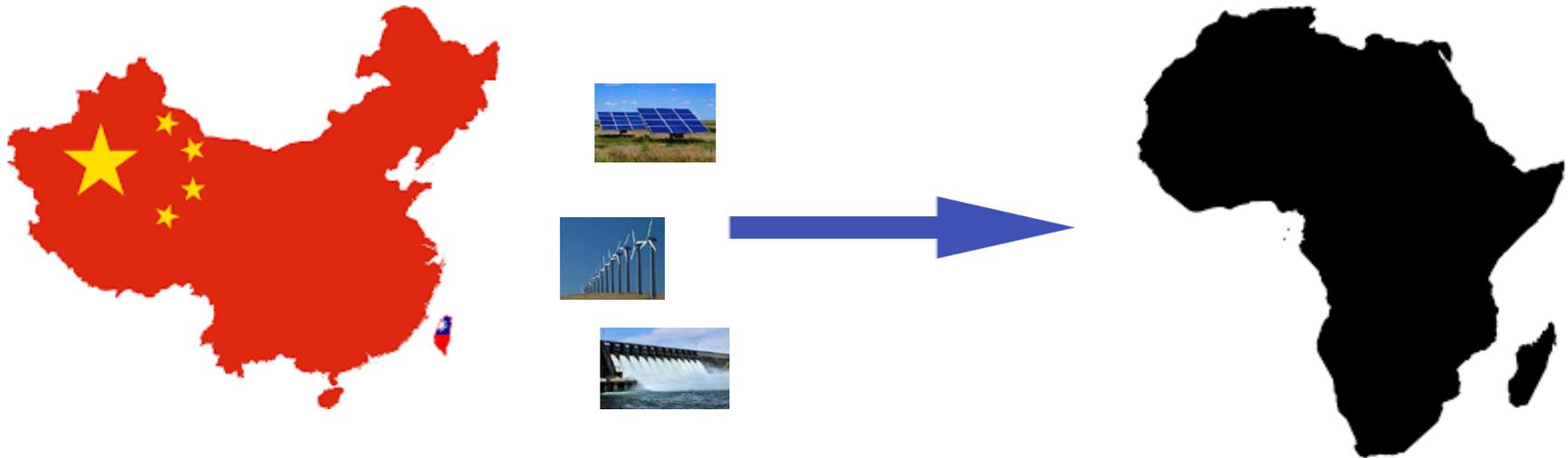


South-South technology transfer: the role of China in the renewable energy sector in Africa



Draft paper

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Background

- Generally growing prominence of China in Africa
 - Discussion about South-South vs. North-South technology transfer
 - Negative sentiments widespread in academia and policy:
 - 'Landgrabbing', 'new colonialism', 'predatory lending', 'no local benefits',
- Need for a more balanced and nuanced perspective (Kaplinsky and Morris, 2009; Sun, 2017)?
- Need to deconstruct the idea of 'China' operating as a uniform state apparatus in Africa (Shen and Power, 2017)?

Research questions

- In the renewable energy (RE) sector, most research on China in Africa focus on large-scale hydro power
- We analyse the role of China in relation to hydropower, wind turbines and solar PV technologies
- Research questions
 - (i) How are Chinese actors currently operating in the RE sector in Africa?
 - (ii) What are the social and economic co-benefits of Chinese RE projects in Africa?

Analytical perspective

Broad perspective drawing on:

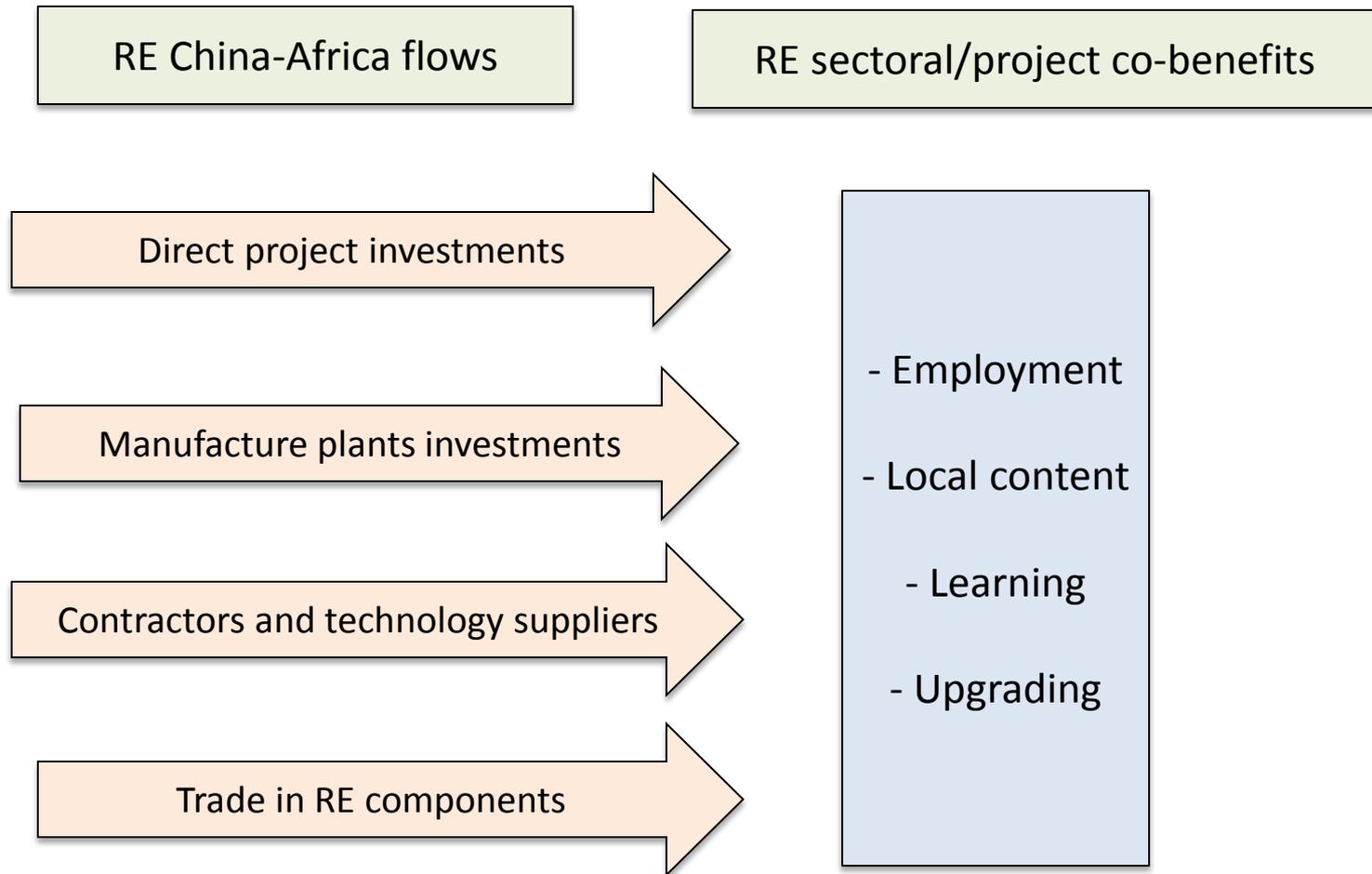
- Literature on international technology transfer: cross-border flow of tangible and immaterial items (Bell, 1987; Ockwell et al., 2008; ...)
- Spillover from foreign direct investments: labour turnover, demonstration effects and supplier linkages (Saggi, 2000; Javorzik, 2004; ...)
- Upgrading in global value chains: 'learning from importing', lead firms and governance (Gereffi et al., 2005; ...)

Data and methods

- Review of grey literature on the role of China in Africa's RE sector (reports by IRENA, IEA,)
- Review of existing project databases (thewindpower.net, Enerdata, Solarplaza, etc.)
- Trade statistics (UN COMTADE database)
- Empirical research in Kenya and South Africa on specific RE projects
- Case studies in the peer-reviewed literature on specific RE projects.

Main findings (RQ1)

- Disentangling/deconstructing the role of 'China' in Africa
- We identify three main types of flows:
 - 1. Foreign direct investments:**
 - a) Direct investments by Chinese companies in RE projects in Africa
 - b) Chinese investments in local RE manufacture plants in Africa
 - 2. Global value chains:** Project involvement of Chinese lead firms (project turnkey contractors) and technology hardware suppliers
 - 3. Trade in goods:** Imports of RE components from China to Africa.

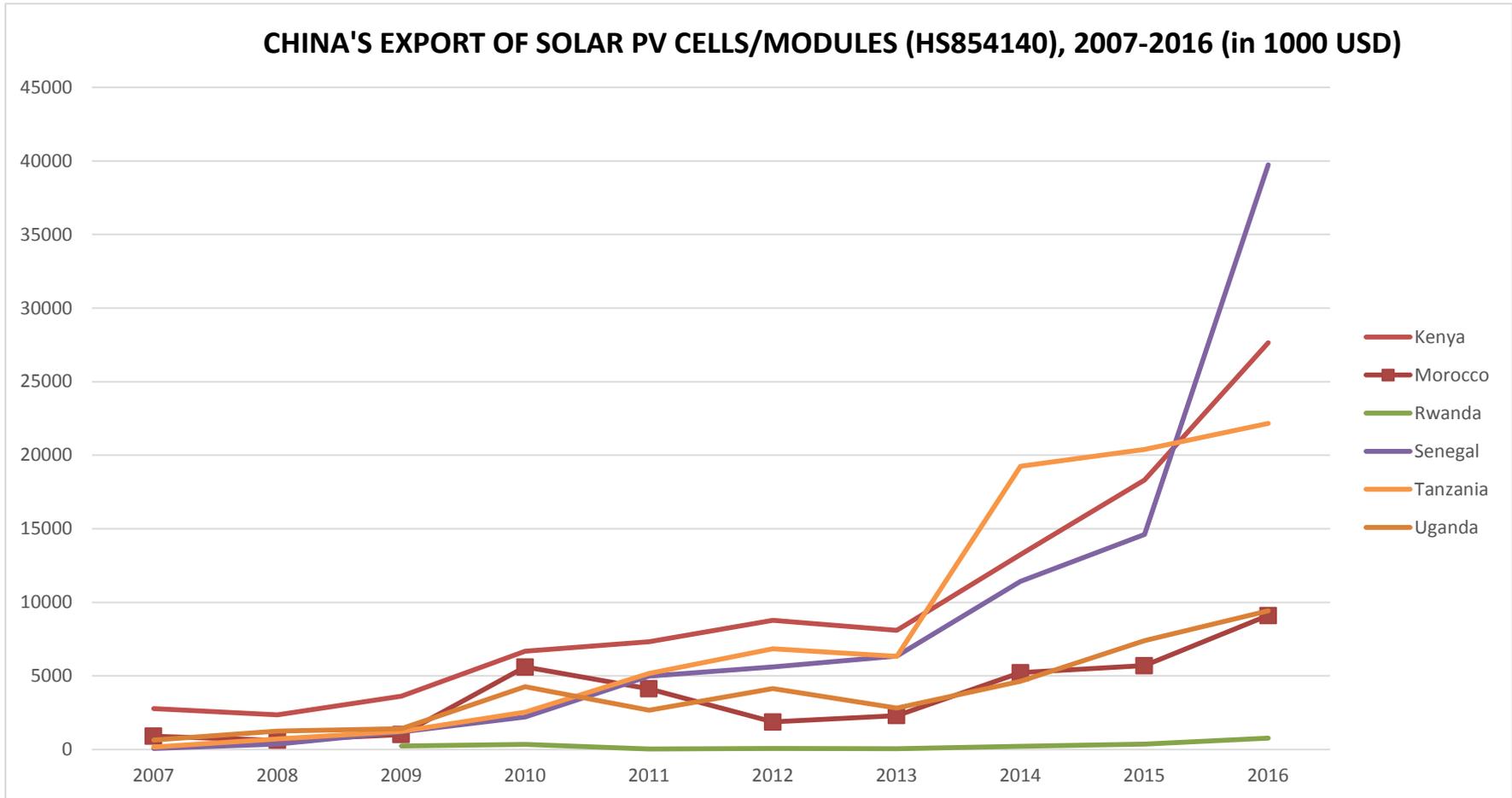


Main findings (RQ1)

Direct Chinese investments:

- Increasing Chinese direct investments in large wind and solar PV projects as complement to hydropower
 - Large hydro: 56%:, other RE sources: 7% (wind, solar, biomass and geothermal)
 - Total investments in new capacity: US\$ 13 billion (2010-2015)
 - China EXIM Bank main investor in 60% of the RE projects
- Near total absence of investments in local RE production capacity
 - Wuxi Suntech (warehouse), Jinko Solar (assembly) in South Africa.

Main findings (RQ1)



Main findings (RQ2)

- Existing research generally highlight negative impacts, especially hydro..
- But, may be more to the story based on case studies:
 - Bui Hydro Dam in Ghana (400 MW), Adama wind in Ethiopia (153 MW), Garissa solar PV plant in Kenya (55 MW)
- Example of socio-economic co-benefits: Direct employment in construction
 - Bui Dam: 1,836 construction workers (91% Ghanaian, 9% Chinese) (Kirchherr et al., 2016)
 - Average of around 20% employed during dam construction in Africa is Chinese (Brautigam, 2015)
 - Chen (2016) estimated 1,500 employees involved in Adama (66% Ethiopians, 26% Chinese workers)
 - Indirect employment and operation and maintenance jobs?
 - Local content, such as involvement of local sub-suppliers and service providers (Garissa)
 - Technology transfer and 'learning through participation' (Adama).

Concluding reflections

Based on our tentative findings, it appears that:

- 'China' operate in Africa in a less uniform manner than normally perceived
- Various types of 'flows' involving different types of state and non-state actors engaged both directly and indirectly
- But, how do these flows differ more specifically (further disentanglement)?
- Are underlying motives and strategies aligned and coordinated?
- Raise a need for a more detailed understanding of how China operate in the RE sector Africa as a starting point
- Generally increasing research on large scale RE projects in Africa.

Concluding reflections

Anecdotal evidence points at:

- Co-benefits associated with Chinese built RE plants in Africa
- Negative impacts still important, but always for the worse in all respects?
- Raise questions about a need for a more balanced perspective
- Does impacts differ across RE technologies, project size, investors, countries, project-specific configurations?
- Is some form of Chinese involvement the key determinant variable?
- Nature of types of skills and capability missing and developed?
- Short term vs. longer term impacts, e.g. employment and learning
- Studying the role of China in its own right to allow for comparison.

Thank you

Suggestions and inputs are welcome

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