



YOUR LOGO

SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

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SUSTAINABLE DEVELOPMENT

What is sustainable development?

“Development that meets the needs of the present without compromising the ability of future generations to meet their needs”

Brundtland Commission, 1987

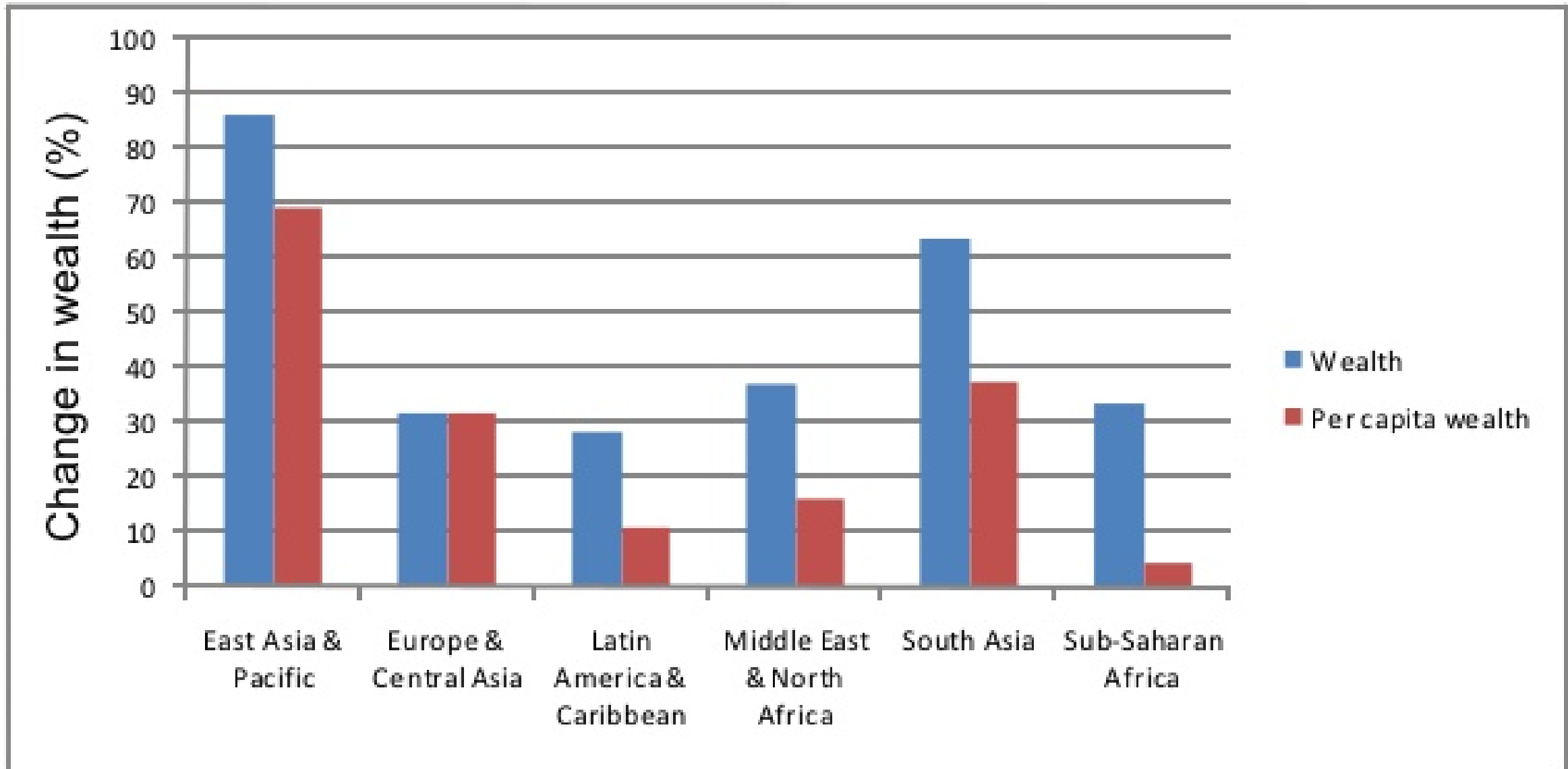
What is sustainable development?

- Sustainable development addresses issues of intergenerational equity, whereby the well-being of future generations should not be compromised
- Wealth is a determining factor; in particular **comprehensive wealth**
- Globally total wealth grew by 34% and per capita wealth by 17% from 1995-2015

Comprehensive wealth comprises:

- Produced capital (buildings, roads, machinery, equipment)
- Natural capital (minerals, fossil fuels, forests, land)
- Intangible capital (human, social and institutional capital)

Growth in total and per capita wealth



Development and the environment

- Advanced industrialized countries: growth was fueled by technologies that utilized energy and natural resources; by-product was widespread pollution
- “Eco-suicide”: unintended consequence of development which depletes natural resources



Impacts of development on the environment

- deforestation and habitat destruction
- soil losses due to erosion and salinization
- water management problems
- overfishing and overhunting
- effects of introduced species on native species
- increased per capita impact on people



Sustainable development goals

- United Nations' 2030 Sustainable Development Goals emphasize the importance of the environment and sustainability of natural resources
- Objectives: to alleviate poverty; maintain health, acquire food and agriculture products, ensure water and sanitation, human settlements, energy, and climate change



Sustainable development goals



The 17 Sustainable Development Goals (SDGs) aim to end poverty, protect the planet, and ensure peace and prosperity for all



ECONOMICS AND THE ENVIRONMENT

Economics and the environment

- Development needs natural resources
- Growing consumption needs leads to the destruction of forests, wetlands, and waterways
- Extraction using unsustainable methods causes environmental degradation, e.g., damage to soil, water supplies and forests



Economics and the environment

- Population pressures on marginal land and increased demand for natural resources accelerates environmental degradation
- This leads to falling farm productivity and per capita food production



Economics and the environment

- Emission of greenhouses due to human activity have global implications such as global warming
- Environmental degradation is not calculated in the costs of production; a negative externality which requires government intervention
- Environmental considerations should therefore be an integrated part of policymaking



Economic growth and the environment

- Relationship between economic growth and the environment is complex
- Technology is an important variable
- Technological change affects efficiency with which we use resources



Examples of effects of technology

- Green revolution: new hybrid seeds
- Recycling of solid waste
- Use of “clean” energy to replace fossil fuels: solar, wind and hydropower
- Refrigeration: prevents food spoilage
- Use of bio-fuels





CLIMATE CHANGE

Global warming

- Destruction of the world's remaining forests and gas emissions from industries and cars contribute to climate change caused by global warming through the greenhouse effect
- Mitigation and adaptation are two responses to address climate change

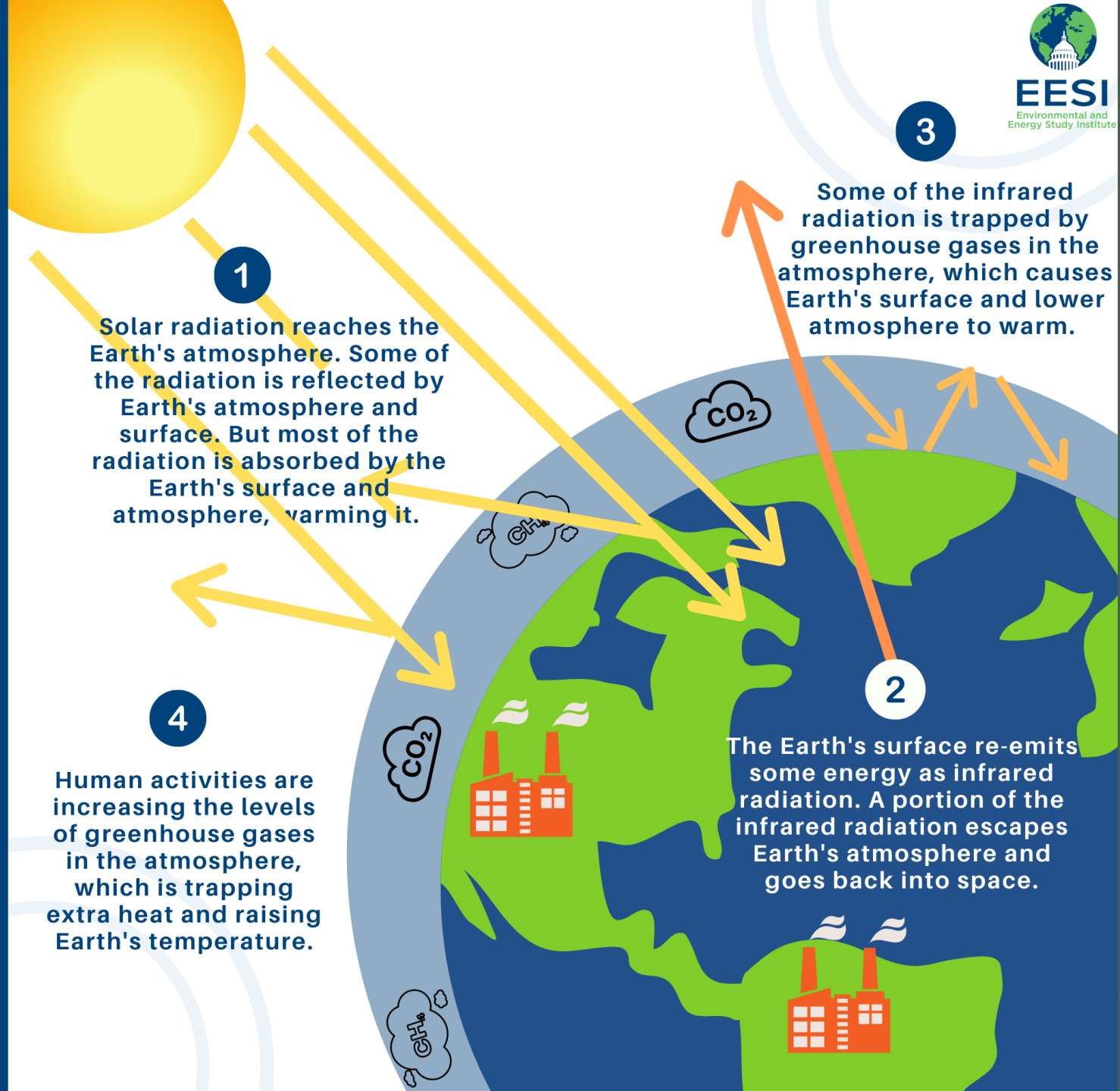


GUIDE TO THE GREENHOUSE EFFECT

The greenhouse effect is a natural process in which atmospheric gases trap the sun's heat and warm the Earth's surface and lower atmosphere. This makes Earth hospitable for life.

Human activities, such as burning fossil fuels for transportation and electricity generation, are increasing the concentration of greenhouse gases in the atmosphere. This enhances the greenhouse effect, trapping extra heat in the Earth's atmosphere and slowly warming the planet.

Graphic By: Sydney O'Shaughnessy



Climate change and challenges

- Depletion of renewable and non-renewable resources/fossil fuels
- Atmospheric concentration of greenhouse gases (CO₂, CO): raises global temperatures by trapping solar radiation in the earth's atmosphere



Effects of global; warming and climate change

- Reduction in grain yields
- Rise in sea level
- Extinction of plant and animal species
- Displacement of people in coastal areas
- Extreme weather conditions causing excessive flooding
- Drought and natural disasters



What is climate change mitigation?

- Any actions or efforts taken to reduce or prevent the long-term risks of climate change on human life and property
- This is done by reducing the sources or enhancing the sinks of greenhouse gases emissions



Climate change mitigation strategies

- Adopt renewable energy sources like solar, wind and small hydro
- Develop sustainable transport (bus rapid transit, electric vehicles, and biofuels)
- Promote more sustainable uses of land



What is climate change adaptation?

- A adjustments in ecological, social or economic systems in response to actual or expected climatic effects
- This requires changes in processes and practices to lessen the impacts of climate change



Climate change adaptation strategies

- Inventory and track ecological resources
- Implement early warning systems to anticipate natural disasters
- Restore and expand natural ecosystem barriers
- construct infrastructure to serve the poor (shelters, flood barriers, protected roads, bridges)



Climate change adaptation strategies

- use scarce water resources more efficiently
- adapt building codes to future climate conditions
- build flood protection
- develop drought-tolerant crops
- choose tree species and better forestry practices
- demand more government transparency
- ensure voice and empowerment for the poor





YOUR LOGO



COFFEE BREAK

Enjoy your 15' pause



ENVIRONMENTAL POLICIES

Market failure

- Market failure: situation in which market prices deviate from scarcity values; individuals and firms make decisions that maximize their profits but cause losses for society as a whole
- Market failure cannot be addressed by the private sector/market; corrective measures will require government intervention



Market failure

- Correcting market failure through government policies and regulations can be an effective mechanism to promote efficient resource use, reduce environmental degradation and generate sustainable development



Market failure

- Common forms of market failure are negative externalities: costs borne by society but not by individual producers
- If resources are depleted at rates faster than they can be replenished, development will be unsustainable

Examples of market failures:

- Pollution generated by a factory
- Extraction of natural resources (forestry, fisheries, mining)
- Smoking
- Overfishing

Property rights

- Common properties generate external costs because no one owns or controls the right to exploit them
- Issuing property rights to an individual will provide incentives to manage the common resource
- As long as the firm sells output in a competitive market, no government intervention is needed



Government regulation

- Government can either be owner or regulator of common goods
- Examples: limiting use/quantity, regulating emission levels, imposing fines
- Imposing regulations will lead to increased cost lower production and increased benefits to society



Taxes, subsidies and environment fees

- Government could achieve optimal rates of resource use by imposing taxes that reduce the incentive to use common properties
- Taxes could be imposed on output that represents external cost of production. For example: cigarette tax, gasoline tax



Taxes, subsidies and environment fees

- Subsidies could be applied to encourage positive externalities
- For example, higher education does not only benefit the individual, but knowledge gained spills over to society



Marketable permits

- Grants the holder the right to harvest a common resource up to a given limit or giving producers the license or right to pollute the environment up to specified amounts

Examples of marketable permits

- US sulfur dioxide reduction scheme; tradeable permits are bought and sold by polluting firms
- Iceland and New Zealand revived fishing stocks by assigning fishing rights at sustainable level by allowing fishers to trade their quotas freely

Conclusion

- Humans depend on the environment; however human activities often end up destructing the very resources they need to survive
- Sustainable development has been defined as “development that meets the needs of the present generation without compromising the ability of future generations to meet their needs”

Conclusion

- There is a strong link between economics and the environment; they are not necessarily mutually exclusive
- As a result of human activities, greenhouse gases are emitted to the atmosphere, creating a greenhouse effect which is commonly understood as global warming
- Climate change is inevitable but could be addressed through climate change adaptation and climate change mitigation

Conclusion

- Much of negative environmental effects of economic activity result from externalities, whereby social costs are not included in firms' profit maximizing decisions
- Policy solutions to address the problem of negative externalities include the creation of property rights, government regulation, taxation, and creation of marketable permits

THANK **Y**OU!