



# Livelihood and gendered socio-economic impacts of climate change in India: what do these imply for SDGs?

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# Sustainable Development Goals (SDGs) and Climate Change

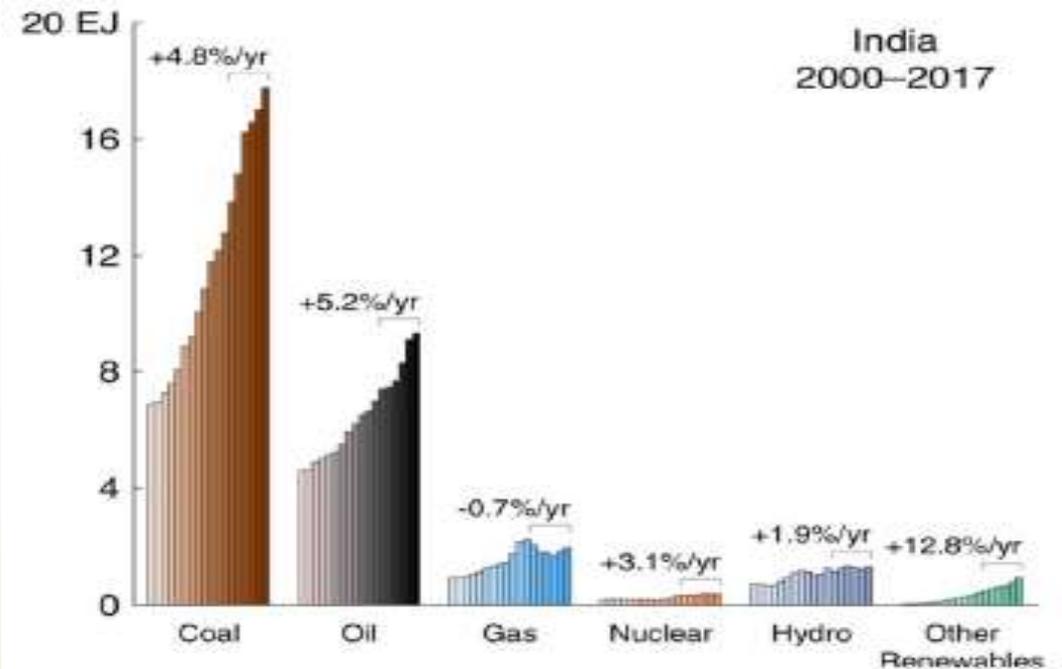
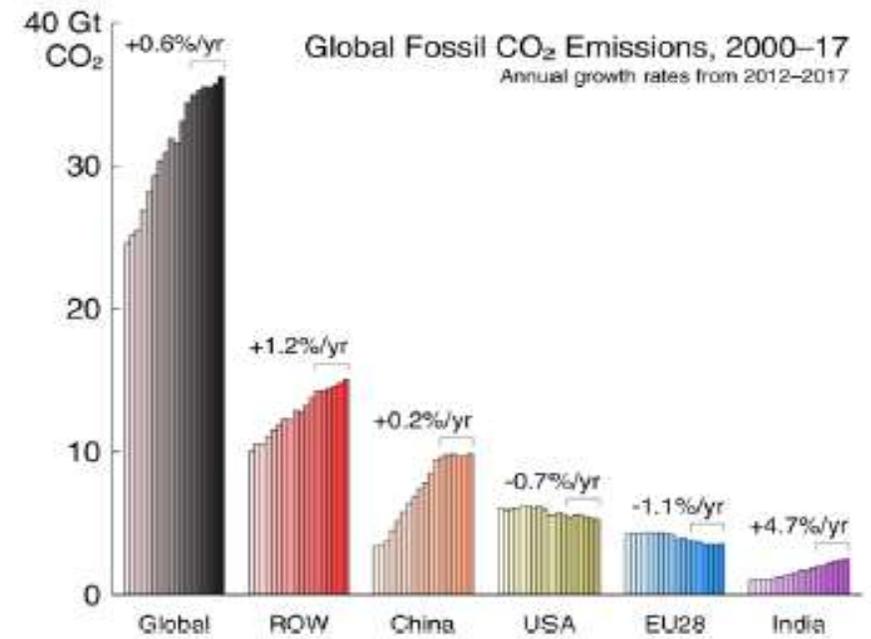
- ▶ By making sustainable development a cornerstone of SDGs, countries across the world have recognized fundamental **relationship between human development and climate change**.
- ▶ Goal 13 of SDGs recognizes need for “urgent action” to “combat climate change and its impacts” -- thrust on both climate change mitigation and adaptation measures. Encompasses three specific aspects:
  - ▶ 13.1, strengthening **resilience and adaptation** to climate related hazards and natural disasters
  - ▶ 13.2 **mainstreaming** of climate change measures into national policies, strategies, and plan, and
  - ▶ 13.3, enhancing **education, awareness and institutional capacity** on climate change mitigation, adaptation, impact reduction, and early warning.
  - ▶ 13.b raising capacity for climate change-related **planning and management in LDCs**, including focusing **on women, youth and local and marginalized communities**

# Goal 13 of SDG and India

- ▶ Currently, India is world's **fourth** largest energy consumer and world's **third** largest carbon emitter
  - ▶ Notably, 2005 is base year for India's Paris pledges and 2013 is most recent year for which reliable data for key economic sectors' contribution to CO<sub>2</sub>e exist
- ▶ Between 2005-2013, India emitted 20.54 billion tons of CO<sub>2</sub>e, with annual emissions growth of 5.57 per cent. Emissions per capita grew by 4.07 percent annually.
- ▶ In the year 2013, India emitted 2.8 gigatons CO<sub>2</sub>e – **less than** U.S. (6.2 gigatons CO<sub>2</sub>e) or China (11 gigatons CO<sub>2</sub>e).
- ▶ **Per capita emissions** also track **well behind** these nations.

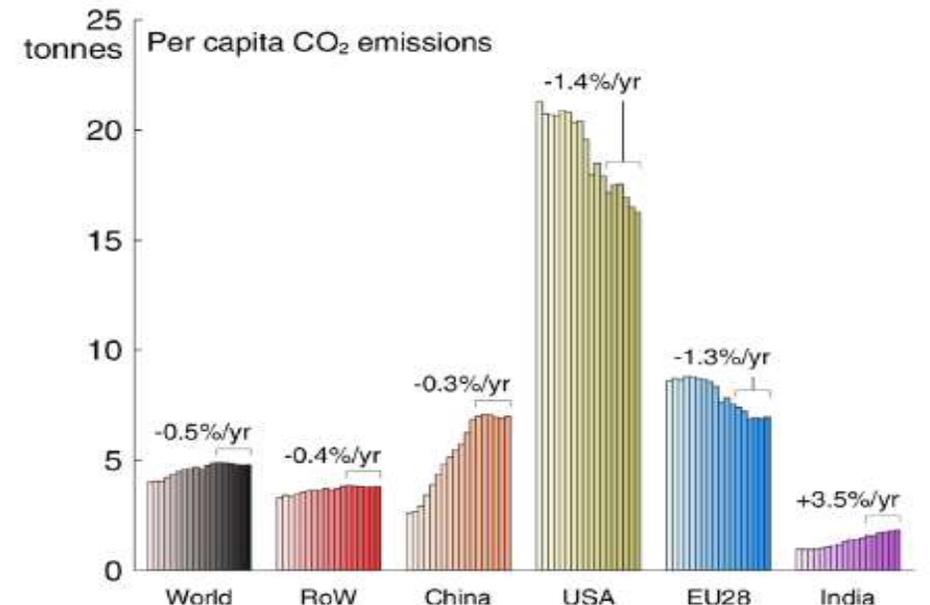
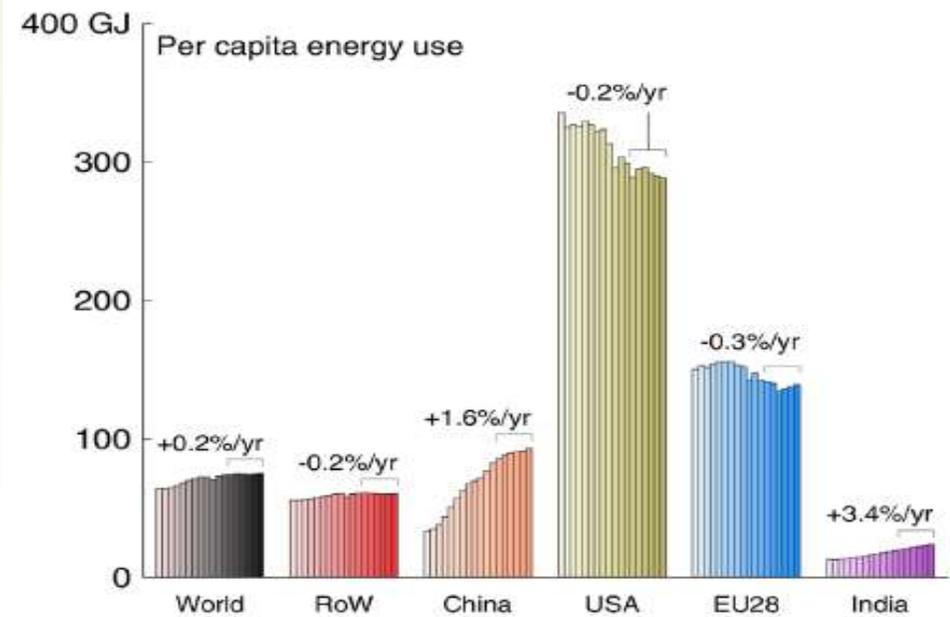
## Global fossil fuel emissions (Jackson et al, 2018)

- Annual growth rates calculated over 2012-17 (BP, 2018)
- Even as India experienced faster growing CO<sub>2</sub> emissions, its **aggregate emissions remain much lower** than those of China, US and EU28
- **Energy-related emissions continue to dominate**, with percentage share in national emissions remaining more or less constant (around two-third)
- Within energy sector, **three-fourth comes from electricity generation**
- India's **emissions intensity expected to decline** due to various considerations outlined by the National Electricity Plan,
  - adoption of cleaner technologies,
  - ambitious goal of updating fuel-mix to 40 percent non-fossil modes by 2030 (commensurate with ROW),
  - enhanced resource and energy use efficiency



## India's energy and CO<sub>2</sub> per capita versus the world (Jackson et al., 2018)

- Notwithstanding India's higher growth, energy use and CO<sub>2</sub> emissions per capita statistics point towards **cross-country inequities**.
- Energy use in **US ten-fold higher per capita** than in India (where hundreds of millions of people still lack access to reliable electricity and clean fuels). It is **five times higher in EU** than in India. India's energy use and CO<sub>2</sub> emissions per capita also much lower than world average.
- **India generally more efficient in aggregate energy use** than several other countries, and also world as a whole, but some scope for improvement remains.
- Four-fifths of industrial GHG emissions from coal consumption. India committed to **reducing emission intensity of gross domestic product (GDP)** by 33-35 per cent by 2030 from 2005 level .
- Schemes like **Perform, Achieve and Trade (PAT)**— MBIs designed to reduce energy consumption in energy-intensive industries by allowing trade in ECerts.



# Going forward...

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- ▶ India's climate policy and development policies are going to be shaped by three interlinked documents: **the Paris Agreement, the SDGs agenda and the Indian NDC submitted UNFCCC** (RIS/ UN, 2016) .
- ▶ All three affect India's national ambitions to grow infrastructure, ensure sustainable development and maintain economic growth.
- ▶ The **National Action Plan on Climate Change** comprises eight sub-missions - mitigation options, such as clean energy and energy efficiency, and adaptation in agriculture and other sectors -- have permitted a **focused approach** to deal with climate change impacts and India's response strategy towards **international dialogues**.
- ▶ Accordingly, significant strides made in this regard:
  - ▶ As of March 2018, 69 GW of grid connected **renewable power** (largely wind and solar) installed – goal of 175 GW by 2022.
  - ▶ **National Clean Energy Fund (NCEF)** put in place in 2010 to finance clean energy initiatives (decentralized and grid connected renewables) and R&D for clean energy. Coal cess raised; Standard & Labeling Program; PAT; ECBC.
  - ▶ As of January 2015, **90 per cent of companies on track in meeting their PAT scheme targets** on account of investments in new energy saving technologies, resulting in about US\$ 5 billion saved in oil imports and electricity savings of that equivalent to the output of 5 coal-fired power plants.
  - ▶ Aggregate **energy intensity of Indian economy declined by 40 per cent between 1995 and 2015**; Likely gains between 2015-2040  $\cong$  30-40 per cent

# Climate change impacts on livelihoods in India (1) (Mani et al./WB, 2018)

- ▶ Mani et al/ WB, 2018 have analyzed impact of temperature and precipitation variations on India's **livelihoods** at district level.
- ▶ Climate change already a grave concern for Indian economy
  - ▶ Temperatures risen considerably and precipitation become less certain.
  - ▶ These changes will have an adverse implication on living standards in India.
- ▶ By 2050, annual average temperatures in India expected to rise by
  - ▶ **1°C to 2°C under climate-sensitive scenario** – representative concentration pathway (RCP) 4.5, represents a future where some collective action taken to limit greenhouse gas emissions;
  - ▶ **1.5°C to 3°C under carbon-intensive scenario** - RCP 8.5, -- projects a future in which no actions are taken to reduce emissions
- ▶ Increasing average temperatures and changes in seasonal rainfall patterns having
  - ▶ Adverse impact on **agricultural productivity**
  - ▶ Perturbations and anomalies in **hydrological cycle**
  - ▶ Low-lying coastal areas at risk from **sea-level rise** and tropical storms
  - ▶ **Mountainous areas at risk** due to changes in snow cover, glacial melt, and frequency of natural disasters

# Livelihood impacts(2) (Mani et al./WB, 2018)

- ▶ Impact of climate change on living standards captured by establishing an empirical relationship between consumption expenditure (indicator of living standards) and climate, controlling for household, district, and geospatial features (World Bank, 2018).
- ▶ In the aggregate, found that projected changes in average temperature and precipitation **negatively impact** on living standards.
  - ▶ Under **climate-sensitive scenario**, the **change in living standards is -1.3 percent until 2030 and -2.0 per cent by 2050**, while that under **carbon-intensive scenario it is -1.5 per cent and -2.8 per cent**.
  - ▶ Around **600 million people in India today live in locations** that could become **moderate or severe hotspots** by 2050 in case of the carbon-intensive scenario  $\cong$  50 percent of the country's population.
  - ▶ Change in living standards for this 600 million people could be as high as -5.6 per cent to -9.8 per cent
  - ▶ These households also more likely rely on **agriculture** as their main livelihood occupation
- ▶ Averting these adverse effects would have to rely on significant developmental measures such as educational attainment, lowering water stress, and improving work opportunities in non-agricultural sector.

# Gendered socio-economic impacts of climate change (1) (Sorensen et al., 2018)

- ▶ **Increasing frequency** of extreme heat events and rising average temperatures
  - ▶ Disproportionate heat-related morbidity and mortality; adverse reproductive outcomes;
  - ▶ Poor access to healthcare; lack of communication and awareness of women's vulnerabilities to heat among decision makers and healthcare personnel.
- ▶ **Poor air quality** from combustion of fossil fuels; increased ground-level O<sub>3</sub> from elevated temperatures
  - ▶ Respiratory and cardiovascular disease; adverse reproductive outcomes;
  - ▶ Women experience greater deposition of inhaled particles in lungs; higher prevalence of anemia, women are more sensitive to toxicological exposure;
  - ▶ Traditional indoor cookstoves using biomass produce carbon monoxide, hydrocarbons, and particulate matter; women spend more time in homes and disproportionately affected.

# Gendered socio-economic impacts...(2)

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- ▶ Increasing frequency of **climate-related disasters**, including hurricanes, flooding, and wildfires
  - ▶ Women suffer disproportionate mortality during natural disasters; female survivors suffer decreased life expectancy; women and girls at high risk of physical and sexual violence;
  - ▶ Women more likely to experience dietary deficiencies, leading to poor physical health and vulnerability to resource shortages post catastrophes;
  - ▶ With unequal access to basic social goods, mortality worsened when women have a lower socioeconomic status; women often homebound caring for children and elderly while waiting prior to evacuation; women suffer disproportionate job loss and stagnant personal economic recovery following disasters.
- ▶ Shifting rainfall and temperature patterns impair crop, livestock, and fishery yields, contributing to **food insecurity**
  - ▶ Women suffer higher rates of macro and micronutrient deficiencies;
  - ▶ Women are inherently sensitive to effects of food insecurity and resulting nutritional deficiencies;
  - ▶ Nutritional scarcity intensified by cultural practices that prioritize food provision to children and adult males; small proportion of female farmers are landowners, therefore, women suffer due to relative lack of control over farmlands and nutritional security.

# Gendered socio-economic impacts...(3)

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- ▶ Shifting rainfall and increased rates of evaporation lead to **water insecurity and risk of waterborne disease**
  - ▶ Water scarcity forces provision from biologically and toxicologically contaminated source, -  
- bacterial, viral, and protozoan infections; traveling long distances to procure water increases exposure to heat; lack of access to water and sanitation creates unsafe conditions for women;
  - ▶ Traditionally, women have household role of providing water for family; water scarcity equates to more time spent harvesting water and less time spent on other activities of livelihood such as economic gain; in some regions, carrying water may use up to 85% of a woman's daily energy intake.
- ▶ Climate-induced environmental change drives **human migration**
  - ▶ Women more likely to undergo short-term migration, which is often excluded from migration analysis;
  - ▶ Lack of basic sanitation and health services compound health issues for refugees and migrant women;
  - ▶ Low education a risk factor for migration, and globally, women suffer disproportionately from lack of education; women have fewer employment opportunities and, therefore, unable to migrate into economically viable and less environmentally vulnerable regions, thus become “trapped”

# Reconciling environment & development goals within SDG paradigm

- ▶ Concerns of **livelihoods vulnerability** linked to following additional SDGs
  - ▶ **Goal 1:** Poverty; **Goal 2:** Food security, nutrition and sustainable agriculture; **Goal 3:** Health; **Goal 6:** Water and sanitation; **Goal 7:** Energy access; **Goal 8:** Economic growth and employment; **Goal 11:** Sustainability.
- ▶ Concerns of **gender-differentiated socio-economic impacts** having strong linkages with
  - ▶ **Goal 1:** Poverty; **Goal 2:** Food security, nutrition and sustainable agriculture; **Goal 3:** Health; **Goal 4:** Quality education and learning opportunities; **Goal 5:** Gender equality; **Goal 6:** Water and sanitation; **Goal 7:** Energy access; **Goal 8:** Economic growth and employment; **Goal 11:** Sustainability.

# Key takeaways....

- ▶ Mainstreaming livelihood and gender differentiated socio-economic impacts in mitigation and adaptation policies;
- ▶ Integrated analysis of complementarities and trade-offs across different SDGs – concerns of energy poverty, education, health etc. loom large;
- ▶ Identifying financial needs and financial gaps, and asserting these in climate negotiations – concerns of additionality – distinction between climate finance and development finance.

## ► References & readings

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Thank you for your attention!