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**MAIA**  
Mapping and Assessment for  
Integrated ecosystem Accounting

The MAIA country fact sheets summarize the state of affairs on natural capital accounting (NCA) in the countries connected to the MAIA project. They serve as an accessible overview and entry point for collaboration. The factsheets describe the needs from policy, society, science and business for the use of NCA, give an overview of the ongoing and published research -including knowledge gaps- in the country, include contact details and an overview of national partners and stakeholders involved in the accounts. Information in this document is based on MAIA Deliverables and exchanges, and the content is reviewed, co-authored and updated by MAIA-liaison persons in the participating country. This version was updated on 15 December 2020.

# Country fact sheet: Czech Republic (CZE)

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# TABLE OF CONTENTS

-  **Summary**
-  **Country policy priorities for developing natural capital accounts**
-  **Pilot accounts under development**
-  **Summary table of accounts**
-  **Summary overview of highlight accounting projects**
-  **Knowledge gaps and difficulties for developing natural capital accounts**
-  **Support needs for developing natural capital accounts**
-  **Involved partners and stakeholders**
-  **References**

## Summary

Agriculture, water management and forestry are perceived as the most important sectors in which ecosystem accounting should be applied. Recent stakeholder consultation also pointed out the value of urban accounts, a protected landscape extent account and thematic accounts for carbon and biodiversity.

An ecosystem extent, condition and monetary asset account was published for all ecosystems in the Czech Republic. An up-date of the condition account is currently in progress. ES accounts are under development for Carbon sequestration, Water filtration and Nature-based recreation and this both in physical and monetary terms. An ES account in physical terms is also being developed for Water retention. For now there is no research on thematic accounts.

The key gaps for developing NCA in Czech republic are data gaps and out of date data, a lack of clear guidelines to implement the SEEA framework and non-existing political demand for ecosystems accounting.

The main data gaps and difficulties for setting up the NCA can be explained by a lack of capacity and, related to that, a lack of political interest. Institutions would need an official policy enforcement to start working on the accounts. Therefore, there is a need for more training, capacity building and increased sharing of information and lessons learned by the MAIA MS. This would enable the Czech Republic to develop a pilot ecosystem account that can demonstrate the usefulness and spark political interest.

## Country policy priorities for developing natural capital accounts

*Based on MAIA D5.1 (Annex 3 section 3)*

Agriculture, water management and forestry are perceived as the most important sectors in which ecosystem accounting should be applied. Recent stakeholder consultation also pointed out the value of urban accounts, a protected landscape extent account and thematic accounts for carbon and biodiversity.

In an ideal scenario, ecosystem accounting would be applied to all policies that address the management of natural resources and nature conservation.

In relation to specific pilot accounts, the policy priorities that have been highlighted during the national stakeholders' consultation in June 2019 are the following:

➤ Agricultural ecosystem accounts have been discussed in the context of the Common Agricultural Policy pointing out the role of biodiversity (via e.g. organic farming), water retention in the landscape, and the number of inputs / intensities in the agricultural landscape (e.g. fertilizers, herbicides).



➤ Water accounts (e.g. lakes, rivers, dams) and surrounding landscapes as well as the wetland account; the participants agreed on the importance of these accounts, since they provide significant ecosystem services.

➤ Accounts for urban areas (e.g. Prague, Brno) mainly from the carbon point of view, and the role of greenery in adapting to climate change and to provide other benefits (e.g. recreation, health).

➤ A protected landscape area account that could be significant for both biodiversity and other ES (e.g. tourism).

Subsequently, thematic accounts were discussed, which either monitor important ES or environmental / human-related issues / interests:

➤ Water account in terms of quality, quantity and specifically water retention in the landscape;

➤ Carbon account for ecosystems and residential areas;

➤ Biodiversity account.

However, the current link between environmental accounts and policy decisions is rather weak in the Czech Republic.



## Pilot accounts under development

### Summary table of accounts

Account		Ecosystem Types / Ecosystem Services	Link to research
Accounts for ecosystem assets	Ecosystem extent account	<b>All ecosystems (2000–2012)</b>	Vačkářů and Grammatikopolou, 2019
		<b>All ecosystems (2000–2018)*</b>	
	Ecosystem condition account	<b>All ecosystems</b>	Vačkářů and Grammatikopolou, 2019
	Ecosystem monetary asset account	<b>All ecosystems</b>	Vačkářů and Grammatikopolou, 2019
Accounts for ecosystem services	Ecosystem services supply and use table - physical terms	<b>Carbon sequestration</b>	
		<b>Water retention</b>	
		<b>Nature-based recreation</b>	
		<b>Water filtration*</b>	
	Ecosystem services supply and use table - monetary terms	<b>Carbon sequestration</b>	
		<b>Water filtration*</b>	
		<b>Nature-based recreation</b>	
Thematic accounts			

Scale	State of development
<b>National</b>	<b>Finished</b>
<i>Regional</i>	<i>Ongoing</i>
<u>Local</u>	<u>None ongoing or published</u>
*Highlighted in the fact sheet	



## Summary overview of highlight accounting projects

### Ecosystem extent account and analysis of agricultural land

#### Scale

The study was conducted at the national scale. Time period covered includes horizons 2000 – 2006 – 2012. The account is being updated using new information.

#### Involved and funding partners

The study was performed by the Global Change Research Institute and funded by Technology Agency of the Czech Republic, with the involvement of the Czech Statistical Office.

#### (Policy) Goal of the study

What are the changes of land cover / ecosystems types in the Czech Republic? What are the main factors influencing land cover change? Where is agricultural land disappearing?

#### Ecosystems under study

The study addressed all categories of ecosystems in the Czech Republic.

#### Methods and data used for the study (if relevant indicators used)

The study employed the methodology of Land and Ecosystem Accounting (LEAC) developed by the European Environment Agency. LEAC is based on Corine Land Cover (CLC) data which are regularly provided for European countries. The LEAC methodology enables to construct tables detecting land production and consumption. Moreover, by classifying land cover flows, it enables to categorise major types of changes between different categories of land cover.

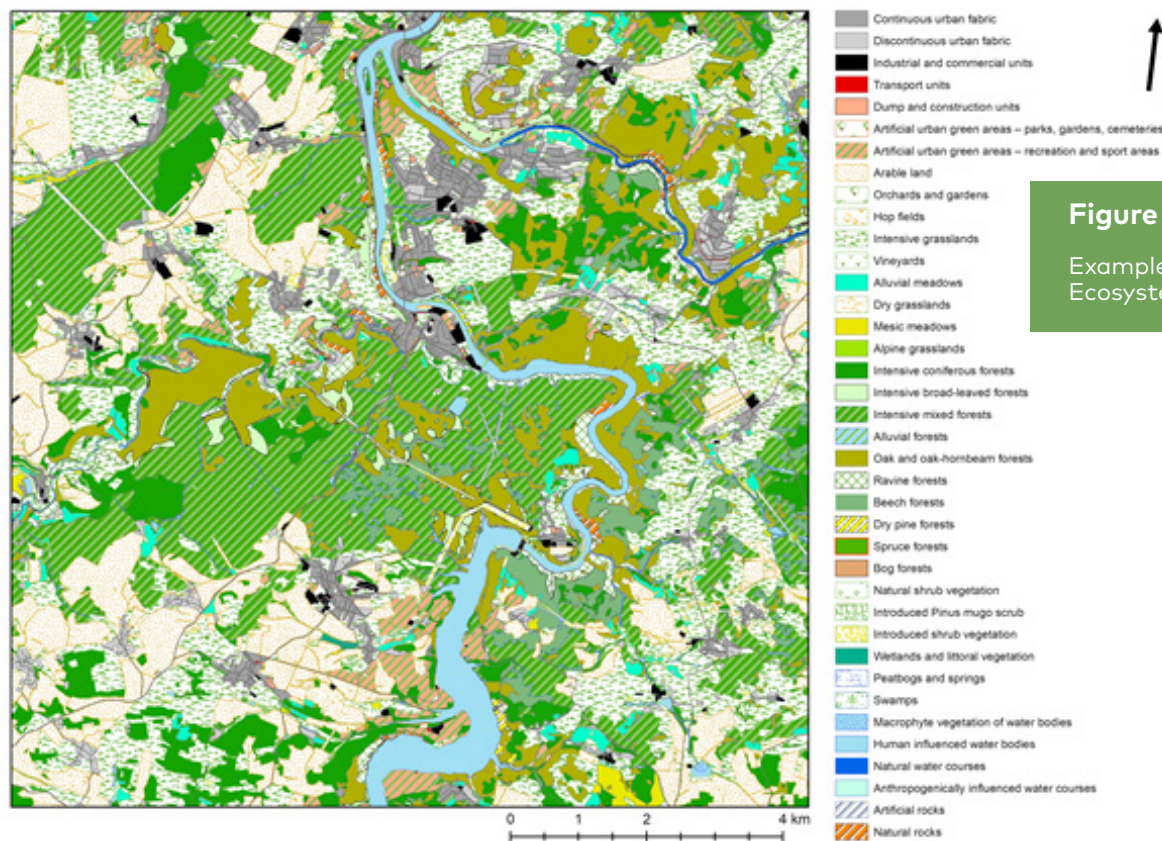
Corine Land Cover data have been complemented by other data sources on agricultural land from Czech Statistical Office databases and land cadastre. Currently, the ecosystem extent account is being revised to be in line with SEEA EEA standards and updated for the period 2018. The extent account will be also constructed based on Consolidated Layer of Ecosystems, developed by CzechGlobe and in cooperation with the planned update by the Nature Conservation Agency.

#### Link to the research/reference

Dava Vačkářů & Ioanna Grammatikopoulou (2019) Toward development of ecosystem asset accounts at the national level, Ecosystem Health and Sustainability, 5:1, 36-46, DOI: 10.1080/20964129.2018.1560233

#### Approximate date of final results

The final update of ecosystem extent accounts is expected at the end of 2021.



**Figure**

Example of Consolidated Layer of  
Ecosystems of the Czech Republic

## The SEEA EEA Water Filtration Account for the Czech Republic

### Scale

The analysis covers the year 2018 only but we plan to extend the analysis and estimate how the drinking production costs have developed during a longer period. The extent of the planned study depends on data availability.

### Involved and funding partners

Data were provided by the Ministry of Agriculture

### (Policy) Goal of the study

The goal of the study is to find which factors influence drinking water production costs. We expect that drinking water production costs are lower if the drinking water is produced from groundwater (after controlling for the treatment technologies) because groundwater is of better quality due to natural water filtration. Furthermore, we suppose that the water production costs are given not only by the raw water source (underground vs. surface) but also by the treatment technology. We expect that some treatment technologies e.g. iron removal or deman-

ganization can significantly increase drinking water production cost.

### Ecosystems under study

Freshwater Ecosystem, Groundwater

### ES/thematic account under study

Water filtration

### Methods and data used for the study (if relevant indicators used)

We apply the replacement cost approach to measure the difference in production costs of drinking water from groundwater relative to surface water. This approach has been applied also in other similar studies e.g. in Horlings et al., 2020; Remme et al., 2015. The unit value of the ecosystem service (provision of drinking water through the natural filtration and storage of groundwater) was calculated as the difference in the unit production costs of companies that mainly extract groundwater and companies that mainly extract surface water in both studies. Contrary to these studies we will study not only the impact of the raw water source (underground vs. surface) on the drinking water production costs but also the impact of treatment technologies.

The 2018 dataset contains yearly data for all water withdrawal points in the

Czech Republic (over 3,500 observations) on e.g. total amount of drinking water produced from surface water and underground, amount of technological water produced, data on water analyses, unit production costs, consumption of electrical power, raw water quality, water treatment technologies – chemical and physical, kind of chemicals applied.

### Research cited in the methods:

Horlings, E., Hein, L., Jongh, L. De, & Polder, M. (2020). Experimental monetary valuation of ecosystem services and assets in the Netherlands. Technical background report (Issue January). <https://www.cbs.nl/en-gb/background/2020/04/monetary-valuation-of-ecosystem-services-for-the-netherlands>

Remme, R. P., Edens, B., Schröter, M., & Hein, L. (2015). Monetary accounting of ecosystem services: A test case for Limburg province, the Netherlands. *Ecological Economics*, 112, 116–128. <https://doi.org/10.1080/20964129.2018.1560233>

### Approximate date of final results

We expect that the analysis of the 2017 year will be finished in spring 2021. Next, we will try to obtain data for other years, and depending on the data available we will analyze other years.



## Knowledge gaps and difficulties for developing natural capital accounts

Based on MAIA D3.2 (Annex 3 section 5);

D5.1 (Annex 3 section 5e and 6d)

The key gaps for developing NCA in Czech Republic are data gaps and out of date data, a lack of clear guidelines to implement the SEEA EEA framework and non-existing political demand for ecosystems accounting.

The available data is not useful for developing specific ecosystem accounts. The Consolidated Layer of Ecosystems of the Czech Republic CLES dataset is in need of an update. Moreover, there is insufficient harmonization of existing data sources and data flows, including a missing common unified database. It was recommended to begin with the adjustment of existing data e.g. on biodiversity and/or water and show the usefulness of ecosystem accounting.

This demonstration of the value of NCA is necessary to create political demand, which up to now is non-existent. There is a general lack of knowledge and awareness about ecosystem accounting, and a perception of low usefulness of and urgency for ecosystem accounting. Up until now, the principal source of funding for NCA projects comes from European initiatives such as EEA grants and H2020 funds. It will be challenging to continue with the implementation of ecosystem accounting after the MAIA project, unless there is an increase in political will.

Other problems for the development of NCA are low capacities and a lack of clear guidelines to implement some points of the SEEA framework.

The progress remains still at an immature state although there has been a good progress in identifying policy needs and priorities and realizing the challenges ahead. In pragmatic terms, the state of data availability as well as the methodology of compiling the accounts, are yet to be defined and reported. The participation of CzechGlobe in the MAIA project offers a great opportunity in data integration and in improving the information on the state and trends of nature.

## Involved partners and stakeholders

Based on D5.1 (Annex 3 section 2);  
European NCA stakeholder day

Government / Ministry of Agriculture	Research	Private sector or NGO
Czech Statistical Office (CZSO)	CzechGlobe	Povodí Vltavy*
Ministry of Environment	Charles University Environment Centre	Povodí Labe
Czech Environmental Information Agency	Czech University of Life Sciences	Povodí Ohře
Czech Hydrometeorological Institute	University of Economics	Povodí Moravy
Ministry of Industry and Trade		Povodí Odry
Ministry of Finance		
Prague city administration		

\* Povodí (river basin) are state-owned organizations.

## Support needs for developing natural capital accounts

Based on MAIA D3.2 (Annex 3 section 6 and 7);

D5.1 (Annex 3 section 6e, 7 and 8)

The main data gaps and difficulties for setting up the NCA can be explained by a lack of capacity and, related to that, a lack of political interest. Institutions would need an official policy enforcement to start working on the accounts. Therefore, there is a need for more training, capacity building and increased sharing of information and lessons learned by the MAIA MS. This would enable the Czech Republic to develop a pilot ecosystem account that can demonstrate the usefulness and spark political interest.

There is a need to improve the technical capacity of the team. This includes training courses, technical seminars and knowledge sharing on more specific ways to implement the methodology. On the other hand, the capacity building should go even further with more systematic communication between MAIA partners, especially the most advanced, to share information, experiences, and lessons learned.

In principle, representatives of key government institutions would be willing to participate in these types of training. Continued cooperation with the Czech Statistical Office and other actors relevant for the development of ecosystem accounting, could put NCA on the political agenda. To aid this process, a pilot account based on an adjustment of existing data flows should be made. This would demonstrate how SEEA EEA could be useful in supporting decision-making on ecosystems and biodiversity.

Moreover, institutions would need an official policy enforcement to start working on the accounts. This could be for example the Eurostat regulation or Government resolution. Otherwise, representatives of key government institutes will remain hesitant particularly due to the low staff availability and capacity needed in accounting work.

## References

- Horlings, E., Hein, L., Jongh, L. De, & Polder, M. (2020). Experimental monetary valuation of ecosystem services and assets in the Netherlands. Technical background report (Issue January). <https://www.cbs.nl/en-gb/background/2020/04/monetary-valuation-of-ecosystem-services-for-the-netherlands>
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- Vačkář, D., Grammatikopoulou, I., 2019. Toward development of ecosystem asset accounts at the national level. *Ecosystem Health and Sustainability* 5, 36–46. <https://doi.org/10.1080/20964129.2018.1560233>