The Graphical User Interface for CAPRI version 2014

Wolfgang Britz

Institute for Food and Resource Economics

Chair of Economic and Agricultural Policy

University of Bonn

Bonn, July 2014

Acknowledgments

Many people have over the years contributed to the development, maintenance and application of the CAPRI modelling system. After more than ten years since a first prototype was constructed, it is almost impossible to list them all and name their specific contributions. The author opted for this rather technical paper to refrain from citing the different (working) papers which shed more light on methodological questions, but rather refers in general to the CAPRI documentation.

Nevertheless, it is only fair to mention Hans-Josef Greuel and Andrea Zintl, who both long before CAPRI was born have already developed software concepts and code which underlined to a large extent until 2006 the DBMS of CAPRI, and in parts, its Graphical User Interface. Finally, Alexander Gocht contributed over the last years to the Java code underlying the GUI. Eriona Dashja, a student assistance, checked in 2011 the user manual against the actual interface, changed the text where necessary and corrected typos. The work described in here would have been impossible without the funds by different donors, mainly the EU Commission, with regards to changes in 2009 until 2013 especially under the FP 7 project CAPRI-RD

All errors in text and code remain with the author.

The author

Dr. Wolfgang Britz is a senior researcher and lecturer with the Institute for Food and Resource Economics at the University of Bonn, and has co-ordinated since several years the activities based on the CAPRI modelling system. His responsibilities further on include the methodological concept of CAPRI and, to a larger extent, its software implementation.

Contact:

Dr. Wolfgang Britz
Institute for Food and Resource Economics, University Bonn
Nussallee 21
D-53115 Bonn

Tel.: ++49-(0)-228-732502

Wolfgang.Britz@ilr.uni-bonn.de

Content

Background

The use of the CAPRI modelling system is increasing, and the user group becomes more diversified. Whereas in the first years, almost all users had directly contributed to model development and were familiar with the underlying GAMS code, more and more users now get to know about the system during training sessions, and have only a limited knowledge of GAMS and the CAPRI GAMS code. Already the very first version of CAPRI, operational from 1999 onwards, features a Graphical User Interface (GUI) to supports users to apply CAPRI for simulations and exploit results.

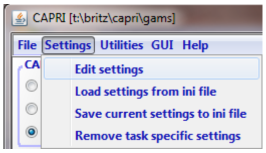
The so-called new GUI in use since 2012 builds on a toolkit developed by Wolfgang Britz called GGIG (GAMS Graphical Interface Generator, http://www.ilr.uni-bonn.de/agpo/staff/britz/ggig_e.htm). That toolkit is not only used for CAPRI, but also for other GAMS and R based projects. It allows designing the GUI via a XML file rather than by direct Java programming. That implies that CAPRI developers will not only code GAMS, but also add, change or remove controls from the interface. Hence, changes to the interface are now more frequent than in the past. The GUI user guide will therefore possibly not document all detailed settings, especially quite specialized settings for debugging purposes. It is generally documented to use the defaults for any non-documented features.

As the CAPRI GUI is based on a toolkit shared with others, the same holds on parts of its documentation which therefore consists to three documents:

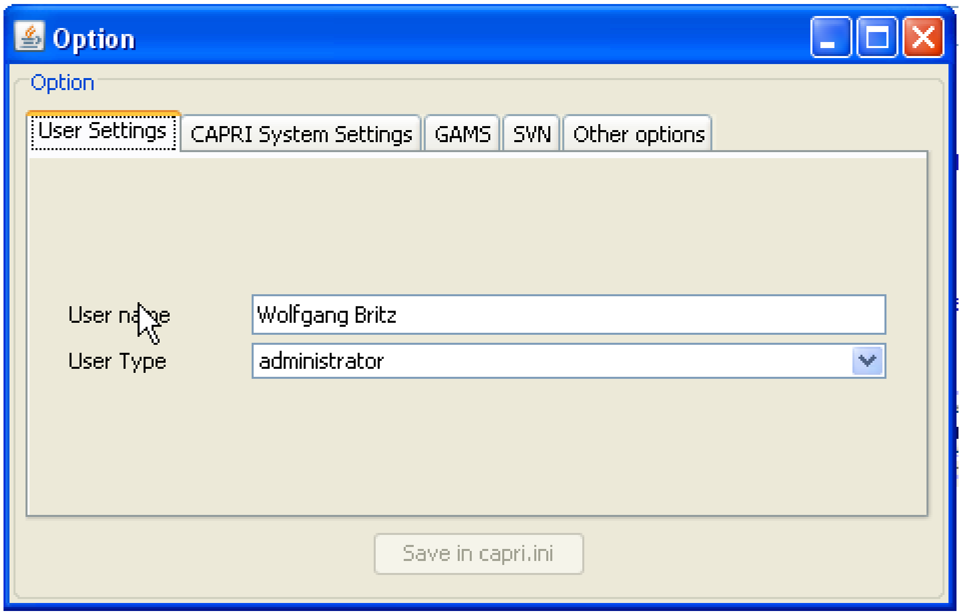
1. The GGIG programmer guide – that document is only relevant for CAPRI coders who add or change controls on the interface.
2. The **GGIG user guide**: that essential document explains how the different elements of the interface can be operated, e.g. how to work with tables and graphs, how to use the batch execution utility etc.. It is shared with other projects and comprises to a larger extent content found in earlier CAPRI user guides.
3. The **CAPRI GUI guide**, the current document, which discusses the specifics of the CAPRI GUI and comprises some examples not relevant for other projects using GGIG.

Initialization

Logging in

The first step when the CAPRI GUI is opened for the first time is to set the user name and level. This is done by selecting the “settings” menu from the menu bar. As long as no user name is entered, the user cannot change its type and will only have exploitation rights. The user type “runner” has additionally the right to run scenarios. A user of type “administrator” can perform all operations, including generation of a new data base and calibration of the modelling system. In order to access the user settings, choose  from the menu bar.

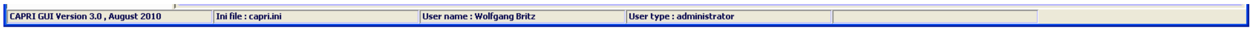
CAPRI [t:\britz\capri\gams]
File
Settings
Utilities
GUI
Help
Edit settings
Load settings from ini file
Save current settings to ini file
Remove task specific settings



User name: Wolfgang Britz

User Type: administrator

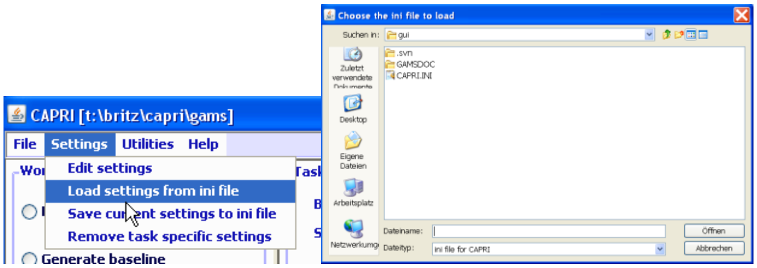
The user and user types can also be seen in the bottom panel of the GUI:



CAPRI GUI Version 3.0 , August 2010 | Ini file : capri.ini | User name : Wolfgang Britz | User type : administrator

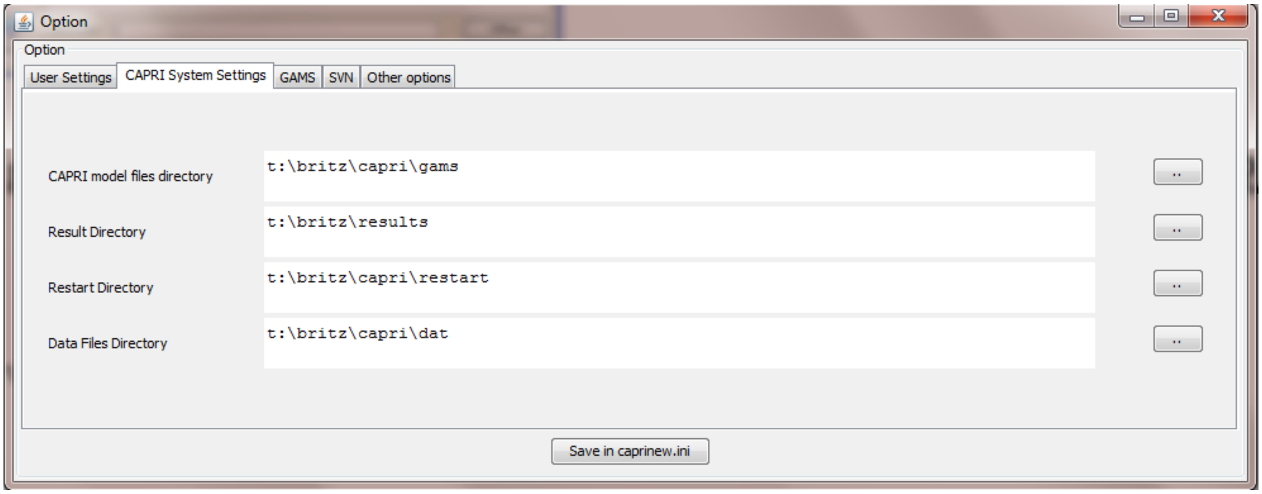
Choosing a initialization file

Some users require several CAPRI versions installed in parallel. In order to ease the task, the user can call the GUI with a specific ini-file by defining the ini-file in the batch command file calling the GUI. Alternatively, the ini file can be changed via the options menu. Each ini-file may then point to different directories, according to the settings discussed in the following.


CAPRI [t:\britz\capri\gams]
File
Settings
Utilities
Help
Edit settings
Load settings from ini file
Save current settings to ini file
Remove task specific settings
Generate baseline
Choose the ini file to load
Suchen in: gui
.svn
GAMSDOC
CAPRI.INI
Zuletzt verwendete Dokumente
Desktop
Eigene Dateien
Arbeitsplatz
Netzwerkumgebung
Dateiname:
Dateityp: ini file for CAPRI
Öffnen
Abbrechen

Linking the GUI to the local CAPRI installation

Next, the GUI needs to know where your CAPRI system is installed.



CAPRI model files directory: t:\britz\capri\gams

Result Directory: t:\britz\results

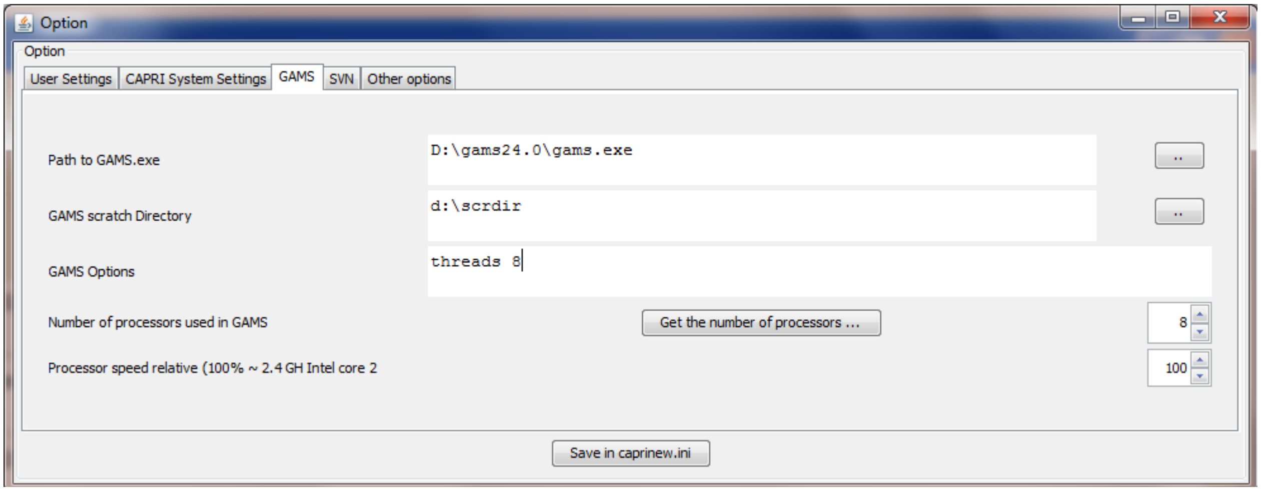
Restart Directory: t:\britz\capri\restart

Data Files Directory: t:\britz\capri\dat

The “CAPRI model files directory” points to the location of the GAMS sources for CAPRI whereas the “Result directory” points to the location where results from CAPRI tasks will be read from and written from; and accordingly for “Restart” and “Data Files” directories. Changing these settings allows switching between different installations for advanced users, e.g. when different branches from the CAPRI software versioning system are installed.

GAMS settings

In order to generate results, a GAMS installation and license are required. The relevant settings are found on the “GAMS” tab:



Path to GAMS.exe: D:\gams24.0\gams.exe

GAMS scratch Directory: d:\scrdir

GAMS Options: threads 8

Number of processors used in GAMS: 8

Processor speed relative (100% ~ 2.4 GH Intel core 2: 100

The "Path to Gams.exe" points to the actual GAMS engine to use. Currently, versions 22.8 and higher are supported. It is recommended to use GAMS 23.3 and above to benefit from calling CONOPT in memory. The button "get the number of processors …" will retrieve the number of available processors in the computer.

The "Scratch Directory" will be passed to GAMS and determines where GAMS stores temporary files. A directory on a local disk (not one on a file server) should be chosen.

The "GAMS options" field allows the user to send its own settings to GAMS, e.g. as shown above, the page width used in GAMS listings and the number of maximal process dirs generates by GAMs.

The number of processors used in GAMS will determine how many parallel GAMS processes will be started with threads are in use. The relative processor speed is used in the pre-steps of the market model to determine from the solution time of the sub-model when the next more complex sub-model or the full model will be solved. Going above 100% might speed up solving the market model.

SVN settings

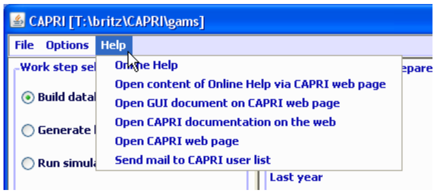
CAPRI is hosted on the SVN software versioning system (see e.g. http://en.wikipedia.org/wiki/Apache_Subversion) which ensures that CAPRI users and developers can operate smoothly in a distributed network. For developers who need to upload changes made to CAPRI code to the server (a process called "commit"), TortoiseSVN (http://tortoisesvn.tigris.org/) is the recommended tool. TortoiseSVN is integrated nicely into windows, but it might take a while until the logic behind the SVN operations is fully understood by a novice user.

For users which do not contribute to the code basis of CAPRI or use TortoiseSVN in other contexts, installing and learning to master TortoiseSVN as an additional tool is an unnecessary burden. Therefore, the client based SVN basic operations which allow a user to keep its local copy synchronized with the server are now embedded in the java code of the GUI. For those who only need read-only access to the CAPRI server repository, an installation of TortoiseSVN is no longer necessary.

The changes necessary in the GUI can be summarized as follows. Firstly, new SVN related entries in the initialisation file can be edited by the user. And secondly, a new dialogue allows starting an update. The following sections give a quick overview over the new functionalities.

The set-up of the SVN related information is discussed in the general GGIG user Guide.

Getting help


CAPRI [T:\britz\CAPRI\gams]
File
Options
Help
Work step sel
Build datal
Generate l
Run simula
Online Help
Open content of Online Help via CAPRI web page
Open GUI document on CAPRI web page
Open CAPRI documentation on the web
Open CAPRI web page
Send mail to CAPRI user list
epare
Last year

The “Help menu” allows opening the online help system, which can be invoked by pressing “F1”. A copy of the content is also stored on the CAPRI web page and can be accessed via the second menu item. “Open GUI document on CAPRI web page” will open the current document.

Basic layout of the GUI

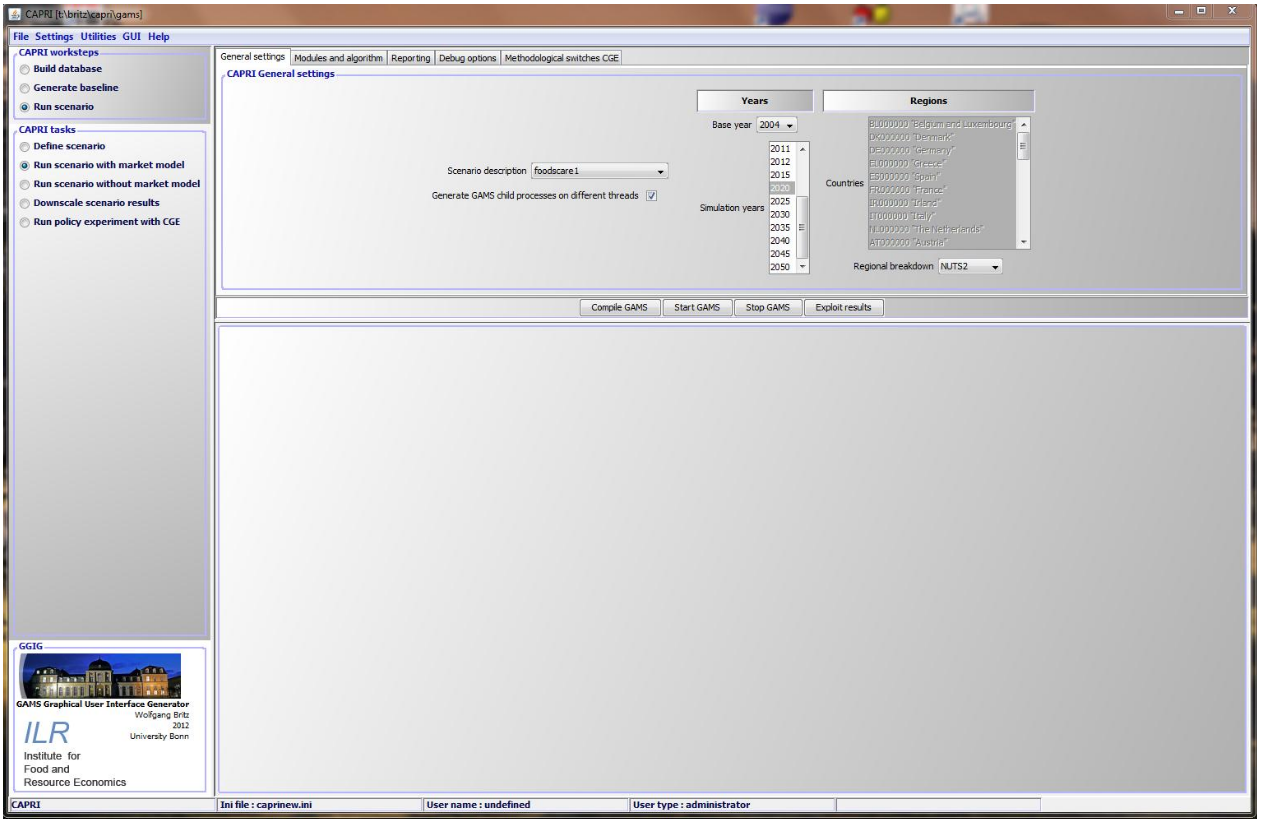
The GUI is generally structured as seen below. The left upper hand panel allows the selection of the different CAPRI work steps. The left lower hand panel lists the tasks belonging to the work steps. In both cases, only one button will be active. The right hand side offers controls depending on the properties of the task, grouped on different panes. There are buttons allowing starting the task, and a window which collects information at runtime. The footer lists the user name and type, and comprises a progress bar.

For tasks linked to a GAMS program, the buttons as shown below will be active:

- "**compile GAMS**": starts the GAMS compiler, but does not execute the program. A listing file will be generated. Used to test if a program compiles without errors.
- "**run GAMS**": tries to execute the GAMS program. A listing file will be generated where possible compilation or run-time errors are reported.
- "**stop GAMS**": sends a "signal interrupt" to the GAMS engine. It may take a while until GAMS reacts and stops with an error message after running its finalization routines.
- "**show results**": open the scenario exploiter

Note: for exploiters, the three buttons referring to GAMS will not be visible. The same holds for runners and the work steps "Build data base" and "Generate baseline".

Graph: Basic layout of the GUI



Scenario description: foodscare1

Generate GAMS child processes on different threads ☑

Base year: 2004

Simulation years: 2011, 2012, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050

Countries: BL000000 "Belgium and Luxembourg", DK000000 "Denmark", DE000000 "Germany", EL000000 "Greece", ES000000 "Spain", FR000000 "France", IR000000 "Irland", IT000000 "Italy", NL000000 "The Netherlands", AT000000 "Austria"

Regional breakdown: NUTS2

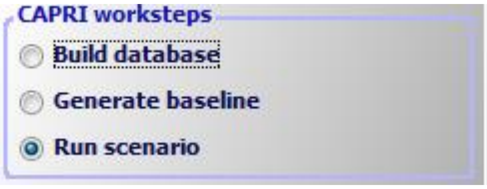
CAPRI | Ini file : caprinew.ini | User name : undefined | User type : administrator

The different work steps

Each work step may comprise different tasks. No task will require starting more than one GAMS program, but some tasks will start the very same GAMS program with different settings. Some tasks will not start GAMS, but other tools inside the GUI.

The different work steps are shown in a panel in the lower left corner of the GUI, and are presented by so-called radio-buttons, which means, that only one button can be selected at any time.

Graph: the work step panel



CAPRI worksteps

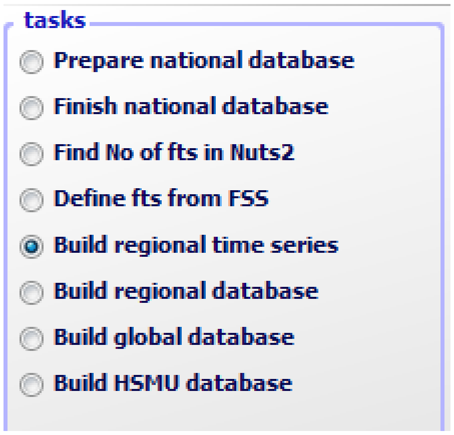
○ Build database
○ Generate baseline
● Run scenario

Each work step may comprise several tasks, which are shown in the second panel, below the work step panel. The content of the panel hence changes when the user selects a different work step. Again, the different task panels comprise radio buttons for selections purposes.

Note: Some utilities which were in older version of the GUI listed as “work steps” can now found under “Utilities” in the menu bar such as the GDX Viewer.

Build database

Graph: the task panel for “build database”



tasks

○ Prepare national database
○ Finish national database
○ Find No of fts in Nuts2
○ Define fts from FSS
● Build regional time series
○ Build regional database
○ Build global database
○ Build HSMU database

Building up the data base is the logical starting point in sequences of work steps. A new data base for the model needs to be constructed either after updates of the underlying statistical raw data, or after methodological changes in the code affecting content and structure of the data base. Controlling if updating the model yielded satisfactory results, possibly for the different tasks, is a time demanding task which requires in-depth knowledge about the quality of the different in-going data and the logical relations between the different elements of the data base. Users interested in ex-ante policy analysis are usually better off by taking the data base as given, and consequently, the work step is disabled for users which have no “administrator” status.

The work step consists of six different tasks:

1. ***Prepare national data base****: Generation of complete and consistent time series at national level, mainly based on Eurostat data (CoCO, from Complete & Consistent)*. CoCo runs per Member State simultaneously for all years, if data from other Member States are used to derive fallbacks as an? EU average, only the raw statistical data are used. The user can only choose which countries to run, and which years to cover.

2. ***Finish national data base:*** *Completion of the CoCo data by time series on consumer prices and certain feeding stuffs*. In both cases, it turned out that only the complete and consistent time series for all Member States from 1. provide a good basis for that step. The step is hence run simultaneously for all Member States and years, based on the results of the CoCo task. Here, only the years to cover can be chosen by the user.

3. ***FSS selection routine:*** *Determines the definition of farm type groups*.

4. ***Build regional data base, time series****, Generation of time series at regional level (CAPREG)*. The treatment of years in CAPREG is not identical. For all years, activity levels, output coefficients and input coefficients (excluding feed inputs) are generated. However, only for the base period, a three year weighted average around the chosen base year, feed input coefficients are estimated and the supply models are calibrated based on techniques borrowed from Positive Mathematical Programming. The user can hence choose for which Member States to run CAPREG, for which years and for which base year. Equally, the farm type module may be switched on or off.

5. ***Build regional data base*** *(CAPREG)*. Currently the same as three, only that the base year data will be loaded instead of time series.

6. ***Build global data base*** *(GLOBAL): Building up the international data base*. The step includes aggregation of Supply Utilization Accounts and bilateral trade flow matrices from FAO to the product and country definitions of CAPRI, aggregation of the supply and demand elasticities from the World Food Model to the product and country, estimation of bi-lateral transport costs and conversion of the FAPRI baseline to the product and regional aggregation of CAPRI.

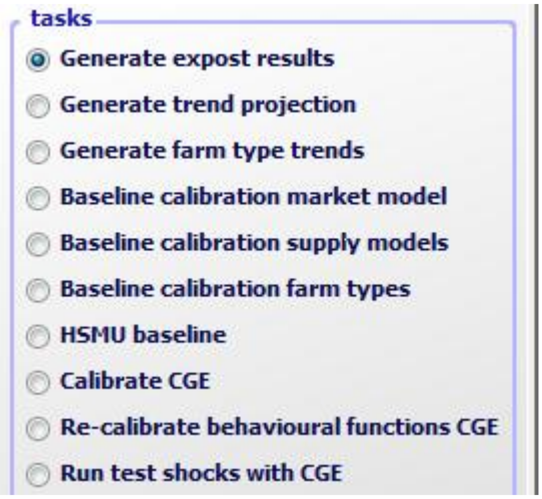
7. ***Build HSMU data base (CAPDIS_GRID):*** spatial downscaling of regional results for the base year to 1x1 km grid cells.

The underlying methodology for the different work steps is described in detail in the CAPRI model documentation. The sequence of the tasks as described above follows the work flows. It should be mentioned that certain preparatory steps, as downloading updated data from EuroStat, and converting these data into GAMS tables read by CoCo and CAPREG are no yet integrated in the GUI.

The actual controls available will depend on task. Please use the “F1” button to open the online help to get detailed information on settings for the tasks.

The work step “Generate baseline”

Graph: the task panel for “Generate baseline”



tasks

● Generate expost results
○ Generate trend projection
○ Generate farm type trends
○ Baseline calibration market model
○ Baseline calibration supply models
○ Baseline calibration farm types
○ HSMU baseline
○ Calibrate CGE
○ Re-calibrate behavioural functions CGE
○ Run test shocks with CGE

For manifold reasons discussed in methodological papers, economic models as CAPRI are not suited for projections, but as tools for counterfactual analysis against an existing comparison point or an existing set of ex-ante time series. The point in time or these time series are called “base line” or “reference run”. CAPRI “runners” which use the model for ex-ante policy simulation do not need to construct their own baseline, but are typically better off by sticking to the baseline provided on a yearly basis along with the latest version of the GAMS code, data base and software. Accordingly, the step and the included tasks are only for user type “administrator”. According to current planning, the baseline will be updated in close co-operation with DG-AGRI twice a year in early summer and early winter, following the release of a new “medium term market outlook” by DG-AGRI.

The CAPRI baseline is a mix of trends, expert knowledge and automated checks for logical consistency, and is constructed by a sequences of tasks:

1. *Generation of ex-post results*. Albeit not strictly necessary for the base line, the ex –post results often prove quite helpful when analysing the reference run. The ex-post results are model run for the base at base year policy and other exogenous parameters, inflated to the chosen simulation year.

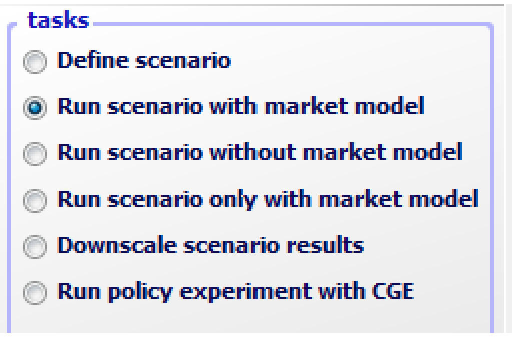
2. *Generation of the trend projection*. The trend projection task is rather time consuming, and may run several days when the farm types are included. It consists of several sub-tasks. Firstly, independent trend lines for many different variables and all regions are estimated, and for each of these trends lines, statistics as R², variance of the error terms etc. are calculated. These results, together with the base period data and the policy shifts, are used to define so-called supports, i.e.

the most probable values for the final projection. These sub-tasks are relatively fast. The final consistency sub-task is broken down in two iterations. In the first iteration, only the Member States consistency problems are solved. For the different projection years, the problem will look for minimal deviation from the supports – which may be interpreted as a priori information in a Bayesian interpretation – such that different necessary logical relations between the data are not violated – the data information in a Bayesian estimator. These relations define e.g. production as the product of yield and activity level or force close market balances. The details can be found in the methodological documentation. Once that step is done, the Member states are added up to the EU level, and new support are defined which take given expert projection into account, currently mainly a baseline provided by DG-AGRI. In the second round, the Member State problems are solved again, and then, problems for all NUTS II regions in each Member State, and, for all farm types inside of each NUTS II region.

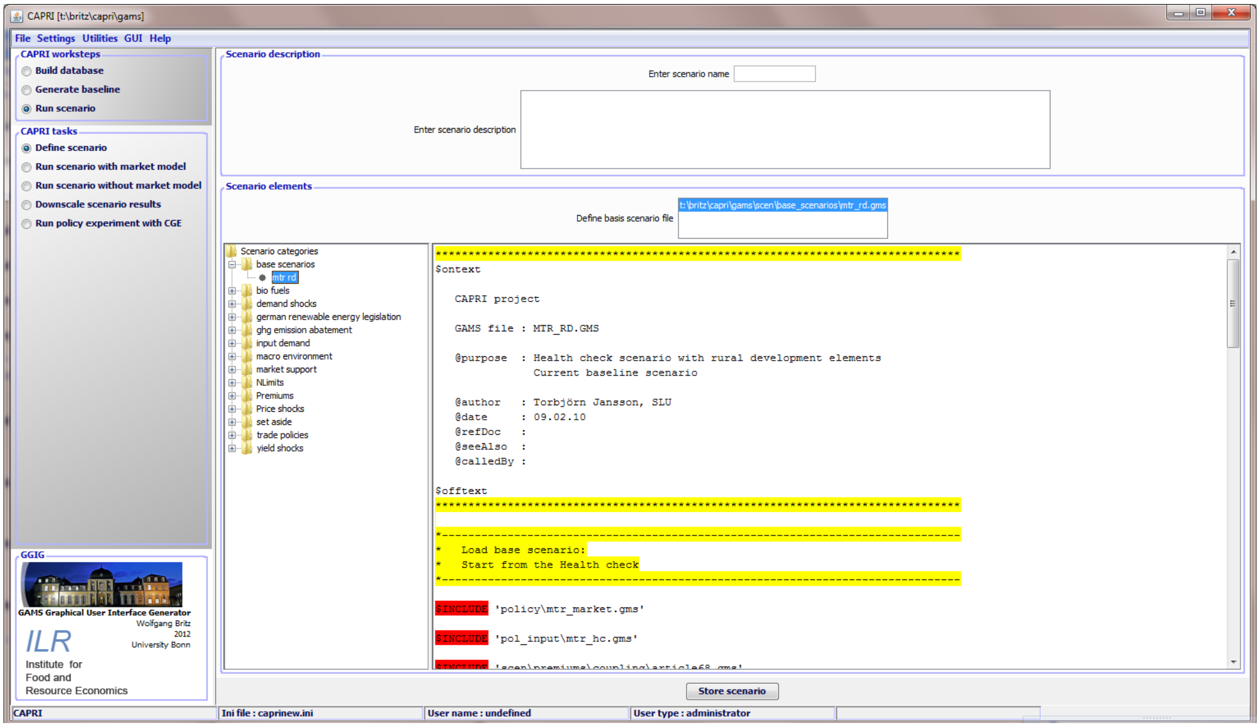
3. *Baseline calibration market model*. In that task, the results from the trend projection as Member State level serve as the major input to generate the baseline, along with input from GLOBAL and CAPREG.
4. *Baseline calibration supply model*. In that task, the prices from the calibration of the market model are taken as given and the regional or farm type supply models are calibrated. That step can be performed independently for the different countries.
5. *HSMU Baseline*. Downscales the regional or farm type results from the baseline to clusters of 1x1 km grid cells and calculates indicators at that level. These are up-scaled again to NUTS 2.
6. *Calibrate CGE*. Calibrates the regional CGEs to the baseline calibration results of the supply models at NUTS2 level.
7. *Run test shocks with CGE*. Allows to test the CGEs on selected predefined shocks.

The task run scenario

Graph: the task panel for "Run Scenario"


tasks
○ Define scenario
● Run scenario with market model
○ Run scenario without market model
○ Run scenario only with market model
○ Downscale scenario results
○ Run policy experiment with CGE

Define scenario task



Define basis scenario file: t:\britz\capri\gams\scen\base_scenarios\mtr_rd.gms

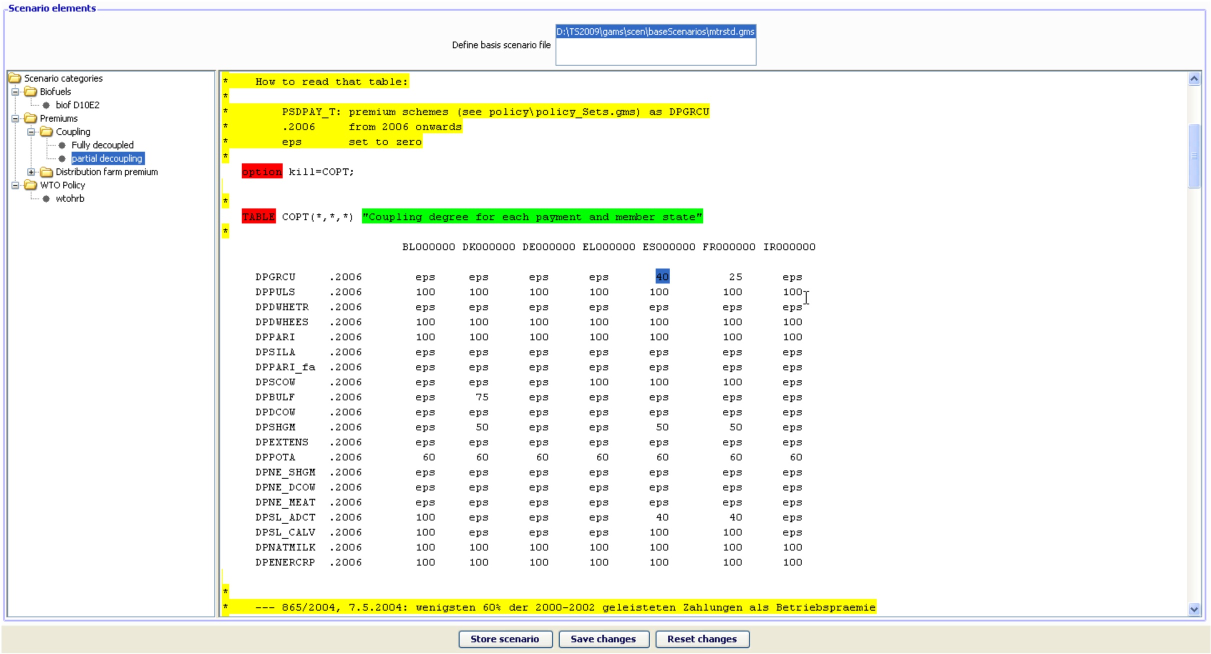
```
********************************************************************************
$ontext

   CAPRI project

   GAMS file : MTR_RD.GMS

   @purpose  : Health check scenario with rural development elements
               Current baseline scenario

   @author   : Torbjörn Jansson, SLU
   @date     : 09.02.10
   @refDoc   :
   @seeAlso  :
   @calledBy :

$offtext
********************************************************************************

*-------------------------------------------------------------------------------
*   Load base scenario:
*   Start from the Health check
*-------------------------------------------------------------------------------

$INCLUDE 'policy\mtr_market.gms'

$INCLUDE 'pol_input\mtr_hc.gms'

$INCLUDE 'scen\premiums\coupling\article68.gms'
```

Choosing the task adds the panel with GUI elements shown above. The panel consist of two major panes:

1. A top pane where the user can enter a name for his new scenario, and a description text.

2. A bottom pane where the user can define the base scenario to start with (currently in the trunk "MTR_RD.gms") and the snippet to add. The available snippets and their structure are shown on the left hand side in an expandable tree which shows the sub-directories found under "gams\scen", with the exclusion of a sub-directory called "baseScenarios" and the ".svn" directories. Empty directories are not shown. The user may select any number of snippets, even several from the

same sub-directory. Double-clicking on one of the snippets shows the content of the file on the right hand side, so that the user can inspect the code as seen below in more detail. GAMS keywords are shown in red, comments in yellow and strings in green. He can also edit the file – changes are shown in blue. Once changes had been saved, the tree shows a (user modified) behind the category. The user can also remove the changes from snippets.



Define basis scenario file: D:\TS2009\gams\scen\baseScenarios\mtrstd.gms

```
*    How to read that table:
*
*        PSDPAY_T: premium schemes (see policy\policy_Sets.gms) as DPGRCU
*        .2006     from 2006 onwards
*        eps       set to zero
*
   option kill=COPT;

*
   TABLE COPT(*,*,*) "Coupling degree for each payment and member state"
*
                          BL000000 DK000000 DE000000 EL000000 ES000000 FR000000 IR000000

     DPGRCU     .2006        eps      eps      eps      eps       40       25      eps
     DPPULS     .2006        100      100      100      100      100      100      100
     DPDWHETR   .2006        eps      eps      eps      eps      eps      eps      eps
     DPDWHEES   .2006        100      100      100      100      100      100      100
     DPPARI     .2006        100      100      100      100      100      100      100
     DPSILA     .2006        eps      eps      eps      eps      eps      eps      eps
     DPPARI_fa  .2006        eps      eps      eps      eps      eps      eps      eps
     DPSCOW     .2006        eps      eps      eps      100      100      100      eps
     DPBULF     .2006        eps       75      eps      eps      eps      eps      eps
     DPDCOW     .2006        eps      eps      eps      eps      eps      eps      eps
     DPSHGM     .2006        eps       50      eps      eps       50       50      eps
     DPEXTENS   .2006        eps      eps      eps      eps      eps      eps      eps
     DPPOTA     .2006         60       60       60       60       60       60       60
     DPNE_SHGM  .2006        eps      eps      eps      eps      eps      eps      eps
     DPNE_DCOW  .2006        eps      eps      eps      eps      eps      eps      eps
     DPNE_MEAT  .2006        eps      eps      eps      eps      eps      eps      eps
     DPSL_ADCT  .2006        100      eps      eps      eps       40       40      eps
     DPSL_CALV  .2006        100      eps      eps      eps      100      100      eps
     DPNATMILK  .2006        100      100      100      100      100      100      100
     DPENERCRP  .2006        100      100      100      100      100      100      100

*
*    --- 865/2004, 7.5.2004: wenigsten 60% der 2000-2002 geleisteten Zahlungen als Betriebspraemie
```

Storing the scenario then generates a file as shown below, user name, the reference to CAPMOD.GMS and the date and time are automatically added by the GUI. The files will be added to the files stored in “gams\pol_input”.

Run scenario tasks

At the core of CAPRI stands its simulation engine, which iteratively links different types of economic models: aggregate programming models at regional or farm type level, with an explicit representation of agricultural production technology, aggregated versions of these models at Member States model linked together to derive market clearing prices for young animals, and finally, a global spatial multi-commodity model for main agricultural products and selected secondary processed products.

Differences in results between simulations may be rooted in three different blocks:

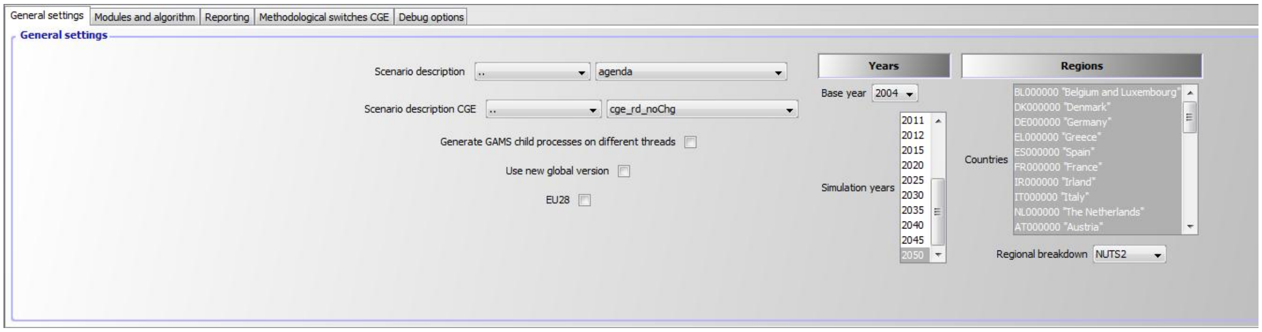
1. Differences in the in-going base year data and baseline. CAPRI allows several base years and calibration points to co-exist, and users may choose the base and baseline year.

2. Difference in what economic models are linked together and in the regionalisation level as the user may switch the market modules on or off, may run the model at Member State NUTS II and

farm type level or with the regional CGEs switch on or off. The CGE can also used in stand-alone mode.

3. And finally, the most common, differences in the exogenous assumptions including the policy definition.

Graph: The interface for the tasks “Run scenario”



Scenario description .. agenda

Scenario description CGE .. cge_rd_noChg

Generate GAMS child processes on different threads □

Use new global version □

EU28 □

Base year 2004

Simulation years 2011 2012 2015 2020 2025 2030 2035 2040 2045 2050

Countries BL000000 "Belgium and Luxembourg" DK000000 "Denmark" DE000000 "Germany" EL000000 "Greece" ES000000 "Spain" FR000000 "France" IR000000 "Irland" IT000000 "Italy" NL000000 "The Netherlands" AT000000 "Austria"

Regional breakdown NUTS2

The following discusses the major settings:

General Settings

- ***Scenario description***: the GAMS file which comprises the settings for policy and further exogenous variables for a simulation. The files are stored in “gams\pol_input” or sub-directories thereof and must be valid GAMS code. Use a text editor as e.g. the GAMS GUI to manipulate the files and generate new ones. Pressing F2 opens the file in the editor, if one is defined via the settings menu.

- ***Generate GAMS child processes on different threads:*** uses parallel GAMS processor to exploit multi-processor machines.

- ***Use new global version:*** should be on. Refers to the latest release from FAOSTAT.

- ***EU28:*** Include Croatia into EU aggregate and uses flexible EU aggregates depending on the time point.

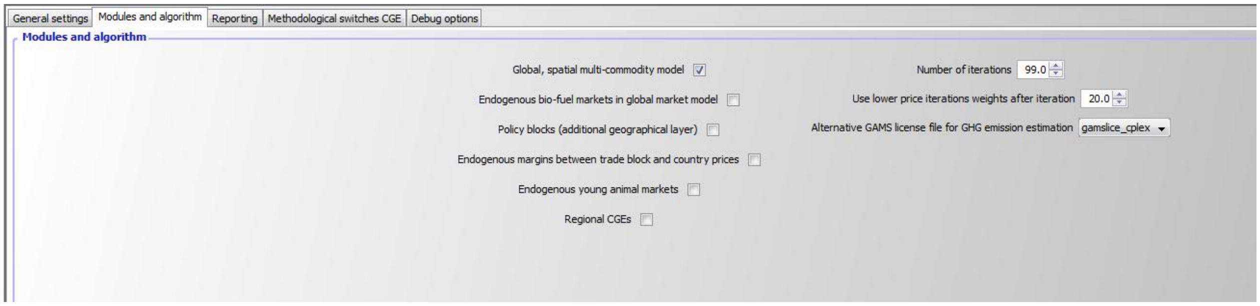
- ***Base year***: determines the three year average underlying the regional (see ***Build regional data base***) and global data base (see ***Build regional data base***) and the trends (see ***Generate trend projection***).

- ***Simulation years***: the years for which results are generated and trends are loaded.

- ***Countries***: if the global market model is switched off (run scenario without market model), the user may run a simulation for selected Member States, only.

- ***Regional break down***: the level of regional dis-aggregation in the supply part. It is not longer recommended to use the “Member State” level for production runs.

Modules and algorithm



Modules and algorithm

Global, spatial multi-commodity model ☑

Endogenous bio-fuel markets in global market model □

Policy blocks (additional geographical layer) □

Endogenous margins between trade block and country prices □

Endogenous young animal markets □

Regional CGEs □

Number of iterations 99.0

Use lower price iterations weights after iteration 20.0

Alternative GAMS license file for GHG emission estimation gamslice_cplex

- ***Global market model***: Switch the spatial global market model for agricultural products on and off. If switched off, output prices will be fixed to the baseline results. If switched on, the supply model will work with prices provided by the global market model, and the global market model will be iteratively calibrated to the results of the supply models aggregated to Member State level.

- ***Endogenous bio-fuel markets in global market model***: Renders supply, demand and trade for bio-ethanol and bio-diesel endogenous.

- ***Policy blocks***: Change the policy presentation in the model such e.g. TRQs for the whole of the EU are present, and not at level of EU15 etc.

- ***Endogenous margins between trade blocks and country prices:*** Renders the difference the average producer prices for a trade block (e.g. EU15) and the countries in that trade block, and the margin between the Armington aggregator prices and the consumer price endogenous depending on the countries net trade position. Still experimental, default is off.

- ***Endogenous young animal markets:*** Allows fixing young animal markets to the results of the baseline (no longer endogenous). Should normally be switched on.

- ***Regional CGEs:*** Switches the regional CGEs on and off.

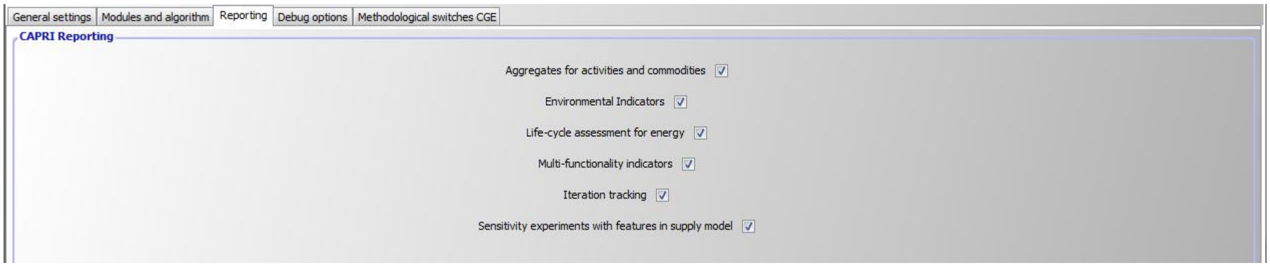
- ***Number of iterations***: with market models switched on, CAPRI sequentially calibrates the market models to supply model results which are solved at prices from the market models. Usually, the model will automatically converge in between 5 and 20 iterations. It is best to use 99 iterations as the default setting.

- ***User lower price iterations weights after iteration:*** That setting allows fine tuning the convergence process. Normally, a 50:50 weights between current and last iterations prices is used.

The lower weights give less weight to the current iteration and more to past ones which might help in some cases with convergence.

- ***Update Hessian until iteration:*** The price elasticities for supply and feed demand for countries with supply models are iteratively updated until the given number of iteration is reached.

Reporting



CAPRI Reporting

Aggregates for activities and commodities ☑

Environmental Indicators ☑

Life-cycle assessment for energy ☑

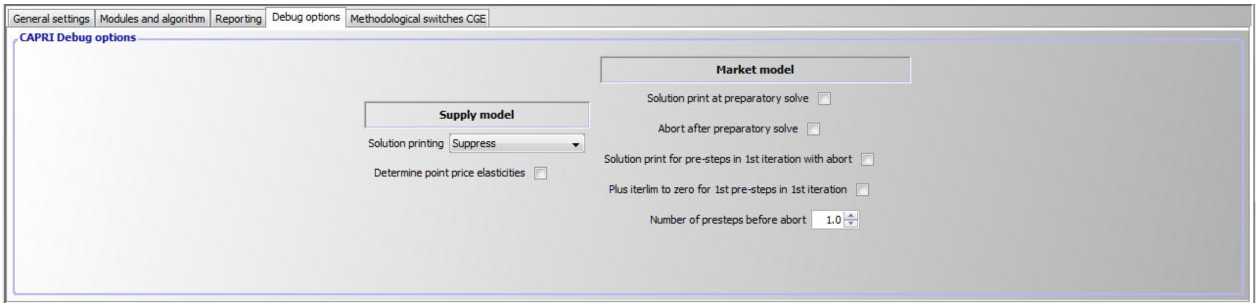
Multi-functionality indicators ☑

Iteration tracking ☑

Sensitivity experiments with features in supply model ☑

The panel allows switching certain part of the post-model reporting on and off. It is usually recommended to use all reports as the reporting part cannot (yet) used independently. If only core results are needed and computing time matters, these reports can be switched off.

Debug options



CAPRI Debug options

Supply model

Solution printing: Suppress

Determine point price elasticities □

Market model

Solution print at preparatory solve □

Abort after preparatory solve □

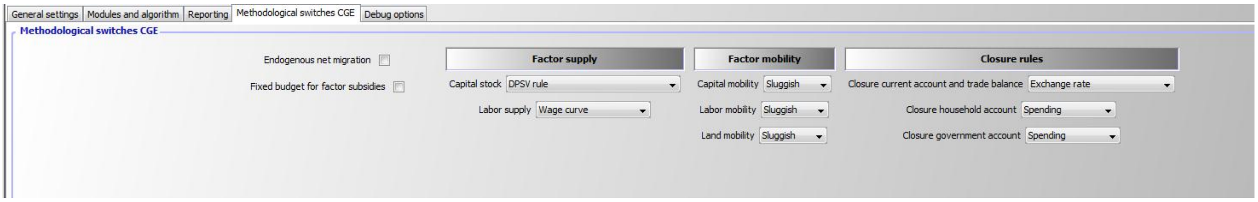
Solution print for pre-steps in 1st iteration with abort □

Plus iterlim to zero for 1st pre-steps in 1st iteration □

Number of presteps before abort: 1.0

Those are options useful when debugging the model which switch either model listings on/off or stop execution at certain points.

Methodological switches CGEs



Methodological switches CGE

Endogenous net migration □

Fixed budget for factor subsidies □

Factor supply

Capital stock: DPSV rule

Labor supply: Wage curve

Factor mobility

Capital mobility: Sluggish

Labor mobility: Sluggish

Land mobility: Sluggish

Closure rules

Closure current account and trade balance: Exchange rate

Closure household account: Spending

Closure government account: Spending

Please consult the methodological documentation of the regional CGEs for a detailed discussion of these options.

Interaction with GAMS

The interaction with GAMS consists of three parts:

- Generating GAMS code based on user input
- Starting GAMS
- Controlling the GAMS run

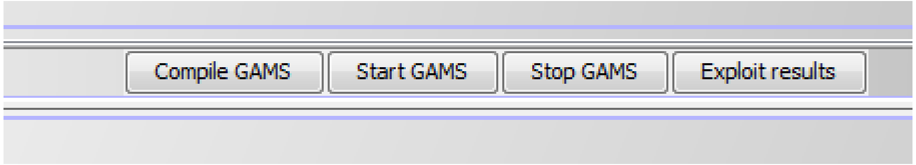
There are two types of input files generated based on user input. The first one are so-called scenario files and define the exogenous drivers for a CAPRI run as population growth, macro-economic environment or policy definitions. Here, the final aim is to integrate the scenario editor from SEAMLESS into the CAPRI user interface. The scenario files are typically stored for longer period on disk, both to provide templates for other scenarios as well as for documentation purposes. The name of the file to load is passed to GAMS either as an argument or stored in an input file with a fixed name. The second types are rather small files with a fixed name which typically comprise the information for which years and regions to run the GAMS program along with a small number of methodological switches. These files are overwritten with each start of the related GAMS code.

GAMS is started as a sub-process in an own thread. The output from GAMS which is typically shown in command processor window is redirected into a pipe and its content read from there and shown in a window on the CAPRI user interface, so that the user can check GAMS execution at run time. The code allows filtering out specific statements generated by GAMS to be shown in the windows title bar to give an indication about program progress.

There are two final control mechanisms. Firstly, the return code by GAMS which indicates if the GAMS program was correctly compiled and then executed. Typical execution time errors are math errors as division by zeros or read/write errors on external files. Secondly, the user can apply different type of exploitation tools to check the logical content of the results.

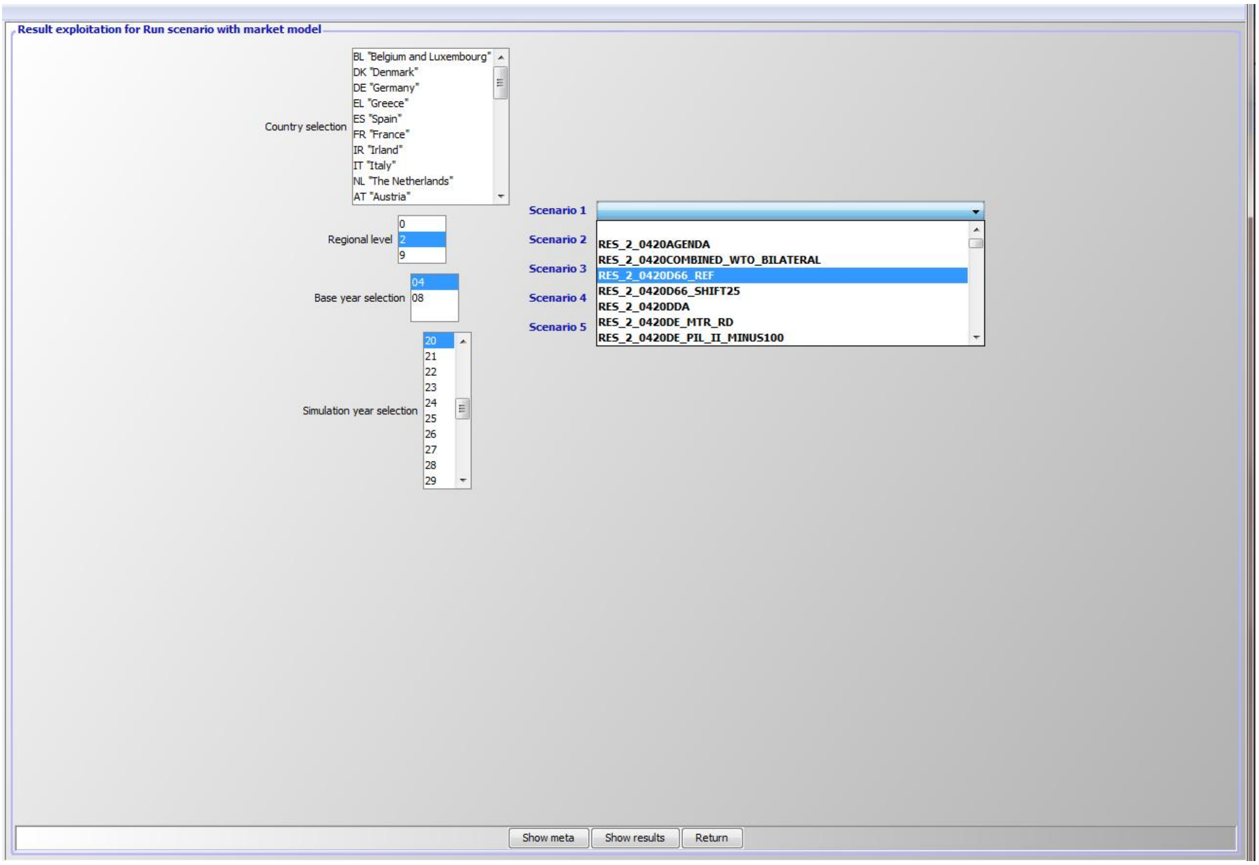
Exploiting results

For each work step, pressing the "Exploit results" button:



Will load the exploit result exploitation panel.

Graph: The interface in "exploitation" mode

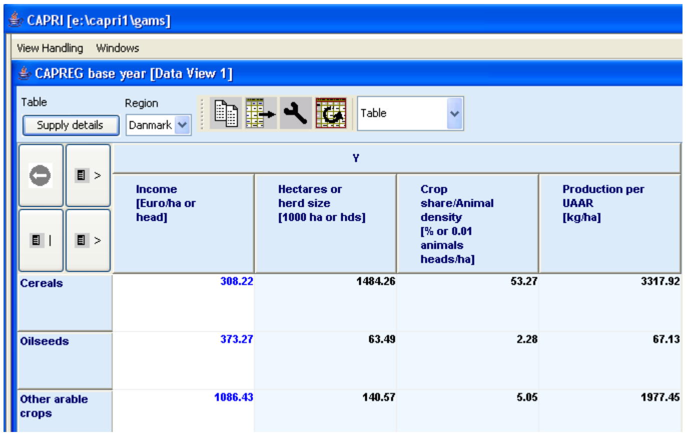


The right hand side comprises a set of drop-down boxes from which up to five different scenarios (or result files) can be selected. The first element in each box is empty.

The left hand side shows, depending on the work step, selection control for countries, the regional level, base year and simulation year. Operating these control filters out files from the disk shown in the drop-down boxes. In the example above, only results files for the base "04", simulation year "20" and the regional level 2 (= NUTS2) can be selected.

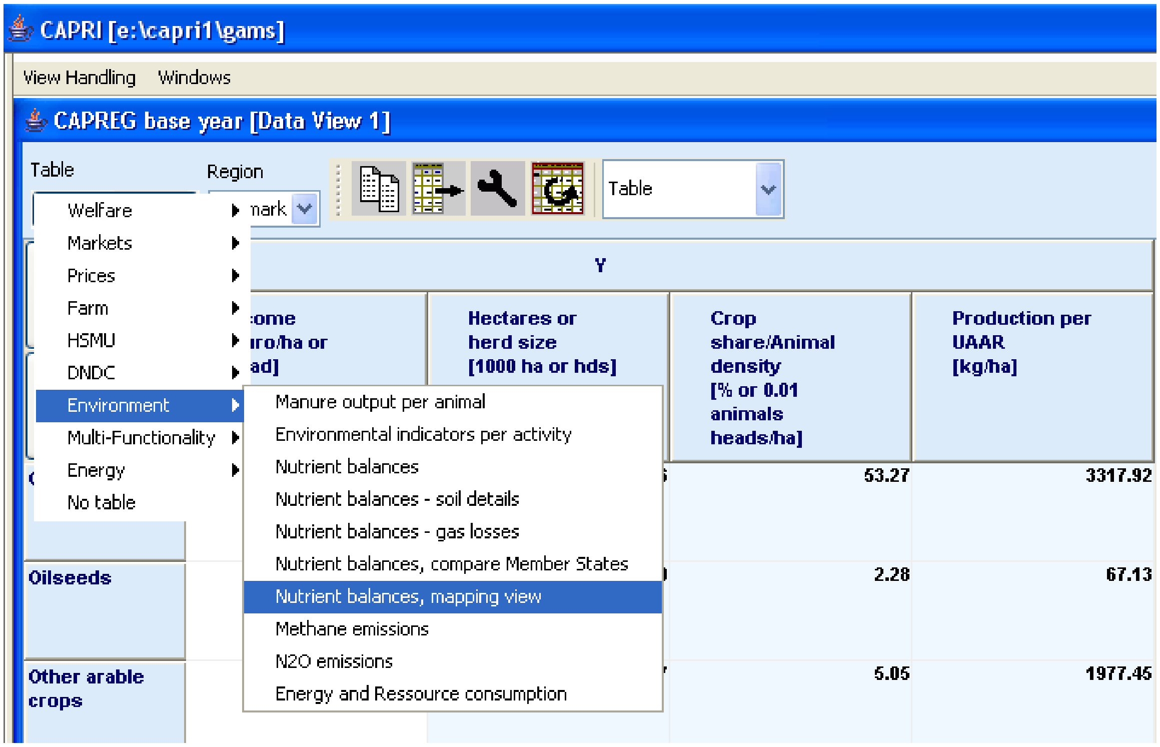
Drawing a map showing the nitrate surplus for EU27 at regional level in the base year

First, we need to select “Exploit data base results” in the work step selection panel, and then choose the radio button “Show CAPREG base year data”. Then, in the Member States drop-down list, right click the mouse, and select “EU27”. The “Load and show button will then load the results.

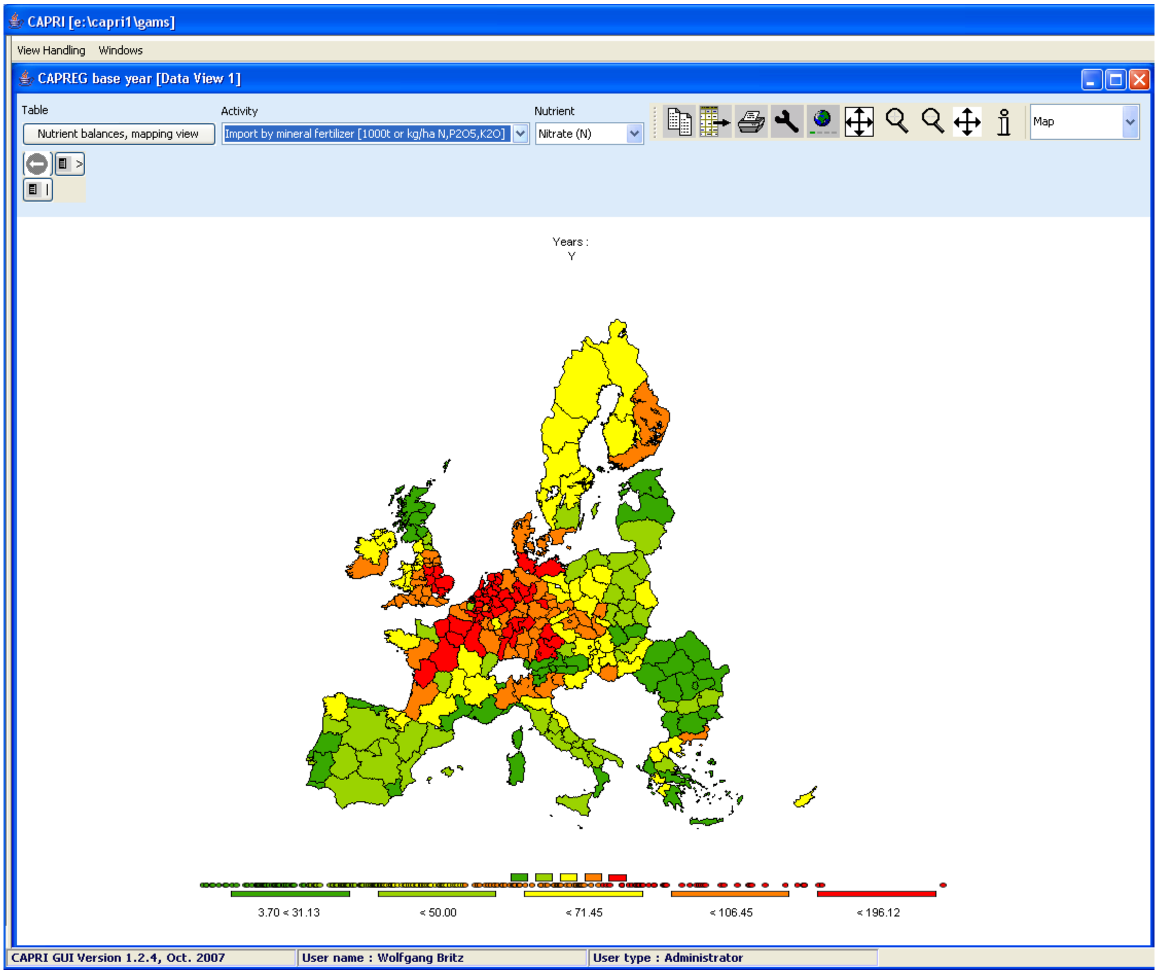


	Income [Euro/ha or head]	Hectares or herd size [1000 ha or hds]	Crop share/Animal density [% or 0.01 animals heads/ha]	Production per UAAR [kg/ha]
Cereals	308.22	1484.26	53.27	3317.92
Oilseeds	373.27	63.49	2.28	67.13
Other arable crops	1086.43	140.57	5.05	1977.45

Next, select a different selection of tables by pressing on the button below “Table”, which currently shows the topic “Supply details”. In the drop-down list, go-to “Environment” and select “Nutrient balances, mapping view”.


CAPRI [e:\capri1\gams]
View Handling
Windows
CAPREG base year [Data View 1]
Table
Region
nark
Table
Welfare
Markets
Prices
Farm
HSMU
DNDC
Environment
Multi-Functionality
Energy
No table
Manure output per animal
Environmental indicators per activity
Nutrient balances
Nutrient balances - soil details
Nutrient balances - gas losses
Nutrient balances, compare Member States
Nutrient balances, mapping view
Methane emissions
N2O emissions
Energy and Ressource consumption
Y
:ome
iro/ha or
ad]
Hectares or herd size [1000 ha or hds]
Crop share/Animal density [% or 0.01 animals heads/ha]
Production per UAAR [kg/ha]
53.27
3317.92
Oilseeds
2.28
67.13
Other arable crops
5.05
1977.45

The following map should appear. You may select different elements of the balance now by using the drop-down box below “activity” or change the nutrient, by using the drop-down box under “nutrient”.


CAPRI [e:\capri1\gams]

CAPREG base year [Data View 1]

Table: Nutrient balances, mapping view

Activity: Import by mineral fertilizer [1000t or kg/ha N,P2O5,K2O]

Nutrient: Nitrate (N)

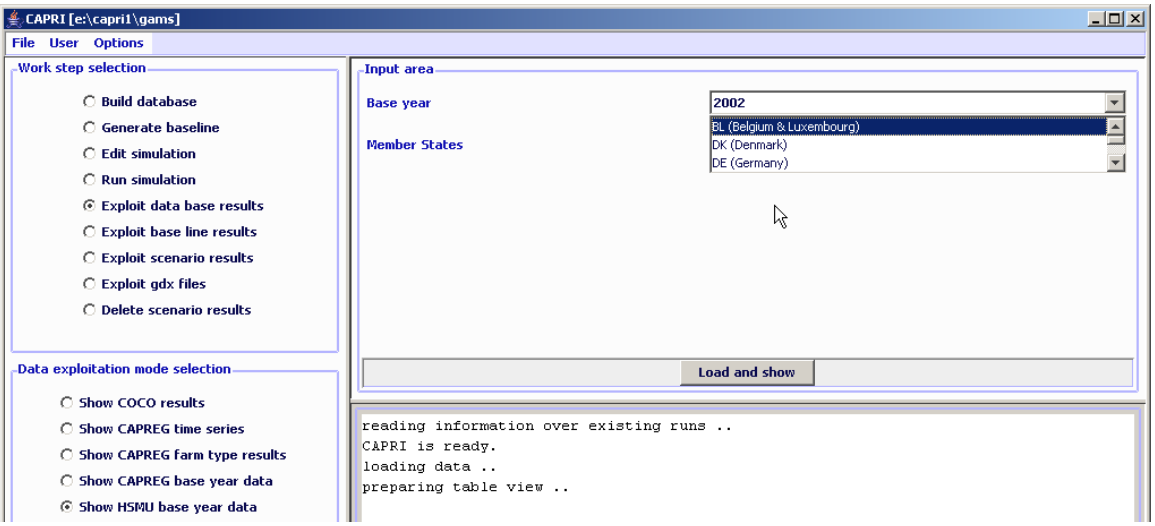
CAPRI GUI Version 1.2.4, Oct. 2007

User name : Wolfgang Britz

User type : Administrator

Drawing a map of the High Nature Value Farmland indicator for Belgium & Luxembourg for the base year

Firstly, we need to select “Exploit data base results” in the work step selection panel, and then choose the radio button “Show HSMU base year data”. Then, in the Member States drop-down list, Belgium & Luxembourg must be selected, as shown below.



○ Build database
○ Generate baseline
○ Edit simulation
○ Run simulation
● Exploit data base results
○ Exploit base line results
○ Exploit scenario results
○ Exploit gdx files
○ Delete scenario results

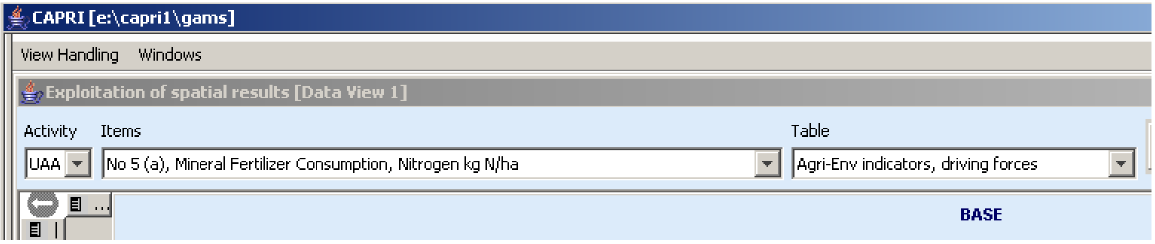
Base year: 2002

Member States: BL (Belgium & Luxembourg), DK (Denmark), DE (Germany)

○ Show COCO results
○ Show CAPREG time series
○ Show CAPREG farm type results
○ Show CAPREG base year data
● Show HSMU base year data

```
reading information over existing runs ..
CAPRI is ready.
loading data ..
preparing table view ..
```

Pressing the “load and show” button will then bring up the first table links to the HSMU results as shown below.

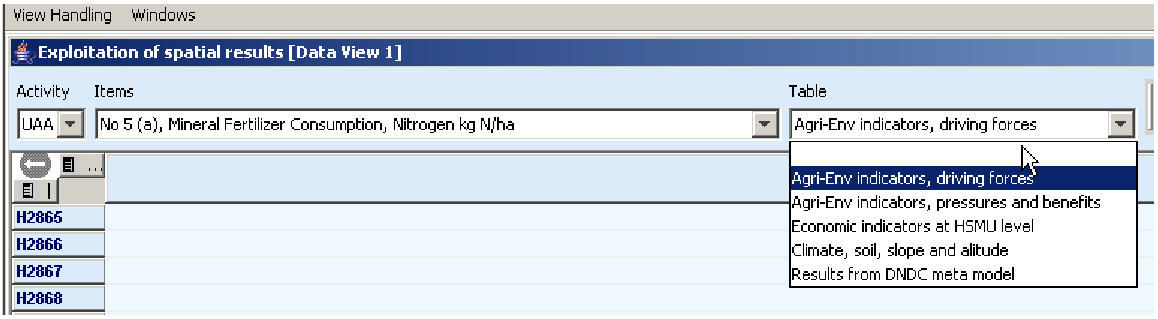


Activity: UAA

Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha

Table: Agri-Env indicators, driving forces

Now, according to the guidelines for RD indicators, HNV is to be found under “Pressures and benefits”, which is stored as another table. So opening the drop down list for the tables allows us to select the correct table.



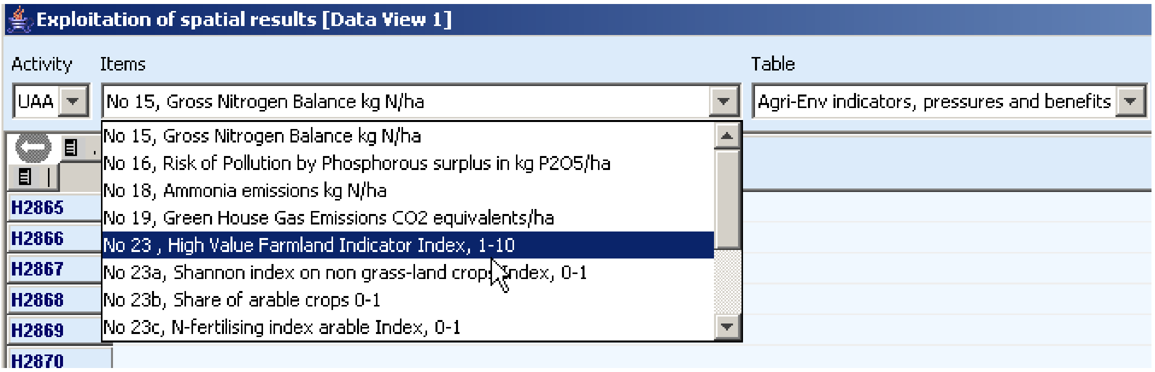
Activity: UAA

Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha

Table: Agri-Env indicators, driving forces

- Agri-Env indicators, driving forces
- Agri-Env indicators, pressures and benefits
- Economic indicators at HSMU level
- Climate, soil, slope and alitude
- Results from DNDC meta model

Next, we need to find the correct item and in order to do so, the drop-down list for the items must be selected and the indicator 23 selected, as seen below.



Exploitation of spatial results [Data View 1]

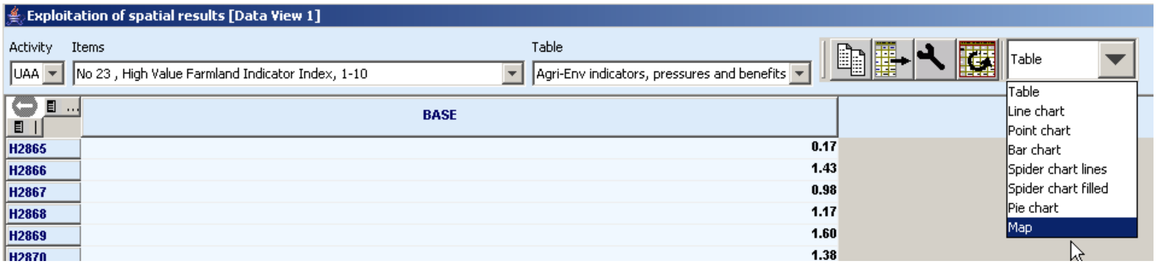
Activity: UAA

Items: No 15, Gross Nitrogen Balance kg N/ha

Table: Agri-Env indicators, pressures and benefits

No 15, Gross Nitrogen Balance kg N/ha
No 16, Risk of Pollution by Phosphorous surplus in kg P2O5/ha
No 18, Ammonia emissions kg N/ha
No 19, Green House Gas Emissions CO2 equivalents/ha
No 23 , High Value Farmland Indicator Index, 1-10
No 23a, Shannon index on non grass-land crops Index, 0-1
No 23b, Share of arable crops 0-1
No 23c, N-fertilising index arable Index, 0-1
H2865
H2866
H2867
H2868
H2869
H2870

Those numbers should now be shown as a map. To do so, select “Map” from the drop-down list where “Table” is shown.



Exploitation of spatial results [Data View 1]

Activity: UAA

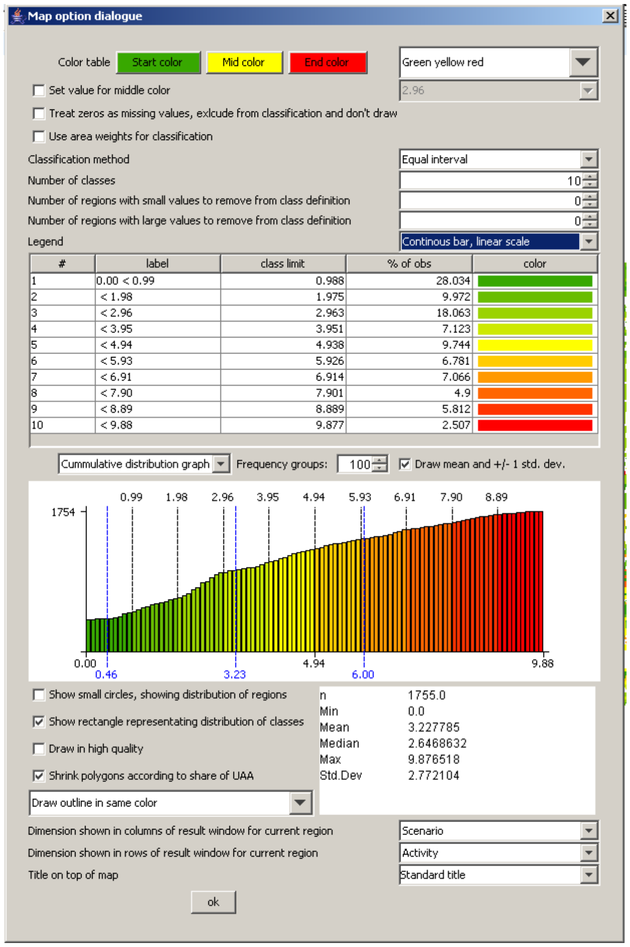
Items: No 23 , High Value Farmland Indicator Index, 1-10

Table: Agri-Env indicators, pressures and benefits

	BASE
H2865	0.17
H2866	1.43
H2867	0.98
H2868	1.17
H2869	1.60
H2870	1.38

The “hour glass” cursor is shown and the geometry will be loaded which may take a few seconds. Afterwards, the standard map comes up (green-yellow-red color model, quantile classification, polygons shrinked, no area weights, zeros included in classification). Now, for the HNV indicator ranging from 0-10, where 10 is the best possible index value, and real zeros indicate missing values, the following settings could be appropriate:

- Equal interval classification with 10 classes
- Zeros treated as missing values
- And, using area weights may be appropriate so that the frequency graph below the maps shows the share of UAA in each of the ten classes
- As linear scale works nicer for our example, and, as the data only ranges to 9.88, we should round the number to an integer (use the “tools” button 🔧, and choose “0” in the “Fraction digits” scroll-down box.)



Map option dialogue

Color table [Start color] [Mid color] [End color] Green yellow red

□ Set value for middle color 2.96

□ Treat zeros as missing values, exlcude from classification and don't draw

□ Use area weights for classification

Classification method: Equal interval

Number of classes: 10

Number of regions with small values to remove from class definition: 0

Number of regions with large values to remove from class definition: 0

Legend: Continous bar, linear scale

#	label	class limit	% of obs	color
1	0.00 < 0.99	0.988	28.034	🟩
2	< 1.98	1.975	9.972	🟩
3	< 2.96	2.963	18.063	🟩
4	< 3.95	3.951	7.123	🟨
5	< 4.94	4.938	9.744	🟨
6	< 5.93	5.926	6.781	🟧
7	< 6.91	6.914	7.066	🟧
8	< 7.90	7.901	4.9	🟧
9	< 8.89	8.889	5.812	🟥
10	< 9.88	9.877	2.507	🟥

Cummulative distribution graph Frequency groups: 100 ☑ Draw mean and +/- 1 std. dev.

□ Show small circles, showing distribution of regions

☑ Show rectangle representating distribution of classes

□ Draw in high quality

☑ Shrink polygons according to share of UAA

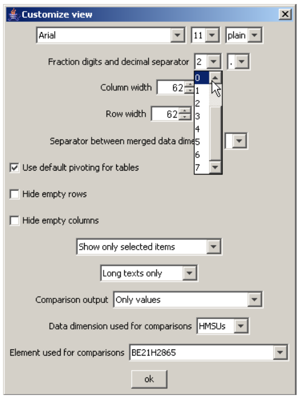
Draw outline in same color

```
n        1755.0
Min      0.0
Mean     3.227785
Median   2.6468632
Max      9.876518
Std.Dev  2.772104
```

Dimension shown in columns of result window for current region: Scenario

Dimension shown in rows of result window for current region: Activity

Title on top of map: Standard title



Customize view

Arial 11 plain

Fraction digits and decimal separator: 2 .

Column width: 62

Row width: 62

Separator between merged data dime

☑ Use default pivoting for tables

□ Hide empty rows

□ Hide empty columns

Show only selected items

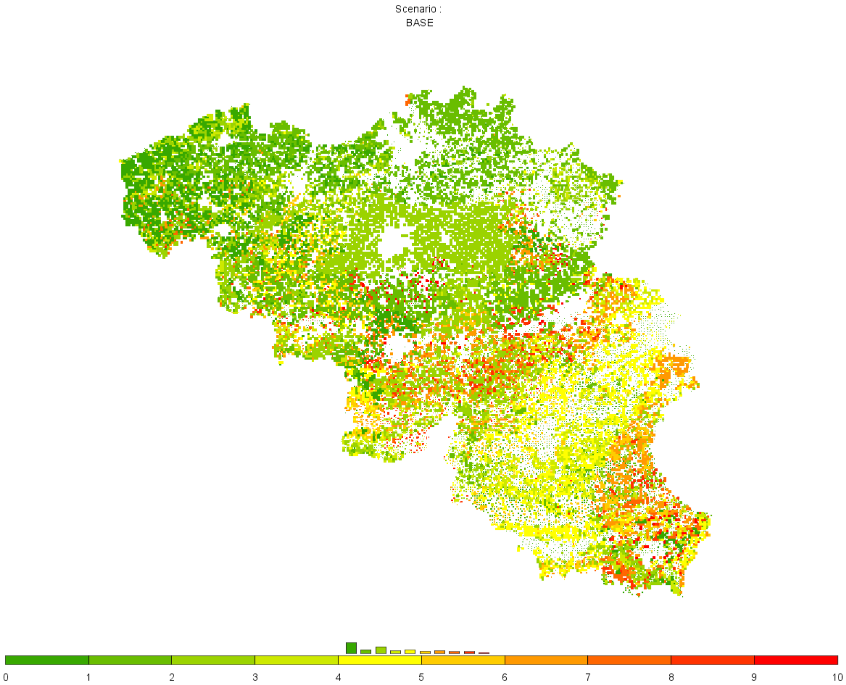
Long texts only

Comparison output: Only values

Data dimension used for comparisons: HMSUs

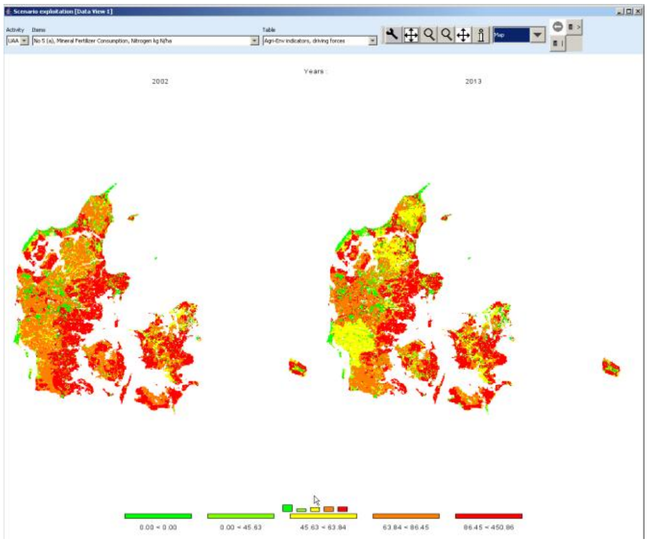
Element used for comparisons: BE21H2865

That should give the following map, which then can be exported to other applications via the clipboard 📋 or can be send to the printer 🖨:



Drawing a map showing changes between the base year and the ex-ante results from the baseline

When scenarios or different points are compared with each other, it is often useful to draw maps which show relative or absolute changes. The following map is the typical starting point when the baseline is analyzed: two maps with identical class definitions, one for the base and one for the projection year.


Scenario exploitation [Data View 1]

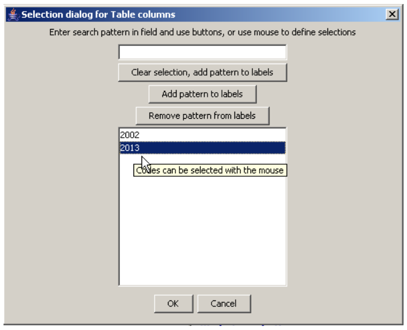
Activity: UAA

Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha

Table: Agri-Env indicators, driving forces

Map

In order to draw a map with changes, we must first get rid of the base year by de-selecting the first map. This is done by using the “column selection” button which is found in the upper right corner of the window. When the button is double-clicked, a dialog opens, and one can select the projection year with the mouse, only. Afterwards, the left map will no longer be present.

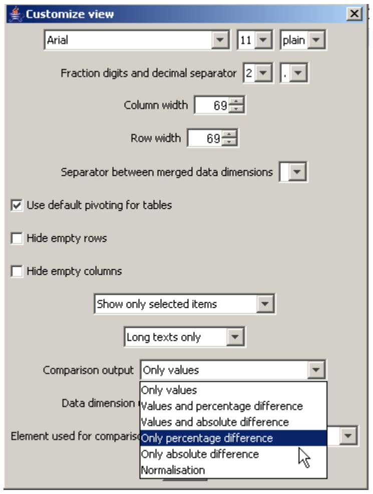


Selection dialog for Table columns

Enter search pattern in field and use buttons, or use mouse to define selections

Clear selection, add pattern to labels
Add pattern to labels
Remove pattern from labels
2002
2013
Codes can be selected with the mouse
OK
Cancel

Next, we need to change the absolute values shown in the map to relative changes to the base year. That can be accomplished by using the tool dialogue (press button). In the tool dialogue, select “only percentage differences” in the drop-down box labeled “comparison output”, and then put the “data dimension used for comparisons” to “Years”. The “Element used for comparisons” should be “2002”. After pressing o.k., the map will change as shown.



Customize view

Arial 11 plain

Fraction digits and decimal separator 2 .

Column width 69

Row width 69

Separator between merged data dimensions

☑ Use default pivoting for tables

☐ Hide empty rows

☐ Hide empty columns

Show only selected items

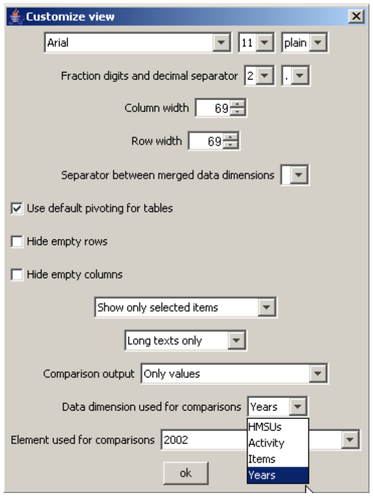
Long texts only

Comparison output Only values

Data dimension

Element used for comparis

Only values
Values and percentage difference
Values and absolute difference
Only percentage difference
Only absolute difference
Normalisation



Customize view

Arial 11 plain

Fraction digits and decimal separator 2 .

Column width 69

Row width 69

Separator between merged data dimensions

☑ Use default pivoting for tables

☐ Hide empty rows

☐ Hide empty columns

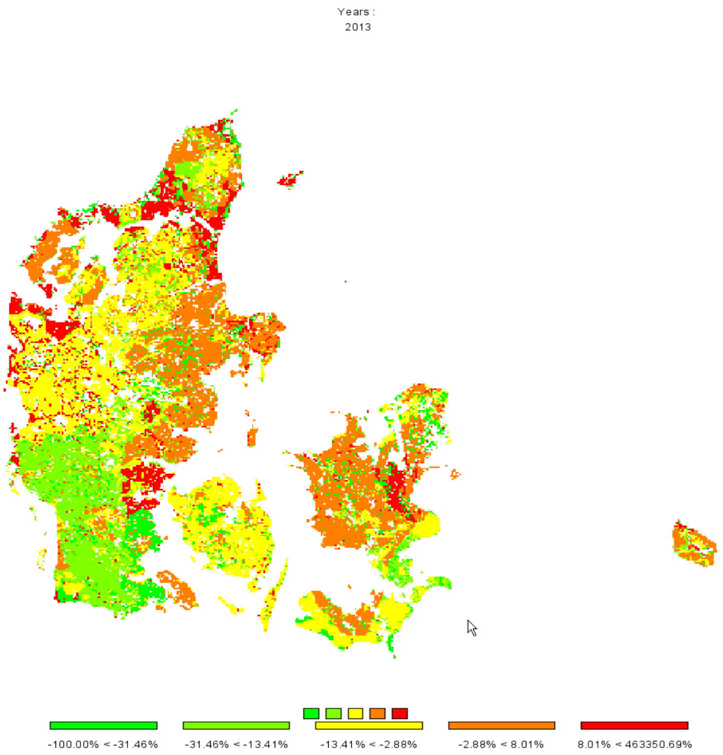
Show only selected items

Long texts only

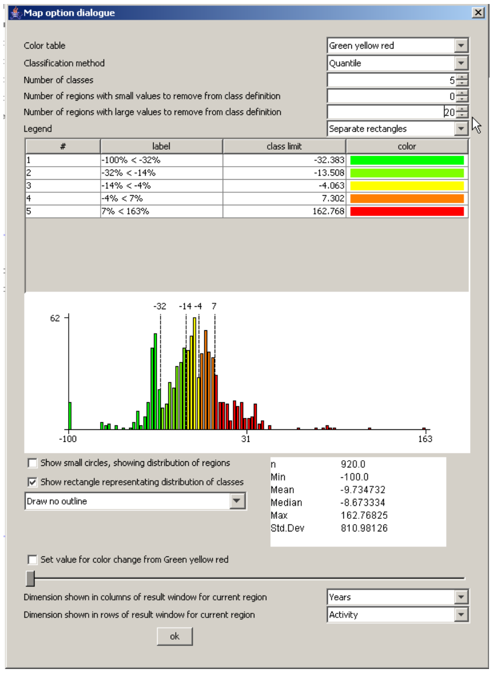
Comparison output Only values

Data dimension used for comparisons Years

Element used for comparisons 2002



Now, there are two things we would most probably like to change: the number of digits shown in the legend, and getting rid of very large values shown in the legend. The number of digits can be changed with the “tool” dialogue by changing the fraction digits. Large numbers can be excluded from the classification by increasing the “Number of regions with larger numbers to exclude from class definition”, in the example below the number had been set to 20.



Map option dialogue

Color table: Green yellow red
Classification method: Quantile
Number of classes: 5
Number of regions with small values to remove from class definition: 0
Number of regions with large values to remove from class definition: 20
Legend: Separate rectangles

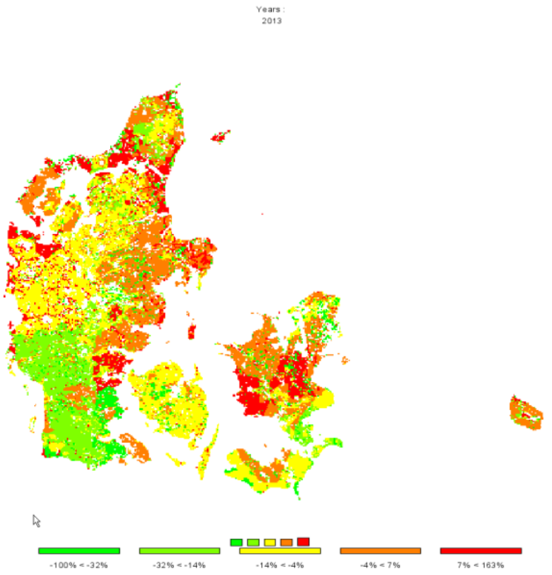
#	label	class limit	color
1	-100% < -32%	-32.383	🟩
2	-32% < -14%	-13.508	🟩
3	-14% < -4%	-4.063	🟨
4	-4% < 7%	7.302	🟧
5	7% < 163%	162.768	🟥

☐ Show small circles, showing distribution of regions
☑ Show rectangle representating distribution of classes
Draw no outline

n	920.0
Min	-100.0
Mean	-9.734732
Median	-8.673334
Max	162.76825
Std.Dev	810.98126

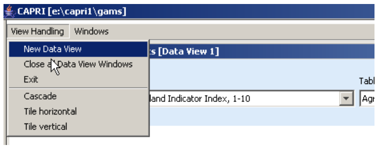
☐ Set value for color change from Green yellow red

Dimension shown in columns of result window for current region: Years
Dimension shown in rows of result window for current region: Activity

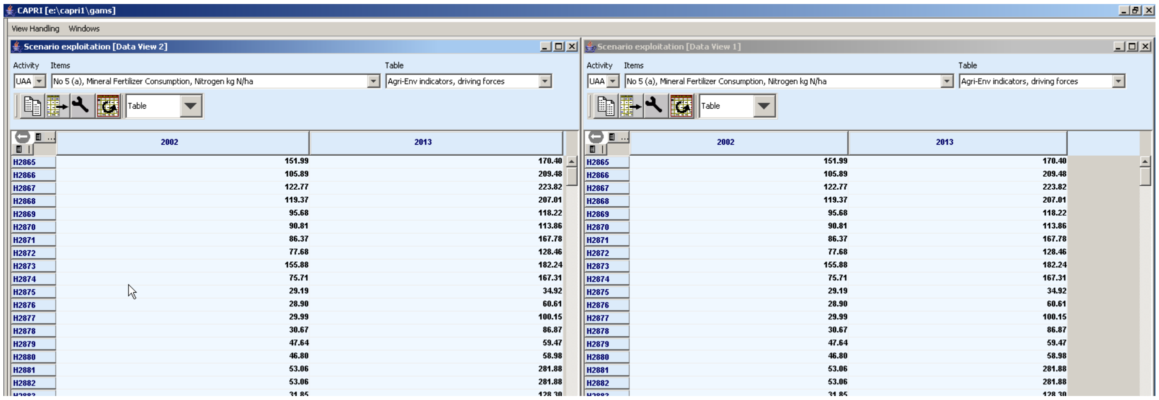


Drawing a map with the base year results next to one showing changes from the base year to the baseline results

There are two ways to draw different maps. If more then one column is selected in the underlying table view, several maps with identical coloring and scaling will be drawn as shown in the sample above. That is not advisable – in our example we need two different scales: one appropriate for the absolute values and one appropriate for changes. In order to do so choose "View Handling", "New Data View" and then "Tile vertical".



We will then see something similar to the one shown below.



Scenario exploitation [Data View 2]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

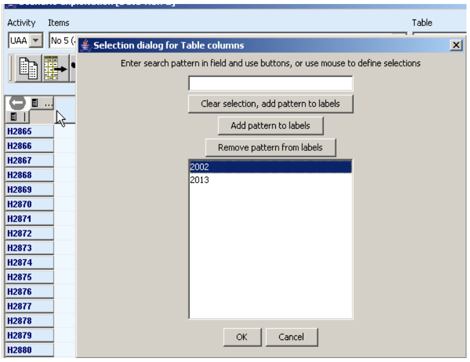
	2002	2013
H2865	151.99	170.40
H2866	105.89	209.48
H2867	122.77	223.82
H2868	119.37	207.01
H2869	95.68	118.22
H2870	90.81	113.86
H2871	86.37	167.78
H2872	77.68	128.46
H2873	155.88	182.24
H2874	75.71	167.31
H2875	29.19	34.92
H2876	28.90	60.61
H2877	29.99	100.15
H2878	30.67	86.87
H2879	47.64	59.47
H2880	46.80	58.98
H2881	53.06	281.88
H2882	53.06	281.88
H2883	31.85	128.30

Scenario exploitation [Data View 1]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

	2002	2013
H2865	151.99	170.40
H2866	105.89	209.48
H2867	122.77	223.82
H2868	119.37	207.01
H2869	95.68	118.22
H2870	90.81	113.86
H2871	86.37	167.78
H2872	77.68	128.46
H2873	155.88	182.24
H2874	75.71	167.31
H2875	29.19	34.92
H2876	28.90	60.61
H2877	29.99	100.15
H2878	30.67	86.87
H2879	47.64	59.47
H2880	46.80	58.98
H2881	53.06	281.88
H2882	53.06	281.88
H2883	31.85	128.30

Now, in the left hand side, only the results for the base year should be shown. That can be accomplished by deselecting the column for "2013" – use the column selection button to do so.

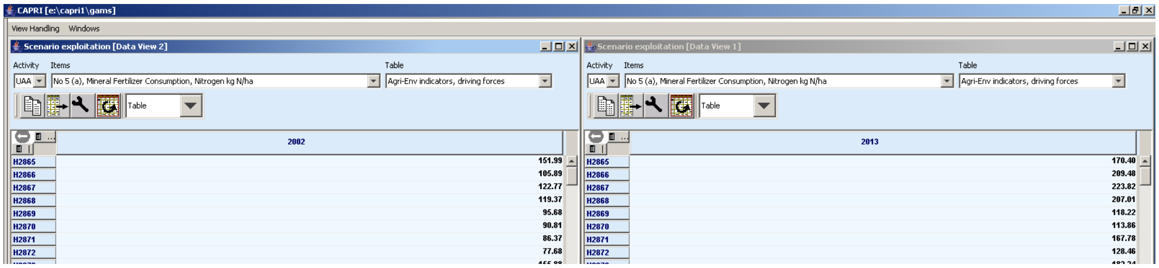

Activity
Items
Table
UAA
No 5 (
Selection dialog for Table columns
Clear selection, add pattern to labels
Add pattern to labels
Remove pattern from labels
OK
Cancel

Enter search pattern in field and use buttons, or use mouse to define selections

2002
2013

H2865
H2866
H2867
H2868
H2869
H2870
H2871
H2872
H2873
H2874
H2875
H2876
H2877
H2878
H2879
H2880

The very same trick should be applied for the other view, only deselecting the results for "2002". Now we see something as below:



Scenario exploitation [Data View 2]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

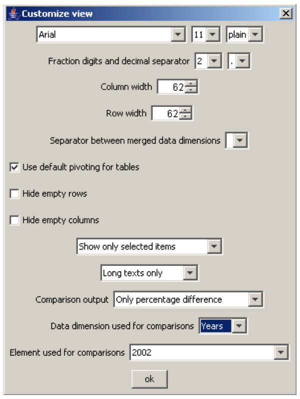
	2002
H2865	151.99
H2866	105.89
H2867	122.77
H2868	119.37
H2869	95.68
H2870	90.81
H2871	86.37
H2872	77.68

Scenario exploitation [Data View 1]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

	2013
H2865	170.40
H2866	209.48
H2867	223.82
H2868	207.01
H2869	118.22
H2870	113.86
H2871	167.78
H2872	128.46

Now, for the map with the results for 2013, we should switch to percentage difference to the year "2002" by opening the "tool" dialog 🔧. There, under "Comparison output", choose "Only percentage difference", Select "Years" under "Data dimension used for comparisons" and ensure that "2002" is selected in "Element used for comparisons".



Customize view

Arial | 11 | plain

Fraction digits and decimal separator: 2 | .

Column width: 62

Row width: 62

Separator between merged data dimensions

☑ Use default pivoting for tables

☐ Hide empty rows

☐ Hide empty columns

Show only selected items

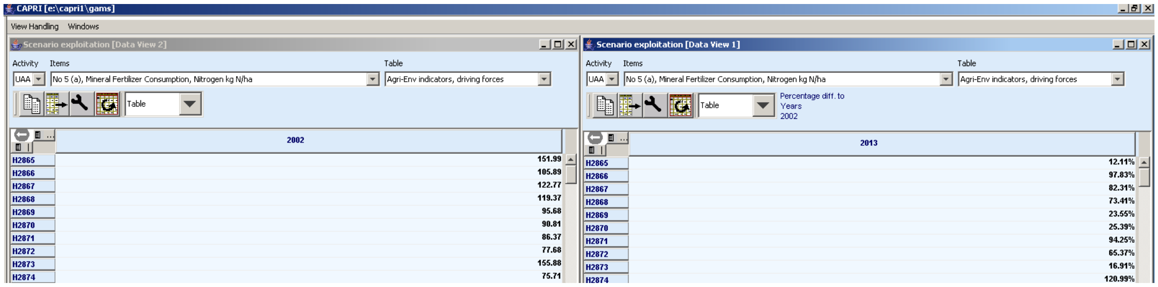
Long texts only

Comparison output: Only percentage difference

Data dimension used for comparisons: Years

Element used for comparisons: 2002

Now we should get a result as below.



Scenario exploitation [Data View 2]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

	2002
H2865	151.99
H2866	105.89
H2867	122.77
H2868	119.37
H2869	95.68
H2870	90.81
H2871	86.37
H2872	77.68
H2873	155.88
H2874	75.71

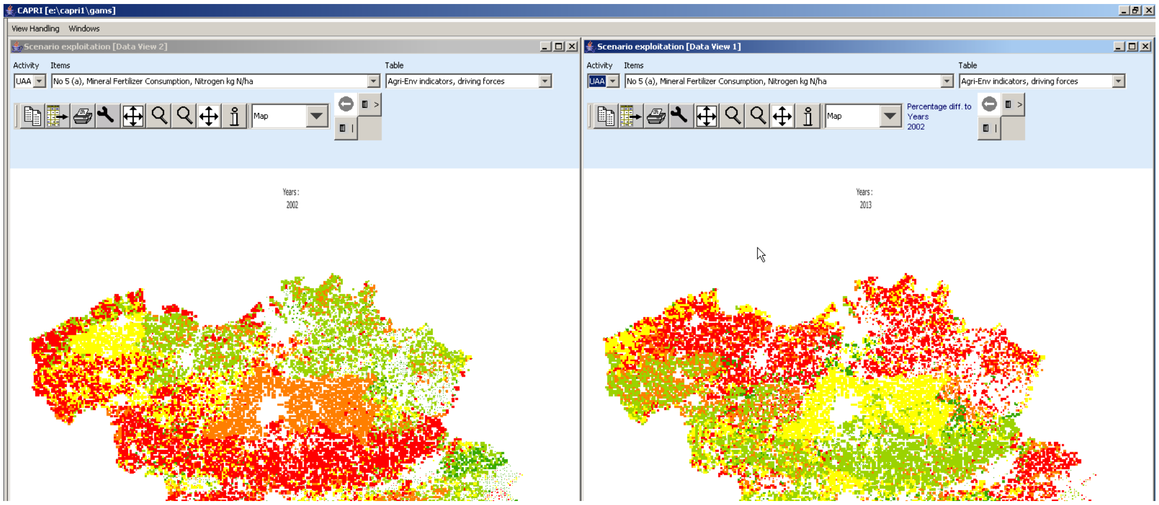
Scenario exploitation [Data View 1]

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Table

Percentage diff. to
Years
2002

	2013
H2865	12.11%
H2866	97.83%
H2867	82.31%
H2868	73.41%
H2869	23.55%
H2870	25.39%
H2871	94.25%
H2872	65.37%
H2873	16.91%
H2874	120.99%

Now, for both views, the output should be switched to maps, and there we are …

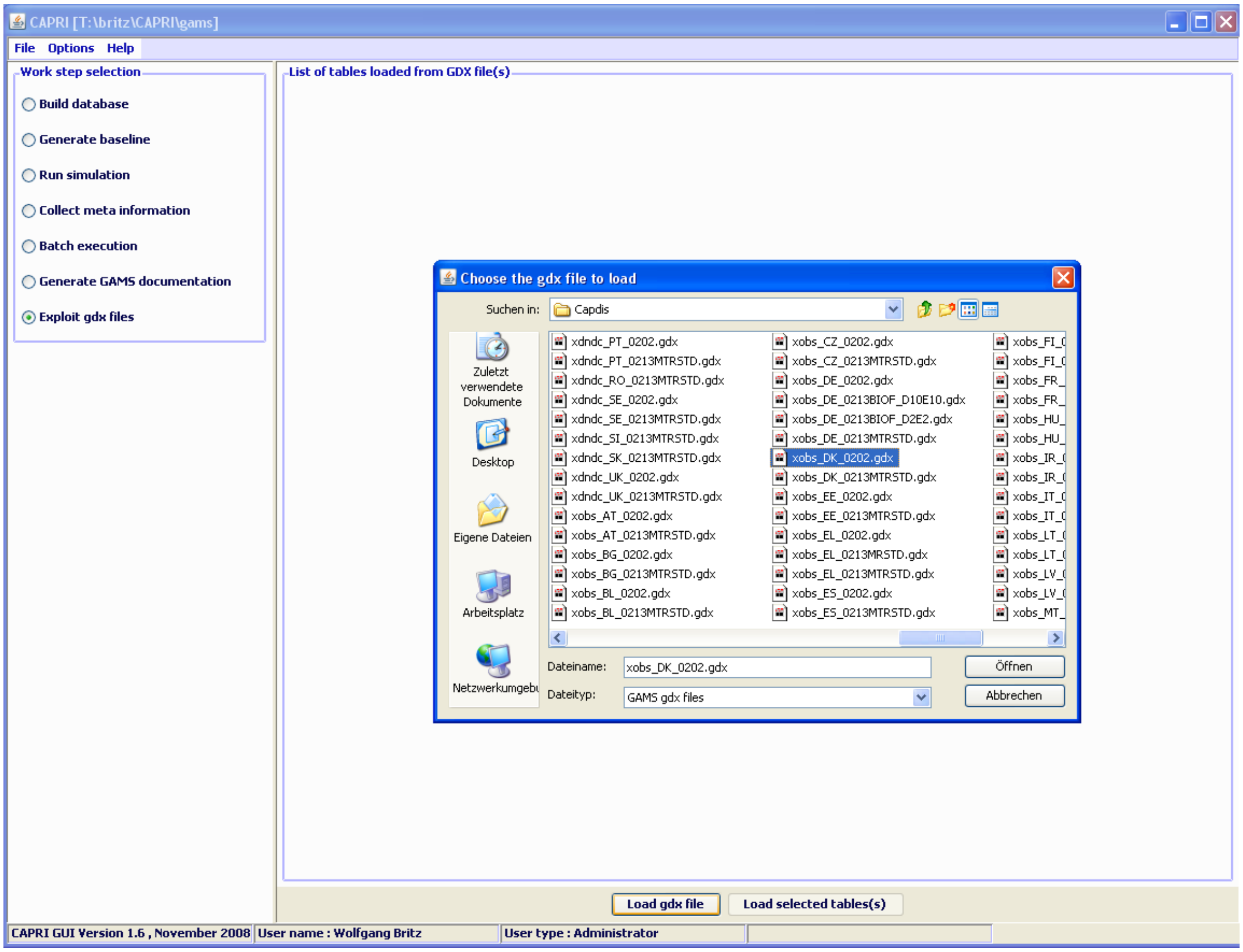

CAPRI [e:\capri1\gams]
View Handling Windows
Scenario exploitation [Data View 2]
Scenario exploitation [Data View 1]
Map

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Years : 2002

Activity: UAA
Items: No 5 (a), Mineral Fertilizer Consumption, Nitrogen kg N/ha
Table: Agri-Env indicators, driving forces
Percentage diff. to Years 2002
Years : 2013

Using the GDX viewer: an example: loading data from the spatial downscaling

The option described here is introduced for completeness. The names of the file generated by the disaggregation programs start with "XOBS_" followed with the two character code of the Member state, then an underscore followed by the base year and the simulation year, and if applicable, the code for the simulation which is identical to the name of the GAMS files used from "pol_input" which was used to run the scenario.



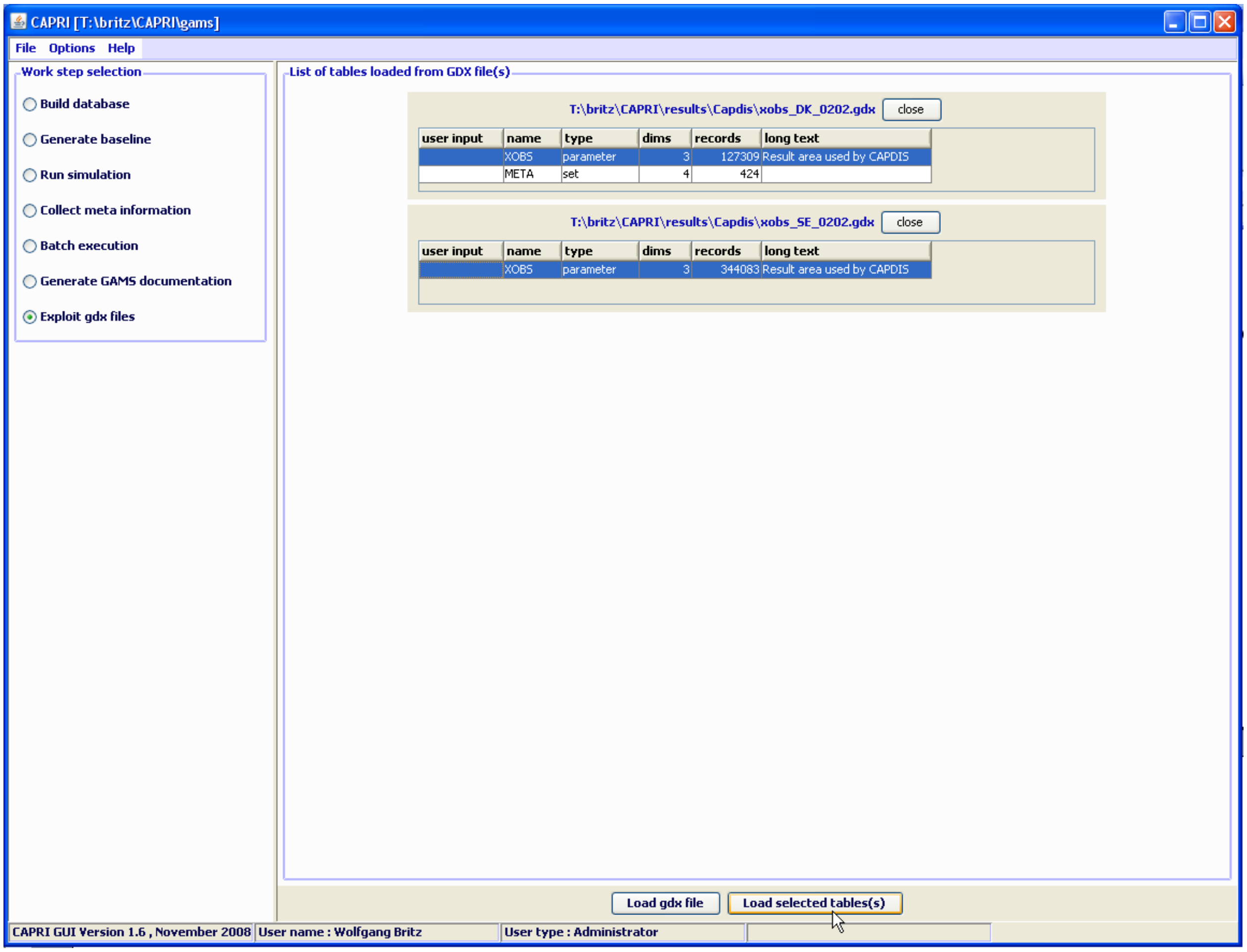
Suchen in: Capdis

Dateiname: xobs_DK_0202.gdx

Dateityp: GAMS gdx files

CAPRI GUI Version 1.6 , November 2008 | User name : Wolfgang Britz | User type : Administrator

If one wishes to see the information for several Member States simultaneously, one may click on “Load gdx file” again and add additional files. Afterwards, the lines with the parameters “XOBS” should be selected.


CAPRI [T:\britz\CAPRI\gams]
File
Options
Help
Work step selection
○ Build database
○ Generate baseline
○ Run simulation
○ Collect meta information
○ Batch execution
○ Generate GAMS documentation
● Exploit gdx files
List of tables loaded from GDX file(s)
close
close
Load gdx file
Load selected tables(s)
CAPRI GUI Version 1.6 , November 2008
User name : Wolfgang Britz
User type : Administrator

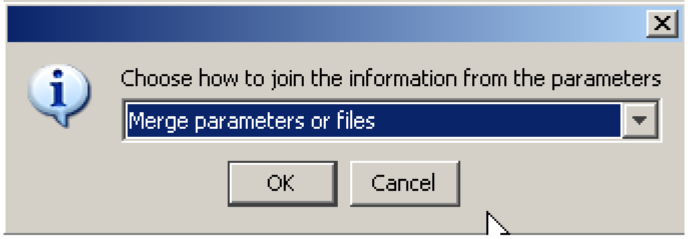
T:\britz\CAPRI\results\Capdis\xobs_DK_0202.gdx

user input	name	type	dims	records	long text
	XOBS	parameter	3	127309	Result area used by CAPDIS
	META	set	4	424	

T:\britz\CAPRI\results\Capdis\xobs_SE_0202.gdx

user input	name	type	dims	records	long text
	XOBS	parameter	3	344083	Result area used by CAPDIS

Pressing load selected tables will open the following dialogue, choose


Choose how to join the information from the parameters

Merge parameters or files

As otherwise, the program will introduce a new dimension for the data loaded from the different files, and you will not be able to see the information for “DK” and “SE” together in one map. Afterwards, the selected records will be loaded from the files.

Depending on the amounts of records, that may take several seconds. Before turning to the mapping view, only one column should be selected. Press on the button left of “SWHE” in the table headers (”Open selection dialog for table column”), and select with the mouse one of the codes, then press o.k. The table should now comprise only one column. Afterwards use the drop-down list with the viewing options and choose map as shown below. Choose “HSMU.” to select the geometry for the HSMUs. The program will now load the geometry for the HSMU and draw the map which takes several seconds.

Tracking the iteration behaviour of CAPRI ,

Background

CAPRI uses an iterative link between the supply and market modules. In some cases, a complete model run may take quite some time. Knowledge about the intermediate results during iterations may help to decide about the success of the current run. That is especially due during debug exercises where structural changes are introduced.

Since quite a while, CAPRUI therefore comprises instruments to check the outcome already during the model's execution. For quite a while, a XML-XLST solution was used, which is now replaced by a GX-JAVA one which is discussed in here.

How to use the tracking tool

Some technical background

The tracking tool requires as the normal CAPRI GUI the installation of Java run time engine. The tracking tool can be found in "GAMS\XMLITER", and consists of three components:

1. The java code stored in "CAPRI.JAR". The JAVA call is stored in a batch file called "stepReport.bat"
2. A XML based definition of the tables, found in "iter-tables.xml"
3. A GDX files produced by the GAMS code of CAPRI at the end of each iteration termed "stepOutput.gdx"

Starting the tracking tool and reloading

The tracking tool can be started by the batch "Stepreport.bat", e.g. by a double-click in the Windows explorer. It will open an application as shown below. The basic functionality of the table viewr is equal to the CAPRI GUI and described there. There is however one difference: with the "reload" button at the bottom of the application, the GDX file can be reloaded from disk. Attention: under GAMS22.8, the reload may be prevent the GAMS program to write to the GX file. Please use reload only during the iteration of the supply model.

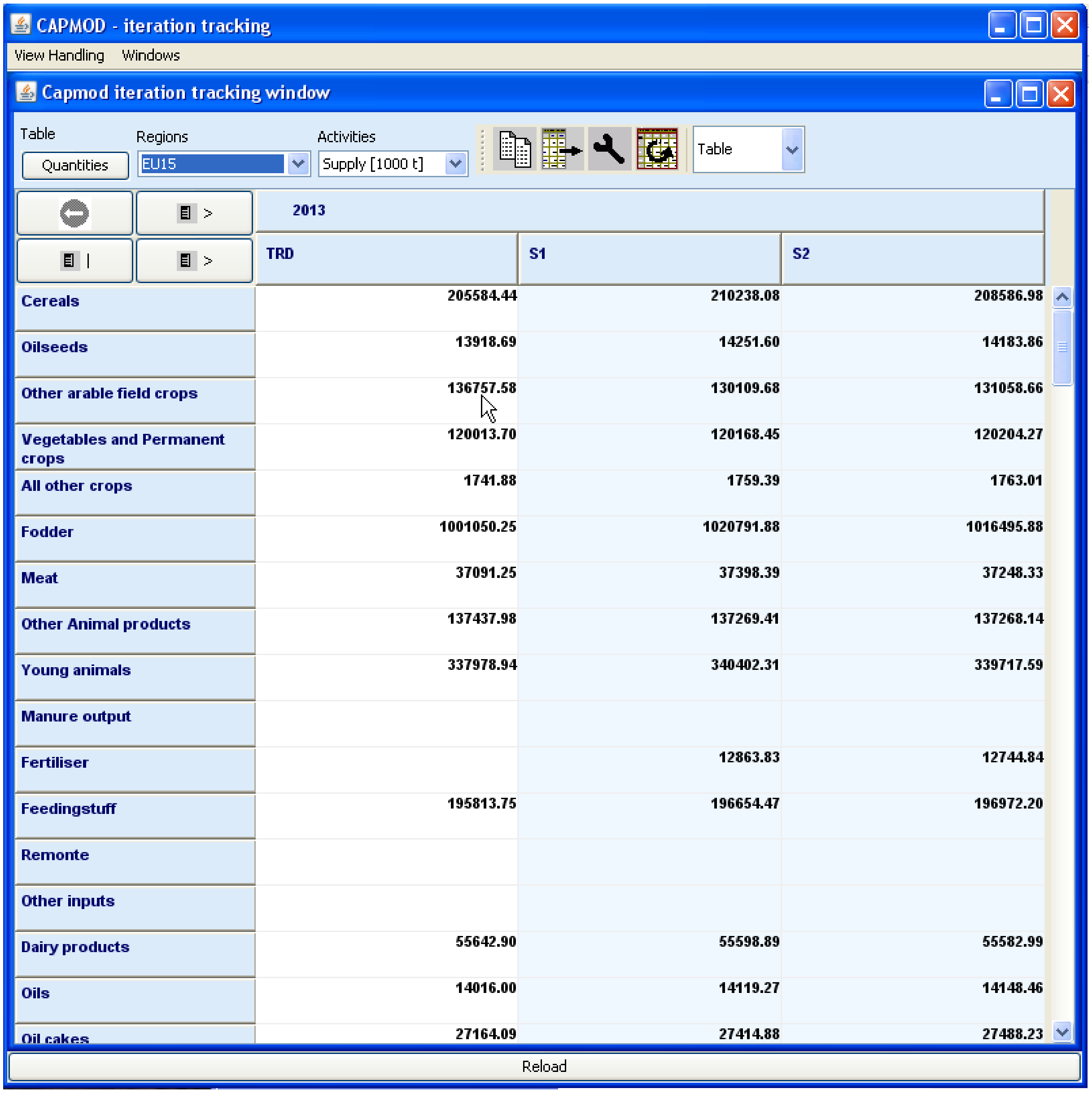


Table: Quantities

Regions: EU15

Activities: Supply [1000 t]

Table

	2013		
	TRD	S1	S2
Cereals	205584.44	210238.08	208586.98
Oilseeds	13918.69	14251.60	14183.86
Other arable field crops	136757.58	130109.68	131058.66
Vegetables and Permanent crops	120013.70	120168.45	120204.27
All other crops	1741.88	1759.39	1763.01
Fodder	1001050.25	1020791.88	1016495.88
Meat	37091.25	37398.39	37248.33
Other Animal products	137437.98	137269.41	137268.14
Young animals	337978.94	340402.31	339717.59
Manure output			
Fertiliser		12863.83	12744.84
Feedingstuff	195813.75	196654.47	196972.20
Remonte			
Other inputs			
Dairy products	55642.90	55598.89	55582.99
Oils	14016.00	14119.27	14148.46
Oil cakes	27164.09	27414.88	27488.23

Available tables

There are table to track the change in quantities (supply and feed) from the supply models, for the activities and premiums, and for prices. The latter one shows both the prices returned from the market models, as the ones sent to the next solve of the supply models. A further tables reports the seconds needed for the different steps.

Index