Inclusive Value Chains, Agricultural Development and Poverty Reduction

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Key Points

• Value chain development (VCD) is a potentially **important** source of agricultural growth

• Type and amount of VCD **varies significantly** across countries / time / commodities

• Much **variation** in the institutional design

• Inclusion of **smallholders** is mixed

• Poverty can be affected through **multiple channels**

• **Significant future potential**, but also limits:

  – **Private:**
    • Models observed in transition countries in 2000s are increasingly observed in LDCs
    • **Private VCD is concentrated in “higher value”-chains**

  – **Public:** Increasing initiatives to use VCD to reach poor farmers
A simple value chain model

- **Input/Technology Company**
  - Finance
  - PRODUCT (Technology & Inputs)
- **Farmer**
  - Finance
  - PRODUCT (Raw Material)
- **Processor**
  - Finance
  - PRODUCT (Processed)
- **Consumer**
Finance, technology and value chains

• Nature of the different markets in the value chain will be different because of the nature of the production process and financial requirements

  – **INPUTS** (technology @ farm level / raw material @ processor level) needs to be supplied at the start of the production process

  – Payments for **OUTPUT** comes at the end of the production process

=> **Finance** is crucial to bridge the gap between the two.

• This difference is stronger when

  – **Access to finance** (loans/own liquidity) is more difficult for different agents along the value chain
  – **Duration** of production processes vary
Value chain innovation 1

Technology Company

Farmer

Raw Material

Processor

Processed product

Consumer

Finance

TECHNOLOGY & INPUTS
What other analyses find ...

“Private agricultural marketing companies have become dominant providers of smallholder input credit in Sub-Saharan Africa.

In various countries of the region, they are today in practice the sole providers of seasonal input advances to the small-scale farming community.”

IFAD (2003, p.5)
### Why do farmers contract in value chains?

**Central Asia (Cotton – WB Study)**

<table>
<thead>
<tr>
<th>Reason for contracting (%)</th>
<th>Kazakhstan 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed prices</td>
<td>4</td>
</tr>
<tr>
<td>Guaranteed sales</td>
<td>6</td>
</tr>
<tr>
<td><strong>Access to credit</strong></td>
<td><strong>81</strong></td>
</tr>
<tr>
<td>Access to quality inputs</td>
<td>11</td>
</tr>
<tr>
<td>Access to technical assistance</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
</tbody>
</table>
Value chain innovation 3

- Technology Company
- Farmer
- Processor
- Consumer

Directional arrows and labels:
- Tech & Inputs
- Raw Material
- Finance
- Processed product
TRIANGULAR STRUCTURES
Processor/Retailer – guaranteed supplier loans:

- Retailer/processor provides loan guarantees for bank loans to suppliers
Poland Dairy Sector 1995 - 2003

VCD innovations & small farm investments (milk cooling equipment)

(Dries & Swinnen, WD 2002)
Value Chain Organization
From “simple” to “sophisticated”

• Trade credit
  – (Input supply programs)
• Investment loans
• Bank loan guarantee programs
• Leasing
• Warehouse receipt systems
• ...

## VC in Romanian Dairy - 2004

<table>
<thead>
<tr>
<th>Type of support</th>
<th>DANONE</th>
<th>FRIES-LAND</th>
<th>PRO-MILCH</th>
<th>RA-RAUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension services</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quality inputs</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Input Pre-finance</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Investment loans</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bank loan guarantees</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
From empirical observations

1. Value chain innovations can contribute importantly farm access to finance and to technology transfer

2. But: contract enforcement problems are very serious (breach on both sides)

3. Structure of the value chain is endogenous
   – to market imperfections
   – to enforcement institutions
   – to nature of the commodity
   – to nature of the technology

4. Benefits for the poor can come through 3 channels:
   – Access to inputs and markets
   – Efficiency premia for poor suppliers
   – Employment opportunities for poor households
Value Matters!

Condition for contract feasibility
(without external enforcement)

**Minimum value** required to enforce contracts via efficiency premia

=> Private VCD works better in high value markets than low value commodities (e.g., staple foods)
Value & VC

Commodity Value
(& Characteristics)

Governance of Value Chain (incl VCF)

Surplus Creation & Surplus Distribution along the Value Chain
Efficiency & Equity in Value Chains with Imperfect Markets

Value affects both *surplus creation* and *surplus distribution*.
Note: with vertical coordination, policy changes that affect output markets will also affect input provisions ("endogenous vertical coordination"). Examples are liberalization programs in the 1980s and 1990s.

Staple food crops (low value)

- State-controlled governance systems are still prevalent (food self-sufficiency is a political issue)

- Private VC is less developed, private trade relies mostly on simple spot market transactions
Traditional export crops
(medium value)

- **Shift to Private Governance** organized around private trading and processing companies, with interlinked VC contracts …

- **Major contract enforcement problems in VC**
Non-traditional export crops (high value)

- **Recent phenomenon** with strong expansion after economic reforms

- Completely private VC governance with extensive vertical coordination
## Changing structure of trade

### Product Share in Agri-Food Exports from Developing Countries (%)

<table>
<thead>
<tr>
<th>Product Category</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TROPICAL products</strong></td>
<td>39.2</td>
<td>16.7</td>
</tr>
<tr>
<td>(Cocoa, tea, coffee, sugar, …)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEMPARATE products</strong></td>
<td>28.8</td>
<td>27.0</td>
</tr>
<tr>
<td>(Meat, milk, grains, …)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SEAFOOD, FRUIT &amp; VEGs</strong></td>
<td>21.6</td>
<td>44.1</td>
</tr>
<tr>
<td><strong>Other PROCESSED</strong></td>
<td>10.4</td>
<td>13.2</td>
</tr>
<tr>
<td>(tobacco, beverages, …)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Empirical evidence *

1. Smallholder inclusion is mixed

2. Smallholders can have significant benefits if included, even with concentrated supply chains

3. Benefits from employment can be important for the poorest and women

* See also reviews by Maertens and Swinnen (JDS, 2012; WTO 2014; ARRE 2015)
# Comparative Illustration: 3 Cases of SSA Hort Export to EU VC

<table>
<thead>
<tr>
<th></th>
<th>Small-holders</th>
<th>Industry structure</th>
<th>High value exports to EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madagascar green beans</td>
<td>100% contract</td>
<td>Monopoly</td>
<td>yes</td>
</tr>
<tr>
<td>Senegal green beans</td>
<td>Mixed &amp; changing</td>
<td>Competition</td>
<td>yes</td>
</tr>
<tr>
<td>Senegal cherry tomatoes</td>
<td>0%</td>
<td>Monopoly</td>
<td>yes</td>
</tr>
</tbody>
</table>
1. High standard F&V exports from Madagascar to the EU

- Rapid **growth**
  - 100 farmers in 1990
  - 10,000 small farmers on contract in 2005

- Major **technology** (fertilizer) adoption effects

- Important **productivity spillovers**
  - Rice **productivity** increased by 70%
  - Length of **lean periods** falls by 2.5 months
    - (with contract: 1.7; without contract: 4.3 months)
Our VC Studies:
Why do farmers contract in value chains?

Sub Sahara Africa -- Horticultural Exports

<table>
<thead>
<tr>
<th>Reasons for contracting (%)</th>
<th>Madagascar 2004</th>
<th>Senegal 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable income</td>
<td>66</td>
<td>30</td>
</tr>
<tr>
<td>Stable prices</td>
<td>19</td>
<td>45</td>
</tr>
<tr>
<td>Higher income</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Higher prices</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Guaranteed sales</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td><strong>Access to inputs &amp; credit</strong></td>
<td>60</td>
<td>63</td>
</tr>
<tr>
<td><strong>Access to new technologies</strong></td>
<td>55</td>
<td>17</td>
</tr>
<tr>
<td>Income during the lean period</td>
<td>72</td>
<td>37</td>
</tr>
</tbody>
</table>

*Source: Maertens et al., 2009; Minten et al., 2009*
2 & 3. Senegal Horticultural Export Value Chains & EU Standards

- **Export Value (1,000 current USD)**
  - Other fruits and vegetables
  - Tomatoes
  - Mangoes
  - Beans

- **Map of Senegal**
  - Key cities: Dakar, Saint-Louis, Thies, Richard-Toll, Diourbel, Kaolack, Tambacounda, Kolda, Naya, Matam, Podor, N'Dour, Ile de Goree, Basse-Casamance National Park, Casamance Region, Gambia, Guinea-Bissau, Guinea, Mauritania, Mali

- **Timeline**: 2003 to 2012
- **Export Value Range**: 0 to 70,000 (1,000 current USD)
EU Standards & Value Chain Structure: Green Bean Exports in Senegal

% household participation in region

- Employed
- Contract
- Participation
EU Standards & Value Chain Structure: Green Bean Exports in Senegal

% household participation in region

HH Income

Average household income (1,000 F CFA)

Total sample
Non-participants
Agro-industrial employees
Contract farmers

- Total household income
- Income from farming
- Income from agr. wages
- Income from non-agr. sources
Standards & Vertical Integration in F&V Export Value Chains in Senegal River Delta

Worst Case Scenario?

1. Very **stringent** standards
2. **Poor** country
3. Complete **exclusion of smallholders**
4. Extreme VC **consolidation**
5. Foreign owned multinational
Worst Case Scenario?

• Strong employment growth: 40% of households in the region employed

• Strong positive income and anti-poverty effects at HH and regional level

(Static estimates)
Income impact of wage employment

Agrifood VC sector

Service sector

Change in income per adult equivalent

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>q10</th>
<th>q25</th>
<th>q50</th>
<th>q75</th>
<th>q90</th>
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Case Study: Kidney Bean Value Chain in Kyrgyzstan Development, Nutrition and Food security outcomes

From the **mid-90s, bean production started** to develop for commercial purposes in the Central part of the Talas Valley due to sustainable demand from Turkish trading firms and an increase in the prices for kidney beans. Currently, **the share of beans exports of total export of the Talas region is 92-96%**, and as a result kidney beans are the region’s main export commodity.

Prevalence of poverty

Prevalence of stunting below age 5

*Source: Tilekeyev 2018*
Employment effects

• Especially important for the **poorest** (no land) and for **women**
What about domestic VC & staple foods?

• Much of our research on Eastern Europe & co focused on found extensive and widespread VC innovations in domestic VC.

• In poor countries (eg India & SSA), VC innovations seem concentrated in high-value VC. => *Can development programs help?*
Small dairy farmers in Bulgaria (2003-09)

Quality standards & Size distribution

- EU quality
- Other

<table>
<thead>
<tr>
<th>Year</th>
<th>EU quality</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>68.5%</td>
<td>14.3%</td>
</tr>
<tr>
<td>2009</td>
<td>31.5%</td>
<td>85.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herd size</th>
<th>2003</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Cows</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>3 to 5 Cows</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>6 to 9 Cows</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>More than 9 Cows</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Milk production in India and Punjab 2002-2017

Dairy in India 2008-2015

- Panel evidence from dairy farms in Punjab shows limited VC innovations despite significant market growth
- Very limited among smallholders
- Concentrated and emerging in (new class ?) of larger farmers

Source: Official statistics
Punjab (India) dairy value chain 2008-2015
Farm investments (Hygiene index) and VC channels

Source: Burkitbayeva, Janssen and Swinnen (2018)
Two stories from Ethiopia
Two VCs with increasing consumption

- Extensive empirical analysis of **Teff (staple food)** value chains in Ethiopia shows **no VC innovations** despite strong growth in consumption
  - (see various papers by Bart Minten, Seneshaw Tamru & co, incl “The Economics of Teff” 2018, IFPRI)

- **Growing beer value chains with extensive VC innovations.**
  - Beer consumption is increasing with rising incomes and expanding urbanization, and so are the number of beer factories (12). The most pressing challenge for breweries is quality and availability of malt barley.
  - Imports of malt (barley) are hampered by shortage of foreign exchange.
  - Contract farming for malting barley are growing in the most productive areas, with breweries providing free improved seed and technical assistance to farmers. Improved seeds are expected to increase yields by 100% and farmers are guaranteed a 10-15% price premium.
  - However, contract breach is widespread (50% of farmers stick to the contract) because with excessive demand for the malting barley, side selling is very attractive.
Future potential of VCD for poverty reduction

- **Private sector:**
  - strongest growth in high value sectors (with innovation requirements and potential)
  - Many of the models observed in East Europe in the 1990s are now developing in higher vl poorer countries, such as SSA

- **Public/Private/NGO sector**
  - Much of the CSR & NGO programs include VC-type elements
  - **How can one make VCD work in staple food markets?** (80-90% of poor countries’ agriculture)
VCD Initiatives by Gov’ts, NGOs & Development Organizations

• Much variation in VCD programs.
  
  – **Entry point** (farmer, buyer of agri-food producer, financial institution, multi-stakeholder platforms)
  
  – **Narrow** (focused on one actor/constrain) vs **integrated**
  
  – **implementation agency** (public, semi-public, or private)
  
  – **finance modality** (grant, subsidy, or (concessional) loan)
  
  – and the **intensity and length** of public involvement (one-time or continuous).
Example:
VCD model for SSA food staple sourcing

- Special purpose vehicle (SPV) to source staple foods by WFP in East Africa
- Joint project with World Bank, input supplying companies and re-insurance companies
VCD through Financial Institutions (VCF)

One potential model (IFC):

- Dedicated credit line/
  Risk sharing
- Technical assistance

IFC ➔ Farmer ➔ Buyer

- Loan ➔ Re-payment
- Product Delivery ➔ Payment
- Guarantee

Many variations possible.
Farmers Associations

Can help smallholder benefit through:

• Reduction of transaction costs
• Reduce small farmer constraints
  – Training (reducing human capital constraints)
  – Enhancing access to capital
• Enhance bargaining power

Evidence: “yes, but”

[And: are the poorest smallholders part of the associations ?]
-- see Section 6 of WB note
SUMMARY SLIDES

• Summary of “why do value chains work”
• Summary of policy implications
• Summary of lessons

Based on

When do value chains “work”?  

Value chains are more likely to overcome imperfections in credit and technology markets:

- If the total surplus created by the value chain is higher ("high value");
- If the costs of contract breach (incl. reputation costs) are higher;
- If the specificity of the contract/technology/product is higher (i.e. if the specific value of the product is lower for alternative buyers);
- If products are perishable and/or require specific storage and processing;
- If transaction costs in sourcing product are lower.
When do value chains include smallholders?

Smallholders are more likely to be included in value chains:

- If the farm sector is more homogeneous (i.e. when there are only/mostly small farms in the region);
- If sourcing from smallholders is “cheaper or not too much more expensive” than sourcing from large farmers or vertically owned estates. This is more likely
  - for products for which smallholders have a competitive advantage, i.e. products that are labor intensive;
  - if transaction costs per farmer (for searching, screening, communication of requirements, technology transfer, quality monitoring, etc) are not (much) higher on small farms;
  - if small farmers are less likely to breach contracts than large farms.
When do value chains reduce poverty (given that they work) ?

The poor can benefit

• directly from modern value chains either by participating as self-employed (contract) farmer or

• by being employed as worker on larger farms or in processing activities
When do value chains reduce poverty (given that they work)?

**Smallholders** are more likely to benefit

• If the value in the chain is larger;
• If farmers have stronger bargaining power;
• If there is significant demand for the produce and the farmer’s opportunity for side-selling the produce or for alternative uses of the value-chain-provided inputs/technology is larger (i.e. if the farmer’s hold up opportunities are larger);
• If the buyer’s alternatives and hold-up opportunities are lower; which is more likely if:
  – There are more alternative buyers
  – There are fewer alternative suppliers.
  – The specificity of the product requirements are less (i.e. product’s valuation by other buyers is higher)
  – The transferred technology has long term effects.
When do value chains reduce poverty (given that they work) ?

Employment creation through value chains is more likely to reduce poverty ...

- If the employment creation is complementary to small farms’ activities (i.e. employment is on large farms which do not take land from small farmers; or on processing and marketing activities in the chain);

- If new employment requires relatively low-skills, creating opportunities for the very poorest.
Policy Implications I

*Improve the enabling environment for value chain development*

- **Recognize the importance** of value chain developments for rural development policy.

- Create the **right policy and regulatory environment** for conditions for investment.
  - Property rights, low corruption, low administrative burden
  - Macro-economic stability
  - Contract enforcement institutions
  - Competition policy..
Policy Implications II

Enable smallholder inclusion in high value chains

- Lower trading costs through improvements in rural infrastructure (particularly important to reach remote areas).

- Reduce the number of transactions by investing in intermediary institutions and farmer organizations.

- **Empowering** farmers is needed to strengthen their position in the chain for bargaining for better contract terms and vis-à-vis governments for better policies.
Rethinking the role of the government

• Focus public support on sections not served by private sector
  – those firms or farms being excluded from private initiated programs,
  – those low-value market segments for which private solutions are unlikely,
  – those technologies that are not provided by the private sector.

• Value-chain development only part of the solution -> part of a wider rural development strategy

• Opportunities for engaging with other partners in VCD (PPPs, NGOs, multi-stakeholder platforms, ...)

• Selective government involvement in markets carries a number of risks (additionality, sustainability, distortion..)
Policy Implications III

Rethinking the role of the government

• Focus public support on those firms or farms being excluded from private initiated programs, those low-value market segments for which private solutions are unlikely, and those technologies that are not provided by the private sector.

• Value-chain development only part of the solution -> part of a wider rural development strategy

• Look for new opportunities to become directly involved in value chain development through PPPs, value chain finance, long term NGO support to farmers, and the facilitation of multi-stakeholder platforms

• Selective government involvement in markets carries a number of risks (additionality, sustainability, distortion..)

• Inclusiveness does not guarantee poverty reduction. The surplus created by value chain development might be claimed by other value chain actors.
Lessons I

1. Value chain developments are often driven by a need for quality upgrading and/or guaranteed supplies.
2. Private contractual initiatives have emerged to overcome problems of supply and poor public institutions for governing exchange.
3. Traders, agribusinesses and food companies contract with farms and provide inputs and assistance in return for guaranteed and quality supplies.
4. Many institutional innovations for technology transfer use both a pull and push strategy. The push strategy consists of improving access to technology. The pull strategy consists of providing better incentives for investments in technological upgrading.
5. Access to finance by the initiator of the technology transfer program is essential.
Lessons II

6. Contract enforcement is key whether vertical coordination is feasible.

7. Successful programs create the right conditions for successful and self-enforcing contracting.

8. More competition may spread equity and efficiency benefits but also undermine enforcement.

9. Companies prefer working with relatively fewer, larger, and more modern suppliers.

10. In reality, companies work with surprisingly large numbers of suppliers and of surprisingly small size.
Lessons III

11. The effects of these programs can be very substantial as they can move the entire value chain towards a higher equilibrium, with impacts for all agents.

– Increased output and productivity of the company that initiates vertical contracting
– Positive effects on farm productivity, product quality, and farm incomes.
– Poverty reduction through employment creation on larger farms.
– Increased access (and stability of access) to high quality and safe products by consumers.