StarTree final congress

"Wild Forest Products in Europe" 13–14 Barcelona, October 2016

Wild forest products international trade: which opportunities for the European market?

Davide Pettenella, Enrico Vidale
Riccardo Da Re and Giulia Corradini

StarTree Multipurpose trees and non-wood forest products, a challenge and opportunity

Università degli Studi di Padova | TESAF | www.star-tree.eu

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 612385

A work carried out under the StarTree project (Working Package 3)

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Outline

- Methodology
- Results
- Policy implications

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Methodology

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Methodology

Three fundamental steps:

1. Definition of NWFP
2. Data source
3. Data cleaning

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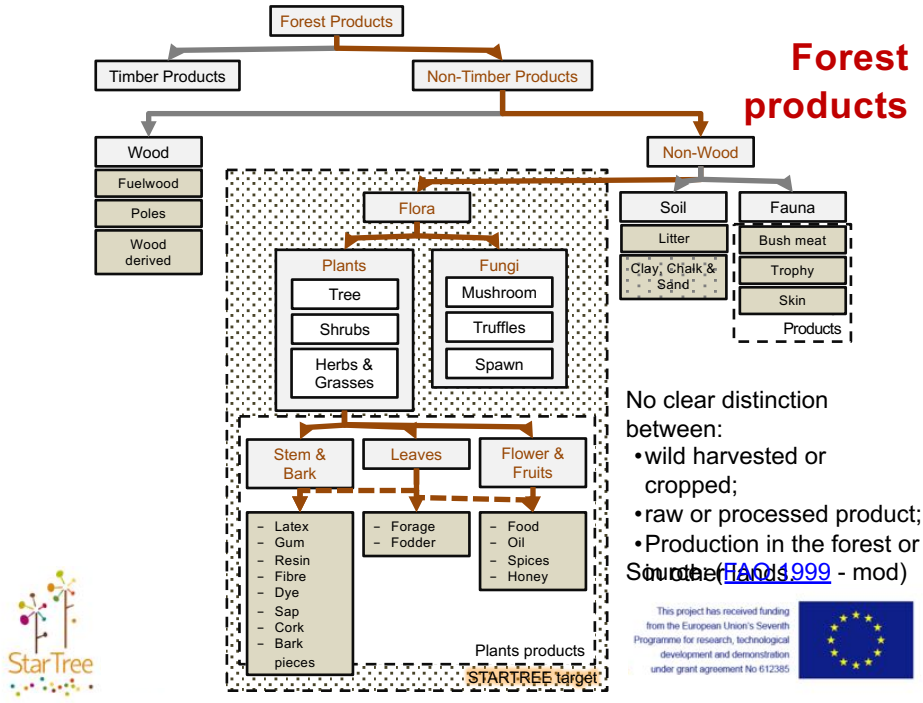

Forest products

No clear distinction between:

- wild harvested or cropped;
- raw or processed product;
- Production in the forest or in other lands;

Source (FAO 1999 - mod)

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Definition

Different approaches in definition:

- By the origin
- By the typology of products (by species)
- By level of processing (raw, processed, end product)
- by commercial categories (size, fresh, dry, purity, etc.)
- By the end use (food, fiber, …)
- By management system
- By functional use
- ...

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1. NWFP definition

NWFP are "products of biological origin other than wood derived from forests, other wooded land and trees outside forests" - (FAO 1999)

NTFP are "all biological materials other than timber which are extracted from forest for human use" - (De Beer and McDermott 1989)

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NWFP definition

A slight convergence in the definition of NWFPs comes from national laws and standards

propose

Today a

consum

resultin

parts th , g , as, forests and agricultural areas" (EU Reg. 2092/91; see Kilchling et al. 2009)

The concept of "wild product" is recognized by the NWFP customers!
→ "Wild Forest Products" (WFP) should be used in communication and marketing

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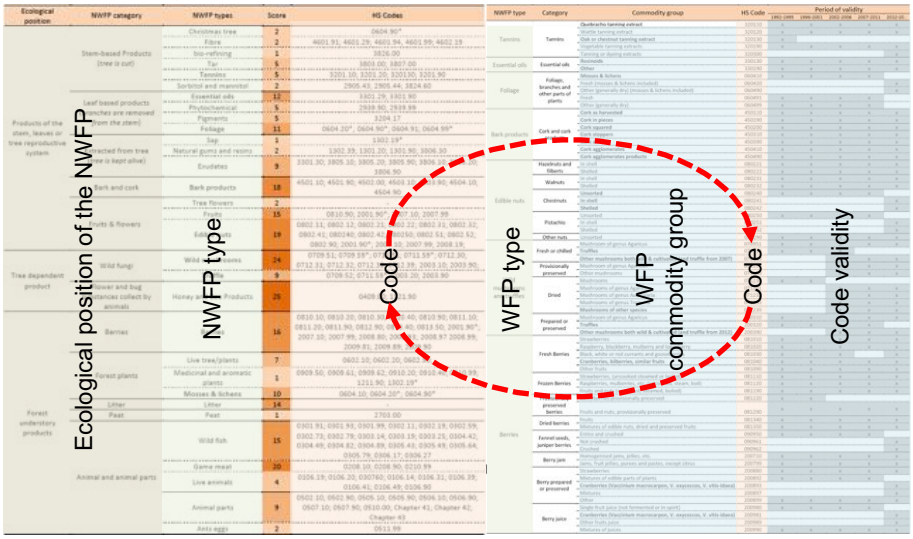
Coordination of classification approaches developed in Star-Tree

Ecological classification

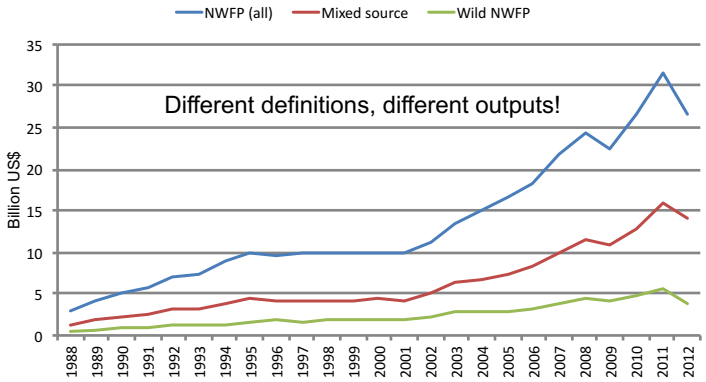
Trade classification



Source: WCO (2014), ComTrade (2013), mod.

Source: WCO (2014) mod.

Strategic role of WFP definition



2. WFP trade data sources

- International:
  - **ComTrade**
  - FAOStat
  - EuroStat
  - US Bureau
  - World Bank
  - ...
- Other: national/sectoral (national statistical agency, category associations, etc.)

more detailed (less aggregated than FAO), primary source for FAO, more "international" (not focused on EU countries), …

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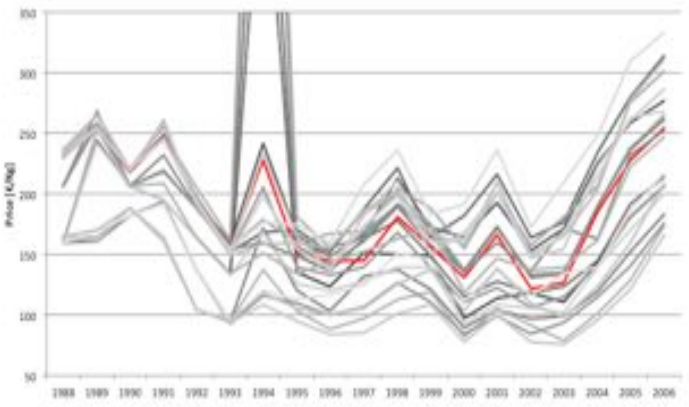
3. Selection of a data cleaning approach: the problem

Example of truffle price (average price per year [€/Kg])



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Data cleaning

- No common agreed methodology to deal with the problem of outliers and the mismatch of data on import-export
- Only suggested approaches

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Selection of a data cleaning approach

Approach	*Pro*	*Cons*
a) Use the raw data as reported	No data cleaning	Double accounting of quantity and economic value of specific commodities
b) Use an average of the reported data from each source	Fast data cleaning and database preparation	Problems on price estimation and quantity accountability
c) Use import data in preference to export data (the rationale is that many countries are much more strict in regulating imports than exports, and hence records are likely to be better)	Fast data cleaning and database preparation	Quantity underestimation and unreliable reporting of some developing countries
d) Use data from developed economies in preference to data from developing economies, or large economies in preference to small economies (this may be justified on the basis of assumed better reporting practices, or the law of large numbers)	Better comparison with Eurostat and US trade statistic bureau	Problems persist in trade data among developing countries

Note: Adapted from UN-ESCAP (2009) page 34.

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A new data cleaning methodology

- No common agreed methodology to deal with the problem of outliers and the mismatch of data on import-export
- Only suggested approaches
- A new methodology developed and tested (now also in other products trade analysis)
  - **Mirroring** technique selection
  - **Outliers** detection
  - **Missing data** estimation

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Results

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Data elaboration

Three fundamental steps:

1. General trade patterns analysis (trends, concentration: top importers, top exporters, …)
2. Focus on 4 main WFP target categories
3. More advanced statistical analysis

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Some spot results will be presented. For more information

Project no. 311919

Star-Tree

Multipurpose trees and non-wood forest products: challenges and opportunities for policy makers

Start date of project: 1 November 2012
Duration of project: 4 years

Collaborative Project
FP7-KBBE-2012-6-singlestage

D3.1. NWFP in the international market: current situation and trends

Due date of deliverable: **30th November 2014**
Actual submission date: **5th December 2014**

Organisation name of lead contractor for this deliverable: **University of Padua**
Dissemination level: **Public**

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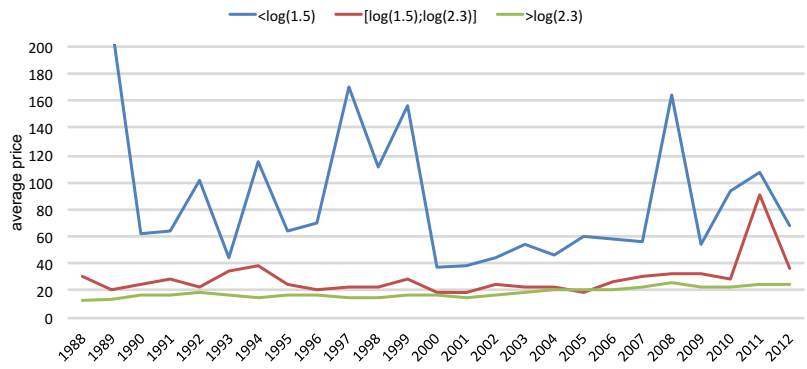
1. General trade patterns analysis

Some examples
Cork price: three market segments inside the international trade



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General trade patterns analysis

Some examples

Top exporters on tanning market (ton)

Top 10 Exp. Tons

Country	2008	Country	2009	Country	2010	Country	2011	Country	2012
Argentina	63786	Argentina	42082	Argentina	59046	Argentina	55206	South Africa	39026
Brazil	43400	Brazil	32891	South Africa	45591	South Africa	43017	Brazil	33650
S. Africa	39099	South Africa	31188	Brazil	37145	Brazil	38438	Argentina	24838
USA	16223	Indonesia	18435	Indonesia	21201	Indonesia	13636	Indonesia	15844
Italy	10752	India	11288	France	12541	India	9982	USA	10620
India	7680	Italy	10694	Italy	10362	Italy	9270	India	8004
Slovenia	6843	USA	8327	India	9307	USA	7583	Hong Kong	6604
Peru	5589	Peru	5366	Peru	8944	Slovenia	6470	Slovenia	5396
China	4100	Slovenia	5209	USA	7675	Hong Kong	5868	Italy	5182
Zimbabwe	3784	Germany	4559	Slovenia	7493	Peru	5427	Peru	4616

Top 10 Export Links

Country	2008	Country	2009	Country	2010	Country	2011	Country	2012
Italy	155	Italy	158	Italy	161	Italy	166	Germany	128
USA	130	USA	128	USA	135	USA	134	USA	114
Germany	121	France	113	Germany	121	Germany	128	Brazil	96
France	112	Germany	112	France	119	France	119	India	91
Brazil	99	Brazil	109	Brazil	104	India	111	Italy	87
Argentina	94	Argentina	90	India	102	Brazil	105	South Africa	76
South Africa	91	India	89	Argentina	95	Argentina	92	France	70
UK	70	South Africa	84	South Africa	90	South Africa	83	Belgium	67
Belgium	64	Belgium	70	UK	84	China	78	Spain	51
India	62	China	64	China	76	Belgium	77	UK	50

Analysis of trends

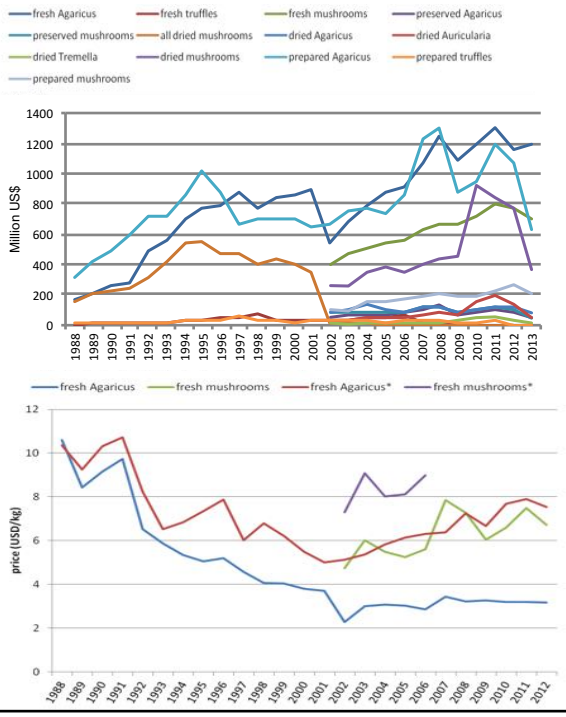
Some examples

Wild mushroom

Domesticated mushrooms are the predominant part of the market in terms of bulk

Wild mushrooms cover the 26.4% of the total traded volume that worthies the 45.6% of the total value (4.98 B US$ in 2011)

Boletes prices are approximately 6.15 €/kg at wholesaler level and chantarelles has been stabilized globally close to 4.5-5€/kg



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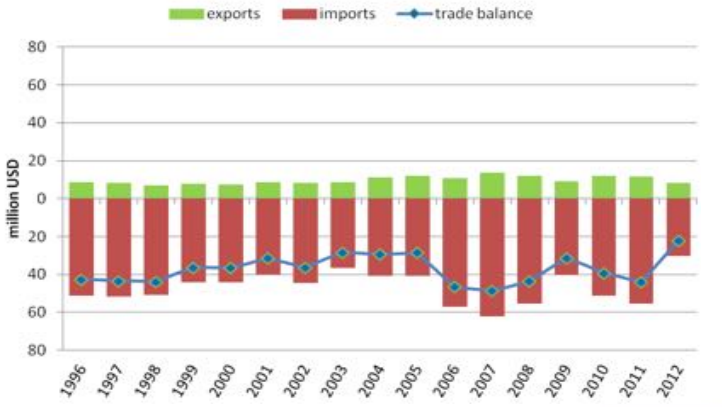
General trade patterns analysis

EU28 total imports, exports and trade balance for quebracho and wattle tannins, from 1996 to 2012 (million dollars)



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EU-World. Trade balance

	Code	Level of processing	Part of wild harvest?	World 2011	From EU28 2011	To EU28 2011	EU28 balance	World-EU28 Exp. %	World-EU28 Imp. %
Honey	040900	Raw	Yes	1906	616	1019	-403	32.34	53.48
Mosses	060410	Raw	Yes	58	33	37	-4	55.98	62.61
Fresh foliage	060491	Raw	Yes	1210	729	887	-157	60.29	73.28
Dry foliage	060499	Raw	Yes	367	170	231	-61	46.33	63.06
Fresh & frozen Agaricus	070951	Raw	No	1302	1102	972	129	84.63	74.68
Fresh & frozen truffles	070952	Raw	Yes	-	-	-	-	-	-
Fresh & frozen mushrooms	070959	Raw	Yes	785	414	480	-66	52.69	61.12
Preserved Agaricus	071151	Processed	No	101	32	53	-21	32.07	52.99
Preserved mushrooms	071159	Processed	Yes	119	17	85	-68	14.45	71.68
Dried mushrooms	071230	Raw	Yes	-	-	-	-	-	-
Dried Agaricus	071231	Raw	No	116	41	58	-17	35.52	49.94
Dried Auricularia	071232	Raw	Yes	196	4	16	-12	1.95	8.12
Dried Tremella	071233	Raw	Yes	55	1	2	0	2.30	3.08
Dried mushrooms	071239	Raw	Yes	1370	71	170	-100	5.17	12.44
Almonds	080211	Raw	No	1043	36	55	-19	3.41	5.28
Shelled almonds	080212	Processed	No	3369	671	1710	-1038	19.93	50.75
Hazelnuts	080221	Raw	No	180	25	41	-17	13.61	23.00
Shelled hazelnuts	080222	Processed	No	1782	296	1342	-1046	16.60	75.32
Walnuts	080231	Raw	No	987	164	308	-144	16.61	31.23
Shelled walnuts	080232	Processed	No	1545	219	678	-459	14.15	43.88
Chestnuts	080240	Raw	Yes	299	153	121	31	51.05	40.60
Pistachios	080250	Raw	No	3013	524	1287	-763	17.38	42.70
Fresh strawberries	081010	Raw	No	2579	1604	1533	71	62.18	59.41
Fresh raspberry	081020	Raw	No	1173	410	442	-32	34.97	37.70
Fresh currants	081030	Raw	No	-	-	-	-	-	-
Fresh cranberries	081040	Raw	Yes	1428	345	488	-143	24.14	34.18
Fresh other	081090	Raw	No	2948	713	914	-201	24.19	30.99
Frozen strawberries	081110	Raw	No	1090	479	706	-227	43.95	64.73
Frozen raspberries	081120	Raw	No	951	416	694	-278	43.72	73.00
Frozen fruits and nuts	081190	Raw	Yes	2530	1033	1484	-451	40.82	58.66
Prepared Agaricus	200310	Processed	No	1179	572	568	4	48.48	48.17
Prepared truffles	200320	Processed	Yes	29	24	17	6	82.02	59.62
Prepared mushrooms	200390	Processed	Yes	228	84	87	-3	36.77	38.20
Quebracho tannins	320110	Raw	Yes	85	7	32	-25	8.27	37.07
Wattle tannins	320120	Raw	Yes	130	4	24	-19	3.37	18.25
Other tannins	320190	Raw	Yes	195	92	57	35	47.05	29.12
Natural Cork	450110	Raw	Yes	147	140	132	8	94.88	89.67
Cork in piecies	450190	Processed	Yes	93	79	69	10	84.94	74.10
Cork squared	450200	Processed	Yes	72	63	42	21	87.82	58.45
Cork Stopper	450310	Processed	Yes	743	705	406	299	94.92	54.71
			Total overview	35403	12086	17247	-5161	34.14	48.72
			Total overview (only raw and partially wild sourced products)	10761	3811	5180	-1368	35.42	48.13

2. Focus on 4 main WFP target categories

Background questionnaire

Ecological classification	NWFP type	NWFP (Background questionnaire)	Interest score	Comtrade HS Codes
Products of the stem, leaves or tree reproductive system	Stem-based Products (*tree is cut*)	Christmas tree	2	
		Fibre	2	
		bio-refining	1	
		Tar	5	380300; 380700
		Tanning	5	320110; 320120; 320130; 320190; 330210; 330290;
		Sorbitol	2	290544; 382460
	Leaf based products (*branches are removed*)	Essential oils	12	330129; 330190
		Phytochemical	5	293990; 293999
		Pigments	5	320417
		Foliage	11	
	Extracted from tree (tree is kept alive)	Sap	1	130219*
		Natural gums	2	130120; 130120; 130190; 380630
		Exudate	9	330130; 380510; 380520; 380590; 380610; 380690
	Bark	Bark products	18	450110; 450190; 450200; 450310; 450390; 450410; 450490
	Fruits & flowers	Tree flowers	2	
		Fruits	15	081090
		Edible nuts	19	080221; 080222; 080231; 080232; 080240; 080250; 080290
Tree dependent species	Products based on species hosted by tree	Mushrooms	24	070959; 071159; 071232; 071233; 071239; 200390
		Truffle	9	070959
		Honey and Bee Prod	25	040900; 152190
Forest understory products	Berries	Berries	16	081010; 081040; 081110; 081120; 200880
	Forest plants	Live tree/plants	7	060310; 060390
		Medicinal and aromatic plants	1	090950; 091020; 091050; 091099; 121190; 130213; 130219*
		Mosses & lichens	10	60410
	Litter	Reprod. material	14	60200; 60290
	Peat	Peat	1	
	Animal and animal parts	Fish	15	
		Game	20	10690
		Live animals	4	30760
		Animal parts	9	
		Ants eggs	2	
Tourism	Tourism		2	

Target WFP in EU

Key products for the EU industry in which there is a international leadership:

- Chestnuts
- Tannins
- Wild mushroom
- Cork

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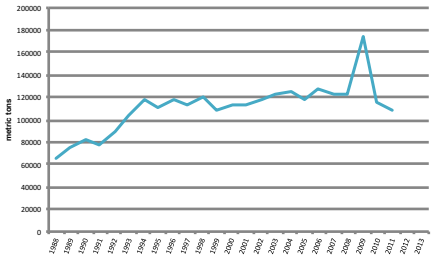
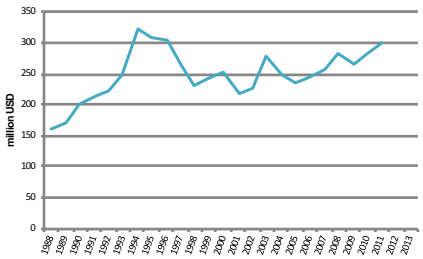
Target WFP in EU
Chestnuts





Exports (million USD)

2000		2005		2010		2011	
China	85,4	China	66,5	Italy	73,2	Italy	79,7
R. of Korea	84,3	Italy	64,1	China	70,1	China	78,4
Italy	40,2	R. of Korea	53,0	R. of Korea	45,4	R. of Korea	48,1
Portugal	13,1	Portugal	11,8	Portugal	22,5	Portugal	25,8
Spain	9,0	Turkey	9,4	Spain	16,6	Spain	20,0

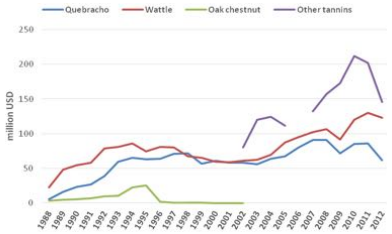
Imports (million USD)

2000		2005		2010		2011	
Japan	149,6	Japan	72,5	Japan	54,4	Japan	59,0
France	13,8	China	21,9	China	23,1	France	28,6
USA	11,5	USA	16,0	France	21,7	Italy	24,2
Asia, nes	9,8	France	13,9	USA	19,9	Switzerland	19,5
Switzerland	6,8	Switzerland	10,9	Germany	17,8	China	19,1

- Italy is (probably was) the largest traders in the world (~26% of world trade)
- Quite stable economy with an average global price of 2€/kg
- There is a new trend on import and this is due to the Asian Gall-Wasp
- Italy, France and Japan are the largest processing countries for chestnuts

Target WFP in EU
Tannin

- 3 major importers (~80% world trade)
- Future availability?
- An increased consumption in the future by skin working industry



Exports (million USD)

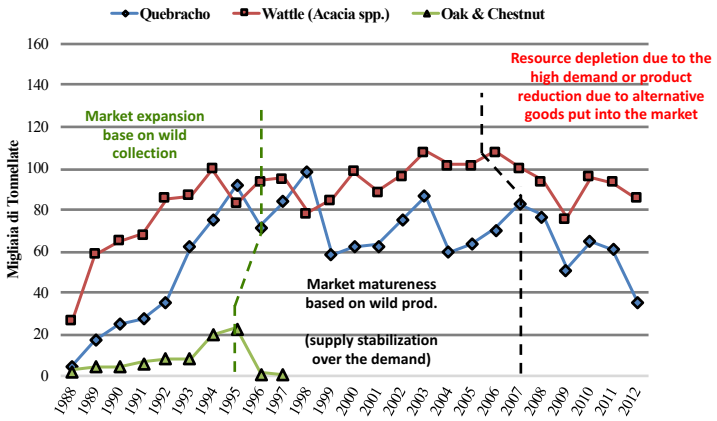
2000		2005		2010		2011	
Argentina	49	Argentina	46	Argentina	68	Argentina	69
Brazil	25	South Africa	34	South Africa	50	Brazil	57
South Africa	20	Brazil	31	Brazil	49	South Africa	53
Hong Kong	6	USA	8	USA	5	USA	6
Kenya	3	Zimbabwe	4	Zimbabwe	4	Zimbabwe	5

Imports (million USD)

2000		2005		2010		2011	
Italy	25	Italy	22	India	28	India	29
Mexico	12	India	18	China	27	Italy	28
India	10	Mexico	16	Italy	23	China	26
China	9	China	12	Mexico	18	Mexico	22
USA	6	USA	6	USA	8	USA	8

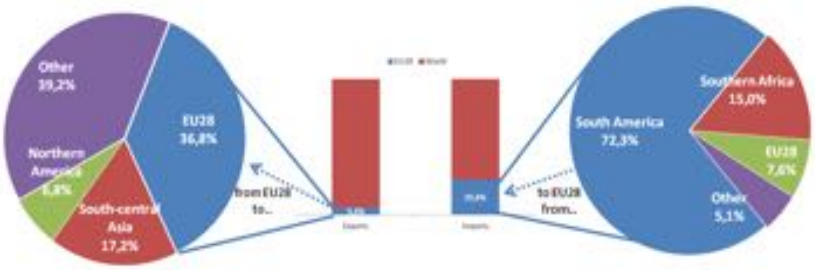
Target WFP in EU

Tannin

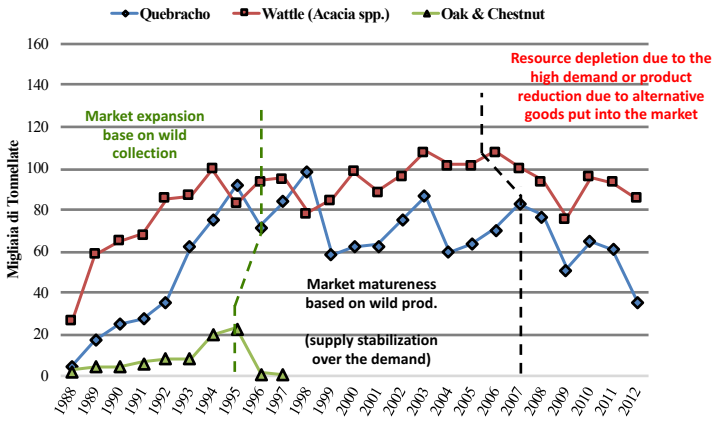


Target WFP in EU

Tannin: EU28 imports and exports' partners for tannins (only quebracho and wattle) in 2011 with respect to global trade



Target WFP in EU
Tannin



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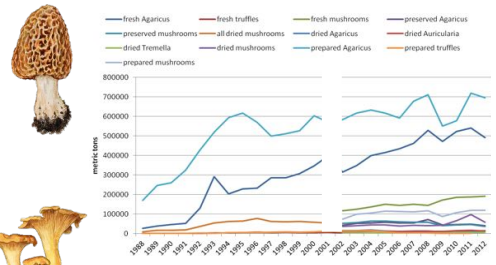
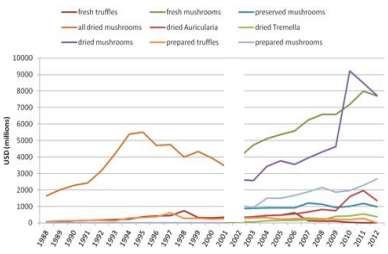
Target WFP in EU
Wild mushrooms





Exports (million USD)

2005		2010		2012	
China	139,1	China	145,1	China	163,7
Netherlands	48,0	Netherlands	77,5	Poland	93,8
Poland	44,5	Poland	75,5	Netherlands	69,4
Romania	25,0	Italy	49,6	Italy	54,4
Russian Fed.	24,3	R. of Korea	44,7	R. of Korea	37,9

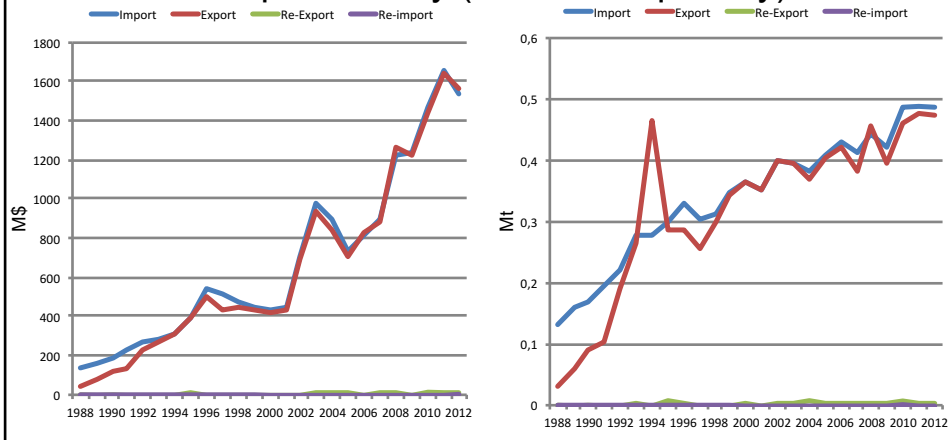
Imports (million USD)

2005		2010		2012	
Japan	152,9	Japan	99,1	Germany	100,1
Germany	75,4	Germany	95,4	Japan	97,8
Italy	61,8	France	83,8	France	90,3
France	51,7	Italy	61,2	Italy	51,9
UK	34,5	UK	58,7	USA	51,1

- Italy is the fourth largest traders in the world both in export (~7% w.t.) and import (~6% w.t.)
- The core international customer is Germany due to higher purchasing power
- The main problem of the sector is not the consumption but the production (still lacking)
- From fresh to frozen and dried WM
- Lack of reliable (global) data

3. More advanced statistical analysis

Some examples: honey (value and quantity)



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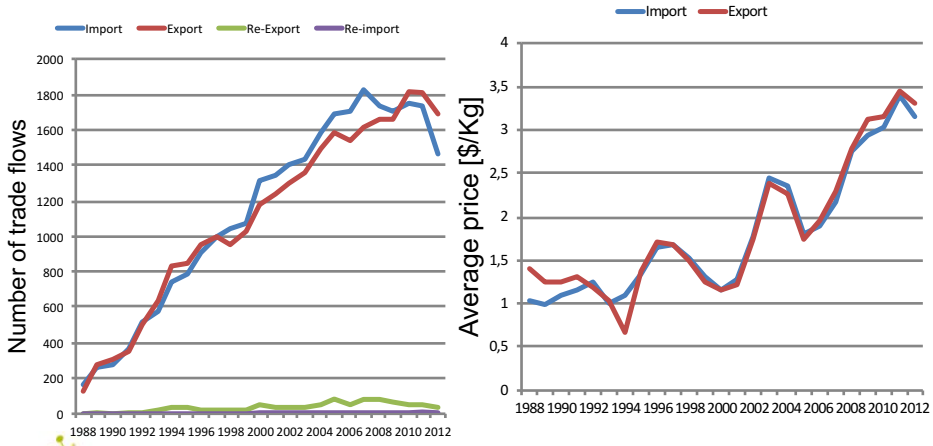
More advanced statistical analysis

Some examples: honey (number of flows and avg. prices)



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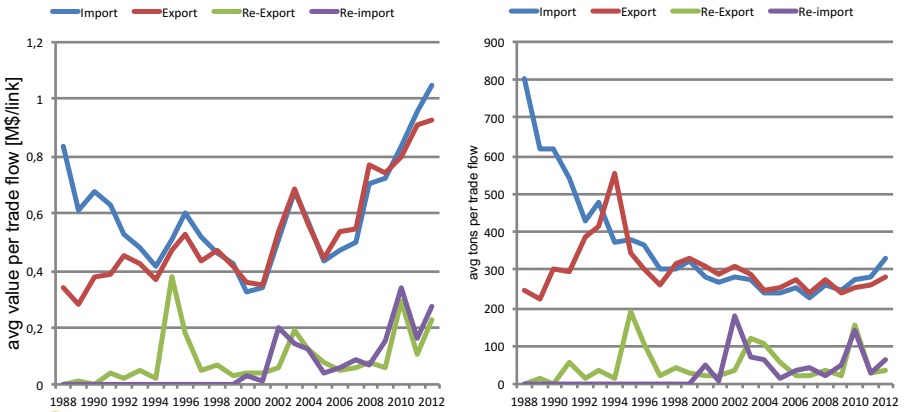
More advanced statistical analysis

Some examples: honey (avg. value per trade flow and avg. quantity per trade flow)



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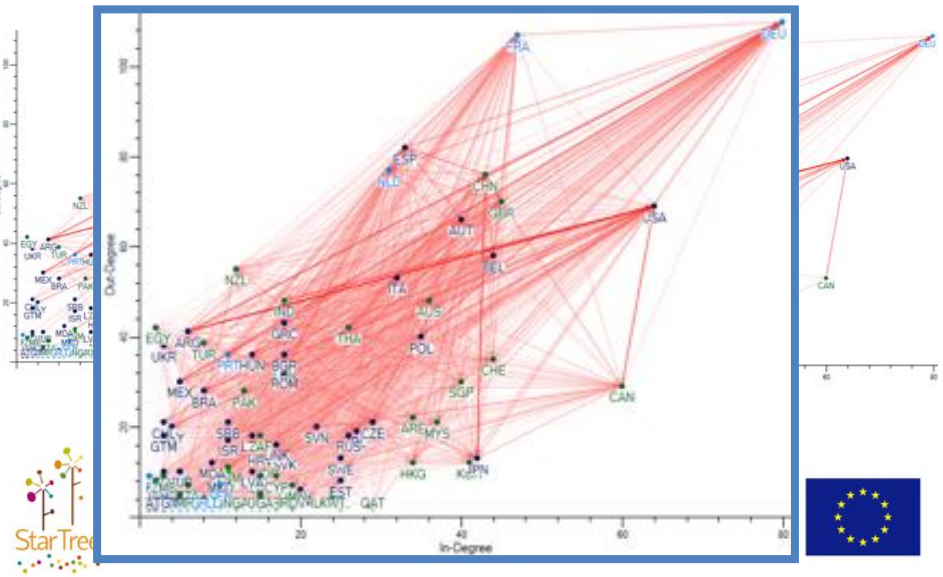
Example: honey trade (2012)



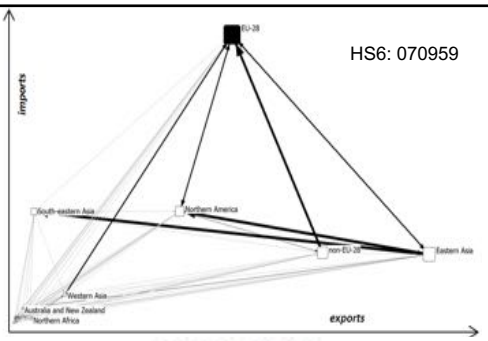
Sub continental TNA & Top traders

Example from wild mushroom

China is undoubtedly the largest fresh wild mushrooms exporter in the world, both in terms of quantity and economic value; alone, it accounted for the 21.2% of the export value in 2012

Poland and Nederland are the two main gate to EU market

Core global consumers are Japan, Germany, France, Italy and UK



Exports (million USD)

2005		2010		2012	
China	139,1	China	145,1	China	165,7
Netherlands	48,0	Netherlands	77,5	Poland	93,8
Poland	44,5	Poland	75,5	Netherlands	69,4
Romania	25,0	Italy	49,6	Italy	54,4
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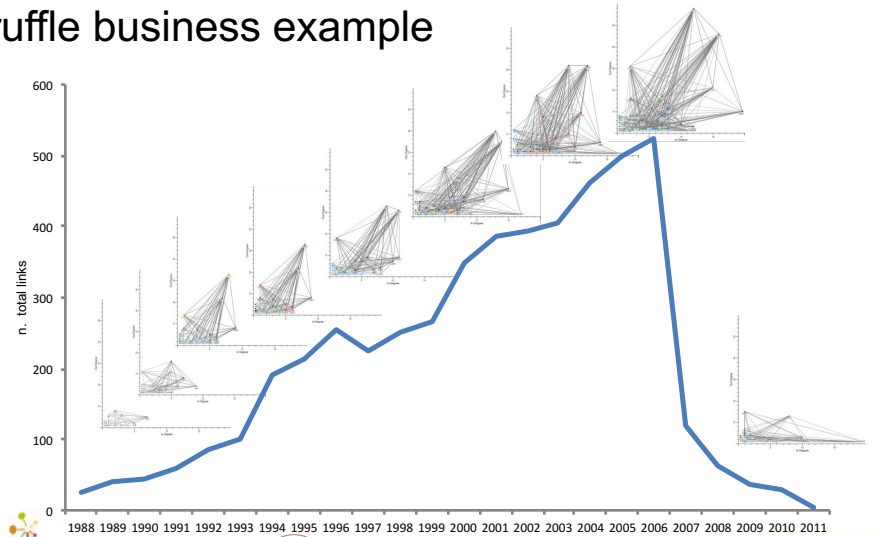
More advanced statistical analysis

truffle business example



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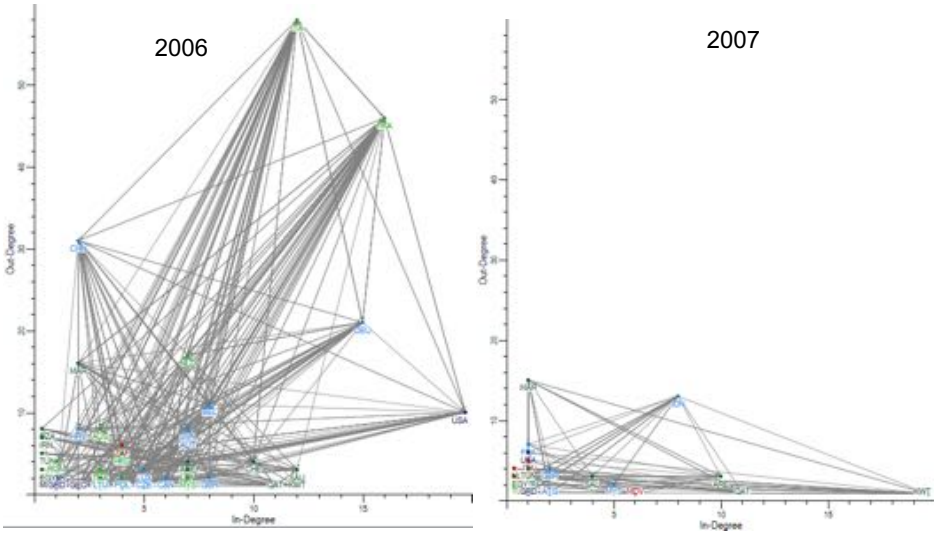
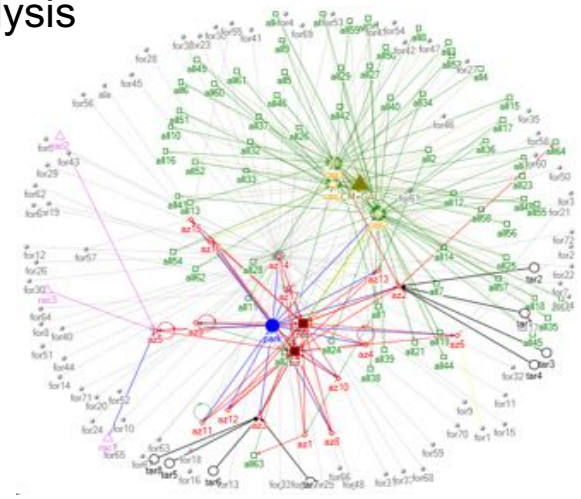
truffle business example



More advanced statistical analysis

Network analysis



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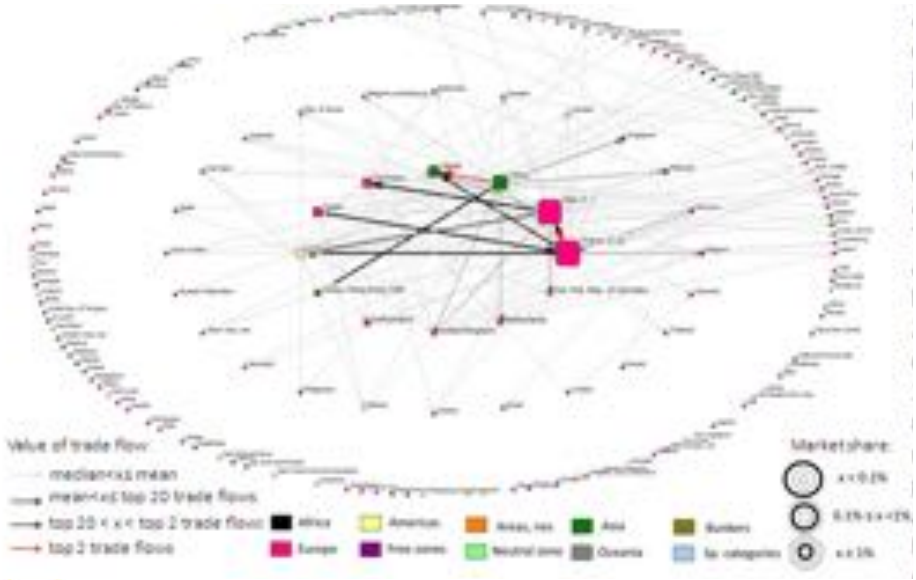
More advanced statistical analysis

Network analysis



Policy implications

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Final remarks

- **No common pattern** in trade (and production) of all WFP
- For most of them trade relations are increasing: **internationalization** of the market, also **intra-trade** in the EU
- **Trade** is playing a **increasing role** in covering EU fast growing **domestic demand** → some issues are becoming more relevant:
  - **QA** and traceability
  - **Phytosanitary problems**
  - Definition of **origin** (typical "Italian" pesto made with Pakistan pine nuts)
  - **Taxation** (fair trade conditions)
  - …
- **Very dynamic market** even for "old" products (resin, tannin, chestnut, …)

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Final remarks

Improve and coordinate WFP international **trade monitoring**:

- Propose an amendment of the **HS classification**?
- Develop a **new WFP classification system**?
- Publish an **EU market review**? At which costs? (**methodology**: Delphy, omnibus survey, …)

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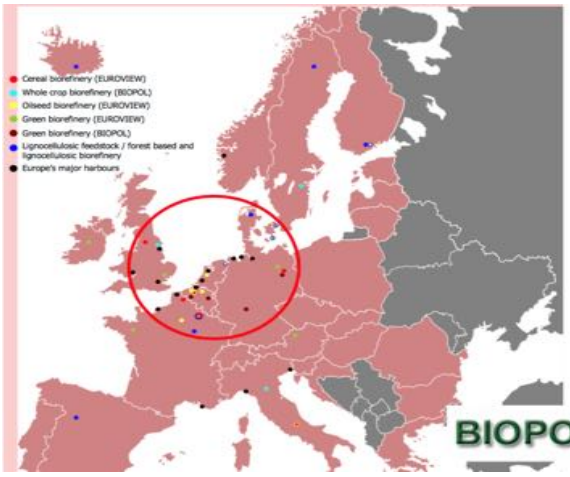
Why all these efforts?

Don't leave to the policy makers (and EU citiezen) think that bioeconomy means bio-rafineries ...



75% of the biorefinery sites and 70% of the largest sea harbors are located within a circle consisting of France, Germany, Denmark, Belgium, the Netherlands, and the UK

BIOPOL

Biorefinery Euroview

Source: Reith and Steinmetz (2009); Fava (2015)

Technological approach vs. social approach in bioeconomy

	Technological approach	Social approach
Focus on	Technological innovations, large scale investments	Social innovations, small scale, high added value P&S (→ low risk)
Vertical vs. horizontal relations	value chain perspective; sectoral development; vertical integration	network economy, inter-sectoral development; horizontal integration
Diversification output and inputs	Wood as the unique raw material; diversification in outputs	Diversification in the use of inputs (industrial wood, biomass, WFP, ES, …)
Market power	Increased market power of the industrial companies controlling the advanced technologies (→ high risks connected to the companies consolidation trends)	Balanced market power among the various diversified operators (→ reduced risk due to diversification)
Model regions	UK, Scandinavian countries	Mediterranean countries, mountain regions
Examples	Innovation assessment approach by the EU Eco Innovation Observatory (http://www.eco-innovation.eu/)	Local Action Groups (Leader+ approach - http://enrd.ec.europa.eu/enrd-static/leader/en/leader_en.html)
Drivers	Patented (private) R&D initiatives, with public support	Public-private initiatives in education, training and non-patented innovations

Berries
Aromatic plants
Mushrooms
Tree leaves, flowers and foliage
WFP are also Bioeconomy!
Forest nuts
Bark
Resin and sap
Tannins