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System for Environmental and Agricultural Modelling; Linking European Science and Society

Manual SEAMLESS-IF

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Partners involved: LU, Alterra







SEAMLESS integrated project aims at developing an integrated framework that allows exante assessment of agricultural and environmental policies and technological innovations. The framework will have multi-scale capabilities ranging from field and farm to the EU25 and globe; it will be generic, modular and open and using state-of-the art software. The project is carried out by a consortium of 30 partners, led by Wageningen University (NL).

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Disclaimer 1:

"This publication has been funded under the SEAMLESS integrated project, EU 6th Framework Programme for Research, Technological Development and Demonstration, Priority 1.1.6.3. Global Change and Ecosystems (European Commission, DG Research, contract no. 010036-2). Its content does not represent the official position of the European Commission and is entirely under the responsibility of the authors."

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When citing this SEAMLESS report, please do so as:

Wallman, P, Knapen, R., 2009. Manual SEAMLESS-IF, SEAMLESS Report No.46, SEAM-LESS integrated project, EU 6th Framework Programme, contract no. 010036-2, <u>www.SEAMLESS-IP.org</u>, 61 pp, ISBN no. 978-90-8585-589-7.



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General information

Task(s) and Activity code(s):	5.6.3.4			
Input from (Task and Activity codes):	5.6.3.2			
Output to (Task and Activity codes):				
Related milestones:	M5.1.6			

Executive summary

This document is a description of how to use SEAMLESS-IF. It describes the most important steps on how to install the software, create and manage projects including choosing indicators, choosing and running model chains and exploring the results. A brief introduction to the general features of the software, such as text formatting, sorting of lists and tables is also provided. Also the Trac system, a web-based management system of software development for reporting bugs, missing functions, glitches in design and usability as well as collecting wishes and requests for future versions, is described in a stepwise how-to format along with information about support and contact information.

This manual describes the delivered version of SEAMLESS-IF 02232009; design, look and functions are subjects to change in later releases.



1 Introduction

The SEAMLESS-IF Manual is a description of how to install and set up the required software to use SEAMLESS-IF and how to accomplish the most important specific tasks. Also the general features of the software are described as well as how to handle projects. It is meant to help end-users of the SEAMLESS-IF system, and may leave out details that are only important to modellers and software engineers.

In this document SEAMLESS-IF most of the time refers to the Graphical User Interface (GUI) of the system. This is the part that the end-user accesses through a standard web browser (i.e. Microsoft Internet Explorer or Mozilla Firefox) and uses to control the system. The GUI connects over the internet to a server application and a database, but these parts of the system are not further described in this manual. Elaborations on this server part, the software design and the modelling environments used to create or run the models in the SEAM-LESS-IF can be found under deliverables of WP5. For the models that are installed and run on the server as part of the SEAMLESS-IF system documentation is available in corresponding deliverables of WP3 and WP1.

This manual describes SEAMLESS-IF as delivered to the EC 02232009; design, look and functions are subject to change in later releases. Due to the rapid and always ongoing development of SEAMLESS-IF, some of the screenshots in the current software release available might look a little different from the ones in this document.

Lastly the web-based Trac system for reporting bugs and suggested enhancements of SEAM-LESS-IF and the procedure to use it is described.



2 Installation of SEAMLESS-IF

SEAMLESS-IF is a distributed web service that can be used through your normal web browser.

2.1 Technical requirements

A distributed web service does not bring along any specific computer hardware requirements. Any somewhat modern Internet connected computer (Table 1) with a web browser installed can be used to run SEAMLESS-IF.

Windows	Macintosh	Linux
Intel [®] Pentium [®] II 450MHz or faster processor (or equivalent)	PowerPC [®] G3 500MHz or faster processor Intel Core [™] Duo 1.83GHz or faster processor	Modern processor (800MHz or faster)
128MB of RAM	128MB of RAM	512MB of RAM, 128MB of Graphics Memory

Table 1: Hardware requirements to run SEAMLESS-IF.

2.2 Software requirements

Besides a web browser (Internet Explorer, Firefox, Opera and Safari for Microsoft Windows PCs, and Safari and Firefox for Apple PCs, have been tested to work properly) SEAMLESS-IF needs Adobe Flash Player 9 or higher to be installed as a plug-in in your Internet browser. You can check if you have the most recent Adobe Flash Player installed on http://www.macromedia.com/software/flash/about/ . If you do not have at least Adobe Flash Player 9 installed, go to http://www.adobe.com/products/flashplayer/ and follow the instructions shown on the web page to install it.

Adobe Flash Player is supported for most platforms and browsers, for a full list please go to <u>http://www.adobe.com/products/flashplayer/productinfo/systemreqs/</u>.



3 General features

3.1 Import of text and text editing

SEAMLESS-IF does not support import of text or external documents at this stage. The easiest way to get large text masses into SEAMLESS-IF is the classical copy/paste; Ctrl+C/Ctrtl+V. Note that SEAMLESS-IF does not support any kind of formatting or font manipulation features like bold, italics, underlines and so on, not even the font size can be changed. All the formatting will be lost when you paste the text into SEAMLESS-IF.

You should use plain text only, without any special characters or symbols, as there is a danger that these might create problems, although not necessarily. Plain text in this context is the English alphabet, with letters and common operands (+, -, *, etc), and no superscripts or subscripts, and no special symbols like euro symbol or similar.

It is not advisable to import text directly from Microsoft Word or similar word processing programs in their default text format, since that text contains all sorts of hidden formatting statements. To enter text into the GUI, do not copy it directly from your word processor, first create a plain txt-file with the text, and then copy from there. This removes all the hidden formatting text.

If you think that emphasising something is essential for the understanding of your text we suggest that you use asterisks, *like this*, or underscores _like this_.

3.2 Sorting of lists

To help you to find the item of interest in a list or a library, SEAMLESS-IF has a sorting function attached to many of its lists. By clicking the headline of the column of the item that you want to sort the list depending on, you can sort the list alphabetically or numerically (depending on the content of the column), ascending arrow showing) or descending arrow show-ing, Figure 1).



Figure 1: Ascending and descending sorting, respectively.



3.3 Resizing of panels and columns

Sometimes it is convenient to resize panels in SEAMLESS-IF to be able to read without too much scrolling, compare data in tables etc. Resizable panels can be recognized by the small mark on the divider, see Figure 2. Just put the cursor on the mark, the cursor will then change shapes, press down the left mouse button, move the panel border in the required direction and release the mouse button.

Shov	v only available indicators calculated by the n	nodel:	All	
Show	v only available indicators calculated with spa	tial extent:	All	
Available Select	Indicators (matching all enabled filters):	-II- Unit		Spatial Re
~	Farm gate N surplus	kg		AEnZ
	Farm income	1000 €		AEnZ
	Share of family labour	%		Farmtype
	Use of mineral nitrogen fertiliser per farm	kg/ha/y		AEnZ
	Average farm income at NUTS2 level	1000€		Farmtype
	Total farm income at regional level	Mn€		Farmtyne

Figure 2: A resizable column.

Also columns in tables can be resized. Move the cursor to the headline of the table and place it on the border line that you wish to move, and proceed in the same way as described above.

3.4 Save/Discard changes

All changes and new input to the screens must be manually saved or discarded. At the bottom of every window, "Save" and "Discard" buttons are placed (Figure 3). Be aware that since the application is operating in the web browser on your computer but data is stored remotely on the server computer, if you do not use the "Save" button you might loose the modifications you made. Also closing the web browser window without saving will result in loss of data.



seamless

3.5 Tool tips

At current, the SEAMLESS-IF user interface makes use of the tool tip feature as its main help system (Figure 4). Hover with the cursor over an item or a word to see the explanation. Note that not all items and words have tool tip explanations.



Figure 4: Tool tips.



4 Using SEAMLESS-IF

4.1 Logging in

To open SEAMLESS-IF go to <u>http://delivered.seamless-ip.org/</u>. If you cannot see the login screen (Figure 5) at this point you probably need to (re-) install the Adobe Flash Player, see section 2.2.



Figure 5: The login screen of SEAMLESS-IF.

Fill in the user name and password that you have been provided from the SEAMLESS administration and click "Log in". If you do not have an account, please contact SEAMLESS.office@wur.nl.

4.2 Application version information

Click on the SEAMLESS logo in the top left corner of the screen to open a window that lists the version information and addresses of the server application and database that are accessed by SEAMLESS-IF, in the bottom part. In case of problems this information is essential and should be mentioned when reporting the issue.

Close the window by clicking on the little cross in the top right corner.



Figure 6: The about screen of SEAMLESS-IF



4.3 User roles

Depending on your user role in SEAMLESS-IF, administrator, project manager, modeller or viewer, you have different rights to manipulate the software and its contents. The standard rights for each role are displayed in Table 2.

Table 2: Standard rights on selected items for the different user roles in SEAMLESS-IF. A = administrator, PM = project manager, M = modeller, V = viewer.

	Create/select	Read	Modify	Delete	Execute
Project	A, PM	V, PM, M	M, PM	A, PM	N/A
Narrative Experiment	M, PM	V, PM, M	M, PM	M, PM	N/A
Experiment	N/A	V, PM, M	M, PM	M, PM	M, PM
Indicator selection	M, PM	V, PM, M	M, PM	N/A	N/A
Visualization	M, PM	V, PM, M	M, PM	M, PM	N/A
Institutional Analyses	M, PM	V, PM, M	M, PM	M,PM	N/A

You are assigned a user role by the SEAMLESS-IF administrator when you apply for a user account. Your user role is stored in the SEAMLESS database, thus you automatically will have the proper set of rights when you log in to the system.

4.4 Managing projects

Available projects that are already stored in the database are visible in the project list that automatically opens after logging in (Figure 7). The projects are grouped according to spatial scale. Note that the list will only show the projects that you have access to based on the account you used to log in and the user role and rights assigned to it. For each project in the list the roles you have for it is displayed in one of the columns.

Each project can be either *published* or *unpublished*. This is indicated in the list by the colour of the text of the project title and description. Projects that appear in red are unpublished, and can be worked on (i.e. modified by users). Once a project is published it will appear in green in the list and further modifications are no longer allowed.



			-
rojects currently available on the SEA	MLESS server to you, grouped by spatial scale	25:	
ID	Project	Description	Project Roles
🖊 🗁 CountryAggregate [Farmtype]			
106	Full model chain baseline 2013	this Project is created for testing the ful	Project Manager
132	Test Case 1: Trade liberalisation	Test case 1 - evaluating impact of trad	Project Manager
🛙 🗁 Region [AEnZ]			
114	Sustainable Water and Nitrogen manag	Contribution of alternative Water and Ni	Project Manager
🛚 🗁 Region [Farmtype]			
102	Shared project for testing		Project Manager
105	FSSIM model		Project Manager

Figure 7: Opening a project.

To see the available projects, click on the arrow to the left of the spatial category.

ID	Project
AEnZ [AEnZ]	
4	Manual test project
🔁 CountryAggregate [Farmtype]	
🚞 Region [Farmtype]	

Figure 8: Open the list of available projects within a spatial category by clicking on the blue arrow to the left.

4.4.1 Opening an existing project

1	b	New	6	Ogian	. f	Refresh	
				<u> </u>	Open the s	elected project	

To open an existing project, double-click the project name or highlight it by clicking on it and then click "Open" in the lower left corner of the screen.

Figure 9: Opening a project.



4.4.2 Closing a project



To close an open project and return to the project list, click the "Projects" button in the upper right corner.

Figure 10: Closing a project.

4.4.3 To create a new project

Only a SEAMLESS-IF Administrator can create a new project. Please contact <u>SEAMLESS.office@wur.nl</u> to have a new project set up for you.

4.4.4 To remove a project

Select the project in the project list. Click "Remove...".

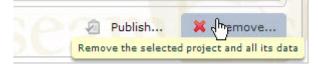


Figure 11: Removing a project.

4.5 Suggested workflow



The design of SEAMLESS-IF suggests a certain workflow divided into three working phases; pre-modelling, modelling and post-modelling and within those phases different steps. The suggested workflow is clear from the task bar on the left hand side of the window. Please note the tool tip with an explanation of the different buttons if you put the cursor over it in minimized mode.

Figure 12: The task bar with tool tips.



5 Pre-modelling activities

5.1 **Project description**

To describe the project and its aims, select the appropriate button in the task bar to the left to open the project description screen (Figure 12).

	Project
	Provide some short information to identify the project:
Title: *	Manual test project
Description: *	This project was set up to demonstrate SEAMLESS-IF
	Problem Describe in some detail the problem investigated in this project:
Narrative:	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi vel augue sed metus sodales molestie. Fusce quis tellus vel nibh malesuada ornare. Proin ac urna. Donec tincidunt. Vivamus ut ipsum nec pede tincidunt volutpat. Vivamus non enim. Integer leo. Etiam dignissim metus nec lacus. Nunc eu risus. Duis vulputate malesuada lorem. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Vivamus a mi feugiat libero consequat accumsan. Duis egestas. Maecenas augue velit, consectetur vel, molestie non, blandit ut, nisi. Curabitur viverra placerat risus. Donec accumsan lacus ut tortor. Aliquam erat volutpat. Integer vitae mauris vitae ante rutrum molestie.
	Maecenas nec elit. Duis id elit eget tortor sodales consectetur. Integer pellentesque, risus ac convallis tincidunt, quam sapien vestibulum est, et condimentum libero risus id quam. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec massa velit, interdum vel, eleifend eu, aliquet ac, est. Ut imperdiet dignissim eros. Mauris nunc dui, feugiat vitae, mattis rhoncus, fermentum non, magna. Praesent ligula ante, egestas id, faucibus eget, sollicitudin in, dui. Aenean dolor. Nullam lobortis, dui eu sollicitudin fringilla, nibh mauris condimentum urna, id fermentum arcu lectus vel sapien.
	Pellentesque dolor mi, mollis sit amet, varius at, bibendum vitae, nisi. Suspendisse egestas lobortis dui. Curabitur orci felis, luctus quis, pretium vitae, consectetur et, arcu. Nulla ut ipsum vitae velit pellentesque viverra. Mauris consequat. Sed eu ipsum. Curabitur

Figure 13: The project description screen.

To specify the spatial extent of the project, use the drop-down menu (Figure 13).

	at, condimentum vel, ante. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere	cubilia Curae; Phasellus nibh.
	Settings	
	This project contains experiments that use the follow settings for analysis:	
Spatial Scale:	CountryAggregate [Farmtype]	-
Model Chain:	CountryAggregate [Farmtype]	Spatial scale of the analysis. The finest unit of analysis
	Region [AEnZ]	is displayed in square brackets. Choice of scale determines appropriate model chain.
	AEnZ [AEnZ]	determines appropriate model chain.
	CountryAggregate [CountryAggregate/Country]	
	CountryAggregate [Region]	Save X Discard

Figure 14: Choose spatial scale in the drop-down menu.

To choose the model chain you want to use in your analysis, use the drop-down menu (Figure 14).

	Inquan occum, esc sic anec uncounc pracerac, pour na organisma mecos, sic anec voluçor eros nona ocrasos, erom auprocing lacinia nibh. Maecenas lacus orci, venenatis imperdiet, posuere vel, condimentum ac, pede. Sed libero purus, vehicula ut, portitor	
	CAPRI only chain FSSIM-EXPAMOD-CAPRI	
	FSSIM-EXPAMOD-CAPRI FSSIM-EXPAMOD-CAPRI-FSSIM	
Spatial Scale:	FSSIM only FSSIM-APES	
Model Chain:	FSSIM-EXPAMOD-CAPRI-FSSIM	
	chain determ	used in the analysis. The choice of model nines the spatial scale of the analysis (with analysis in square brackets).

Figure 15: Choose model chain in the drop-down menu.



The combination of spatial scale and model chain must match, if you choose a combination that does not match you will get an error message (Figure 15). Note that you have to select a working spatial scale/model chain before you can create a complete experiment.

	Settings	
	This project contains experiments that use the follow settings for analysis:	
Spatial Scale:	AEnZ [AEnZ]	•
Model Chain:	CAPRI only chain	•
	No model chain available to calculate at the selected spatial scale!	Model chain used in the analysis. The choice of mode chain determines the spatial scale of the analysis (with finest unit of analysis in square brackets).
		Save X Discard

Figure 16: Model chain warning.

5.2 Narrative experiments

A narrative experiment consists of four main constituents; general information, context, outlook and policy option. A narrative allows you to describe an experiment in a semiformal way. The main purpose is for documentation.

Open the Narrative Experiments by clicking the appropriate button to the left on the screen (Figure 16).

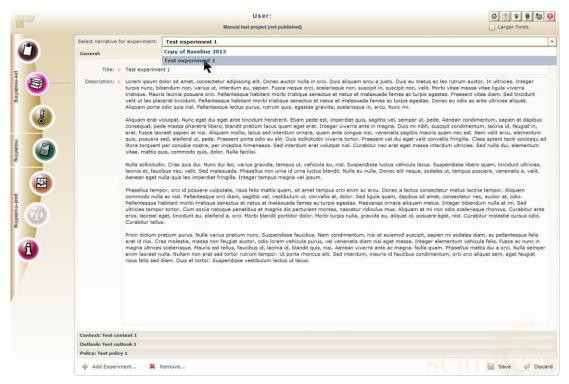


Figure 17: The Narrative experiments window.

In SEAMLESS-IF an experiment is a specific combination of outlook/context/policy options. To open an existing experiment, choose the experiment in the drop-down menu.

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You can create a new experiment by clicking "Add Experiment" in the lower left corner. A window opens that lets you compose new experiment from already existing experiments, by choosing context, outlook and policy individually. Click the radio button to the right of the constituent you want use. When you have chosen context, outlook and policy for your experiment, give it a title and description in the appropriate text boxes and click "Save".

Context se	lection	Outlook selection	Policy selection				
		Policy title					
🛚 🗁 Baseline							
BAL13 (policyoption_id = 2)							
BAL20 (policy	option_id	= 1)		0			
🖻 🗀 Copenhagen had	kation FS	SIM only test Farmt	ype[Region]				
Experiment to te	st FSSIM f	for all regions - Farmtyp	e[Region]				
Unchanged fr	om Baselii	ne (policyoption_id = 25)	\bigcirc			
FSSIM only by Ir	rina Jan 30	logged test/test - Farm	type[Region]				
Full model chain	baseline 2	013 - Farmtype[Countr	yAggregate]				
G20 application - Farmtype[CountryAggregate]							
Hatem (test 21/0	01) - AEnZ	[Region]		Y			
Hatem tect - Far	mtypelDe	lionl					
		Show co	imponents from all pro	jects			
Title:	Test ex	periment					
Description:							
Selected context:	BAL20 (context_id = 100001)				
Selected context: Selected outlook:		context_id = 100001 outlook id = 1))				

Figure 18: Experiment composer. If you check the box at the head of the arrow, all experiments in the database are shown.

Apart from this, outlooks etc are not created here, but in the Experiment Designer (see section 6.1).

The outlook should describe the driving forces of the modelled system, the trends and/or trend deviations in society, which affect the results produced by SEAMLESS-IF, but which are not forecasted by SEAMLESS-IF. These outlooks discuss trends and trend deviations exogenous to SEAMLESS. An outlook has parameters (e.g. unemployment rate or concentration of CO_2 in the atmosphere), and estimates of what values they may have. It is possible to have different outlooks with different values of the same parameters. If there are parameters, features, characteristics etc that are of particular interest in your analysis, you can describe them in the text box a shown in Figure 18. Note that you have to click "Add a row" before you can add text.

Name	Narrative specification
Test characteristic 2	Testing the function again
Test characteristic 1	Testing the function
I	

Figure 19: Text box to describe important characteristics of the analysis.



The context is the object of interest and its boundary conditions; geographical region, scale, farm type, crops and similar things. An example of a context is a medium sized low intensity arable farm in the Flevoland region in the Netherlands that could grow sugar beets, potatoes and spring wheat under conventional management definition. Each experiment should have *one* specific context.

The policy option is the potential political measures defined by a set of policy parameters within a given timeframe or for a time series that related to the problem and the experiment defined in the current project. You can combine several policy options.

5.3 Indicator manager

Open the indicator manager by clicking the appropriate button on the left side of the screen.

In the indicator manager you can you can use the Goal-Oriented Framework (GOF) to choose a set of indicators that is suitable to analyse your problem (Figure 19).



Figure 20: The Goal-Oriented Framework.

GOF divides the assessed system into three dimensions, the environmental, the economic, and the social, referring to the three pillars of sustainable development. Each of these aspects consists of indicators that refer to two "domains" of assessment which are considered as systemic units; impacts on agriculture and impacts of agriculture on the rest of the world. The "Impacts on agriculture" domain hosts indicators that assess impacts of the agricultural sector on itself. The second domain (impacts of agriculture on the rest of the world) hosts indicators that assess the impacts of agriculture on society as a whole: these indicators could also be named as the indicators measuring the external effects of agriculture on society as a whole (Table 3). GOF is based on three generic themes that are the same between the three dimen-



sions of sustainability (environmental, economic and social). Within each dimension each theme is thereafter specified for each dimension.

	Environmental	Economic	Social
Ultimate goal	Protection of human health and welfare, living beings and habitats	Viability	Quality of life indi- vidual, in society
Process for achievement	Maintenance of envi- ronmental balances or functions	Performance	Social and human capital
Means	Environmental com- partments and non- renewable resources	Financial and pro- ductive capital	Population

Table 3: Structure and themes of GOF. The same structure is valid in both domains.

To select indicators for your project, use the drop-down menus to choose the spatial extent and the domain of interest. Click the green plus sign in the lower left corner of the theme/dimension box of interest (Figure 20).

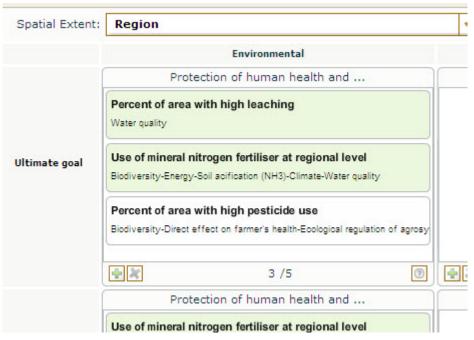


Figure 21: One theme/dimension box in GOF.

You can see the number of available indicators in each category, and how many are actually chosen at the bottom of the box. In Figure 20 three out of five available indicators are chosen. To see and add indicators click the green plus sign to open the indicator selection window (Figure 21). Click on the indicator to select it, click "Add selected".



		eys to select multiple indicators)		
Name	Unit	Spatial Resolution	Status	
Mineral N use at regional level	kg/ha/y	Region	0	9
Mineral N use at member sta	kg/ha/y	Region	۲	
Mineral N use at EU level	kg/ha/y	Region	۲	0

Figure 22: The indicator selection window.

To see more information about the selected indicator, double-click it in GOF or click the question mark as indicated in Figure 21 to open the indicator information window (Figure 22).

		🛛 This i	s an endorsed indicator	
General	Model	Scale	Goal Oriented Framework	Fact Sheet
	Genera	Í.		
Name:	Total ag	ricultural o	output per hectare at EU level	
Unit:	€/ha			
State:	V Imple	mented (c	an be calculated by the system)	
Description:	Total ag	ricultural o	output value per region at EU level	

Figure 23: The indicator information.



The indicator information window has five different tabs with detailed information about the indicator, what model calculates it etc. If you would like to have even more detailed information about an indicator, go to the fact sheet tab and click "View fact sheet..." and a pdf –file will open in a new browser window (Figure 23).

			http:	://delivered.seamless-ip.org/seamless_docs/FactSheets/Environmental/5-Ero
In		rea with high erosion	× QQ	🗢 🙋 http://delivered.seamless-ip.org/seamless_d 🔛 😽 🔀 Google
		in endorsed indicator, but can not yet be calculated	Eile Re	edigera go To Favorites Help X 🔛 Snagit 🖬 🖬 🖪
	General Model	Scale Goal Oriented Framework Fa	act Sheet	rites Øhttp://delivered.seamless-ip.org/seamle
		More Details		💾 🔄 🕎 🧶 1 / 3 Ik 🖑 🥰 🖲 🖲 70.5% • 🤞
	Fact sheet location:	http://delivered.seamless- ip.org/seamless_docs/FactSheets/Environmental/S Erosion.pdf	5-	Indicator fact sheet 1. General information on the indicator Name of the indicator group Soil EROSION PER FARM TYPE Endocred indicators with specific use
L		Add Selecte Z76 Protection of human health and Use of nineal introgen furtiliser at regional level	ad 📄 🐳 Ada	SOIL EROSION PEAK FER FARM PERCENT OF AREA WITH HICH EROSION PERCENT OF AREA WITH HICH EROSION Purpose, impact assessed and processes described by the indicator Purpose of the indicator: This indicator depices the and losies due to water erosion by farm type (expressed in t soil per th). Impact: This indicator assesses the impact of cropping systems on soil protection against water erosion (on-site effect) and the drive that the indicator is a summer than your of the set on tholdy. They will also increase the rink of unitarity on the set one plane) by increasing the water through the indicator and the set of the rink of the indicator is a summer the indicator is a set of the rink of the indicator is a set of the rink of the indicator.
	Hears	Tell-etty Engy for an anno 1971, Coras Francisky	_	The scoins is actionable by the model APES which simulates the effect of minfall on soil, taking into acco the field duranteristics (type of soil, slope and length of slope, cop) and residue, soil cover, protect menure).

Figure 24: Fact sheet.

You can also choose indicators freely without the help of GOF. Click "Indicator Library" at the bottom of the screen to change the view. Select indicators by ticking the check boxes.

		iters will, when enabled, be applied to the indi					
-		Show only available indicators calculated by the model: Show only available indicators calculated with spatial extent:					
-	Show	Show only available indicators calculated with spatial extent:					
1	Available	Indicators (matching all enabled filters):					
	Select	Name	Unit		Spatial Resolution	Status	
		Farm gate N surplus	kg		AEnZ	0	1
D:		Farm income	1000€		AEnZ	0	۲
6		Share of family labour	%		Farmtype	0	۲
-		Use of mineral phosphorus at region level	kg/ha/y		Region	0	۲
		Use of mineral nitrogen fertiliser per farm	kg/ha/y		AEnZ	0	۲
		Agricultural income per total labour input	€/AWU		Region	0	۲
\sim		Agricultural income per ha at regional level	€/ha		Region	0	۲
		Agricultural income per ha at member st	€/ha		Region	0	۲
		Agricultural income per ha at EU level	€/ha		Region	٥	0
<u> </u>		Total value of animal production per hect	€/ha		Region	0	1
		Total value of animal production per hect	€/ha		Region	0	0
197		Total value of animal production per hect	€/ha		Region	0	۲
		Total value of crop production per hectar	€/ha		Region	0	۲
		Total value of crop production per hectar	€/ha		Region	0	۲
		Total value of crop production per hectar	€/ha		Region	٥	۲
		Total agricultural output at regional level	Mn C		Region	0	۲
		Total agricultural output at member state	Mn €		Region	0	۲
		Total agricultural output at EU level	Mn €		Region	0	۲
		Total agricultural output per hectare at re	€/ha		Region	0	۲
		Total agricultural output per hectare at m	€/ha		Region	0	۲
		Total agricultural output per hectare at E	€/ha		Region	o	۲
		Total agricultural inputs at regional level	Mn€		Region	0	۲
		Total agricultural inputs at member state	Mn€		Region	0	0
		Total agricultural inputs at EU level	Mn€		Region	0	۲
	Select	all Deselect all (Or use the checkbox in	the Select col	umn to choose per indicat			

Figure 25: The indicator library.



You can filter the indicators according to model used to calculate it and/or spatial extent (Figure 25). Tick the check boxes and use the drop-down menus to see the different filtering options.

		Larger Fonts			
	iters will, when enabled, be applied		e from the project model chain: FSSIM [Version: 4]		
Show only available indicators calculated by the model:					
Show	v only available indicators calculate	ed with spatial extent:	Farmtype	•	
Available	Indicators (matching all enabled f	ilters):	Farmtype		
Select	Name	Unit	Region		
	Mentie .		CountryAggregate		
	Farm gate N surplus	kg	ALITZ	· · · · · · · · · · · · · · · · · · ·	
	Farm income	1000 €	ΔFn7	0	

Figure 26: Filtering indicators.

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6 Modelling activities

The main part of the modelling is the experiment design. An experiment consists of several different parts that all have their own screens in SEAMLESS-IF (Figure 27).

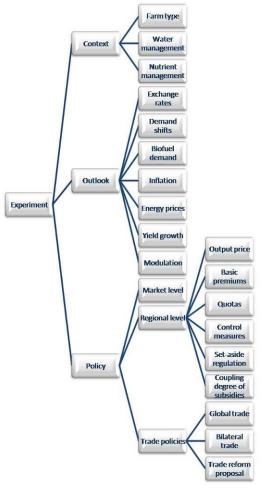


Figure 27: The structure of an experiment.

6.1 Experiment Designer

Start the modelling phase by clicking the appropriate button on the left side of the screen. By default the experiment designer opens, one of four steps in the modelling phase (Figure 28)





Figure 28: The modelling phase has four steps.

Choose the experiment you want to work with in the drop-down menu (Figure 29) and click "Load parameters" to retrieve the experiment from the SEAMLESS database.

lished)					û ⑦ ★	Donts
Select experiment	Test experimen Test experimen New test experi	t	🛷 Load param	neters	X Discard	Save
and nutrient) mar	nagement			Nutrient	management	
Farm	ed area (ha)	Labo	our use (hour/y)		Numb	er of farms

Figure 29: Choosing experiment.

6.1.1 Context

The context of a problem is the object of interest, which is delimited by the boundaries to the biophysical and agro-management system. These biophysical and agro-management boundaries determine what is inside and what is outside our system.

When opening the context screen, you are presented three different tabs (Figure 30). The context defines, among other things, the geographical context and the farm types to be considered in the experiment.



a.				User: Test project (not published)			Larger Fonts
				Select experiment	Test experim	ent 🔹 🦑 Load parameters	🗙 Discard
	Con	text					
		Farm typ	pe	Water management (and nutrient) management	gement	Nutrier	nt management
ş							
-	1	Select all	Deselect all				
n	4	Select all					
		E7	Included crops Winter soft wheat		-	Potential Irrigation (>20 events + ti	rigger at high PAW)
Y .		2	Spring soft wheat		-	Meeting water demand based on PA	w
		×	Winter durum wheat			- 13	
		2	Spring durum wheat			User def PAW<0.8 for water-sensitive	
• •		×	Winter barley			non water sensitive crops, whi calculated to restore field cap	acity at event.
		~	Spring barley				acreet
*		~	Rye			End period 239	select
<u> </u>		~	Oats			0 PAW threshold (%)	25 50 75 100
		~	Rice				<u> </u>
RA .			Maize			Repetitions !!	,
9		\checkmark	Maize pop corn			5	150
		\checkmark	Sweet maize			Water (mm/ha) per repetiton	
		\checkmark	Millet			-	
			Sorghum			Changed nutrient management	
			Triticale				
		~	Sunflower				
		v	Rape				
		~	Soya				
		~	Lupin				
			Beans				
		~	Peas				
		×	Potatoes				
		×	Sugar beet Cotton				

Figure 30: The context tab.

There are also tabs where you can specify product orientation, nutrient and water management.

6.1.2 Outlook

An outlook describes what trends and trend deviations are foreseen to occur in society that might affect the implementation of policy options within a given context, which are not modeled endogenously in SEAMLESS-IF.

The outlook tab consists of seven tabs (Figure 31)



			Test project (not published)				Larger Fonts	
			Select ex	periment Test expe	eriment 🔹 🥜 Loa	d parameters	Discard 🔡	
Conte	axt.			· · · · ·				
Outlo								
	Exchange rates	Demand shifts	Biofuel demand	Inflation	Energy prices	Yield growth	Modulation	
	rading partner	Trading pa	utnar		Value (%)		Baseline Value (%	
	est of Europe	European			100.00		100.0	
	est of Europe	European			100.00		100.00	
		Western b			100.00		100.0	
0	est of Europe		nd Romania		100.00	100.		
•	ussia, Belarus and Ukraine	European			100.00	100		
0	ussia, Belarus and Ukraine	Norway			100.00	10		
R	ussia, Belarus and Ukraine		nd Romania		100.00	100		
	ussia, Belarus and Ukraine	European			100.00		100.0	
	ulgaria and Romania	European			100.00	100-		
8	ulgaria and Romania	Norway			100.00	100		
W	estern balcans	Norway			100.00	10		
в	ulgaria and Romania	European	Union 10		100.00	10		
W	lestern balcans	European	Union 10		100.00	100		
W	estern balcans	European	Union 15		100.00	10		
R	est of Europe	Norway			100.00	10		
W	estern balcans	Bulgaria a	nd Romania		100.00	0		
U	SA	Russia, Be	larus and Ukraine		100.00		100.00	
c	anada	Norway			100.00		100.00	
c	anada	European	Union 15	100.00		0 1		
c	anada	European	European Union 10		100.00		100.0	
c	anada	Bulgaria a	Bulgaria and Romania		100.00		100.0	
C	anada	Western b	Western balcans		100.00		100.0	
C	anada	Rest of Eu	rope		100.00		100.00	
C	anada	Russia, Be	larus and Ukraine		100.00		100.0	
						[Reset to baselin	

Figure 31: The outlook screen.

If you are logged in as a modeller or project manager, you can edit the numbers by clicking on them and then input the desired value. If a number is different from the baseline assumption, the line will be green (Figure 32). The values can be reset to baseline values by clicking "Reset to baseline" in the lower right corner of the screen.

look								
Exchange rates	Demand shifts	Biofuel demand	Inflation	Energy prices	Yield growth	Modulation		
Country	Product			Value (1000 t)	Base	line value (1000 t)		
Poland	Grain maize		50.78		78			
Poland	Sugar		[54.01			54.01		
Poland	Wheat		500.00			376.75		
Lithuania	Rape oil	Rape oil		5.88		5.88		
Lithuania	Sunflower o	Sunflower oil		2.18		2.18		
Austria	Rape oil		200.35		5 2			
Czech Republic	Sunflower o	Sunflower oil		97.16		97.16		
The Netherlands	Wheat	Wheat		937.71		937.71		937.71
The Netherlands	Sugar		201.90			201.90		
The Netherlands	Rye and me	Rye and meslin		0.04		0.04		
The Notherlands	Crain maiza			704 30		704 10		

Figure 32: The line turns green if the value is different from the baseline value.

6.1.3 Policy

Each experiment within a project assesses the effects of one or a combination of several policy option(s). One policy option could refer to one or more policy measures as part of it.



Each policy option has a set of exogenous policy parameters within a given timeframe or for a given time series.

In the policy screen, three main tabs are presented. The market level policy is used to manipulate the export subsidies.

			Test projec	t (not published)				Larger Fonts
				Select experiment	Test experime	ent 🔹 👶	Load parameters	💥 Discard 🛛 🔚 S
	Context							
	Outlook							
-	Policy							
	Ma	rket level policies		Regiona	I level policies		Trad	le policies
D								
Ö	Output price	Basic premium	Quota	Control measures	Set asi	de regulation	Coupling degr	ree of subsidies
				•				
	Region	Farmtype	Crop/animal product	Level	Amount (t)	Baseline amount (t)	Additional price (C	Baseline ap (€/t)
	Bayern	Large scale - high int		A	11.54	11.54	27.29	27.29
· ·	Bayern	Large scale - high int		TOTAL	252.51	252.51	0.11	0.11
	Bayern	Large scale - high int	dairy cow milk	TOTAL	342.86	342.86	0.11	0.11
開	Bayern	Large scale - high int	Beet, sugar- Ware	в	3.55	3.55	-2.72	-2.72
<u> </u>	Castilla y Leon	Large scale - medium	Beet, sugar- Ware	в	19.54	19.54	33.38	33.38
	Castilla y Leon	Large scale - medium	Beet, sugar- Ware	A	468.97	468.97	33.38	33.38
RA.	Bayern	Large scale - high int	Beet, sugar- Ware	в	0.00	0.00	-2.72	-2.72
	Emilia-Romagna	Large scale - medium	Beet, sugar- Ware	A	361.91	361.91	16.39	16.39
	Mazowsze-Podlasie	Small scale - medium	Beet, sugar- Ware	A	2.99	2.99	31.21	31.21
	Emilia-Romagna	Large scale - medium	Beet, sugar- Ware	8	9.18	9.18	16.39	16.39
	Mazowsze-Podlasie	Small scale - medium	dairy cow milk	TOTAL	41.45	41.45	0.11	0.11
	Mazowsze-Podlasie	Small scale - medium	Beet, sugar- Ware	В	0.17	0.17	1.04	1.04
	Bayern	Medium scale - high i	dairy cow milk	TOTAL	144.83	144.83	0.11	0.11
	Mazowsze-Podlasie	Small scale - medium	Beet, sugar- Ware	A	26.24	26.24	31.21	31.21
	Bayern	Medium scale - high i	Beet, sugar- Ware	A	0.00	0.00	27.29	27.29
	Bayern	Medium scale - high i	Beet, sugar- Ware	В	0.00	0.00	-2.72	-2.72
	Brandenburg	Large scale - medium	Beet, sugar- Ware	A	25.56	25.56	27.29	27.29
	Brandenburg	Large scale - medium	Beet, sugar- Ware	8	215.65	215.65	-2.72	-2.72
	Brandenburg	Large scale - medium	Beet, sugar- Ware	A	700.87	700.87	27.29	27.29
	Mazowsze-Podlasie	Small scale - medium	Beet, sugar- Ware	в	1.52	1.52	1.04	1.04
	Brandenburg	Large scale - low inte	Beet, sugar- Ware	8	8.70	8.70	-2.72	-2.72
								Reset to baseline

Figure 33: The policy option screen.

The regional level policies has tabs for set aside regulation, premiums, coupling degrees of premiums, quotas and prices which are straight forward fill in. To create control measures, use the drop-down menus in the control measures tab to decide what region should have a specific rule, then click "Add" in the lower right corner of the screen and then fill in the desired values in the columns. Delete a rule by clicking "Delete" to the right.



64-								i e r : (not publishe	id)						▲ ⑦ 🕷 👼
								Sel	ect experim	ent Test ex	operiment	- @L	oad pa	arameters	💥 Discard 🛛
	Co	ntext								0.		1. 1. N. N.			
		tlook													
		licy													
3							-				Second Second		-	-	
			Ма	rket level	policies				Reg	jional level p	olicies			1	rade policies
J		Output	price	Basi	c premium	Q	uota	Contro	l measure	s	Set aside regi	lation	()	Coupling d	legree of subsidies
		Region	Min	Rule	Rule le .	Erosion (Irrigatio	Nitrate le	Nitrogen	Nitrogen us	Pesticide Pr	Soil organic	: mat		
		Danmark	~	Tax	0.00	0.00	0.00		0.00	0.00			0.00	Delete	
- ·														Delete 1	
E															
<u> </u>															
		-													
Shere															
1															
¥															
		Create n	ew policy	measure											
		Region	Fleve	and	*										
		Rule	Pena	Ity 🔹											
			Penalt	ty,											
			Subsid												🔶 Ada
			Tax	- C											

Figure 34: Editing the control measures.

In the trade policies, you can manipulate both global and bilateral trade agreements in the experiment.

6.2 Experiment queuing

Click on the second little green circle to the left to open the experiment queuing (Figure 35).



Figure 35: Experiment queuing.



Highlight the experiment that you want calculated and then click "Add to queue" in the lower left corner of the screen.

6.3 Model chain viewer

To see the available model chains in SEAMLESS-IF click on the third green circle to open the model chain viewer. This is shown graphically to give you an idea about how the different models are connected. To get a short description about a specific model put the cursor over its box and read the tool tip that shows up (Figure 36).

		User:	🛆 🕐 🟶 🕷
		Test project (not published)	Larger Fonts
	Select the model chain to view (in bold the ch	ain used for the project):	Description:
	Overview of all SEAMLESS-IF models		An overview of all the SEAMLESS-IF models, both included and not included in t system.
	Global	GTAP	
9	Earth system		
	National	SEAMCAP	
<u> </u>	Biosphere		
	Regional	EXPAMOD	
	Ecosystem Landscape	Mextrapolates and aggregates	
	Farm	FSSIM	
Y	Community SCA		
	Field APES		
Y	Population		
a	Biophysical	Economic Social	
-			

Figure 36: The graphical representation of a model chain.

6.4 Processing center

The processing centre screen is showing the information about the current state of the server calculations and the execution queue (Figure 37). To remove an experiment from the queue, highlight the experiment in the list and click "Remove from Queue" in the lower right corner of the screen.

The execution processing management screen is not working in the current release.



uci.			Test project (not publishe	d)	🟠 🕐 😻 👼 🧶
3			Queue Overview	Execution process management	
	Queue of	experiments waiting fo	or processing (click Refresh to update):		
	Pos Id	State	Title	last completed model	
8	0 88	Waiting	Test experiment	Undefined	
Y					
0					
-					
A					
\checkmark					
1					

Figure 37: The process centre screen.



7 Post-modelling activities

Post-modelling activities in SEAMLESS-IF are restricted to visualizations of indicators in the current release.

7.1 Visualizations

A visualization is a graphical representation of the project data and/or results and is like a small project in itself. It consists of five different parts that should be considered.

Click the "Visualizations" button in the task bar. If you want to look at already existing click "Open..." in the lower left corner of the screen (Figure 38).

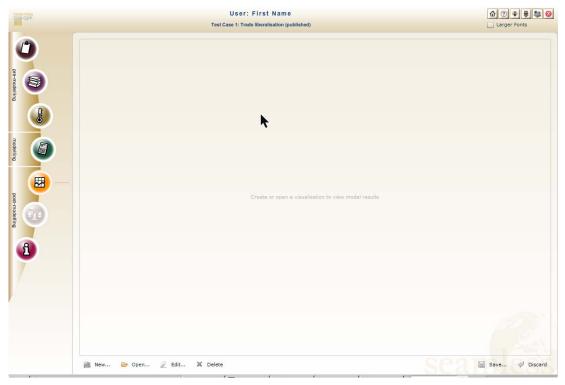


Figure 38: The visualization window

A list with the available visualizations opens up, highlight the desired visualization and click "Open" in the lower left corner of the screen.



Title	Author(s)	Description
Agricultural income across NUTS regio	SEAMLESS	This view shows the Agricultural income per NUTS region for the analysed Experiments
Welfare indicators at country level	SEAMLESS	Welfare indicators are not complete for Non EU countries yet.
Economic Farmindicators	Seamless	Some economic indicators per farmtype
National N balance	Seamless	Positions of the Nitrate balance
📃 Оред		X Cancel

Figure 39: Open a visualization.

By default, the visualization opens in table mode. You can choose which indicator to study and to see the numbers as absolute numbers, absolute difference compared to the baseline or as relative change to baseline expressed in per cent, by using the drop-down menus (Figure 40). There is an option to have the results sorted in columns according to experiment by checking the appropriate check box. The internal fields option is for debugging purposes.



		Test Case 1: Trade lil	peralisation (published)				Larger For
		Agricultu	ral income across NUTS regio	ns (by s	SEAMLESS)		
		Table	Cross Table Chart Ra	dar Cha	art Map		
N	Indicator: Agricultural i	ncome per ha at EU level [€/h	a]			+	Absolute
	Options: Create colum	ns per experiment 🔲 Show inte	rnal fields				Absolute
							Absolute difference to baselin
	Baseline	CountryAggregate.Name	Calculated	A	Activitygroup.Label_en		Relative change to baseline (
	814.2	Norway	3	26.71 S	oft wheat production	activity	G20 proposal
	834.34	Norway	2	70.46 R	tye and meslin produc	tion acti	ivity G20 proposal
	1149.91	Norway	8	35.83 B	Barley production activ	vity	G20 proposal
	1238.8	Norway	8	65.32 C	Dats and summer cere	al mixes	s proc G20 proposal
	614.21	Norway	5	76.92 C	Other cereals production	on activi	ty inc G20 proposal
	557.63	Norway	4	29.61 R	lape production activit	ty	G20 proposal
	120690	Norway	13	20690 F	lowers production act	ivity	G20 proposal
9) —	2454.88	Norway	14	37.79 F	odder root crops prod	luction a	ctivit G20 proposal
<u></u>	872.81	Norway		712.5 F	odder other on arable	land pr	oduct G20 proposal
	-11.9	Norway		77.82 G	Gras and grazings pro	duction a	activit G20 proposal
	651.66	Norway	5	02.25 G	Gras and grazings pro	duction a	activit G20 proposal
	1570.55	Norway	11	19.11 P	Potatoes production ac	tivity	G20 proposal
	508394	Norway	20	85500 T	omatoes production a	ctivity	G20 proposal
	4870.25	Norway	10	169.8 0	Other vegetables prod	uction ad	ctivity G20 proposal
	6668.62	Norway	3	298.8 A	Apples pears and pea	ches pro	oducti G20 proposal
	727.91	Norway	17	66.86 C	Other fruits production	activity	G20 proposal
	1517.2	Norway	14	02.52 D	Dairy cows production	activity	low y G20 proposal
	2340.31	Norway	19	98.27 D	Dairy cows production	activity	high G20 proposal
	101.46	Norway		-22.8 M	tale adult fattening ac	tivity lov	w fina G20 proposal
	-8.93	Norway	-1	25.43 N	lale adult fattening ac	tivity hig	gh fin G20 proposal
	15.08	Norway			leifers fattening activi		
	-92.04	Norway	-1	66.93 H	leifers fattening activi	ty high f	inal v G20 proposal
	-345.6	Norway			Suckler cows production	on activit	ty G20 proposal
	-448.9	Norway	-2		leifers raising activity		G20 proposal
	84.91	Norway		9.08 0	alves male fattening	activity	G20 proposal

Figure 40: The table tab of the visualization editing window.

To copy the table contents to the clipboard, click "Copy" in the upper right corner of the screen (Figure 41). This can be pasted into spreadsheet software such as Microsoft Excel.

						Test Case 1:	Trade liberalis	ation (publishe	d)					La	rger Fonts	
							Econ	omic Farmin	dicators (b	y Seamless)						
						1	able Cr	oss Table	Chart I	Radar Chart	Мар					
		Display v	alues as:	Absolute			+								In Sea	ру
	9				G20 pr	oposal			Sub	sidies			WTO pi	Copy the tal	ble data to the	clipt
		Farm.D escripti on	Farm.F ADNRe gion.Na me	Product ion share of income [ratio]	Value of farm product ion [1000 C]	Subsidi es [1000 C]	Farm income [1000 C]	Product ion share of income [ratio]	Value of farm product ion [1000 €]	Subsidi es [1000 C]	Farm income [1000 C]	Product ion share of income [ratio]	Value of farm product ion [1000 C]	Subsidi es [1000 C]	Farm income [1000 C]	
		Large scale	Midi-Pyrene	1.04	94923.6	43564.2	91375.1	1.06	101557	43567.5	95419.9	1.04	95918.6	43564.5	91933.5	1
		Large scale	Andalucia (i	0.55	93851.7	114254	171335	0.55	95065.8	114201	172378	0.55	94010.5	114245	171465	
	\sim	Large scale	Netherlands	1.25	178871	9297.93	142697	1.24	181696	10827.8	147026	1.25	178887	9480.17	143046	
		Large scale	Champagne	0.59	64243.8	40165	108682	0.64	73020.9	40539.1	113557	0.59	64348.6	40458	109091	
		Large scale	Pomorze-Ma	1.67	658937	81324.9	395033	1.72	830897	82633.3	483551	1.67	674165	81541.1	403404	
	<u> </u>	Large scale	Castilla y Le	0.86	74164.5	48268.9	86116.1	0.87	85236.5	48970.6	97889.9	0.86	75392.9	48345.2	87420.9	
		Large scale	Bayern	0.43	8815.95	5677.28	20575.1	0.44	9810.24	6714.95	22055.4	0.43	8835.06	5820.45	20737.4	
	RA	Medium sca	Mazowsze-F	1.41	36574.3	7673.61	25972.6	1.66	64612.6	6627.15	38964.3	1.44	38938.9	7585.42	27061.5	
2	9	Large scale	Champagne	0.35	49653.9	46132.5	140164	0.34	51027.2	54196.3	149629	0.35	49793	46977.4	141151	
		Medium sca	Castilla y Le	0.94	29918.8	15178.9	31822.2	1.09	46326.8	14817.8	42613.9	1.12	36921.1	14507.5	32897.9	
2		Medium sca	Andalucia (i	0.69	44912	8038.84	64970.2	0.7	46248.8	8038.8	66306.9	0.69	45334.4	8038.81	65392.5	
1		Medium sca	Andalucia (i	0.61	18011.3	6079.25	29697.4	0.58	18021.3	7563.91	31187	0.6	18011.3	6241.02	29858.9	
		Large scale	Denmark	1.44	228087	39849.3	157927	1.45	232549	39271.5	160704	1.44	228625	39781.9	158272	
		Large scale	Andalucia (i	0.67	168311	50459.1	250962	0.67	169401	50455.6	252050	0.67	168408	50458.5	251058	
		Medium sca	Netherlands	1.42	61933.4	2583.32	43605.8	1.4	62642.3	2951.04	44894	1.42	61949.8	2634.23	43716.9	
		Large scale	Auvergne	0.87	106295	46763.7	122475	0.89	112071	46767.3	126221	0.87	107559	46764.7	123094	
		Small scale	Castilla y Le	0.96	7128.81	3628.39	7396.54	1.12	11333.1	3473.63	10154	1.15	8833.42	3469.38	7650.08	
		Small scale	Mazowsze-F	1.3	7522.09	1563.51	5784.93	1.52	11567.7	1510.13	7624.7	1.32	7860.01	1558.96	5939.75	
		Large scale	Midi-Pyrene	0.99	118499	49870.2	119880	1	125064	49873.7	125059	0.99	119550	49870.5	120663	
		Large scale	Denmark	1.22	155647	42849	127830	1.23	158385	42224.4	128978	1.22	155981	42767.7	127961	
		Medium sca	Castilla y Le	0.93	17883.9	10339.7	19302.7	1	24790.5	10364	24827.1	1.01	20034.3	10153.8	19860.7	
		Small scale	Andalucia (i	0.64	19081.8	4517.25	29701.6	0.65	19808.1	4516.97	30427.3	0.65	19333.6	4517.17	29953.2	- 1

Figure 41: Cross table.



Click on the cross table chart to see the indicator set per experiment (Figure 41).

In the chart tab, you can see a bar chart of one indicator at a time (Figure 42). Choose indicator and format of the representation in the drop-down menus. If you hover with the cursor over a bar, you will see detailed information about this specific result.



Figure 42: Bar chart.

To display multivariate data, the radar chart, also known as spider diagram, could be used.

Click the radar chart tab to open, choose what region and format to look at. To see detailed information about a data point, hover with the cursor over it (Figure 43).



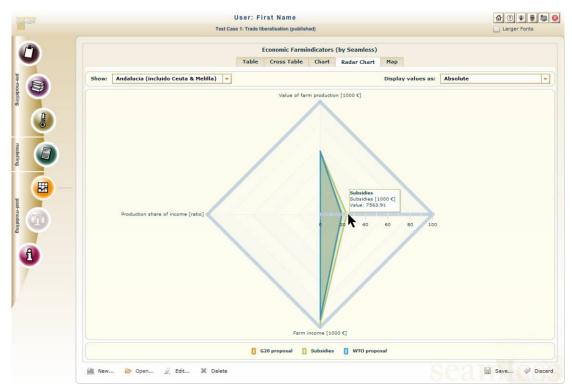


Figure 43: Radar chart.

To look at a map of spatially distributed data, click the map tab. Choose the experiment, the indicator and the format in the drop-down menus (Figure 44). To see details, hover over the region of interest. You can zoom the map by either using a scroll wheel on your mouse or by using the + and - keys on your keyboard. Pan the map either by right-clicking on the map and then move the mouse or by using the arrow keys on your keyboard.





Figure 44: Map visualization

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8 Policy Analysis

Currently not implemented.



9 Documentation

Open the list of available documentation by clicking on the i-button to the left (Figure 45). Scroll through the list to find the document of interest, or use the search function to find it. To open the document, highlight it and click "Show topic…" in the lower right corner of the screen or just simply double-click on it in the list. A new browser window will open with the document in pdf-format.

	User: First Name Test Case 1: Trade liberalisation (published)		🕼 🕐 🕷 😻 🚳
0	All Topics	Find:	Search Topics
pre-modelling	SEAMLESS Policy Relevance Flyer Keywords: policy, relevance, overview Flyer detailing the policy relevance of SEAMLESS and the SEAMLESS-F software.		
	Sustainable Development Keywords: sustainabity, development A pdf document with a short introduction to the subject by Lennart Olsson		
	SEAMLESS Project Website Keywords: SEAMLESS, website, overview, integrated project Access to the official SEAMLESS integrated Project website.		
post-modelling	SEAMLESS Introduction Movie Keywords: movie, overview A movie explaining the key aspects of the SEAMLESS project and the SEAMLESS-F software.		
	View unvillable help topics to learn more ALESS and bits SEAMLESS if Topic Neyworks "science; research; scaling, models, overview Ryer explaining the science behind SEAMLESS in a nutshell.		
	Training material to postgraduate course "Integrated Assessment of Agriculture and Sustainable Development" Keywords: training, sylabus, course The first SAMLESS course "Integrated Assessment of Agriculture and Sustainable Development" is organized in Wageningen, provided per module.	The Netherlands, from 16-22 November 2008. In this	course syllabus documentation is
	Download completed	SC	Show Topic

Figure 45: The documentation screen.



10 Ontology Browser

At the core of the SEAMLESS-IF system an ontology is used as base of the integration of data, knowledge, the software framework, the model components, and so on. An ontology is a formal representation of a set of concepts within a domain and the relationships between those concepts. To understand more about the system and the interactions between the used models the user interface provides access to an Ontology Browser. This can be started (in a separate browser window) by clicking on the Ontology Browser button in the top right corner.



Figure 46: Ontology Browser button

The Ontology Browser window displays on the left (you might have to stretch the browser window a bit) a navigation structure with a number of panels. Click on one of the headers (e.g. "knowledge tree", "ontologies", "search results") to open a panel. Each panel provides access to the ontology content in a different way, and you can use it to select one of the concepts defined in the ontology (and thus used in SEAMLESS-IF).

	o.org:8060/browser/zul/main.zht	SEAMLESS ontology brows	ser :: v1.0 - Google Chrome	9- /
seamless ont	ology browser v1.0			
(nowledge tree	Conservation Options :: In	tercropping	pro	odent
Agricultural Activity Agricultural Activity Per Farm Agriemployment Agromanagement Configuration Alternative Beef Option	where the fields would non erosion. For intercropping.	mally be without crops to p it should be specified whi	is are used during the winterperi prevent nutrient losses and soil ch intercrop is of interest, and v	
Alternative Diary Option	- Attributes			_
Animal Production Animal Shares Area Of Intervention Beef Management	phosphorus Use	one <u>Floating Point</u>	Phopshorus use on teh cro in kg (s) per hectare. Amount of phosphorus per ha in one cropping season	
Biophysical Simulation Di CAPRIParameter Calibration Term Climate Zone	nitrogen Use	one <u>Floating Point</u>	Nitrogen use on the crop ir kg(s) per hectare. Amount nitrogen per ha in one cropping season	
Conservation Options	nitrogen Use Organic	one Floating Point	No description given	
Crop Residue Management Perennial Rotations Intercropping	potassium Use	one <u>Floating Point</u>	Amount of potassium in kg per ha in one cropping season used on a crop	Ĵ
Field Borders Reduced Tillage	Links to other objects			
Constraints Context Costand Labour Per Regional Zone Crop	has Inter Crop	one <u>Crop</u>	an intercrop used in an intercropping conversation management.	
Crop Area 2 Crop Group Crop Information 2 Crop Management				
Intologies				
earch results				

Figure 47: Ontology Browser window



On the right side of the Ontology Browser window the available detailed information of the selected concept is displayed. Not everything is described in full details yet. Text that is underlined usually provides a reference to another concept, the link can be followed by simply clicking on it.

It is possible to search the ontology for a certain text by entering the search phrase in the box above the navigation panels on the left. The search button next to it starts the search operation. Results will be displayed in the navigation panel and can be clicked to open the descriptions of the matching concepts.

← → C ☆ http://delivered.seamless-ip.org:8060/b	prowser/zul/main.zhtml		► B• .
seamless ontology b	rowser v1.0		
rop	Crop		crop
Knowledge tree	Description		crop
Ontologies		list of crops we are using in	Seamless Crops are
Search results		level, i.e. that of APES and	
I-7 of 32	Attributes	90) 	
Crop crop This is the classification list of crops we are using in Seam	harvest Index	one <u>Floating Point</u>	indicates which percentage of the crop is harvested as main product and which percentage as by oroduct.
Grass Management activity This describes the management of a grass crop	water Sensitive	one <u>Boolean</u>	No description given
Sowing Operation agrirule describes the sowing of the crop	nitrogen Content	one <u>Floating Point</u>	the percentage of nitrogen in a crop, usually between 0 and 20 percent of crop biomass.
	IsWinterCrop	one Boolean	No description given
Crop Production farmopt Production of one crop product			
	Links to other objects-		
Crop Product crop these are the crop products as a unique combination of a crop	has Crop Soil Requirements	one <u>Crop Soil</u> Requirements	No description given
Crop Soil Requirements prodent	produces	zero or <u>Crop</u> more <u>Product</u>	Each crop produces some products
The minimum requirements to grow a Crop in a certain soil pro	has Crop Rotation Requirements	zero or <u>Crop Rotation</u> more <u>Requirements</u>	No description given
Yieldof Crop Product farmopt this gives the yield of a crop product for a certain location	has Crop Climate Requirements	one <u>Crop Climate</u> <u>Requirements</u>	No description given
	is Part Of Crop Groups	zero or more Crop Group	Each Crop is part of several Crop Groups
Bookmarks	has Nitrogen Recoveries	zero or <u>Crop Nitrogen</u> more <u>Recovery</u>	No description given

Figure 48: Searching the ontology

To close the Ontology Browser simply close the browser window that displays it. This will not affect the SEAMLESS-IF GUI in the other window. Please note that if you close the browser application completely this will also close the SEAMLESS-IF GUI and unsaved modifications will be lost!



11 User Management

In case you log in with an account that has *administrative* rights, you can enter the User Management screens by clicking on the User Management button in the top right corner.



Figure 49: User Management button

This opens the User Management screen, that lists information about all the known users and accounts to the system (not shown here for privacy reasons). Below the screen there are buttons for updating the list ("Refresh"), to create a new user, to modify data for an existing user, to remove a user/account from the system and to close the User Management and go back to using SEAMLESS-IF.

11.1 Creating a new user

In the main User Management screen click on the "New..." button to open the window that allows entering information about the new user. After filling out all the details click on the "Ok" button to save the data on the server. Click "Cancel" if you want to abort.

and the second		User	: Administrator		🏠 🕐 🐐 👙 🥸 📀
			No project		Larger Fonts
	User Details				
account name:					
first name:					
last name:					
institute:					
email:					
password:					
			🗟 Ok 🛛 💥 Canc	el	
	role		project		description
	1010		project		ucscription
New	🗁 Edit				Seam Remove

Figure 50: Creating a new user account

After creating the new user, the roles she or he has in projects has to be defined. To do so click on the "New..." button below the table that lists all the project roles for the user, in the lower part of the screen.



This opens the window that allows you to assign the project roles. Again, click "New..." to create a new project role, or select an existing one from the list and click "Edit..." to modify it. You can also select an existing role and delete it by pressing the "Remove" button.

	User: Administrator	☆ ⑦ 巻 畢 🎕 🔇
	No project	Larger Fonts
role	project	description
Viewer	Test Case 1: Trade liberalisation	Test case 1 - evaluating impact of trade liberalization of Europe
Viewer	Sustainable Water and Nitrogen management	Contribution of alternative Water and Nitrogen management to farming systems sustainability Nitrate Directive application of SEAMLESS-1P (PD 6.3.3.2)
📄 New 😂 Edit		X Remove
Projectrole Details		•
project: Choose a project		
projecti		
🔛 Ok 🎇 Cancel		

Figure 51: Assigning project roles to a user

When done editing the project roles for the user either click "Ok" to store the changes, or click "Cancel" to ignore them.

11.2 Editing an existing user

To modify account information and project roles of an existing user go to the main User Management screen, select the user in the list and click on the "Edit…" button below the list. You will see the same windows as described before (for creating a new user), but this time they work based on the data for the selected user. Other than that all functionality is the same.

11.3 Removing an existing user

The account for an existing user can be removed from the system by selecting it in the main user Management screen and clicking on the "Remove" button below the list. The user will no longer be able to access the system once the account is deleted.

11.4 Closing the User Management

When done updating the user accounts you can close the User Management by clicking on the "Close" button in the bottom right corner of the User Management screen. For security reasons you will be requested to log in again to the system. Other users will also only see the effects of your user management changes when they re-enter the system. E.g. when assigned new project roles the user should log out and back in again to use the new permissions.



12 How to use the Trac system

Trac is a web-based management of software projects, and is available for all SEAMLESS-IF users for reporting bugs, missing functions, glitches in design and usability as well as for collecting wishes and requests for future versions. Its goal is to simplify effective tracking and handling of software issues and improvement suggestions.

12.1 How to login to Trac

To use the SEAMLESS Trac system you need a login ID and a password. If you do not already have an ID or you have forgotten your ID or the password, please contact the SEAM-LESS administrator, <u>SEAMLESS.office@wur.nl</u>

Click on the little bug button in the upper right corner of SEAMLESS-IF (Figure 52). Start logging in by clicking 'Login' in the upper right corner (Figure 53).



Figure 52: A direct link to the Trac system web site is the bug report button.

				Search
	Legin Set	tings	Help/Guid	e About Trac
map	Browse Source	Vie	w Tickets	Search
Start Page	Index by Title	Index	by Date	Last Change

Figure 53: The Trac login.

The login screen appears (Figure 54) where you should fill in the user name and password provided by the Trac system administrator.



Connect to trac.sea	mless-ip.org
	GA
The server trac.sean and password.	nless-ip.org at Trac requires a username
	is requesting that your username and an insecure manner (basic authentication nection).
User name:	💈 patrikw 💌
Password:	••••• <u>]</u>
	Remember my password
	OK Cancel

Figure 54: Connect to the Trac server.

12.2 How to submit a ticket

Start by browsing tickets already submitted by others to see if your issue/problem/request has already been addressed by someone else. Click 'View Tickets' in the upper right corner of the screen. You will be presented a list of available ways of sorting the tickets already in the system (Figure 55).





Available Reports

This is a list of reports available.

Report	Title
{1}	Active Tickets
{2}	Active Tickets by Version
{3}	All Tickets by Milestone
{4}	Assigned, Active Tickets by Owner
{5}	Assigned, Active Tickets by Owner (Full Description)
{6 }	All Tickets By Milestone (Including closed)
{7}	My Tickets
{8}	Active Tickets, Mine first

|--|--|

Figure 55: A list of available ways of sorting the tickets

Choose a suitable report format (all tickets by milestone is often a good choice) by clicking on it. As you can see, you can also keep track of your own submitted tickets here for followup and to see the progress of its handling. In these reports, you can explore what tickets are submitted, to whom it has been assigned, the severity etc. (Figure 56). You can also look at individual tickets by clicking them in the list.



-	Integrated SCM & Project Management				logged in a	s patrikw	Logout	Settings	Help/Guide	Search About Trac
			Wiki	Roadmap	Browse Sou	rce	View Ticke	ts 🚺	New Ticket	Search
This rep	I Tickets by Milestone (17 matches) nort shows how to color results by priority, whe odification time, description and reporter are in				rt.			Availabl	e Reports C	ustom Query
P2M1	Release									
Ticket	Summary	Component				Version	Туре		Owner	Created
#24	NUT2 regions in experiment designer	nfrasiructure Sof	tware - Sea	mGUI - Mode	lling	1.0	enhanc	ement	lorenzo	08/17/07
#26 #38	narrative experiments lost once again build8 version: narrative experiments lost on	PreModellin	g ure Software	e - SeamGUI e - SeamGUI		1.0 1.0		lorenzo, seamles	/karin/patrik is	08/17/07
#39	again build8 version running problems			e - SeamGUI	- Modelling	1.0	defect	seamles	S	08/28/07
P2M4	Release									
Ticket	Summary		Component		Vers	ion	Туре	Owner	Cre	ated
#1	None		component	1	0.1		task	benny	* 01/	24/07
#27	User account in database		Administrat	ive tasks	0.2		task	karina	08/	17/07
#28	Trac ticket management and follow-up		Administrat	ive tasks	0.2		task	karina	08/	17/07
	one1 Release									
milest										
	Summary	Compone	nt			Version	1 Type		Owner	Created
				re - SeamGU	I - Modelling		n Type defec	t	Owner seamless	Created 09/12/07

Figure 56: Tickets sorted by milestone.

If you find out that your issue is not already reported, click 'New Ticket' in the menu in the upper right corner of the screen (Figure 57). On the New Ticket page, enter a short summary that will give an idea of what the problem is. Below that, choose one of defect/enhancement/task that fits. Describe the problem in more detail under Full description.

The "Ticket Properties" box (Figure 58) contains some administrative information about the ticket: "Priority" can be set on a scale from "trivial" to "blocker", "Version" should be 0.2 for SEAMLESS-IF, and "Assign to" should be the names or user names of one or more of the developers in WP5. If you do not know whom to assign it to, just leave it empty. The rest of the entries can also be left empty if you do not know what to put there.

If you want to add a file to your ticket (for example a screenshot or a log), check the box at the bottom. You will be prompted for the filename.

You can see what the ticket looks like by pressing "Preview". Register it with "Submit ticket".

		Search
Logout Settings	Help/Guide	About Trac
View Tickets	Now Ticket	Search
itle Index Recen	nt Langes	Page History

Figure 57: Click "New Ticket" in the upper right corner.



megrate	d SCM & Project Management		Wiki	Roadmap	logged in as patri Browse Source	kw Logout S	ettings Help/Guid	e About Trac
			WIKI	Koadmap	Browse Source	View Lickets	New licket	Search
eate New	Ticket							
rt summary:								
rem ipsum dole	or sit amet							
e: defect defect enhancem I task	ent ay use WikiFormatting	here):						
	olor sit amet, consectet							
erra lobor em. Donec	tis posuere, lacus orci quis lacus eu purus adip	dignissim velit, ve iscing dictum. Nunc	el imperdiet scelerisqu	risus tellu e nisl quis	за 🗌			
verra lobor cem. Donec quam erat	tis posuere, lacus orci	dignissim velit, ve iscing dictum. Nunc tenti. Phasellus co	el imperdiet scelerisqu mmodo conva	risus tellu e nisl quis llis nunc.	s a ante.			
verra lobor cem. Donec quam erat vamus inter que. In mas	tis posuere, lacus orci quis lacus eu purus adip volutpat. Suspendisse po dum tempus diam. Proin q sa urna, mollis vitae, c	dignissim velit, ve iscing dictum. Nunc tenti. Phasellus co uis risus a tortor consectetuer sed, mo	el imperdiet scelerisqu mmodo conva faucibus so ollis et, ri	risus tellu e nisl quis llis nunc. dales. Nam i sus. Pellent	sa ante.			
verra lobor cem. Donec quam erat vamus inter que. In mas tis vulput amcorper e	tis posuere, lacus orci quis lacus eu purus adip volutpat. Suspendisse po dum tempus diam. Proin q sa urna, mollis vitae, c ate velit. Quisque ut mi lementum lorem. Donec ma	dignissim velit, ve iscing dictum. Nunc tenti. Phasellus co uis risus a tortor onsectetuer sed, mo . Etiam cursus urna uris risus, interdu	el imperdiet c scelerisqu mmodo conva faucibus so ollis et, ri a eget felis m eget, sod	risus tellu e nisl quis llis nunc. dales. Nam i sus. Pellent . Vivamus ales a, ultr	s a ante. d esque			
verra lobor cem. Donec quam erat vamus inter que. In mas tis vulput amcorper e	tis posuere, lacus orci quis lacus eu purus adip volutpat. Suspendisse po dum tempus diam. Proin q sa urna, mollis vitae, c ate velit. Quisque ut mi	dignissim velit, ve iscing dictum. Nunc tenti. Phasellus co uis risus a tortor onsectetuer sed, mo . Etiam cursus urna uris risus, interdu	el imperdiet c scelerisqu mmodo conva faucibus so ollis et, ri a eget felis m eget, sod	risus tellu e nisl quis llis nunc. dales. Nam i sus. Pellent . Vivamus ales a, ultr	s a ante. d esque			
erra lobor em. Donec quam erat amus inter pe. In mas tis vulput amcorper e leo. Ut n	tis posuere, lacus orci quis lacus eu purus adip volutpat. Suspendisse po dum tempus diam. Froin q sa urna, mollis vitae, c ate velit. Quisque ut mi lementum lorem. Donec ma on tortor. Phasellus et	dignissim velit, ve iscing dictum. Nunc tenti. Phasellus co uis risus a tortor onsectetuer sed, mo . Etiam cursus urna uris risus, interdu	el imperdiet c scelerisqu mmodo conva faucibus so ollis et, ri a eget felis m eget, sod	risus tellu e nisl quis llis nunc. dales. Nam i sus. Pellent . Vivamus ales a, ultr	s a ante. d esque			
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Figure 58: Describe your problem with all details needed to recreate it in the text box.

You can change the ticket properties by using the drop-down menus in the 'Ticket Properties' box. Priority can be set from lowest to highest and severity from trivial to blocker on multi step scales. How these properties are set is not critical; all tickets will be individually read, assessed and labelled by the software developers in WP5. Assign the ticket to a person. If you do not know to whom it should be assigned or otherwise are in doubt, assign it to a WP leader. You can provide some keywords to help the readers of the tickets in the sorting procedure, but that is optional. The CC field is not used. Submit the ticket by clicking 'Submit ticket'.

12.3 How to get feedback from Trac

When you have opened a ticket in Trac, you can get updates about it by email. For this to work, you have to give Trac a valid email address.

			Search
logged in as patril	kw Logout Set(ក្រ	gs Help/Guide	About Trac
Browse Source	View Tickets	New Ticket	Search

Figure 59: Where to change your Trac settings.



Press "Settings" in the row of links in the upper right corner (Figure 59). Enter your email address in the box under "Personal information". Press "Submit changes" (Figure 60).

-	Integrated SCM & Project Management				logged in as patrikw			About Trac
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ame: Pa	atrik Wallman							
	atrik Wallman trik.wallman@lucsus.lu.se							

Figure 60: Remember to press "Submit changes" before you leave the page.

Now Trac will send you email when you have created a ticket, as well as whenever something changes in it.

For the interested reader a lot of documentation and help functions are provided on the web page.

12.4 A Short guide to Trac Wiki

The Trac system also contains a wiki function. A wiki is a medium that can be edited by anyone with access to it, and provides an easy method for linking from one page to another. The Trac wiki is a typically collaborative website, this means that when you are logged in to the Trac system you can edit the pages you are reading.

12.4.1 Comparing versions in Trac wiki

The wiki always saves the different versions of a wiki page for easy comparison of different versions of the page. To view recent changes, click on "Last Change" (Figure 53) to open changes page (Figure 61). Click "Page history" (red arrow, Figure 61) to see all revisions of a page (Figure 62).





POWERED	by cogewait bortware.			

Figure 61: Compare changes between different versions of wiki pages.

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0	0	13	09/25/07 11:03:01	patrikw						
0	0	12	09/25/07 10:55:57	patrikw						
C	0	11	09/25/07 10:50:12	patrikw						
0	0	10	09/25/07 10:49:27	patrikw						
C	0	9	09/25/07 10:41:54	patrikw						
0	0	8	09/24/07 15:36:59	irinab						
0	0	7	09/24/07 09:38:38	irinab						
0	0	6	09/24/07 09:34:16	irinab						
0	0	5	09/24/07 09:33:54	irinab						
0	0	4	09/21/07 17:27:02	irinab						
C	0	3	09/20/07 15:04:43	patrikw						
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۷	iew	changes								

Figure 62: All versions of a page are stored and can be retrieved from the data base.

12.4.2 Editing a wiki page

To be able to edit a wiki page you need to be logged in to the system. Once you have logged in, the appearance of the screen changes, allowing you to edit wiki pages (Figure 63).



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	Delete this version	Delete page						
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Edit this page 🙀 Attach file								
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Figure 63: Click "Edit this page" to be able to write text on a wiki page.

Click "Edit this page" and type your text in the editing box that shows up. When you are finished editing click "Submit changes" (Figure 64). To format your text, use the buttons on the top of the editing window.

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Figure 64: The editing window.

It is also possible to "Preview" the wiki page (Figure 65) before submitting it.



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Figure 65: A draft version can be scrutinized before submitting the changes.

The interested reader can find lots of further information on wiki formatting, built-in functions etc in the Trac wiki documentation available on the web site.

12.5 Support of Frequently Asked Questions

An FAQ (Frequently Asked Questions) web page will be set up in the Trac system as soon as any FAQs have been collected. Just click on the link in the menu to the right on the web page (Figure 66).

logged in as patrik	w Logout	Settin	gs H	elp/Guide	Search About Trac
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Trac account and v	wish to	Naviga Main Manun TW 3 Prototy	I SEAM ain pa	LESS-IF Pro	ptotype 2

Figure 66: The menu of the SEAMLESS-IF wiki page in the Trac system.

∭seamless

Glossary

- **Context**: the object of interest and its boundary conditions, which is delimited by the boundaries to the biophysical and agro-management system. For example, arable farms in the Flevoland region with five different crops. Each Experiment needs one and only one specific context.
- **Experiment**: an experiment is one run of the models within SEAMLESS-IF that evaluate the effects of one or a combination of 'policy options' in one context and one outlook
- **Impact**: the expected changes in indicator-value due to changes in policy options, context and outlook on the future as compared to the reference (base) situation.
- **Integrated modeler**: a researcher who is assigned a research project by the policy expert, which entails an integrated assessment, and wants to solve the questions in this research project by using the SEAMLESS-IF.
- **Model Configuration**: It defines what kind of configuration of the models should be used. Either this may defined by the model specifications, or it may be relevant to the Experiment.
- **Outlook**: An outlook on the future, that describe the trends and/or trend deviations in society at large, which affect the results produced by SEAMLESS-IF, but which are not forecasted by SEAMLESS-IF. These outlooks discuss trends and trend deviations exogenous to SEAMLESS.
- **Policy expert**: a stakeholder (e.g. policy maker at the EU, national or local government, or a farmers' representative) that wants to assess the impacts of a policy change and commissions a project to integrated modellers.
- **Policy Option**: It is defined by a set of policy parameters within a given timeframe or for a time series that the integrated modeller concerns related to the problem and the experiment defined in the current project.
- **Problem Definition**: the question the policy expert wants to have an answer to. The problem definition is defined by the policy evaluator and the integrated modeller helps to translate the problem to capabilities of the SEAMLESS-IF tools, for example: 'to assess the integrated cross impacts of a specific change in the CAP and/or an implementation of the Nitrate directive.' Each problem can be tackled in different ways, leading to one or more experiments for each problem.
- **Project**: A project is used to tackle one problem that the user wants to assess by using SEAMLESS-IF. One project has one and only one problem; and has one or a set of 'Experiments'.
- **Scale**: the physical dimensions (most commonly space and time) of observed entities and phenomena (meaning that dimensions and units of measurement can be assigned), which can be either spatial or temporal.