**ValueLinks Module 2**

**Value chain analysis**

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**ValueLinks 2.0**

1. Setting boundaries
2. Chain analysis and strategy
3. Value chain strategies
4. Programs and projects
5. Business models
6. Business linkages
7. Services
8. VC Financing
9. Quality and standards
10. Policy instruments
11. Managing data & monitoring

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**Solutions for improving the value chain**
The Toolbox for Chain Analysis

Contents

1. Value chain mapping
2. Economic analysis of value chains
3. Environmental analysis of value chains
4. Social and poverty analysis of value chains

Contents of value chain maps

Basic value chain maps visualise...

- The sequence of production and marketing functions performed
- The value chain „operators“ taking these functions (micro level)
- Vertical business links between the operators
- The chain „support service providers“ (meso level)
Basic concepts

Value chain functions

- **Specific Inputs**: Provide equipment and inputs
- **Production**: Grow, Harvest, Dry etc.
- **Transformation**: Classify, Process, Pack
- **Commerce Trade**: Transport, Distribute, Sell
- **Consumption**: Consume

Categories of actors in value chains and their relations

- **Specific Input providers** → **Primary producers** → **Packers, Industry** → **Traders (sales pt.)** → **Consumers (the market)**

Value chain map

- **Consumption** → **Retail (final sales point)** → **Wholesale** → **Transformation** → **Production** → **Specific Inputs**
- **Consumers (the market)** → **Retailer** → **Wholesalers** → **Packers / Industry** → **Primary Producers** → **Specific input providers**
- **Support Service Provider 1** → **Support Service Provider 2**
How to proceed in mapping

**Steps**

- Specify the final product and end market(s)
- Establish the stages of the chain (specifying the functions performed)
- Establish the main sequence of operators
- Differentiate the chain into channels if appropriate
- Map support service providers
- Prepare thematic detail maps if required

Fresh Table Apple (traditional varieties), Georgia

- **Consumption 2006:** 35000 t  
  average: 70000 t

- **Antonovka** 3-5 Lari / kg  
  Kechura 1-2 Lari / kg

- **Retail**
  - Supermarkets in big urban centres
  - Small food stores
  - Open market traders

- **Intermediary trade (sorting for quality)**
  - Fruit traders

- **Sorting table/industry apples**

- **Primary production**

- **Provision of seedlings**

- **Farmers**
  - Local tree nurseries

- **Extension services**  
  Ministry of Agriculture

- **Farmer associations**
Leather, Ethiopia

Segmenting channels & business models

Criteria

- **Type of product**
  - Low, medium or high quality product
  - Price
  - Intermediate or final product

- **End market**
  - Rural, urban or export market
  - Type of customers (price-sensitive or quality conscious)

- **Technology**
  - Stage (from low to high input / hand-made or mechanized)
  - Type and (minimum) scale of processing enterprises (from small artisanal to large-industrial)

- **Linkages**
  - Type of business linkages between suppliers and buyers
**Value chain mapping**

**Box 2.2.4: Tool – Value chain mapping symbols**

- **Micro level**
  - VC stage
  - Specific function
  - Value chain operator
  - Links between operators

- **Meso & Macro level**
  - Value chain supporter
  - Value chain enabler

- **All levels**
  - Constraint
  - Potential
  - Action

**Source:** own concept

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**Jute products, Bangladesh**

90% of Jute

- **Exporters/Traders**
  - Local Traders/Purchase Centres
  - Intermediaries
  - Jute Growers

8% of Jute

- **Producers** (organized in a cluster)
  - Semi-industrial factories
  - Furnishers/Converters

- **Exporters/Traders**

2% of Jute

- **DJP for local**

**Jute product value chain**

CJP = conventional jute products

DJP = diversified jute products
Maize, African country

Honey value chain
Vertically integrated value chain

- Marketing
- finishing
- weaving
- dyeing
- spinning
- carding

Exporter

Small integrators

Large Integrator

Exclusive buyer/Exporter

Chain mapping in the tourism sector

- Travel Agencies
- Ferries
- Local public transport
- Pensions
- Cafés
- Sport services
- Online Portals
- Airlines
- Private taxis and buses
- Resorts
- Events managers
- Food and Beverages
- Accommodation
- Food and Beverages
- Activities

Tour operators

Department of Tourism (DOT)

Local Government Units (LGU)
Quantification

- **Importers**
  - n = 5
- **Producers**
  - n = 40
- **Small producers**
  - n = 8000
- **Industrial SME's**
  - n = 120
- **Retailers A**
  - n = 10
- **Retailers B**
  - n = 800

**Export Market**
- Turnover: 200 Mio €

**Market 1**
- Turnover: 20 Mio €

**Market 2**
- Turnover: 30 Mio €

**Or**
- Number of Employees
- % of women employed
- Product quantity
Large-scale VC map: Export coffee, Ethiopia

What makes a good map

**Criteria**

- Make sure the map has a clear message
- Avoid overload of information – not more than 2 or 3 channels at a time.
- Separate micro and meso analyses
- The map has to be understandable to people who have not participated in making it!
The Toolbox for Chain Analysis

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1
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Social and poverty analysis of value chains

Economic analysis

Elements of the economic analysis

- **Size and market share of VCs in global and domestic markets**
  - Production and consumption figures
  - Export and import figures (using WTO records)
  - Share of the VC in the total export value

- **Value-added along the value chain**
  - Contribution of chain segments to total value

- **Benchmarking important VC parameters**
  - Benchmarking of unit cost of production
  - Benchmarking of labour and other factor productivities
Amla value chain in India

Amla Candy

Primary production

Trading

Wholesale

Processing

Retail

Product price per kg of Amla

Farmer

Agent

Process.

Wholes.

Retailer

Value addition by the VC

Other inputs OPERATIONAL services

Intermediate product

5 Rs

8 Rs

20 Rs

8 Rs

12 Rs

80 Rs

60 Rs

44 Rs

16 Rs

5 Rs

Concept of value addition
### Calculation of value-added

#### Components of the value generated by the VC

<table>
<thead>
<tr>
<th>VALUE GENERATED by the value chain or by stages of the VC</th>
</tr>
</thead>
<tbody>
<tr>
<td>= Price*volume of product sold</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VALUE-ADDED captured in one stage of VC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Wages</td>
</tr>
<tr>
<td>• Interests and rents</td>
</tr>
<tr>
<td>• Depreciation</td>
</tr>
<tr>
<td>• Direct taxes</td>
</tr>
<tr>
<td>• Profit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER INPUTS &amp; SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Inputs, equipment</td>
</tr>
<tr>
<td>• Energy, water</td>
</tr>
<tr>
<td>• Operational services</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTERMEDIATE PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Raw material, semi-finished or traded product (depending on VC stage)</td>
</tr>
</tbody>
</table>

- Used to pay claims of the owners of factors of production (capital, labour, land) + taxes
- Transferred to external suppliers
- Transferred to operators at the previous stage

### Value-added captured by the VC

#### ...along the value chain

- **Primary Producers**
- **Product Makers**
- **Traders**
- **Consumers**

- Value-added going to input providers outside the VC
- Value-added captured by the VC
- Total Value consumed

- Service / Input Providers
- Value-added
Assessing competitive advantage

Comparing performance in footwear: India – Italy – China

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Source: Learning From Global Buyers; H. Schmitz, P. Knorringa
Environmental analysis of value chains

The link between value chains and the environment

Value chains may...

<table>
<thead>
<tr>
<th>...cause negative impact on climate and the environment (1)</th>
<th>...be affected by climate change and environmental degradation (2)</th>
<th>...contribute to compensating emissions and/or contribute to creating a „green economy“ (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production, marketing and consumption cause environmental cost</td>
<td>Directly: ▪ Reduced productivity ▪ Increasing production cost ▪ Food insecurity</td>
<td>▪ CO2 sequestration and sale of carbon credits</td>
</tr>
<tr>
<td>High, yet uncompensated GHG emissions</td>
<td>Indirectly: ▪ Rising resource prices (water, energy, raw materials, waste disposal)</td>
<td>▪ Products and services for the green economy (environmental technology, services and investment)</td>
</tr>
<tr>
<td>Wasteful utilization of scarce resources (especially water)</td>
<td></td>
<td>▪ Renewable energy</td>
</tr>
</tbody>
</table>

Procedure in three steps

Qualitative assessment

- Step 1 Conceptual model of the interaction between the VC and the environment.
- Step 2 Identification of environmental impacts of the VC and on the VC
- Step 3 Assessment and valuation of the environmental impacts

Tools

- Environmental impact matrices
- Lifecycle inventory
- TEEB
- Measures of resource efficiency
- Footprinting
- Environmental indicators
- Identification of hot spots
Rice VC – technical systems

**From VC functions to technical systems**

<table>
<thead>
<tr>
<th>Stages of the VC</th>
<th>Technical systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Primary production</td>
<td>1.1 Upland rice</td>
</tr>
<tr>
<td>1.2 Lowland / swamp</td>
<td></td>
</tr>
<tr>
<td>1.3 irrigated rice</td>
<td></td>
</tr>
<tr>
<td>2 Intermediate trade</td>
<td>2.1 bulking, storage</td>
</tr>
<tr>
<td>3 Processing</td>
<td>3.1 parboiling</td>
</tr>
<tr>
<td>3.2 milling (white rice)</td>
<td></td>
</tr>
<tr>
<td>4 Trade wholesale/retail</td>
<td>4.1 transport</td>
</tr>
<tr>
<td>4.2 storage, packaging,</td>
<td></td>
</tr>
<tr>
<td>5 Consumption</td>
<td>5.1 Cooking</td>
</tr>
</tbody>
</table>

Rice VC – resources and ecosystems

**Relevant resource categories and ecosystems**

**Water**
Issues: Pollution, excessive consumption, price hikes (pumping cost), water shortages due to drought/decreasing water table, late rains/extended dry season

**Energy**
Issues: Low energy efficiency, fuel price inflation, blackouts, access to fuel wood, charcoal

**Soil**
Issues: Soil fertility, erosion

**Ecosystems**
Issues: Swamp ecosystem services, biodiversity

**Climate**
Issues: Excessive heat, violent rains, flooding, strong winds
### Environmental impact matrix

<table>
<thead>
<tr>
<th>VC stage</th>
<th>Technical processes</th>
<th>Water</th>
<th>Energy</th>
<th>Soil</th>
<th>Ecosystems</th>
<th>Climate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Upland, rainfed rice production</td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td></td>
<td>Lowland/ swamp production</td>
<td>↓</td>
<td>↑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irrigated rice</td>
<td>↓</td>
<td>↑</td>
<td></td>
<td></td>
<td>↓</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Bulking / storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>Transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↓</td>
</tr>
<tr>
<td></td>
<td>Storage/ packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td>Cooking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

↓ Impact of the VC (type 1)

↑ Impact on the VC (type 2)

### List of environmental impacts

<table>
<thead>
<tr>
<th>VC stage</th>
<th>Technical processes</th>
<th>Type 1 environmental impacts of the value chain</th>
<th>Type 2 environmental impacts on the value chain</th>
</tr>
</thead>
</table>
| Primary      | Upland, rainfed rice production | • Water pollution  
• Downstream silting | • Increasingly unreliable rainfall  
• Erosion, loss of soil fertility |
|               | Lowland/ swamp production    | • Lower water tables  
• Loss of biodiversity and ecosystem services of swamps | • Temporary flooding  
• Iron toxicity  
• Loss of soil fertility |
|               | Irrigated rice               | • Water scarcity  
• Aggravated methane emissions  
• Plastic waste | • Inefficient irrigation, variable water supply  
• Plastic waste in fields |
| Intermediate  | Bulking / storage            | . | . | . |
| 3 Processing  | Parboiling                   | • Overexploitation of wood  
• Air pollution | • Rising fuel wood prices  
• Decreasing water availability |
|               | Milling                      | • High carbon emissions | • Inefficient use / high energy cost (operating below capacity) |
| Trade        | Transport                    | • High carbon emissions | . |
|              | Storage/ packaging           | . | . | . |
| Consumption  | Cooking                      | . | . | . |
Assessment of severity / valuation

Valuation methods

- The economics of ecosystems and biodiversity (TEEB)
- Measures of resource efficiency and ecological footprints
- Measurement against environmental sustainability indicator sets

- A short cut: Identifying the environmental “hot-spots”

Identification of hot spots

A short-cut: Identifying hot spots

Specifying the relevance of the resource problem concerned:
classify the risk of degradation/depletion and efficiency problems for the resource category at stake, according to a scale reaching from: (0) ‘not relevant’, (1) minor ‘efficiency and degradation problem’, (2) significant ‘efficiency and degradation problem’, to (3) risk of ‘unacceptable environmental damage’. The task is to judge the impact on the resource category.

Specifying the importance of the technical process concerned:
The economic importance of the environmental impact is classified according to a scale from (0) ‘resource easily replaced or negative impact avoided’, (1) ‘low intensity of use’, (2) ‘high intensity of use’, and (3) ‘indispensable resource’ without which the value chain cannot continue operations.

Determining hot spots:
multiply the numbers of both rankings – the points assigned to resource categories and to technical processes. Conventionally, results of (6) or (9) are considered to be “hot spots”.
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Gender mapping

Gender mapping of business operations

Typical division of tasks in African agriculture
Gender mapping

Gender mapping of the rice VC, West Africa

Mapping poor producers

Poverty mapping of low-value staple foods

= poor producers  = poverty markets
Describing poverty groups

**Poverty mapping of low-value staple foods**

- **Growers** ➔ **Processors** ➔ **Wholesale Traders** ➔ **Retail Traders** ➔ **Consumers (market)**

- **Poverty rate**: % / number below the national poverty line
- **Average income**: Average income: ... $.
- **Food insecurity**: May – July
- **Skills**: x% illiterate, no access to education
- **Social problems**: e.g. child labor, at farm level

- **Poverty rate**: % / number of workers below the poverty line
- **Average income**: Average income ... $.
- **Skills**: x% illiterate, no vocational training
- **Social problems**: e.g. work safety, no child care services for women

- **= poor producers**
- **= poor workers**

Livelihood analysis

**The „multi-chain perspective“ of poor people**

- **Smallholder producer**
  - producing commercially
  - providing wage labour

- **Market**
  - Industry ➔ **Market**
  - Trade ➔ **Market**

**= poor producers**
Poverty and competitiveness

Constraints of poor producers

Lack of productive resources
- Limited access to productive resources
- Lack of capital

Market failure affecting the poor - exclusion
- Absence of services and products for poor producers
- Inefficient markets – high cost of transaction, little trust

Scale issues
- Small scale, informality, unfavorable contracts
- Barriers to scaling up production
  (shifting to larger scale business models)
- Weak position of SMEs/excessive buyer power

Poverty and vulnerability

...linked to their business model

Financial stability
- High price volatility
- Exclusion of small suppliers in demand crises
- Vulnerability of the poor during economic crises

Technological and ecological sustainability
- Pollution and depletion of natural resources (especially in a short-lived export boom)

Social sustainability
- Conflicts over the use of natural resources and/or conflicts between commercial and subsistence production
- Conditions of employment
Summary: Main lessons to remember

- Value chain analysis creates a picture of the socio-economic reality. It always shows the present situation first – as a basis for projections guiding development action.
- The VC map shows the structure of the VC and is the foundation for any other type of VC analysis. Of particular interest for ValueLinks are the economic, environmental and social aspects of VCs and gender dimension.
- Economic VC analysis quantifies the total value created by the value chain and its composition. It also assesses the functioning and the competitiveness of the chain as a whole.
- Environmental analysis shows how the technical processes in the VC interact with ecosystems and the natural resources utilized for producing. The environmental impact matrix allows identifying both environmental impacts on the VC (type 1) and impacts of the VC on the environment (type 2). Analysts have to judge the severity of the impacts to identify hot spots.
- Social analysis identifies three types of poverty groups in value chains – poor micro entrepreneurs, poor wage workers/unemployed, and poor consumers. Each group is located in the VC map. The analysis characterizes these groups and their livelihood conditions.
- Gender analysis starts by introducing gender aspects into the VC map. This refers to the role of women and the constraints they face in economic life.