The Potential for Socially-Inclusive Development Models for Bio-Fuel Crops in Mozambique:

Institutional Arrangements and Poverty Reduction Effects

Rui M.S. Benfica

Maputo, Mozambique

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Outline

- Why care about socially inclusive models for Bio-fuel Crops?
- Alternative institutional arrangements with Smallholders
- Institutional arrangements, inclusiveness and poverty reduction
- Examples from Mozambique
- Conclusions for Inclusiveness and Poverty Reduction
- Implications for bio-fuel crops
Why Care about Socially-inclusive Models for Bio-fuel Crops?

- Smallholder dominated agriculture
- Bio-fuel crops generally well suited for plantation models:
  - Capital intensive
  - Weak linkages to smallholders
- In spite of relative abundance of land, smallholder displacement is a real threat
  - Food security
  - Rural livelihoods/poverty
- There is room for alternative models that are more inclusive and can generate stronger poverty reduction effects, while ensuring profitability in marketing/processing

Alternative Institutional Arrangements

- Spot market trading: Processors/traders with independent farmers
- Contract coordination/Interlinked Transactions: Processors/traders with contract farmers
- Vertical Integration: Plantation agriculture
Spot market trading: 
Processors/traders with independent farmers (IP)

- Production and supply of crop by independent producers
- Favorable for crops and areas with
  - Low transaction costs
  - Efficient product and factor markets, and effective service delivery
- Actors flexible to respond to market conditions
- In Africa, where transaction costs are high, and markets fail/missing, NOT reliable for many high value crops due to reliability of supply, and inconsistent quality.
- Sub-sectors in Mozambique: Maize, cashew, mango, etc.

Interlinked Transactions: 
Processors/traders with contract farmers (CF)

- Contracting between two levels in the supply chain
  - Processors/traders supply inputs/assistance on credit
  - Farmers agree to use inputs as instructed and supply all output at agreed price (minus input costs)
- Response to weak/missing input and credit markets
- Government gives firms regional monopsony rights
- Limitations:
  - Barriers to entry due to selectivity
  - Price instability/distortion in residual market
  - Monopsonic power => assymetric negotiations
- Sub-sectors in Mozambique: Cotton, tobacco, etc
**Vertical Integration:**
**Plantation agriculture (PA)**

- Production and marketing/processing stages combined under common management/ownership

- Firms engage in direct production of crops
  - Saves logistical and information costs associated with procurement of raw materials and sales of outputs
  - Eliminates uncertainty/risks regarding volumes and quality
  - Can be an effective response to market failure

- Problems with vertical integration:
  - Social costs due to market concentration and reduced tax revenue
  - Scale incompatibility between internalized stages of production
  - “Bias” towards internal supply while external supply may be available at better quality and/or lower prices

- Sub-sectors in Mozambique: Sugar, Tea.

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**Organization of Production and Trade:**
**A Conceptual Framework (1)**

Model of contractual preferences:

\[
Y = [X(Z)]
\]

- **Y** – Vector of alternative arrangements (IP/CF/PA)
- **X** – Vector transaction characteristics:
  - Conditions of asset specificity
  - Degree and type of uncertainty
  - Complexity and frequency

- **Z** – Vector of determinants of transaction characteristics
Organization of Production and trade: A Conceptual Framework (2)

Y – Alternative Institutional Arrangements/Forms of Organization
X – Transaction characteristics: asset specificity, uncertainty, complexity and frequency.

Determinants (Z) of Transaction Characteristics (X)

<table>
<thead>
<tr>
<th>Production Characteristics (Z₁)</th>
<th>Processing/Marketing Characteristics (Z₂)</th>
<th>Economic and Political Factors (Z₃)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor intensity</td>
<td>Economies of scale</td>
<td>Land availability</td>
</tr>
<tr>
<td>Economies of scale</td>
<td>Quality standards</td>
<td>Market development</td>
</tr>
<tr>
<td>Input intensity</td>
<td>Degree of perishibility</td>
<td>Communication infrastru.</td>
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<td>Perinial vs annual crops</td>
<td>Value/weight/volume</td>
<td>Level of skills/education</td>
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<td></td>
<td>Exportability</td>
<td>Strength of legal system</td>
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<td></td>
<td>Multiplicity of local buyers</td>
<td>Strength of local govt</td>
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<td></td>
<td>Domestic processing</td>
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</tbody>
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Institutional Arrangements, Inclusiveness and Poverty Reduction

- Impact of arrangements on inclusiveness and poverty reduction is an empirical question

- Some key concepts to consider:
  - Linkages: Production (forward/backward), consumption
  - Direct effects: wages and smallholder profits
  - Indirect effects: wages from secondary employment and re-spending in non-farm goods

- For either direct or indirect effects to be felt and sustained, activities must be profitable for both the firm involved and smallholders alike

Examples from Mozambique
Tobacco – Contract Farming (1)

Why contract farming predominates?

- Product quality and farm yields depend on intensive input use (knowledge), but input/credit markets weak => Independent producers not viable => Need for vertical coordination

- Plantation not attractive due to high labor intensity => high supervision costs

- Disperse production by smallholder possible due to high value/weight => low transport costs

- Raw output that needs processing before final sale => limited number of buyers => low risk of default => Contract farming e
Examples from Mozambique
Tobacco (Contract Farming) (2)

Links to Inclusion/Poverty Reduction

- Profitable to promoter/firms
- High cash benefits to participating farmers
- Wage Employment to non-growers (labor intensive)
- Technology spillovers
  - Input use in food crops
  - Rotation/residual fertilizer for food crops
  - Adoption by non-growers
  - Local Re-spending
    - Vibrant non-farm economy
- Strong economy-wide effects of expansion and sector policies

Examples from Mozambique
Sugar Cane – Plantation Agriculture

Why plantation predominates?

- Needs high investment in equipment (e.g., irrigation, etc)
- Dispersed production (IP and CF) not viable due to:
  - Need of abundant land, water and railroad access
  - Low value/weight of sugar cane => high transport costs
- Needs high economies of scale in production to be compatible in scale with processing capacity
- Needs raw material of consistent quality
- All these factors favor Plantation agriculture
  - BUT more inclusive coordination mechanisms possible
- Under current models relatively Limited inclusion of smallholders and linkage effects weak for broad-based poverty reduction effects
Conclusions for Inclusiveness and Poverty Reduction

- Under ideal conditions, IP is highly inclusive with potential for poverty reduction,
  - But under current conditions it does not support high value crops
- PA generates only one direct effect (wages) and tends to use capital intensive technologies.
  - It will generally be less inclusive and
  - Due to weak linkages, generates less poverty reduction than successful CF
- In our context sustainable inclusion and poverty reduction can be achieved by
  - Making contract based relationships (CF) successful. i.e., financially attractive to firms and profitable to smallholder; and
  - Relying on indirect effects as well (local farm employment, and re-spending)

Implications for Promotion of Bio-fuel Crops (Jatropha, coco, etc)

- A successful development model for bio-fuel crops has to promote growth, employment and broad-based poverty reduction effects
  - Maximize direct and/or indirect effects on smallholders
  - Secure profitability to value chain actors
- New initiatives need to be structured in a way that smallholders are included and not crowded out
  - Balanced coordination mechanisms in production/marketing
  - Promote hybrid Plantation + Contract Farming arrangements
  - Aim at high yielding varieties/larger areas per farmer
- Government needs to facilitate private investors initiatives, through
  - Undertaking public investments in infra-structure
  - Adequate land allocation policy
  - Creating a better/healthier business environment
  - Giving added incentives to pro-poor (socially-inclusive) initiatives
Source Papers (by author):


