Private sector investment in the biofuel value chain in Ghana seen in an innovation system perspective

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Objectives, concepts and approach

Research question
Why and how were large-scale export productions of biofuels established in Ghana? Why did the investment projects fail?

Conceptual framework
MLP framework (transition framework) for analysis of technology niche development, including adoption theory and hype cycles
Global value chains perspective for being attentive to investment drivers and international linkages

Methodology:
Literature review, review of journal papers
Interviews with stakeholders presenting different strategic interests: (Investors, CEO's, plant managers, farmers, universities, government (energy commission))
Field visits to producers and plants
The hype of Jatropha in Ghana

1995-2005: Slow preparation stage
- oil price
- transport fuel
- Donor projects,
- local champion

2006-2008: Rush for land and large scale investment
- Oil price, EU-blending,
- National policy,- NGO
- Massive investment,
- First critical reports

2009-2011: Crises
- Financial crisis, oil price
- Oil-exploration, national policy
- High cost and low yield
- Number of enterprises go bankrupt or hibernate
- Kimminic and Smart oil expands

2012-2015: Liquidation and hibernation
- access to capital, oil price
- policy and blending mandate postponed
- The largest player Kimminic stops payment
- Smart oil opts for more profitable value chains

Observers pessimistic about development of a viable niche
High expectations became reasons for failure

The hype around Jatropha also became the reason for its likely failure.

- At the landscape level, the **overheated international finance markets** leading up to the financial crisis in 2008, was a driver until 2008, and became a hindering factor after 2008 influencing as well fuel prices as access to capital.

- At the niche level, the claim of Jatropha being an 'environmental wonder crop' was used as a mobilizing metaphor for involving actors and access to capital, and led to disappointment when these claims were not achieved.

- **Exaggerated claims of access to land** was a strong driver for access to capital for the individual company, but the resulting accuses of land grabbing and the fuel vs. fuel discussion became a strong hindering factor for the niche development in general.
Value chain governance

Important requirements for market access
- Physical quality (chemical composition, purity)
- Environmental quality (Traceability and sustainability; certification)
- Volume (high)

Implications
- Requires strong coordination along the chain
- Requires large amount of capital
- Important for who are able to participate in the value chain.

Lead firms
- Oil companies (refineries, blenders, wholesalers, retailers)
- Foreign-owned biofuel producers (they control the resource)
Value chain governance

Markets:
- Local small scale market (straight vegetable oil, low demand)
- Local markets (blending mandates, uncertain demand)
- Export markets (lowest risk in terms of demand)

Strategies:
- Involving oil-companies as main shareholders, ensuring capital and export market for crude oil for refining in EU
- Establishing own biofuel processing/refining capacity ensuring access to export market and opportunity for supplying local market
- Establishing local value chains

Export was contingent on large quantities of biofuel
- Need of rapid growth to ensure volume
- Need for vertical integration in value chains to reduce risk and bottlenecks (production of seedlings, production of seeds, extraction, refinery and transport to oil companies in Europe)
- Need of large amounts of capital
Value chain governance

Open chain
- Bulk sales
- Refining
- Pressing
- Cultivation

Vertical integration
- Kimminic
  - Bulk sales
  - Refining
  - Pressing
  - Cultivation

Bio-polar structure
- Biofuel Africa
  - Bulk sales
  - Refining
  - Pressing
  - Cultivation

Local value chain
- Ghaya
  - Local consumer
  - Pressing
  - Cultivation
Conclusion

• The agricultural sector in a developing country is unable to respond 'quickly' to increased demand for biofuels
• Analysis of GVC dynamics, aspects and/or structures is essential for understanding biofuel niche development
• International actors, policies and linkages are critical for success or failure of biofuel value chain development
• National protected regimes were not important in this case (mainly export projects)
• Investors wanted to control large parts of the value chain, from production up to wholesale.
  • Strong vertical coordination was deemed necessary to deliver what the EU market wanted.
  • Access to capital and buyer commitment became critical aspects
Kimminic,
5,000-10,000 ha. abandoned and overgrown with weeds
Kimminic,
A biodiesel factory - 400 tons/day

Abandoned during construction, due to lack of finance
Kimminic - dismantled and stolen machinery
THANKS FOR YOUR ATTENTION