ecoEditor Workshop

Agroscope
EMPA
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PSI

Presentation to ecoinvent Users and Data Providers Meeting, Gothenburg, Sweden

2013.08.29

Tereza Lévová

& Emilia Moreno Ruiz

ecoinvent Centre

Content

- ecoEditor introduction
- Functions of the ecoEditor (explained directly in the software)
- Exercise – creating new dataset

ecoEditor Introduction

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Content

- Purpose
- Main features
- Data management in the ecoEditor
- How to start
- Opening the ecoEditor for the 1st time
- *All the functions explained directly in the ecoEditor*

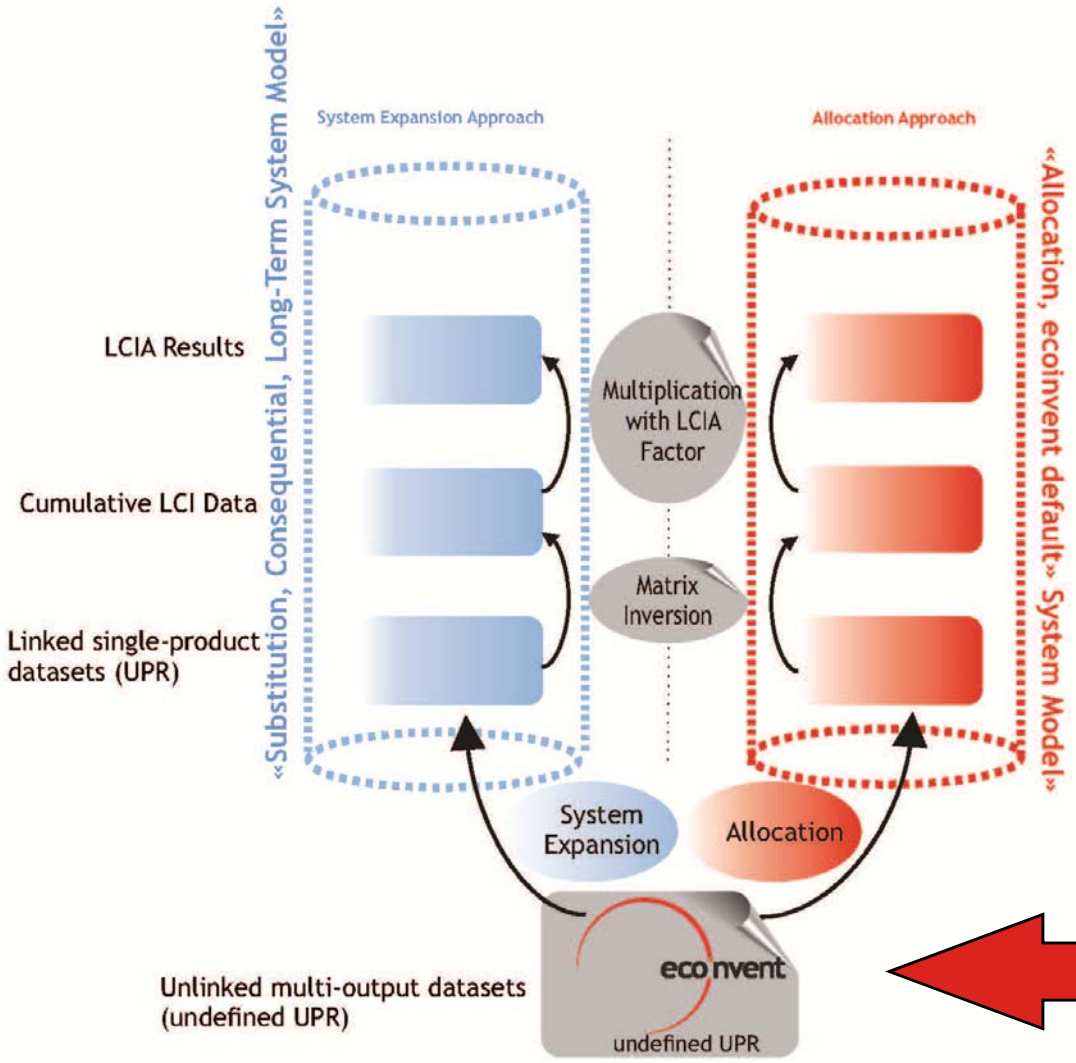
Purpose

- The ecoEditor is a freeware used by the ecoinvent Centre for
  - creating datasets
  - editing datasets
  - reviewing datasets
  - uploading datasets to the ecoinvent database

Main features

- Use of the ecoSpold2 format -> new possibilities (parameters, variable names, formulas, etc.)
- Undefined multi-output dataset template -> guidance in collection of the necessary data
- Build-in help
- Validation of the new dataset -> more than 300 build-in rules which ensure the completeness and quality of the dataset

Format of the datasets



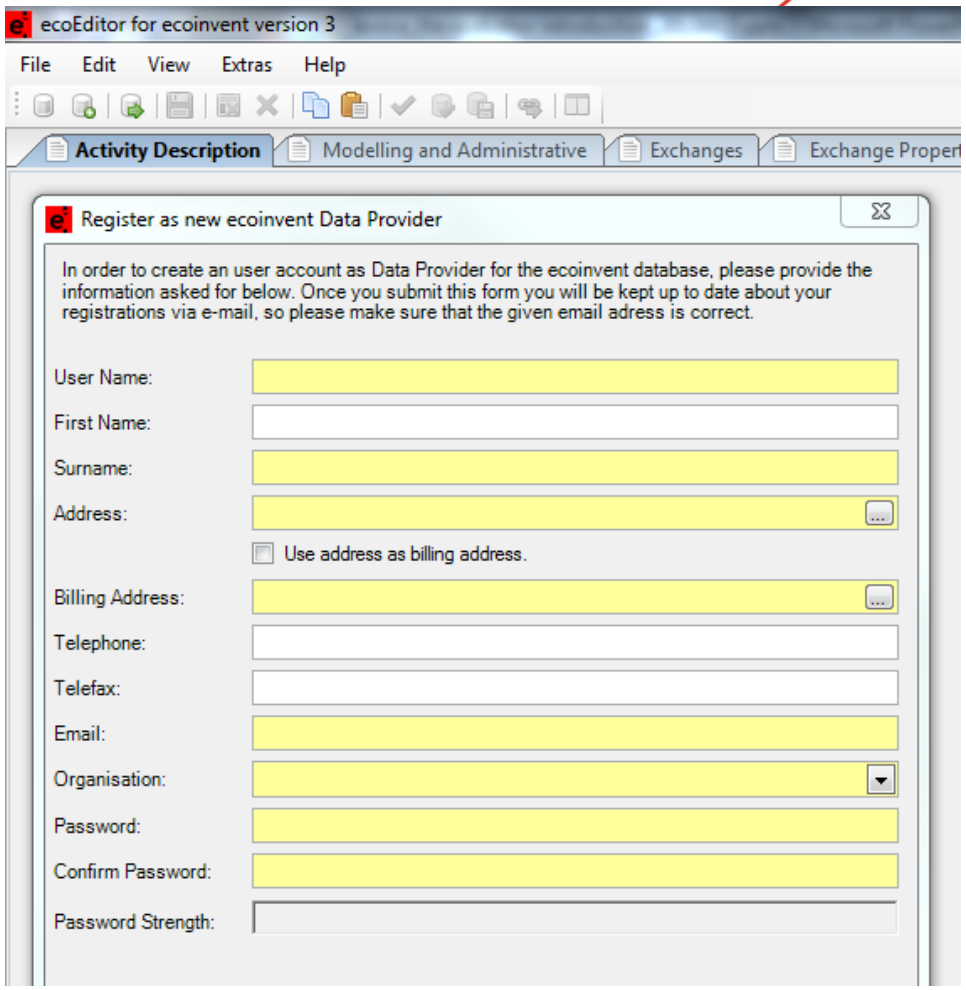
- Undefined multi-output dataset template

Data management in the ecoEditor

- During installation so called **master data** are downloaded and stored in your computer
- The database is accessed **online** -> each dataset is downloaded separately, the datasets are not stored in your computer unless you do so manually
- The datasets you create in the ecoeditor are **not visible** to the ecoinvent Centre unless you submit them

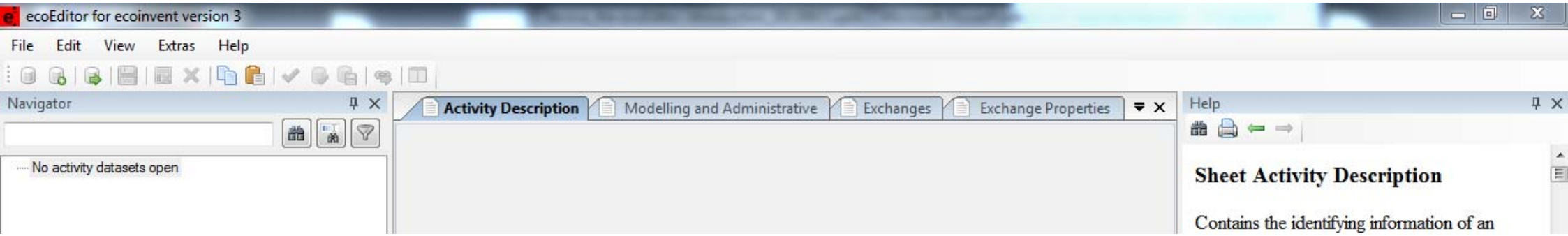
How to start

- Download the installation file from the ecoinvent webpage and install the ecoEditor
- Start the ecoEditor
- Go to Extras -> Account Management -> Create account (Update EcoQuery Account) -> Register Data Provider Account + fill in all the information
- Wait for the approval of your account by the ecoinvent Centre



Opening the ecoEditor for the 1st time

- Horizontal menu, classic windows style

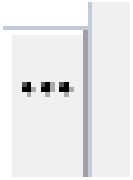


- Read about the ecoEditor from the guide, Help -> Show ecoEditor Introduction
- Go to File -> Update Master Data -> download of the latest master data
- *All functions explained directly in ecoeditor …*

Example dataset

- diethyl ether production /GLO

Symbols, icons, etc.

- The “star”  means, that there is **more text**, that visible in the current view
- “Three dots”  is an icon, which can be clicked on and a **new window** will open
- Text **in black** was entered by the data provider and can be edited
- Text in grey was generated automatically during submission and cannot be edited

ecoEditor exercise

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Content

- Regional versus global (GLO) dataset
- Creation of new dataset “From Scratch” in the ecoEditor
- Activity Description and Modelling and Administrative
- Exchanges – new product, amounts, mathematical relation, etc.
- Validation – online, offline
- Creation of new dataset “ From Existing Dataset”
- Review process

Regional versus global (GLO) datasets

- Regional datasets cannot be submitted without global (GLO) dataset
- Procedure of submitting both regional and GLO datasets:
  - Manually
  - Parent-child relationship
  - Automatic creation of the GLO dataset

Regional versus global (GLO) datasets

- Manually
  - When unique data for both the GLO and the regional datasets are available
  - Both the GLO and the regional datasets are entered manually

-> simple, less validation errors

-> changes in the future must be done manually as well

GLO

REGIONAL

Regional versus global (GLO) datasets

- Parent-child relationship
  - When only part of the data are unique in the regional dataset and there is a probability they will change in the future
  - GLO dataset is created first and regional dataset is created as its child

-> more validation rules

-> all changes in the parent in the future will automatically be updated in the child

Regional versus global (GLO) datasets

- Automatic creation of the GLO dataset
  - The regional dataset(s) is created first and the GLO dataset is created using the automatic function (because no unique data are available)
  - The GLO is created as a weighted average (by production volume) of the regional datasets

-> save time, less validation errors

-> changes in the future can be done either manually or using again this function

Coming soon!

New Dataset: mango production / IN

- *File -> New -> New Dataset From File -> From Scratch*
- Activity Name: mango production
- Geography: India (IN)
- Time Period: 1/1/2008 to 12/31/2013
- *File -> Save Dataset As …*

Activity Description

- General Comment:
  - This dataset represents mango production in India. Yield = 2.5 t/ha, duration of one cycle: 12 months, etc.
- Included Activities Start:
  - From maintenance of the orchards after harvest of the previous crop.
- Included Activities End:
  - This activity ends with harvest and storage.

Activity Description

- Classifications, System: Value
  - ISIC rev.4 ecoinvent: 0.125: Growing of other tree and bush fruits and nuts
- Technology level:
  - Current
- Technology, Comment:
  - Average of all different technologies of mango production in India.

Modelling and Administrative

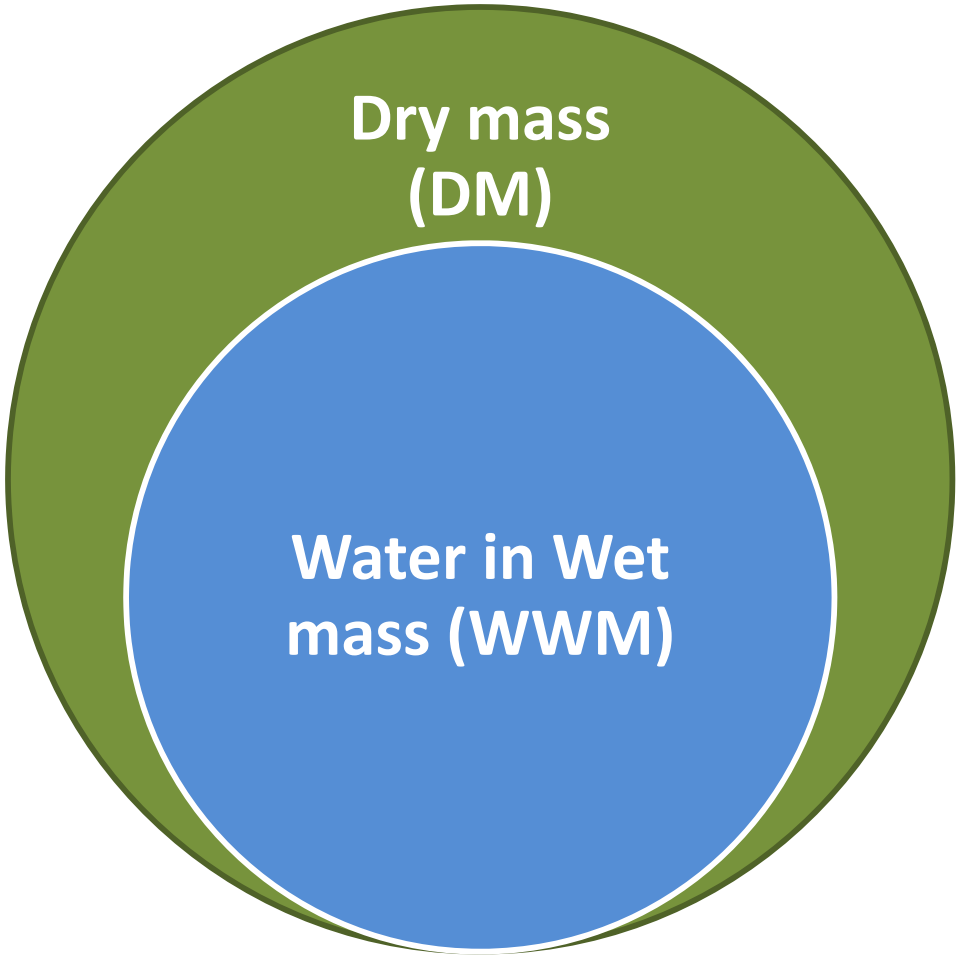
- Representativeness, Percent:
  - 75%
- Representativeness, Sampling Procedure:
  - The data were partially directly from the farmers and combined with the information provided by the Association of Indian Mango Producers.
- Data Generator and Publication, Person
- Data Generator and Publication, Data Published In

Exchanges – new product

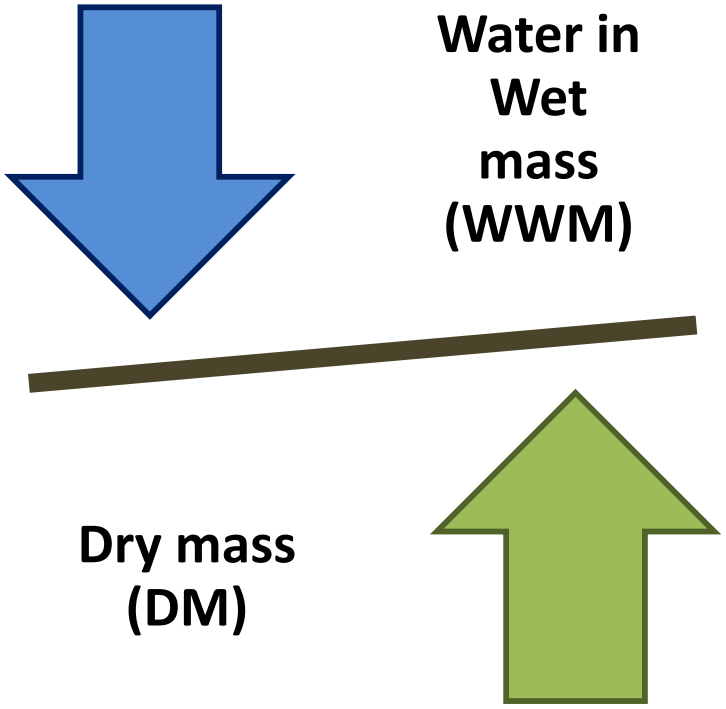
- *Exchanges -> Add -> Intermediate Exchange -> Create Exchange*
- Name: mango
- Variable Name: mango
- Unit: kg
- Classification: 0131: Tropical and subtropical fruits
- Properties:
  - wet mass = 1kg, dry mass = 0.17kg,
  - water in wet mass = wet mass – dry mass = 0.83kg
  - water content = water in wet mass/dry mass = 4.88kg
  - carbon content, fossil = 0kg, carbon content, non-fossil = 0.47kg

Mass and carbon compulsory properties

Wet mass (WM)



Water content (U)



Mass and carbon compulsory properties

- Carbon:
  - fossil
  - non-fossil

Interrelated properties

Wet mass (WM)	Dry mass (DM)	Water mass (W)	Water content (U)
WM	WM-W	W	W/(WM-W)
WM	DM	WM-DM	(WM-DM)/DM
WM	WM/(1+U)	U*WM/(1+U)	U
W+DM	DM	W	W/DM
(W/U)+W	W/U	W	U
(1+U)*DM	DM	DM*U	U

Compulsory properties: units

	natural gas, high pressure (m3)	palm fruit bunch (kg)
Wet Mass (WM) (kg/unit of the flow)	0.84	1
Dry Mass (DM) (kg/unit of the flow)	0.84	0.53
Water in Wet Mass (WWM) (kg/unit of the flow)	0	0.47
Carbon content, fossil (kg C/kg DM)	0.60	0
Carbon content, non-fossil (kg C/kg DM)	0	0.59

Exchanges - amounts

Type	Name	Unit	Compartment	Subcompartment	Amount
Reference Product	**mango**	kg			1
FromTechnosphere	irrigation	m3			0
FromTechnosphere	phosphate fertiliser, as P2O5	kg			0.00746
FromTechnosphere	fertilising, by broadcaster	ha			0.000418
FromTechnosphere	pesticide, unspecified	kg			8.82E-05
ToEnvironment	Phosphate	kg	water	ground-	2.09E-06
ToEnvironment	Pesticides, unspecified	kg	soil	agricultural	0
FromEnvironment	Transformation, to permanent crop, irrigated	m2	natural resource	land	0.299
FromEnvironment	Transformation, from permanent crop, irrigated	m2	natural resource	land	0.5
FromEnvironment	Occupation, permanent crop, irrigated	m2*year	natural resource	land	0.299

Parameters

Name	Variable Name	Unit	Amount	Variable Name	Mathematical relation	Uncertainty	Comment
yield, agriculture	yield_agriculture	metric ton/ha	2.4	yield_ mango_ production	6*0.4	0.0006 (2,2,2,2,2)	Calculated value based on literature. The yield of mango production in India is 6t/acre (SOURCE). 1acre=0.4ha.
irrigation demand	irrigation_demand	m3/ha/ year	728	irrigation_ demand_ mango	(100*140*52)/1000	0.0006 (2,2,2,2,2)	Calculated value based on literature. 100 l/plant/week is the irrigation requirement of one mango plant grown in India (SOURCE). 140 plant/ha is the number of plants grown per one hectare of land (SOURCE). 52 weeks/year. 1000 l/m3.

Exchanges - Mathematical Relation

- The amount of pesticide, unspecified released to soil **is equal** to the amount of pesticide, unspecified which enters the activity
- The amount of irrigation needed is calculated using parameters

Type	Name	Unit	Amount	Variable Name	Mathematical Relation
Reference Product	**mango**	kg	1		
FromTechnosphere	irrigation	m3	1.7472		(yield_mango_production*irrigation_demand_mango)/1000
FromTechnosphere	pesticide, unspecified	kg	8.82E-05	pesticide_ unspecified_input	
ToEnvironment	Pesticides, unspecified	kg	8.82E-05	pesticide_ unspecified_to_soil	pesticide_ unspecified_input

Exchanges – Uncertainty, Source, Comment

Type	Name	Unit	Uncertainty	Source	Comment
Reference Product	**mango**	kg			
FromTechnosphere	irrigation	m3	0.0006 (2,2,2,2,2)		Calculated based on literature data (SOURCE). See the mathematical relation and parameters and their comments.
FromTechnosphere	phosphate fertiliser, as P2O5	kg	0.0006 (2,2,2,2,2)		Calculated based on literature data (SOURCE).
FromTechnosphere	fertilising, by broadcaster	ha	0.0006 (2,2,2,2,2)		
FromTechnosphere	pesticide, unspecified	kg	0.0006 (2,2,2,2,2)		
ToEnvironment	Phosphate	kg	0.04 (2,2,2,2,2)		
ToEnvironment	Pesticides, unspecified	kg	0.04 (2,2,2,2,2)		
FromEnvironment	Transformation, to permanent crop, irrigated	m2	0.12 (2,2,2,2,2)		
FromEnvironment	Transformation, from permanent crop, irrigated	m2	0.12 (2,2,2,2,2)		
FromEnvironment	Occupation, permanent crop, irrigated	m2*year	0.04 (2,2,2,2,2)		

Exchanges – Production Volume

- Annual Production Volume (APV) need to be filled **only for the Reference Product and By-products**, if there are some
- APV represent the amount of the reference product produced in a given technology and geography
- The unit of the APV is identical with the unit of the reference product

Type	Name	Unit	Annual Production Volume	Production Volume Comment
Reference Product	**mango**	kg	**16.34E9**	Literature value (SOURCE) for the year 2010. The Indian production represents 42% of the global production of mangoes.

Exchanges – Activity Link

- When it is clear from where the concrete product comes from
  - phosphate fertiliser, as P2O5 -> *Activity Link* -> set to “citric acid production” RER, meaning I know the fertilizer I am using comes from this concrete activity; and this activity can adapt its production to my needs
- Modelling challenges
  - The transport from the market must be included directly in the production activity
  - The amount of phosphate must be lower than what is the activity to which it links producing

Validation - offline

- Dataset is being validated offline against the validation rules which are build in the ecoEditor
- *File -> Validate Dataset* 
- *Modelling and Administrative, Review, Details*
  - Validation failed with errors: The sum of all land use transformations from (0.0.5 m2) must equal the sum of all output transformations to (0.299 m2).
- *Modelling and Administrative, Review, Other Details*
  - Balances; dry mass, wet mass, carbon content, etc.

Validation - online

- Dataset is being validated online against the other datasets already present in the database and against the online validation rules
- *File -> Submit Datasets for Validation …* 
- *Tasks -> Refresh ->* Right Click *-> View Validation Results*
- *Modelling and Administrative, Review, Details*
  - Validation failed with errors: Non-global datasets cannot be uploaded unless a global dataset (for the same activity name, time period and macro-economic scenario) exists in the database or is uploaded together with the non-global dataset. No matching activities found.

Validation - online

- Dataset is being validated online against the other datasets already present in the database and against the online validation rules
- *File -> Submit Datasets for Validation …* 
- *Tasks -> Refresh ->* Right Click *-> View Validation Results*
- *Modelling and Administrative, Review, Details*
  - Validation failed with errors: Non-global datasets cannot be uploaded unless a global dataset (for the same activity name, time period and macro-economic scenario) exists in the database or is uploaded together with the non-global dataset. No matching activities found.

New Dataset: mango production / CN

- *File -> New -> New Dataset From File -> From Existing Dataset*
- Dataset: *Open* mango production /IN
- Activity Name: mango production
- Geography: China (CN)
- Time Period: 1/1/2008 to 12/31/2013
- *File -> Save Dataset As …*

Parameters

Name	Variable Name	Unit	Amount	Variable Name	Mathematical relation	Uncertainty	Comment
yield, agriculture	yield_agriculture	metric ton/ha	3.2	yield_ mango_ production	8*0.4	0.0006 (2,2,2,2,2)	Calculated value based on literature. The yield of mango production in India is 8t/acre (SOURCE). 1acre=0.4ha.
irrigation demand	irrigation_demand	m3/ha/ year	500	irrigation_ demand_ mango	(80*120*52) /1000	0.0006 (2,2,2,2,2)	Calculated value based on literature. 80 l/plant/week is the irrigation requirement of one mango plant grown in India (SOURCE). 120 plant/ha is the number of plants grown per one hectare of land (SOURCE). 52 weeks/year. 1000 l/m3.

Exchanges - Mathematical Relation

- The amount of pesticide, unspecified released to soil **is equal** to the amount of pesticide, unspecified which enters the activity
- The amount of irrigation needed is calculated using parameters

Type	Name	Unit	Amount	Variable Name	Mathematical Relation
Reference Product	**mango**	kg	1		
FromTechnosphere	irrigation	m3	1.597		(yield_mango_production*irrigation_demand_mango)/1000
FromTechnosphere	pesticide, unspecified	kg	8.82E-05	pesticide_ unspecified_input	
ToEnvironment	Pesticides, unspecified	kg	8.82E-05	pesticide_ unspecified_to_soil	pesticide_ unspecified_input

Exchanges - amounts

Type	Name	Unit	Compartment	Subcompartment	Amount
Reference Product	**mango**	kg			1
FromTechnosphere	irrigation	m3			1.597
FromTechnosphere	phosphate fertiliser, as P2O5	kg			0.00746
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ToEnvironment	Pesticides, unspecified	kg	soil	agricultural	5E-05
FromEnvironment	Transformation, to permanent crop, irrigated	m2	natural resource	land	0.299
FromEnvironment	Transformation, from permanent crop, irrigated	m2	natural resource	land	0.299
FromEnvironment	Occupation, permanent crop, irrigated	m2*year	natural resource	land	0.299

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- APV represent the amount of the reference product produced in a given technology and geography
- The unit of the APV is identical with the unit of the reference product

Type	Name	Unit	Annual Production Volume	Production Volume Comment
Reference Product	**mango**	kg	**4.35E9**	Literature value (SOURCE) for the year 2010. The Chinese production represents 11% of the global production of mangoes.

New Dataset: mango production / GLO

- Regional datasets cannot be submitted without global (GLO) dataset
- There are several types of GLO
  - Original data for the GLO dataset are available -> dataset to be created as any other unique dataset, possibility of using parent-child relationship
  - No original data are available -> dataset to be created using automatic function in the ecoeditor (the data provider can choose if he/she wants to claim the authorship for this dataset)
- The annual production volume of the global dataset have to be always entered

The review process

- Before the submission to the review, the data provider must:
  - Make sure that there are no validation errors
  - Make sure, that most of the validation warnings are justifiable
  - Reach an agreement with the ecoinvent Centre management, that the dataset should be submitted
- *File -> Submit Datasets For Review* + follow the progress of the review in the *Tasks* sheet

Thank you for your attention!

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