

## 38<sup>th</sup> UNU Global Seminar Student Report by Rajat

### 1. Introduction



Rajat is Doctoral student at the Graduate School of Environmental Sciences at Hokkaido University, Japan. His research interest is the application of remote sensing technology for the sustainable development of terrestrial ecosystems. As a Ph.D. student, I am doing research on how to provide the most accurate forest biomass estimation using microwave remote sensing. This would provide the forest ecosystem monitoring research community with better tools for carbon budget mapping and its uncertainty analysis.

As most of GHG emission are due to anthropogenic factors and this seminar was related to what lifestyle style transformation to achieve net neutrality so I found it interesting to know more about what lifestyle changes can be implemented to achieve net zero. UNU seminar is a high-level platform to learn from the renowned researchers and young students to understand the situation around the globe and make a strong network with students from different universities to implement the learnings from this seminar for further research in this area.

### 2. Keynote Speech Summary

I was most interested in the keynote speech given by **Prof. Shobhakar Dhakal**, “Role of transforming lifestyle for energy transition towards the net-zero-emissions world”, as this was related directly to the theme of this seminar. Prof. Shobhakar Dhakal firstly discussed the need of energy transition then energy transition pathways for Net Zero Emissions by 2050 lastly, he focused on the lifestyle changes are the key to energy transition.

#### **Why there is a need of energy transition?**

Prof. Dhakal pointed out the world is not on track to meet sustainable development goals (SDGs) specially the Asia Pacific region. In Asia Pacific region none of the 17 SDGs will be achieved at the current rate of change. Therefore, world is not on track to limit temperature rise by 1.5°C. Based on the global surface temperature data period from 1850 – 2000 is the warmest in 100,000 years. After the comparison of natural and human factors responsible for the temperature rise it has been found that human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years.

Global net anthropogenic GHG emissions are increasing every year and around 64% of the emission comes from CO<sub>2</sub> emitted by fossil fuel and industry (CO<sub>2</sub>-FFI), around 18 % CO<sub>2</sub> emission are from

land use change. Remaining carbon budgets is very less for limiting warming to 1.5°C and 2°C, so to control the GHG emission there is a need for energy transition.

### **Pathways for Net Zero Emissions by 2050**

By implementing the changes in both policies and changes in economic structure like energy supply decarbonisation, energy efficiency gains, and energy demand reduction, at least 18 countries have sustained production-based GHG and consumption-based CO<sub>2</sub> emission reductions for longer than 10 years. In most recent three years (2015-2018), 32 countries have seen absolute emission decoupling, 41 countries have seen relative emission decoupling with economy. Absolute decoupling means a decline of emissions in absolute terms or as being stable while GDP grows. Relative decoupling means growth of emissions being lower than growth of GDP.

Multiple low-carbon technologies have shown rapid progress in cost, performance, and adoption - enhancing the feasibility of rapid energy transitions for example sustained decreases in the unit costs of solar energy (85%) wind energy (55%) and large increases in their deployment >10x for solar, >100x for EVs. Small 'granular' technologies like solar pv, EV battery, wind energy are being adopted at a faster rate than large technologies.

To limiting warming to 1.5 °C the global GHG emissions peak before 2025, reduced by 43% by 2030 and Methane reduced by 34% by 2030. But Future cumulative CO<sub>2</sub> emissions from existing and currently planned fossil fuel infrastructure exceeds remaining carbon budgets limiting warming to 1.5°C. There should be restrictions in existing and planned fossil fuel infrastructure particularly in developing countries.

All sectors have the possibilities to reduce at least halve emission by 2030 (of 2019) by focusing on both demand and supply side.

- In the energy sector solar energy and wind energy have the highest potential to reduce the net emission by 2030.
- Reduced conversion of forests and other ecosystems in AFOLU
- In industrial sector fuel switching (electricity, nat. gas, bio-enerav. H<sub>2</sub>)

Demand-side mitigation can be achieved through changes in socio-cultural factors, infrastructure design and use, and end-use technology adoption by 2050.

So, to achieve the net zero by 2050 avoid the fossil fuel-based development plans, expand the EV network, increase the investment in renewable energy resources and zero carbon ready building.

### **lifestyle changes are the key to energy transition.**

Lifestyle changes are not adequately captured in IAM and Energy System Models and scenarios and often provide limited insights. Net zero emissions in 2050 cannot happen without the consent and active support of people. The lifestyle changes will affect multiple aspects of people's lives - from transport, heating and cooking to urban planning and jobs. Lifestyle change can lead to 24% and 22% of CO<sub>2</sub> emission reductions in 2030 and 2050 respectively. Urban design can reduce the average city dweller's carbon footprint by up to 60% by shaping lifestyle choices and influencing day-to-day behavior.

## Three key mechanism Lifestyle change

- Lifestyle changes cut emissions in sectors where other options for doing so are scarce for example aviation sector
- Behavioural changes cut emissions from existing carbon intensive assets
- Behavioural changes reduce energy demand, taking pressure off new sources of low-carbon electricity and helping to keep biofuels production within sustainable limits

### **Most important lifestyle changes for net zero emission**

- Reducing excessive or wasteful energy use - e.g., reducing indoor temperature settings, adopting energy saving practices in homes, limiting driving speeds on motorways
- Transport mode switching, e.g., cycling, walking, ridesharing, or taking buses
- Materials efficiency gains e.g., higher recycling, and improved design and construction of buildings and vehicles, single-use plastics

### **3. Group Discussion Summary**

Our group looked at mobility management to reduce carbon footprint. Transport, particularly motor vehicles, contributes a significant amount of (nearly one-quarter) carbon dioxide to the atmosphere as a major source of greenhouse gases. For instance, In the US, transportation contributes almost 27 percent of all greenhouse gas emissions, ranking first (US EPA, 2022). What makes things worse is that in the years ahead, energy consumption for transportation is predicted to increase significantly.

To preserve a livable climate, the average emissions per person per year will need to drop to around 2 to 2.5 tons of CO<sub>2</sub>e by 2030. We have proposed the initiatives like living car-free, walking or riding a bike instead of driving, use of electric vehicles and hybrid vehicles, option for public transit such as (ideally zero-emissions) buses and trains for commuting where available, and when active modes of transport are not practical.

High cost, pricing and hard accessibility, inconvenience and unavailability, habits, culture, lack of support from government and companies, knowledge deficits, the herd mentality at work can be the obstacles that inhibit people from adopting a more sustainable lifestyle.

To remove these obstacles following measures should be implemented

- Develop policies to encourage public transportation companies and individuals to purchase and use clean energy vehicles Eg: tax exemptions, tax reductions, or subsidies.
- Incorporate education in schools, that includes how our daily action affects climate change to what degree
- Involve citizens in the policy-making process/ connect people and government: give people the opportunity to share their opinions
- Improve the infrastructure and public transportation
- Battery electric vehicle (BEV), fuel cell vehicle (FCV), hybrid vehicles

#### **4. Overall Feedback**

The seminar was a great opportunity for me to learn what is the current situation of climate action and policies around the globe and how lifestyle change can play an important role in achieving the net zero emissions. Keynote speech sessions from the experts was very informative and during world café sessions diverse ideas from participants of different countries was unique to situation in those countries. Group work was important for in depth learning and improvement of presentation skills. This seminar improved my networking with the young professional and students in different part of the world.