

Multidimensional Poverty & Environmental Deprivations

Panel 5: Human & Environmental Welfare

T20 TF5 Side Event: Multidimensional Poverty in the Midst of the COVID-19 Pandemic: A Commitment to Reducing Poverty in All Its Forms

27 July 2022

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Poverty-Environment Nexus – two of the biggest challenges of the 21st century (combined?)

“Poverty and climate change are the two great challenges of the 21st century. Our responses to them will define our generation, and because they are linked to each other, if we fail on one, we will fail on the other” Nicholas Stern (2009), Author of Stern Review Report on the Economics of Climate Change

“Two of the great social challenges of the twenty-first century are to alleviate poverty and to reverse global environmental change” Alpízar & Ferraro (2020), Commentary for *World Development*

- 1.3 billion out of 5.9 billion people living in the developing countries around the world are multidimensionally poor (global MPI 2021)
- The most recent IPCC report shows that in regions of high vulnerability, “between 2010-2020, human mortality from floods, droughts and storms was 15 time higher ... compared to regions with very low vulnerability”
- Disproportionately large impact of environmental degradation on the poor (Akter and Mallick 2013; Thiry, Alkire, and Schleicher 2018; Dasgupta et al. 2005; Angelsen et al. 2014; Cavendish 2000)

Multidimensional Poverty & Environmental Deprivations – Emerging Approaches

Emerging literature on integrating environmental deprivations into multidimensional measures,

- ‘green’ or ‘sustainable’ Human Development Indices (HDI);
 - Ecological Threat Register (ETR);
 - the global Living Planet Index;
 - Vulnerability Indices, the
 - Rural Multidimensional Poverty Index
- Focus on rural, vulnerability, sustainability (how environmental indicators – some with geospatial data - are used depend on the purpose statement of the measure)

What additional indicators, particularly related to the environment should be included within multidimensional measures of poverty?

In principle, a poverty measure shows the deprivations poor people suffer at the same time in the same period – it provides a snapshot.

Environmentally augmented MPI should *include additional environmental deprivations* that the same people are actually facing at the same time as the poverty deprivations. It should fill in the snapshot.

Possible Environmental Indicators (1)

1. Air Quality (outdoor) - SDGs 3, 7, 11
2. Storms - SDGs 11, 13
3. Fire - SDGs 11, 13, 15
4. Earthquakes - 11, 15



Setting deprivation cutoffs feasible either based on

1. adopting international standards
 - Air Quality - annual average concentrations of fine particulate matters should not exceed 5 micrograms per cubic meter air ($\mu\text{g}/\text{m}^3$),
 - Number of tropical storms (knots or km/h)
2. and/or empirical trials and normative reasoning
 - Number of recorded (wild) fires. Prevalence of slash and burn practice

Possible Environmental Indicators (2)

5. Forest Cover/Loss - SDGs 6, 13, 15
6. Soil Erosion SDGs 13, 15
7. Precipitation (Drought, Flooding) - SDGs 13, 15
8. Temperature - SDGs 13, 14, 15
9. Biodiversity Loss - SDGs 14, 15

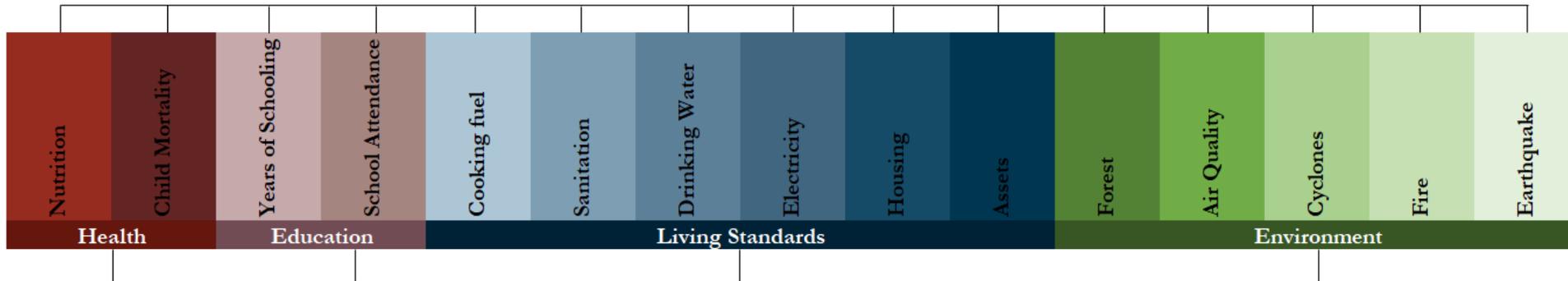


- Greater technical challenges to define critical mass for classifying deprivations related to human welfare (forest cover/soil erosion) – less international guidance & greater empirical challenges
- Direct and indirect links with human welfare. E.g. precipitation and temperature:
 - Direct: Floods or (life-threatening) heatwaves
 - Indirect: Food security – here, below normal rainfall during cropping season and higher than average temperatures during harvest season most crucial

Environmentally-augmented Multidimensional Poverty Index (eMPI)

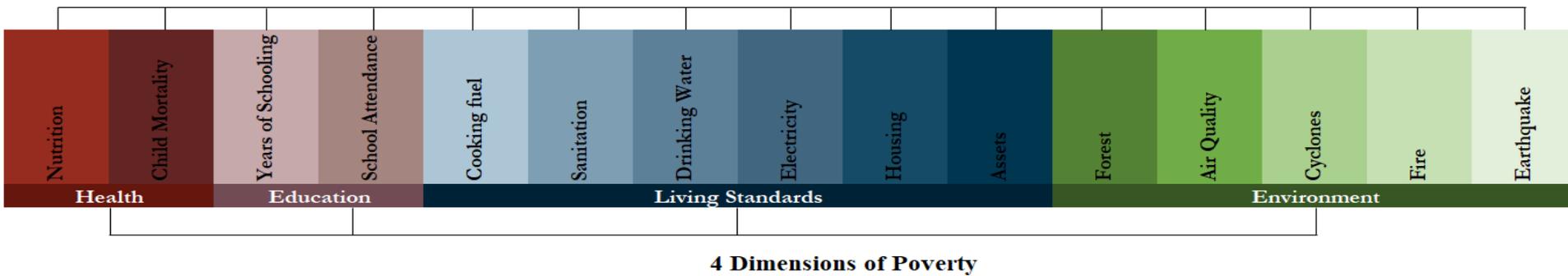
- Direct measure of human poverty with environmental degradation as constituent component
- Normative justification: Amartya Sen's Capability Approach
- Criteria for integrating environmental aspects:
 - Human focused (what is a constitutive element of poverty?)
 - Basic capabilities: to live, to breath etc.
 - Type of indicators: achievements/outcome
 - Data: correct time
- Disaggregation by key variable of interest: region, rural-urban/ Changes over time analysis

15 Indicators



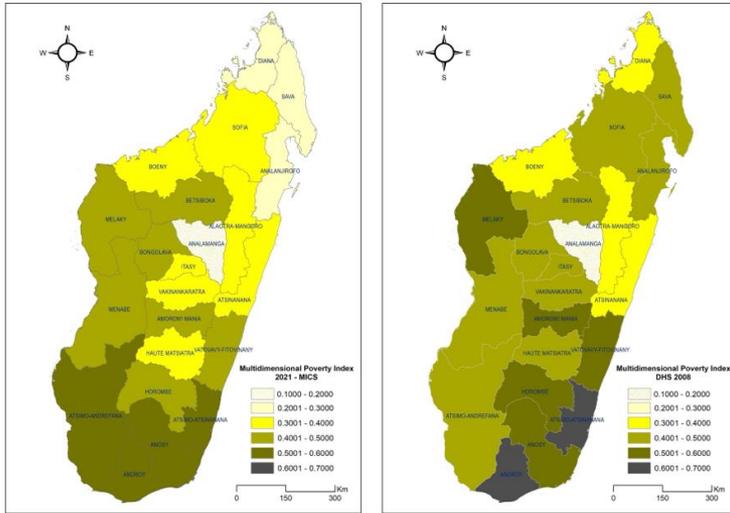
4 Dimensions of Poverty

Source: Alkire, Andrianandrasana, Fortacz, Vollmer (forthcoming)

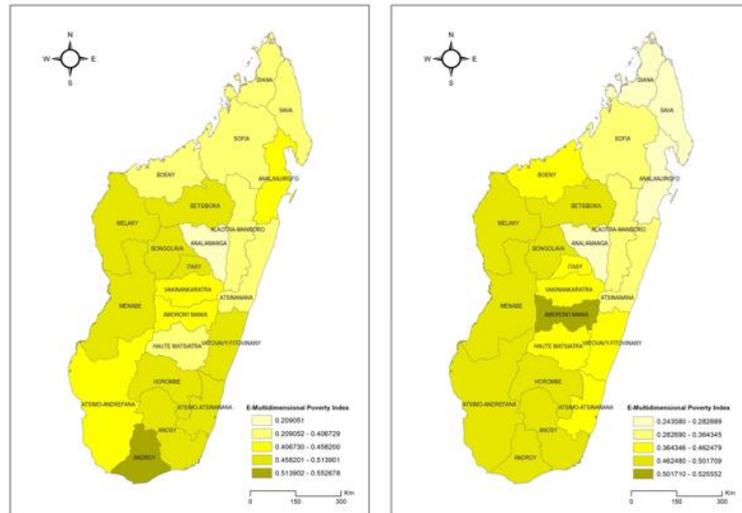


- All households within the same cluster are considered deprived if certain criteria are (not) fulfilled.
- All households in a cluster are deprived if
 - the annual concentration of fine particulate matter is higher than $5 \mu\text{g}/\text{m}^3$ (micrograms (one-millionth of a gram) per cubic meter air) within a 10km radius.
 - the forest cover is less than 10% within a 10km radius.
 - a cyclone was recorded within a 50km radius. Tropical depressions (wind circulation under 61.1km/h) and tropical cyclones (wind circulation of 62.7km/h - 117km/h) are considered as cyclones.
 - three or more fires were recorded within a 10km radius
 - an earthquake (with a magnitude of 4 or more) was recorded within a 10km radius.

Map. 1: global MPI Madagascar



Map. 2: EMPI Madagascar

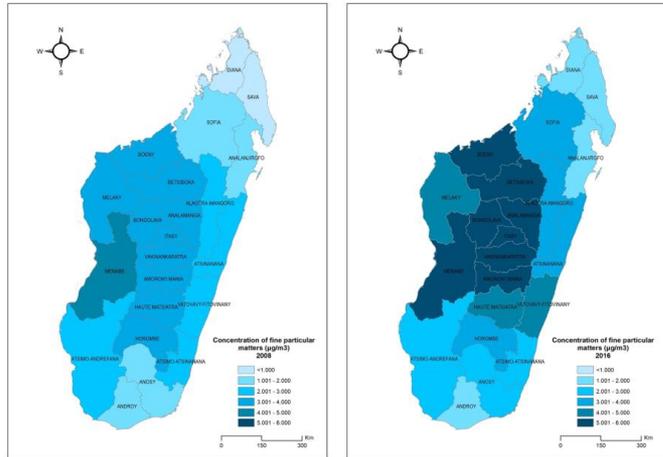


- The inclusion of environment dimension increases the incidence of poverty:** The headcount ratio of the EMPI is 85% in 2008 and 82.2% in 2018 vis-à-vis 75.7% and 67.8%, respectively, based on the GMPI.

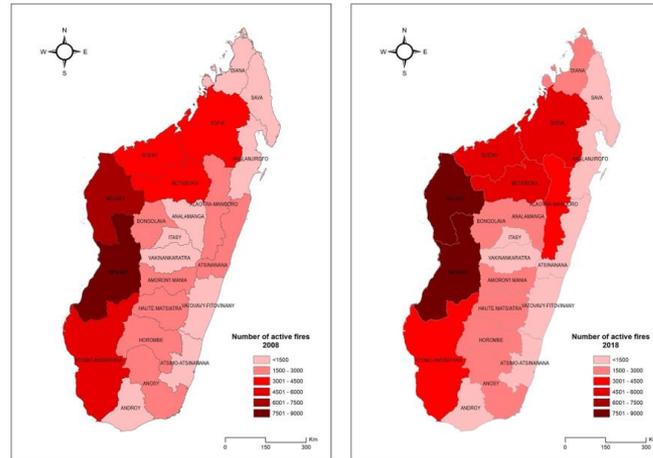
 - The EMPI uncovers (makes visible) environmental deprivations faced by the poor.
- “Equivalent intensity”:** People experience higher levels of intensity in both years with the GMPI results (57.2% vs. 48% in 2008; 55.2% vs. 47.6% in 2018.) – however, this is due to structure of the measure (three-dimensions vs. four dimensions)
- The geographic shape of poverty changes only marginally:** almost all (nine) of the ten poorest subnational regions of the GMPI are also among the top ten in the EMPI (yet with changes in some rankings).

Results driven by

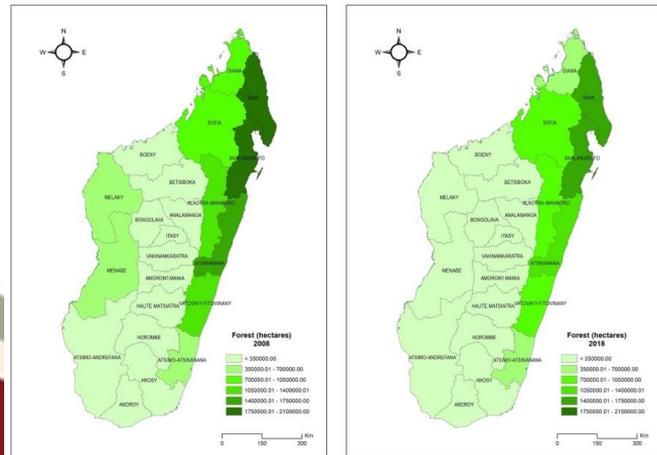
Map. 3: Air Quality



Map. 5: Number of Active Fires



Map. 4: Forest Cover



- Deteriorating Air Quality
- Greater Forest Cover Loss
- + Increased wildfires

Discussion Points

1. Exposure to environmental deprivations are often covariate “shocks” – e.g. earthquakes, cyclones. Are coping strategies equally relevant (earthquake-proof housing)?
2. Should environmental deprivations solely be measured by satellite imagery? What about deprivations that happen on a commute or outside the household, on lands? How to catch?
3. Does satellite imagery provide sufficient policy guidance with regards to human welfare?
 - Deprivations are often measured at cluster level, not household level. Is it *just* to classify *all households* within a cluster deprived?
 - Challenges of deciding on cluster radius (little guidance in the literature)
 - Some degradations more “frequent” (e.g. Fire, Air quality) than others (e.g. Earthquakes, Cyclones) – implications for policy planning?
 - Severity of event will have uneven consequence – coping & chance

Discussion Points (cont.)

- 3) Satellite imagery provide sufficient policy guidance?
- Heterogeneity of environmental issues: Exposure to environmental degradation differs by region and rural-urban (empirical question): poor air quality often an urban deprivation, cyclones hit coastal areas, fires strongly affect rural populations (slash and burn, forest fires). Should indicators differ?
 - Temperature and precipitation (drought or flooding) – What deprivation cutoff(s) should be set in absolute terms (e.g. extreme temperature)?
 - De facto, environmental hazards hit certain occupational groups (fishers, farmers, herders) differently than others. How to catch?
 - Missing values can be a challenge
 - Could deprivations be combined (e.g. assets indicators)?

Conclusions

- It is vital to integrate environmental deprivations directly into measure of multidimensional poverty – in addition to reporting each separately.
- This enables stronger overview of policy implications (and communications) – related to both poverty and environmental costs.
- Any policy salient comparisons must be robust to different choices of parameter and statistically significant.

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