline and diesel, it produces pollutants that contribute to air pollution. These pollutants include carbon monoxide, nitrogen oxides, and particulate matter.

Carbon monoxide (CO) is a colourless and odourless gas that is harmful when inhaled. It can reduce the amount of oxygen carried by our blood, leading to health issues such as headaches, dizziness, and even death in high concentrations. **Nitrogen oxides (NOx)** are a group of gases that are formed when fuel is burned at high temperatures. They contribute to the formation of smog and can cause respiratory problems, especially in vulnerable populations such as children and the elderly

Particulate matter (PM) consists of tiny particles suspended in the air, which can be solid or liquid. These particles can be directly emitted from vehicle exhaust or formed through chemical reactions in the atmosphere. PM can penetrate deep into our lungs and bloodstream, leading to respiratory and cardiovascular problems.

The impact of transportation on air quality is particularly significant in areas with high traffic congestion and heavy reliance on cars. However, there are ways to mitigate these impacts. Transitioning to electric vehicles, improving public transportation systems, promoting carpooling, and investing in infrastructure for cycling and walking can all help reduce emissions and improve air quality.It's important for individuals, governments, and businesses to work together to find sustainable transportation solutions that minimize the negative impact on air quality and create a healthier environment for everyone.

Finally, **the plane is the most polluting means of transport** and the one that generates the most greenhouse emissions. On many occasions, for long-distance journeys we have no choice but to take the plane, however, for other shorter journeys, the train can be a much more environmentally friendly alternative. In short, just by making small gestures and thinking a little about the environment when we travel, we could create a much more sustainable and less polluted planet.

Solutions to Reduce the Impact of Air Travel on the Environment

1. Setting up of Regulations

As a solution to environmental degradation due to air travel, industry regulation is needed. In 2006, the International Civil Authority (ICAO) proposed the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which gives airline restrictions on carbon emissions. If the limit is exceeded, then airlines will buy offsets from other sectors.

2. Use of Technology

To deal with the problem of climate impact caused by the aviation industry, technology can be used in the design and systems of planes to make them more efficient. A breakthrough in the use of another type of fuel that is greener, like biofuels, hydrogen**,** solar panels, and batteries, could save the world from the degradation of the environment by aircraft engines running on kerosene.

3. Carbon Offsetting Programs

Charging the number of greenhouses emitted into the air by aircraft could go a long way in discouraging pollution. Airlines should pay for every ton of greenhouse gases they emit, just like other forms of transportation**.** This makes airlines accountable for their pollution and encourages them to emit less because it costs them money.

In addition, the government should also add environmental and social costs. Most airplanes have embraced this and have been developing projects that help offset their carbon footprints.

4.Using Alternative Means

One of the most effective ways to reduce the amount of carbon footprint is by flying less often. This means in the case where other forms of transport are available; it is not a must for an individual to fly**.** Instead, driving or taking the train to their destination as a preference for most people would mean airlines burn less fuel**.** Taking holidays that are not so far away could also help reduce greenhouse gas emissions.

5. Invention of Alternative Energy Sources

Unlike other engines, aircraft engines have no other greener alternatives, such as solar or other renewable energy. Technological advancement in the sector might lead to electric planes that emit less and are more fuel-efficient. However, the sector remains negligent in matters of the environment.

4.Noise Pollution:

Transportation can have a big impact on noise levels in our surroundings. The constant noise from vehicles, especially in busy cities, can contribute to noise pollution. This can lead to various negative effects on our well-being, such as increased stress levels, difficulty sleeping, and even potential hearing damage. To address this issue, implementing measures like sound barriers, traffic management strategies, and promoting the use of electric vehicles can help reduce noise pollution and create quieter and more peaceful environments for everyone to enjoy.

Noise pollution can come from outdoor sources, such as road traffic, jet planes, garbage trucks, construction equipment, manufacturing process- es, lawn mowers, leaf blowers, and indoor sources, including: boom boxes, heating and air conditioning units, and metal chairs scraping on floors.

Another effect of transportation on noise is the disruption it can cause in our daily lives. The constant noise from vehicles can make it difficult to concentrate, communicate, and relax. It can also impact the quality of our outdoor spaces, making it less enjoyable to spend time outside or engage in activities like reading or having conversations. By implementing noise reduction measures and promoting sustainable transportation options, we can create a more peaceful and harmonious living environment.

Solutions to Reduce the Impact of Noise Pollution on the Environment

1. Use noise barriers along highways and busy roads to block sound.

2. Implement traffic management strategies like reducing speed limits and using traffic calming measures.

3. Promote the use of electric vehicles, which produce less noise than traditional vehicles.

4. Encourage the development and use of quieter transportation technologies.

5. Design urban areas with noise reduction in mind, such as incorporating green spaces and sound-absorbing materials.

6. Educate the public about the negative effects of noise pollution and promote awareness and responsible behavior.

7. Enforce noise regulations and standards to ensure compliance and minimize excessive noise from vehicles.

8. Conduct research and development to explore innovative solutions for noise reduction in transportation.

5. Land Consumption and Landscape Damage:

The provision of land-based transport requires the direct utilization of land. Long strips of land are consumed, and large areas effectively divided into smaller ones (severance). Previous land uses, such as forestry, agriculture, housing and nature reserves, may be displaced, and zones adjacent to the new development rendered unsuitable for wide range of activities.

The latter aspect is true of pipelines carrying volatile materials (such as pressurised gas), for example, where a corridor of land along the route must be kept undeveloped for safety reason, even if the pipeline itself causes no direct consumption of land. Ironically, severance may seriously restrict the movement of people and animals between previously contiguous areas, with consequences for the quality of community life and the functional integrity of ecosystems.

Airports are such large blocks of land that they create severance effects in their particular location. Some severance effects, notably those of non-motorway type roads, are only partial, though increasing traffic density and speed increases the danger of pedestrian crossings on the same level. Traffic engineers have introduced more light-controlled crossings in recognition of this problem.

Solutions to Reduce the Land Consumption and Landscape Damage:

1. Prioritize compact and mixed-use development to minimize land consumption for transportation.

2. Promote sustainable transportation options like walking, cycling, and public transit to reduce the need for extensive road networks.

3. Preserve natural landscapes and implement smart growth strategies to minimize the impact of transportation on land.

4. Encourage the use of shared mobility services to reduce the need for individual vehicle ownership and parking space.

5. Implement land-use planning policies that prioritize the protection of green spaces and natural habitats.

6. Invest in infrastructure for non-motorized transportation modes, such as bike lanes and pedestrian-friendly streets.

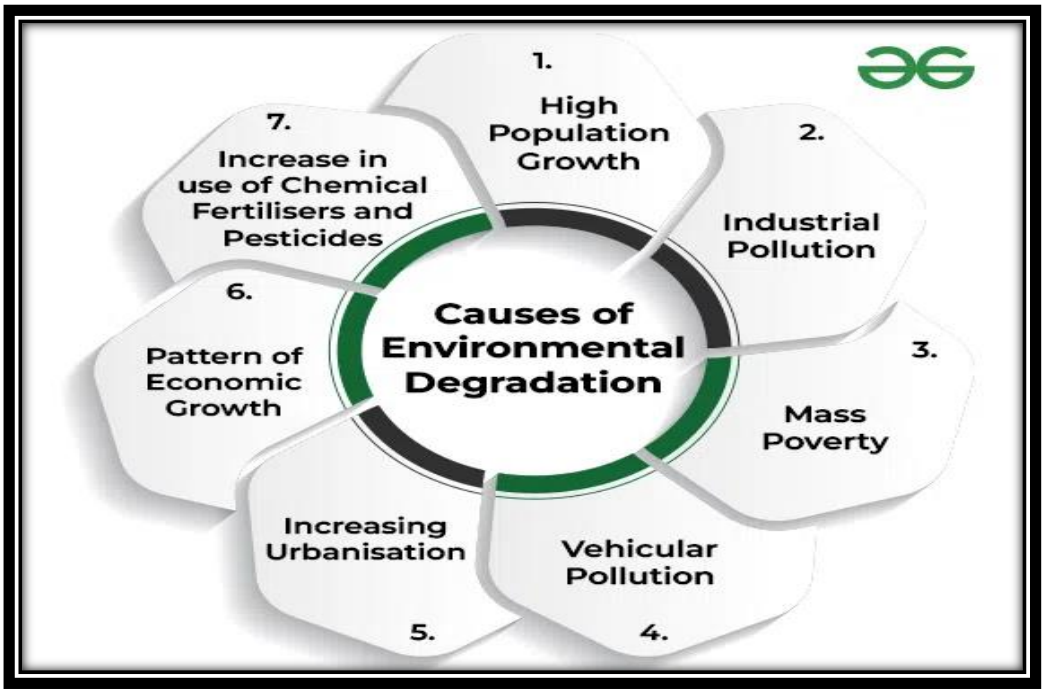
7. Promote transit-oriented development, which focuses on building communities around public transportation hubs to reduce the need for car travel.

8. Encourage the reuse and redevelopment of existing infrastructure to minimize the need for new land development.

9. Implement zoning regulations that promote walkability and mixed-use development, reducing the need for long-distance travel.

10. Foster community engagement and participation in transportation planning to ensure that land use decisions align with the needs and values of the community.

6.Ecological Degradation:



The degradation of terrestrial and aquatic ecosystems, as measured by indicators such as reduced habitat/species diversity, primary productivity or the areal extent of ecologically valuable plant and animal communities, provides one of the most emotive aspects of the tension between transport development and environmental quality.

Severance is another direct consequence of land-based transport development. The physical division of natural or semi-natural ecosystems may inhibit the movement of animal and plant species across transport lines, and the associated reduction in size can threaten the viability and/or biodiversity of the smaller remnants. Likewise, the death of individual animals through collision with vehicles will be an all-too- familiar direct consequence of road transport for many readers. A recent report by Scottish Natural Heritage (1994) included a study, which put the annual road-kill loss of breeding amphibians in Scotland at 20-40 per cent, with an annual kill of barn owls of at least 3,000 individuals.

However, the indirect or secondary effects of transport development may also be responsible for many adverse impacts on wildlife, including those associated with air, water and noise pollution (described below). With reference to water pollution, for example, one could point to the ecological destruction associated with catastrophic, and internationally reported, oil leaks from stricken tanks or the contamination of coastal ecosystems.

Solutions to Reduce the Ecological Degradation:

1. Promote electric vehicles: They produce fewer emissions and have a lower environmental impact.
2. Invest in public transportation: This reduces the number of individual vehicles on the road and decreases emissions.
3. Implement stricter emissions regulations: This ensures vehicles meet environmental standards.
4. Encourage alternative fuels: Biofuels can be a cleaner option compared to traditional gasoline.
5. Promote sustainable travel behaviours: Carpooling, cycling, and walking help minimize environmental impact.

Advantages Of Transportation:

- Improved Accessibility
- Economic Growth
- Social Connectivity
- Cultural Exchange
- Education and Healthcare Access
- Tourism and Recreation
- Efficient Resource Distribution

Disadvantages Of Transportation:

- Air Pollution
- Noise Pollution
- Traffic Congestion
- Land Consumption:

8.0 SKILL DEVELOPED/ LEARNING OUT OF THIS MICRO-PROJECT:

After Implementing this microproject we have learnt:

- Research and Analytical Skills
- Communication Skills
- Problem Solving Skills
- Leadership Skills
- Performance Skills
- Team Building Skills
- Time management Skills

9.0 APLLICATION OF MICROPROJECT:

- It can inform policymakers and transportation planners on the need for sustainable transportation solutions.
- Development of Regulations and Policies reduce emission and promote eco-friendly transportation options.
- Understanding the environmental impact of transportation can contribute to the development of eco-friendly technologies and innovations in the transportation industry.

CONCLUSION OF THIS MICRO-PROJECT:

Transportation has a significant impact on the environment. It contributes to air pollution, noise pollution, and land consumption. These negative effects can harm human health, ecosystems, and biodiversity. However, there are solutions to mitigate these impacts, such as promoting electric vehicles, investing in public transportation, implementing stricter emissions regulations, and encouraging sustainable travel behaviours. By adopting these measures, we can work towards creating a more sustainable and eco-friendly transportation system that minimizes its negative impact on the environment.

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