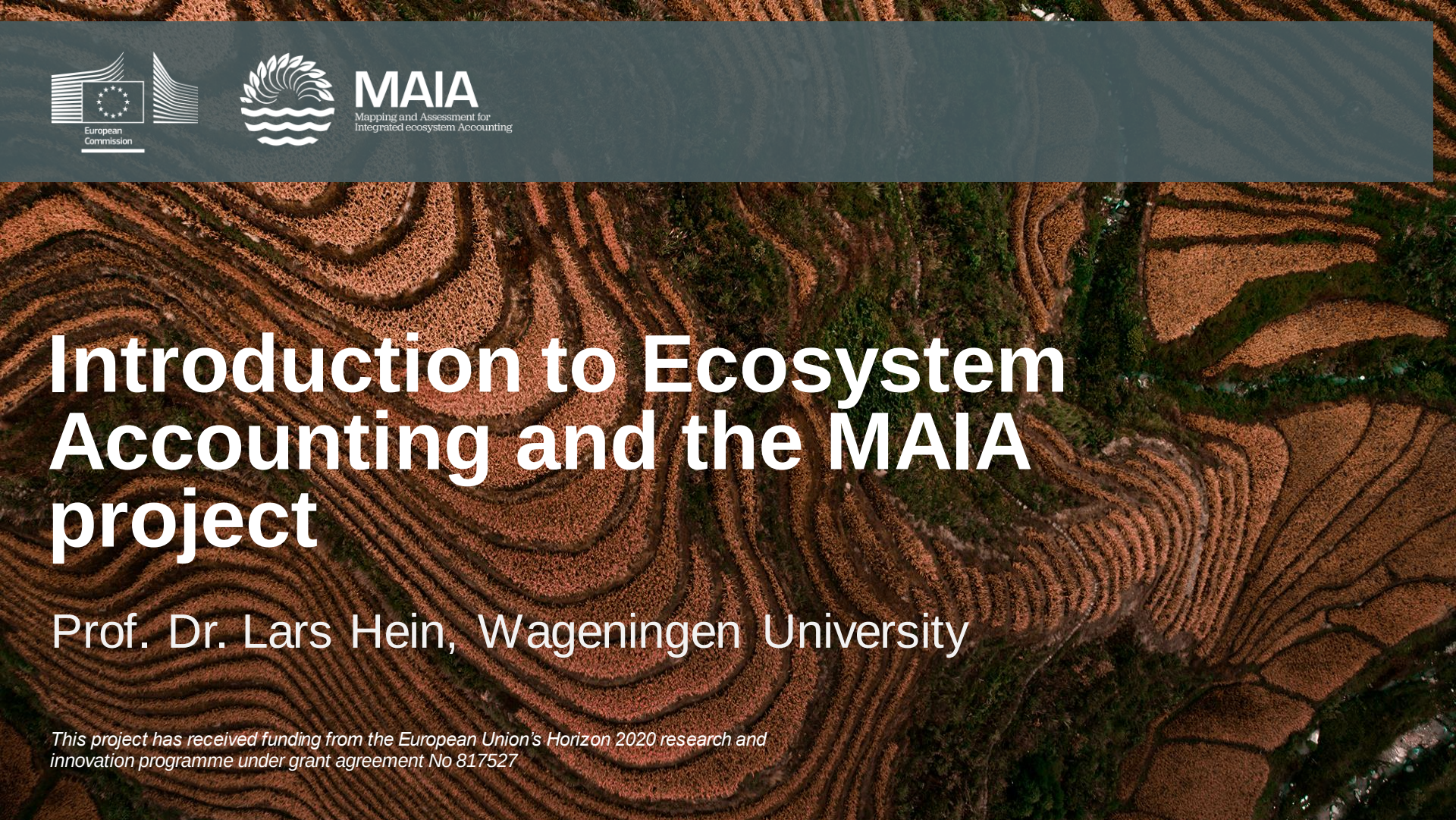


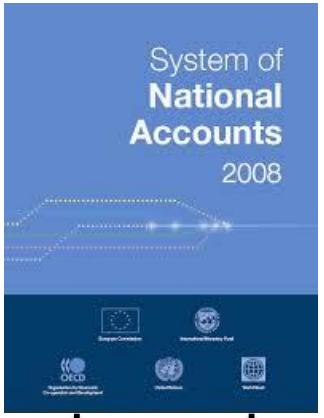
Introduction to Ecosystem Accounting and the MAIA project

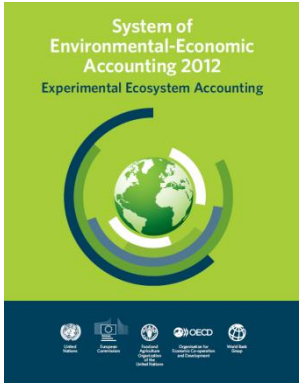
Prof. Dr. Lars Hein, Wageningen University

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817527

THE SEEA FRAMEWORK: Integrating environmental & economic information

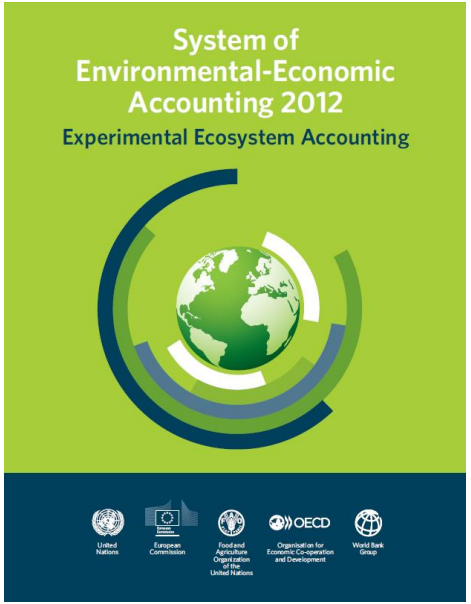
- SEEA = System of Environmental Economic Accounts
- Connected to the System of National Accounts: economic statistics
- Part of the statistical system, guidelines developed by the world's statistical agencies (UNSC), UN, IMF, World Bank, OECD, European Commission.
- Two complementary approaches: the SEEA Central Framework and the SEEA Ecosystem Accounts



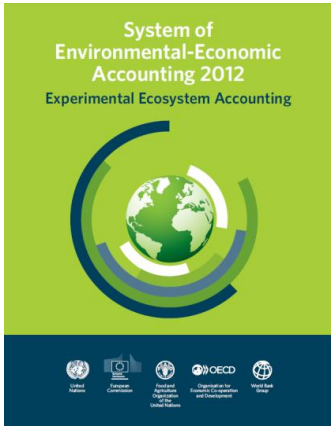


SEEA ECOSYSTEM ACCOUNTING

- A systematic framework to measure the contributions of ecosystems to economic activity;
- Aligned with the National Accounts.
- Includes ecosystem services flows and ecosystem assets
- Includes physical and monetary information
  - DEM, soils, hydrology, land cover, vegetation type, crop production, NPP, ecosystem use, values of services and assets, ecosystem users
- Information in the form of maps and tables



THE ECOSYSTEM ACCOUNTS



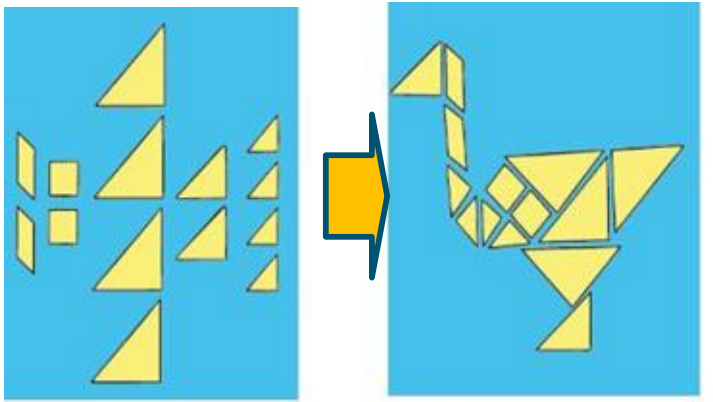
Core accounts

- Ecosystem extent;
- Condition;
- Ecosystem services supply and use;
- Monetary ecosystem assets

Thematic accounts

- Dealing with aspects such as land, water, carbon and biodiversity

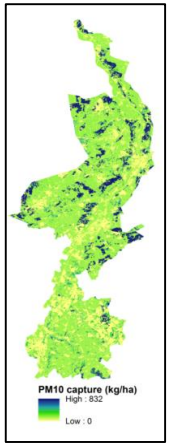
Framework and detailed guidelines ('Technical Recommendations for SEEA EEA') are available



Source figures: UNSD

PHYSICAL AND MONETARY MODELS FOR ECOSYSTEM SERVICES

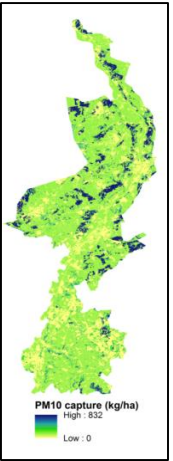
Physical data



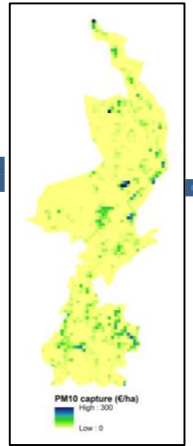
Supply and use (physical)

Physical supply, totals

Ecosystem services	Ecosystem Units	1 Non-perennial plants	2 Perennial plants	4 Meadows (for grazing)	5 Hedgerows	21 Deciduous forest	22 Coniferous forest	23 Mixed forest	24 Heath land	26 Fresh water wetlands	27 Natural grassland	28 Public green space	31 River flood basin	Totals
	extent (ha)	53.600	8.100	27.100	2.900	11.400	7.100	10.400	2.100	900	3.100	4.800	14.100	**220.900**
Crops	tonnes/yr	1.427.300	65.000	-	-	-	-	-	-	-	-	-	-	**1.492.400**
Fodder	tonnes/yr	140.800	4.700	328.700	-	-	-	-	-	-	-	-	66.900	**541.100**
Meat (from game)	kg/yr	11.500	1.500	5.900	800	2.500	1.700	2.900	600	200	800	900	2.400	**36.800**
Ground water (drinking water only)	in 1000 m3/yr	9.000	1.400	4.200	500	1.900	100	500	100	-	700	400	1.300	**27.000**
capture of PM10	tonnes/yr	400	100	200	-	300	400	500	-	-	-	100	100	**2.300**
Carbon sequestration	tonnes C/yr	-	2.400	4.900	500	16.500	10.300	15.100	400	200	600	1.200	2.800	**59.000**
Recreation (cycling)	1000s of bike trips/yr	1.800	300	1.000	100	600	200	400	-	-	100	200	600	**9.100**
Nature tourism	# tourists/yr	94.000	22.000	136.800	57.000	160.300	93.800	147.400	22.700	11.600	55.400	11.800	94.500	**974.300**



Monetary data



Supply and use (monetary)

		Non-perennial plants	Meadows (for grazing)	Hedgerows	Deciduous forest	Coniferous forest	Mixed forest	Heath land	Fresh water wetlands	Natural grassland	Public green space	Other unparsed terrain	River floodbasin	Totals
extent	ha	53.629	27.066	2.940	11.414	7.091	10.637	2.149	936	3.121	4.761	22.591	14.126	**220.922**
Crops	€	35.303.100	-	-	-	-	-	-	-	-	-	-	-	**37.908.400**
Fodder	€	1.960.900	4.587.100	-	-	-	-	-	-	-	-	-	942.300	**7.556.200**
Meat (from game)	€	817.700	223.400	-	186.800	192.700	261.100	35.600	12.700	32.900	14.700	211.200	136.000	**2.249.400**
Ground water	€	3.861.200	1.802.300	193.900	824.200	63.500	218.700	57.300	11.200	295.700	192.600	1.041.100	545.700	**11.602.800**
Capture of PM10	€	301.200	173.700	30.400	200.200	185.700	200.700	27.200	2.400	46.700	78.100	258.200	85.900	**2.275.900**
Carbon sequestration	€	300	165.700	18.000	562.500	350.300	515.000	13.200	6.400	19.300	40.500	139.000	95.600	**2.006.100**
Nature tourism	€	4.410.000	6.349.100	2.357.700	6.930.100	3.162.500	5.441.100	917.000	392.800	2.488.900	625.900	2.870.600	3.162.100	**41.816.200**
Recreation (cycling)	€	NA												NA
	€	46.654.400	13.301.400	2.600.000	8.703.800	3.954.700	6.638.800	1.050.400	425.400	2.883.500	951.700	4.520.200	4.967.500	**105.415.000**
value per ha (excl. Amenity)	€/ha	870	491	884	763	558	636	489	454	924	200	200	352	477
value per ha (incl. Amenity)*	€/ha	870	491	884	1.193	988	1.066	489	454	924	688	220	352	553

APPLICATIONS OF THE ECOSYSTEM ACCOUNTING APPROACH, from micro to macro

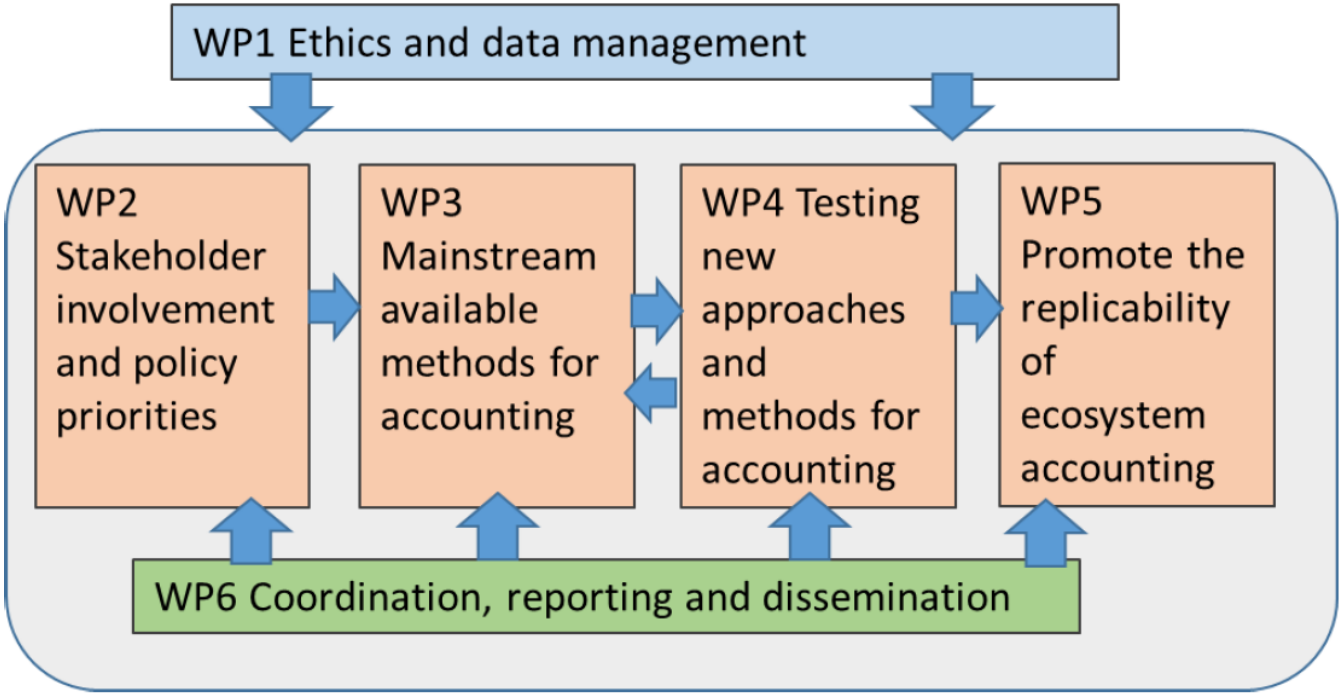
- Monitoring changes in natural capital and use of NC over time
- Identifying areas, ecosystem types or ecosystem services under threat
- Understanding the dependence of economic actors and activities on ecosystems
- Understanding the contribution of ecosystems to the economy and the economic implications of ecosystem change
- As a ready-to-use database for scenario analysis, designing policies, analysing policy effects, etc.

MAIA project: partners

- Wageningen University, The Netherlands
- Leibniz Universität Hannover, Germany
- National Institute of Geophysics, Geodesy and Geography - Bulgarian Academy of Sciences, Bulgaria
- Finnish Environment Institute, Finland
- Universidad Rey Juan Carlos, Spain
- University of Patras, Greece
- National Statistical Institute of Bulgaria, Bulgaria
- Norwegian Institute for Nature Research, Norway
- INBO Research institute Nature and Forest, Belgium
- Agencia Estatal Consejo Superior de Investigaciones Científicas, Spain
- UVGZ|Global Change Research Institute CAS (part of The Czech Academy of Sciences | AVCR), Czech
- CBS Statistics the Netherlands , The Netherlands
- WCMC LBG, United Kingdom
- Paris Institute of Technology for Life, Food and Environmental Sciences, France
- VITO, Belgium
- Executive Environmental Agency (ExEA) at the Bulgarian Ministry of Environment and Waters, Bulgaria
- SarVision, The Netherlands
- SSB Statistics Norway, Norway
- BFN, Germany

Mapping and Assessment for Integrated ecosystem Accounting (MAIA)

MAIA project: Work Packages



Progress stakeholders consultations

Country	Date	Type of consultation
Finland	17/12/2018	Stakeholders consultation workshop
Netherlands	05/02/2019	Stakeholders consultation workshop
Belgium - Flanders	27/02/2019	Stakeholders consultation workshop
Germany	01/04/2109	Expert meeting – A larger national stakeholder meeting is planned in autumn 2019
Norway	02/05/2019	Orientation meeting with key stakeholders. National consultation planned in autumn 2019
France	10/05/2019	Stakeholders consultation workshop
Czech Republic	11/06/2019	Stakeholders consultation workshop
Bulgaria	12/06/2019	Stakeholders consultation workshop
Spain	03/07/2019	Stakeholders consultation workshop
Greece	30/09/2019	Stakeholders consultation workshop

MAIA accounts to be produced (tentative)

Country	Scale			Accounts				
	National	Regional	Local	Extent	Condition	ES Supply and Use	Asset	Biodiversity
Belgium		X (Flanders)		X	X	X	X	X
Bulgaria		X (Plovdiv)	X (Karlovo)	X		X		
Czech	X			X		X	X	
France			X (to be decided)	X	X		X	
Finland	X			X	X	X		X
Germany	X			X		X		
Greece		X (Peloponnesus)		X		X		X
Netherlands	X			X				
Norway		X (Greater Oslo)	X (Oslo)	X	X	X		X
Spain	X	X (Andalusia)		X		X		
Total	5	**5**	**3**	**10**	**4**	**8**	3	4

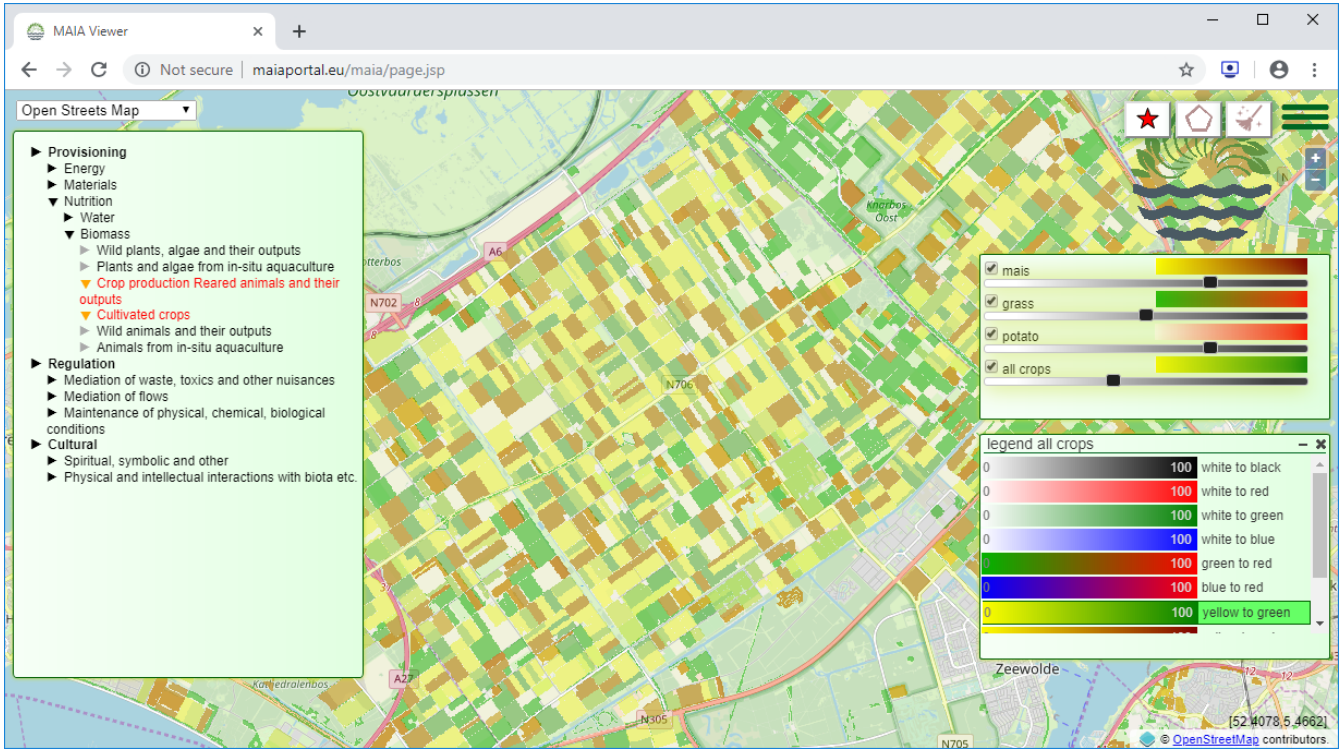
MAIA innovations

- To assess how water regulation services can be modelled and included in accounts
- To develop and test innovative approaches for valuing ecosystem services and assets
- To analyse how open access, big data platforms can be used to model cultural ecosystem services
- To assess how biodiversity accounts can be developed
- To pilot marine ecosystem accounts in an EU context

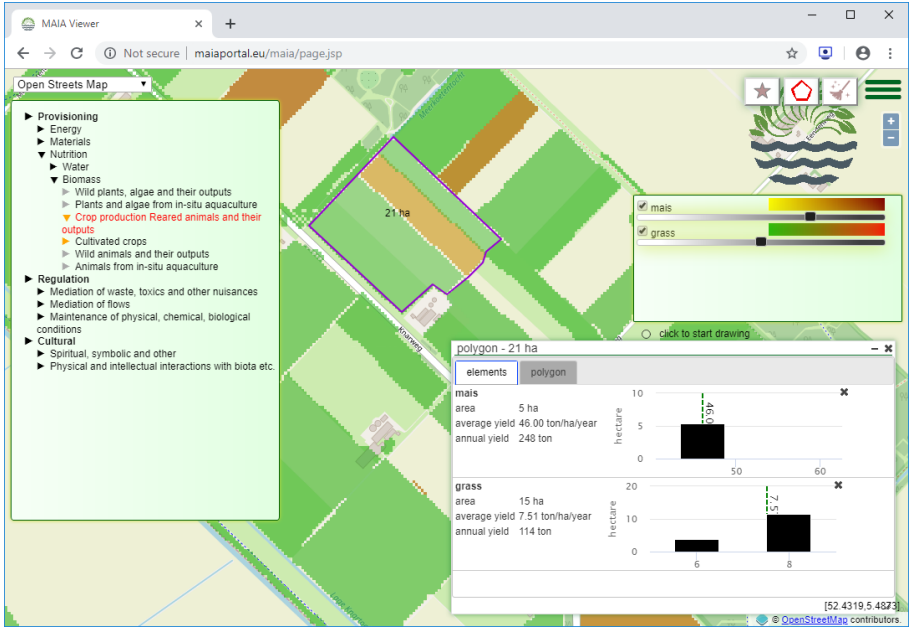
MAIA: viewer

Multi lingual support

Baselayers



Functionalities: Location, Polygon, Administrative unit calculation



- The user may draw a polygon on the map.
- The annual yield can be calculated for any polygon and any data layer.
- Support for community borders, district borders and province borders is planned.

Further policy applications to be developed

Horizon 2020 sister project: WeValueNature

WE VALUE NATURE

NCA in the private sector

- Identify state-of-play, gaps in, barriers/bottlenecks to and opportunities for enhanced private and public sector coherence on NCA and related techniques and develop a strategy for enhanced coherence.
- Produce inspirational case studies and Insight Papers on lessons learnt.
- Gather business experience of the use of effective methodologies and datasets in NCA to stimulate use of these methodologies and datasets in business decision-making.
- Strengthen coherence between the private and public sectors on NCA and related assessments

Collaboration between MAIA and WeValueNature

- Coordination of work streams (regular contact between the two project Coordinators; role in each other's Advisory Group; representation at each other's annual meeting)
- Collaboration on stakeholder involvement and identification of policy uses
- To be discussed: joint case studies where data form SEEA accounts is integrated in/used to support private sector NCAs.

MAIA
Mapping and Assessment for Integrated ecosystem Accounting

Mapping & Assessment for Integrated ecosystem Accounting
http://maiaportal.eu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817527