

## Climate change displacement responsibility along global production chains

Topic: Input-Output Analysis: Industrial Policies

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CO<sub>2</sub> emissions have exceeded the planet's boundaries in recent years. A map of national contributions to cumulative emissions of CO<sub>2</sub> could be helpful in allocating CO<sub>2</sub> atmospheric concentrations responsibilities to seek equal responsibility access to atmospheric commons (Hickel, 2020). The rise of globalization since the end of the 80s shows a rapid increase in developing countries' production-related emissions due to the rise of international trade exports from developing to developed countries (WTO, 2022). The net production emissions transfer from developed to developing countries increased rapidly from the beginning of the 90s until 2005. It has declined since 2006, with a maintained positive balance of 1.5 GtCO<sub>2</sub> per year (Wood et al., 2020). The resulting phenomenon of the increase in the carbon footprint responsibility of affluent economies must be considered when allocating the recent fast growth of atmospheric emissions concentration responsibilities.

Climate change is not only a matter of future generations. One of the current consequences of exceeding the planet's boundaries in terms of greenhouse gas emissions concentrations is the increase and stabilization of sudden weather-related events impacting human life along the Earth. According to the data gathered by the Global Internal Displacement Database (GIDD) (IDMC, 2023), from 2008-2021, more than 24 million people were displaced inside the borders of their country because of severe climate-related events, with China, Philippines, Indonesia, Pakistan, or Bangladesh as the most hit countries. Several questions arise when examining the internal displacements regional patterns, in which emerging countries predominate. Is the Global South more prone to climate migration due to its sectoral structure's vulnerability? Considering the currently intricate global production chains and the magnitude of international trade, what is the role of the developed regions on the vulnerability suffered by emerging economies? Our work intends to address these questions by combining data on internal migrations, a vulnerability-to-climate-change index, and the input-output methodology.

On the one hand, using an environmentally extended MRIO model, this paper will allocate the observed climate change displacement responsibility from the GIDD among the consumer perspective cumulative emissions since the globalization boom in the early 90s. The method will allow us to evaluate the contribution of each country to the cumulative emissions generated since 1990.

On the other hand, we will analyze the influence of global trade on the vulnerability profile of the regions most affected by internal migration. First, we will identify among the countries with more internal climatic displacements in the GIDD those less prepared to adapt and more vulnerable to climate change based on the ND-GAIN score (ND-GAIN, 2023). This index summarizes a country's vulnerability to environmental challenges in combination with its readiness to implement adaptation actions. In terms of vulnerability, the index is disaggregated into several contributing factors, among which the so-called sensitivity factor -the extent to which a country is dependent upon a sector negatively affected by climate change- is considered. Therefore, the combination of the GIDD list of countries and types of disasters, and the ND-GAIN sensitivity score, will allow us to isolate the countries more vulnerable due to their sectoral structure.

After identifying these countries, we will explore how trade specialization has guided them to a more vulnerable situation. By using the detailed information provided by the MRIO models regarding

international trade trends and production specialization processes in emerging economies, this paper will assess to what extent the way the global production chain shapes a country's production structure contributes to increasing the climate vulnerability of emerging economies. The environmentally extended MRIO model will be developed based on the GLORIA database, which provides a list of 160 countries plus four regions, and a time series covering 1990-2019 (Lenzen et al., 2021).