

Global Warming and Planet

Editors: Dr. Avinash B. Ade and Dr. Sumia Fatima

ISBN: 978-93-88854-93-1

Published by: Discovery Publishing House Pvt. Ltd., New Delhi (India)



Method to reduce Carbon dioxide Emission

Shilpa Jagtap

ABSTRACT

Every living habitat breathes oxygen in and CO₂ out. Every industrial process generates carbon in some form. Every transportation involves some form of engine which is based on combustion of fuel or coal which generates carbon in some form. Offsetting your unavoidable CO₂ emissions is immediate need of your personal contribution to climate change. It's also the need of hour to use natural and cleaner energy. Basic idea is to monitor and control carbon emission at different sectors like agriculture, industrial, transportation, water usage, renewable energy. It also covers saving different forests, Himalayan Ecosystem and water bodies.

Methods to reduce carbon dioxide emission and how you can contribute to save our planet earth as world is at risk and everyone must try to save it. Small but effective ways can reduce your CO₂ emission contribution. This chapter explained those ways in detail.

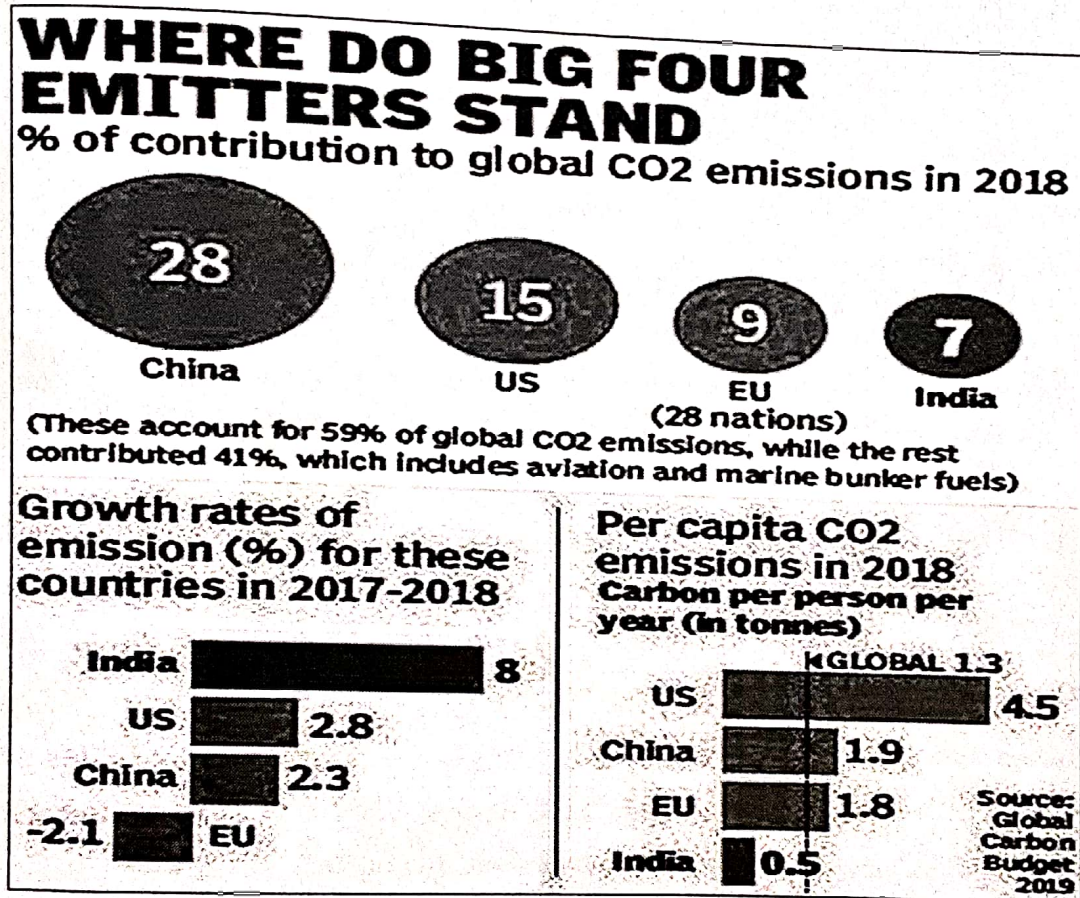
Keywords: CO₂, GHG, NAPCC, Emission Reduction Unit (ERU)

Introduction

Greenhouse gas emissions from human activities strengthen the greenhouse effect, causing climate change. Most is carbon dioxide from burning fossil fuels: coal, oil, and natural gas. The largest polluters include coal in China and large oil and gas companies, many state-owned by OPEC and Russia. Human-caused emissions have increased atmospheric carbon dioxide by about 50%. Electricity generation and transport are major emitters, the largest

Dept. of Botany, Sahebraoji Buttepatil Mahavidyalaya, Rajgurunagar
e-mail: shili237@yahoo.com

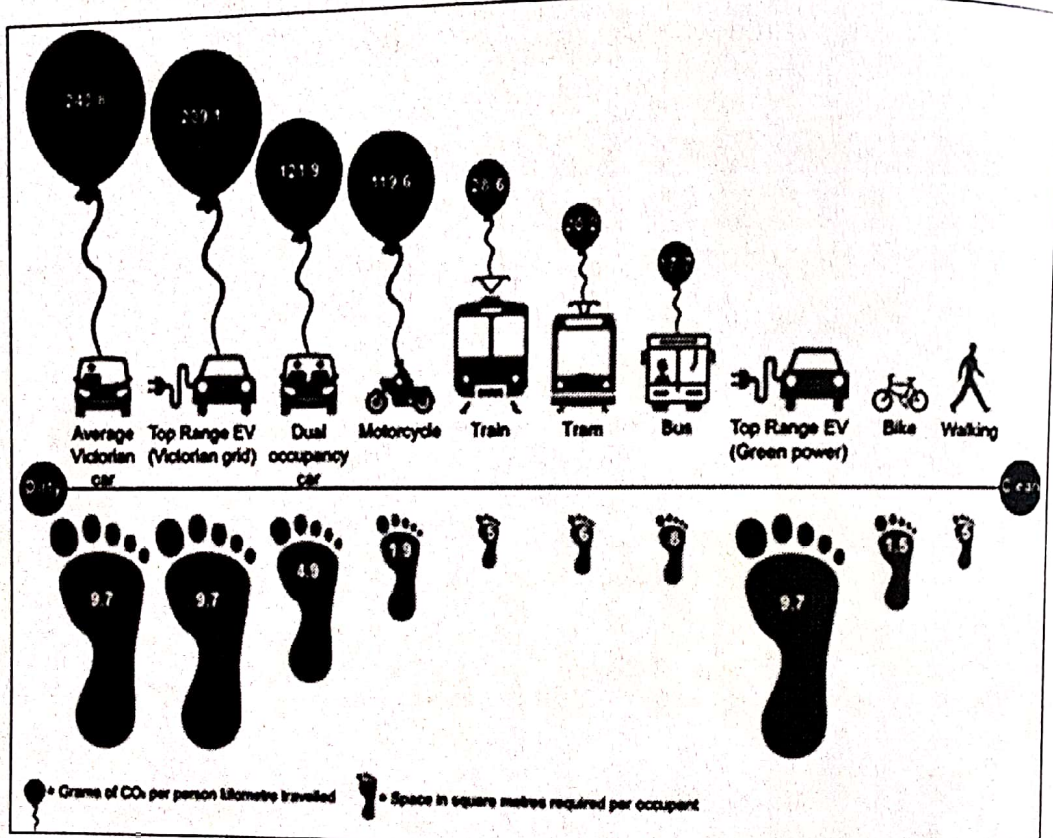
single source being coal-fired power stations with 20% of GHG. Deforestation and other changes in land use also emit carbon dioxide and methane. The largest source of anthropogenic methane emissions is agriculture, closely followed by gas venting and fugitive emissions from the fossil-fuel industry. The largest agricultural methane source is livestock. Agricultural soils emit nitrous oxide partly due to fertilizers. Similarly, fluorinated gases from refrigerants play an outsized role in total human emissions. At current emission rates averaging six and a half tones per person per year, before 2030 temperatures may have increased by 1.5 °C (2.7 °F), which is the limit for the G7 countries and aspirational limit of the Paris Agreement.



Ways to reduce carbon dioxide emissions for individual

Reduction in the carbon dioxide emissions from driving use alternatives to driving – walking, cycling or using public transportation. Driving low carbon emitting vehicles like CNG or electric cars. Charging the electric cars with solar chargers can reduce the carbon emission at large. The buying of SUV and 4WD vehicles should be stopped unless needed rather using cargo carrier on top of the hatch car. It saves fuel and thus carbon emission. Driving style, frequently accelerating and braking can reduce the car's mileage and thus increases carbon emission. Avoiding it can contribute to reduce CO₂ emission. Tire Air pressure and Oil servicing on regular basis may tune the

car properly and increases mileage of the car thus reduces CO₂ emission. Avoiding travels in traffic will save wastage of gas and avoids unnecessary CO₂ emission. Use online apps to get traffic updates. Reduce the carbon emissions from air travel. Petrol based aviation generates huge carbon emission so it's better to avoid long unnecessary air travels and use economy class if necessary so that more people can travel in one flight. Vacation travel must be short and near home. Fly fewer round trips and use road or Rail travel for most part of the journey.













Source: True Tribe Wild by Nature Feb. 08, 2019

Work Air Travels can be reduced by using online conferencing apps like SKYPE, MS TEAM etc. Avoid Private Jets, it should be minimized if not avoided. It contributes large in terms of CO₂ emission. Reduction in home energy carbon emissions is essential. Uses of air conditioners, refrigerators increases carbon emission. Avoiding using them or using energy efficient devices by referring high energy star rating devices can reduce carbon emission. Using insulated wiring, weather proof techniques for the home so that frequent use of heater and the AC can be avoided. Room lights must be used if necessary and use of LED bulbs should be preferred. Use of solar panels on the roof so that electricity can be generated at the home which in turn reduce energy generation requirement of the country. Reducing carbon emissions from food can be done by eating local farm based organic food and avoiding ready to eat or processed food can solve the problem as it

requires transportation of such food which generated carbon emission. Reducing the consumption of meat reduces animal and thus forests are being reduced. Deforestation is the top reason for global warming and CO₂ emission.

Top options for reducing your carbon footprint

Average reduction per person per year in tonnes of CO₂ equivalent

	Live car-free 2.04		Refurbishment /renovation 0.895
	Battery electric car 1.95		Vegan diet 0.8
	One less long-haul flight per year 1.68		Heat pump 0.795
	Renewable energy 1.6		Improved cooking equipment 0.65
	Public transport 0.98		Renewable-based heating 0.64

Source: Centre for research into Energy Demand Solution

Other ways to reduce Carbon Emissions

Water saving is also a way to reduce carbon emission. Water pumps used for watering the plants must be replaced by drip irrigation. Shower tops that uses less water, devices like washing machines; dishwashers etc. that uses less water must be used. Recycling the devices and reusing the wastage of the production processes can reduce the new production and use of raw material can reduce carbon emission. Use of clean energy sources such as solar, wind, geothermal, hydroelectric and biomass energy should be promoted.

India's Initiative towards saving Carbon Emission

India is emerging as a fastest developing country and also a third highest carbon emission country. With its 130 Crore population, India is facing extreme climate change events and pollution hazards. Maintaining global 2-degree Celsius climate change challenge as per PARIS Agreement on Global Warming and Climate Changes is possible only when developing country like India will held hand in hand with Global Players like China, USA Etc. In 2015 PARIS Agreement Global Countries agree on maintaining sustainable growth strategies and limit CO₂ emission. First time ever the time-based action plans formed for all signing countries and seek coordination on environmental,

industrial and political level. Action plan by Government of India is also in line with the action plan suggested by Paris Agreement. NAPCC i.e. National Action Plan for Climate Change thus formed will take initiative.

Pollution Control Board controls quality and quantity of industrial waste and gases emitted which pollutes our rivers and air. It also restricts IT industry generating lots of e-waste which causes hazardous pollution. Biomedical waste in recent days increased many times due to Covid 19 Pandemic and thus polluting our environment. All these pollution causing industries are monitored and their processes are so integrated with filters that solid wastes and poisonous gases are removed before they mixed into environment. Government of India in its Action Plan for its CO₂ emission control formed eight missions and they are as follows:

- National Solar Mission
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat.
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission on Strategic Knowledge for Climate Change.
- National Mission for a Green India
- National Mission for Sustainable Agriculture



Source: India at UN (Permanent Mission of India to United Nations, Geneva)

National Solar Mission

Objective: To increase the use of solar power as a sustainable energy source and share the national energy mix at large. Mission will also boost the Research and Development of Solar systems with the help of International research organization in the solar field to provide cost effective easy to use solar systems. Target for 80% usage of Solar systems in the 100-150-degree Celsius applications and 60% usage in 150-250 degree Celsius applications is set for a decade starting from 2017. Also, 1000 MW power generation through photovoltaic solar panels target set by NTPCC.

National Mission for Enhanced Energy Efficiency

Objective: To mandate energy efficient industrial processes and to certify the savings of such energy for trade in energy market. It's also promotes for developing energy saving appliances and products. It identifies the Future energy saving technologies and promote them by public private partnerships. It also works on tax saving incentives for such an initiative.

National Mission on Sustainable Habitat

Objective: This mission aims at Urban energy efficiency and approaches three areas, Buildings and Commercial centers in urban area. Solid Waste management in Municipal Corporations. Efficient Public transport.

National Water Mission

Objective: This mission aims at Water conservation, minimizing water wastage and distributing water in equal proportion in the stake holders like farmers, Industry and domestic users. Target set at 20% increase in efficiency of water usage. Its focus areas are rainwater harvesting, River cleaning, farming with drip irrigation and sprinklers.

National Mission for sustaining the Himalayan Ecosystem

Objective: Aims at development of a mountain ecosystem, this mission works hand in hand with local bodies like 'Panchayat' and promotes them to play greater role in Mountain Ecosystem conservation. This mission plans for appropriate land using policy, Water shed management practices, infrastructure planning that avoids damage of sensitive ecosystem. It follows Nation Environment Policy, 2006 by Promoting Tourism based practices and enable local communities to live better livelihoods. It controls the inflow of tourists to avoid damage to the mountain ecosystem.

National mission on Strategic Knowledge for Climate Change

Objective: This mission aims at strategic alliance with global communities in Research and Development. It also will collaborate own dedicated climate change related institutions and universities and private sector to develop mechanism to combat climate change issue.

All these missions are working under ministers of respective departments and Inter sectorial groups and ministers in Finance, Planning and Commission, Experts in Industry, University and Academia. Overall India and Indians are well prepared for controlling Carbon emission and contributing their share in controlling Global warming.

National Mission for a Green India

Objective: Enhancing ecosystem services by increasing forest cover area from 23% to 33%.

This mission works hand in hand with Joint forest Management Committees set up under state departments of Forests.

National mission for Sustainable Agriculture

Objective: Aim of this mission is to make India more resilient to climate change and identify the crop varieties that are thermal resistant. This can be achieved by integration of traditional knowledge and practical system, Information Technology and Credit and Insurance mechanism.

Global Climate Change Initiatives

Montreal Protocol 1987

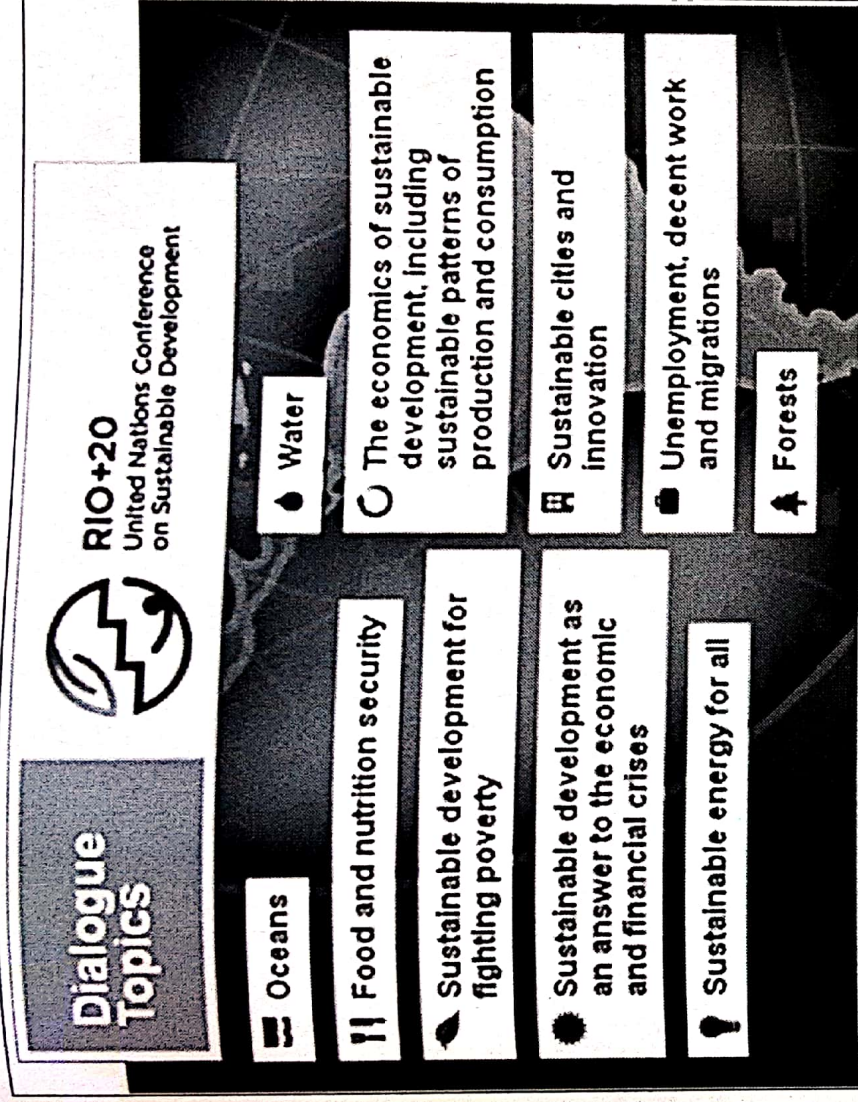
The most successful and widely followed agreement on Global warming and Climate change is 1987's Montreal Protocol. Though the amendments and inclusions periodically added, the basic Montreal Protocol is the guideline for all developed and developing countries. This is a schedule phase out of Ozone depleting substances like CFC (Chlorofluorocarbons), Halons, HCFC's (Hydro CFC's). In 1990 the same protocol is amended by Finance module and funding those developing countries for timely phase out of ozone depleting substances. Five amendments London 1990, Copenhagen 1992, Vienna 1995, Montreal 1997 and Beijing 1999 had strengthened the protocol further by adding or removing substances in the list of ozone depleting substances after discovering them as technological and environmental advancements.

United Nations Climate Change Conference Copenhagen 1992

United nations Copenhagen conference agreed upon the cap of 2 degrees on the temperature rise and all participating industrialized countries will follow strict norms and will inform the actions taken by them every two years to the United Nations.

Rio+20 Earth Summit June 1992, Rio de Janeiro, Brazil

Two success points of Rio+20 Summit is to set SDG- sustainable development goal and to set high level Political forum to achieve sustainable development through green economy. Poverty eradication and sustainable development (Institutional framework) through Green economy (Green energy, reducing CO₂ Emission, Public transportation and clean water)

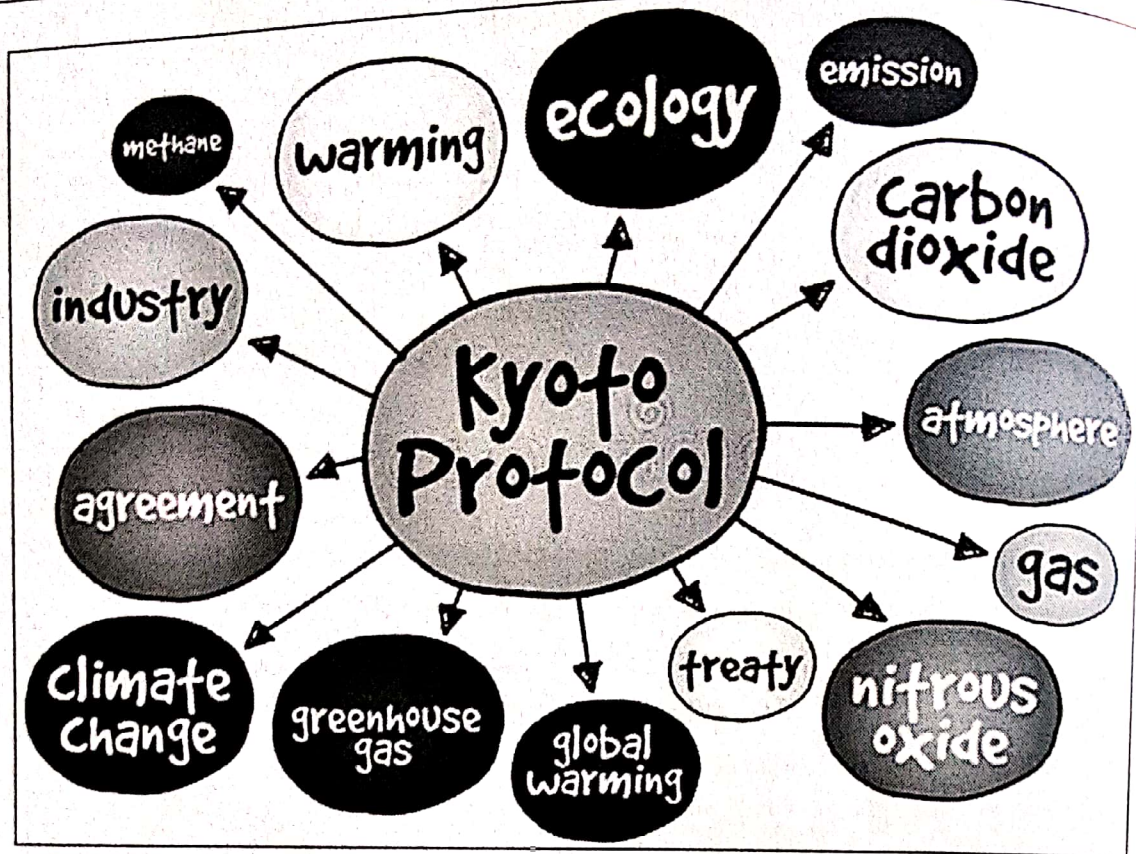


Source: Window to Nature –The Weekly Environmental Diary by Malaka Rodrige

Kyoto Protocol

Kyoto Protocol comes in force from 16 February 2005 and is the legal and forceful binding to reduce the Green House Gases emission. GHG's includes carbon dioxide, methane, nitrous oxide, Sulphur hexafluoride, hydro-fluorocarbons and perfluorocarbons. 183 signing countries agreed upon the responsibility of the developed countries for GHG (Greenhouse Gas) emissions from 150 years of Industrialization. Also agreed to reduce GHG emissions to 5.2% below the 1990 level by the year 2010. Kyoto protocol is also known for its Kyoto Mechanism which offers carbon as a trading commodity in the market and one can sell the amount of carbon units in excess with him.

Article 12 of the Kyoto Protocol states that the countries can enter into emission control program and earn certificate for emission reduction CER equivalent to 1 tons of CO₂ reduction. This CER is achieved by increasing Solar power usage, Energy efficient appliances etc. These are salable certificates in the market. Developed countries can thus compensate by purchasing such CER for their excess carbon emission with some flexibility. Article 6 of Kyoto protocol states that the countries which are developed can set up a project under joint implementation program in developing countries to reduce carbon emission and earn emission reduction unit ERU which is equivalent to 1 tons of CO₂ reduction. ERU is a market salable unit.



Source: 14 Kyoto protocol Stock Vector Images

Trade units are Assigned Amount Unit (AAU)- If not used can sell in the market.

RMU Removal Unit Land Use, Land-Use-Change, Forestry.

ERU Emission Reduction Unit – Joint implementation Project

CER Certified Emission Reduction – Clean development mechanism project.

Clean Development Mechanisms- CDM

Joint Implementation JE

Nagoya Protocol 2010

In October 2010 protocol implemented to share fair and equitable sources of genetics to save Bio Diversity is termed as Nagoya Japan Protocol. By helping to create benefit of conserving genetic resources for sustainable bio diversity, Nagoya Protocol enhances the countries participating to conserve bio diversity thus creating sustainable ecosystem.

Cancun Agreements 2010

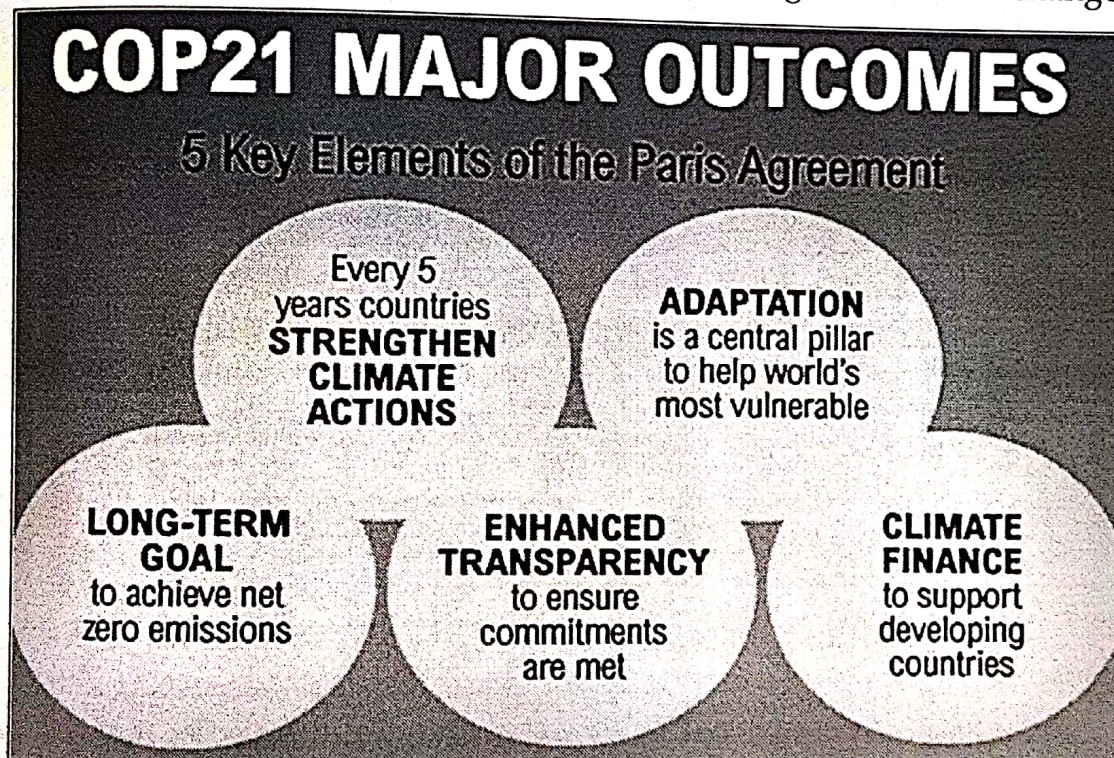
Cancun Agreements Mexico 2010 United Nations conference on Climate Change is a set of steps to implement long term planned climate change program to speed up the reduction in Green House Gas emissions and help developing countries to save themselves from the impact of GHG emissions.

Durban Climate Change Conference Nov. - Dec. 2011

United Nations Climate change conference held in Durban 2011 is the second largest conference and largely successful in terms of balances and negotiations and implementation of Kyoto agreement, Cancun Agreement and Bali Action Plan.

Paris Agreement

2015 Paris Climate Conference, 195 countries have participated and signed legally binding global climate deal. It sets a goal to achieve below 2-degree Celsius Global warming challenge. Appropriate financial flow, New technological framework, Enhanced capacity building framework will be put in place and enhanced transparency of action and support from robust framework will ensure the speedy actions against global climate change.



5 Key Elements of the Paris Agreement

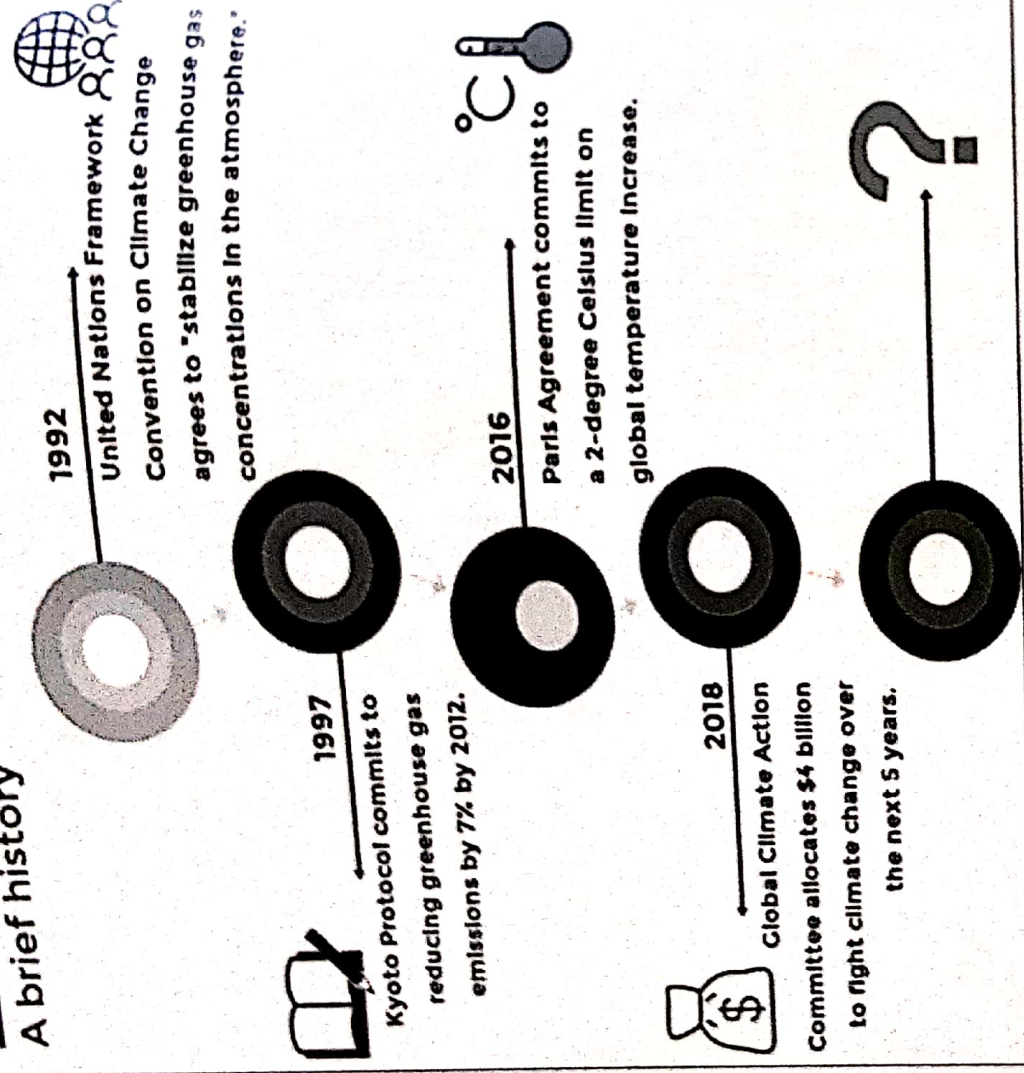
Source: World Resources Institute

Kigali Amendment

Its amendment to Montreal protocol and terms Hydrofluorocarbon (HFC) emission control. Its signed by 200 countries and agrees upon reducing powerful greenhouse gases emission to limit global temperature rise by 0.5 degree Celsius. Commonly causes are refrigeration and air conditioners for temperature rise which has emissions of HFC and energy efficient appliances can significantly reduce HFC emission.

Climate Agreements

A brief history



Source: California Magazine - A day Late and A Summit Short: Can California Save the world

Conclusion

Thus after studying Global, National and Individual level methods of reducing CO₂ emission we can now well aware of Global concern about climate change. We can achieve Goals set by our country by individually participating in the Climate Control Program. Our small share can make a big impact on achieving climate control.

REFERENCES

1. NRDC Natural Resources Defense Council From Wikipedia, the Free encyclopedia: <https://www.nrdc.org/>
2. Greenhouse gas Emission Wikipedia [https://en.wikipedia.org/wiki/Greenhouse_gas_emissions#Relative_CO₂_emission_from_various_fuels](https://en.wikipedia.org/wiki/Greenhouse_gas_emissions#Relative_CO2_emission_from_various_fuels)
3. COTAP.org 25 ways to Reduce CO₂ Emission. <https://cotap.org/reduce-carbon-emissions>

4. True Tribe Wild by Nature Feb 08, 2019 -What is your Carbon Footprint and how can you offset it? <https://truetribe.paris/blogs/news/what-is-your-carbon-footprint-and-how-can-you-offset-it>
5. CO₂ Living Plant a Tree, Reduce My carbon Footprint, What is Carbon Foot print update 2021. <https://co2living.com/what-is-a-carbon-footprint-updated-2021/>
6. India at UN (Permanent Mission of India to United Nations, Geneva) <https://www.facebook.com/IndiaUNGeneva/>
7. 304 Kyoto Protocol stock Photos. <https://www.dreamstime.com/photos-images/kyoto-protocol.html>
8. Window to Nature –The Weekly Environmental Diary by Malaka Rodrige <https://window2nature.wordpress.com/2012/06/11/join-the-rio-dialog/>
9. California Magazine- A Day Late and A Summit Short: Can California Save the world by Glen Martin; <https://alumni.berkeley.edu/california-magazine/just-in/2021-08-25/day-late-and-summit-short-can-california-save-world>