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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: **Norway (NO)**

Jomme Desair, Sander Jacobs,
Sylvie Campagne, Benjamin Burkhard

Country co-authors:

Per Arild Garnåsjordet (SSB), Kristine Grimsrud (SSB),
Iulie Aslaksen (SSB), David N. Barton (NINA),
Simon Jakobsson (NINA)

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Summary

Current policy priorities are focused on land use and land use change which provides useful information to the municipalities to support their goal of "land use neutrality". "Land use accounts" may be an easier starting point to introduce ecosystem accounting concepts in Norway from the bottom up. It is a priority to establish physical accounts and accounts that are compatible with the Norwegian Ecological Base Maps. Research is also needed for the monetary accounts, in order to have tested solutions available if/when policy windows arise.

Norway has developed some ecosystem extent accounts, including thematic accounts for forests, agriculture and some urban areas. A national ecosystem map lays the foundation for a future account. All except the urban accounts are on a national scale and the publications are to be expected soon. Urban green extent accounts have been prepared by some larger cities. For ecosystem condition there are also multiple publications in press: for all ecosystems except urban and for agricultural ecosystems, both on a national scale, for urban recreation areas and an urban tree inventory on a regional scale. A national monetary asset account is to be published soon for agricultural ecosystems on a national scale while a regional account is under development for urban ecosystems. Norwegian municipalities have implemented extent-condition and service mapping of recreation areas which with repetition could become a national recreation account. The Nature Index for Norway was established in 2010 and is the equivalent of a biodiversity account.

The national classifications historically used for NCA, are not compatible with the new IUCN classifications used in SEEA extent accounts. There are insufficient resources to test the new classification methods at national scale. Until now there has been limited national policy support for implementing a system of ecosystem accounts.

The political momentum of ecosystem accounting has increased with the Global Consultation of the draft statistical framework for SEEA EA. The consultation process in Norway has been facilitated by MAIA. The project is continuing to promote best practices accounting examples. In general, there is a need for better horizontal and vertical coordination.

Country policy priorities for developing natural capital accounts

Based on stakeholder consultation carried out by MAIA Norway partners NINA and SSB in November 2019 (Barton and Garnåsjordet 2019)

Current policy priorities are focused on land use and land use change which provides useful information to the municipalities to support their goal of "land use neutrality". "Land use accounts" may be an easier starting point to introduce ecosystem accounting concepts in Norway from the bottom up. It is a priority to establish physical accounts and accounts that are compatible with the Norwegian Ecological Base Maps. Research is also needed for the monetary accounts, in order to have tested solutions available if/when policy windows arise.

Land cover accounts need to be put in place before other accounts are established. There is still a need for very simple and even coarse land use statistics. Municipalities have the main responsibility for land use planning, but do not have land cover/extent accounts to use in their day-to-day management. Further work needs to address what information municipalities need in order to make decisions on land use.

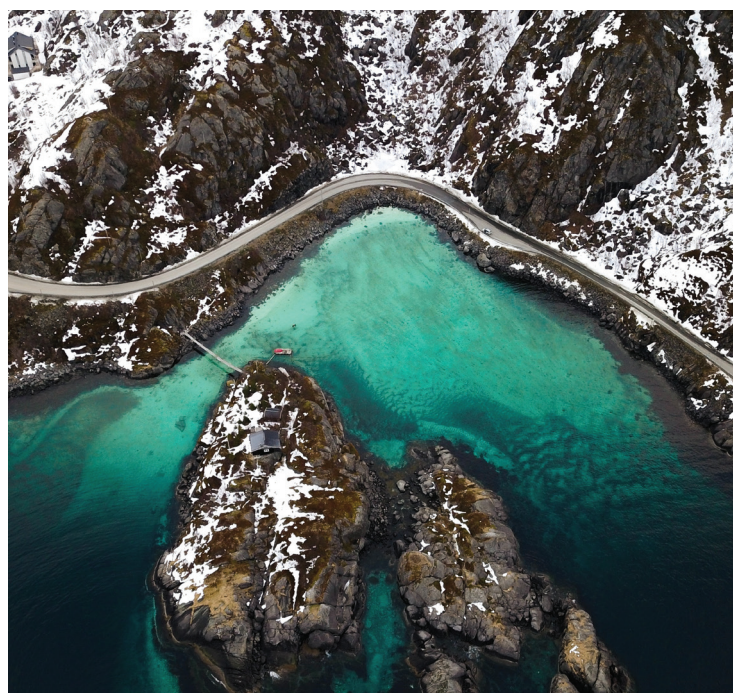
A municipal level objective of "land use neutrality" might be a policy driver of ecosystem accounts in Norway. A number of municipalities have implemented land use accounts, which may provide some impetus to national level efforts and coordination concerning (elements of) ecosystem accounting. "Land use accounts" may be an easier starting point to introduce ecosystem accounting concepts in Norway from the bottom up.

Currently, there is a lack of demand for nature accounting from the higher political level. Municipalities are not required to use NCA. However, Statistics Norway has recently been given more of a mandate to work on ecosystem accounts. Now, a technical

group should be established to prepare standards for next steps.

It is a priority to establish physical accounts. An OECD-like "dashboard" approach to indicators should be developed. Ecosystem accounts should also be built on the foundation of the new Ecological Base Maps managed by the Norwegian Biodiversity Information Centre: Økologiske grunnkart (artsdatabanken.no). There is a need to focus accounting on land cover use of infrastructure, especially wind power, holiday homes, road and rail.

On some issues monetary accounting data can be prioritized, in particular restoration and compensation and infrastructure projects. Regarding monetary ecosystem service accounts patience is required. While premature politically, research into future possibilities is still required, in order to have tested solutions available if/when policy windows arise.



Pilot accounts under development

Summary table of accounts

Account		Ecosystem Types / Ecosystem Services	Link to research
Accounts for ecosystem assets	Ecosystem extent account	All ecosystems	In press: Venter and Sydenham
		Agricultural ecosystems	In press
		Urban*	Nowell et al., 2021
		<i>Urban (green) ecosystem</i>	Garnåsjordet et al., 2020
	Ecosystem condition account	Agricultural ecosystems	In press
		All ecosystems, except urban*	Jakobsson et al., 2021 and see also: https://www.nina.no/english/Fields-of-research/Assessment-system-for-ecological-condition
		<i>Urban recreation areas</i>	Cimburova and Barton, 2021
Accounts for ecosystem services	Ecosystem services supply and use table - physical terms	<i>Urban tree account</i>	Hanssen et al., 2019
		Agricultural ecosystems	In press
	Ecosystem services supply and use table - monetary terms	<i>Urban ecosystems</i>	
Thematic accounts		Biodiversity*	
		Biodiversity*	https://www.naturindeks.no/:Nature Index

Scale	State of development
National	Finished
<i>Regional</i>	Ongoing
<u>Local</u>	None ongoing or published

*Highlighted in the fact sheet

Summary overview of highlight accounting projects

Ecological base maps

Scale of study

National geospatial database

Involved and funding partners

Norwegian Biodiversity Data Centre, Norwegian Ministry of Climate and Environment

(Policy) Goal of the study

Provide the basic geospatial data for municipal planning and policy in Norway. A possible basis for future compilation of ecosystem extent and condition accounts for SEEA EA

Ecosystems under study

All except urban

ES/thematic account under study

Base maps

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

Various nature classification and indicators

Link to the research/reference

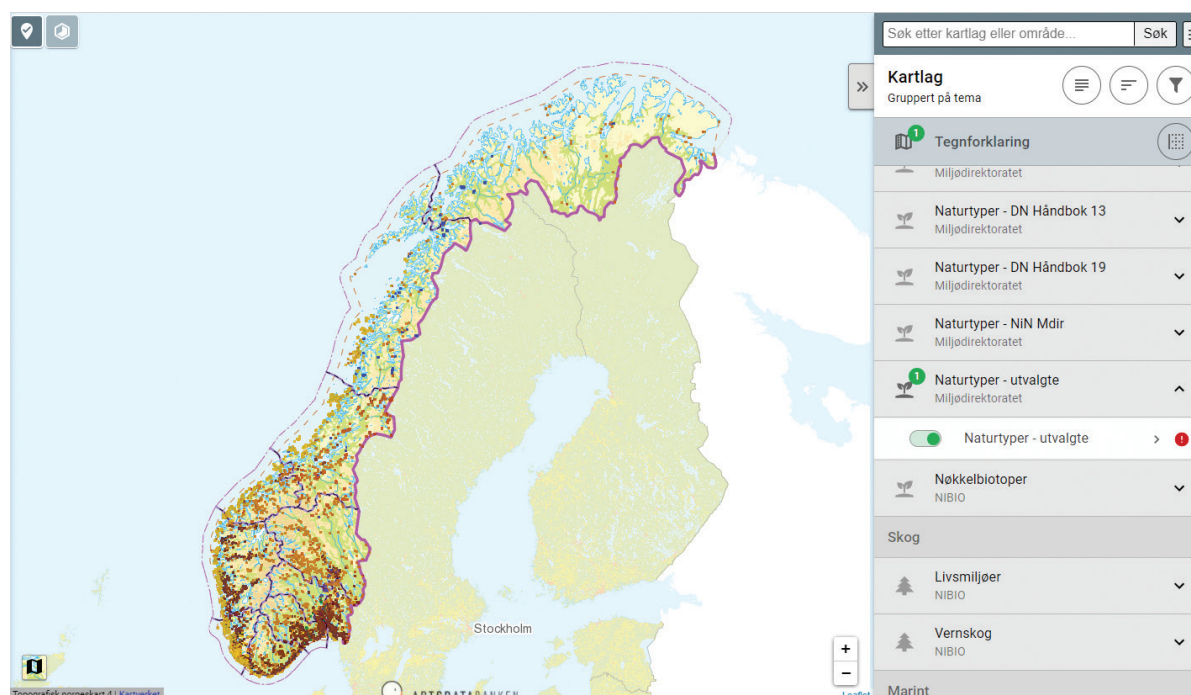
<https://okologiskegrunnkart.artsdatabanken.no/#/>

Approximate date of final results

Implemented

Source

Økologiske grunnkart
([artsdatabanken.no](https://okologiskegrunnkart.artsdatabanken.no/))



Norwegian Nature Index

Scale of study

National geospatial database;

Involved and funding partners

NINA; Norwegian Ministry of Climate and Environment, a number of data supplying institutions nationally;

(Policy) Goal of the study

National biodiversity trends;

Ecosystems under study

All except urban;

ES/thematic account under study

Species indicators, ecosystem indicators, thematic biodiversity indices;

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

The Norwegian Nature Index (nina.no);

Link to the research/reference

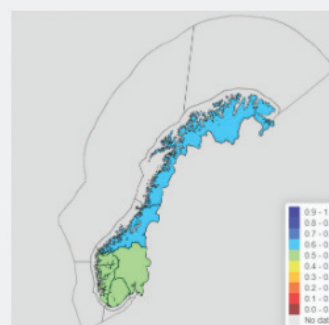
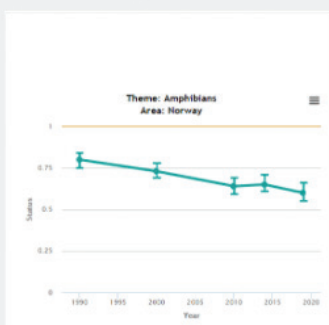
Naturindeks.no/Home;

Approximate date of final results

Implemented since 2010.

Nature Index for Norway

The Nature Index measures the condition of biological diversity in Norway, and gives an oversight into the development of the ecosystems, for selected species groups and themes.



The figure shows developments for amphibians from 1990 onwards.

Indicator-based ecological condition assessment approach (IBECA)

Scale of study

Regional pilots, national aim;

Involved and funding partners

NINA; Norwegian Environmental Agency, a number of data supplying institutions nationally;

(Policy) Goal of the study

Compile ecosystem condition indicators at national level; basis for SEEA EA condition accounts;

Ecosystems under study

All;

ES/thematic account under study

Ecosystem condition accounts;

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

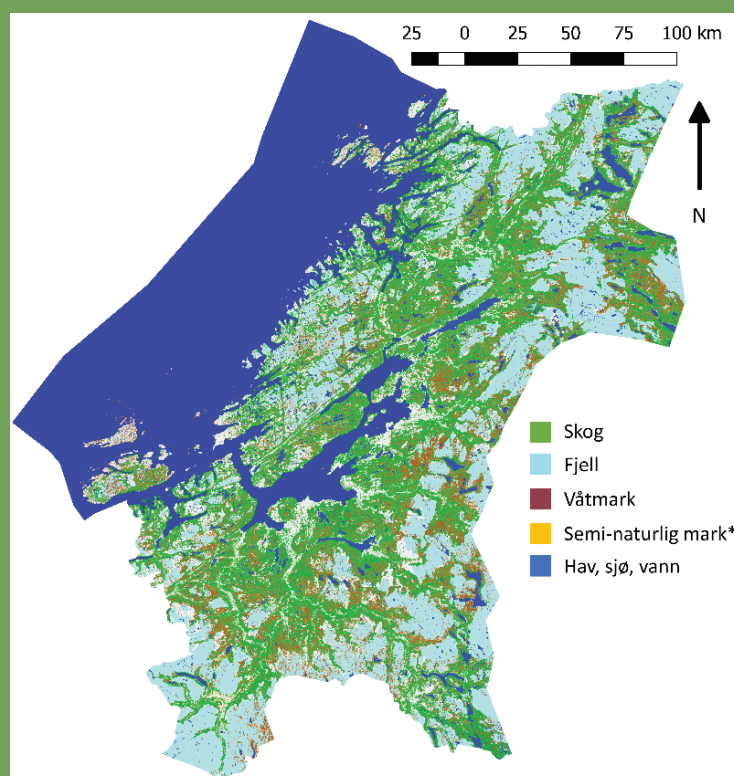
The methods can be accessed through this link: <https://ars.els-cdn.com/content/image/1-s2.0-S1470160X20304295-mmc2.docx>

Link to the research/reference

Jakobsson, S., Töpper, J.P., Evju, M., Framstad, E., Lyngstad, A., Pedersen, B., Sickel, H., Sverdrup-Thygeson, A., Vandvik, V., Velle, L.G., Aarrestad, P.A., Nybø, S., 2020. Setting reference levels and limits for good ecological condition in terrestrial ecosystems – Insights from a case study based on the IBECA approach. Ecological Indicators 116, 106492. <https://doi.org/10.1016/j.ecolind.2020.106492>;

Approximate date of final results

Pilots completed.



Source

<https://brage.nina.no/nina-xmlui/handle/11250/2599977>

Oslo Urban EEA

Scale of study

Municipal

Involved and funding partners

NINA,SSB, AHO, Norwegian Research Council;

(Policy) Goal of the study

Demonstrate ecosystem accounting to Oslo Municipality;

Ecosystems under study

Urban;

ES/thematic account under study

Urban thematic accounts;

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

<https://nina.earthengine.app/view/urban-nature-atlas>;

Link to the research/reference

<https://www.nina.no/english/Fields-of-research/Projects/Urban-EEA>;

Approximate date of final results

URBAN EEA completed. Selected accounts further developed by MAIA project.



Coordinating SEEA EA related activities by Statistics Norway

Scale of study

National, regional, local/municipal;

Involved and funding partners

MAIA, ad hoc funding via other projects;

(Policy) Goal of the study

Explore the possibility to develop SEEA EA in Norway, by knowledge synthesis from several sources, by extensive contact with research institutes, in particular Norwegian Institute for Nature Research (NINA), Norwegian Institute for Bioeconomy Research (NIBIO), and Norwegian Institute for Water Research (NIVA), and with authorities, in particular Ministry of Climate and Environment, and Norwegian Environment Agency.

The research department of Statistics Norway has taken a lead role in coordinating activities to explore possibilities for developing SEEA EA in Norway. Within Statistics Norway, the research department has close cooperation with statistical departments, in particular land use statistics, environmental statistics and national accounts, to prepare for future implementation of SEEA EA

in Norway. Statistics Norway cooperated closely with NINA on the URBAN EEA project on urban ecosystem accounts, to be followed up in a new Eurostat project URBAN-ECO, "Ecosystem extent and condition accounts in urban areas and steps towards modelling of urban ecosystem services", applying remote sensing. Cooperation with NINA also includes the Nature Index for Norway. Cooperation with NIBIO includes preparing for work on area accounts, based on land use mapping data and principles of SEEA EA. Cooperation with NIVA includes a pilot study of recreational ecosystem services from the Oslo fjord region. The Department of National Accounting at Statistics Norway has been contacted by and is in discussions with The Research Council of Norway regarding making Ocean Satellite Accounts. Moreover, Statistics Norway has suggested SEEA EA as framework for several proposals to the Research Council of Norway. Statistics Norway has active communication with Ministry of Climate and Environment, and a meeting was arranged early in 2020 for discussing possibilities for developing SEEA EA nature accounts in Norway. Statistics Norway arranged (as a MAIA output) a meeting in November 2020 where Norwegian Environment Agency participated and discussed cooperation on a joint response to the UN on SEEA EA from Statistics

Norway, Norwegian Environment Agency, NINA and NIVA. Statistics Norway is initiating cooperation with Ås municipality near Oslo, a municipality with challenges of conserving agricultural land while building new residential areas, and the municipality expresses interest in cooperation on developing area accounts;

Ecosystems under study

All;

ES/thematic account under study

Extent and condition, ecosystem services;

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

Synthesis of knowledge from cooperating research partners;

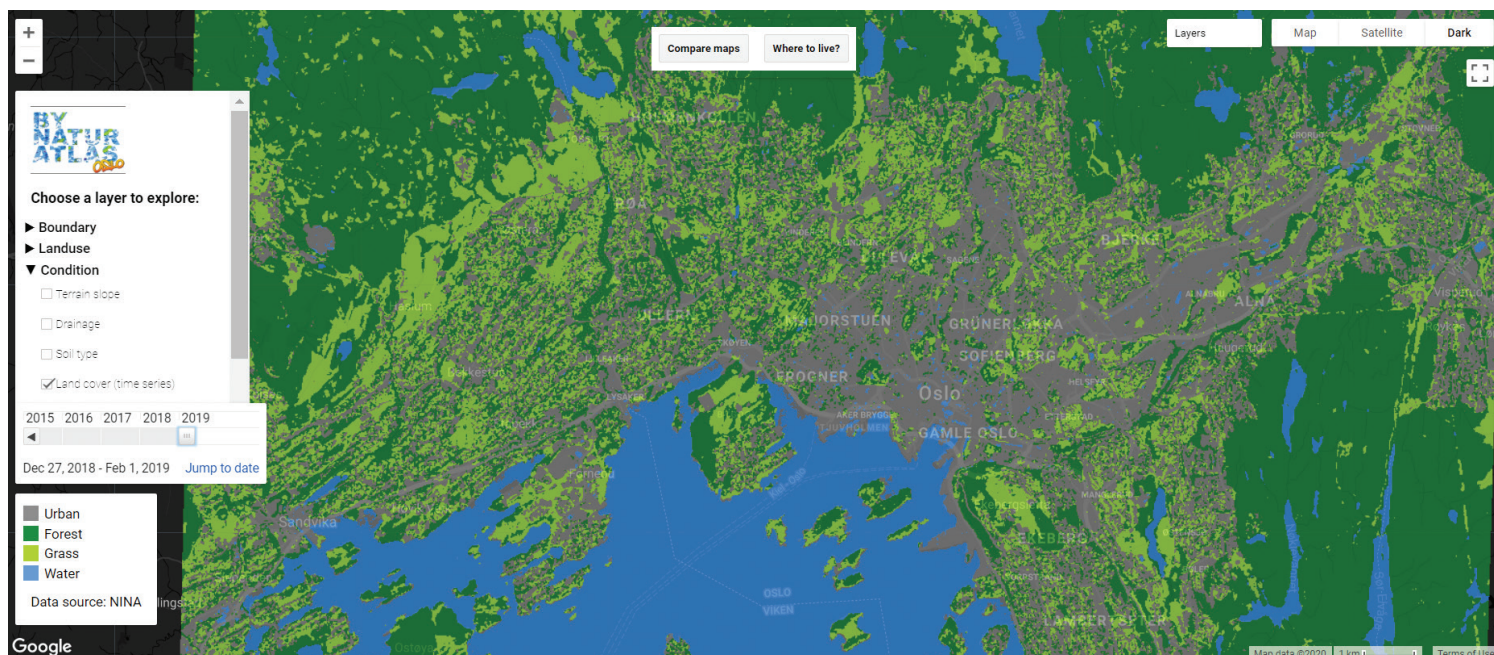
Link to the research/reference

See full reference in Reference list: URBAN EEA: Garnåsjordet, P. A. et al. (2020). <https://www.ssb.no/436200/urban-green.integrating-ecosystem-extent-and-condition-as-a-basis-for-ecosystem-accounts.examples-from-the-oslo-region>

NIVA report: Chen, W. et al. (2019) <https://www.niva.no/nyheter/hvor-mye-er-oslofjorden-verdt>;

Approximate date of final results

2022.



Source

<https://nina.earthengine.app/view/urban-nature-atlas>

Knowledge gaps and difficulties for developing natural capital accounts

Based on MAIA D3.2 (Annex 9 section 1 and 5) and stakeholder consultation carried out by MAIA Norway partners NINA and SSB in November 2019 (Barton and Garnåsjordet 2019)

The national classifications historically used for NCA, are not compatible with the new IUCN classifications used in SEEA extent accounts. There are insufficient resources to test the new classification method on a national scale. National level experimentation with ecosystem accounts has not taken place. Municipalities are starting to test ecosystem extent accounts.

The new IUCN classification of ecosystems is seen as an improvement by Norwegian Environment Agency. However, NINA had to decline testing the IUCN ecosystem classification in Norway, because the current nature classification system – Nature in Norway (NiN) – is not compatible and there are no resources available to carry out such a test at national level. The IUCN and NiN classifications are not compatible because NiN does not have main ecosystems as a classification level. NEA will look further at the compatibility of the IUCN classification with the aims of mapping the extent of main ecosystems in Norway. It is already foreseen that transition zones between ecosystems (ecotones) will be a challenge. There is as of yet no official classification of main ecosystems in Norway compatible with the current Indicator Framework for Good Ecological Status (Fagsystemet).

A number of nature mapping projects have been under way for some time. Compatibility with the SEEA EA remains to be evaluated. For example, the so-called M98 guidance for mapping and valuing recreation areas in Norway is implemented by municipalities with large differences in implementation. Results have not been calibrated between municipalities. Still, this is a large mapping effort that brings new information to the table – it cannot be discarded because it is not consistent across the whole country.

The Nature Index for Norway has existed since 2010 and the Assessment system for ecological condition is being tested at regional level. The new Nature types in Norway (NiN 3.0) is a hierarchical system for describing nature type extents. Compatibility with UN SEEA EA ecosystem extent accounting needs to be evaluated. The NiN system is more detailed, but also more resource demanding than the previous DN13 system for nature value mapping, leading to slower achievement of national coverage than originally expected. Differential use of extent and condition accounts is required: Nature type mapping at local level and the System for Ecological Condition at larger scale.

Apart from data incompatibility, policy support is the principal gap at national level. There is no mandate in Norway to create an official ecosystem account beyond extent and condition accounts and the periodic update of the Nature index. For local and regional initiatives, the principal gap is found in communication. It is necessary to improve and diffuse the knowledge of the existing and future initiatives. This includes their use, purpose and the overall importance of ecosystem accounting. How the various national ecosystem mapping and accounting initiatives support planning and policy has not been documented. There is a need to focus accounting on landcover use of infrastructure, especially wind power, holiday homes, road and rail.

Support needs for developing natural capital accounts

Based on MAIA D3.2 (Annex 9 section 6 and 7) and stakeholder consultation carried out by MAIA Norway partners NINA and SSB in November 2019 (Barton and Garnåsjordet 2019)

The political momentum of ecosystem accounting has increased with the Global Consultation of the draft statistical framework for SEEA EA. The consultation process in Norway has been facilitated by MAIA. The project is continuing to promote best practices accounting examples. In general, there is a need for better horizontal and vertical coordination.

It is clear that the MAIA team should continue to facilitate feedback to SEEA EEA Revision from Norwegian agencies and ministries and on top of that promote better inter-agency coordination in Norway, by being a catalyst. This can be done by continuing to make Norwegian agencies aware of EU KIP-INCA experiences and by promoting best practice accounting examples – Norway until now often looks to the UK for NCA.

MAIA should continue to involve stakeholders i.a. and expand experimental work started in Oslo to other municipalities. It is premature to implement a full set of accounts at national level. There is a greater flexibility and will at the municipal/local level than national level to experiment with information systems. Municipalities are the main land management administrative level in Norway. At the same time, continued priority should be given to popular communication of ecosystem accounting information. MAIA should approach the ministries of Finance, Climate and Environment, Food and Agriculture, Fisheries and Coasts, and Municipalities and Modernization.



Involved partners and stakeholders

Based on D5.1 (Annex 9 section 2); European NCA stakeholder day

Government	Research	Private sector or NGO
Norwegian Environment Agency (NEA)	Norwegian Institute for Nature Research (NINA)	Sabima
Statistics Norway (SSB)	Norwegian Institute of Bioeconomy Research (NIBIO)	Menon centre for environment and resources
Ministry of Climate and Environment of Norway	Norwegian Institute for Water Research (NIVA)	
	AgriAnalyse	

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