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Inclusive Transition: Need, Demand and Challenges

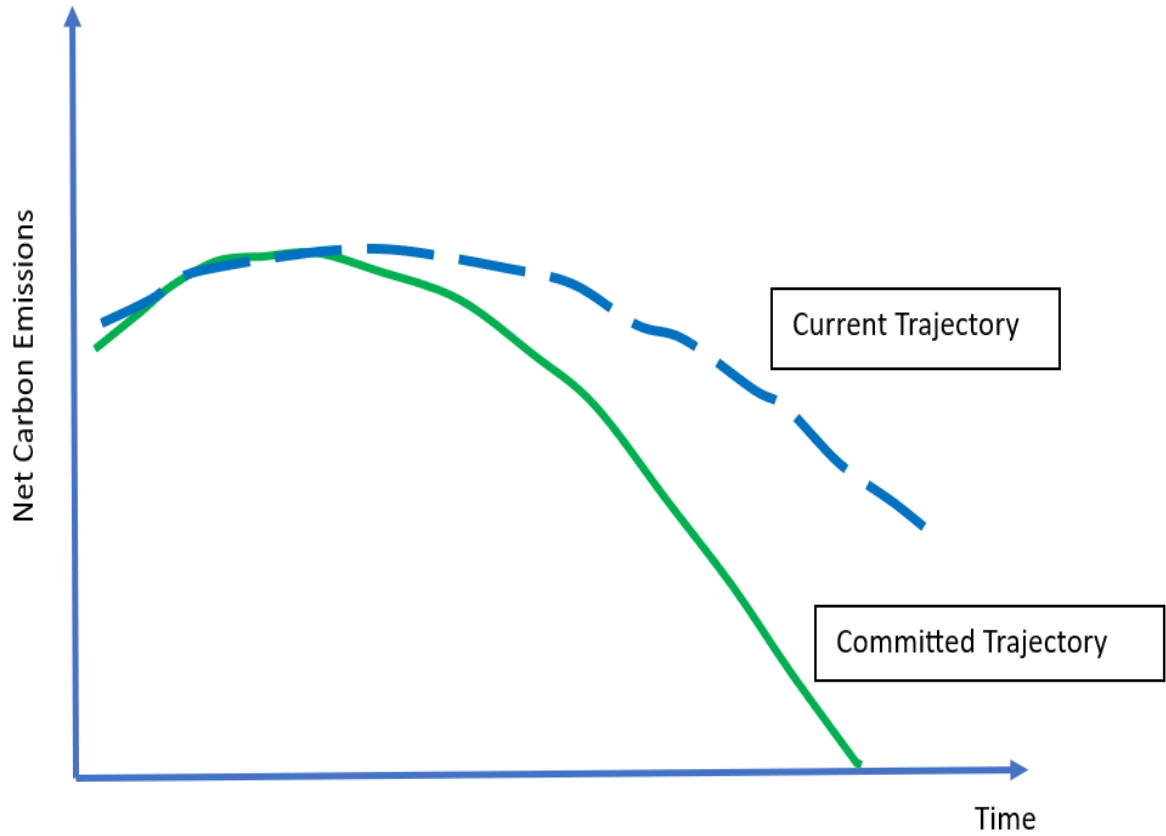
Ajay Mahal

December 11, 2024

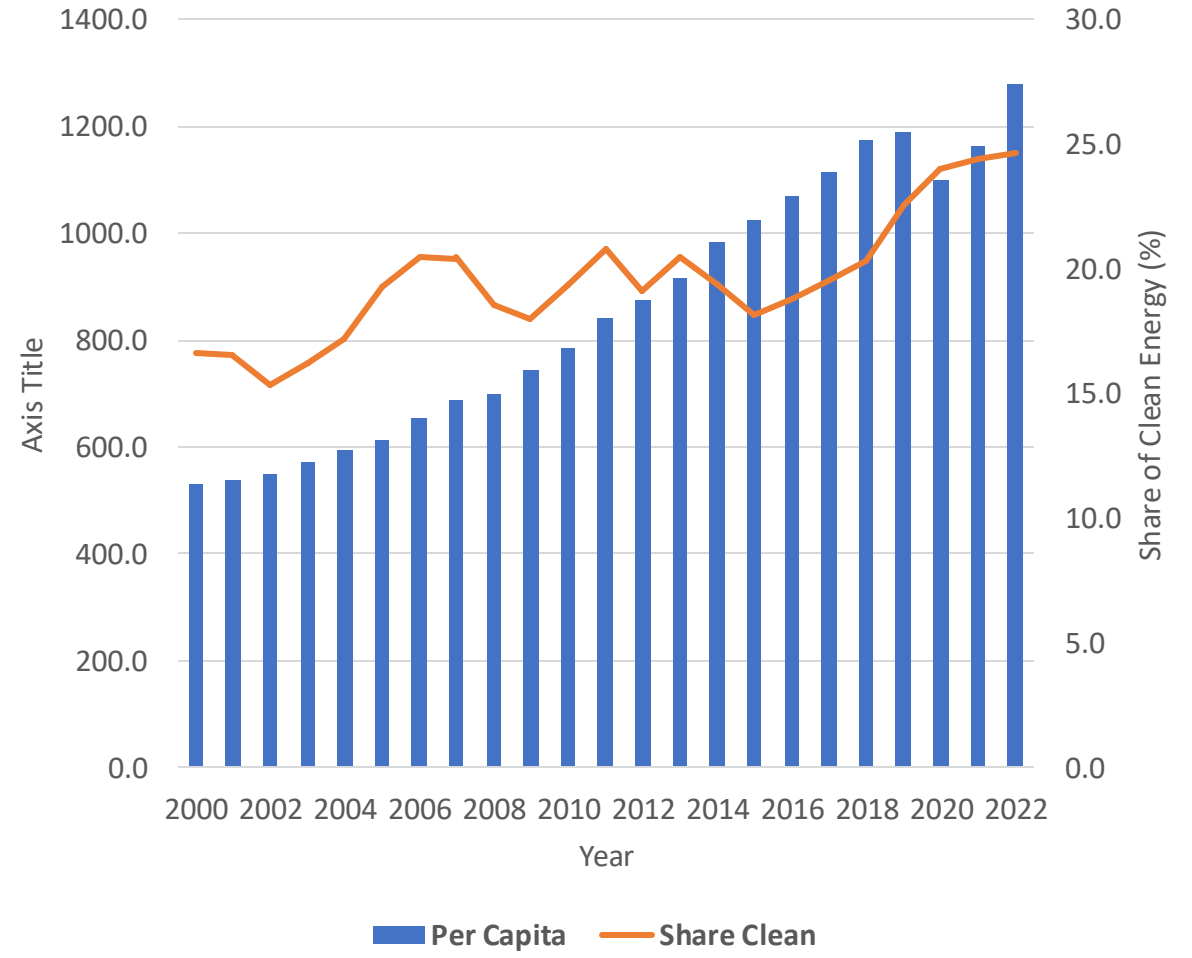
What is the Goal of Net Zero Energy Transition?

- To **Reduce Net Carbon Emissions to Zero** by a Specific Date (**as well as other greenhouse gas emissions**). Development and Implementation of
 - Technologies that use Renewables in Energy Production
 - Efficiency in Production and Use of Energy
 - Removal of Carbon from the Atmosphere

Trajectory of Emissions & Renewables in Energy Consumption



Electricity Consumption Per Capita and Share of Clean Energy in Electricity Consumption in India, 2000-2022
Source: IEA



Implications

- Time to Net Zero “...**short, and getting shorter**”
- Required Speed of Change “... **becoming faster**”
- “Successful” and “Rapid” **Economic and Technological Transition**

“Inclusive Transition”: What is This?

Just Transition

“Greening the economy in a way that is **as fair and inclusive as possible** to everyone concerned, **creating decent work opportunities and leaving no one behind...**”

Social Inclusion

“The process of **improving terms on which individuals and groups take part in society** – improving, **ability, opportunity** and dignity of those disadvantaged...”

Inclusive Transition: Why?

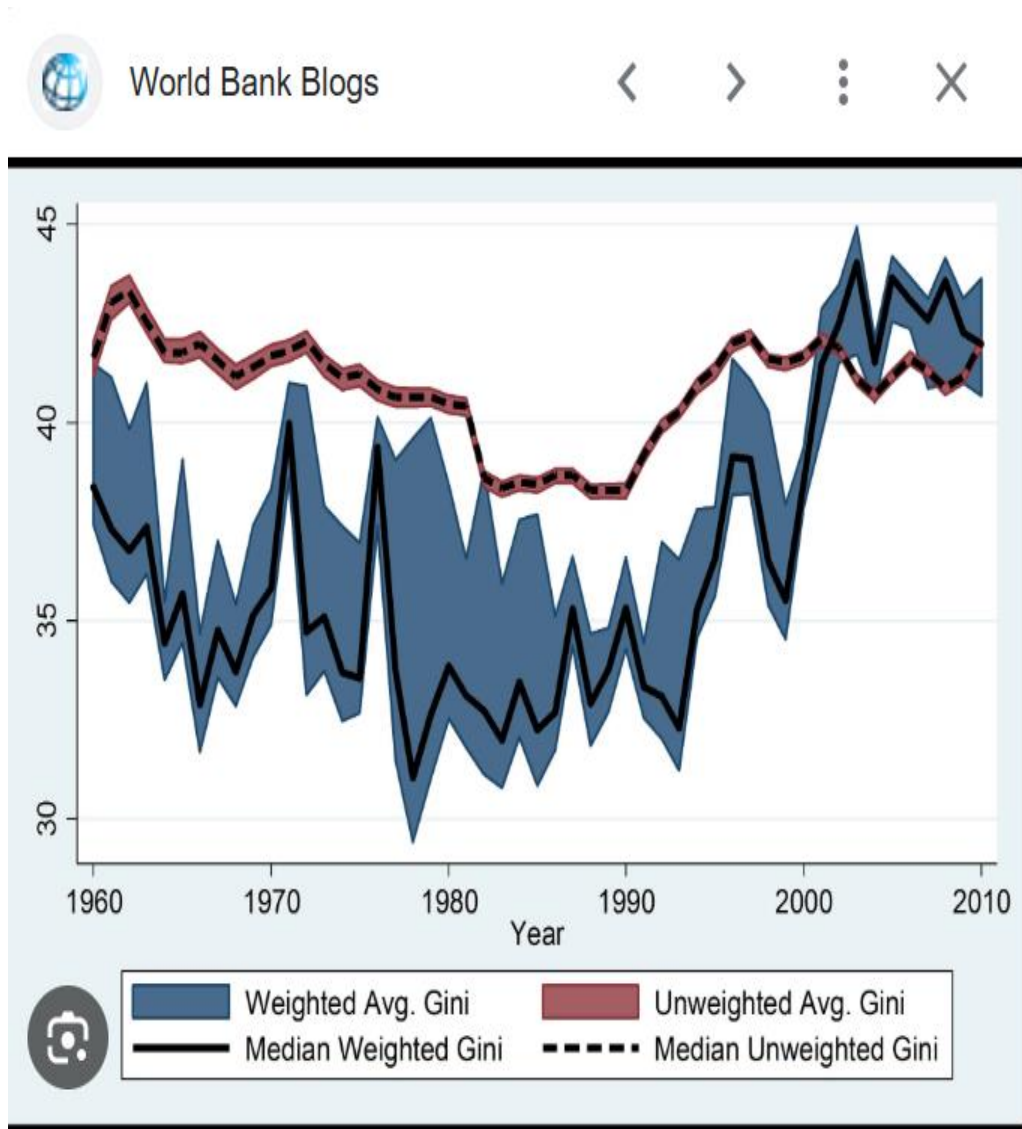
- **Is of Intrinsic Value** from the perspective of Current *and* Future Generations

Transition to Net Zero Could be Directly Inclusive

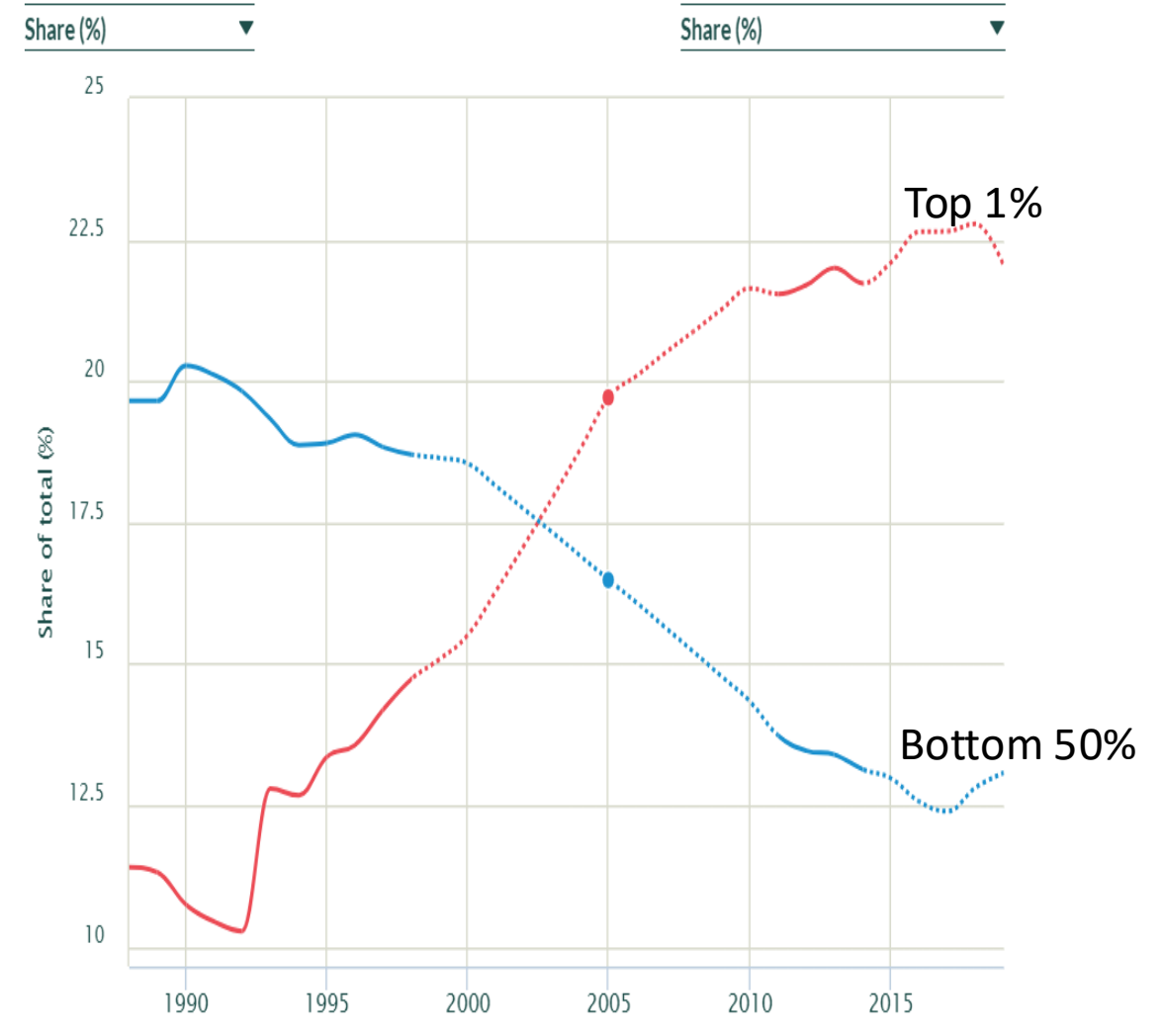
- Outdoor manual work capacity falls from 100% at a temperature of 26 degrees C to 0% at 37 degrees C. Has economic implications for manual workers (including agricultural workers) who tend to be among the poorest (McKinsey Institute 2022)
- Occupational heat exposure appears to be linked to a type of kidney disease among manual workers (Chapman et al 2021; John et al 2021)
- Temperature shocks lowered consumption among rural households and industrial workers and raised them among service workers in urban areas (Agarwal 2021).

Concern: Growing Inequalities Worldwide and in India

Sources: World Bank; World Inequality Database

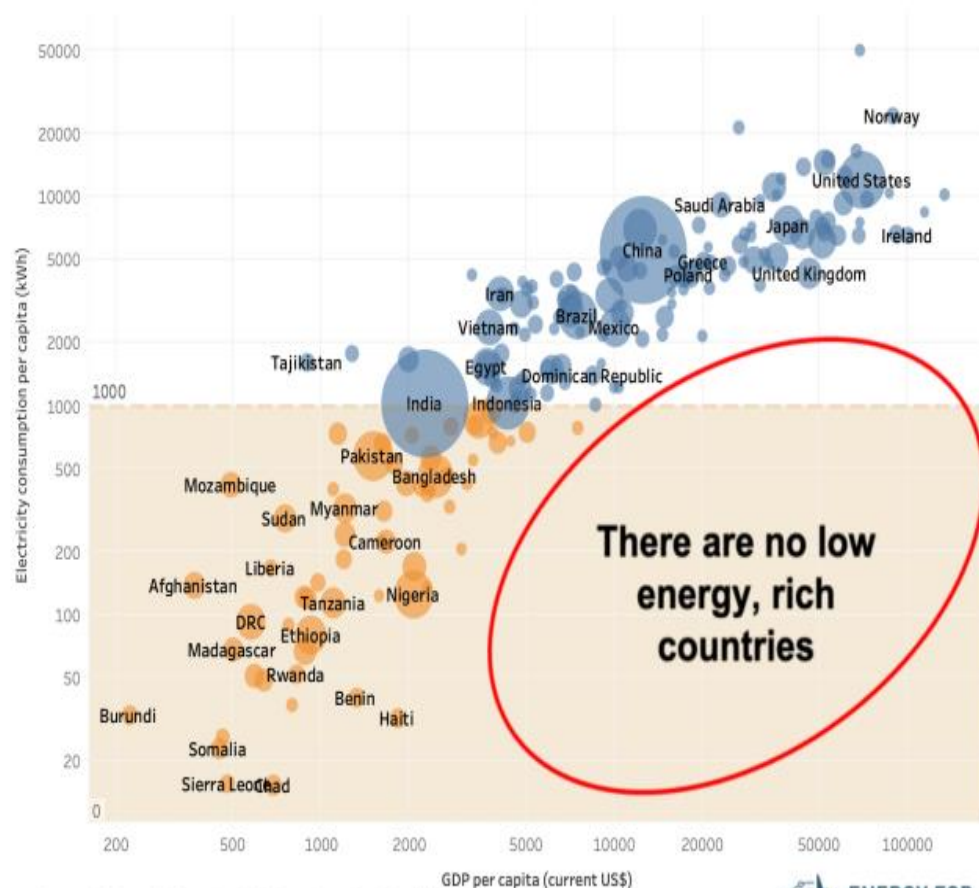


Income inequality, India, 1988-2019



Concern: The Rich Access More Energy than the Poor

Cross-Country Evidence



Source: US Energy Information Administration, World Bank (2021)

$R^2 = 0.8$



Household Level Evidence

India (Haider et al 2024): Rural & Urban Setting

Positive Income Elasticity of Demand for Energy Consumption: **0.25**

If one household has double the income of another, their energy expenditures would be 25% greater. However, did not explore non-linear relationships

China (Gao et al 2024): Urban setting

As household income increases, electricity consumption does not change initially, but then jumps once a specific income threshold is reached (**the “long-tailed” effect**)

Technological Change and Inequalities

- Qureshi (2021) – suggests that technological change in the digital era in high income countries has been characterized by concentration of productivity gains in relatively small number of large firms. In turn these have been driving the demand/earnings for highly skilled workers, with mid-level skills seeing stagnation
- Muller (2023) – documents findings of rising inequalities with high premiums for highly skilled workers within firms in the German Context
- Jha (2024) – finds declining skill premiums in India over the last 2 decades – linked to poor quality training, mismatched workers, and oversupply of “skilled” workers

Technology, growth, and inequality

Changing dynamics in the digital era

Zia Qureshi

Technological change, training, and within-firm wage inequality in Germany

Christoph Müller 

European Sociological Review, Volume 40, Issue 3, June 2024, Pages 450–463,

<https://doi.org/10.1093/esr/jcad051>

Published: 19 September 2023 **Article history** ▼

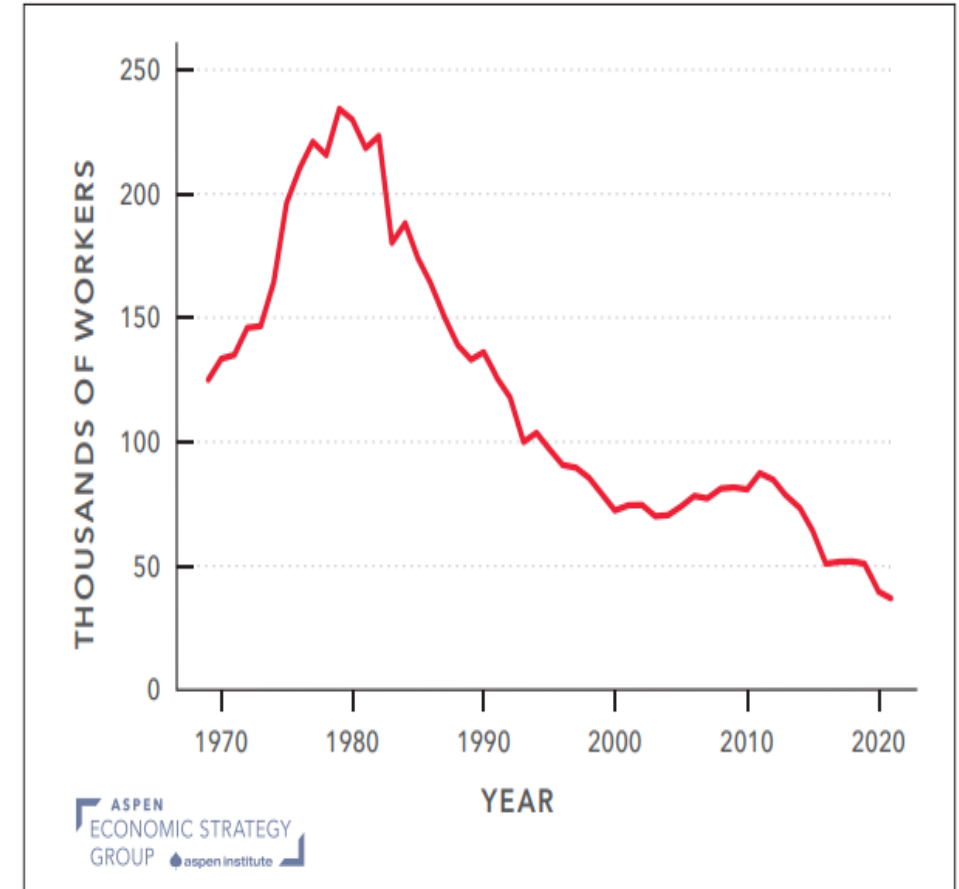
Regional Implications of Energy Transition: Case Study for Jharkhand (& a look at the US experience)

(Source: Climate Policy Initiative; Figure from Hanson 2021)

US Experience

Figure 5. The Decline of Employment in Coal Mining

- 85% of India's Solid Fossil Fuel Production Concentrated in 5 States (one is Jharkhand)
- Major Revenue Losses to State Government
- Projected Loss of Income to Employees in Fossil Fuel Mining: INR 8,800 Crore
- Loss of Jobs/Economic Activity in Eco-systems around Mining Towns may be even larger – Migration



Note: Data are from the BEA National Industry Product Accounts.

Inclusive Transition: Why?

Instrumental Role in Supporting Net-Zero Transition

Human Capital to Support the Energy Transition

- Pollin et al (2008) estimated that 1\$ of investment in renewable energy creates twice as many jobs as 1\$ investment in fossil fuel energy
- International Renewable Energy Agency estimated that 1 million green jobs were created in India by the end 2023. Stock of Potential Workers Exists to Support Transition in India provided that
 - it is healthy
 - appropriately educated and trained
 - is available where it is needed
 - green business opportunities are supported

Women's Work in India

- Major reason is declining labour force participation among rural women who are married and have above average education – suggest this is so *because domestic work is more attractive relative to outside work*

- *(Fletcher et al 2017)*

- significant demand for jobs even among those not in the labour force

- want to work but unable to find appropriate jobs

- access to vocational training helps

Why are fewer married women joining the work force in rural India? A decomposition analysis over two decades

Farzana Afridi, Taryn Dinkelman and Kanika Mahajan

Journal of Population Economics

Vol. 31, No. 3 (July 2018), pp. 783-818 (36 pages)

Published By: Springer Nature



Economic Inequality, Political Instability and Policy Pushback

- Inequality across individuals does not seem to matter for Political Conflict
- What matters is economic inequality underpinned by group differences constructed around identities (religion, ethnicity, regional)
- Driver of backlash against Globalization



World Development
Volume 185, January 2025, 106820



Development Review

Revisiting the links between economic inequality and political violence: The role of social mobilization

Patricia Justino ✉

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What Sorts of Actions Might Help?

- Skill Development for Green Jobs, including retraining of people formerly employed in fossil fuel sector, business loans, etc.
- Mechanisms to support Job-market Matching
- Mechanisms to support people who become unemployed (as fossil fuel related economic activities decline) and that cannot migrate or be trained, (e.g., income transfers, health coverage, caregiving)
- Measures to support regional equity

Challenge 1: Market Signals & Fiscal Bottlenecks

- Left to itself, the **market would underinvest in clean technologies** – underestimate the benefits in terms of improved health, or its follow-on economic benefits (and *underestimate the costs* of fossil fuels)
- **High upfront costs** – the emergence of game changing technologies that may render existing technologies obsolete
- Bhandari & Dwivedi (2022): **Government revenues from fossil fuels** would continue increasing until 2040, but they **would fall sharply as a share of projected spending** (from approximately 9.8% to 3.0%)

Challenge 2: Quadrilemma not Trilemma

The Tussle for Energy Security and its Implications for the
Energy Transition