THE POWER TO GROW

THE NEXUS BETWEEN POWER AND AGRICULTURE IN SSA

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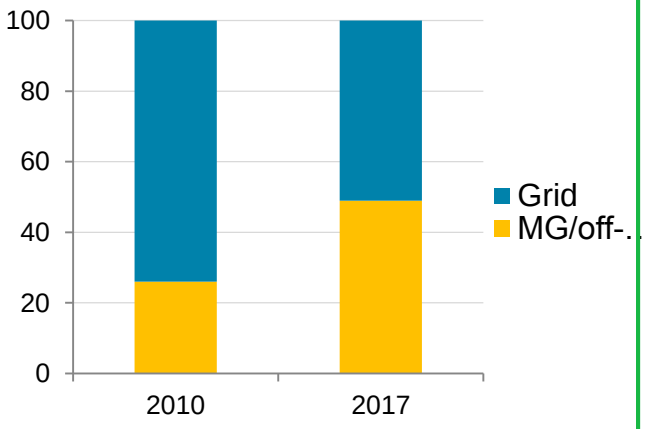
Increasing access to reliable, affordable energy is the overarching goal of the WB Energy practice

- 600 million people without access to electricity in Sub-Saharan Africa
- Financial viability of electricity supply – especially to rural areas – is a key constraint to scaling up electricity access
  - Small dispersed loads and low affordability
  - Anchor loads/productive uses
  - Availability of different technological options
  - Improvements in upstream planning and coordination

Percentage of access supported through WB projects



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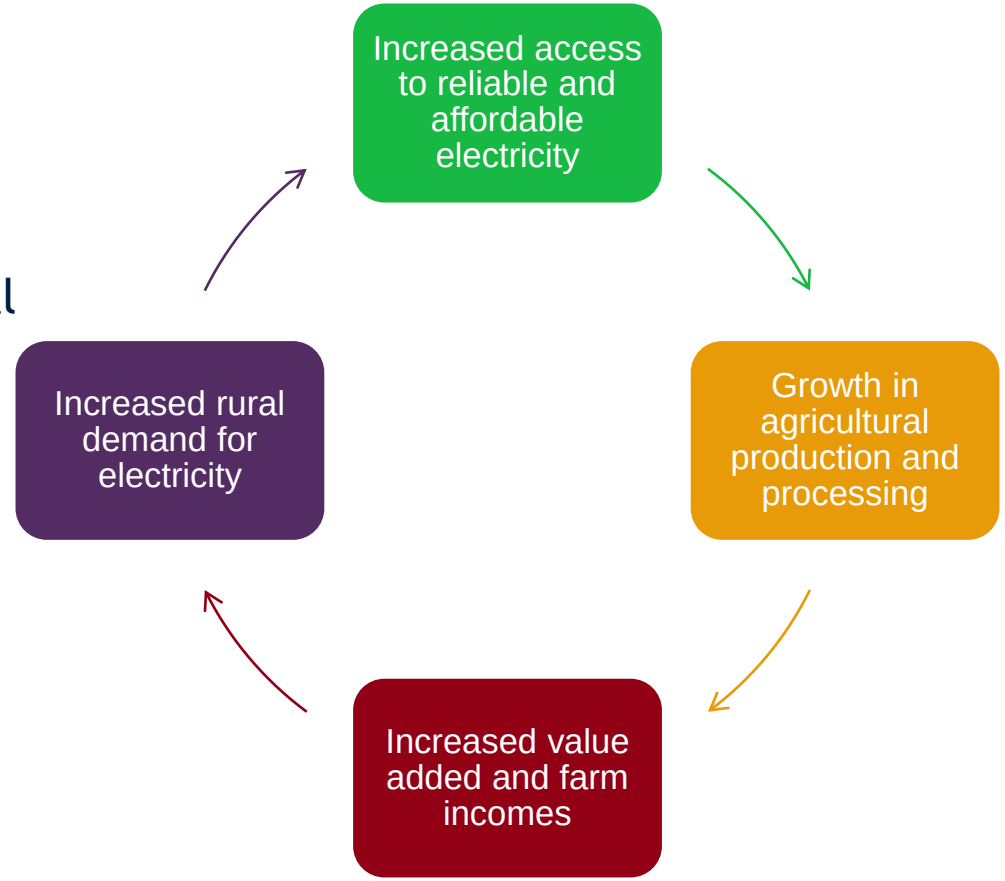
Power Agriculture Nexus – the Energy sector perspective

- The nexus approach recognizes the salience of interactions across sectors, going beyond the conventional within sector cause-and-effect approach

- Agriculture is most important source of productive load in rural communities – enhanced welfare impact of rural electrification



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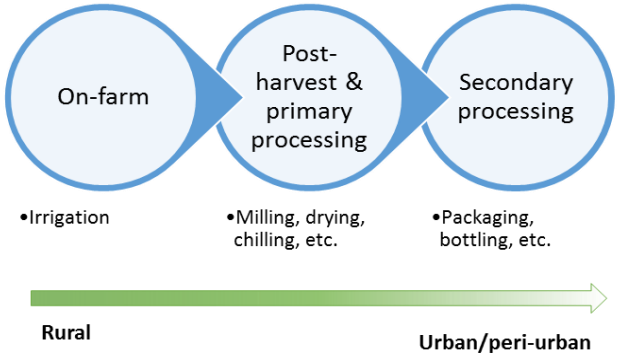
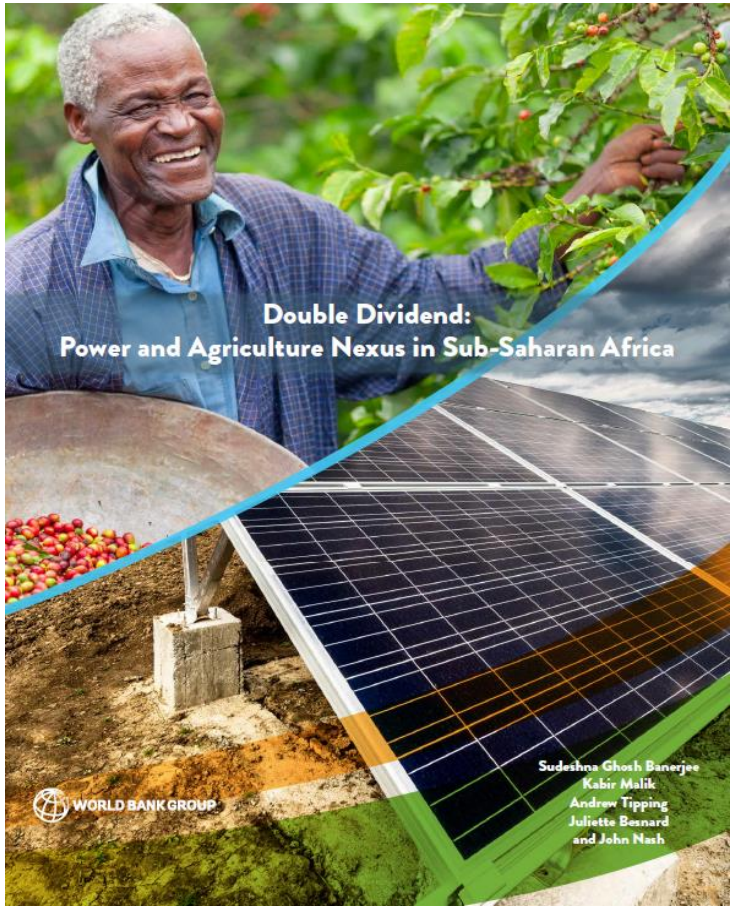
Double Dividend: Power & Agriculture Nexus in SSA

- Expanding urban food markets in SSA – on the back of robust economic growth ($1 trillion by 2030)
- Agricultural sector must respond though increased productivity and development of value chains
- By 2030, the region's electricity demand from agriculture is estimated to double to about 9 GW



- Rural electrification projects – both grid and off-grid – promote the productive uses
- Anchor loads in agriculture can enable viability of Grid and off-grid supply arrangements for community electrification
- Such programs can also deliver strong climate benefits by promoting cleaner energy technologies and off-setting existing use of fossil fuel powered processes



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Double Dividend: Power & Agriculture Nexus in SSA

Demand Source

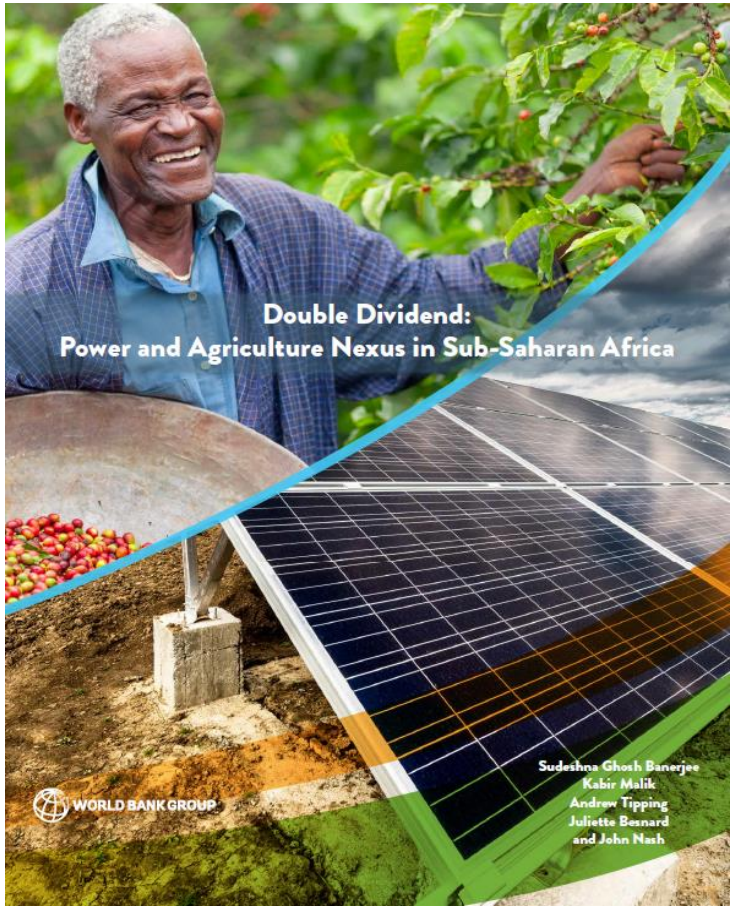
- Irrigation will likely be the largest stable source of electricity demand from agriculture in rural areas
- Electricity intensive value chains (poultry, livestock, floriculture, tea, etc.) may also be significant sources of electricity demand driven by urban demand

Supply arrangement

- Large scale agriculture developments may justify main grid extension
- Mini-grids: remote consumers, grid unreliability, and leverage private sector funds to accelerate rural electrification
- Rapid technological change in increasing the competitiveness of decentralized, stand-alone supply options.

Key Challenges

- Seasonality of power demand
- Physical and market infrastructure development
- Fragmentation of load



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Recommendations

1. The region's policymakers and power companies must think about demand creation

2. A coordinated planning, encompassing geospatial efforts and multi-agency inputs, is necessary

Recommendations to operationalize power-agriculture integration and overcome challenges to harnessing such complementarities

3. Policymakers can support a stable regulatory environment for electricity suppliers and the financial health of the sectors

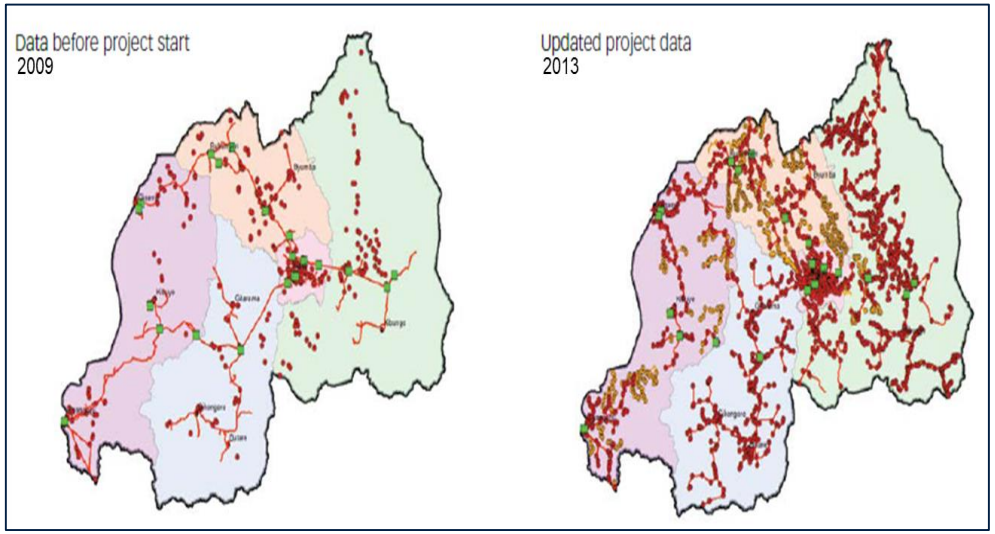
4. The power-agriculture nexus should be part of the low-carbon growth agenda and integrate climate change resilience

5. Dialogue across sectors (energy, agriculture, water) must be forged to operationalize this agenda

Operationalization of the Nexus in SSA

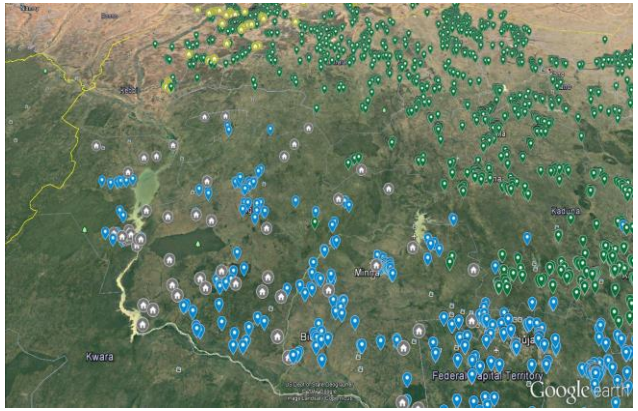
1. Geospatial Electrification Planning: SSA

- Upstream coordination in electrification planning and agricultural development
- Inclusion of GIS layers capturing electricity demand from agricultural activities



2. Approaches to electrification investments: Nigeria

- Close coordination between the Energy and Agriculture practices to target mini-grid development
- Agriculture project: matching grants to increase farm productivity for various value chains through adoption of irrigation and processing technologies
- Energy project: $ 150 million (proposed) for mini-grid development based on solar-hybrid technology



3. Support for grid and off-grid and productive uses: Tanzania, Kenya, Malawi, Zambia

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Thoughts – looking ahead

- **Technology**: Energy efficiency has been a great driver of off-grid electricity solutions, resulting in falling costs to liquidity constrained consumers. Similar opportunities can arise from energy smart processing technologies – even greater impact as these are income enhancing.
- **Business models**: critical and are interwoven with technology
  - Grid based: low cost technologies, planning inputs based on big data and satellite imagery
  - Off-grid: smart metering, energy efficient appliances, mobile payments
- **Information**: Quality standards and awareness campaigns are key to uptake of new technologies and market growth in off-grid electrification. Similar lessons for agri-food technologies?
- **Collaboration and co-ordination**: What can we do to break the barriers and work more closely together? How can the energy sector and policymakers help agricultural sector deliver its mandate?
  - Landscape vs. technology/value chain approach