

# SEIS COOKBOOK

DESIGNED FOR PRACTITIONERS IN  
**ENVIRONMENTAL**  
INFORMATION MANAGEMENT



*This project is funded by the European Union and is implemented by the European Environment Agency*





## Things to remember – a brief 'SEIS' checklist

(extract from the *SEIS Cookbook*, European Environment Agency, 2013)

### Why a checklist?

The checklist is a self-assessment tool for measuring the status of SEIS development and identifying possible gaps and areas for further enhancement.

### What is in the checklist?

The checklist includes all three pillars of SEIS - content, infrastructure and cooperation - and incorporates different contextual functions of SEIS – process – as a set of rules and tools, and technical solutions.

Where possible, links to the SEIS case studies are provided as tips for existing approaches to unaddressed issues.

## Content

### International reporting requirements

**Do you have an overview of all your reporting obligations to international organisations?**

- Yes                       No

**What is the share of international reporting in the overall environmental reporting conducted in your country?**

- Very little               About half               Most

**What system do you use for the monitoring and management of your international reporting obligations?**

- National database for compliance to MEAs  
 EEA [Reporting Obligations Database](#) (ROD)  
 No system, each National Focal Point is responsible for relevant reporting to the MEA

**Is there an overview of the overlapping data and information required for international reporting?**

- No  
 In progress  
 Yes  
 Yes, and we are developing guidelines for the harmonised collection, storage and sharing of data and information for international reporting working together in inter-regional programmes (including MEAs, and relevant EU institutions).

### Assessments reports

#### Indicators

**Is an indicator based reporting system established for the production of:**

- |                       |                              |                             |
|-----------------------|------------------------------|-----------------------------|
| National SOER reports | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| National report       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| National web-portals  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Are internationally agreed indicators incorporated into the national set of environmental indicators?**

- Yes                       No

**If 'yes', which?**

- EEA core set of indicators  
 EEA thematic indicators  
 UNECE environmental indicators  
 OECD environmental indicators  
 UN Indicators for Sustainable Development  
 WHO/Europe  
[Case: [Slovenian Indicators](#)]

**The environment is a complex system that cannot be contained within man-made borders. Do you have or use common indicators (cross-border, regional)?**

- |                                |                              |                             |
|--------------------------------|------------------------------|-----------------------------|
| Air                            | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Transboundary water management | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Biodiversity                   | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Industrial accidents           | <input type="checkbox"/> yes | <input type="checkbox"/> no |

[Case: [HELCOM indicators](#)]

**Data formats**

Digital information is essential for SEIS.

**What proportion of environmental data and information is available in electronic formats?**

- Very little      About half      Most

**What is the format of electronic data and information:**

- Excel tables  
Word documents  
Relational databases  
Other, specify:

**How would you describe the accessibility of environmental data and information?**

- On the internet free and open  
On the internet with fee  
On the internet – needs registration  
Upon request  
Difficult to access

**What is the share of information described by metadata?**

- Very little      About half      Most

On what themes:

- water      air      waste      spatial data      only statistical data

**Infrastructure**

**Organisational aspects**

Is there a Spatial Data Infrastructure in the country?

- Yes       No

**Are there specific technical bodies to discuss, follow up and carry out the technical implementation of SEIS?**

- Yes      No

[case: [Germany](#), [Czech Republic](#)]

**Is there a technical plan to develop and implement SEIS?**

- Yes                       No

If 'yes'

**Which main SEIS IT components are incorporated in the plan?**

- Metadata  
 Data Specifications  
 Network Services

[Case: [WISE Implementation Plan](#)]

**Information provision**

**Is there a unique portal for environmental information?**

- Yes, for all themes there is one portal  
 Portals exist for different environmental topics (e.g. water, biodiversity)  
                     Connected to each other                       Use common components                       Not connected  
 No, environmental themes are covered by independent websites

**Current IT solutions for data storage and management**

**Do you have an IT system for sharing environmental data at the national level?**

- No  
 As a pilot  
 Yes, though only for some themes  
 Yes, functional for all environmental information

[case: [Portal U](#)]

**What is the management structure of the system to share environmental information?**

- Centralised  
 Decentralised  
 Combination of decentralised data collection and centralised processing

**Are data being stored in the same standard for each type?**

- |                 |                              |                             |
|-----------------|------------------------------|-----------------------------|
| Data management | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Spatial data    | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Data exchange   | <input type="checkbox"/> yes | <input type="checkbox"/> no |

If 'no':

**Is communication between datasets or systems using different standards currently being accommodated?**

- yes                       no

**Are data management infrastructures being developed in order to integrate data in different standards? (only for geo-spatial data)**

- yes                       no

**To what degree are information flows automated for monitoring and reporting?**

Automatic aggregation of data for indicator generation

- Very little                       About half                       Most

[case: [Slovenian Atlas](#)]

Automatic report generation

Very little       About half       Most

[case: [Sweden](#), [PortalU](#)]

### Current visualisation techniques

Are data provided in tables and graphs?       Yes       No

Is GIS used to visualise data and information?       Yes       No

If 'Yes'

**What are the base maps' scales?**

1:10 000       1:25 000       1:50 000       1:100 000       Other, please specify

**Are the same visualisation techniques used for all themes?**       Yes       No

## Cooperation

### Data Sharing

**The basis for data and information sharing:**

- Legally binding procedures
- Specific intra-institutional agreements or procedures for information exchange and information
- No provisions for sharing of environmental information

**Are procedures for data sharing among information suppliers and users in place?**

At national level       Yes       No

At national/sub-national/local level       Yes       No

At national/international level       Yes       No

[case: [Austria](#), [Belgium EIONET](#), [Germany](#)]

If 'Yes'

**Are these procedures well known to all information suppliers and users?**

- No
- Yes, through working groups in national SEIS project
- Yes, through dedicated capacity-building activities
- Yes, through publishing the data sharing procedures and data policy on the web

[Case: [Belgium](#)]

**Are ICT tools for data and document sharing in use?**

- National community platform for national SEIS
- Reportnet (EEA system for data sharing)
- Eionet Forum (EEA system for document sharing)
- ENVIROWINDOWS

Other

**Is your country participating in any initiative or working group on information sharing practices at the international level?**

No

Yes, metadata standards and portals for Statistical Services

Yes, indicators development EEA, EECCA, OECD

Yes, special data standards

## SEIS Implementation

**Do you have an overall vision underpinning your strategy on development of the IT infrastructure in line with SEIS principles?**

Yes

No

[Case: [PortalU](#)]

**Have you carried out user requirements analysis regarding data/information and technical functionalities of the system?**

For the whole system

Only for selected themes

No

**Are you reviewing monitoring and reporting mechanisms to reduce duplication and overlaps, and update for policy relevance?**

In a systematic way

Occasionally, for selected themes in pilot projects

No

## Ideas for SEIS implementation

Building SEIS is a long-term journey, with many (inter)national ‘fellow travellers’ and a lot of coordination and technical arrangements. There is no ideal template or perfect technical solution. From a management point of view, SEIS is a step-by-step, long-term process, building on existing structures and international standards. Better sharing of experience can help committed organisations in their journey.

The step-by-step process includes:

1. Create an overall vision;
2. Anchor SEIS to national legislation and IT strategies; and
3. Develop a strategic plan

It is important to develop a vision that is realistic within the mandates of the organisations involved, and at the same time to ensure that SEIS development does not become a purely technical project. It should be clear that the first priority is to improve the quality of information and logical integration of different systems in order to provide a better basis for informed policy and decision-making. If possible, include cost estimates for the different steps, and tangible benefits resulting from these investments.

From the beginning of the project, try to involve stakeholders and build cooperation as much as possible. SEIS is a joint venture between environmental information managers, governmental officials and IT specialists. It is thus important to reach a common understanding and establish a good conceptual grounding. Involving stakeholders will bring everyone up to date, ensure engagement and commitment, and allow identification of the pioneers who may have resources and be inspired to build demonstration projects and further the case for SEIS development.

SEIS development may link a number of data providers and information producers with a broad audience of information users. Data providers could have different approaches to information production, data formats, standards, or to data accessibility, legal protection of copyrights, security of information and pricing. This could hinder the integration of information, and could also raise doubts about participating in SEIS and sharing information. Cooperation and involvement from the start will help.

### 1. Create an overall vision

Creating a coherent and realistic vision for SEIS at national level is important. It helps to grasp long-term ambitions. Without it, there may be a lack of coordination among data and information providers, causing inconsistencies, extra work and sub-optimal system performance.

The overall ambition for SEIS depends largely on the mandate. It can be as broad as establishing a comprehensive national shared environmental information system, developing a one-stop shop for environmental information in Germany or setting up a system to support a multilateral environmental agreement secretariat such as InfoMAP. A more modest ambition could be to build a



pilot IT system for harmonising existing data flows at a (sub-) national level for several specific topics (e.g. air, water, waste, ecosystem) like, for example, in [Ukraine](#).

## 2. Anchor SEIS to national legislation and IT strategies

Once a vision of SEIS development has been created it has to be anchored to national legislation and national information infrastructure strategies to guarantee national commitment and safeguard implementation.

The identification of legal requirements at national and international level is not only a technical necessity; it will also provide a solid ground for strengthening inter-institutional cooperation and justify human and financial investments in SEIS infrastructure.

One key question to answer is: What is the current legislation that demands environmental information? This could include several types of documents such as laws, acts and procedures for environmental monitoring and information, national IT strategies, or the provision of eGovernment services. A second question is: What are the international reporting obligations related to the environment (e.g. water, air, waste, climate change)? The Reporting Obligation Data (ROD) database, developed by the EEA as part of Reportnet, makes it easy to answer this question.

If a legal background to build the IT infrastructure necessary to fulfil the above legal requirements is missing, then amendments to national legislation, which demand the development of a National Environmental Information System supplying the requested environmental information based on SEIS principles, should be included in the vision (next step).

## 3. Develop a strategic plan

As case studies in this cookbook show, the journey from initial vision to fully operational systems may take several years. A strategic plan keeps the journey on track. It reflects the ambitions and desired functions, and should give visibility, clarity and stability to development efforts, making it possible to adapt to new circumstances as problems or opportunities arise.

### Identify SEIS services and users

Developing a strategic plan begins with answering the question: What services should SEIS provide and to whom – in order to supply the right information to the right people at the right time in the right way? The answers here should be fully consistent with the vision made earlier in the first step.

In technical terms, this means formulating high-level **information, functional, and non-functional requirements**. This is also sometimes referred to as the **‘technical specification’** of the system.

**Information requirements:** describe what information is needed, in what format and quality (e.g. analytical reports on the ecological health of lakes). Assess the available national, regional and international indicators and select the ones that are best fit for purpose, taking into account the comparability aspects. Then determine what data and information already exist - SEIS-related

projects aim to use existing data and information where possible. Once existing resources have been mapped, they can be compared with the vision and the legal and user requirements to produce a data gap analysis. From this analysis a prioritisation is made, identifying the most urgent aspects to develop as a first or next step. For example, Europe's Environment Assessment of Assessments provides a replicable methodology for assessment of information gaps and quality of existing information.

**Functional requirements** describe specific functionalities and processes within the system (what the system must do). For example: the system only accepts data uploads from users who are logged on, otherwise data can be downloaded directly from the data viewer.

**Non-functional requirements** represent characteristics that need to be considered when designing the system (how the system behaves). For example, compliance with INSPIRE principles, use of open standards, characteristics of the user interface and output/reporting requirements.

The **process** for specifying user requirements involves identifying stakeholders (data and information providers and users), establishing a dialogue with them and surveying their information needs and systems requirements. Formulation should not be left to 'experts'; it should be a participatory exercise where each stakeholder's unique voice is heard. Some stakeholders may need support to identify their needs.

### **Other points to consider when making a plan**

**Assess and evaluate risks:** Identifying potential barriers and risks, and appropriate risk mitigation actions, are an important part of the management and governance of SEIS development projects. These can include:

- Technical, for example, delays in prototype development due to uncoordinated standards and protocols;
- Organisational, for example, lack of inter-institutional trust and underestimated resources allocated to system development; and
- Human, for example participation in the SEIS project is considered as 'taking time' away from regular work.

**Funding:** Building SEIS may require substantial funding, depending on the number of existing building blocks available. It may be possible to implement some or much of the work within existing national budgets for environmental monitoring and assessment, compliance with MEAs, eGovernment programmes, infrastructure development, or professional education. Additional funding may however be desirable or necessary. Streamlining existing SEIS related activities can enhance results using the same resources. Sources do exist that could be used to fund a well-developed project proposal with clear objectives. They might include international development agencies, twinning programmes or bilateral cooperation. One lesson from the case studies is that it can be accomplished in stages. Streamline existing SEIS related activities to enhance results, using the same resources, and also consider that SEIS goes beyond public authorities, therefore public-private partnerships are essential.