

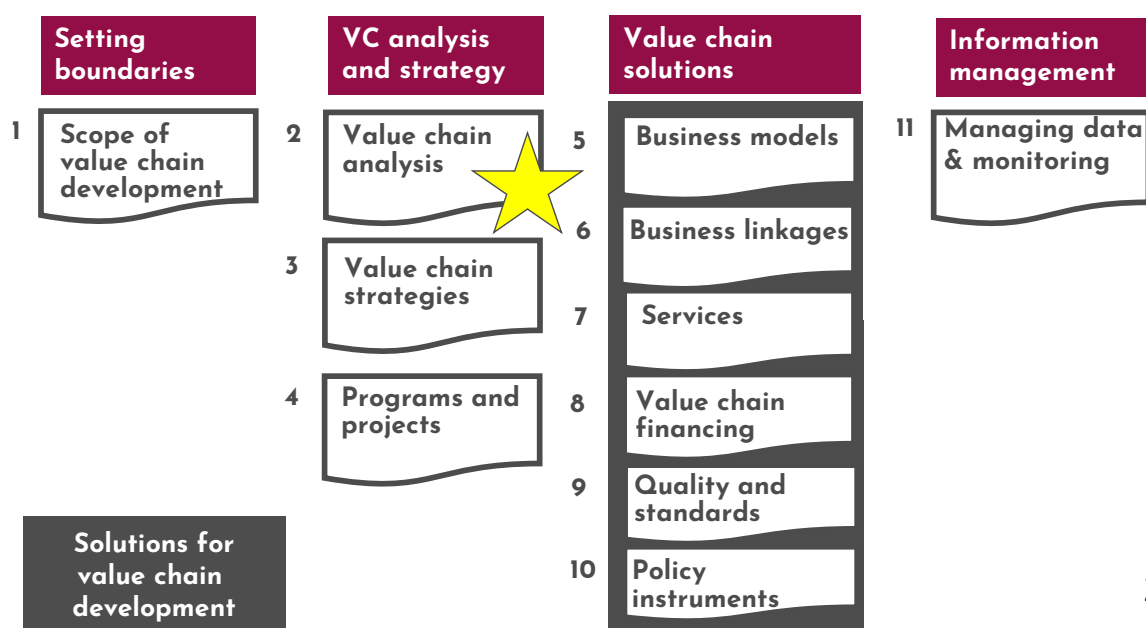


ValueLinks Module 2

VALUE CHAIN ANALYSIS



STRUCTURE OF VALUELINKS 2.0





MODULE 2



01

STRUCTURAL ANALYSIS: VALUE
CHAIN MAPPING

02

ECONOMIC ANALYSIS
OF VALUE CHAINS

03

ENVIRONMENTAL ANALYSIS
OF VALUE CHAINS

04

SOCIAL ANALYSIS OF VALUE
CHAINS

3

CONTENTS OF VALUE CHAIN MAPS

Basic value chain maps visualize...

- End markets for products
- 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)
- The value chain enablers (macro level)

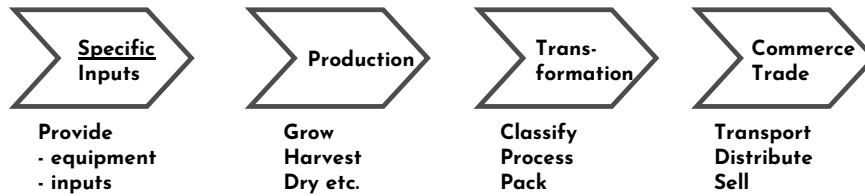


- *Develop the value chain map as a picture of the current situation*
- *At micro level, present only the actors who become owner of the product*

4

BASIC CONCEPTS

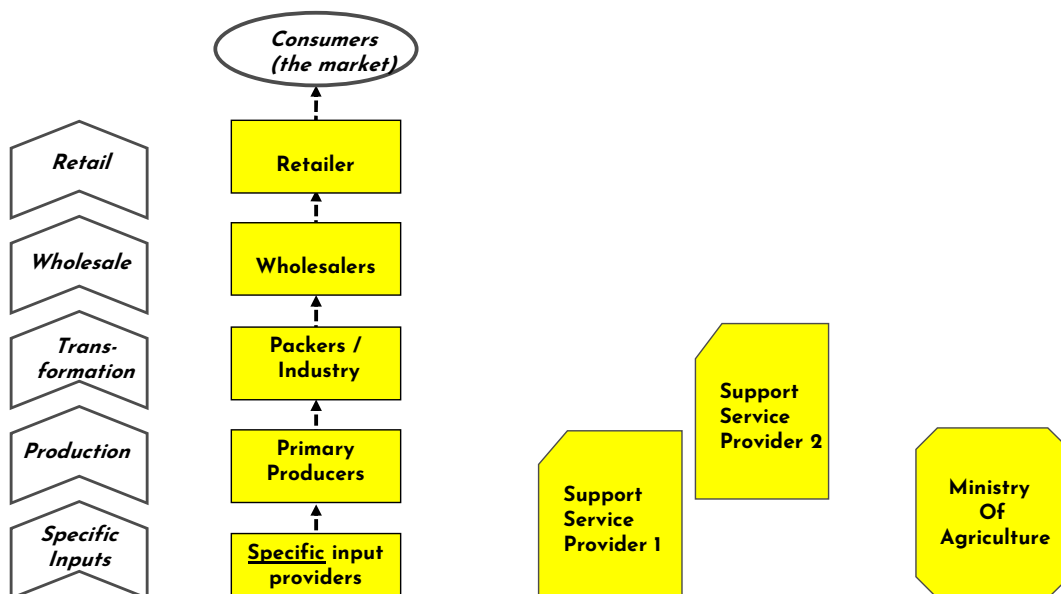
Value chain functions



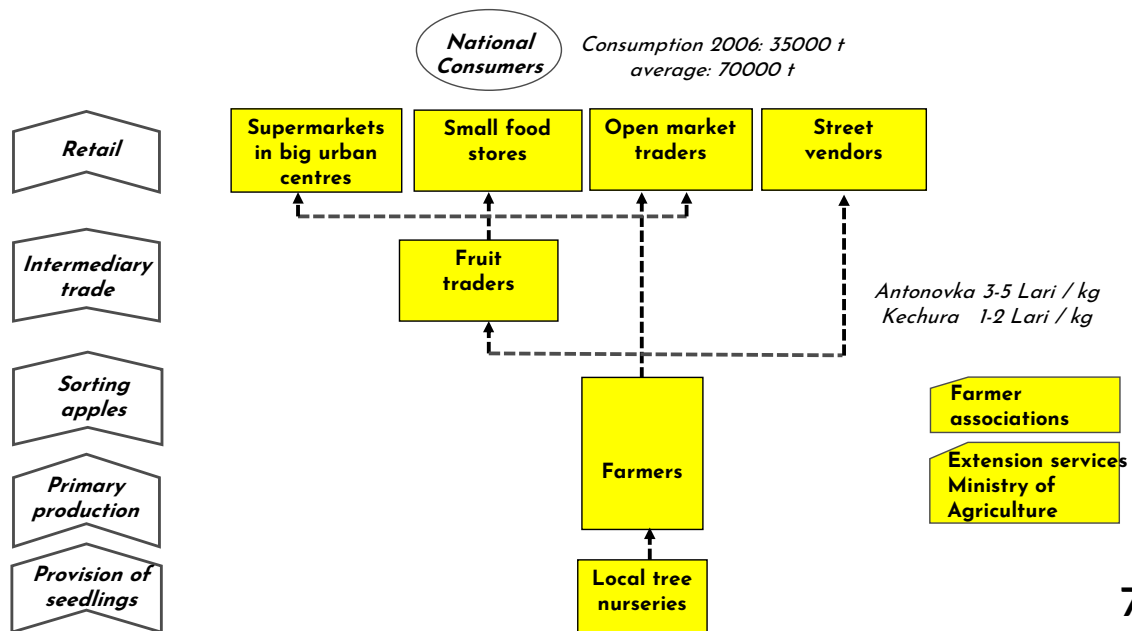
Categories of actors in value chains and their relations



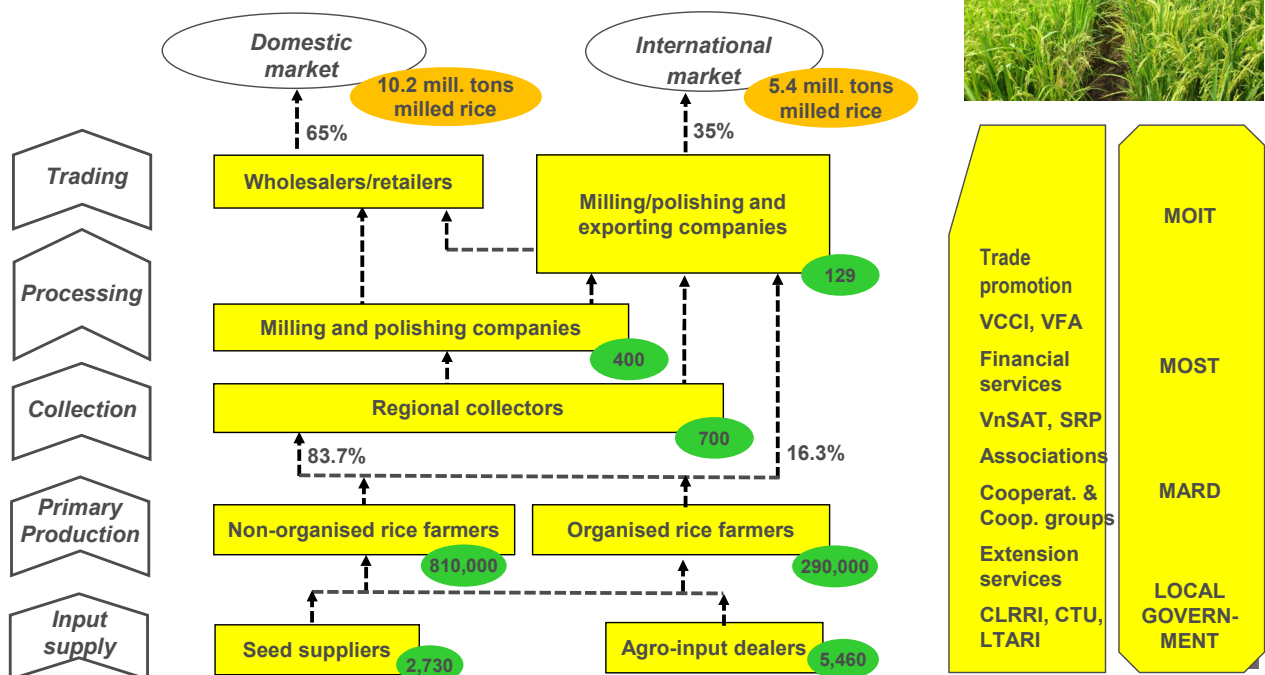
VALUE CHAIN MAP



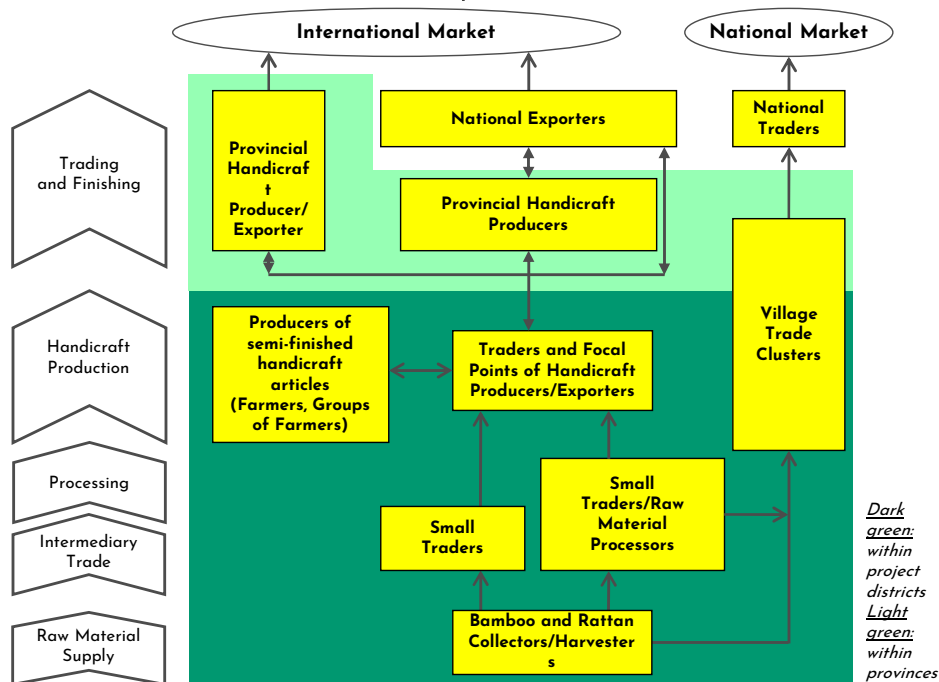
FRESH TABLE APPLE, GEORGIA



THE RICE VC IN THE MEKONG DELTA



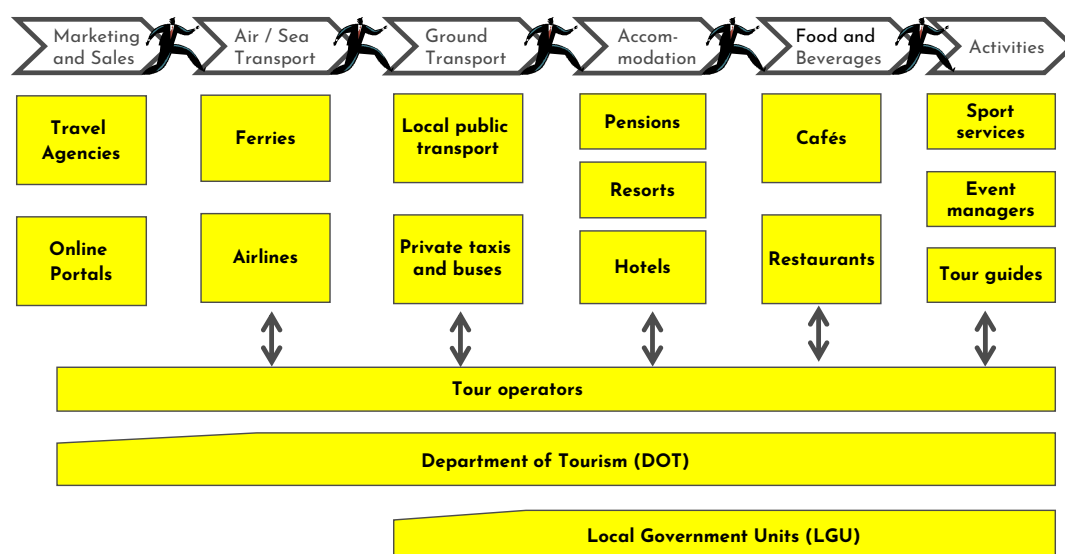
VC MAP BAMBOO/RATTAN HANDICRAFTS, NORTHERN VIETNAM



9



CHAIN MAPPING TOURISM



10



WHAT MAKES A GOOD MAP

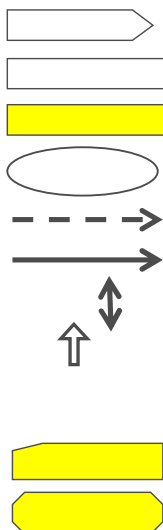


CRITERIA

- 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 analysis
- The map has to be understandable to people who have not participated in making it.

VALUE CHAIN MAPPING SYMBOLS

Card shapes/color code



Micro level of the VC

- Value chain stage
- Specific business activity
- Value chain operator
- End market of value chain
- Informal business linkages
- Formal business linkages
- Subcontracting linkages
- Service linkages

Meso & Macro level

- Value chain supporter
- Value chain enabler



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13



ECONOMIC ANALYSIS

Size and market share of VCs in global and domestic markets

- Production and consumption figures
- Export and import figures
- 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 labor and other factor productivities

14



INFORMATION SOURCES FOR TRADE-RELATED DATA

ITC **TRADE MAP**
Trade statistics for international business development
Monthly, quarterly and yearly trade data. Import & export values, volumes, growth rates, market shares, etc.

Home & Search Data Availability Reference Material Other ITC Tools More Login English

Trade Map provides - in the form of tables, graphs and maps - indicators on export performance, international demand, alternative markets and competitive markets, as well as a directory of importing and exporting companies.
Trade Map covers 220 countries and territories and 5300 products of the Harmonized System. The monthly, quarterly and yearly trade flows are available from the most aggregated level to the tariff line level.

Imports Exports

Service Product Single Group Please enter a keyword or a product code

Country Region Please enter a country/territory or region name

Trade Indicators Yearly Time Series Quarterly Time Series Monthly Time Series

Concentration and average distance in 2018
Imported product: Total

Importing markets in 2018
Product: Total

Growth

CBI is the Centre for the Promotion of Imports from developing countries
Annually, CBI supports more than 800 entrepreneurs to become successful exporters on the European market through our export coaching projects. Moreover, CBI publishes around 450 market studies every year. Learn more about CBI

Find out what CBI can do for you

15



THE AMLA VALUE CHAIN IN INDIA

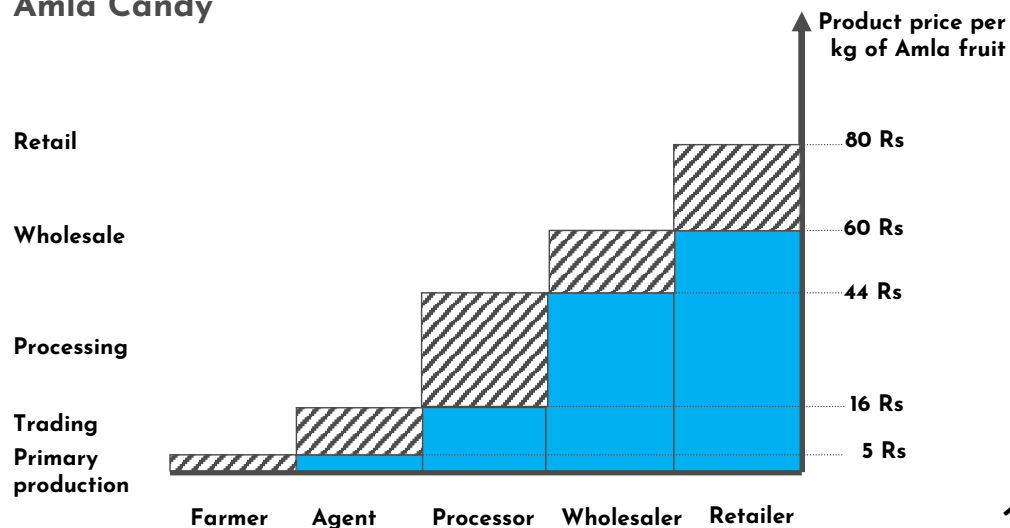


16



VALUE ADDED CALCULATION – STEP 1: ESTABLISH PRICE LEVELS

Amla Candy



17



CALCULATION OF VALUE ADDED – STEP 2: CALCULATE ADDED VALUE



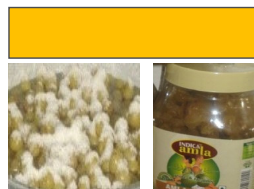
Factory sales price
Amla Candy: 44
Rupees



Value added is
how much?

20 Rupees

Cost of
intermediate
product: 16
Rupees



Cost of other
inputs/services:
8 Rupees

Value added = value of output - intermediate consumption




18



VALUE ADDED CALCULATION

Value added = value of output - intermediate consumption

Value added = value of output - cost of intermediate products - cost of other inputs and services

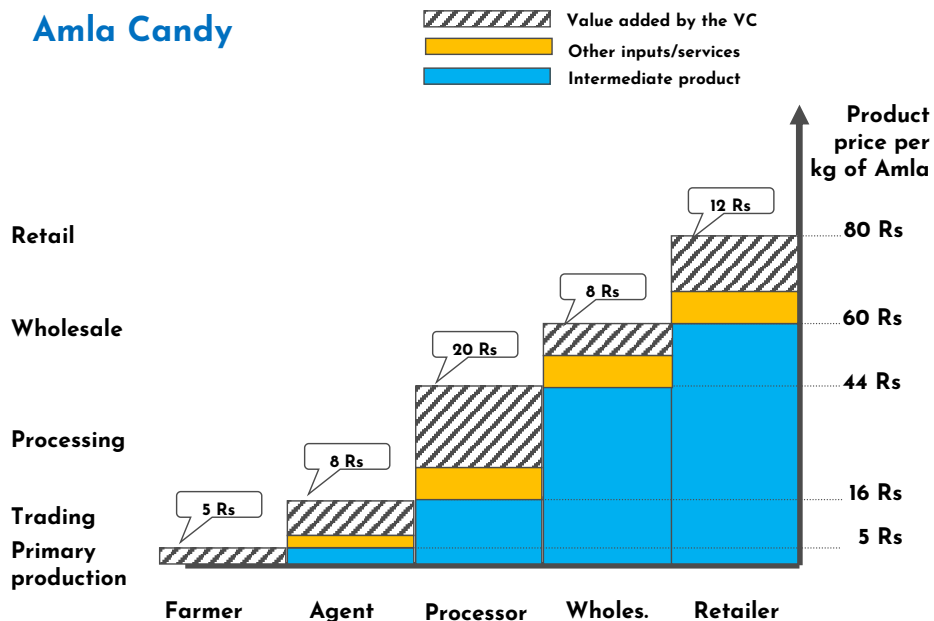
VALUE GENERATED by the value chain or by stages of the VC = Price*volume of product sold = Output	VALUE-ADDED captured in one stage of VC <ul style="list-style-type: none"> • Wages • Interests and rents • Depreciation • Direct taxes • Profit 		Used to pay claims of the owners of factors of production (capital, labour, land) + taxes
	OTHER INPUTS & SERVICES <ul style="list-style-type: none"> • Inputs, equipment • Energy, water • Operational services 		Transferred to external suppliers
	INTERMEDIATE PRODUCTS <ul style="list-style-type: none"> • Raw material, semi-finished or traded product (depending on VC stage) 		Transferred to operators at the previous stage

19



VALUE ADDED CALCULATION – STEP 2: CALCULATE VALUE ADDED

Amla Candy



20



BENCHMARKING

Comparing performance in footwear: India - Italy - China



Source: *Learning From Global Buyers*, H. Schmitz, P. Knorringer

21



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22



ENVIRONMENTAL ANALYSIS

The link between value chains and environment/climate change

Agricultural value chains may...		
...cause negative impact on the environment and cause CC (1)	... be affected by climate change and environmental degradation (2)	... contribute positively to climate and environment (3)
<ul style="list-style-type: none"> Carbon/GHG emissions Wasteful energy and water consumption Pollution (water/air/soil) Reduced biodiversity Deforestation Increased soil erosion 	<ul style="list-style-type: none"> Increasing temperature Changing/less predictable rainfall Natural disasters (drought, floods) Increasing pests and diseases Increased/reduced CO₂ fertilization Climate migration 	<ul style="list-style-type: none"> Carbon offsetting Renewable energy Pollination Agroforestry
VC strategies: CC mitigation (e.g. circular economy measures) and reduction of negative environmental impact)	VC strategies: CC adaptation (e.g. Climate-Smart Agriculture, climate information services, climate standards, Eco-system-based Adaptation)	

23



ENVIRONMENTAL ANALYSIS

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VC strategies: CC mitigation (e.g. circular economy measures) and reduction of negative environmental impact)	VC strategies: CC adaptation (e.g. Climate-Smart Agriculture, climate information services, climate standards, Eco-system-based Adaptation)	

Mitigation: An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2001a).

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC, 2001a)

24



ENVIRONMENTAL ANALYSIS OF VALUE CHAINS

Procedure in three steps

STEP 1

Conceptual framework of the interaction between the VC and the environment/CC

- Table of environmental impacts
- Impact chain mapping



STEP 2

General tools recommended for environmental analysis in VC studies

- Hot spot analysis
- Climate proofing



STEP 3

Advanced assessment tools for climate change and environmental analysis

- Cool Farm Tool
- Climate Expert Tool
- ACE Calculator
- FAO EX-ACT tool
- etc.



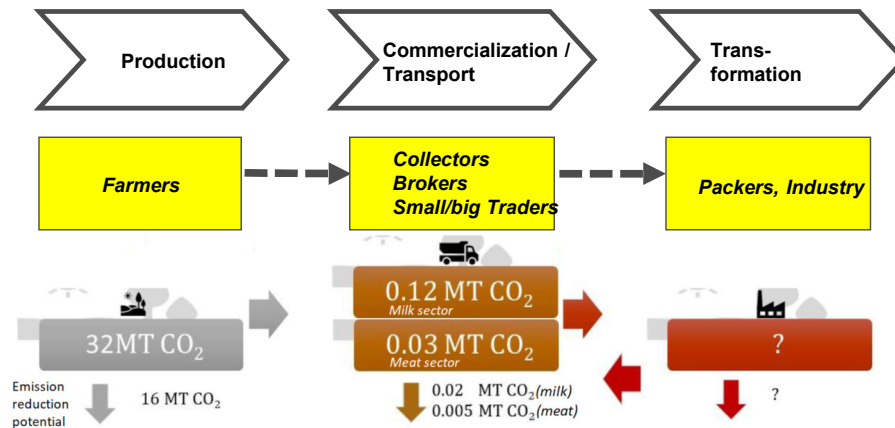
TABLE OF ENVIRONMENTAL IMPACTS

VC stage	Technical processes	Type 1 environmental impacts <u>of</u> the value chain	Type 2 environmental impacts <u>on</u> the value chain
Primary production	Upland, rain fed rice production	<ul style="list-style-type: none"> • Water pollution • Downstream silting 	<ul style="list-style-type: none"> • Unreliable rainfall • Erosion, loss of soil fertility
	Lowland/ swamp production	<ul style="list-style-type: none"> • Lowering of water tables • Loss of biodiversity 	<ul style="list-style-type: none"> • Temporary flooding • Loss of soil fertility
	Irrigated rice	<ul style="list-style-type: none"> • Water scarcity aggravation • Methane emissions • Plastic waste 	<ul style="list-style-type: none"> • Unreliable rainfall/water scarcity • Loss of soil fertility
Intermediate trade	Bulking / storage	<ul style="list-style-type: none"> • Losses due to inefficient storage 	<ul style="list-style-type: none"> • Increased variability of climate conditions
Processing	Parboiling	<ul style="list-style-type: none"> • Overexploitation of wood • Air pollution 	<ul style="list-style-type: none"> • Rising fuel wood prices • Decreasing water availability
	Milling	<ul style="list-style-type: none"> • Inefficient use of energy • High carbon emissions 	<ul style="list-style-type: none"> • Energy scarcity/ High energy cost
Trade	Transport	<ul style="list-style-type: none"> • High carbon emissions 	<ul style="list-style-type: none"> • Energy scarcity/ High energy cost
	Storage/ packaging	<ul style="list-style-type: none"> • Losses due to inefficient storage 	<ul style="list-style-type: none"> • Increased variability of climate conditions
Consumption	Cooking	<ul style="list-style-type: none"> • Overexploitation of wood 	<ul style="list-style-type: none"> • Energy scarcity / High energy costs



VISUALIZATION TYPE 1

VC impact on climate change



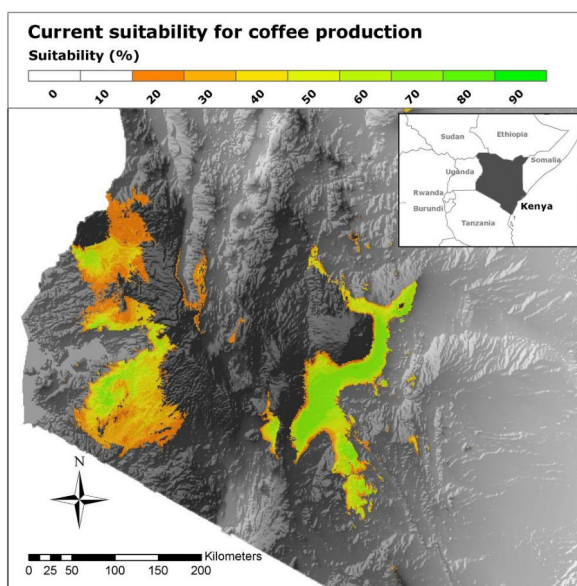
Source: GHG emissions from livestock systems in Colombia, adapted from CIAT, 2020

27



VISUALIZATION TYPE 2

Climate impact on the VC



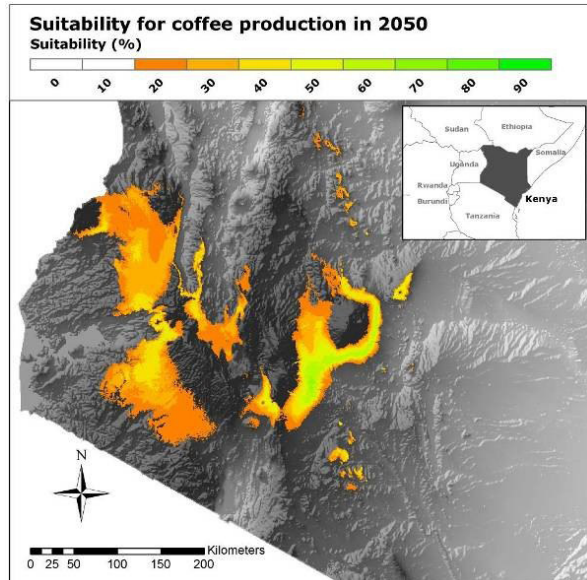
2010 Current Situation

28



VISUALIZATION TYPE 2

Climate impact on the VC



2050 Forecast

- - 2°C temp. increase
- Rainfall \approx the same
- More extreme events

Impact on Coffee

- No or irregular flowering
- Higher evapo-transpiration
- higher water demand
- no or lower yields
- suitability of growing areas
- reduced by 40-60 %

29



ENVIRONMENTAL ANALYSIS OF VALUE CHAINS

Procedure in three steps

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STEP 3

Advanced assessment tools for climate change and environmental analysis


- Cool Farm Tool
- Climate Expert Tool
- ACE Calculator
- FAO EX-ACT tool
- etc.

30



VC CLIMATE PROOFING – STEP

Probability of climate hazard	Level of risk	Extent of damage		
		Low	Medium	High
	High	Medium	High	High
	Medium	Low	Medium	High
	Low	Low	Low	Medium

A System of interest (value chain function)	B Climate hazard of concern the system may be exposed to	Vulnerability		Potential impact(s)		G Risk level	H Selected impacts leading to high risk level	I Adaptation options
		C Sensitivity	D Adaptive Capacity	E Direct impacts (biophysical and socio-economic)	F Indirect impacts (biophysical and socio-economic)			
Irrigated rice production	Extreme rainfall Extreme heat Extreme cold Typhoon	Flooding Drought	Planting trees Resistant seeds	Loss of crops	Loss of income, Famine		Famine	Alternate crops Insurance Introduction of an early warning system

31



IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON THE VC (TOOL) – STEP 2

Climate proofing / climate sensitivity chart

Crop sensitivity chart

Climate stimuli	Production			
	Germination	Growth / flowering / fruit setting	Ripening	Harvest
Temperature				
Rainfall				
etc				

32



ASSESSMENT OF SEVERITY/VALUATION (TOOL) – STEP 2

A short cut: “Hot-spots analysis” by making a qualitative judgement

A) Intensity of the use of the resource	B) Availability of the resource	A x B
<ul style="list-style-type: none"> High intensity of use (3) Medium intensity of use (2) Low intensity of use (1) 	<ul style="list-style-type: none"> Resources almost depleted (3) Resources become scarce (2) Resources largely available (1) 	1-5: No hot-spot 6-9: Hot-spot

High intensity of use of firewood (3) x resources almost depleted (3) = Hot-spot

Hot spot analysis

VC stage	Technical processes	Water	Energy	Soil	Ecosystems	Climate
Primary production	Upland, rain fed rice production					
	Lowland/ swamp production					
	Irrigated rice	High intensity of water use in the irrigation area: 3				
Intermediate trade	Bulking / storage		Resources almost depleted: 3			
Processing	Parboiling					
	Milling					
Trade	Transport					
	Storage/ packaging					
Consumption	Cooking					

3x3 = 9!
Hot spot

ENVIRONMENTAL ANALYSIS OF VALUE CHAINS

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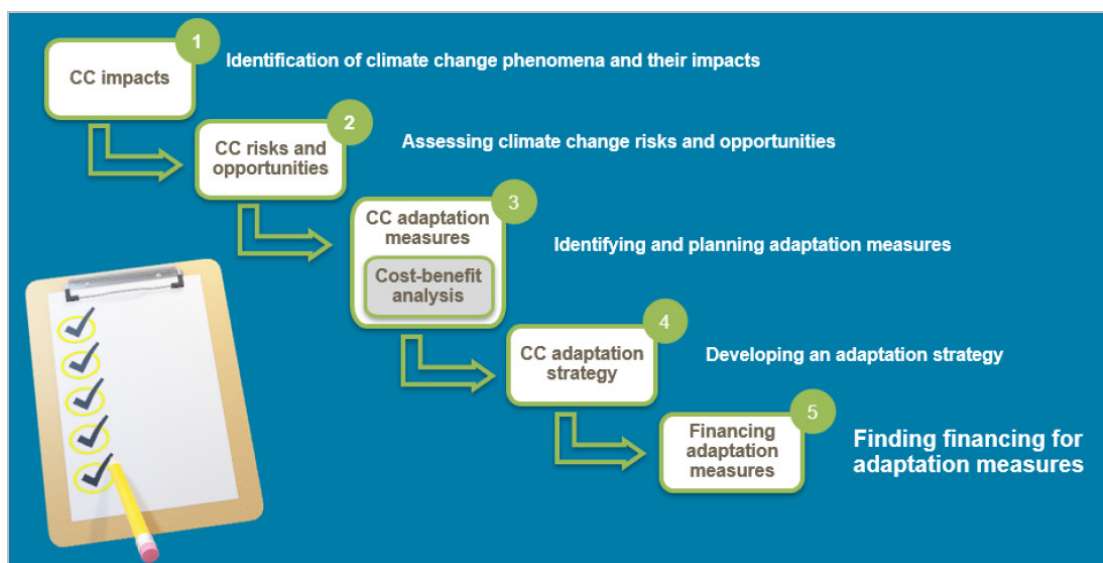
- Cool Farm Tool
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- etc.



COOL FARM TOOL GREENHOUSE



CLIMATE EXPERT TOOL IN A FIVE STEP-BY-STEP PROCESS



37



ACE CALCULATOR

ACE calculator		Jan Broeze Wageningen Food & Biobased Research Version 12 May 2021		WAGENINGEN UNIVERSITY & RESEARCH		CGIAR WORLD LEADER IN Climate Change, Agriculture and Food Security		CCAFS	
Case/scenario title:		Scenario 1: traditional handling		Scenario 2: mechanized					
Marketed food product CLIMATE IMPACT		8.49 kg CO ₂ -EQ. per kg sold on market		6.07 kg CO ₂ -EQ. per kg sold on market					
FOOD LOSS (lost edible part)		34.84%		8.81%					
FOOD LOSS ASSOCIATED GHG EMISSIONS		2.96 kg CO ₂ -EQ. per kg sold on market		0.53 kg CO ₂ -EQ. per kg sold on market					
Moisture and residues loss		30.75%		30.75%					
Case formulation: product and geographic scope; selection of underlying datasets									
Geographical region (production)		SubSaharanAfrica				SubSaharanAfrica			
Specific country / Electr. GHG emission factor		Nigeria 0.55				Nigeria 0.55			
Geographical region (distribution)		SubSaharanAfrica				SubSaharanAfrica			
Specific country / Electr. GHG emission factor		Nigeria 0.55				Nigeria 0.55			
Crop category		Rice				Rice			
Production chain data set (loss factors, etc.)		rice: traditional system				rice: combine harvest, industrial storage and milling			
Distribution chain data set (loss factors, etc.)		rice: traditional system				rice: traditional system			
Harvesting and on-field post-harvest operations (optionally: select when different from default)									
(On-farm) Transport									
Postharvest handling and storage (on-farm)									
Transport									
Processing and Packaging									
(Possibly international) Transport									
Processing/repackaging/distribution									
Distribution transport									
Market/Retail shop									
Summary of climate impacts results									
Overview of climate impacts per chain stage		Direct emissions	FLW-associated	Total	Direct emissions	FLW-associated	Total		
Harvesting and on-field post-harvest operations		3.830	0.426		3.830	0.118			
(On-farm) Transport		0.000			0.000				
Postharvest handling and storage (on-farm)			0.411			0.016			
Transport		0.000			0.000				
Processing and Packaging		0.000	1.095		0.000	0.152			
(Possibly international) Transport		0.000			0.000				
Processing/repackaging/distribution		0.000	0.058		0.000	0.042			
Distribution transport		0.000			0.000				
Market/Retail shop		0.000	0.059		0.000	0.042			
TOTAL (incl. correction for moisture and residues loss)		5.531	2.957	8.488	5.531	0.535	6.066		

Figure 1. ACE Calculator user-interface (all rows with fill-in fields collapsed).

EX ANTE FAO EX-ACT TOOL



The Accelerated Food Security Project in Tanzania

GHG impact (t CO₂-equivalents)

(Positive values = GHG sources, Negative values = GHG sinks/reductions)

Project components	Without project	With project	GHG balance for 20 years
Annual crops	12 199 18	- 416 653	-12 616 561
Irrigated Rice	592 055	3 199 722	2 607 667
Fertilizer emissions	982 045	5 321 271	4 339 226
Other investments	0	235	235
Total area 1 058 385 ha	Final GHG balance - 5 669 433 Per ha - 5,4 Per ha/yr - 0,27		

39



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40



SOME ASPECTS/DIMENSIONS OF SOCIAL ANALYSIS

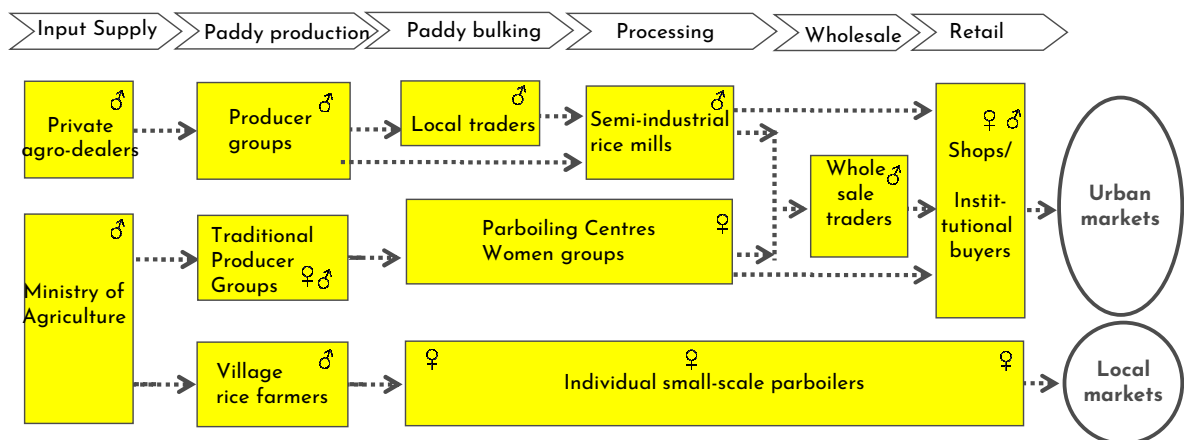
- Gender analysis
- Targeting youth
- Poverty analysis
- Nutrition
- Migration (climate/economic)/returnees

41



GENDER MAPPING

Gender mapping of the rice VC, West Africa



42



GENDER SENSITIVE VALUE CHAIN ANALYSIS

Actor	Access to resources	Control of resources	Perceptions and beliefs	Laws and regulations
Female farmer groups	<p>How did you get your land?</p> <p>How to raise money when you need it?</p> <p>How to find a job?</p> <p>How to obtain reliable information on new agricultural practices?</p>	<p>Who takes the decisions about the farm business?</p> <p>Who takes decisions about which crops to produce?</p> <p>Who negotiates sales?</p>	<p>Description of daily activities on the farm</p> <p>Are there any aspects of production that are difficult for you because you are a woman/man?</p> <p>Are there any aspects of production that men/women are discouraged from doing?</p>	<p>Are there any laws or policies that prevent you from operating your farm as a business?</p>
Male farmers				
Male traders				
Female processors				

43



YOUTH EMPLOYMENT



*Some VC projects have a focus on youth employment, as job creation lags behind population growth.
Poor quality of jobs with low productivity is a main challenge.*

Assessment of:

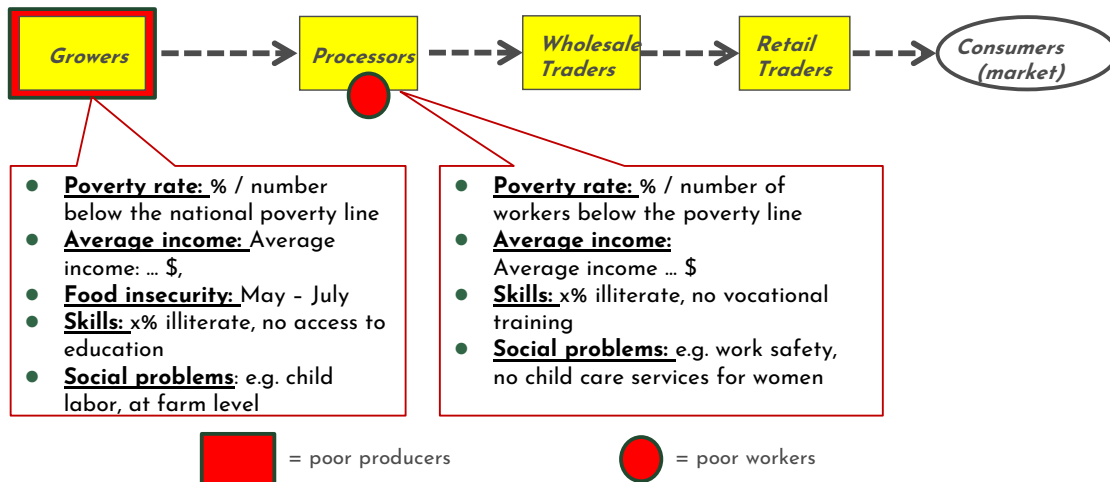
- Age structure of VC actors
- On-farm and off-farm employment of youth (agro-processing, trade and services)
- Number of youth entering the labor market
- Quality of the education and vocational training system (qualification of youth, skills mismatch)
- Youth migration
- Factors hampering youth access to the VC (like access to land)

44



DESCRIBING POVERTY GROUPS

Poverty assessment

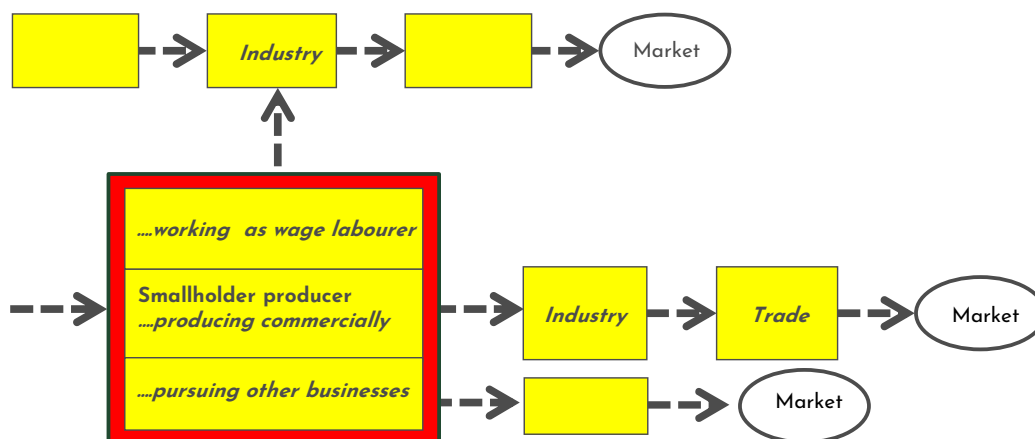


45



LIVELIHOOD ANALYSIS

The „multi-chain perspective“ of poor people



46



POVERTY AND COMPETITIVENESS

Particular constraints of poor producers

Lack of productive resources

- Limited access to productive resources
- Lack of capital

Market failures affecting the poor

- Small scale, high cost of transaction, informality, unfavorable contracts
- Barriers to scaling up production
- Absence of services and products for poor producers
- Vulnerability: exclusion of small suppliers in demand crises
- Weak position of SMEs/excessive buyer power

Social sustainability

- Conflicts over the use of natural resources and/or conflicts between commercial and subsistence production
- Lack of reserves, no savings
- Conditions of employment

47



NUTRITION-SENSITIVE VC PROMOTION

Value chain development and nutrition

VC promotion can increase food security and improve nutrition

- VC promotion can lead to greater availability of staple crops at lower cost.
- VC promotion can focus on particularly healthy food (e.g. moringa VC).

Malnutrition is still prevalent in global VCs:

- Increased monetary income does not necessarily lead to better nutrition.
- Smallholder farmers are often not able to generate a decent income.
- Trade offs of specialization: The specialized production of commercial crops can lead to reduced production of diverse staple foods for own consumption.

Consequences for VC analysis:

- Assessment of health and nutrition status (height or weight for age of children, teeth, dietary status).
- Assessment of nutritional behavior, access to different types of food and general consumption preferences.

48

