How will agricultural sustainability policies in the West impact the rural poor in Africa?

The promising role of Agroecology
Almost all aspects of human life depend on a thriving natural world

Stockholm Resilience Centre (2016)
Impacts of our current food systems

- Agriculture is responsible for 80% of global deforestation
- Food systems release 27% of global GHGs
- Agriculture accounts for 70% of freshwater use
- Drivers linked to food production cause 70% of terrestrial biodiversity loss
- Drivers linked to food production cause 50% of freshwater biodiversity loss
- 52% of agricultural production land is degraded

Sources: Kissinger et al., 2012; Campbell et al., 2017; CBD, 2014; ELD Initiative, 2015; IPCC, 2019
The need to increase production – but where?

Tittonell et al. (2016)
Data source: FAOSTAT
The need to increase production – but how?

Sustainable Intensification vs. (Agro-)Ecological Intensification

Table 1

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Classical agronomy</th>
<th>Agroecology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disciplines</td>
<td>Auto-ecology (populations)</td>
<td>Syneconology (communities)</td>
</tr>
<tr>
<td>Dynamics</td>
<td>Predictable outcomes (risk probabilities), feedbacks formalised, continuity</td>
<td>Complex feedbacks, randomness, hysteresis (non-linearity, irreversibility, discontinuity)</td>
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<tr>
<td>Diversity</td>
<td>A burden (e.g., weeds, heterogeneity, asynchrony) Theory of control (best practices)</td>
<td>An attribute (e.g., synergies, natural antagonisms, risk spreading) Theory of regulation (let nature do its job)</td>
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<tr>
<td>Up-scaling</td>
<td>Aggregation (nest systems from field to world). Production at scale S (Ps) is calculated as:</td>
<td>Emerging properties and interactions (the whole is more than the sum of its parts).</td>
</tr>
<tr>
<td></td>
<td>$Ps = Y_e \times Ae + \ldots + Y_h \times An$</td>
<td>Production at scale S (Ps) could be calculated, for example, as:</td>
</tr>
<tr>
<td></td>
<td>$Y_{e,n}$: yield in production environments e, n</td>
<td>$Pe = (Y_{1,e} + Y_{2,e} + Y_{e} \times Y_{h,e} \times Y_{h,n}) \times Ae$</td>
</tr>
<tr>
<td></td>
<td>$A_{e,n}$: area of production environments e, n</td>
<td>$Pn = (Y_{1,n} + Y_{2,n} + Y_{n} \times Y_{h,n} \times Y_{h,n}) \times An$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$Ps = Pe + \ldots + Pn + Pe \times \ldots \times Pn$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$Y_{1,2,e,n}$: yield of activities 1, 2, i in production environments e, n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$A_{e,n}$: area of production environments e, n</td>
</tr>
</tbody>
</table>

Tittonell (2014)
A Green Revolution for Africa?

• 15-year-old effort to the tune of $1 billion

• **Goal:** ‘double yields and incomes for 30 million small-scale farming families while halving food insecurity by 2020’

• ‘PIATA improved maize yields in Ethiopia, Ghana, and Nigeria, but **not** in Tanzania, Burkina Faso, or Kenya.’

• ‘Across these six countries, only farmers in Burkina Faso experienced improved maize sales as a result of PIATA.’

• ‘Farmers who adopted improved inputs and experienced yield increases were typically younger, male, and relatively wealthier…. productivity and income gains were also concentrated among these relatively high-resource farmers.’

• ‘AGRA’s next strategy could formally recognize that agricultural technologies and practices—such as fertilizer use and rice cultivation—can negatively impact environmental conditions and greenhouse gas emissions.’
What is Agroecology?

IPES-Food (2016)
What is Agroecology?

The **10 Elements of Agroecology** (FAO, 2014)

The **13 Principles of Agroecology** by the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2019), adapted by Biovision Foundation.
Measuring the Performance of Agroecology

Tool for Agroecology Performance Evaluation (TAPE) - Test version (FAO, 2019)
Measuring the Performance of Agroecology

Tool for Agroecology Performance Evaluation (TAPE) - Test version (FAO, 2019)
• Over last decade, growing body of literature demonstrating positive impacts of agroecology:

- **Environment** (Francis et al., 2003; Gliessman, 2015; Modernel et al., 2018)

- **Food and nutrition security** (Luna-González and Sørensen, 2018; Deaconu and Mercille, 2019; Kerr et al., 2019, Kerr et al., 2021)

- **Households' incomes** (D'Annolfo et al., 2017; Van der Ploeg et al., 2019).
The role of industrialized countries in Africa’s agricultural development

• Shift in research foci
• Reallocation of Official Development Assistance (ODA)
• Smallholder focus of climate finance
• Halting of trade agreements & investment treaties
• Binding regulations on Human Rights standards & curbing of corporate power
• Inclusive (multilateral) decision making
My work at Both ENDS with partner organizations on agroecology

https://www.bothends.org/en/Whats-new/Publicaties/
Stefan Schüller, s.schuller@bothends.org
Agroecological approaches operationalized in five levers at three levels of action (Gliessman 2014, 2016)
Figure 2: Agroecological elements in relation to key approaches in Dutch development policies for inclusive and sustainable food systems (authors’ own elaboration)