Standardization & Balancing
`PrintTree` plugin

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Abstract

This vignette provides a description of the `printTree` plug-in: This plug-in has been created for creating a document will all the tables of the Standardization and Balancing together, by country-year-FBScommodity.

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Disclaimer

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This paper is dynamically generated on June 12, 2018 and is subject to changes and updates.

1 Introduction

The process of combining commodity balances for creating Food Balance Sheets is explained in a separate document[1]. The process is based on a structured and clear set of relationships between commodity given by the *Commodity tree* which is also explained in another document. The *Standardization and Balancing* generates balances for FBS commodities at different levels of aggregation: by FBS item, by group, by family and Total (by country). The `printTree` plug-in performs the all process (as the `Full standardization and balancing does`) but only for a single FBS item's SUA. It saves the different outputs, plus some detail about commodity tree, extraction rates and shares in a .md file and send it to the user for easy consultation.

One of the main drawbacks of the structure of plug-ins and processes in the SWS for FBSs calculation is the fact of having pieces of information separated in different data-tables and data-sets. This makes it a bit complicated for a user to have the full picture of a country when is trying to validate a Food Balance Sheet. For this reason, a tool has been created for having slices of country information in a single document. Indeed, the complexity of the Food Balance Sheet makes it not possible to have all pieces of information together. In particular, FBSs have many dimensions: countries, FBS commodities, years, SUAs. Also, there are many ways of looking at the data: by country, by year, by FBS commodity by step of the process and so on.

The SWS shows the data in data-sets representing different step of the process. These data-sets are ordered by country, commodity and year. This structure is not the best in many cases fr a user. The `printTree` plug-in shows, for a selected FBS item, country and year, the different tables in a unique document.

2 Content (the output of the plug-in)

The output of the plug-in is a `.md` file that is better red by *Notepad ++*. The name of the document is:

`year_M49_sample_test.md`, for example: `2014_1248_sample_test.md`, where 1248 is the M49 code for China Mainland. It is composed the following parts:

2.1 `sua_unbalanced`

First, the `Sua Unbalanced` if shown for the FBS item selected. In the example of figure 1 The Sua for the FBS item *WHEAT & PRODUCTS* is shown. This means that all the CPC commodities of the Commodity Tree of Wheat are shown, plus the commodities that will be aggregated in the FBS item *WHEAT & PRODUCTS* but are NOT in the commodity Tree of Wheat: *Food PReparations* and *Mixes and dougths*[2].

2.2 `sua_unbalanced + Production filled`

The first step of the Sua Filling is the creation/increment of production for derived commodities. The overall process is described in the methodological document of Standardization and Balancing.

The result of this step is reported in the second part of the printTree document (figure 2). Any change from the previous table is reported with 3 asterisk (***) before and after.

[1] see Standardization & Balancing for Food Balance Sheet Calculation

[2] a more detailed description of the commodities included in the sua_unbalanced table is contained in the methodological document of *Standardization and Balancing*

sua_unbalanced

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals
Wheat	0111	126,208,400	2,971,249	957.468	1,120,565	-	-	29,181,617	4,277,567	-	2,985,279	2,713,000	-
Wheat and meslin flo	23110	70,500,000	33,054.85	188,674	-	67,300,000	-	-	-	-17,344.99	-	-	-
Breakfast Cereals	23140.03	170,860.8	25,747.15	89,664.33	-	106,943.6	-	-	-	-27.5622	-	-	-
Mixes and doughs for	23180	-	6,496.907	38,071.88	-	0	-	0	-	0	-	-	-
Other Fructose and S	23210.03	126,277.2	3,659.027	162,323.8	-	0	-	-	-	0	-	-	-
Starch of Wheat	23220.01	239,816.3	11,035.48	40,310.55	-	-	-	172,196.4	-	-	7,919.253	-	-
Wheat Gluten	23220.02	25,580.4	876.867	117,372.9	-	-	-	0	-	-	-	-	-
Communion wafers, em	23490.01	13,262.67	8,797.298	5,820.58	-	16,239.38	-	-	-	-4.1853	-	-	-
Uncooked pasta, not	23710	1,415,692	12,519.61	22,550.3	-	1,405,661	-	-	-	-362.2762	-	-	-
Food Preparations of	23999.02	-	69,685.96	21,977.43	-	47,708.53	-	-	-	-12.2958	-	-	-
Bran of Wheat	39120.01	21,414,279	156,359.4	2,200.316	-	16,500,000	-	4,827,244	-	-4,252.487	-	-	-
Gluten Feed and Meal	39130.04	793,739.8	160,230.6	529,332.8	-	-	-	-	-	-	-	-	-
bread	F0020	15,486.19	2,897.86	4,209.966	-	14,174.09	-	-	-	-3.653	-	-	-
pastry	F0022	193,950.4	89,593.34	117,629.5	-	165,914.2	-	-	-	-42.7605	-	-	-

Figure 1: printTree output 1 - sua unbalanced

sua_unbalanced + production filled (step 1 of suaFilling):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals
Wheat	0111	126,208,400	2,971,249	957.468	1,120,565	-	-	29,181,617	4,277,567	-	2,985,279	2,713,000	-
Wheat and meslin flo	23110	70,500,000	33,054.85	188,674	-	67,300,000	-	-	-	-17,344.99	-	-	-
Breakfast Cereals	23140.03	170,860.8	25,747.15	89,664.33	-	106,943.6	-	-	-	-27.5622	-	-	-
Mixes and doughs for	23180	-	6,496.907	38,071.88	-	0	-	0	-	0	-	-	-
Other Fructose and S	23210.03	**158,664.8**	3,659.027	162,323.8	-	0	-	-	-	0	-	-	-
Starch of Wheat	23220.01	239,816.3	11,035.48	40,310.55	-	-	-	172,196.4	-	-	7,919.253	-	-
Wheat Gluten	23220.02	**116,496**	876.867	117,372.9	-	-	-	0	-	-	-	-	-
Communion wafers, em	23490.01	13,262.67	8,797.298	5,820.58	-	16,239.38	-	-	-	-4.1853	-	-	-
Uncooked pasta, not	23710	1,415,692	12,519.61	22,550.3	-	1,405,661	-	-	-	-362.2762	-	-	-
Food Preparations of	23999.02	-	69,685.96	21,977.43	-	47,708.53	-	-	-	-12.2958	-	-	-
Bran of Wheat	39120.01	21,414,279	156,359.4	2,200.316	-	16,500,000	-	4,827,244	-	-4,252.487	-	-	-
Gluten Feed and Meal	39130.04	793,739.8	160,230.6	529,332.8	-	-	-	-	-	-	-	-	-
bread	F0020	15,486.19	2,897.86	4,209.966	-	14,174.09	-	-	-	-3.653	-	-	-
pastry	F0022	193,950.4	89,593.34	117,629.5	-	165,914.2	-	-	-	-42.7605	-	-	-

Figure 2: printTree output 2 - sua unbalanced with production

2.3 Availabilities, extraction rates and shares for Food Processing calculation

The document includes the table with extraction Rates, shares, weights and availabilities (figure 3) used for the next step, which is the calculation of Food Processing. Please notice that here, not just the portion of commodity tree of Wheat is reported, but also any other related commodity. In particular, with *related* commodity is meant that, if a child of the commodity tree of wheat, is also child of dome other commodity of some other tree, also this commodity is reported, because is related to that child of wheat. This additional commodity will be also shown in the next steps because its figures might change, and actually change, when the figure of the FBS wheat tree change.

Availability of Parent for Food Processing Calculation = Prod+Imp-Exp | Shares by Child | weight of children:

Child	ChildName	Parent	ParentName	extractionRate	availability	share	weight
23110	Wheat and meslin flo	0111	Wheat	0.780000	129,178,692	1.00	1
39120.01	Bran of Wheat	0111	Wheat	0.220000	129,178,692	1.00	0
23710	Uncooked pasta, not	23110	Wheat and meslin flo	1.000000	70,344,381	1.00	1
23140.01	Germ of Wheat	0111	Wheat	0.021245	129,178,692	1.00	0
F0020	bread	23110	Wheat and meslin flo	1.000000	70,344,381	1.00	1
23140.02	Bulgur	0111	Wheat	0.950000	129,178,692	1.00	1
F0022	pastry	23110	Wheat and meslin flo	1.000000	70,344,381	1.00	1
23220.01	Starch of Wheat	23110	Wheat and meslin flo	0.750000	70,344,381	1.00	1
23220.02	Wheat Gluten	23110	Wheat and meslin flo	0.080000	70,344,381	1.00	0
23140.03	Breakfast Cereals	23140.04	Pot Barley	0.800000	391,340.6	1.00	1
23490.01	Communion wafers, em	23110	Wheat and meslin flo	1.000000	70,344,381	1.00	1
24230.01	Wheat-Fermented Beve	23110	Wheat and meslin flo	1.147352	70,344,381	1.00	1
23210.03	Other Fructose and S	23220.01	Starch of Wheat	1.000000	210,541.2	1.00	1
39130.04	Gluten Feed and Meal	23220.02	Wheat Gluten	1.000000	617,865.7	0.33	0
39130.04	Gluten Feed and Meal	39120.04	Bran of Maize	1.000000	1,235,731	0.67	0

Figure 3: printTree output 3 - availabilities, extraction rates and shares for Food Processing calculation

2.4 `sua_unbalanced + Production filled + Food Processing`

From table in figure 3, Food processing (**??**) can be better understood. Also in figure 4 Any change from the previous table is reported with 3 asterisk (***) before and after.

2.5 `sua_balanced` and Nutrient Values

After food processing, the sua filling compute/change any other figure that is required. The result is the sua_unbalanced table (figure 4). The table also reports the DES (Dietary Energy Supply). Indeed, as described in the methodological document, DES is based on food quantities at this step of the process.

sua_unbalanced + production + food processing caluclated (step 2 of suaFilling):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals
Wheat	0111	126,208,400	2,971,249	957.468	1,120,565	-	**90,384,615**	29,181,617	4,277,567	-	2,985,279	2,713,000	-
Wheat and meslin flo	23110	70,500,000	33,054.85	188,674	-	67,300,000	**1,958,146**	-	-	-17,344.99	-	-	-
Breakfast Cereals	23140.03	170,860.8	25,747.15	89,664.33	-	106,943.6	-	-	-	-27.5622	-	-	-
Mixes and doughs for	23180	-	6,496.907	38,071.88	-	0	-	0	-	0	-	-	-
Other Fructose and S	23210.03	158,664.8	3,659.027	162,323.8	-	0	-	-	-	0	-	-	-
Starch of Wheat	23220.01	239,816.3	11,035.48	40,310.55	-	-	**158,664.8**	172,196.4	-	-	7,919.253	-	-
Wheat Gluten	23220.02	116,496	876.867	117,372.9	-	-	**0**	0	-	-	-	-	-
Communion wafers, em	23490.01	13,262.67	8,797.298	5,820.58	-	16,239.38	-	-	-	-4.1853	-	-	-
Uncooked pasta, not	23710	1,415,692	12,519.61	22,550.3	-	1,405,661	-	-	-	-362.2762	-	-	-
Food Preparations of	23999.02	-	69,685.96	21,977.43	-	47,708.53	-	-	-	-12.2958	-	-	-
Bran of Wheat	39120.01	21,414,279	156,359.4	2,200.316	-	16,500,000	-	4,827,244	-	-4,252.487	-	-	-
Gluten Feed and Meal	39130.04	793,739.8	160,230.6	529,332.8	-	-	-	-	-	-	-	-	-
bread	F0020	15,486.19	2,897.86	4,209.966	-	14,174.09	-	-	-	-3.653	-	-	-
pastry	F0022	193,950.4	89,593.34	117,629.5	-	165,914.2	-	-	-	-42.7605	-	-	-

Figure 4: printTree output 4 - sua unbalanced with Food Processing

sua_balanced:

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
Wheat	0111	126,208,400	2,971,249	957.468	1,120,565	-	90,384,615	29,181,617	4,277,567	-	2,985,279	2,713,000	-	-
Wheat and meslin flo	23110	70,500,000	33,054.85	188,674	-	**68,372,646**	1,958,146	-	-	-17,344.99	-	-	-	**478.3753**
Breakfast Cereals	23140.03	170,860.8	25,747.15	89,664.33	-	**106,971.2**	-	-	-	-27.5622	-	-	-	**0.8201**
Mixes and doughs for	23180	-	6,496.907	38,071.88	-	0	-	0	-	0	-	-	-	**0**
Other Fructose and S	23210.03	158,664.8	3,659.027	162,323.8	-	0	-	-	-	0	-	-	-	**0**
Starch of Wheat	23220.01	**314,020.8**	11,035.48	40,310.55	-	-	158,664.8	**120,537.5**	-	-	**5,543.477**	-	-	-
Wheat Gluten	23220.02	116,496	876.867	117,372.9	-	-	0	0	-	-	-	-	-	-
Communion wafers, em	23490.01	13,262.67	8,797.298	5,820.58	-	16,239.38	-	-	-	-4.1853	-	-	-	**0.1405**
Uncooked pasta, not	23710	1,415,692	12,519.61	22,550.3	-	**1,406,024**	-	-	-	-362.2762	-	-	-	**10.1699**
Food Preparations of	23999.02	-	69,685.96	21,977.43	-	47,708.53	-	-	-	-12.2958	-	-	-	**0.3545**
Bran of Wheat	39120.01	21,414,279	156,359.4	2,200.316	-	**16,689,929**	-	**4,882,810**	-	-4,252.487	-	-	-	**70.0635**
Gluten Feed and Meal	39130.04	793,739.8	160,230.6	529,332.8	-	-	-	**424,637.7**	-	-	-	-	-	-
bread	F0020	15,486.19	2,897.86	4,209.966	-	14,174.09	-	-	-	-3.653	-	-	-	**0.0696**
pastry	F0022	193,950.4	89,593.34	117,629.5	-	**165,957**	-	-	-	-42.7605	-	-	-	**1.2069**

Figure 5: printTree output 5 - sua balanced (after Sua Filling)

2.6 Availabilities, extraction rates and shares for Standardization

Also for Standardization, a table extracted from the commodity tree is reported, with Availability, extraction rates, shares and weights. Also in this case, *related* commodities are shown.

Availability of parents in terms of their children = FoodProc * eR | Final Shares by child:

Child	ChildName	Parent	ParentName	extractionRate	availability	share	weight
23110	Wheat and meslin flo	0111	Wheat	0.78	70,500,000	1.00	1
39120.01	Bran of Wheat	0111	Wheat	0.22	19,884,615	1.00	0
23710	Uncooked pasta, not	0111	Wheat	0.78	72,458,146	1.00	1
23140.01	Germ of Wheat	0111	Wheat	0.02	1,920,221	1.00	0
F0020	bread	0111	Wheat	0.78	72,458,146	1.00	1
23140.02	Bulgur	0111	Wheat	0.95	85,865,385	1.00	1
F0022	pastry	0111	Wheat	0.78	72,458,146	1.00	1
23220.01	Starch of Wheat	0111	Wheat	0.58	54,343,610	1.00	1
23220.02	Wheat Gluten	0111	Wheat	0.06	5,796,652	1.00	0
23140.03	Breakfast Cereals	0115	Barley	0.48	3,003,784	1.00	1
23490.01	Communion wafers, em	0111	Wheat	0.78	72,458,146	1.00	1
23210.03	Other Fructose and S	0111	Wheat	0.58	54,502,275	1.00	1
39130.04	Gluten Feed and Meal	0111	Wheat	0.06	5,796,652	0.76	0
39130.04	Gluten Feed and Meal	0112	Maize (corn)	0.09	1,803,440	0.24	0

Figure 6: printTree output 6 - availabilities, extraction rates and shares for standardization

2.7 `fbs_standardized`

figure 7 shows the result of standardization. Only zero-level commodities are reported in this table. Again any change from the previous table is reported with 3 asterisk (***) before and after.

2.8 `fbs_balanced` and adjustment of Nutrient Values

Two tables are reported for balanced Food Balance Sheet. One for the quantities (figure 8) and one with the Nutrient values updated (figure 9).

2.9 FBS aggregation

Finally, all the FBS item aggregated are reported. Also related FBS items are reported. Tables reported in figure 9 contain all level of aggregations.

All the tables presented are contained in a single document.

fbs_standardized

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
Wheat	0111	126,208,400	**3,184,654**	**781,808**	1,120,565	**89,711,591**	**0**	**29,387,664**	4,277,567	**-22,766.5**	**2,994,755**	2,713,000	**0**	**560.0257**
Mixes and doughs for	23180	-	6,496.907	38,071.88	**0**	0	**0**	0	**0**	0	**0**	**0**	**0**	0
Food Preparations of	23999.02	-	69,685.96	21,977.43	**0**	47,708.53	**0**	**0**	**0**	-12.2958	**0**	**0**	**0**	0.3545

Figure 7: printTree output 7 - fbs standardized

fbs_balanced:

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
Wheat	0111	**126,221,780**	**3,191,406**	**780,150.4**	**1,090,866**	**89,236,062**	0	**28,608,797**	**4,164,198**	**-23,369.88**	**2,915,384**	**2,641,097**	0	560.0257
Mixes and doughs for	23180	**0**	**11,099.67**	**11,099.67**	0	0	0	0	0	0	0	0	0	0
Food Preparations of	23999.02	**0**	69,685.96	21,977.43	0	47,708.53	0	0	0	-12.2958	0	0	**12.2958**	0.3545

fbs_balanced with updated nutrient values:

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
Wheat	0111	126,221,780	3,191,406	780,150.4	1,090,866	89,236,062	0	28,608,797	4,164,198	-23,369.88	2,915,384	2,641,097	0	**557.0572**
Mixes and doughs for	23180	0	11,099.67	11,099.67	0	0	0	0	0	0	0	0	0	0
Food Preparations of	23999.02	0	69,685.96	21,977.43	0	47,708.53	0	0	0	-12.2958	0	0	12.2958	0.3545

Figure 8: printTree output 8 - fbs balanced and fbs balanced with nutrients updated

FBS Table at first level of aggregation (fbs items):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
WHEAT & PRODUCTS	2511	126,221,780	3,272,192	813,227.5	1,090,866	89,283,771	0	28,608,797	4,164,198	-23,382.18	2,915,384	2,641,097	12.2958	557.4117
MAIZE & PRODUCTS	2514	215,646,300	2,607,014	972,292.9	-37,732.75	10,744,697	6,099,781	143,788,614	2,297,543	-2,588.947	36,431,670	9,700,000	8,259,039	60.1679
SWEETENERS, OTHER &	2543	0	17,640.24	17,591.35	0	48.89	0	0	0	-0.0126	0	0	0.0126	0.0003
BEVERAGES, FERMENTED	2657	3,361,468	6,863.671	19,739.94	0	3,349,455	-	0	0	-863.0211	0	0	0	3.1026

FBS Table at second level of aggregation (fbs aggregates):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
CEREALS &PROD. EXCL	2905	557,425,224	20,835,349	3,248,501	10,922,600	266,674,214	9,160,912	199,216,583	13,786,396	-69,280.44	42,941,839	20,934,770	11,444,037	1,442.044
SWEETENERS	2909	12,807,305	3,617,025	598,872.7	-1,049,485	15,803,669	286,340.5	0	0	-2,449.464	0	22,704.02	764,678.6	110.3185
ALCOHOL (INCL BEER&W	2924	63,996,617	820,182.3	343,950.1	0	62,183,025	22,859.59	0	0	-16,034.09	2,282,994	0	4.3807	95.9322

FBS Table at third level of aggregation (fbs macro aggregates):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
VEGETABLE PROD. (DEM	2903	1,778,914,939	154,782,065	26,232,702	9,948,701	1,107,614,579	227,982,944	340,218,284	17,403,713	-315,270.4	78,697,328	97,503,864	28,410,159	2,465.202

FBS Table at final level of aggregation (Grand Total):

itemName	Item	Production	Imports	Exports	StockChange	Food	Food Processing	Feed	Seed	Tourist	Industrial	Loss	Residuals	DESfoodSupply_kCd
GRAND TOTAL - DEMAND	2901	1,940,733,489	177,486,138	27,427,634	9,948,701	1,272,788,655	229,422,480	347,720,409	18,125,532	-370,776	81,577,706	99,470,600	32,108,686	3,127.772

Figure 9: printTree output 9 - FBS aggregations

3 printTree Plug-in

3.1 Input dataset

The plug-in is selected and launched from the `sua_unbalanced` data-set. Therefore, a session has to be opened in this data-set (figure 10). From the session, the *R plugins* section has to be opened and the `printTree` plug-in selected (figure 11).

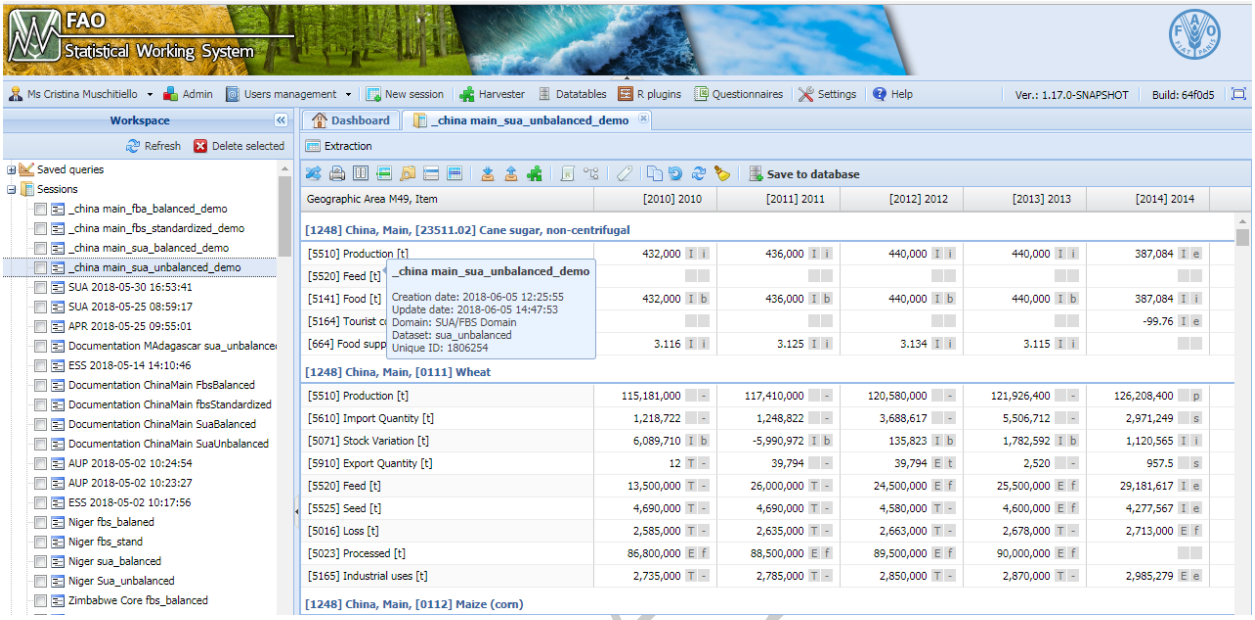

Figure 10: printTree plug-in: input dataset

3.2 Plug-in definition

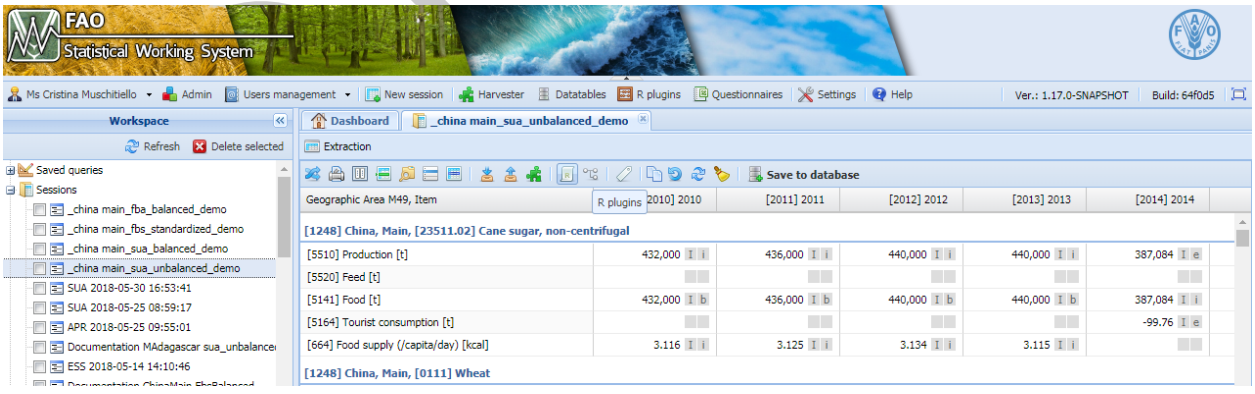

Figure 11: printTree plug-in: call plug-in window

Figure 12 shows the drop-down menu for the selection of the FBS item. Also first and last year have to be selected and the countries. Always *session country* is selected in this case (figure 13).

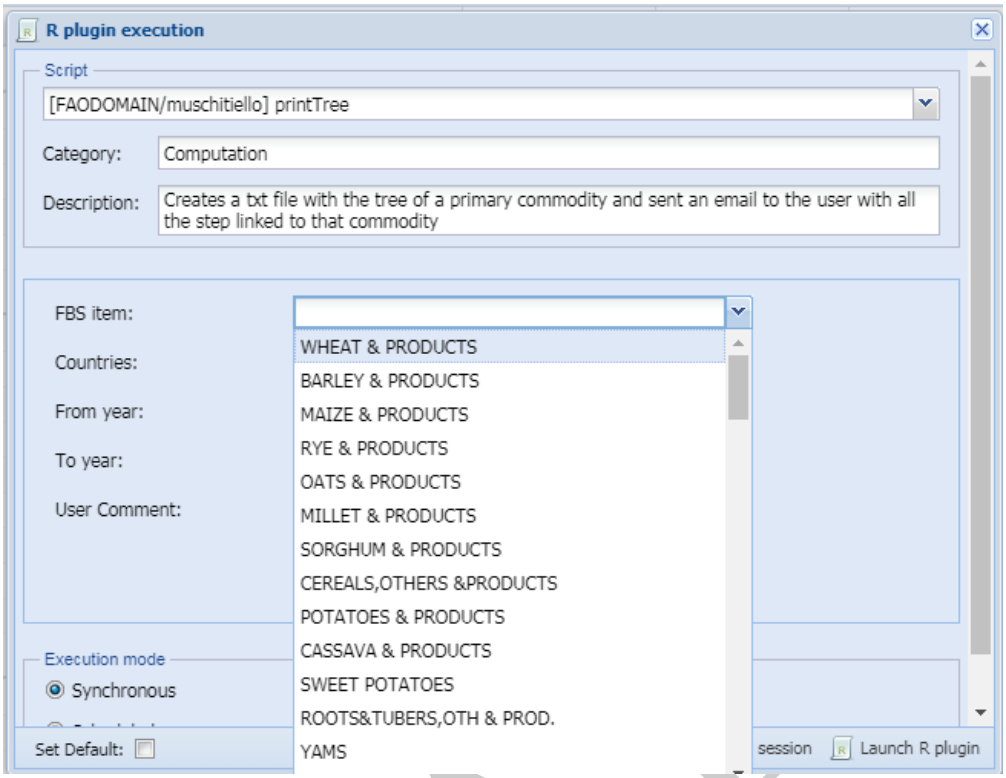

Figure 12: printTree plug-in: select FBS item from drop down menu

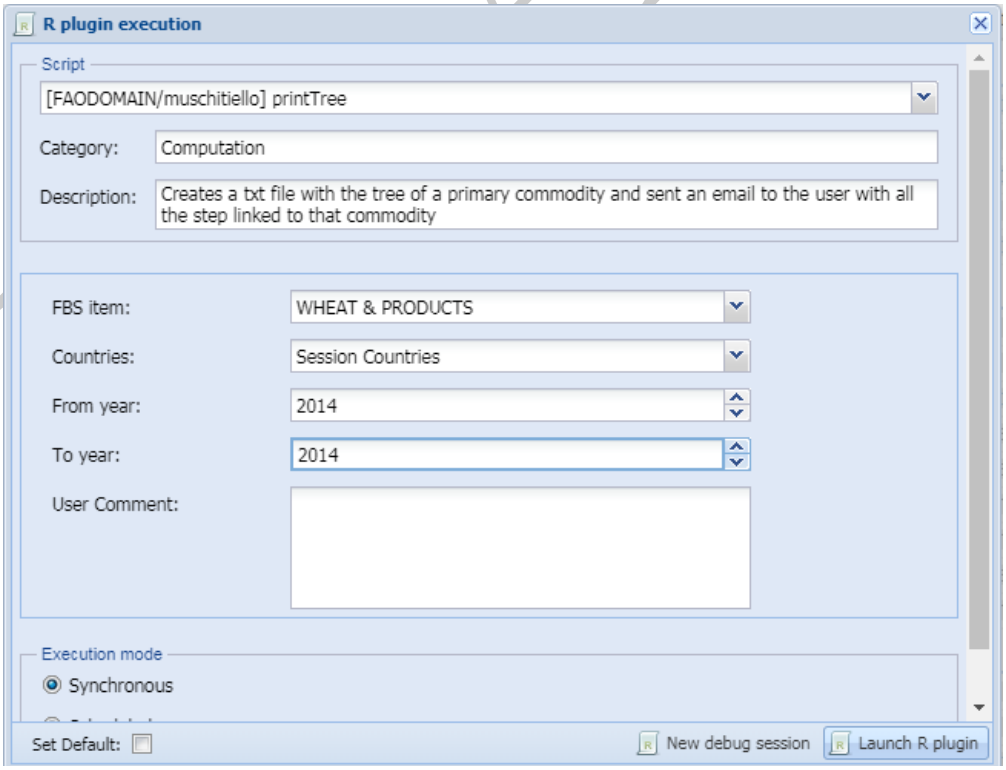

Figure 13: printTree plug-in: select other parameters and run

3.3 Plug-in output

When the plug-in has run, an email is sent with an attached folder (figure 14). The folder includes other folder before reaching the file. This is due to the structure of the SWS server and for the moment is not possible to simplify this structure (figure 15). Finally the file is contained, the content of which has been already explained. It has to be opened with *Notepad ++*.

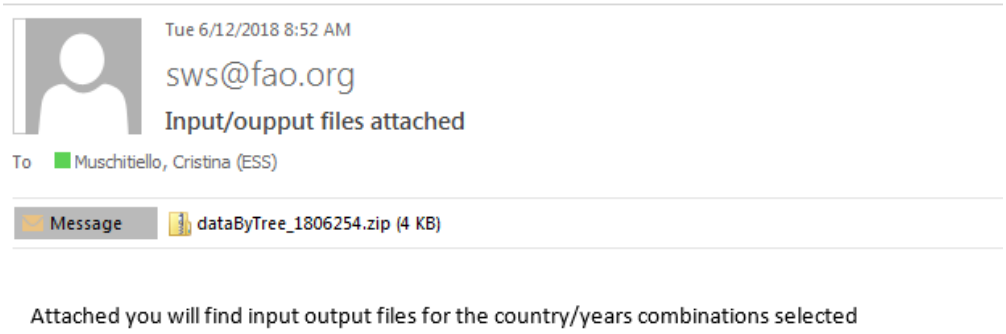

Figure 14: printTree plug-in: email

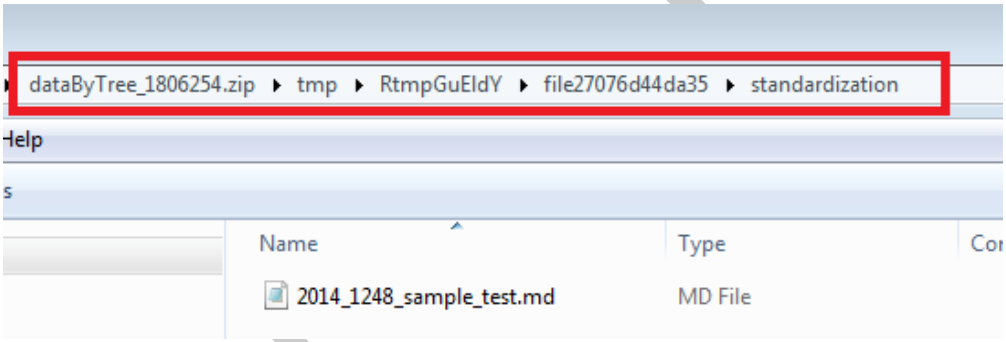

Figure 15: printTree plug-in: folders