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School of Global Affairs and Public Policy

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NAVIGATING THE CROSSROADS: CLIMATE CHANGE, GHG EMISSIONS, AND ECONOMIC SECTORS IN EGYPT

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NAVIGATING THE CROSSROADS: CLIMATE CHANGE, GHG EMISSIONS, AND ECONOMIC SECTORS IN EGYPT

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Chapter objective

- Explore the links between industrialization, climate, economic growth and restructuring

- Country – Egypt
- Time span - 1970 to 2022

Main findings

- Glimmer of hope towards emissions-growth decoupling.
- Focusing on specific industrial sub-sectors, we find that:
  - Energy and heating generation is the biggest emitter;
  - Transportation is the sector requiring the largest efforts to reduce its environmental footprint;
  - Agriculture needs further efforts to mitigate climate change effects in order to ensure the country's food security;
  - Energy use in manufacturing and construction needs to be greener and more efficient.
- Green industrial policies are yielding results and need to be strengthened and supplemented by more initiatives.

The policy dilemma

- Industrial output ▷ GHG emissions (Le Quéré et al., 2020)
- Industrial output ▷ negative ecosystem effects (Mgasi, 2014); negative externalities affecting Earth's absorption capacity

but also

- Industrial output ▷ growth, innovation, development, SDGs

Theoretical framework

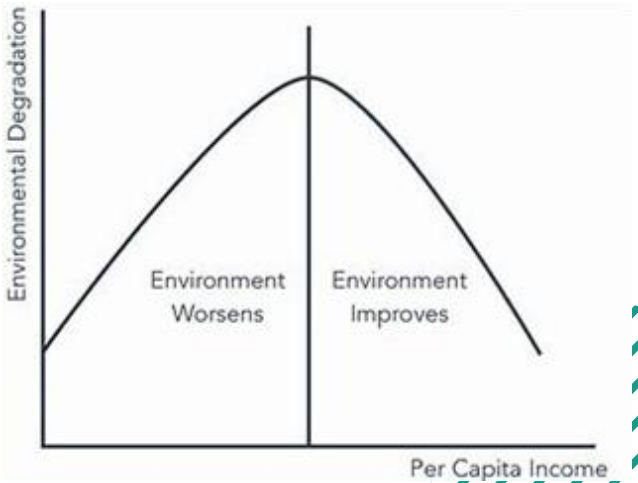
Decoupling analysis

Relative decoupling = when GDP increases while GHG emissions also rise, albeit at a slower rate.

Absolute decoupling = where economic growth is concurrent with a decrease in GHG emissions, indicating a positive trend towards environmental sustainability (Ward et al., 2016).

Coupling = GHG emissions rising as fast or even faster than GDP.

Empirical framework



Environmental Kuznets Curve (EKC)

At the early stages of industrialization, growth is typically accompanied by environmental degradation.

After a certain per capita income threshold, growth can start leading to declining emissions and pollution (Stern et al., 1996).

This inflection is due:

- to the introduction of cleaner production technologies (Grossman and Krueger, 1996),
- to structural changes in the composition of outcome (services replacing extractive industries and heavy manufacturing)
- or to the greater public demand for emission controls.

Green industrial policies

WHAT?

Investments, incentives, regulations, and policy supports designed to stimulate and facilitate the development of environmental technologies (Harrison et al., 2017; Rodrik, 2014).

WHY?

The environment-growth relationship is not exogenous but is influenced by policy choices (Panayotou, 1997).

WHY?

Escape the emissions-growth coupling trap.

Use industrialization to provide job opportunities, incomes, and give a chance for poorer countries to catch up while improving their ability to adapt to climate change (Naudé, 2011).

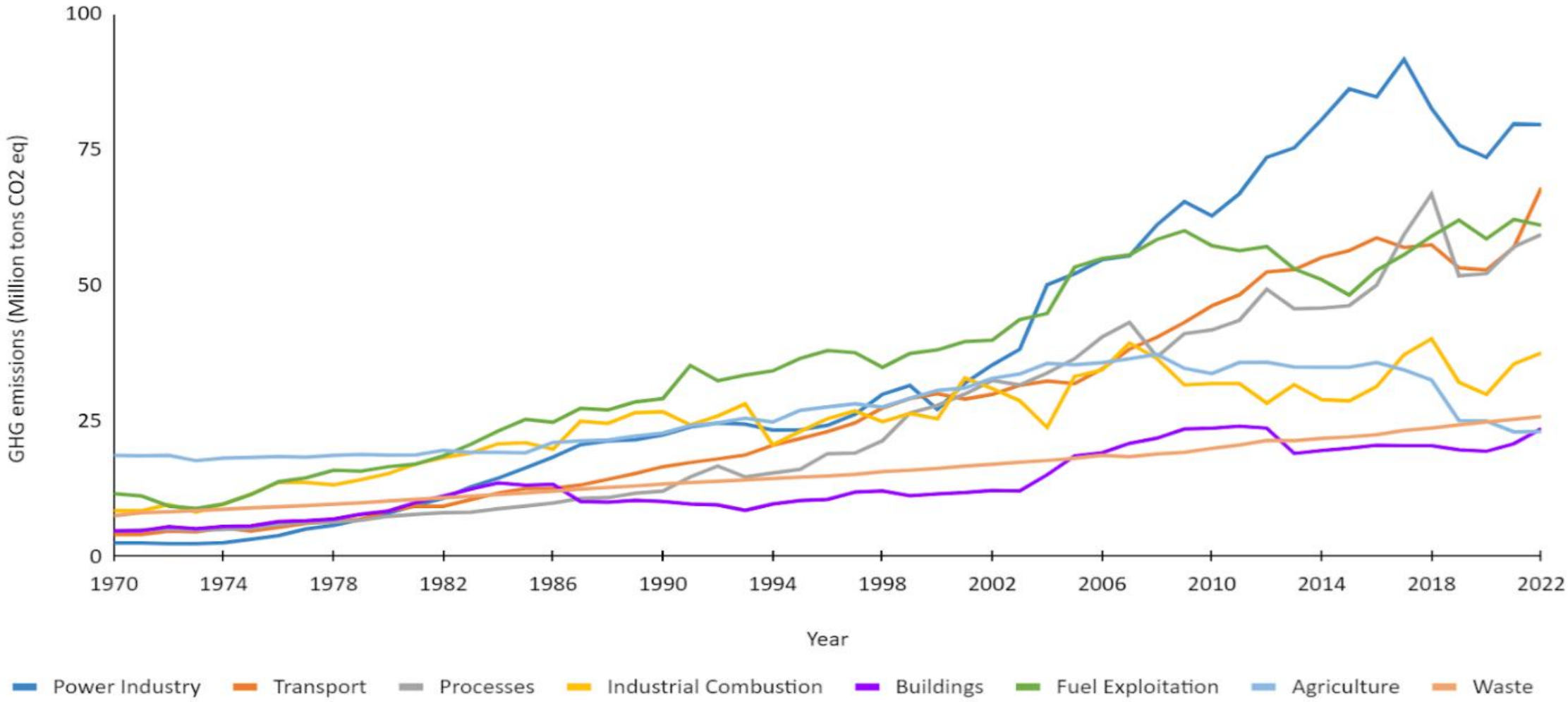
HOW?

- Identify proactively the areas with most significant constraints to climate adaptation investment;
- Channel public and private investment to these activities;
- Monitor if these investments contribute to sustain decent employment and to increase long-term climate security and productivity (UNCTAD, 2021).

Looking at the evidence

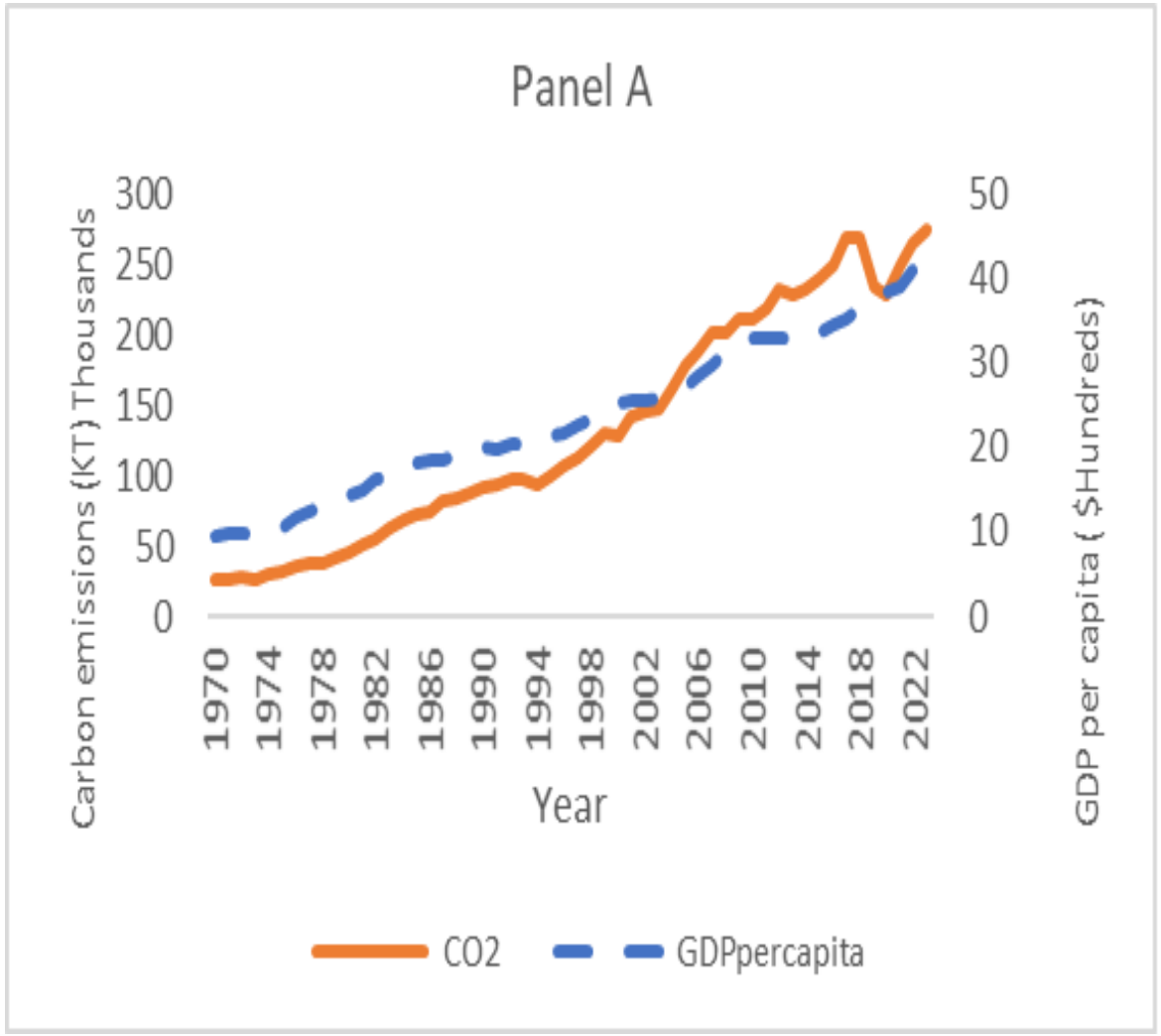
- Temperature increases as measure of climate change
- Population growth and urbanization increase emissions and in return climate change affects disproportionately the poor in the rural areas
- Did incorporating energy-efficient technologies lead to emissions decoupling?
- Sectoral analysis

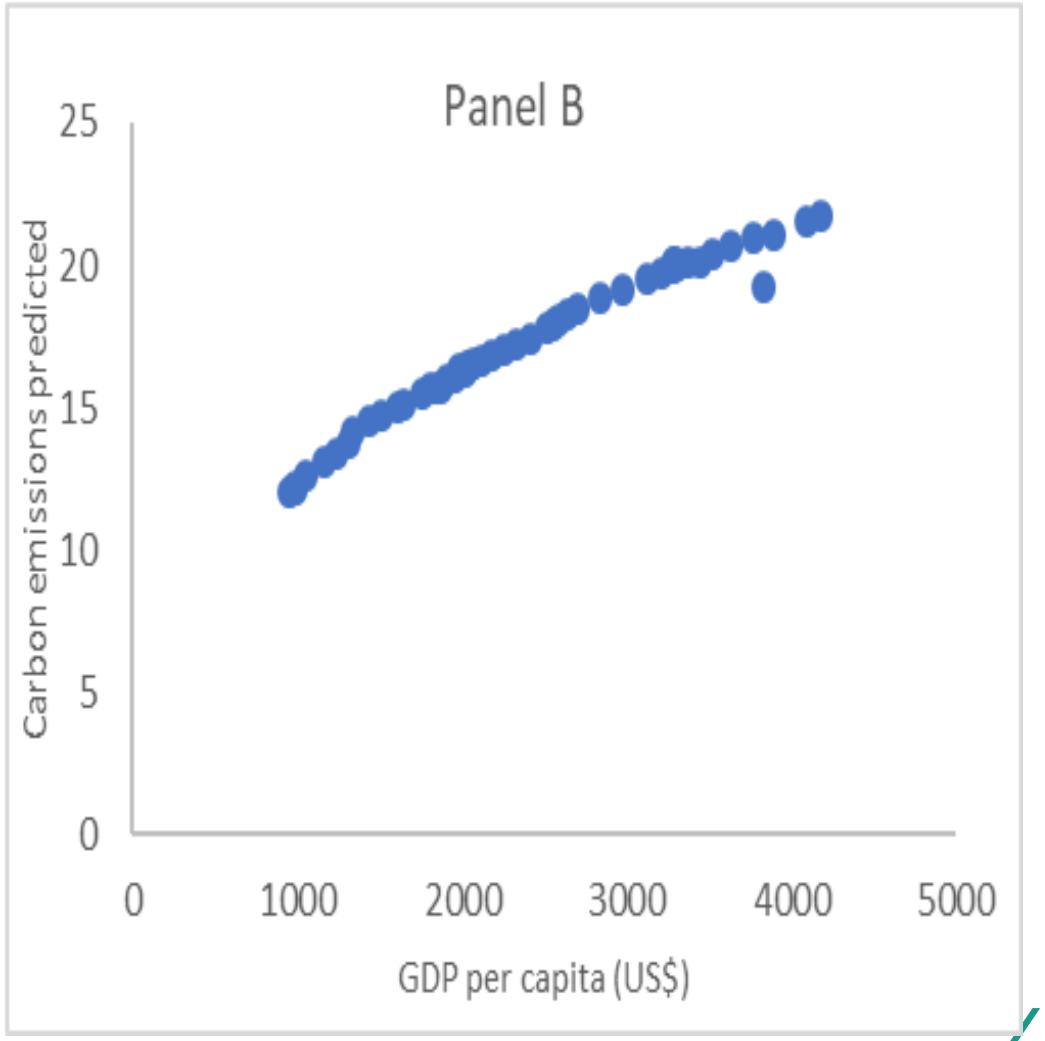
Egypt emissions profile by sector, 1970-2022



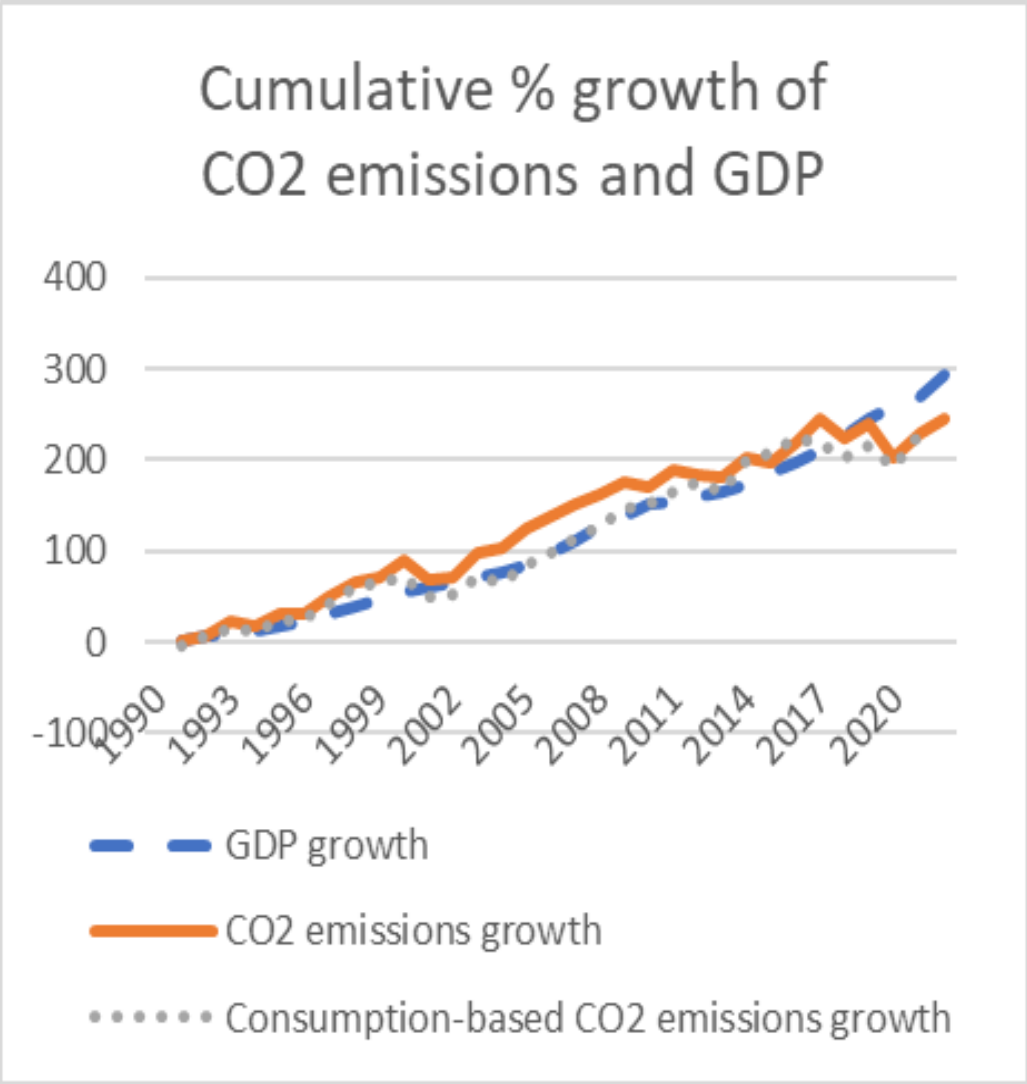
(EDGAR 2023)

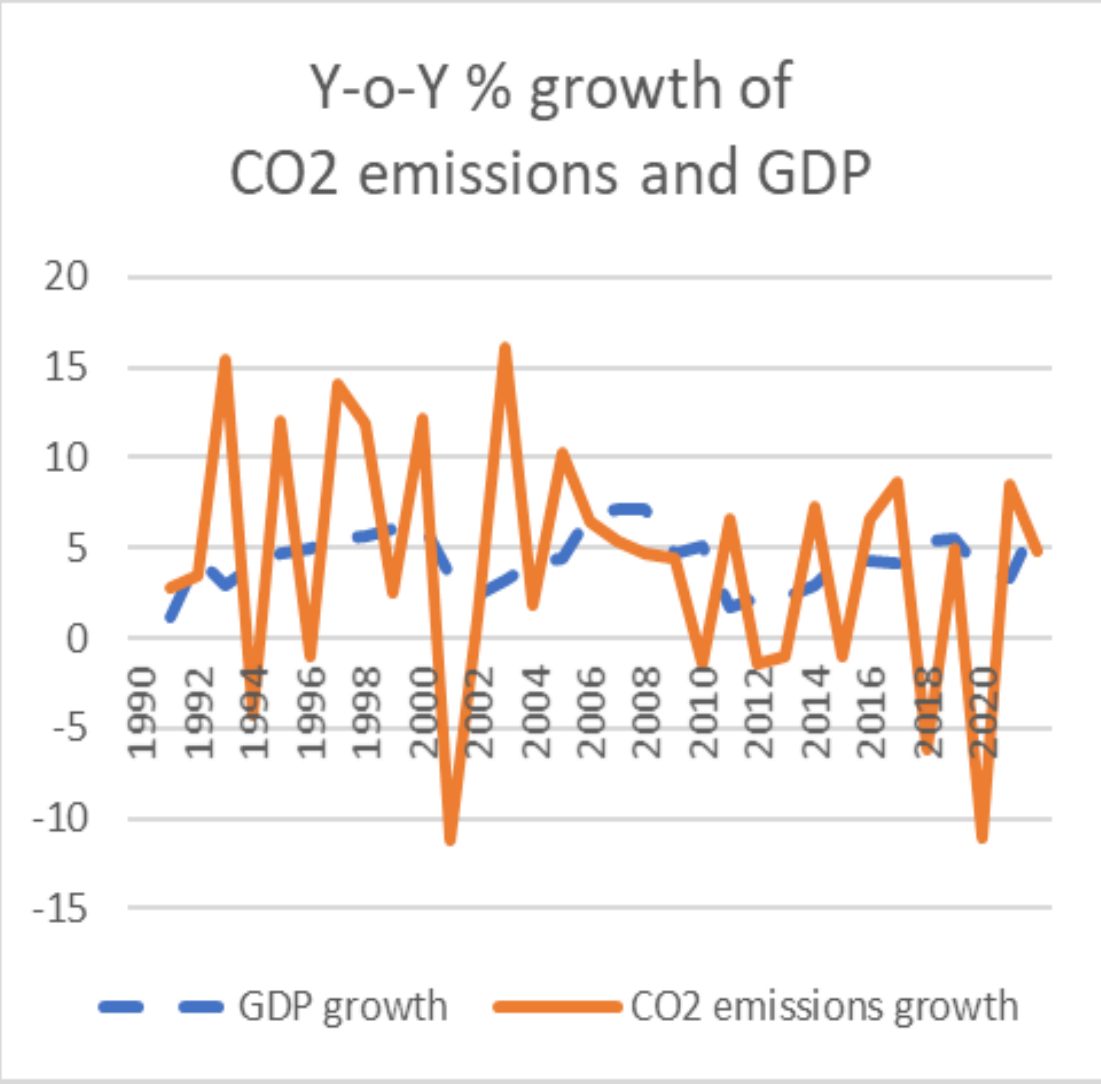
Trends of GDP per capita vs. GHG emissions, 1990-2022



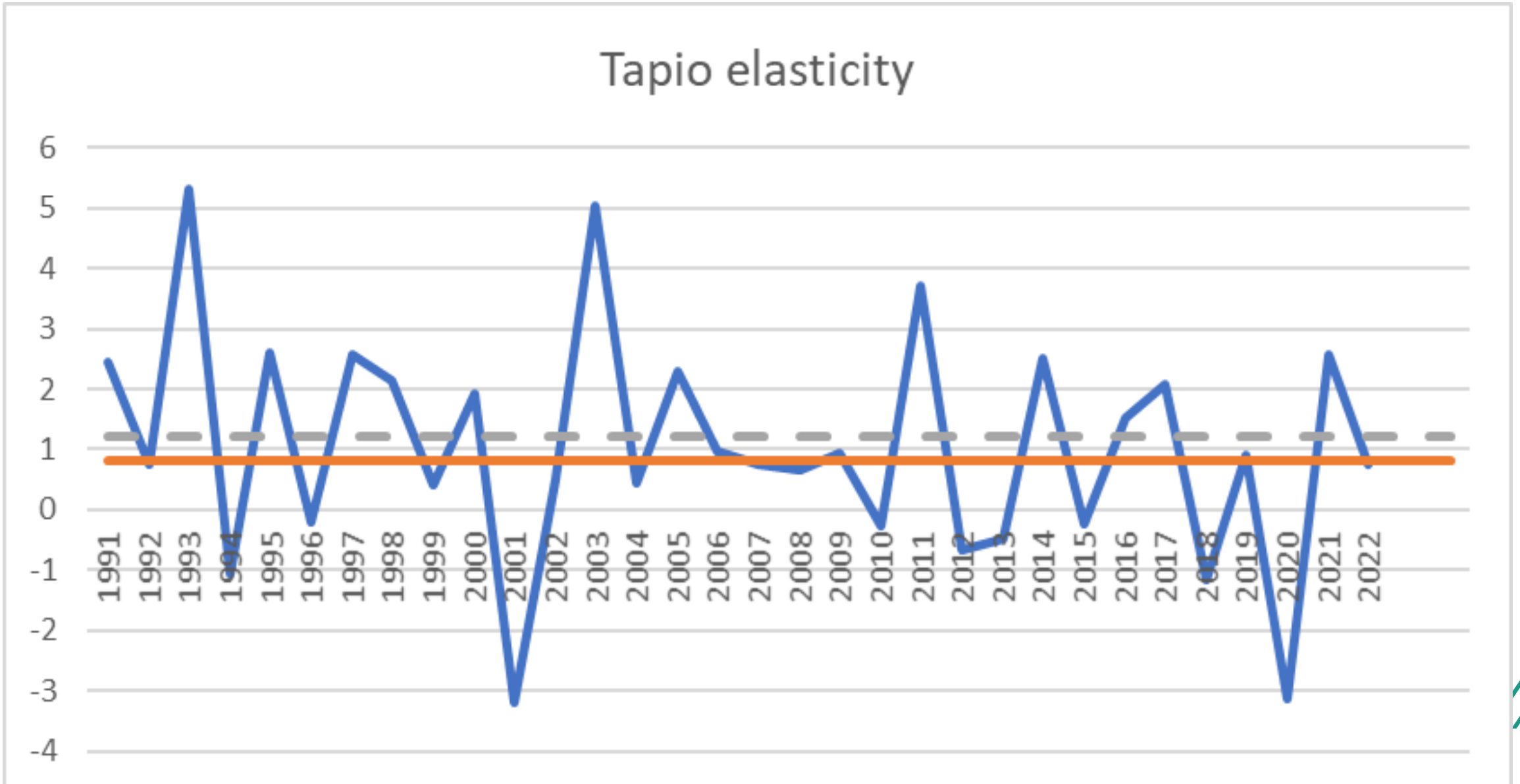


Cumulative growth rates of CO2 emissions and GDP





Tapio decoupling elasticity for Egypt



Green industrial policies

Electricity and heat generation – expected increase in consumption - strategic shift towards renewables – national goal of 42%.

Transportation – GHGs up 300%, twice the average; highest rate of air pollution mortality - expansion of the Greater Cairo underground metro network, promotion of natural gas in commercial vehicles, particularly taxis, and intensified use of environmentally sound river transport. More efforts needed.

Green industrial policies

Climate and food security – saltwater intrusion threat - Country Platform for the Nexus of Water, Food and Energy (NWFE).

Manufacturing, including construction - GHGs up 282%, particularly due to the steel, iron, cement, fertilizers, aluminum, and oil refining industries – move to green energy and UNIDO-led Industrial Energy Efficiency Project, plus vision to construct green cities.

Green industrial policies

National determined contributions – reduce GHG emissions by 33% by the year 2030.

Issuing Sovereign Green Bonds valued at 750 million and listed on the London Stock Exchange. Offering a Green Economy Financing Facility.

Fostering environmentally responsible investments through implementation of the Environmental Sustainability Criteria Guideline in finance. Mandating ESG disclosures for companies listed on the Egyptian Stock Exchange through the Financial Regulatory Authority’s Decrees 107 and 108.

Recommendations

- Invest massively in solar, wind, hydro, and other sustainable energy alternatives
- Adopt stringent energy efficiency standards across industries, buildings, and transportation sectors
- Implement sustainable urban planning
- Foster urban resilience
- Embrace circular economy principles
- Embed climate action and SDGs in the nation's budgetary frameworks
- Empower and involve the local communities