



Social LCA of natural resource and material use: a global assessment

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Global Assessment of the Natural Resources Use and Management (forthcoming IRP Report)

- Focus on environmental assessment:
 - Natural resources extraction (**Fossils, Biomass, Metals, Non-metallic Minerals**)
 - Processing to materials; **no use phase and disposal**
 - Global trade analysis based on Exiobase v3
- Also socio-economic issues
 - Employment
 - Employment risks
 - Added Value

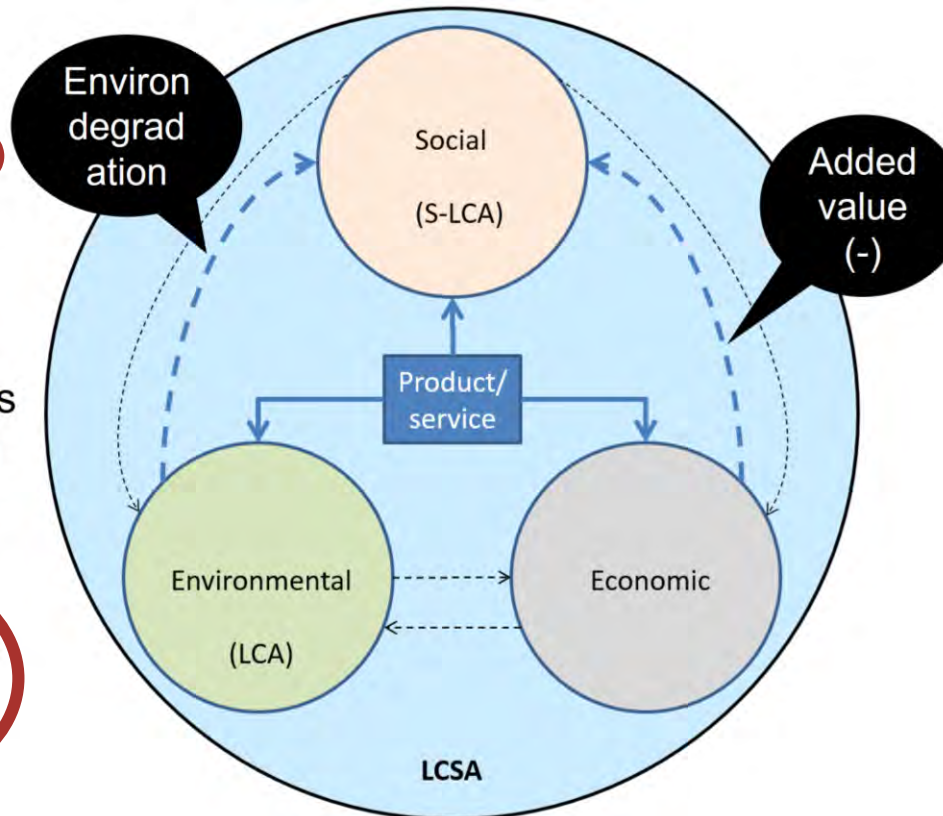
Approach based on Method by Zimdars et al. (2017)

Direct effects

- Production (worker)
- Use (effect of product)

Rebound effects

- Environmental impacts affect well-being
- Economic benefits might improve well-being



DATA & Tool:



Haas A; Pfister S, Zimdars C (2017),
 “Social LCA Data in a Tool”,
 Mendeley Data, v1
<http://dx.doi.org/10.17632/885knh8s4j.1>

Paper:



Zimdars C, Haas A, Pfister S (2017)
 Enhancing comprehensive
 measurement of social impacts in S-
 LCA by including environmental and
 economic aspects. *Int J Life Cycle
 Assess.* [doi:10.1007/s11367-017-1305-z](https://doi.org/10.1007/s11367-017-1305-z)

Social accounting schemes

- SLCA by default regionalized

1. Impact: Social risks of working hours (direct effect):

- Social hotspot database (SHDB)
- 113 regions * 57 sectors



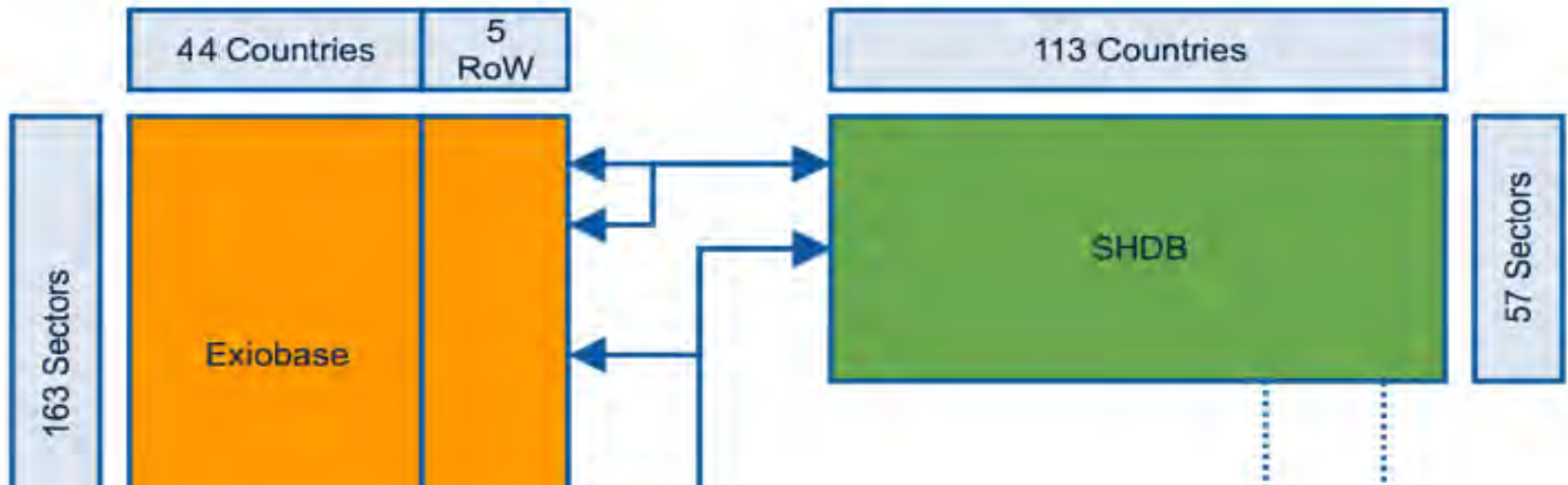
2. Inventory: Added Value and Employment

- Exiobase v3
- 49 regions * 163 sectors



Structure for quantitative risk assessment

Match SHDB and Exiobase sectors-region



Specific risk factors for each country-specific sector (CSS)

Structure for quantitative risk assessment of work hours

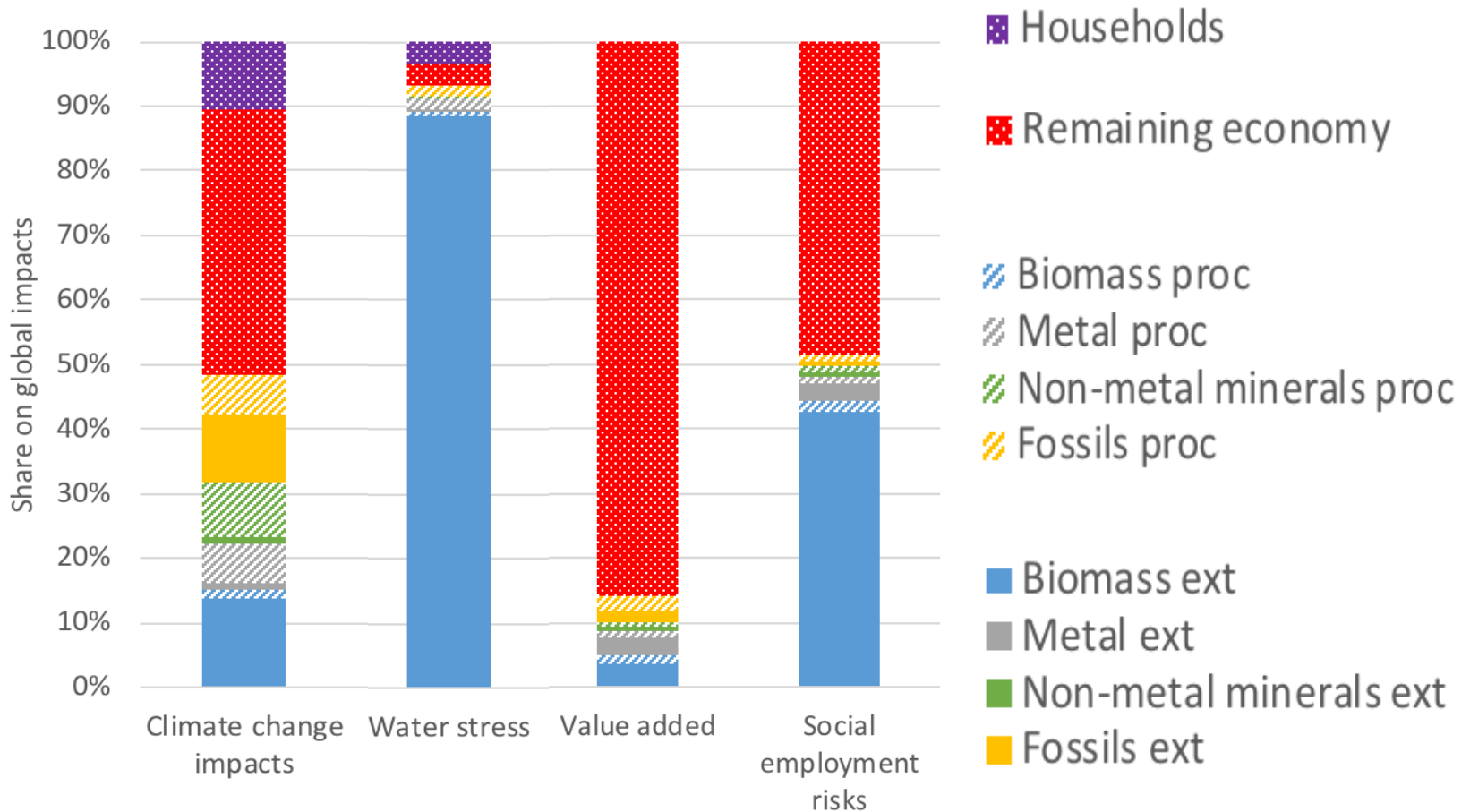
Transform risk levels to numbers (work related risks)

Qualitative risk level (SHDB)	Quantitative value
Not applicable	1
Low risk	2
Medium risk	4
High risk	8
Very high risk	16
No data	4



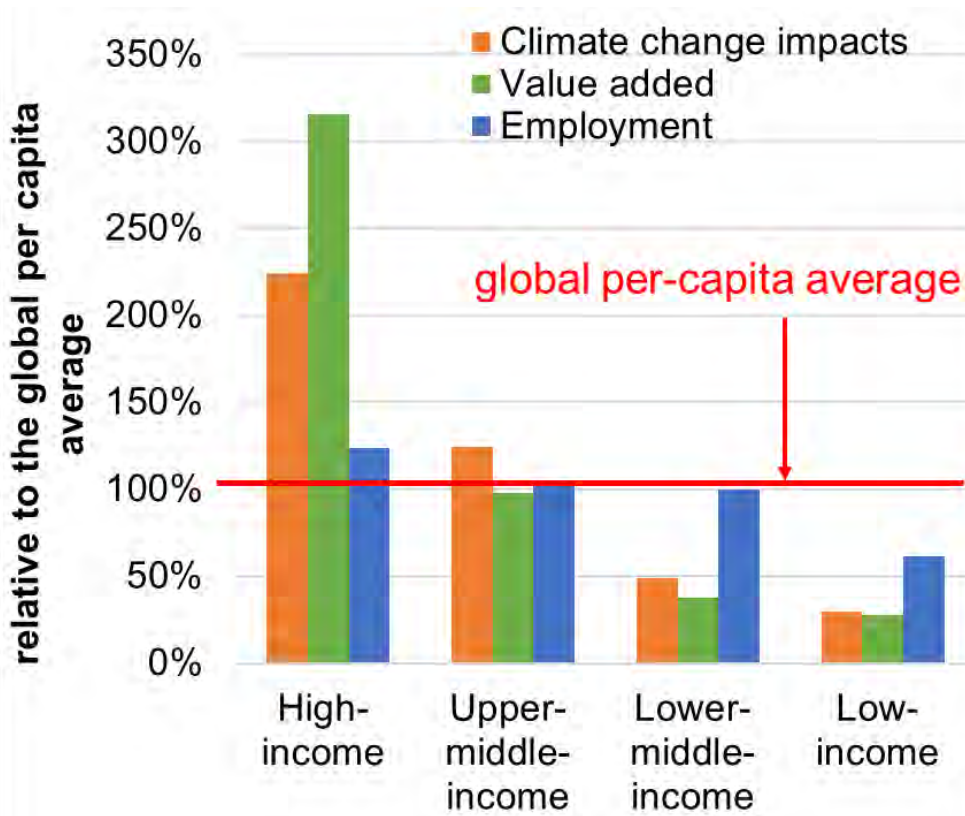
Average over all risks:
sector-region
specific risk factor

Global environmental impacts and socio-economic indicators by resource and material

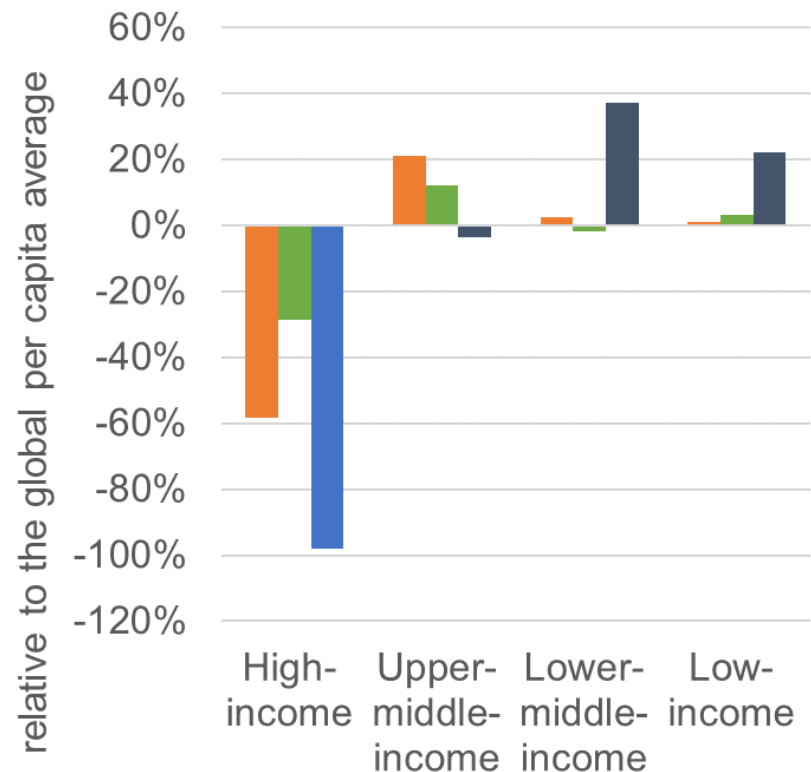


Climate impacts, added value and employment per income class - materials

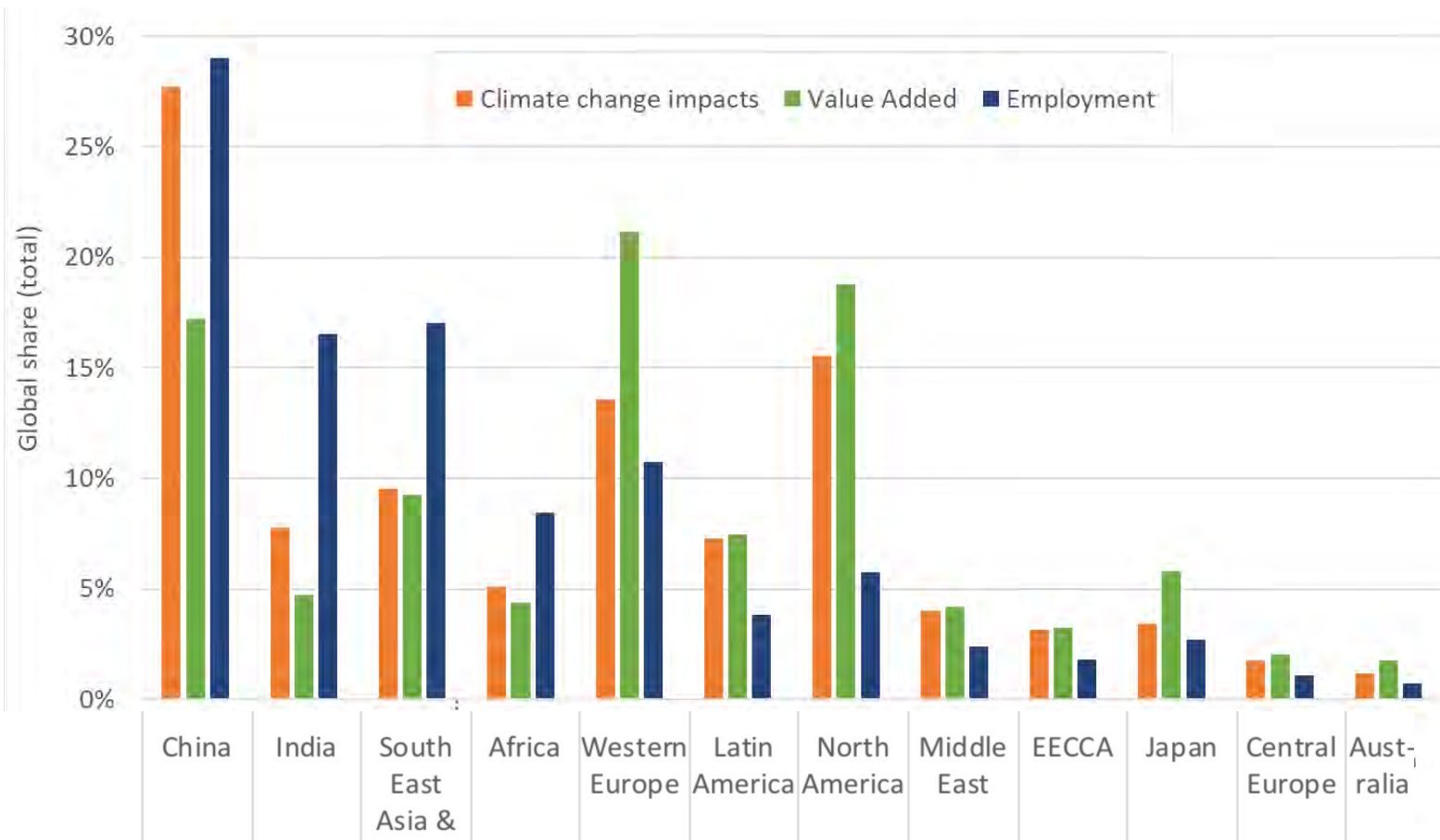
Footprint per capita



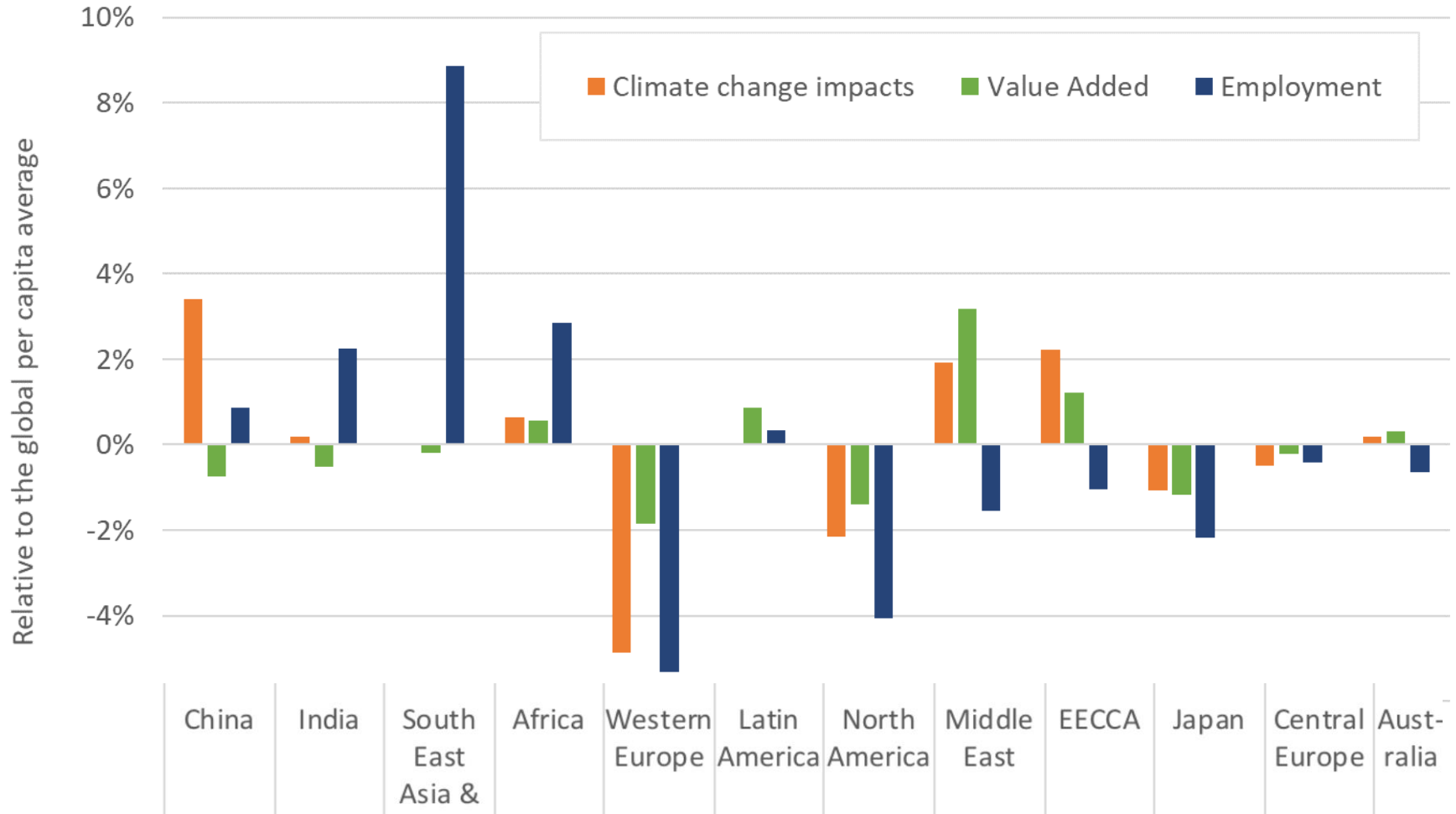
Net «export» per capita



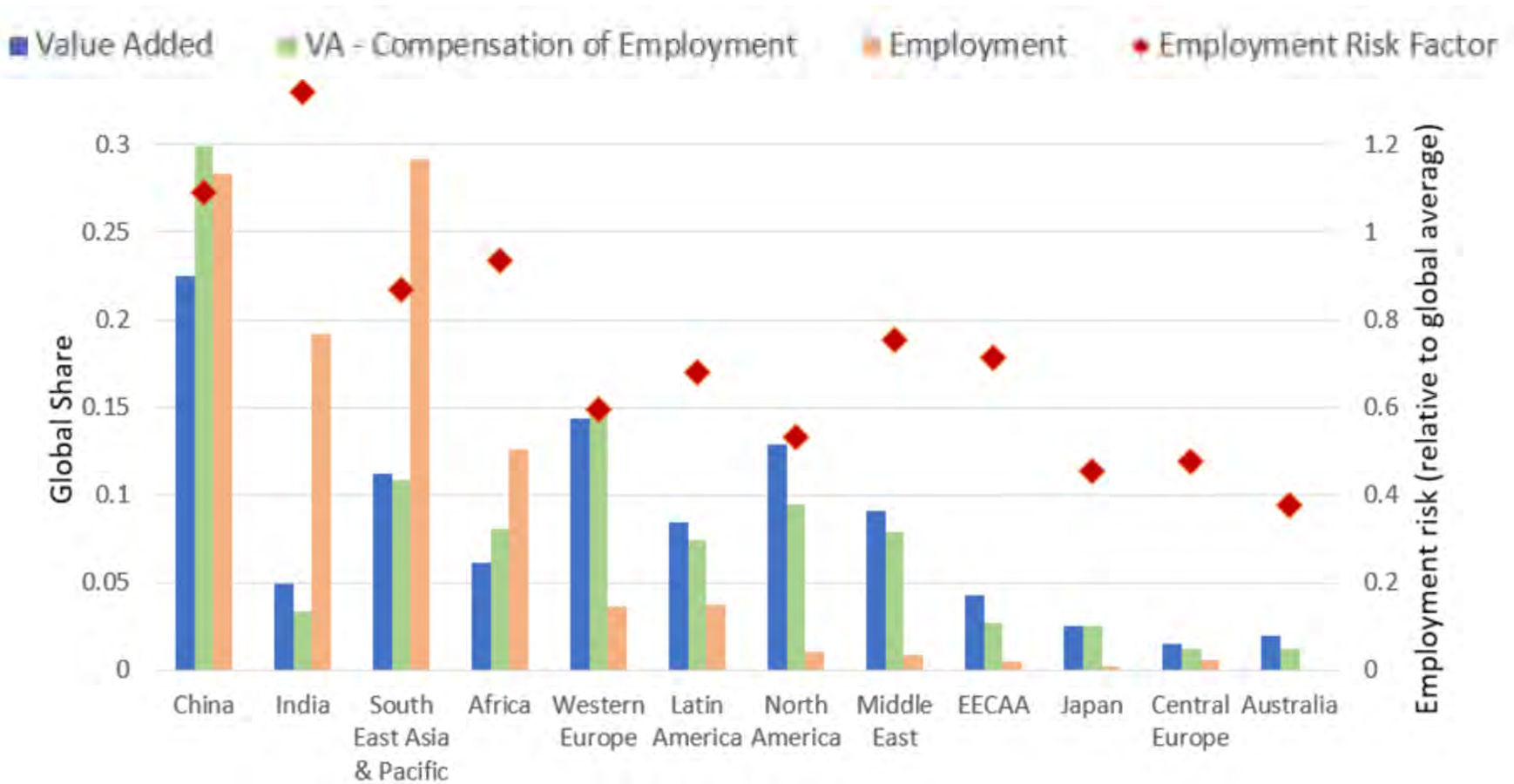
Footprint of materials by region (consumption perspective)



«Trade balances» of materials by region



Global share of total value added, compensation and employment in material production



Conclusions material production and trade

- Higher burden in emerging and developing economies:
 - Low AV and high impacts -> especially agriculture
 - High work related risks
- Trade increases gap:
 - Larger net «import» of work related risks than added value in developed economies
 - Larger net «export» of work than added value
- Social LCA operational with MRIO (limited details)

Thank you for your attention!

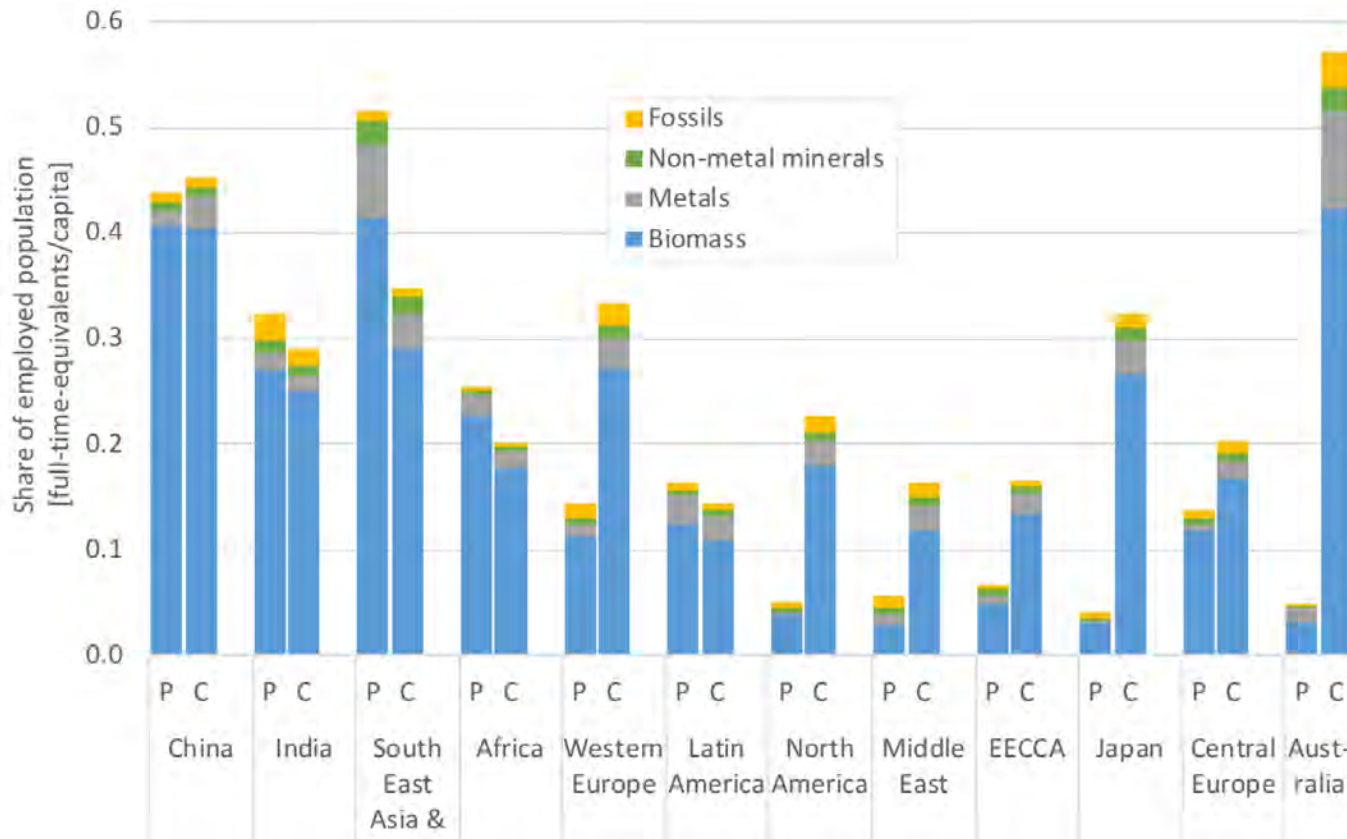


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Share of population working in the resource sector (full-time-equivalents per capita)

P: production perspective, C: consumption perspective



Value added (Euro/capita) in resource sector

P: production perspective, C: consumption perspective

