



# Commodity Chain Analysis

## Financial Analysis

**Bockel, L.,<sup>1</sup> Tallec, F.,<sup>2</sup>**

Policy Officer, Agricultural Policy Support Service, Policy Assistance  
Division, FAO

Consultant, Agricultural Policy Support Service, Policy Assistance Division,  
FAO

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, FAO



---

### See also FAO's the Value Chain Analysis software

The FAO-VCA software tool carries out value-chain analyses for agricultural and rural development policies. By storing relevant data it can calculate flows of physical outputs and inputs, flows of aggregated costs, value-added and net benefits. In addition, it allows users to directly compare different hypothetical scenarios. [FAO-VCA Software Tool»](#) [Value Chain Analysis for Policy Making: Methodological Guidelines for a Quantitative Approach»](#)

See all VCA material on EASYPol resource package: [Value Chain Analysis](#)

### About EASYPol

EASYPol is a multilingual repository of freely downloadable resources for policy making in agriculture, rural development and food security. The EASYPol home page is available at: [www.fao.org/easypol](http://www.fao.org/easypol). These resources focus on policy findings, methodological tools and capacity development. The site is maintained by FAO's [Policy Support Group](#).

The designations employed and the presentation of the material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

© FAO December 2005: All rights reserved. Reproduction and dissemination of material contained on FAO's Web site for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material for resale or other commercial purposes is prohibited without the written permission of the copyright holders. Applications for such permission should be addressed to: [copyright@fao.org](mailto:copyright@fao.org).

## Table of contents

1	Summary .....	1
2	Introduction.....	1
3	Principles of financial accounting.....	3
	3.1 Value added .....	3
	3.2 The production-trading account.....	6
	3.3 The consolidated account of the chain.....	8
4	Empirical estimation.....	10
	4.1 Setting up the accounts of individual agents .....	10
	4.2 Setting up the consolidated account of the chain .....	11
5	Analysis.....	12
	5.1 The financial profitability of activities in the chain.....	12
	5.2 Overall efficiency of the chain .....	12
	5.3 Price formation .....	14
	5.4 The analysis of transfers .....	14
6	Conclusion .....	15
7	Readers' notes .....	15
	7.1 Time requirements .....	15
	7.2 Frequently asked questions .....	15
	7.3 Complementary capacity building materials .....	15
	7.4 EASYPol links .....	16
8	Further readings.....	16

## 1 SUMMARY

This module provides a presentation of the way to develop a financial analysis using a commodity chain. It belongs to a set of modules which discuss how to proceed step-by-step on commodity chain analysis.

The module first examines the principles of financial accounting and shows how to work out the value added and how to get the production-trading account and the consolidated account of the chain. The second part explains how to set up the accounts of individual agents and the consolidated account of the chain. In the third part, the financial analysis of the chain is discussed.

## 2 INTRODUCTION

This module deals with the use of Commodity Chain Analysis (CCA) within the framework of economic studies undertaken as background for economic policy analysis at a sectoral level<sup>1</sup> (in particular for the agriculture and food sector) or at global level, such as predicting the impact of proposed measures on the agriculture sector.

For the purpose of analyzing policies, a chain is composed of a series of operations or transformations, a set of agents and a system of markets (in terms of both physical flows and their monetary equivalents), as well as the behavior of agents as guided by their economic interests. This means that it is important for the analyst to remember from the outset that the chain of a product covers far more ground than simply its channels of commercialization.

The relevance of CCA in policy analysis work clearly appears at two different steps:

- it is first a tool for setting out the complete financial accounts<sup>2</sup> of the various agents all along the length of the chain;
- it is also an accounting framework allowing us to organize and structure most of the necessary information in a systematic way and to deal with the effective economic analysis which completes financial analysis.

---

<sup>1</sup> This paper (initially translated into English by Anne M. Thomson, 1998) is based on a translation from French of FAO's Training Materials for Agricultural Planning, No. 35, *Note de méthodologie générale sur l'analyse de filière: Utilisation de l'analyse de filière pour l'analyse économique des politiques*, by Pierre Fabre, 1994.

<sup>2</sup>The terms "financial" and "economic" are used here in their commonly accepted definitions in the area of development studies:

- financial analysis is undertaken from the perspective of individual agents, or categories of agent (farmers, retail traders, primary assemblers); it includes the analysis of production-utilisation accounts, the profitability of investments etc.
- economic analysis is undertaken from the perspective of the overall economic system (national economy, sector or chain) or large groups of heterogeneous agents (regional studies, studies of segments of the commodity chain); it includes the analysis of consolidated accounts, of large aggregates, etc.

## Objectives

This module shows analytical tools which can be used to value the financial analysis. It explains how to determine the value added, the production-trading account and the consolidated account of the chain. It also discusses about the financial profitability of activities of the chain.

This module can be used in different contexts such as:

- reference material for policy analysts in carrying out their on-the-job tasks,
- in academic courses.

## Targeted audience

This module is intended for a wide audience, ranging from policy analysts and decision makers, to development practitioners, training institutions, and media. It is of particular relevance to senior and mid level officials and professional officers in ministries of agriculture, livestock, forestry, rural development, and cooperatives, including line departments and training institutes/units. It should also be of particular interest to senior executives of parastatals, financial institutions, and NGOs/CBOs. Suitably adapted, it may also be used as a reader in undergraduate courses in development.

## Required background

To understand the content of this module, basic elements of micro-economics and a basic knowledge on agriculture commodity sector trade functioning are required. But no specific technical background, beyond reasonable language skills, is required for this module.

The trainer is strongly recommended to verify that trainees have a minimum understanding in micro-economics. If this background is weak or missing, the trainer may consider to include a glossary to the module.

It is anticipated that individuals with a degree in economics, and agricultural or rural development related areas, and those with several years of experience in agricultural policy analysis or development planning and implementation, at a mid to senior level position, should have little difficulty in grasping the module's content.

To find relevant materials in these areas, the reader can follow the links to other EASYPol modules or the references<sup>3</sup>. This module belongs to a set of modules which discuss how to proceed step by step on commodity chain analysis. It is introduced through module EASYPol CCA1 which presents commodity chain analysis as a framework.

---

<sup>3</sup> EASYPol hyperlinks are shown in blue, as follows:

- a) training paths are shown in **underlined bold font**;
- b) other EASYPOL modules or complementary EASYPol materials are in **underlined bold italics**;
- c) links to the glossary are in **bold**; and
- d) external links are in *italics*

### 3 PRINCIPLES OF FINANCIAL ACCOUNTING

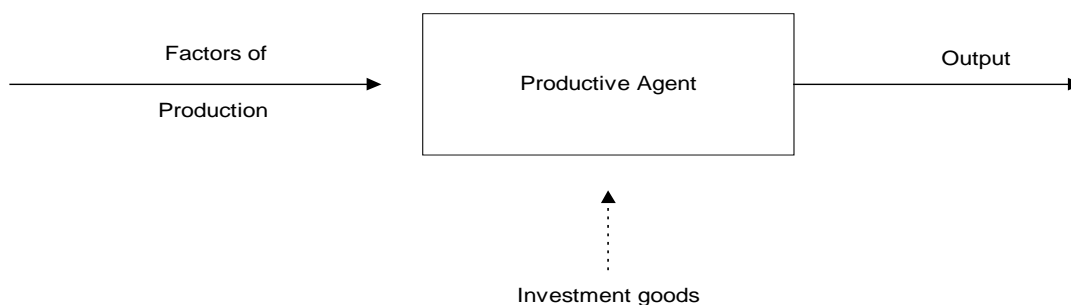
#### 3.1 Value added

One of the most critical concepts in CCA is that of **value added**. Many of the calculations carried out are in terms of the value added created by individual agents. In order to understand what the meaning of this is, we can start by thinking of a productive agent as being represented by a box into which inputs flow and out of which comes a product or an output. Implicit in the notion of a “flow” is a period of time (in this context often referred to as the accounting period) which is usually taken to be a year. This allows us to divide the inputs of the production process into two groups:

- factors of production which are totally transformed or consumed during the accounting period, **intermediate inputs**;
- factors of production which are only partially used during the accounting period, where they provide inputs to the production process over a number of years before being fully depleted, **investments goods**.

This can be depicted as per Figure 1 below:

**Figure 1 - Productive Agent**



If **II** is the value of intermediate inputs used and **Y** is the value of the output, then the difference, **Y-II**, represents the value which the agent has added during the accounting period to the value of the inputs in the process of production or processing.

**Value added** (VA) is defined by the equation:

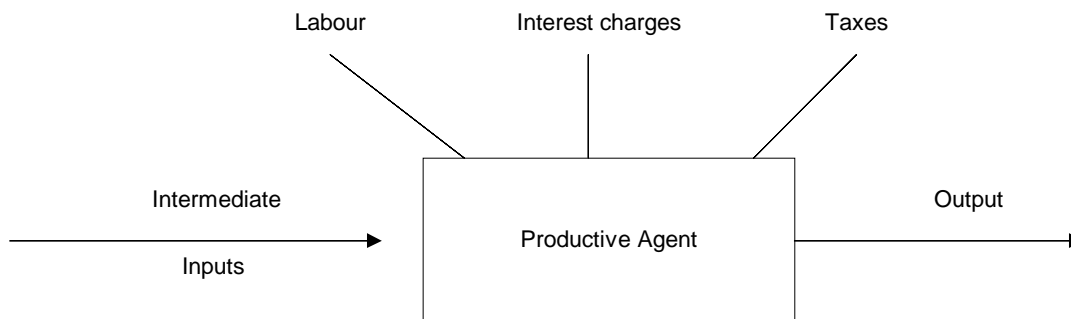
$$VA = Y - II$$

The new wealth created by a productive activity is not, therefore, measured by the gross value **Y** of the product, but by the value **Y** reduced by the wealth which had to be consumed in the production process. Value added measures the creation of wealth, the contribution of the production process to the growth of the economy. This is fundamental, not only to CCA, but to all analytical work in the area of economic growth and development.

The use of the word *value* can be misleading. At this stage, the calculation of value added is carried out using market prices, and any distortion in those prices will be reflected in that calculation. The use of shadow pricing, which will be discussed later, attempts to correct for these distortions and gives a truer reflection of economic value.

The value  $Y$  of the final product incorporates the value of all the factors which go to make up the production of  $Y$ . In addition to the value of intermediate inputs, this includes the cost of labor embodied in the productive process, the expenses on the financial services, such as investment loans and working capital, which facilitate the process of production, and the various taxes and duties levied during the production process. This can be represented as per Figure 2 below:

**Figure 2 - Gross Profit**



The difference between value added and expenditure on labor, interest charges and taxes is termed **gross profit (GP)**.

$$GP = VA - (\text{wages and salaries} + \text{interest charges} + \text{taxes})$$

In other words, the GP represents the return to cultivation, once the costs of production, intermediate inputs, labor costs, interest charges and taxes have been deducted.

Two types of labor cost can be distinguished when we analyze an individual or family-run enterprise or farm:

- salaries, allowances, various payments in kind and social security payments levied in respect of employees of the owner-manager. This type of remuneration will be referred to as “personnel remuneration” for the rest of this paper, and applies to a variety of types of employee: those paid on a monthly basis, daily laborers, temporary workers, those working in a co-operative organization etc.
- the profit (GP) which accrues to the owner-manager (and his/her family) in respect of their productive work, their management input, capital invested and initiative.

These should be treated separately when decomposing value added, and the equality can be re-written as follows:

$$VA = \text{personnel remuneration} + \text{interest charges} + \text{taxes} + GP$$

Value added is thus composed of four elements:

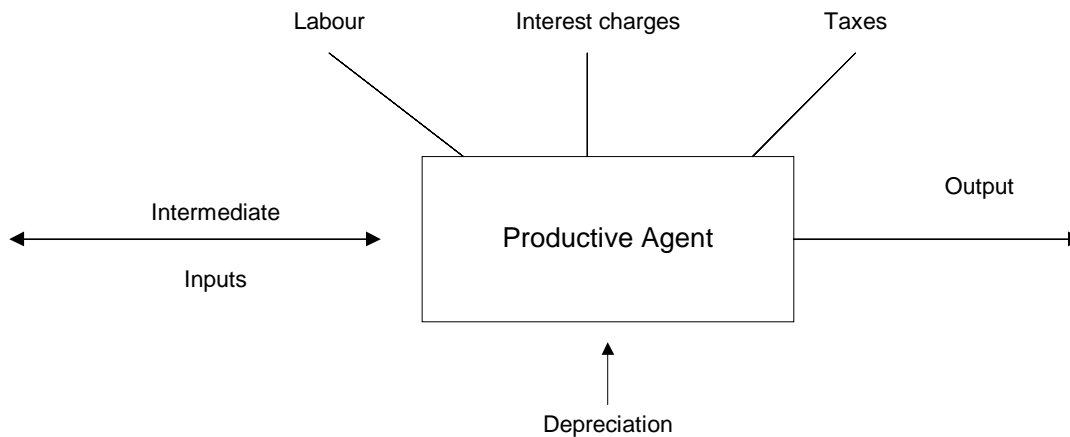
- personnel remuneration,
- interest charges,
- taxes and duties,
- and a balance, called the gross profit, representing the return (or loss) to the activity under consideration.

However, one more factor of production has contributed to production: **investment**, which is often realized prior to production but continues to provide services over a period of time, and is to some extent consumed in the year in consideration. A theoretical value must be attributed as a cost to production corresponding to the use of the investment, a value known as **depreciation**. As this is a measure of the consumption of a factor of production, depreciation is an element in the value Y, but it is not a financial flow in the year being analyzed.

When depreciation is subtracted from the Gross Profit, the balance is termed the **Net Profit (NP)**:

$$\text{Net Profit} = \text{Gross Profit} - \text{Depreciation}$$

**Figure 3 - Net profit**



The GP expresses the economic gain, or loss, to the agent once all current production costs are met. The NP expresses the economic gain or loss taking into account the predictable costs of actual investment, i.e. the resources that the agent has already mobilized.

Whereas the NP measures the increase in wealth of the individual agent, value added measures the increase in wealth for the nation as a whole, as represented by the sum of remuneration to labor, interest charges and taxes in addition to the net margin of the entrepreneur.



Value added is therefore not just an element of income, but it also represents the distribution of that income amongst the four fundamental agents of the national economy: households (the recipients of the return to labor), financial institutions (interest charges), government administration (taxes), and non-financial enterprises (gross or net profit).

In the same way as margins can be defined in both net and gross terms, so value added can be measured in net and gross terms according to whether depreciation is or is not included<sup>4</sup>.

Finally, we can distinguish between internal (or domestic) value added and national value added: the first does not take into account the nationality of the agents to whom income is distributed and thus includes the salaries of both nationals and expatriates, and dividends accruing to national or foreign shareholders. The second only includes revenues received by national agents.

### **3.2 The production-trading account**

#### **a. The production account**

The production account can be used to calculate value added. It traces out the various processes involving goods and services, corresponding to the flows of inputs and outputs. It is analogous to the SUA (Supply Utilization Account), except that the supply column is called “inputs” and the utilization column is called “outputs”.

Because of lags in deliveries and payments, two adjustments should be made to the actual financial figures, to ensure comparability between agents and time periods: (i) Cash sales should be corrected for deliveries made but not paid for and (ii) changes in stocks (during the period) should be taken into account when estimating overall production figures. Actual production figures should be entered in this table.

Inputs are the costs of intermediate inputs used during the working period. Here again it is the actual productive activities which we wish to analyze, so similar adjustments to those discussed for output measurement must be made to ensure proper measurement of inputs.

These adjustments can cause considerable variation in the data for enterprises linked to agricultural production. The timing of the agricultural production cycle may be very different from the accounting period.

---

<sup>4</sup> The use of the terms “gross” and “net” in economics can be very confusing because, according to the context, they can refer to the inclusion or exclusion of any one of the following elements:

- taxes on industrial and commercial profits,
- interest charges,
- depreciation.

In this paper, the concept will be used only to refer to the inclusion/exclusion of depreciation.

**Table 1 - Production account**

INPUTS	OUTPUTS
♦ <b>Stocks</b> at beginning of period	♦ <b>Stocks</b> at end of period
♦ <b>Intermediate Inputs:</b> – Purchases of materials and merchandise – Purchased labor, supplies and services – Transport and traveling – Miscellaneous expenses (including banking charges and commissions)	♦ <b>Sales:</b> – Merchandise and finished products – Scrap and by-products  ♦ <b>Work undertaken internal to the enterprise</b>
♦ <b>Gross Value Added</b> [- Depreciation = Net Value Added]	
<b>TOTAL</b>	<b>TOTAL</b>

NB: Including depreciation in Inputs gives a figure for Net Value Added.

The balance obtained (final stocks + output - initial stock - intermediate inputs) represents the **Gross Value Added** of the agent.

**b. the trading account**

This account looks at the distribution of the value added created by the productive activity of the agent amongst different recipient agents.

The balance shown in the production account is entered in the column headed Supply and any trading subsidies received by the agent are added. The Utilization column shows the distribution of all these revenues amongst the different agents involved in the production process.

**Table 2 - The trading account**

UTILIZATION	SUPPLY
♦ <b>Personnel remuneration</b> (salaries, social security payments etc.)	♦ <b>Net value added</b>  ♦ <b>Trading subsidies</b> , disaster insurance etc.
♦ <b>Financial charges</b> (interest, insurance)	
♦ <b>Tariffs and taxes</b>	
♦ <b>Gross profit</b> - Depreciation = Net profit	
<b>TOTAL</b>	<b>TOTAL</b>

### c. The production-trading account

This integrates the operations and the economic results of a productive agent in a given time period by, as the name suggests, combining the production and trading accounts.

**Table 3 - Production-Trading account**

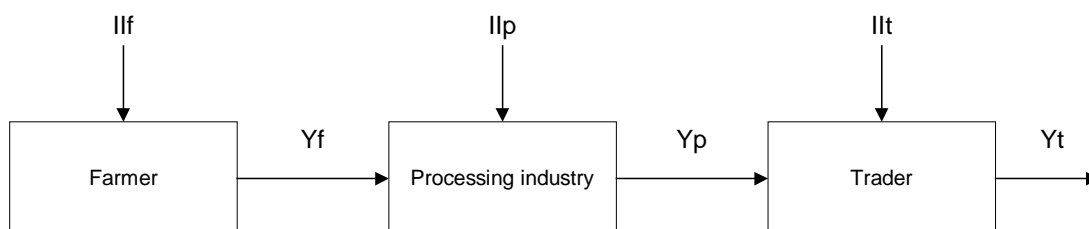
UTILIZATION	SUPPLY
<ul style="list-style-type: none"> <li>◆ Beginning stocks</li> <li>◆ Intermediate inputs:               <ul style="list-style-type: none"> <li>Purchases</li> <li>Purchased labor, supplies and services</li> <li>Transport</li> <li>Miscellaneous expenses</li> </ul> </li> <li>◆ Gross value added               <ul style="list-style-type: none"> <li>Personnel remuneration</li> <li>Financial charges</li> <li>Gross profits:                   <ul style="list-style-type: none"> <li>- Depreciation</li> <li>- Net profits</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ End stocks</li> <li>◆ Sales:               <ul style="list-style-type: none"> <li>Merchandise and finished products</li> <li>Scrap and by-products</li> </ul> </li> <li>◆ Work undertaken internal to the enterprise</li> <li>◆ Trading subsidies, disaster insurance etc.</li> </ul>
<b>TOTAL</b>	<b>TOTAL</b>

### 3.3 The consolidated account of the chain

The accounts of all the different agents making up the chain or sub-chain under consideration can be aggregated into a single account. This is referred to as the consolidated account.

A single account for the group of agents is established by including only the flows of exchange between the group and the rest of the economy (national or international). Internal transfers between agents belonging to the group are eliminated. The amount(s) obtained<sup>5</sup> represents the consolidated profits of the group of agents.

The principle of consolidation can be represented schematically as follows, by a simple chain of three agents:



<sup>5</sup> Value added, Gross trading profits, Net trading profits.

where  $Y_i$  = output from agent  $i$ ,  $I_{i,j}$  = intermediate input from outside the chain, used by agent  $i$ . This excludes the product which is the subject of the chain itself.

The production accounts of these agents are as follows:

Farmer	Processing Industry	Trader																
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">I<sub>if</sub></td> <td style="border: 1px solid black; padding: 5px; text-align: center;">Y<sub>f</sub></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">V<sub>Af</sub></td> <td style="border: 1px solid black; padding: 5px;"></td> </tr> </table>	I <sub>if</sub>	Y <sub>f</sub>	V <sub>Af</sub>		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">Y<sub>f</sub></td> <td style="border: 1px solid black; padding: 5px; text-align: center;">Y<sub>p</sub></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">I<sub>ip</sub></td> <td style="border: 1px solid black; padding: 5px;"></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">V<sub>Ap</sub></td> <td style="border: 1px solid black; padding: 5px;"></td> </tr> </table>	Y <sub>f</sub>	Y <sub>p</sub>	I <sub>ip</sub>		V <sub>Ap</sub>		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">Y<sub>p</sub></td> <td style="border: 1px solid black; padding: 5px; text-align: center;">Y<sub>t</sub></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">I<sub>it</sub></td> <td style="border: 1px solid black; padding: 5px;"></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">V<sub>At</sub></td> <td style="border: 1px solid black; padding: 5px;"></td> </tr> </table>	Y <sub>p</sub>	Y <sub>t</sub>	I <sub>it</sub>		V <sub>At</sub>	
I <sub>if</sub>	Y <sub>f</sub>																	
V <sub>Af</sub>																		
Y <sub>f</sub>	Y <sub>p</sub>																	
I <sub>ip</sub>																		
V <sub>Ap</sub>																		
Y <sub>p</sub>	Y <sub>t</sub>																	
I <sub>it</sub>																		
V <sub>At</sub>																		

The consolidated account is the “sum of the accounts” of the agents of the chain after having eliminated those elements which cancel each other out because they are part of the output of an upstream agent or part of the inputs of a downstream agent. If we put the individual accounts together, we get:

I <sub>if</sub>	[Y <sub>f</sub> ]	Farmers
[Y <sub>f</sub> ] I <sub>ip</sub>	[Y <sub>p</sub> ]	Processing Industries
[Y <sub>p</sub> ] I <sub>it</sub>	[Y <sub>t</sub> ]	Traders
V <sub>A chain</sub>		

The items shown in brackets [ ] cancel each other out. The final consolidated account results as follows:

I <sub>if</sub> I <sub>ip</sub> I <sub>it</sub>	Y <sub>t</sub>
V <sub>A chain</sub>	

If one part ( $Y_f'$ ) of the production of farmers or of the processing industry ( $Y_p'$ ) leaves the chain (through export or domestic sales to final demand), the value realized for this production must be included in the production column of the consolidated account, so the sum is equal to:

$$Y_f' + Y_p' + Y_t.$$

The value added of the entire chain is calculated as the amount:

$$VA \text{ chain} = Y \text{ chain} - II \text{ chain}$$

or, since values added are additive, we can add algebraically the value added of each of the agents of the chain:

$$VA_{\text{chain}} = \sum VA_{\text{agents}}$$

The consolidated trading account is calculated in a similar fashion, by adding the different elements of income distributed contained in the trading accounts of all the agents in the chain: the figure for personnel remuneration, the sum for financial charges, the sum for taxes and duties paid and the sum for gross profits<sup>6</sup>.

## 4 EMPIRICAL ESTIMATION

### 4.1 Setting up the accounts of individual agents

The first stage in quantification is to construct the production-trading accounts of each agent in the chain. Often this means that the analyst has to deal with agents who have no formal accounts, or whose accounts do not contain the necessary information for completion of the production-trading account. Specific research or survey work may be necessary.

As indicated above, for each agent in the chain, the analyst has to:

- determine the value of production (turnover),
- calculate intermediate input costs,
- calculate expenditure on salaries, financial charges and taxes,
- calculate a measure of annual depreciation, where relevant.

The key amounts, value added, gross profits and net profits, are then calculated.

One of the major problems which the analyst has to face is that the valuation of agricultural production when production has not yet entered into monetary exchange (such as own consumption of subsistence farmers) or where there is poor information on the volume and price of transactions (local petty trade, sales spread out throughout the year). The first problem is generally tackled by multiplying physical estimates of flows by market prices. The second problem is more complex and can only be treated on a case by case basis; this is, without doubt, one of the major areas of uncertainty and imprecision in the estimation process. However, this difficulty is not specific to CCA: it is common to all estimates and macro-economic analyses relating to agricultural and/or informal sectors and commodity chains which are dependent on “peasant accounting”.

---

<sup>6</sup> In practice, we should only calculate the sum of “homogeneous” gross profits, i.e. the GP of agents of a similar type (modern businesses, informal sector businesses, peasant farmers), so as to avoid having to undertake calculations, the economic interpretation of which would be problematic (for example adding together the GP of peasant production units with those of industrial units).

In addition, it is necessary to reconcile the accounts of each agent with the physical processes of production of the chain, and in particular the pattern of supplies and deliveries associated with the agricultural calendar.

For an agricultural commodity, it is natural to delineate time in terms of the agricultural season, starting with the delivery of inputs and finishing with the sale of output to the consumer in its final form. This can take over a year for some commodities. Industrial enterprises, on the other hand, keep their accounts on an annual basis, and the beginning of the accounting year might well be in the middle of the agricultural season. This means that a situation may arise where the farmers' accounts are, by definition, the accounts of a season, whereas for the organizations that supply inputs and the processing units, for example cotton ginneries or textile factories, there may be more than one accounting period in an agricultural season.

Unless the organizations themselves cannot supply accounts adjusted to the agricultural season, then the general principle used to deal with this situation is to estimate the flows of output, both in quantity and value terms, as best we can in relation to the season and construct the account on a pro rata basis.

Finally, often agents have a complex relationship with the commodity chain the analyst is trying to construct. Some agents undertake activities other than those which are a part of the chain under investigation. In this case, the analyst has to do his/her best to isolate the costs associated with the activities which relate to the chain. Other agents may be involved in more than one stage of the chain, for example supplying inputs and marketing output. Here the analyst must try to divide the aggregated accounts so as to allocate costs to each of the different functions.

#### 4.2 Setting up the consolidated account of the chain

The consolidated production-trading account for the complete chain has the same component parts as that of an individual agent:

- **Intermediate inputs**, consisting of all intermediate inputs which are not supplied by an agent within the chain;
- **Output**, consisting of the flow of goods delivered onto the final consumption market, or the intermediate market which denotes the downstream limit of the chosen segment of the chain. This must also include the flows of any related by-products and wastage;
- **Value Added**, calculated by taking the difference between output and intermediate inputs, or by adding together the value added for each of the agents comprising the chain, which can be broken down into the four basic elements:
  - personnel remuneration,
  - financial charges,
  - taxes and duties,
  - gross profit.

These four elements are calculated by adding together the amounts for the agents taken individually. The gross profit is rarely calculated for the chain as a whole, but more often broken down into the gross profit accruing to each agent.

Putting the complete chain together generally requires a reconciliation of the physical quantities of product concerned at all stages of transformation. It is therefore important not to forget the different possible uses: additions to stock, own consumption, losses, external trade, whether legal or not, seed and production on own account for agricultural products. The analyst should reach the same results when looking at the supply of the various commodities as when he/she looks at the demand side. This should be undertaken in both physical and value terms.

## 5 ANALYSIS

The financial analysis of the chain, or the section of the chain, under consideration is based on the individual accounts of the agent and of the overall consolidated account. Here the analyst's objective is to identify, on the one hand, the "general equilibrium" achieved within the chain as a whole, in terms of the various flows, and on the other hand, the linkages between the income of the peasant farmer (and other producers), and that of other participants in the chain, taking into account the impact of the national budget, external constraints and transfers arising from taxes and regulated prices.

### 5.1 The financial profitability of activities in the chain

The first output of CCA is the provision of production-trading accounts for a group of agents linked together in that they co-operate directly in the production of a good. We can use the traditional methods and criteria of financial analysis to ask questions about the profitability of the activities in the chain:

- 👍 Does the activity result in a surplus? With or without subsidy?
- 👍 Is this surplus sufficient for the sustainability of the activity, i.e. the maintenance and replacement of equipment and capital, the ability to cover actual and future financial costs?
- 👍 Does this surplus represent a sufficient, normal or appropriate return to the initial capital investment?
- 👍 Will the situation improve or deteriorate over time?

One major difficulty often lies in the absence of a sufficiently long or significant series of accounting data for each agent. If the information available is only for one year, the analyst is restricted to fairly simple benefit-cost ratios.

It is particularly important to carefully examine the viability of the agent over time, by looking at estimates of fixed capital used, annual depreciation, development in technology in the area and the economic conditions for reinvestment.

### 5.2 Overall efficiency of the chain

The concept of economic efficiency of the system (the chain) is more complex than that of the profitability of an investment or the productivity of a factor of production. One

possibility is to compare unit production costs. However, using criteria based on financial costs is limited in scope and insufficient to explain the dynamic of the activity. For this, other economic criteria are necessary.

These criteria can be simple ratios or formulas comparing the costs in a domestic chain with the international price, with costs in similar chains in other countries, or with other commodity chains in the same country.

However two related concepts are keys to any analysis: the distribution of income and the creation of value added. Frequently asked questions are:

- 👉 How is income distributed? Which agents receive what amounts, in absolute and relative terms, for the activities they perform in the chain? What is their contribution to the overall process of production of the chain? What is their part in wealth creation?
- 👉 What is the amount of value added for the chain as a whole? Does the chain create a positive value added? If the answer is yes, then the economic activity in question nominally creates wealth; if the answer is no, then, on the contrary, it consumes wealth and is an agent of impoverishment.
- 👉 How is the value added created and, in particular, by which agents? Which agents produce the greatest value added? And which agents only produce negative value added? What is the role of the primary producers (the peasant farmers) in the creation of this value?

To the extent that sufficient data exists, comparisons may be possible either with other domestic commodity chains or with the same commodity chain in other countries<sup>7</sup>. The first type of comparison gives information which can be used when important political decisions are made about allocating investment. The second elaborates the nature of international competition, particularly important when the product concerned faces this competition in the market place, for example, an export commodity or an import-substitution commodity.

Another aspect of CCA is the possibility of analyzing the link between economic profits and the incentives facing farmers. Simulation exercises can clarify the returns to and the risks faced by peasant farmers, and at the same time show certain elements of the strategies they employ, or can employ. It is possible to examine feasible alternatives and their economic consequences.

We therefore end up with an analysis which covers not only the financial data of the accounts, but which sheds light on technical, economic and organizational aspects of the sector.

---

<sup>7</sup>Using value added per hectare, or per ton, for example.



### 5.3 Price formation

The study of price formation throughout the chain deserves particular attention both because it relates to the distribution of value added amongst the different agents, but also because of its relevance to policy issues linked to the effective functioning of markets. This leads the analyst to ask questions such as:

- 👉 What is the distribution of benefits and implicit transfers which accompany the application of a tariff, centrally regulated prices and other institutional constraints affecting economic activity? What is the impact of the incentive structure? What are the financial flows resulting from these incentives?
- 👉 Is a particular segment of the chain in a position to ensure the maintenance and renewal of its capital stock?
- 👉 Who bears the cost of variations in international prices? How are any resulting positive or negative margins covered? Who bears the economic risk?
- 👉 What is the impact of given actual or proposed policies on transfers? On the increase or reduction of risk? And for whom?

### 5.4 The analysis of transfers

Financial analysis gives us measures of the impact of the commodity chain on each agent (operating profits), on growth (overall value added created), on the distribution on income by category of agent and, where relevant, on external exchange, as a result of direct importation of intermediate goods by agents in the chain and/or of commodity exports.

From this, and the analytical results of price analysis, economists can shed light on the impact of economic policy by making explicit the transfers between agents that these policies imply. For example, when producer prices are fixed at a low level, this does not allow an adequate return to the work of the peasant farmer but favors the industrial sector further down the chain. They face a low price for their intermediate inputs and, for a given final output price, will benefit from an increase in the value added of their activities at a cost to the producers further up the chain.

If transfers are neutral from the point of view of value added created<sup>8</sup>, they play a very important role in terms of the real distribution of income amongst domestic agents. As a consequence, they influence the behavior and strategies of different actors and, eventually, future levels of growth.

The intervention of the government through taxes and subsidies is often one of the ways used to accentuate or diminish the impact of these transfers. Establishing a production-trading account for the government gives analysts information not only on the budgetary impact of the government's activities but also a better understanding of working mechanisms which underlie this.

---

<sup>8</sup>At least for a given final sales price of a product, which is the case for products the price of which is "fixed" on the world market.

The study of the impact of income transfers between agents on overall distribution is one of the characteristic outputs of CCA. This is one reason why the technique can be so useful both for specific policy analysis and for studying wider issues of political economy.

## 6 CONCLUSION

This module focuses on the financial analysis using the commodity chain analysis. It belongs to a set of modules which discuss how to proceed step-by-step on CCA and shows analytical tools that can be used to value the commodity chain. At first, it is important to calculate the value added released by the agents of the chain. Then, we have to determine the production-trading account and the consolidated account of the chain. The obtained tables allow us to find the financial profitability of activities in the chain and the overall efficiency of the chain.

## 7 READERS' NOTES

### 7.1 Time requirements

The delivery of this introductory module may be suitable for any audience of skilled staff who require to be introduced on Commodity Chain. In most cases, it may be presented in a session of one and a half hours.

### 7.2 Frequently asked questions

Frequently asked questions are the following:

Who decides what is in and out the commodity chain?

What is the difference between the commodity chain analysis and value chain analysis?

### 7.3 Complementary capacity building materials

This module is a first step introduction which drives users to the next two modules:

- [Commodity Chain Analysis: Impact Analysis Using Market Prices](#), EASYPol Module 045
- [Commodity Chain Analysis: Impact Analysis Using Shadow Prices](#), EASYPol Module 046

These modules are complemented by a set of case studies that can be used to replicate selected exercises during the lectures or in working groups. The case studies are provided with spreadsheet working frameworks for exercises.

## 7.4 EASYPol links

This module belongs to a set of modules about the Commodity Chain Analysis.

- [Commodity Chain Analysis. Constructing the Commodity Chain: Functional Analysis and Flow Chart](#), EASYPol Module 043
- [Commodity Chain Analysis: Impact Analysis Using Market Prices](#), EASYPol Module 045
- [Commodity Chain Analysis: Impact Analysis Using Shadow Prices](#), EASYPol Module 046

See two case studies using the Commodity Chain Analysis :

- [Case Study on Commodity Chain Analysis: Irrigated Rice Chain of the Niger's Office \(Mali\): Financial and Economic Account](#), EASYPol Module 047
- [Commodity Chain Case Study: Analysis of the Suburban Horticulture Sub-Chain of Bamako \(Mali\)](#), EASYPol Module 048

See all Value Chain material on EASYPol resource package: [Value Chain Analysis](#)

## 8 FURTHER READINGS

There is virtually no Anglophone literature which deals directly with CCA. It is however, discussed in the context of constructing Policy Analysis Matrices, though there is little on financial analysis or even impact analysis.

Aldridge, Kimberly M., 1992. *A framework for analyzing alternative institutional arrangements for the cereals market information system in Mali*, Mémoire de "Master of Science in agricultural economics" au Michigan State University, pp 15-40.

Audette, R., Larivière, S., Martin, F., 1994. *Analyse de filière dans le secteur agro-alimentaire: guide de réalisation d'une étude filière - rapport préliminaire ACDI - Eco. rurale inc.*

Bockel, L., 1996. *Analyse de la sous-filière maraîchage péri-urbain de Bamako*, FAO, Document de formation pour la Planification Agricole, Division de l'Assistance aux Politiques (TCAS), FAO.

Bourgeois, Robin, 1998. *La constitution des filières et les institutions quaternaires.*

Daviron, Benoît, 1998. *Les défaillances de marché et les filières agricoles.*

Fabre, P., 1994. *Note de méthodologie générale sur l'analyse de filière*, Document de formation pour la planification agricole n° 35, FAO ESPT.

Hugon, Philippe, 1998. *Avantages comparatifs, compétitivité et organisation des filières*.

Mauget, René, 2002. *Agri-Food Chain Analysis*. ESSEC Business School, Paris, France.