Assignment – 01

Module 1 (Climate Literacy)

There are 4 questions each carrying equal marks (2. 5 pts each). You can submit PDF copies of answer sheets online on Canvas.

1. Consider a scenario where 20% of Karachi's vehicle fleet (1.5 million cars) is converted to electric vehicles (EVs). Each car travels an average of 12,000 km annually. Research any other relevant quantities and numbers to come up with a concrete plan. (2.5 pts)

   (a) Calculate the annual emissions from the current fleet, assuming each fossil fuel car emits 200 g of CO_2 per km.
   (b) For the EV fleet, assume electricity consumption is 0.2 kWh/km, and Pakistan's grid emits 0.51 kg CO_2e/kWh. Calculate the annual emissions from the EVs.
   (c) Compare the total emissions of both fleets.
   (d) Based on this comparison, discuss whether EVs are a viable solution in the context of Karachi's current electricity grid. Suggest improvements to maximize EV sustainability.

2. The "Ten Billion Tree Tsunami Programme, Phase-I" is a flagship initiative by the Government of Pakistan (2019-2023) to address climate change, biodiversity loss, and environmental degradation. The program aims to plant and regenerate 10 billion trees across the country, improve forest management, and create green jobs. Research any relevant numbers or figures, if needed. (2.5 pts)
   (a) Calculate the total potential CO_2 sequestration if Phase-I (2 billion trees) is completed, assuming that one hectare can accommodate 1,000 trees. How does this compare to Pakistan's annual CO_2 emissions?
   (b) Critically analyze the practicality and feasibility of Phase-I. One paragraph
   (c) Critically analyze the feasibility of scaling this program to 10 billion trees by 2023, considering the financial, logistical, and environmental challenges. One paragraph
   (d) Discuss the socio-economic benefits of this program, including its impact on employment, biodiversity, and local communities. What barriers could limit these benefits?
   (e) Propose improvements to ensure the success of such large-scale reforestation projects in Pakistan's context, including policy, funding, and community involvement strategies.

3. Your carbon footprint is the total amount of greenhouse gases (GHGs) you emit, directly or indirectly, through daily activities like transportation, energy usage, and food consumption. (2.5 pts)

   (a) Calculate the student's annual carbon footprint for electricity usage, transportation, diet, and waste disposal. Express your answer in tons of CO_2 per year.
   (b) Compare the result to the global per capita CO_2 emissions average of 4.7 tons/year. Is the student above or below the global average?

(c) Suggest three practical lifestyle changes the student can adopt to reduce their carbon footprint and calculate the potential reduction in emissions for each suggestion.

4. Track climate change-related articles in the news over the course of a week. Categorize them into different topics (e.g., extreme weather, policy changes, renewable energy). What types of climate-related stories are most common? How does the media portray climate change? Are there any noticeable biases in the reporting? At least 15 articles.(2.5 pts)