

ANALYTICAL TOOLS

EASYPol Series 074

FAO VCA-Tool: A Software for Value Chain Analysis

MANUAL FOR VERSION 3.1

by

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For the

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About the Value Chain Analysis software

This is a software for carrying 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. <u>FAO-VCA Software Tool»</u> <u>Value Chain Analysis for Policy Making:</u> <u>Methodological Guidelines for a Quantitative Approach</u>»

See all VCA resources 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: <u>www.fao.org/easypol</u>. These resources focus on policy findings, methodological tools and capacity development. The site is maintained by FAO's <u>Policy Support Group.</u>

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1. SUMMARY

FAO's VCA-Tool is a software¹ that has been developed for Value Chain Analysis to analyze and compare the effects of different policy options for agriculture and sustainable rural development.

The FAO VCA-Tool software allows you to create an accounting framework for value chain analysis and to compare different scenarios. It also helps you to build and handle your own database.

The VCA software allows you to build different scenarios and to analyse the socio-economic impact of various policies such as domestic prices liberalization, opening to international trade, new technologies adoption, etc. The software allows you to build a *baseline scenario which* corresponds to a benchmark situation and once you generate the policy measures or changes in the value chain, their impacts will modify the original reference scenario.

More specifically, the software enables you to systematically store data for the implementation of Cost-Benefit and Value Added Analyses and allows you to calculate:

- the flows and availability of physical quantities of inputs and outputs;
- the flows of aggregated costs, benefits, net benefits and value added, at agent and aggregate level;
- the flows of incremental costs, benefits, net benefits and value added for different policies;
- a set of economic indicators such as the profitability indexes, the indicators of protection and the indicators of competitiveness at international level (i.e. Effective Protection Coefficient, Domestic Resource Cost ratio).

The FAO VCA-Tool software provides you with an effective alternative to spreadsheets, where you can standardize data, analyze complicated chains, automatically compute margins and selected indicators and compare scenarios.

This manual provides detailed instructions on how to install the software, insert and manage data and carry out calculations of indicators for the different components and levels of a value chain analysis.

The software is the complementary tool to the *Value Chain Analysis for Policy Making* - *Methodological Guidelines for a Quantitative Approach*² which document provides the conceptual and methodological framework for value chain analysis.

¹ Value Chain Analysis Software. FAO VCA Tool 3.1. EASYPol module 073.

² Bellù, L.G., 2012. <u>Value Chain Analysis for Policy Making - Methodological Guidelines for a Quantitative</u> <u>Approach</u>, EASYPol Module 129, FAO, Rome.

You can follow links included in the text to other EASYPol modules or references³. See also the list of EASYPol links included at the end of this module⁴.

2. INSTALLING THE FAO VCA-TOOL SOFTWARE

FAO's VCA-Tool runs with Windows'98 and subsequent versions.

You can download the FAO VCA-Tool as a zip file from FAO's EASYPol website⁵ and it is also available on CD-ROM upon request.

2.1. How to install the software

It is recommended that you install VCA-Tool with the installer package.

Download the file VCA.zip onto your desktop; alternatively, if you have the CD-ROM, copy the zip file into a folder of your choice on your computer.

Then follow the step-by-step procedure to install the software:

- Step 1: Double click on the icon of the Package VCA 3.1.zip file. A new window with the content of the zip file will pop up on your screen. The zip file contains four different files: "VCA 3.1 July12.CAB", "SETUP.EXE", "SETUP.LST" and the "SUPPORT" folder⁶.
- Step 2: Select a folder on your PC to unzip the VCA.ZIP.
- **Step 3:** Double click on the icon of the file SETUP.EXE and follow the instructions prompted on the screen. The FAO VCA-Tool software will be installed in the folder previously selected on your computer. By default, the software prompts the folder: C:\program files\VCA-Tool.
- **Step 4**: Create a link to the file VCA.EXE and copy its icon onto your desktop.

Once the program has been installed, unless specified otherwise, you can update it with new versions of the software by simply replacing the VCA.exe file with a new VCA.exe file released by FAO.

Click the VCA icon on your desktop to run the FAO VCA-Tool. Alternatively, open Windows Explorer, open the VCA folder and click on the file **VCA.exe**.

³ EASYPol hyperlinks are shown in blue, as follows:

a) Resource packages are shown in underlined bold font

b) other EASYPol modules or complementary EASYPol materials are in *bold underlined italics*;

c) links to the glossary are in **bold**; and

d) external links are in **italics**.

⁴ This module is part of the EASYPol Resource Package: <u>VCA software and manuals</u>.

⁵ EASYPol, resources for policy making <u>www.fao.org/easypol</u>. A CD is also available enclosed with the paper version of the manual. Send a "feedback" message: <u>vca-assistance@fao.org</u>

⁶ The README.TXT file contains a summary of this installation note.

Some examples are provided with the software: to run the examples, open the FAO VCA-Tool program and load the exercise files by clicking on **File** and then on **Open an Existing project**.

2.2. How to uninstall the FAO VCA-Tool

To uninstall the FAO VCA-Tool software from your computer use the uninstall facility of Microsoft Windows, if this is not available, carry out the following procedure:

- **<u>Step 1</u>**: Delete the VCA directory and its sub-directories.
- Step 2: Delete the VCA icon by clicking on it with the right-hand mouse button and selecting Delete.

2.3. Technical notes for installation and use

- 1. The software's optimal visualization is at Display Resolution 1024x768 pixels or more.
- 2. The software can be used <u>for only one session at a time</u> (i.e. you cannot work on more than one project at the same time) because when you open or create a dataset a temporary file is originated. This file is the same for each session and if the software is opened for different sessions simultaneously, you risk saving your data incorrectly and with errors, which would be noticeable when the saved file is reopened.

The FAO VCA-Tool works only with one temporary file, regardless the number of xxx you open, causing conflict among sessions and incorrect data storing.

3. Errors and malfunctions can occur when installing the software if you **do not have** administrator access. This occurs due to the creation of the temporary file *temp* in the sub-folder *Data* (where the software has been saved which is accessible by the software only if you have administrator access. To avoid errors and malfunctions, you must modify your user permissions to properly access the folder where the application is installed. Follow these steps to modify your user access permission:

Step 1: Access the C:\Program Files\{Folder Name}.

Step 2: Right-click on the folder FAO VCA-Tool and select Properties, see Figure 1.

File Edit View Favorites Tools Help					
cuit view Havorites	ruus nelp				
ck 🔻 🕤 👻 📝 🔛 Searc	th 🜔 Folders 🔐 🕼 🍻 🗙	9 🔤			
ess 🛅 C:\Program Files					- 6
	Name 🔺	Size Type	Date Modified		
stem Tasks 🛛 🛸	Pod	File Folder	10/01/2011 10:49		
	☐ IrfanVlew	File Folder	11/07/2012 14:11		
Hide the contents of	👝 Irmawin	File Folder	14/09/2005 13:42		
this folder	Tunes	File Folder	10/01/2011 10:50		
Add or remove	🚞 Java	File Folder	05/06/2012 14:56		
programs	🛅 Media Player Classic	File Folder	14/09/2005 14:32		
Search for files or	Messenger	File Folder	19/06/2008 12:03		
folders	Control Microangelo Toolset 6	File Folder	11/07/2012 16:11		
	Microsoft ActiveSync	File Folder	15/09/2010 16:52		
and Folder Tasks *	Microsoft CAPICOM 2.1.0.2	File Folder	11/05/2007 10:10		
and a second	microsoft frontpage	File Folder	14/09/2005 12:39		
Rename this folder	Microsoft Office	File Folder	21/07/2011 00:00		
Move this folder	Microsoft Silverlight	File Folder	14/12/2010 14:30		
Copy this folder	Microsoft Visual Studio	File Folder	04/06/2012 16:01		
E-mail this folder's	Microsoft Works	File Folder	02/03/2010 10:4/		
files	MICROSOFT. NE I	File Folder	02/03/2010 10:43		
Delete this folder	Movie Maker	File Folder	15/09/2010 15:19		
Delete d'ils folder	Mozilia Firetox	File Folder	31/0//2012 11:56		
	MSBullu	File Folder	11/04/2008 11:05		
ner Places 🔹 🛸	Moecacrie Come	File Folder	10/06/2007 13:24		
	i msn	File Folder	19/06/2008 12:02		
OSDisk (C:)	msn gaming zone	File Folder	14/09/2005 12:39		
My Documents	Contraction of the state of the	File Folder	10/06/2008 13:11		
My Computer	Open	File Folder	14/00/2008 11:59		
My Network Places		File Folder	14/09/2005 12:3/		
	Court Search	File Folder	02/03/2007 09.32		
		Eile Folder	17/05/2011 00:51		
tails ¥		File Folder	10/01/2011 10:47		
	Scan with Sophos Anti-V	File Folder	14/09/2005 14:32		
	Ref: Send To	File Folder	11/04/2008 11:02		
	and Safa	Eile Eolder	26/11/2010 19:00		
	SEP Out	File Folder	27/02/2012 10:09		
	Skyr Copy	File Folder	22/07/2011 15:23		
	Soni Paste	File Folder	22/09/2005 16:20		
	Sopt	File Folder	27/02/2012 10:12		
	Sym Create Shortcut	File Folder	11/04/2008 11:24		
	Delete	File Folder	02/03/2011 15:11		
	Onin Rename	File Folder	14/09/2005 13:00		
	DUPH	File Folder	23/10/2006 15:42		
	VCA Properties	File Folder	10/05/2012 12:19		
	C VViewer	File Folder	14/09/2005 14:33		
	🗀 Web Publish	File Folder	04/06/2012 16:01		
	Windows Imaging	File Folder	02/11/2010 14:23		
	🚞 Windows Media Connect 2	File Folder	07/05/2007 15:43		
	🗀 Windows Media Player	File Folder	19/06/2008 11:59		
	Windows NT	File Folder	14/09/2005 12:39		
	🛅 WindowsUpdate	File Folder	14/09/2005 12:37		
	WinRAR	File Folder	19/12/2011 17:36		
	WinZip	File Folder	02/03/2010 15:48		

Figure 1: Changing user access rights: "Properties" folder (1/3)

Step 3: Check the user permissions.

<u>Step 4</u>: If your settings don't allow you to full control the folder, you need to change your user access permissions to give you full control of the software. Figure 3 shows how to switch to a Full Control situation, flagging all the boxes in the security properties.

Figure 2: Changing user access rights: "Properties" folder

Administrators (HQFILE2\Ad	Iministrators) IN\Domain Admin:	s)
Control (FAUDUMAIN) Control (FAUDUMAIN) Control (FAUDUMAIN) Control (FAUDUMAIN) Control (FAUDUMAIN)	intoSec-HDJ 509562-57803382	8-63871
	Add	Remove
Permissions for Administrators	Allow	Deny
Full Control Modify Read & Execute List Folder Contents Read Write		

3. BASIC STRUCTURE OF THE SOFTWARE

3.1. Dashboard description

Figure 3: dashboard of the software.



3.1.1. Main menu bar

The first element appearing when you open the software is the **main menu bar**, see Figure 4. The menu bar comprises the options **Files**, **Tools**, **Options** and **Help commands**.

Figure 4: VCA-Tool main menu bar

E.	AO VC	CA-Tool			
File	Tools	Options	?		

Click File too see the drop-down menu (see Figure 5).

Figure 5: File drop-down menu



The main commands of the File menu are:

- **New project**: to clear all the project memory when you want to start a new project while another project is already loaded.
- **Open an existing project**: to load the data of a project that has already been inserted and saved on the hard-disk. By default the software lists the files (*.VCA) stored in the *Data* subdirectory. Since the software allows you to save a project in three types of format, it is important that you choose the desired option (one file, two files, or text file, see Figure 6 below) from the drop down menu "Files of type".

Figure 6: Choosing the format file

1			
File name:	wheat.VCA	-	Open
Files of type:	One File (*.VCA)	•	Cancel
	One File (*.VCA)		
	Two Files (*1.VCA) VCA File (*.txt)		//

- Save: to save data from your working files.
- Save as: to save your data in a directory and allows you to choose one of three types of file formats. You must give a name to the files and select the File type, while the extension is

prompted by the software (".VCA" for one file; "1.VCA" and "2.VCA" for two files; and ".txt" for a text file).

• **Exit:** to quit the VCA programme.

Click on **Tools** to see the drop-down menu (Figure 7).

Figure 7: Tools drop-down menu

	IOI
File Tools Option	ns ?
File r Help about	Tools
Proje: Calibration	SUA
Statistics	

The main commands of the Tools menu are:

- Calibration SUA (Supply Utilization Accounts): to balance the supply and demand of each ring of the chain or, in other words, to calibrate the distribution of the supply among the various consuming agents.
- **Statistics**: to obtain an overview of a project's data. It classifies the list of commodities in categories and identifies the various segments of the chain in the database.

Click on **Options** to see the drop-down menu (Figure 8)

 Figure 8: Options drop-down menu

 File Tools
 Options

 File name:
 Help about Options

 Project name
 Language

 Wheatexercises
 Type of prices

 Parameters
 Ctrl+P

The main commands of the **Options** menu are:

- Languages: to select a preferred language to analyze the project. Once the project is saved, the selected language is also saved, so when you reload the project the same language will be used.
- **Types of prices:** to choose whether the VCA analysis is carried out using market or reference prices.
- Parameters: to define important parameters for the project.

Click on **Help** and you will see two different options (Figure 9):

Figure 9: Help/ About

🚼 FAO VCA-Tool	
File Tools Options	?
File name: wheat.V	Help
Project name:	About

- Help: to find information on how to use the software.
- About: to find information about the version of the software, the authors, assistance and the disclaimer.

3.1.2. Components bar

The second element appearing when you open the software is the **components bar**. It includes the options related to the information on the project and on its single components: **Commodities**, **Activities**, **Plans**, **Aggregates** (see the left side of Figure 3).

Once you open an existing project, you can see the list of its related components by clicking on **Commodities**, **Activities** or **Plans**. Double click on one of the listed items to display its content on the right of the dashboard. The dashboard on the right shows the value chain related data and allows you to create a component and compute data. Furthermore, the dashboard displays the options to carry out different data analysis such as cost and benefit analysis, value added computation, policy analysis matrix, etc⁷.

Finally, **Project information** leads you to a small text file where you can track detailed information related to the project such as, your hypothetical situation analysis or the data sources used to build the database.

⁷ The list of the analysis that can be carried through the software is extensively analyzed in the EASYPol module 129 <u>Value Chain Analysis for Policy Making -Methodological Guidelines for a Quantitative Approach</u>

3.2. Components

To perform a value chain analysis with the FAO VCA-Tool software, you must create all the components that, combined together, define the economic content of the chain. The hierarchy within the components can be explained as follows: the commodity creates the activity, the activity creates the plan and the plan creates more plans⁸. The FAO VCA-Tool approach goes from simple to more complicated⁹ hierarchies, see Figure 10.

Commodities

In the FAO VCA-Tool software, the basic items of a value chain are the **commodities** sice they are considered to be the basic data of a production system, e.g., seeds, taxes, wheat, energy, labour. These assessable elements are involved in the production, processing and trading of the main outputs of the chain that become commodities themself.

Activities

The combination of some commodities allows you to model the value chain **activities**. In the case of an agricultural chain, the main activities are: commodity production, processing and trading.

Plans

You can combine basic commodities and activities to create **plans**. A plan corresponds to the top level of the hierarchy: it represents an agent, or a group of agents, a geographical area or an exploitation method.

As shown in Figure 10, the FAO VCA-Tool software allows you to create "**plans of plans**", that are basically plans combining other plans (and/or any other component). For example, the plan "Set of all producers" includes different producer plans.

⁸ Refer to Chapter 2 of the EASYPol Module 129, *Value Chain Analysis for Policy Making -Methodological Guidelines for a Quantitative Approach*, for an extensive explanation.

⁹ Note that, when creating and formulating a value chain analysis (VCA), analysts generally start by defining the chain from general to particular. In VCA, this approach is reversed: the analyst should start by entering the basic data, the agents, and the other components of the project, to later switch to the activities and plans, through to the end of the chain



Figure 10: An example of assembling components in VCA

4. DATA INSERTION AND MANAGEMENT

4.1. Creating and saving a project

Once you open the software it is recommended that you first select a language. English is used by default, however it is possible to switch to French or Spanish by clicking on **Options**, in the top menu and then on **Language** (Figure 11).

Figure 11: Selecting a language



Now you can insert the project name in the respective box (Figure 12).

Figure 12: Inserting the a project name

FAO VCA-Too	bl
File Tools Options	?
File name	
Project name:	
,	
Project informati	on
In/Out commodities	Activities
Plans	Aggregated commodities

Once the name of the new project is inserted, press the *Enter* button on the keyboard to save the new information.

Before you save the project, at least one commodity must be registered. Once the first commodity is entered, the project can be saved by clicking on File and then on Save/Save as. By default, the software prompts the file extension format ".vca" (for example, myproject1.vca). The project is saved as a file in the folder of your choice. By default the folder is C:\Program Files\VCA\Data. NB You can change the file name but not the extension.

If you need to change some data but keeping the original project, you must save the existing file using another name and then proceed with your changes. Click on **File**, **Save as**, and enter the new name.

To open an existing file, click on File, then Open an existing file.

If the you are already working on a project and you wish to open another existing project, you must click on **File** and **New project** or on **File**, **Open an existing project** and select the project on which to work on. This procedure reinitializes the software. Once the new file is opened, the non-saved information is lost because it is impossible to work on two projects during the same session (see WARNINGS in Chapter 2).

4.2. Data insertion and management

4.2.1. Basic functions

The two main functions of the FAO VCA-Tool software are Inserting and Management of the commodities, activities and plans.

To avoid duplication of the functioning mode of each component (Activity, Commodity, Plan) a common description is provided in Figure 12a. The specific characteristics of each component are described below.



Figure 12a: Basic functions of a component windows: Activities

For each component you must enter the following information:

i.Short Name: to identify the file commodity, activity or plan. It is advisable that you choose a short name to fit the related table cells and to make it easy to read. You can choose a combination of upper and lower case letters, for example, the component "set of producers" may be named "SetProd".

ii.Unit: to specify the related information of each component:

- *for the commodity,* the unit chosen is the one defined by the price of the commodity. Example: price per pound, per gallon, per lot.
- *for the activity,* the unit reflects the amount of commodities necessary to complete the defined activity. If the amount of inputs necessary per unit is known, the activity will be defined on the basis of the same unit.
- *for the plan,* the unit defines the scope of the set of components in use. For example, for the plan "producer", the unit represents one or more producers of an area or of a subsector.
- iii.Long name: to specify information about the component in the file name (e.g. the plan with "SetProd" can have a long name "Set of producers").

Once you have inserted all the components, you can save it/them by clicking **Register** Commodity/ Register Activity/ Register Plan.

As shown in Figure 12a, the VCA-tool also allows you to use four more functions: Add items, Copy Values, Delete Item and Clear Form.

• Add items: this is available only for activities and plans and allows you to create a new component on the basis of the existing ones. Once the option Activities or Plans is selected, click Add items to choose the category of the new item: Commodities, Activities, Plans or Aggregates (see Figure 12b).

To insert a new item, you must click **In/Out Commodities**. The screenshot in Figure 12c will appear. Select the item of interest and double clicking on it to add it to the list of the **Selected Items**. Once all the items of interest have been selected, click **OK**: a window will appear showing the selected items. The list can be saved following the above procedure. NB Double click on an item from this list to delete it.

Figure 12b: Function "Add items" - Example drawn from the component Plan

🗟 Ad	d items to a	n activity or a plan		×
Help				
		Activities	Selected items	
co	In/Out mmodities	<mark>CuWheatTra</mark> CuWheatMod ProcHi	CuWheatTra	
4	Activities	ProcLo OrdBaking BioBaking		
	Plans			
	ОК			
	ОК			

As mentioned earlier, the FAO VCA-Tool allows you to simulate a policy scenario. Once you have inserted your options, the tables collecting the data will display the policy scenario. The first column of the tables displays the *Base Scenario* situation and it is followed by numbered columns ranging from 1 to 50 and which also describe the policy scenario simulation (see Figure 13). The *Base Scenario* usually corresponds to the reference situation, i.e. the one for which data are available and specified. You can copy the base scenario data into the columns of your subsequent scenarios and then update them as needed once the policy measure¹⁰ is applied. This process is carried out with the **Copy Values** function.

Copy Values: to copy data from a selected scenario to the columns of the following scenarios by selecting the data from the chosen scenario and click on Copy Values. This function can be applied for the component Commodities, Activities or Plans.
 You can save the copied values by clicking on Register Commodity/Register Activity/ Register Plan.

¹⁰ Make sure that all related changes of your policy measure are inserted in the same column in the different windows of the software. All changes induced by the policy measure must be inserted in column 1.

Once the component is created and registered, click on **File**, **Save** to save it in the database of the project or click on **Save as** to build a new project. This step is necessary for you to save the component in your simulated policy project.

- ii. Delete Item: to delete an item. Click first on the line of the item to be deleted and then click Delete Item (see Figure 12c).
- iii. **Clear Form**: to cancel the data in the open window. Once the screen is clear, you can create new components.

Modify name	Delete item
In/Out commodities	
BioBread Energy Fertilizers Flour LabourFar LabourMil IabourBak Land OrdBread SeedWheat Wheat WheatBio	
A-Z Up Down	

Figure 12c: Basic functions of the main menu

When you create and save a component, it is added to the list of the other similar components, which are on the lefthand side of the dashboard. Double click on a component of the list in the left part of the dashboard and a window appears containing all the data related to that component. You can further classify the components already listed. To see the list of all commodities registered in the project click one of the buttons **In/Out Commodities**, **Activities**, **Plans** on the left side of the dashboard.

Commodities, Activities and **Plans** are sorted by date of creation by default on the left side of the dashboard. You can change this to an alphabetic order by clicking the **A-Z** button (NB lower-case letters come after upper-case letters). Click **UP** or **DOWN** to move a selected item up or down the list.

Complex items evolve from the combination of basic items appearing in the activity or in the plan according to their order of insertion. Items can be sorted according to your needs by clicking **UP** or **DOWN** (see Figure 12c).

To change the name of a component, you must open the list with the compent, select the component and click **Modify Name**, insert the new name, the name of the component is then updated everywhere in the database.

Note

- i.To modify the name of a component, do not change it in the window of the component in the right side of the dashboard, as this would only modify the short name creating a new component but would not change the name of the existing file.
- ii.To delete a component from the database, you should open the component list, place the cursor on a component and click **Delete Item**. The component will be deleted from the database.
- iii.Everytime you make a change, click on **Register** (**Commodity**, **Activity**, **Plan**) on the window of the component to save the changes of the project and click on **File**, **Save**, to save the changes in the whole database.

4.3. The Components

As already highlighted previously, the components **Commodities**, **Activities** and **Plans** constitute the base of the Value Chain Analysis in the FAO-VCA Tool. Each component is analyzed herebelow.

4.3.1. Commodities (and services)

To have a clear idea of the development/analysis of the whold value chain you must identify the inputs and outputs needed to complete the different activities by listing all commodities and services (included in the **In/Out Commodities** box). You can also add commodities while setting up the chain.

After inserting a short name, a unit and a long name¹¹ for each commodity (see Figure 13), you must:

- i. Specify whether the commodity is part or not of the value added; this information allows the software to automatically compute the value added for each activity and plan.
- ii. Specify whether the commodity is a depreciation item.
- iii. Enter a monetary unit price (the market price) on the basis of the defined unit and copy the values.
- iv. Enter an economic unit price (the reference price¹²) on the basis of the defined unit and copy the value.
- v. Enter the non tradable part of the commodity at its market price.

¹¹ See the basic functionalities in paragraph 4.2.1

¹² See the EASYPol Module 129, <u>Value Chain Analysis for Policy Making -Methodological Guidelines for a</u> <u>Quantitative Approach</u>.

- vi. Enter the non tradable part of the commodity at its reference price.
- vii. Save the Commodity.

The above procedure will be further analysed in the following chapters.

When the commodity is used in Activities or Plans, the physical amounts are expressed in total monetary value of input or output of the related activity.

If you need to express the input or output in monetary terms but the price per unit is unknown, you can assign a value "1" to the unit price.

Figure 13 : Window of the component Commodities

Short name Unit .ong name Copy values	Clear	form		Register good Compute reference prices	Is it a	n item of the	value added item?	2	© Yes C No C Yes © No	>		
BIGES	>	Base scenario	1	2	3	4	5	6	7	8	9	11 🔺
arket prices	\rightarrow											
elerence prices	<									-		+
on trad. share market	%											
on trad. share reference	%											
								12				
				-				- 				-
												=

4.3.2. Activities

To build a value chain you need to specify the amount of inputs necessary to complete an activity.

An activity represents a set of input commodities combined to produce one or multiple commodities or outputs. In a value chain context, an activity is often associated to a stage of the chain as for example production, processing or trading of the main commodity.

Click on **Activities** on the left side of the dashboard window to open. Insert the short name of the activity, its unit and its long name¹³ on the right side of the dashboard and then set up the activity by combining the commodities and the services as inputs necessary to complete the activity. It is important here to specify the outputs generated by the activity.

To set up the activity, click **Add Items**¹⁴ and select the commodities necessary to complete the activity. Then click **OK**, the window will close and the commodities selected will appear among the items of the activity.

Now you need to specify the necessary amount of each commodity to complete a unit of the activity and the amount of output generated by each unit of the activity. In order to do so, insert the amount of each commodity, select the corresponding line, insert the number. If you want to copy the amount in all columns use the function **Copy values**.

Make sure that there is coherence between the unit of the activity, the yield and the amount of inputs to be stored. Then click **Register Activity** to save the activity.

The items are inserted in the activity as inputs by default. An output must be identified among the list of inputs inserted by selecting the line of the related commodity and clicking **Change In/Out**. The nature of the commodity will be converted from input to output (see Figure 14).



Figure 14: Window of the Activities component

Every input is characterised by the minus sign, since items are expenditures. The minus sign appears automatically once the window containing the input related information is opened again after you have saved the activity. To double check, after saving the activity, close the window and open it again to verify that the input commodity has a minus sign.

¹³ See paragraph 4.2.1.

¹⁴ See paragraph 4.2.1.

4.3.3. Plans

Another fundamental step in the building process of a value chain is the identification of the agents implementing the activities. Creating a **Plan** is a similar process to that of an Activity. After inserting a short name, a unit and a long name¹⁵, you can start creating the plan. A plan can involve any of the existing activities, commodities or plans.

In general, the component **Plan** is used to model an agent or a group of agents.

In the value chain, an agent can perform one or various activities. At the Plan level agents specify the number of times an activity is performed by the same agent. Then, depending on the measure unit of an activity (i.e. hectare of crop land or pound of output) you need to specify the units of output released by the agent. This concept is further clarified below with two examples:

Example 1: Modelling a rice production activity (surface-based)

- activity : rice production
- unit of the activity : hectare

In this example, the Plan "Rice producer" is created and the activity "Rice production" previously created is inserted in the Plan. In this Plan, the number of hectares of rice crop available for the agent is specified. This is why in this case the unit of the Plan is "one producer". In this example, the unit "one producer" corresponds to the hectare since it is assumed that the agent only grows rice.

Example 2: Modelling a rice production activity (weight -based)

- activity: rice production
- unit of the activity: pound of rice.

In the Rice producer Plan, the number of pounds of rice produced by the agent is specified. As in the previous example, the unit of the Plan is defined as "one producer" and therefore as one pound of rice if the agent grows only rice.

Hereafter six different possible combinations are presented and illustrated with some examples:

a. A Plan made of one activity

For example, a farmer who produces only rice. A plan named "Rice Producer" is created in the activity "Rice Production" which was previously created. As explained above, the number of times the activity is performed by the farmer must be specified.

¹⁵ See paragraph 4.2.1.

b. A Plan made of various activities

If a farmer grows different types of crops (for example irrigated rice, rain rice and others) they correspond to different activities. A Plan named "All Rice Producer" is created and the activities "Irrigated Rice Production" and "Rain Rice Production" previously created are added to the Plan. As explained previously, the number of times each activity is performed by the farmer must be specified.

c. A Plan made of a plan

Once the Plan "Rice Producer" is defined and corresponds to the agent "Rice Producer", a Plan of a plan can be created to analyse a set of rice producers and not only an individual agent. To perform this procedure a Plan of a plan named "Rice Producers" is created inserting the plan "Rice Producer" and the number of rice producers involved in the chain.

d. A Plan made of various plans

Assuming two Plans made of various plans are already created named "Irrigated Rice Producers" and "Rain Rice Producers", respectively corresponding to the set of irrigated rice producers and the set of rain rice producers. The aim of the Plans of plans is to analyse the set of producers for every type of rice. A Plan "All Rice Producers" is created and the plans "Irrigated Rice Producers" and "Rain Rice Producers" are inserted. The number of times the activity is performed is, as usual, specified. In this case, there is only one set of irrigated rice producers and one set of rain rice producers. Therefore, a number "1" will be inserted on the line corresponding to each plan.

e. A Plan made of various plans and one or various activities

The plan "Rice Producer" has already been created. Some of the rice producers also produce onions. A Plan named "Rice/Onion Producer" is created and the existing plan "Rice Producer" is inserted too as the activity "Onion Production". The Plan of the agent rice and onion producer has just been created.

f. A Plan is made of activities/plans and one or various items

In this example a farmer produces green beans, onions and garden peas. the cost for electricity for the overall exploitation identified by the whole price for the item "Electricity power" is known, but not the precise single costs related to each activity. A Plan representing the producer is made and the three activities ("Green Beans Production", "Onions Production" and "Garden Peas Production") are inserted as well as the item "Electricity power" previously created.

This is also valid in case a tax paid on the overall exploitation including different crops. The "Tax" commodity is inserted at the Plan level, and not at the activity level.

Example 3. How to model own final consumption of a producer

The own final consumption of a producer in VCAis recorded as one component of the total output value of the production process and is valued at market prices (as long as they reflect its opportunity cost). For example let's suppose that the total production of maize is 100 tons per

year and that 40% is retained as own final use. In this case the production and income accounts of the economic activity "maize production" will look like the one depicted





Hereafter, three options to compute it as a component of the total output value are illustrated. On the basis of the nature and focus of the analysis she has to carry out, the user can choose the most suitable one.

Option 1. One way of including own final use in the production accounts is to create an activity producing two outputs: the output for own final consumption (or home consumption) and the marketed output.

Option 2. A second option is to represent the production and home consumption as two distinct activities. the "*Maize Production*" activity combines inputs and factors of production to obtain an agricultural commodity as output (i.e. maize). The "*Own final consumption*" activity buys part of this output and uses it as an input turning the agricultural commodity into the commodity retained for own final use (i.e. home consumed maize). These two activities correspond to two different agents, being one run by the producer and the second by the consumer.

This option is in line with the representation found in most social accounting matrices and computable general equilibrium models, where home consumption is modeled as a payment from the household to the production activity¹⁶. Figure 16 depicts the logical scheme underlying this option.

¹⁶ In many computable general equilibrium models, the demand for home consumption results from the consumer decision on how to allocate his income between two commodities: a marketed commodity and a commodity for home consumption. In such models no function describes the producer's choice on how to allocate production between market and home-consumption.





Option 3 Another option is to create one activity for production (i.e. maize), whose output is produced output (i.e. maize produced), and one activity allocating all production between market sales and own final consumption. Hence, the latter activity will have two outputs: share of produced output sold (i.e. maize sold) and share of produced output home consumed (i.e. home consumed maize). Figure 17 provide a figurative representation of the mechanism described.





As for activities, the items (commodities) are inserted by default in the Plan as inputs. You can change the status of the commodity by clicking **Change In/Out** and the commodity is converted from input into output or vice versa.

Once the components are inserted in the Plan, you need to specify the amount of each component required to define the plan. To specify the amount, place the cursor on the corresponding line on the right side of the dashboard, insert the corresponding figure and copy the value (Figure 18). Repeat all the procedures carried out for the **Activity** to save the **Plan**.





Aggregates

You can aggregate items using to the function **Aggregated Commodities**. This function is particularly useful to create balances or synthetic information, displayed further in the computing sheets released in VCA.

For example, you can create the aggregate "Intermediate goods" gathering all the intermediate goods of an activity and/or an agent. In the same way, the balance "Gross Operating Income" is computed as the total value net of the labour costs, of the financial costs and the taxes. See below for detailed steps to create an aggregate:

a. Click on **Aggregated Commodities** button in the left part of the sorting board. The window illustrated in the Figure 19 will pop up.

Making aggregates			×
Help			
Aggregated commodities			
Short name			
Total Labour			
	Add items Delete it	em Clear forr	m
Long name			
Labour used in the chain	In/Out commodities	Coefficients	▲]
	LabourFar	1.00	
	LabourMil	1.00	
	labourBak	1.00	
Register			
aggregate			-1
		- I -	

Figure 19 : Window of the component Aggregates

- b. Give a short name to the aggregate, as well as a long name if necessary.
- c. Click Add Items.
- d. Click **In/Out Commodities** and select the commodities from the list. Click on each commodity to be added to the selection and then click **OK**.
- e. Click **Delete Item** to remove a component from the aggregate. Place the cursor on the line of the commodity to be deleted and click **Delete**.
- f. When the aggregate is created, click **Register Aggregate** to save the aggregate.

The coefficient that represents the quantity of the component used in the aggregate is set to 1 by default, but it can be changed if necessary in the range 0 to 1. For example, when only half the total value of a commodity is taken into account, the coefficient to be applied is 0.5.

To create a balance, negative coefficients will be considered. For example, the aggregate outcome of an aggregate with commodity "A" for which the coefficient is 1 and an aggregate with a commodity "B" for which the coefficient is -1 will be "A - B".

4.4. Options of the software

As already mentioned before, the functions listed in the Option's drop-down menu allow you to use three important tasks (see below for more details).

4.4.1. Languages

English is the default language, but it is possible to switch to French or Spanish language by clicking on Language.

As already explained in section 3.1, once the project is saved, the selected language is also saved. Once you load the project, the same language will stand;

4.4.2. Parameters

Parameters is in the **Options** menu **which is** located in the main menu bar. It helps define some basic adjustments for analysis.



Figure 20: Selecting the paramenters

- Scale Factor: You can convert and visualize the data in thousands or millions Figure 20), a feature that can ease data presentation and reading. A reminder appears ahead of the charts if the option thousands or millions has been selected.
- **Number of decimals:** to choose the number of decimals needed to better interpret data for the analysis (Figure 20)
- Forex Data Entry: to choose and insert official and shadow exchange rates before the reference price¹⁷ calculation. Clicking on Forex Data Entry (Figure 20)

¹⁷ See the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological Guidelines for a</u> <u>Quantitative Approach</u>

Select the currency corresponding to the data to be inserted in the chart. Three different currencies and their relative exchange rates can be inserted if necessary: "International currency", "Regional currency" and "Other currency".

Insert the exchange rates and copy the values. Insert changes related to the chosen scenarios. Once you click on **Compute Forex Premium**, the Forex Premium Coefficient appears down in the chart (Figure 21).

Click **Save_Exit** to save the project.

Figure 21: Defining exchange rates

-	Comp		*		
Copy values	pre	emium	2		
Base scenari	D 1		2	3	. •
			-		
	650.000	650.000	650.000	650.000	
	780.00	780.000	780.000	780.000	
	1.200	1.200	1.200	1.200	
					-
t.	1				
	Copy values Base scenario	Copy values	Copy values Compute forex premium Base scenario 1 650.000 650.000 780.000 780.000 1.200 1.200	Copy values Compute forex premium Base scenario 1 2 650.000 650.000 650.000 780.000 780.000 780.000 1.200 1.200 1.200 1.200 1.200 1.200	Copy values Compute forex premium Base scenario 1 2 3 650.000 650.000 650.000 650.000 780.000 780.000 780.000 780.000 1.200 1.200 1.200 1.200

4.4.3. Price to be used

You can choose either market or reference prices. It is possible to switch from market to reference prices and vice versa by clicking **Options** in the menu on the top and then selecting them on **Type of prices (Figure 22)**.

Figure 22: Selecting the prices to be used



4.5. Other features of the software

In this paragraph, three important functions of the software are explained and analyzed: the exporting data function, the printing function and the function allowing you to display the different components of the chain.

4.5.1. Exporting VCA data to Excel

You can copy data or the calculation charts from the FAO VCA-Tool software to an Excel spreadsheet. See below :

<u>Step 1:</u> Select the part of the chart to be copied by placing the cursor on the cells of the table to copy data onto the board on the right. The left upper corner of the part to be copied is always (0,0) and corresponds to the beginning of the entire original chart.

Step 2: Click on the right button of the mouse and the following message will pop up (Figure 23).

Figure 23: Exporting data to an Excel file

FAO VCA-Tool
Your table has been copied into the clipboard. To transfer it to Excel, either: 1)Open Excel and paste the content of the clipboard into the spreadsheet; or 2)Click on the OK button to transfer the content into a spreadsheet automatically created under the DATA folder
OK Cancel

There are two options you can choose to store the data on Excel:

Option 1: If you click **OK**., the data copied will be stored in an Excel file with the same name and location of the VCA file. To access data exported in Excel, close the FAO VCA-Tool software, then open Excel and click **File**, **Open**. Go to the folder where the VCA file is located. Select the file ".xls" with the name of the project containing the recently copied data. Open the file, the copied data will be displayed.

Different tables can be copied from the software. In order to collect all of them on the same excel file, you have to ensure that all files of interest have been copied before closing the software. When you re-openi the project, this function will copy the data into the same excel file substituting the data already saved. To avoid cancelling any previous data, you must change the name of the Excel file, or add data to it by means of the clipboard (see Option 2).

Option 2: Click on **Cancel**, to copy and store data in the clipboard. You can then paste data into any Excel file of your choice.

4.5.2. Print function

With the FAO VCA-Tool you can print any of the tables created by the software (commodity, activity, plan, PAM, scenarios, etc).

To print these tables, just click **Print Form** on the menu bar of the table you want to print (Figure 24).



4.5.3. Show component function

If you click in the *activity table* on **ShowComponent** in the top menu bar, it displays the details of the input or output selected in the table of the current activity showing the prices of the commodity for which you need information (Figure 25).

To select the commodity, click on the name of the commodity and a coloured line appears.

Activitie	nowComponen	сорутов	Excel	Help							
Short name CuWheatTra											
Unit onehectar				_		Register	C	compute osts and			
Long name				Display Con	nponent						_ 🗆 🗙
1			- (Commodity: Fer	tilizers						
Сору	Add items	Chang	le	Unit: Kg	\mathcal{I}						
values			-	PRICES		Base scenario	1	2	3	4	5 1
			(Market prices	Phice	1.4	1.4	1.4	1.4	1.4	1.4
I/Outputs	Туре	Unit	B	Reference prices	Price	0.946	0.946	0.946	0.946	0.946	0.946
Land	Input	Hectar		Non-trad obara market	*/	20.0					<u> </u>
LabourFar	Input	ManDay		Non trad, share referer	10 9/	22.1					
Fertilizers	Input	Kg		TNOT GO. STIDIE TETETET	10	22.1					
Wheat	Output	Ton		4			>				<u> </u>

Figure 25: Show component function (commodity)

Click in the *plan table* on **ShowComponent** in the top menu bar it displays the details of the item selected in the table of the current plan (Figure 26).

To select the item, Click on the name of the item that creates the plan and a coloured line appears.

Print Form St	nowComponent	Сору	ToExcel Help			_				
Short name										
Unit oneFarm				r —	Regi	ster	Compute costs and	1		
Long name	Additoms	Ch	Display Activity: Cu	Component WheatTra						<u>_ </u>
values	Add items		1/Outputs Land	Type Input	Unit Hectar	Base scenario	1	2	3	4
1/Outpute	Type	tur	LabourFar	Input	ManDay	-25	-25	-25	-25	-25
CultinostTro	Activity	-Non	Fertilizers	Input	Kg	-18	-18	-18	-18	-18
CultibootMod	Activity	-	Wheat	Output	Ton	3	3	3	3	3
Cuvvneatwou	Activity		\searrow							

Figure 26: Show component function (activity)

You can use this function also in the Compute Costs and Benefits table.

4.6. Closing VCA

To quit the software, click Exit in the File menu.

5. SPECIAL FUNCTIONS: SUPPLY AND UTILIZATION ACCOUNT (SUA)

Often in a value chain analysis, data collected are not entirely coherent and you need to perform some adjustments to have a consistent study framework. For example, the data issued by the suppliers may not match that issued by customers and so the supply-demand quantitative flows need to be balanced to proceed with the analysis and avoid any lost amounts of a commodity.

To meet this balance, the FAO VCA-Tool has designed the Supply Utilization Account (SUA) function to help you perform these adjustments. The SUA allows you to calibrate the amounts of a commodity sold according to the amounts of a commodity purchased and vice versa.

It is recommended that you use this function at each step of the chain to make sure that the amounts of each commodity are coherent at each level. You therefore need to create a plan for each step of the chain: if wheat is the primary commodity you can create a plan for all the suppliers (WheatProd) and all the customers (WheatPurch) and see if they the amounts of wheat are balanced.

5.1. How to make an adjustment

Click **Tools** on the menu bar and select the **Calibration SUA** option, and the window in Figure 27 will pop up. At this stage you must specify all the items involved in the adjustment:

• the commodity (in **Commodity**)

- the scenario (in Scenario)
- the suppliers (in Supply Plan)¹⁸
- the purchasers (in **Demand Plan**)¹⁹

Figure 27: Defining adjustment parameters

Calibration sup	ply/demand		
Commodity: Supply plan Demand plan Sum/Balance	Commodity Scen	D.0 0.0 0.0 0.0	Compute supply/demand
Select the adjustment level	Choose type of adjustment Closing calibration Delta change Adjust. multiplier Replacement value	Adjust. multiplie 💌	Compute adjustment Register adjustment <u>Exit</u>

Now click on Compute Supply/Demand In correspondence to each plan different quantities will appear in regarding:

- the measure unit •
- the total amount offered by the suppliers •

¹⁸ Only the plans supplying the selected commodity are proposed.¹⁹ Only the plans requiring the selected commodity are proposed.

- the total amount bought by the purchasers
- the difference between the two amounts (Sum/Balance)

If the difference is negative, the demand of the commodity is higher than its supply while a positive difference indicates that the supply is higher than the demand.

It is important to specify whether the adjustments should be carried out at the supply level or at the demand level, (Figure 28): you should be aware of which available data are more reliable and which amount, produced or purchased, is underestimated or overestimated. The supply option is selected by default.

Figure 28: Choose the variable to adjust



Adjustments to various variables and/or levels are included until the balance is reached (see Figure 29).

Once the choice is made (i.e. between demand or supply level), a window will appear with a chart that contains the data related to the selected variable of the plan. This window provides you with the different levels of the adjustments available.



Figure 29: Details regarding the chosen variable

The column corresponding to level 0 contains the selected plan: "Supply Plan" or "Demand Plan" according to the variable to be adjusted. Level 1 contains the agents of level 0, and level 2 contains the agents of level 1, and so on. The last level of each chart corresponds to the Activities.

Select the level where the adjustment will be performed by clicking on the cell containing the plan or activity for which the adjustment is needed. A second chart will pop up on the right containing the details of the selected component.

This procedure is valid for all adjustment modes provided by the FAO VCA-Tool.



Figure 30: Details of the chosen level

If the component selected is on level 0, then the items regarding level 1 and their respective amounts will be displayed in the new chart on the right (see Figure 30).

This function helps you choose the variable to adjust. In actual fact, you can gradually analyse the different components at various levels so that you can keep track of the amounts of the items before applying the adjustments.

The FAO VCA-Tool provides four adjustment modes to finalize the calibration. Click on one of the components of the box, **Choose type of adjustment** will provide the type of adjustment

- **Closing calibration** that it is recommended when the remaining difference is low and it is hard to find a multiplier that completely balances the amounts. The closing calibration will adjust the amounts to a zero balance.
- **Delta change** indicates the variation of the total amount produced or consumed by the "Supply plan" or by the "Demand plan" if there is one unit variation in the amount of the adjusted component. This information is reported in the corresponding cell named Delta change.
- Adjustment multiplier displays various adjustment multipliers in the drop-down menu on the right. The first corresponds to **Dem/Supp** and is used to adjust at the supply level; the second corresponds to **Supp/Dem** and is used to adjust at the demand level. The other multipliers increase or decrease the amount to be adjusted by 10% to 20%. You can also manually choose the multiplier.
- **Replacement value** allows you to insert the amount to be adjusted into the corresponding cell and the new value will be attributed to the sub-component.

Figure 31: Selecting the type of adjustment



Once the adjustment type mode is selected, click **Compute Adjustment**: the total amounts of the "Supply Plan" or of the "Demand Plan" will be automatically updated.

If the adjustment is suitable, click **Register Adjustment**. If the adjustment is not finalised, select another adjustment mode or another level or variable to complete the adjustment. When the adjustment is finalised, quit the application by clicking **Exit**.

If the adjustment is not suitable, click **Compute Supply/Demand**, this function cancels the adjustment previously performed. Remember that, after this process, the software selects the variable "supply" by default. Repeat by selecting another mode, level or variable of adjustment (Figure 32).



Figure 32: Performing an adjustment

Once you have saved the adjustment and closed the application, you can find the adjustment by opening the page of the adjusted component. The new amount will be reported in the column of the pre-selected scenario. You can copy the new amount into all scenarios.

6. How to perform the calculations

6.1. Costs and benefits

With the FAO VCA-Tool, you can compute the *Costs and Benefits* table for an activity, for a plan or for a plan of plan(s). This table expresses, in physical quantities and/or in monetary terms, all the inputs and outputs included in the component studied. It also allows you to compute the Net Benefits and the Value Added²⁰.

6.1.1. Regular features

Open the window of the component (Activity or Plan) for which the Costs and Benefits analysis needs to be evaluated.

²⁰ Please refer to Chapter 3 of the EASYPol Module 129 <u>Value Chain Analysis for Policy Making - Methodological</u> <u>Guidelines for a Quantitative Approach</u>, for an extensive explanation.

Activit Print Form Activities Short name CuWheatTra Unit	ies ShowComponer	nt CopyToExc	el Help					
Long name	Add items	Change In/Out	Delete item	Up Down	Clear	ster vity form	Comp costs bene Comp PA indice	and efits bute M ators
I/Outputs	Туре	Unit	Base scenario	1	2	3	4	5
Land	Input	Hectar	-1	-1	-1	-1	-1	-1
LabourFar	Input	ManDay	-25	-25	-25	-25	-25	-25
Fertilizers	Input	Kg	-18	-18	-18	-18	-18	-18
Wheat	Output	Ton	3	3	3	3	3	3

Figure 33: Selecting the "Compute Costs and Benefits" function

Click on the button **Compute Costs and Benefits**. A new window will pop up (Figure 34). The quantities of all the inputs and outputs of the activity selected (or of the plan) are reported in the table for each scenario.

Figure 34: Costs and Benefits in physical quantities

Activity:		Quantities	>		Sele aggre	ect gates	Sho	w Values
CuWheatT	ra				Sho aggre	gates	Sc	enario nparison
	Unit	Base scenario	1	2	3	4	5	6
INPLITS								
1141 010								
Fertilizers	Kg	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Fertilizers LabourFar	Kg ManDay	18.0	18.0 25.0	18.0 25.0	18.0 25.0	18.0 25.0	18.0 25.0	18.0 25.0
Fertilizers LabourFar Land	Kg ManDay Hectar	18.0 25.0 1.0						
Fertilizers LabourFar Land OUTPUTS	Kg ManDay Hectar	18.0 25.0 1.0						

As shown in Figure 34, in the upper left corner you can see the name of the activity or plan for which the calculation is being performed. A sticker indicates which type of data you are analysing (the data reported in in the table are physical quantities (**Quantities**)).

Click Show Values to see the data of the table in monetary terms.

Activity: CuWheat	Type of table C Detailed C Summary	Values Market pri	ces	a	Select ggregates Show ggregates	Show Sr	Quantities cenario mparison	
		Base scenario	1	2	3	4	5	6
R	Total output value	450.0	450.0	450	.0 450.0	450.0	450.0	450
	Wheat	450.0	450.0	450	.0 450.0	450.0	450.0	450
= c + o	Intermediate Inputs	25.2	25.2	25	.2 25.2	25.2	25.2	25
lc	Inputs from inside the chain							
lo	Inputs from outside the chain	25.2	25.2	25	.2 25.2	25.2	25.2	25
l l	Fertilizers	25.2	25.2	25	.2 25.2	25.2	25.2	25
VA = R · I	Value added	424.8	424.8	424	.8 424.8	424.8	424.8	424
Dep	Depreciation							
NVA = VA - Dep	Net value added	424.8	424.8	424	.8 424.8	424.8	424.8	424
F	Value added components	525.0	525.0	525	.0 525.0	525.0	525.0	525
	LabourFar	375.0	375.0	375	.0 375.0	375.0	375.0	375
	Land	150.0	150.0	150	.0 150.0	150.0	150.0	150
NVA - F	Profits/Losses	-100.2	-100.2	-100	.2 -100.2	-100.2	-100.2	-100

Figure 35: Costs and Benefits in monetary terms

The software automatically computes the net benefits and the value added due to the information previously provided by you when the commodities were defined²¹.





6.1.2. Calculating aggregates

The Cost Benefit table allows you to compute several economic indicators besides the value added due to the Aggregate Function²². This function allows you to aggregate commodities to compute their sum or the difference, according to their coefficients.

Click **Selection of Aggregates** to choose the aggregates to be used in the costs and benefits analysis. A new window will appear listing the available aggregates in the left column. Double

²¹ See paragraph 4.3.

²² See paragraph 4.2.5.

click the name of an aggregate to add or remove it from the list of the selected aggregates (Figure 37).

Figure 3	37:	Selection	of	Aggregates
----------	-----	-----------	----	------------

🛢 In/Out	put quantiti	es					
Print Form Activity: BioBaking	ShowComponen	t CopyToExce	el Help S	Sele aggreg Shor aggreg	ct ates w ates	Show Values Scenario comparison	
[Unit	Base scenar		1 .	. T-	1 - T	- '
INPUTS			Select agg	regates			×[
Energy	KW	1,5	Help				(
Flour	Ton		Activity BioR	aking			[
labourBak	MD		Adding. Diel	diang			F
OUTPUTS							[
BioBread	Ton			List of	Selected		[
				aggregates	aggregates		[
			Show aggregate OK To remove	Totel Lebour InputsPurch FinalProducts	Total Labour		

Click **Show Aggregate** will display the components of an aggregate (Figure 37). Once you have selected the aggregates, click **OK**.

	List of aggregates	Selected aggregates		
Show ggregate	Total Labour InputsPurch FinalProducts			
	Sector Display C	Component	_O×	
	Signate: 1	Component		
	Aggregate: 1	Component		
	Aggregate: 1	Component		
	Display C Aggregate: 1 LabourFar LabourMil LabourMil	Component		
	Display C Aggregate: 1 LabourFar LabourFar LabourBak	Component		
	Display C Aggregate: 1 LabourFar LabourMil labourBak	Fotal Labour Weights 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	Display C Aggregate: 1 LabourFar LabourMil labourBak	Fotal Labour Weights 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		

Figure 38: Displaying the list of components of the aggregate selected

To display the selected $aggregate(s)^{23}$ in the table, click **Show Aggregate**: Aggregates will appear at the bottom of the table (Figure 38).

6.1.3. Comparing scenarios

You can also compare different scenarios. Click **Scenario comparison**. According to whether **Scenario comparison** refers to the window *Quantities* or to the window *Values* of the **Costs and Benefits** table, the comparisons will be respectively generated in quantitative or monetary value data.

²³ The aggregate is computed according to the data of the activity or plan for which the Cost and Benefit table is issued.

🗟 Scenario compa	rison	
Print Form ShowComp. Scenarios to be compared Base scen Base scen scen Base scen Base scen Base sc	CopyToExcel	Help

Figure 39: Selecting scenarios for comparison

Once you open the window of scenario comparison (Figure 39), select the scenarios to be compared. Two options are available:

- **Show Table 1**: the scenarios will be compared to the base scenario.
- Show Table 2: the scenarios will be compared to the first scenario selected in the list of the scenarios.

Click **Show Table 1**, the table of the comparisons will appear (Figure 40). The software computes the differences in values (quantitative or monetary) and then in percentage, between the data of the base scenario and the ones of the scenario(s) selected. The differences are computed for all the inputs and outputs of the activity component or of the plan component analysed.

Scenario comp	parison p. CopyToExcel Help				
	Plan: FarmSector				
Scenarios to be compared	Comparison among sce Quantities	narios			
Base scen.			Base scen.	1	
	Difference w.r.t. base scenario				-
$\square 2$					
	Wheat	Ton	0.0	30.0	
	Fertilizers	Kg	0.0	228.0	
	LabourFar	ManDay	0.0	180.0	
	Land	Hectar	0.0	9.0	
	-		-		
	2 of upriation with base economic		-		
			-		
	Wheat		0.00%	0.19%	
□ 12 💌	Fertilizers		0.00%	0.16%	
	LabourFar		0.00%	0.28%	
(Show table1)	Land		0.00%	0.21%	
Show table2					
EVIT					
EXII					
	-				
	-			2	
	-	-			
	-				
		1			-

Figure 40: Comparisons issued in table1

Click **Show Table 2**, another table of comparisons appears (Figure 41). Here the software reports the values (quantitative or monetary) for each selected scenario. Differences in value and in percentage are computed between each scenario selected and the first scenario, for all the inputs and the outputs of the activity component or of the plan component analysed.

Scenario comp Print Form ShowCom	D arison np. CopyToExcel H	lelp				
	Plan: FarmSecto	or .				
Scenarios to be	Comparison am	ong scena	rios			
Jeompareu		Quantities				
Base scen.		Base scen.	****	Scenario 1	****	•
☑ 1	Difference w.r.t. base	Value	Value	Differ.	%Var.	-
	Wheat	15,620.0	15,650.0	30.0	0.19%	
□ 4	Fertilizers	138,199,4	138,427,4	228.0	0.16%	
	LabourFar	65,301.0	65,481.0	180.0	0.28%	
	Land	4,280.0	4,289.0	9.0	0.21%	
		-			-	
∐ 9 □ 10						
	J					=1
Show table 1	1	1 1				_
Show table2						
EXIT						

Figure 41: Comparisons issued in table 2

In both the tables, the component studied and the unit of the data are displayed.

6.1.4. Selecting parameters

If you want to express the values of the Cost and Benefit tables in reference price or to convert them in thousands or millions, follow the same procedure explained in paragraph 4.4.2 for the selection of the parameters.

To return to the default situation, with the items in units and at market price, go to **Options**, **Parameters** and change them back

6.2. Calculation of reference prices

If you want to perform a value chain analysis, each commodity should be defined both by a market price and a reference price. The latter expresses the opportunity cost of a commodity²⁴, it is not observable on the market and needs extra calculations.

Before computing reference prices in the software, you have to insert the official and shadow exchange rates, needed for the calculation of the reference prices of the tradable commodities.

To insert the exchange rates, go to **Options**, **Parameters** and follow the procedure explained in paragraph 4.4.2.

After having selected the currency for which exchange rates have to be inserted, enter the official exchange rate (OER) and the shadow exchange rate (SER) between the currency selected and the currency in use in the value chain studied. Copy the values of each exchange rate.

Select the cell of the Forex Premium Coefficient equivalent to SER/OER. Click **Compute Forex Premium** to display the Forex Premium Coefficient in the correspondent line.

If different currencies are necessary for the reference prices calculation, select a second currency and enter the related data. The data regarding the first currency will be temporarily saved. Once all exchange rates are inserted, click **Save**, and then **Exit**.

To save the information in the database, click File, Save.

After this step, go to the page of the commodity for which the reference price must be computed and click **Compute Reference Prices**.

🛸 In/Out commodities	
Print Form CopyToExcel Help	
In/Out commodities	
Short name	
Unit	in the second second
	Register
Long name	
II	Compute
Copy values Clear form	prices

Figure 42: Opening the Compute Reference Prices function

²⁴ Refer to Chapter 7 of the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological</u> <u>Guidelines for a Quantitative Approach</u> for a detailed explanation.

If you have already worked on the calculation of the reference price of the specific commodity and have saved the work done, the window will already contain the information previously saved.

If it is the first time the reference price of the commodity is being calculated, the message in Figure 43 will appear.

Figure 43: Economic price not yet defined



Click **OK**, and the window in Figure 44 will pop up.

🗟 Reference prices	6		
Print Form ImportData	CopyToExcel	Help	
	Select:		1
Bio Bread	Method:	Method	
	Scenario:	Base scenario	
	L]
			Data entry
			EXIT

Figure 44: Selecting the computing parameters

Once Figure 43 appears, you must select the reference price computing method.

Different computing methods are available according to the nature of the commodity analysed, such as:

- Import substitute
- Output exportable
- Input imported
- Input exportable
- Non tradable commodity
- Production factor

The first four methods will be deepened in the next paragraph. The last two computing procedures related to the non-tradable commodities will be further analyzed in paragraph 6.2.2.

6.2.1. Tradable commodities

To compute the reference prices for the tradable commodities with the FAO VCA-Tool you have to:

- Select the type of the commodity analysed.
- Select the scenario for which the reference price has to be computed. This option allows you to compute different reference prices for different scenarios. If the reference price is the same for each scenario, you can copy the reference price in all the scenarios from the window of the commodity itself.
- Select the related currency.
- Click **Data Entry** and a table for data insertion appears (Figure 45).

Part of the information required in the table changes according to the method used. For instance, the parity price calculation for an imported commodity is based on the CIF price, whereas for an exported commodity it is based on the FOB price ²⁵.

²⁵ Refer to Chapter 5 of the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological</u> <u>Guidelines for a Quantitative Approach</u> for a detailed explanation.

🗟 Reference prices Print Form ImportData CopyToExcel Help Select: Select currency Bio Bread Other currency C International currency Method: Output: Exportable -OER 120.000 C Regional currency SER 140.000 Output: Exportable Scenario: Base scenario ForexPremium 1.167 -Other currency OUTPUT EXPORTABLE 1 Other currency Data entry DATA ENTRY 2 Benchmark prices (FOB) in foreign currency 0.000 a 120.000 4 Ь OER: Official Exchange Rate Compute Forex Premium Coefficient 1.167 6 7 8 d Export tax (unit) 0.000 0.00% е Export tax (ad valorem %) £ Transport from domestic market to border 0.000 Handling from domestic market to border - 9 0.000 g 10 Storage from domestic market to border 0.000 h 11 12 i. Observed market price (OMP) 0.000 Prices as exog. variables Transport from production level to domestic market 0.000 i. 13 k Handling from production level to domestic market 0.000 14 Τ Storage from production level to domestic market 0.000 O Wedges as exog. variables 15 Observed price at production level (OPPL) 0.000 m 16 17 0.00% Share of transfer of tariffs n Forex transport share 0.00% 0 18 Р Forex handling share 0.00% 19 0.00% q Forex storage share 20 21 Production externalities 0.000 r 0.000 Quality adjustment 22 23 24 25 t Wedge between market and parity price (*) 0.000 EXIT 0.000 Wedge between market and production parity price (*) u MARKET PRICES 26 27 28 29 (*) It is not required to enter these data

Figure 45: Example of data insertion and computing table, with the "Output Exportable" method

Before inserting any information in the table for the calculation, you must specify the nature of the data available.

There are two available alternatives (see Figure 46):

- If the prices in the domestic market and/or in different production areas are known, select the **Price as exogenous Variables** option. Insert the information into the table;
- If the prices in the domestic market and/or in different production areas are not known, verify that the margins between parity price and domestic market prices and the margins between parity prices and prices at production level are known, and select the option "Wedges as exogenous Variables".

Figure 46: Selecting exogenous variables

- Prices as exog. Variables
- C Wedges as exog. Variables

Where there is an asterisk (*) next to some elements of the table, you do not have to insert data. According to which exogenous variables you select, the asterisk moves from lines \mathbf{t} and \mathbf{u} (prices as exogenous variables) to lines \mathbf{i} and \mathbf{m} (wedges as exogenous variable).

You can now insert the required information in the table. The exchange rates and the Forex premium coefficient of the currency previously selected are automatically reported in the table.

As you can see, the data insertion table is quite detailed, however, some of the data needed to compute the reference price may be missing in the table, or, that some data of the table may not be required to perform the specific calculation.

In the first case, be careful that you aggregate various data together. In the second case, the lines where data are not required are to be left empty, or the zero can be inserted.

Once the table is complete, click **Compute** to finalize the calculation of the prices (Figure 47). The computing formulas used are reported in the left column of the table.

Figure 47: Compute reference price

Compute

Once the computation is final, the table will show you new rows with two kinds of data:

- The first part is related to the Market Prices calculations, which allow you to calculate parity prices at the domestic market level and at the production level, of the tradable and non-tradable share of the commodity.
- The second part is related to Reference Prices calculations, which allow you to calculate the parity price before and after the externalities/policy interventions/distortions are taken into account at the domestic market level, at production level, of the tradable and non-tradable share of the commodity.

Reference price	s			
Print Form ImportData	CopyToExcel H	lelp		
	- Select		Select currency	
Fertilizers			C International curre	ncv
	Method:	Input: Imported	C D	
Input: Imported	Scenario: Base scenario V			/
			C Other currency	
	INPUT IMPOR	RTED		7
1	Foreign currer	ncy: Regional currency		-
23	Wedge between ma	rket and production parity price (*)	-0.31	
24				
25	MARKET PRI	CES		
26 A=a*b	Benchmark price (Cl	F)	0.60	
27/B=A*e+d	Import tax		0.14	
28				
	I ransport from borde	0.05		
30 9	Handling from borde	0.04		
	0.06	-1		
12 C-AsReleash	Reference paritu priz		0.09	_
	Wedge between ma	rker and parity price	0.03	
15 1	Observed market pri	1 10		
36				
37 j	Transport from dom	estic market to production level	0.06	
38 k	Handling from dome	stic market to production level	0.04	
38 1	Storage from domes	tic market to production level	0.02	
40 s	Quality adjustment		0.60	
41 E=C+(i+k+l)+s	Adjusted quality refe	rence parity price (AQRPP)	1.61	
42 F = m-E	Total wedge betwee	-0.31		
43 m	Observed price at pr	1.30		
45 G = m · i	Wedge between OD	IMP and UPPL	0.20	
46	Ohere Care had all		40.01	
4/ [[m-A-[[+]]-0-[g+K]^p- 40 (h+0%-)/m)*100	Share of non-tradable	le import costs	46.31	
40 -(n+ij*qj/mj*100	RECOGNICE	PRICES		
50	nerenence	FRIGES		-
1 301			1 1-	

Reference price	s i i i i i i i i i i i i i i i i i i i			
Print Form ImportData	CopyToExcel Help			
Fertilizers	Select: Select C Inter Method: Input: Imported C Inter	currency ernational currency gional currency		
Input: Imported	Scenario: Base scenario - C Oth	er currency		
		·		
	INPUT IMPORTED	<u> </u>		
1	Foreign currency: Regional currency			
43 m	Ubserved price at production level (UPPL)	1.30		
44 45 C - m i	Viadas habusas ODMB and OPPI	0.20		
45 0 = m · 1	wedge between ODMF and OFFL	0.20		
40 47 [[m-à-[[+i]*o-[]]]	Share of non-tradable import costs	46 31		
48 -(h+l)*a)/m)*100		40.01		
49 (REFERENCE PRICES			
50				
51 A'=a*b*c	Benchmark price (CIF)	0.69		
52 B'=((a*b)*e+d)*(1-n)	Import tax	0.06		
53 C'=f*o*c+f*(1-o)	Transport from border to domestic market	0.05		
54 D'=g*p*c+g*(1-p)	Handling from border to domestic market	0.04		
55 E'=h*q*c+h*(1-q)	Storage from border to domestic market	0.06		
56				
57 F'=A'+B'+C'+D'+E'	Reference parity price (RPP)	0.90		
58		0.10		
59 1	Consumption externalities	-0.10		
60 \$	uuaiity adjustment	0.60		
67 H'=i*o*o+i*(1-o)	Transport from domestic market to production level	0.07		
63 l'=k*p*c+k*(1.0)	Handling from domestic market to production level	0.04		
64 J'=l*a*c+l*(1-a)	Storage from domestic market to production level	0.04		
65	starage non-demoste market to production rever	0.06		
66 K'=F'+(H'+I'+J')-r+s	Adjusted guality reference parity price (AQRPP)	1.73		
67				
68 ((K'-A'-(f+j)*o*c-(g+k)*p*c-	Share of non-tradable import costs	53.62		
69 (h+l)*q*c)/K')*100				
70				

Figure 49: Calculating Reference parity prices

Save the data inserted in the table so that you can easily reproduce the calculations when needed. To do so, click **Register** and then click **Exit** to close the window.

Reference prices as well as the non-tradable share of the commodity at market and reference prices should be further reported on the window of the commodity analysed. They will be used for the calculation of the Policy Analysis Matrix (PAM)²⁶.

²⁶ Refer to Chapter 8 of the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological</u> <u>Guidelines for a Quantitative Approach</u> for a detailed explanation.

In/Out commoditie	Help I <mark>S</mark>					
Short name					Is it	an
Unit Long name				Register commodity		
		1		Compute		
Copy values	Clear fo	orm		prices		
Copy values	Clear fo	orm Jase scenario	1	prices	3	
Copy values	Clear fr	orm Dase scenario	1	prices	3	
Copy values PRICES Market prices Reference prices	Clear fr	Dase scenario		2	3	
Copy values PRICES Market prices Reference prices Non trad. share market	Clear fr	ase scenario		2	3	

Figure 50: Reporting the information on the commodity window

6.2.2. Non-tradable commodities

When you select the "Non-tradable Commodity" method the following instructions appear, see Figure 51.

Figure 51: Suggested method for non-tradable commodity

FAO VCA-Tool
To get a proper estimate of the production costs of an intermediate product (non-tradable commodity): 1) define an activity/plan of production of the commodity or of its substitute, 2) run the PAM for the activity or plan, 3) transfer the production costs to the non-tradable commodity.
OK

This is a warning message to help you determine the reference price of a non-tradable commodity. In particular, it is recommended that you:

• Build the commodity production activity (or the production activity of one of its substitutes) to accurately assess the production costs. The sum of the production costs allows you to determine the parity prices.

- Develop the PAM of the commodity production activity (or the production activity of one of its substitutes) to transfer²⁷ the tradable and non-tradable shares of the production costs (Inputs) to the commodity produced (Output), at market and reference prices.
- Transfer the production costs and the tradable shares determined from the activity and the • PAM in the data insertion. Then, compute the table of the non-tradable commodity.

Now click "**OK**" and the window in Figure 52 appears.

🖻 Refere	ence prices		
Print Form	ImportData CopyToExcel Help		
Energy NonTrad.	Select: NonTrad. Commod. Commod. Scenario: Base scenario	•	
	NON-TRADABLE COMMODITY		Data entry
	3 Domestic price or production cost (**) 4 5	0.000	Compute
	6 Technical adjustment coefficient (**) 7	1.000	Register
	8 Adjusted market price	0.000	
	10 Share of non-tradables (**) 11 Share of tradables 12 12		
	13 REFERENCE PRICES		
	15 Reference cost of production (**) 16	0.000	
	17 Adjustment for externalities (**) 18 Technical adjustment coefficient (**)	1.000	
	20 Reference price	0.000	
	22 Share of non-tradables (**) 23 Share of tradables	100.000	EXIT
	24		

Figure 52: Selecting computing parameters

Select the required scenario and click **Data Entry**; the data insertion and the computing table will be displayed.

If you have the necessary information²⁸ (for example the production cost, the adjustment for the externalities, the technical adjustment coefficient, and non-tradable share), fill in the table accordingly. Where there is an asterisk (*), you are not required to insert data.

²⁷ See section 6.3.3 Shares Transfers.
²⁸ After creating the activity or if you have all the necessary information at hand.

Now click **Compute:** the adjusted market price, the reference price and the tradable shares will be computed.

You can save the data inserted in the table to easily reproduce the calculation when needed.

Click Save and then click Exit to close the window.

Once all the relevant data have been inserted in the database, you can perform calculations for the value chain analysis²⁹.

6.2.3. Import data function

To define the reference price of a new commodity you can also import information from another commodity using the **ImportData function**.

Click **ImportData** and then select the commodity with a reference price already defined (see Figure 53). The information on reference prices is imported for the new commodity and you can use all of them or just the ones you need for the new computation. Then click **Compute** to obtain the market and reference parity prices and the other indicators.

To save this information, click Register.

Figure 53: Import data function

Reference prices					
Print Form ImportData	CopyToExcel He	elp			
Fertilizers	Select: Method: Scenario:	Input: Imported Base scenario	•	Select currency C International currency Regional currency C Other currency	Regional currency OER 1.000 SER 1.150 ForexPremium 1.150
			Select a C In/Out con BioBread Energy Fertilizers Flour LabourFa LabourMa LabourMa Land	ommodily as source of date	Data entry Compute Register • Prices as exog. variables • Wedges as exog. variables
					EXIT

²⁹ See chapter 5: Special functions: Supply and Utilization Account (SUA).

6.3. Policy analysis matrix (PAM)

The FAO VCA-Tool allows you to build the Policy Analysis Matrix (PAM) for an activity, for a plan or for a plan of plan(s). PAM³⁰ also allows you to assess the competitiveness of a commodity chain through the relative indicators (e.g. the Domestic Cost Resources, the Nominal Protection Coefficient, Nominal protection coefficient on inputs, Effective Protection Coefficient).³¹

To compute the PAM, double click the component window (activity, plan) for which a PAM is needed and the click **Compute PAM indicators** (Figure 55).

oute
and
efits
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pute
ators /

Figure 54: Opening the PAM window

The window in Figure 55 pops up.

³⁰ Refer to Chapter 8 of the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological</u> <u>Guidelines for a Quantitative Approach</u> for a detailed explanation.

³¹ NB: PAM indicators must be read with utmost caution. As values at market and reference prices are used, it is important that your estimate basis be reliable. The list of inputs must also be complete. Due to the difficult task of collecting information, it is hardly the case (especially for non-tradable inputs which should include the cost of domestic resources used) to achieve the resulting output. Reliable data in relation to the capital are hardly accessible. In general, quantitative information and economic prices should be provided for machines and equipment, buildings and infrastructure, land, labour force and water. The task of gathering this information should be monitored using sound and reliable methods and cannot be reliably carried out by officers with inadequate literacy on the subject.

Figure 55: PAM Calculation window

			Revenues	Inputs	Inputs	Profits
				Tradable	Non-tradable	
cenario: Base scenario		Values at:				
		Market prices	** A **	** 8 **	** C **	** D **
Select scenario for the PAM		Reference prices	** E **	** F **	** G **	** H **
		Differences	** A-E **	** B-F **	** C-G **	** D-H **
Base scenario						
		Values at:				
Compute DAM		Market prices				
Compute FAM		Reference prices				
		Differences				
% Non-tra % Non-tra						
Market prid Reference						
Revenues	-					
BioBread 70.0 70.1	2					
Flour 95.0 97.1	2					
OrdBread 70.0 70.1	<u>1</u>					
Wheat 94.3 95.1	4					
Inputs	-					
Energy 100.0 100.0						
Fertilizers 46.3 53.1						
EXIT						
				_		

6.3.1. The Policy Analysis Matrix

The large table at the right of Figure 55 is meant to compute PAM and it consists of four columns:

- i. Revenues
- ii. Inputs Tradable³²
- iii. Inputs Non-tradable
- iv. Profits (computed as the net revenues, after computing the costs of the tradable and non-tradable inputs)

Each column of the table provides market price data and reference price data. The third row corresponds to the difference between the values at market and reference prices for each column.

The letters reported in the table are used to express the formulas applied to compute the competitiveness indicators.

The small table on the left sums up all non-tradable shares of the inputs and outputs of the component studied, at market and reference prices. These shares will be used to fill in the PAM.

The four competitiveness indicators (DRC, NRPI, NRP and ERP)³³ computed from the PAM are described in the green frame (see bottom left box in the window).

The component (activity or plan) and the scenario analysed appear in the orange reminder stickers at the top left of the window.

Before computing the PAM, select the scenario for which the procedure has to be executed in the drop down menu: Select scenario for the PAM.

Finally, click **Compute PAM**: the table at the right is automatically filled with the data selected (Figure 51).

The competitiveness indicators are reported in the matrix with their respective computing formulas. For example, the Domestic Resources Cost (DRC) is calculated according to the following formula: G / (E-F), corresponding to: "non-tradable inputs at reference price / (revenue- tradable inputs) at reference price" (Figure 55).

³² The software makes the repartition tradable inputs/non-tradable inputs on the basis of the each items insertion.

³³ The Domestic Resources Cost ratio, the Nominal Protection Coefficient on tradable Inputs, the Nominal Protection Coefficient and the Effectiveness Protection Coefficient

Figure 56: Computing in the PAM window

lan: Chain					Revenues	Inputs	Inputs	Profits	
						Tradable	Non-tradable		10
icenario: Ba	se scena	rio		Values at:					
				Market prices	** A **	** 8 **	** C **	** D **	
Selectscena	rio for the P	АМ		Reference prices	** E **	** F **	** G **	** H **	
		1		Differences	** A-E **	** B-F **	** C-G **	** D-H **	
Base scenario	•								
				Values at:					
				Market prices	13,463,462.9	104,054.8	8,270,090.8	5,089,317.3	
	ompute P	AM		Reference prices	13,522,391.5	60,735.8	8,319,362.6	5,142,293.1	
				Differences	-58,928.6	43,319.0	-49,271.8	-52,975.8	
	% Non-tra	% Non-tra		Indicators					
	Market pric	Reference		DRC	0.62		G / (E-F)		
Revenues				NPC	1.00		(A/E)		
BioBread	70.0	70.0		NPI	1.71		(B/F)		
Flour	95.0	97.0		EPC	0.99		(A-B)/(E-F)		
OrdBread	70.0	70.0							
Wheat	94.3	95.7		PRICE ANALYS.					
nputs						Unit	Switching	****	
Energy	100.0	100.0				Price	Simultaneous	One by one	
Fertilizers	46.3	53.6	-	Energy	Market	0.035	0.056	0.267	
					Reference	0.044	0.071	0.278	
				Fertilizers	Market	1.400	2.251	38.226	
	FXIT				Reference	0.946	1.526	38.155	
_				LabourFar	Market	15.000	24.116	92.936	
					Reference	15.000	24.204	93.748	
				LabourMil	Market	20.000	32.155	466.431	

6.3.2. Price analysis

A price analysis is displayed in the table below the indicators (see Figure 56). New prices are estimated for each commodity, according to the hypothesis of perfect competition (or zero profit condition). This function allows you to assess the flexibility of each commodity until the breakeven point, where there is neither a loss, or a profit. Adjustment prices are then calculated for each commodity, for the inputs and the outputs of the component analysed.

The **Unit Price** column inside the table on the right displays the current price of the commodity at market and reference prices.

The Switching **Simultaneous** column gives you an estimate of the new commodity's price if the prices of all the commodities of the component were changed simultaneously according to a zero profit situation.

The **One by one** price column gives you an estimate of the new commodity's price at a zero profit if the price of the commodity was the only unit to be changed.

6.3.3. Shares transfer

At the bottom of the table (Figure 51), the non tradable shares of the output(s) are reported at market and reference prices. These shares are calculated on the basis of non-tradable shares of the output production costs, i.e. total inputs.

You can transfer these shares to the output commodity window in question. The transfer will take into account the adjustments of the prices of the commodity.

To transfer shares, select from the drop-down menu below the PAM table the commodity (input) to which the shares will be attributed (Figure 57). A pre-selection of commodities is automatically suggested by the software.

Figure 57: Selecting the output for the transfer of non-tradable parts.

- Transfer of Non-Trad. Shares Select the commodity of the transfer	
BioBread 💌	

Once the commodity is selected, click on **Shares Transfer** in the menu at the upper part of the window (Figure 58).

Figure 58: Transfer of non-tradable shares



The dialog box in Figure 59 now appears:

Figure 59: Confirmation of transfer



Click **OK**, the window of the commodity selected will appear and the following data are reported in related rows (Figure 60):

- Non-Tradable share Market that includes the non-tradable share at market prices, the switching simultaneous adjustment price at market prices, and the one by one adjustment price at market prices.
- Non-Tradable share Reference that comprises the non-tradable share at reference prices, the switching simultaneous adjustment price at reference prices and the one by one adjustment price at reference prices.

Figure 60: Reporting data to the commodity window

In/Out commoditie	S				
Short name BioBread					Is it an
Unit Ton			R	egister mmodity	
Long name			1 =		
Copy values	Clea	r form	C re	ompute ference prices	
PRICES		Base scenario	1	2	3
Market prices		1200	1200	1200	1200
Reference prices	\mathcal{I}	1260	1260	1260	1260
Non trad, share market	%	70.0			
torr a da. orraro manter	96	70.0			
Non trad. share reference	~	70.0			
Non trad. share reference		Data Base	PAM Esti.	Switch1	Switch2
Non trad. share reference Market prices		Data Base 1,200.0	PAM Esti.	Switch1 746.4	Switch2 -3,987.1
Non trad. share reference Market prices Reference prices		Data Base 1,200.0 1,260.0	PAM Esti.	Switch1 746.4 780.8	Switch2 -3,987.1 -3,981.1
Non trad. share reference Market prices Reference prices Non trad. share market	%	Data Base 1,200.0 1,260.0	PAM Esti.	Switch1 746.4 780.8	Switch2 -3,987.1 -3,981.1

To save this information, you must insert all or partial data in the dedicated cells of **Market Prices** and **Reference Prices** rows and in the first cell of **Non-tradable Share Market** and **Non-tradable Share Reference** lines.

Any information that you do not insert in the prices table is lost when you close the window. If the commodity is saved, the project will be saved as well with the changes.

7. STATISTICS FUNCTION

In the FAO VCA-Tool software you can display an overall figure of a value chain to understand the relationships between the different agents. For each commodity produced and traded, it is possible to view the related activities and plans.

The statistics function helps you to quickly identify the different links of the chain and understand the database structure.

When you click **Tools** in the menu bar and then click **Statistics**, the window in Figure 61 appears.

٩.	Statistics								_ 🗖	×
Prir	nt Form Help									
Pri pro	mary, intermediate and final ducts	_	Producing acti	vities		Producing plans(*)				
Flo Wi Bio Or	ur neat Biread JBread									
Sel its r	act an item in the list to see elative activities and plans		Consuming act	tivities		Consuming plans(*)				
	Evternal	Value ((*) Agents or grou	ups of agents producing an	d/or co	insuming products of the chain	Final			
	Innuts	Innuts	10060	Products		Products	Products			
1	Enerav	LabourFar		Wheat	-	Flour	BioBread			
2	Fertilizers	LabourMil					OrdBread			
	SeedWheat	labourBak								
4	WheatBio	Land								
5										
6										
7										
8										
9										
10										
11										
12										
•		I		1			1	▶		
Ch	ains found in the data base									
W	heat/Flour/OrdBread/ heat/Flour/BioBread/					Create graph EXII	-			

Figure 61: Statistics window

The large table shows classification of all commodities involved in the chain. The main distinction is between the *commodities of the chain*, produced by the analysed chain and the *commodities out of the chain* produced in other chains.

The different categories of commodities identified are:

- a) External inputs (the intermediate inputs out of the chain).
- b) Value added inputs (the items of the value added in and out of the chain).
- c) Primary products (the first commodities produced by the chain).
- d) Intermediate products (intermediate commodities of the chain generally derived from the processing or trading stages);
- e) Final products (the last commodities produced by the chain and sold to the final consumer).

The upper part of the window consists of an option allowing you to identify activities and plans producing and consuming each commodity of the chain.

Double click on the item the components of which must be retraced in the cell **Primary**, **Intermediate and Final products**. The four other cells will be completed with the information related to the selected commodity (Figure 62).

Figure 62: I dentifying producing and consuming components

Statistics		
Print Form Help		
Primary, intermediate and final products	Producing activities	Producing plans(*)
Flour Wheat BioBread OrdBread	ProcHi ProcLo	UpMiller LoMiller ReMiller MillingSector TUpMill
Select an item in the list to see its relative activities and plans	Consuming activities OrdBaking BioBaking	Consuming plans(*) NorBaker SouBaker BakingSector TNoBakers TSoBakers
	(") Agents or groups of agents producing	g and/or consuming products of the chain

The FAO VCA-Tool allows you to view this information in a graphic chart where the different sub-chains presented in the database are identified (Figure 62).³⁴

³⁴ There are various sub-chains when a chain leads to different final products (which it is often the case when a same product is traded at two different prices and thereby two different products are considered).

Figure 63: Making the graph



The description of a sub chain is made by linking the main commodities of the sub chain. In the snapshot in Figure 57 the two sub chains identified are:

- Wheat / Flour / Ordinary bread
- Wheat / Flour / Biological bread

Select one sub chain and click on Make Graph. The window in Figure 64 appears:

Figure	64:	Selecting	the	starting	point	of	the	graph
								3

			3 -	
	🖻 Graph			
	Print Form Help			
	Commodities produced and consumed in the chain			
	Select the starting commodity of the graph			
\langle	Wheat			
	OrdBread			
		1		
	Create graph			
	EXIT			

The overall commodities of the sub-chains selected are listed. You must select the starting point of the graph according to two options:

• the view of the graph for the chain as a whole, or

the view of the graph only for one or a few links of the chain

Note that the software cannot represent more than three chains or links at a time. Therefore, for long chains, the graph will be created in various steps.

Once you have selected the starting point, the graph that appears will be similar to the one shown in Figure 65.



Figure 65: Graph development

In Figure 65, the list of activities and plans producing and consuming the same commodity is linked to the commodity in the graph. You can easily visualize the agents in the upstream and downstream parts of the chain. The final product of the chain has only producing activities and plans listed in the upstream part of the commodity itself.

Click **EXIT** to close the window.

8. TEXT FILES

You can save the VCA files in text format. This option makes it easier to exchange data and it helps you to share the database building tasks.

To save a VCA file in text format, click **File**, **Save as txt file**. By default, the software suggests that you save the text file in the same directory as the VCA file (Figure 66).



Figure 66: How to save a VCA file as a text file

The structure of the text files is shown in Figure 67.

Manual for version 3.1

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BioBre	ad	Ton	6											
	9	1200 1260 5	1200 1260 0	1200 1260 96.353	1200 1260 93.28	1200 1260 1200	1200 1260 1.05	1200 1260 1	1200 1260 1	1200 1260 1	1200 1260 1	1200 1260 1200	1200 1260 1200	1200 1260 1200
Energy	KW	6 0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	0	0.044	0.044	0.044	0.044	1 2	0.044	1.044	1.044	1.044	1.044	0.044	0.044	0.044
Fertil	izers	Ka	6	v	010	1.2	0.012	1	T	1.2	-	0.043	0.002	v
reitii	12013	1 4	14	14	1 4	1 4	14	14	14	14	14	14	14	1 4
		0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946
	9	3	0	0.6	1	1.15	0.05	0.15	0.05	0.04	0.06	1.1	0.06	0.04
Flour	Ton	6												
		250	250	250	250	250	250	250	250	250	250	250	250	250
		320	320	320	320	320	320	320	320	320	320	320	320	320
	9	2	0	300	1	1.15	10	0.05	4	3	2	260	3	2
Labouri	Far	ManDay	5											
		15	15	15	15	15	15	15	15	15	15	15	15	15
		15	15	15	15	15	15	15	15	15	15	15	15	15
1	9	6	0	100	100	15	1	1	1	1	1	15	15	15
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		120	120	120	120	120	120	120	120	120	120	120	120	120
	9	6	0	100	100	150	0.8	1	1 2	1 3	1 2	0	0	0
ordere.	he	Ton	6	100	100	200	0.0	1000 C						2
01 001 0		900	900	900	900	900	900	900	900	900	900	900	900	900
		900	900	900	900	900	900	900	900	900	900	900	900	900
	9	5	0	96.353	93.28	900	1	1	1	1.1	1	900	900	900
Seedwh	eat	KG	6											
		1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
		0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864
	9	4	0	1.1	1	1.15	0.05	0.1	0.09	0.06	0.03	0.9	0.06	0.04
wheat	Ton	6												
		150	150	150	150	150	150	150	150	150	150	150	150	150
		152	152	152	152	152	152	152	152	152	152	152	152	152
	9	1	0	1.1	120	1.167	10	0.1	2	3	4	200	5	4
ENDAT														
ACTIVI	TIES			-										
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	Lanu	-T	-1	-1	-1	-1 -	-1	-1	-1	-1	-1	-1	-1	-1
1	Cabuuri	an	19	-23	19	-25	-23	-23	19	-23	-25	19	19	19
-	reith	12813	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10

Figure 67: Example of text file

The first row of the text file is the project name.

In the following rows, the different components of the database are listed in hierarchical order: commodities, activities, plans, aggregates and currencies.

The title of the component indicates the beginning of a sub table containing all the information related to that component. The part ends with ENDATA. The pattern is the same for each component.

The red circles on the left indicate the component type. In Activities, subcomponents are commodities. Commodities are represented either by a number 1, if the item is an input, or by a number 2, if the item is an output. Activities are represented by a number 3, plans by a number 4 and aggregates by a number 5. The numbers 1, 2 and 3 in the Currencies' part respectively refer to currencies named in the software: **International currency**, **Regional currency** and **Other currency**.

To add components from a file to another file, you must save the file in text format. In order to do so, you should delete the project name and leave the first line empty. Then, delete the items not to be included in the other file. Save the text file and close it.

Now re-open the VCA-Tool and load the project to add the text file items. Go to **File**, **Open a text file** and select the file containing the data to be added. The components in the text file are automatically added to the lists of components of the active VCA file.

8.1.1. Change the name of an item

The option that allows you to open a VCA file as a txt file can also be used to instead of the **Modify Name** option to rename commodities, activities and plans.

- To change the names you have to:open the txt file you have already saved
- click on the button **Edit** in the menu bar ;
- choose the option **Replace**;

File Ed	it Format Vie	w Help						
Wheat COMMC	exercise DITIES	StepB	1	12	6	183		
Grand	Bio	Ton 1200	6 1200	1200	1200	1200	1200	
1200	Replace			? ×	1200	1200	1200	
0	Find what:			Find Next	0	0	õ	
0 0	Replace with:			Replace	0 0	0 0	0 0	
0 1260 1260	🥅 Match case		ļ	Cancel	1260 1260 0	1260 1260 0	1260 1260 0	
0	0	0	0	0	0	0	0	
0 0	ŏ	ŏ	ŏ	Ŏ	õ	ŏ	ŏ	
Ū	9	5	ŏ	96.353	93.28	1200	1.05	•

Figure 68: modify the dataset names using the text file

When the window displayed in Figure 68 pops up, you should:

- Insert the name of the commodity (activity or plan) that you want to modify in the **Replace**, **Find what** space.
- Insert the new name you want to give to the item in the **Replace with** space.
- Click on **Replace** and the notepad will start to find all the names you need to modify. Note that if you want to modify the name of a commodity, you need to modify all the different parts of the document using the same name.
- When all the names have been found and replaced you can save the txt file with the same name or you can change it.
- If the new file is opened with the VCA-Tool the new names will be also in the VCA dataset.

9. ERRORS REPORTING PROCEDURE

In order to always improve the usability of the FAO VCA-Tool 3.1, we encourage you to report any errors to us you may encounter using the software.

We suggest you follow three simple steps to provide us with your feedback when an error occurs:

- Make a screen shot of the error message by pressing the SHIFT and PRINT SCREEN buttons together to copy the information on the screen. Then paste this image into a message to us.
- Write a short description of what you required from the software and what procedure you carried out that resulted with the error message.
- Send us: (i) the print-screen image, (ii) the brief description and (iii) the file you were using, to the following address:

vca-assistance@fao.org

You can use the above email address for any requirement related to the FAO VCA-Tool 3.1.

10. READERS' NOTE

Before and while using the software we recommend that you to read the EASYPol Module 129, <u>Value Chain Analysis for Policy Making - Methodological Guidelines for a Quantitative Approach</u>.

Download the software application to practice using it and to learn about its different functionalities and to see the illustrated examples.

FAO VCA Software tool, EASYPol module 073.

This module belongs to a set of EASYPol modules which illustrate how to carry out a Value Chain Analysis. After installing VCA, you may learn how to perform Value Chain Analysis by going through other VCA material which you can find in EASYPol resource package <u>VCA software and manuals</u>.