Introduction to the updates made.
Updated Strategies for Monitoring and Assessment of Transboundary Rivers, Lakes and Groundwaters
Chapters 6-7 (Developing step-by-step approaches; Implementing monitoring programmes)

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Chapter 6 - Developing step-by-step approaches

Step by step Approach is still relevant and reccomanded to make the best use of available resources and knowledge

It entails identifying and agreeing on priorities for monitoring and assessment and progressively proceeding from general appraisal to more precise assessments and from labor-intensive methods to higher-technology ones

Examples
- It could also mean starting with data exchange for stations and sampling points close to the border and then, once this activity is well established, extending it to the whole transboundary basin or aquifer
- exchange of information on water status (quality and quantity) and then, as the relationship between riparian countries becomes stronger, sharing information on pressures and driving forces

In transboundary Contexts it can lead to informal cooperation at an operational level and, as mutual trust increases, lead to more formal agreements and establishment of joint bodies

UNECE guidelines on monitoring and assessment of transboundary rivers, groundwaters and lakes promotes this step-by-step approach

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Chapter 6 – Prioritizing monitoring effords, use of models and pilot project in monitoring and assessment

Identification of the main water functions and uses and the main issues relating to it is needed in order to determine the most important information needs for water quality and quantity, and the relevant determinants

No monitoring programme can measure all the variables determinands at as many sites and as frequently as would be desirable. Therefore, within the monitoring design, risk-based approaches should be used to select variables determinands. **In the case of groundwater,** the long-established and widely adopted approach of defining and mapping the vulnerability of aquifers to pollution can be used to prioritize monitoring

Risk assessment can also be used to determine whether the chosen monitoring strategy will fully meet the information needs.

Models (numerical, analytical, or statistical) can play **several roles in monitoring and assessment** and can be used to screen alternative assessment policies and monitoring strategies, optimize network design, assess the effectiveness of measures, and determine the impact on water bodies and the risks to human health and ecosystems. Models play an important role in flood forecasting and early-warning systems. They all need calibration.

Pilot projects establishing effective and efficient monitoring and assessment programmes sustainable in the specific economic context of the countries concerned. They help to initiate bilateral and multilateral cooperation, leading to institutional strengthening and capacity-building.

Chapter 7 – Implementing Monitoring programmes

Chapter 7.2 – Information needs
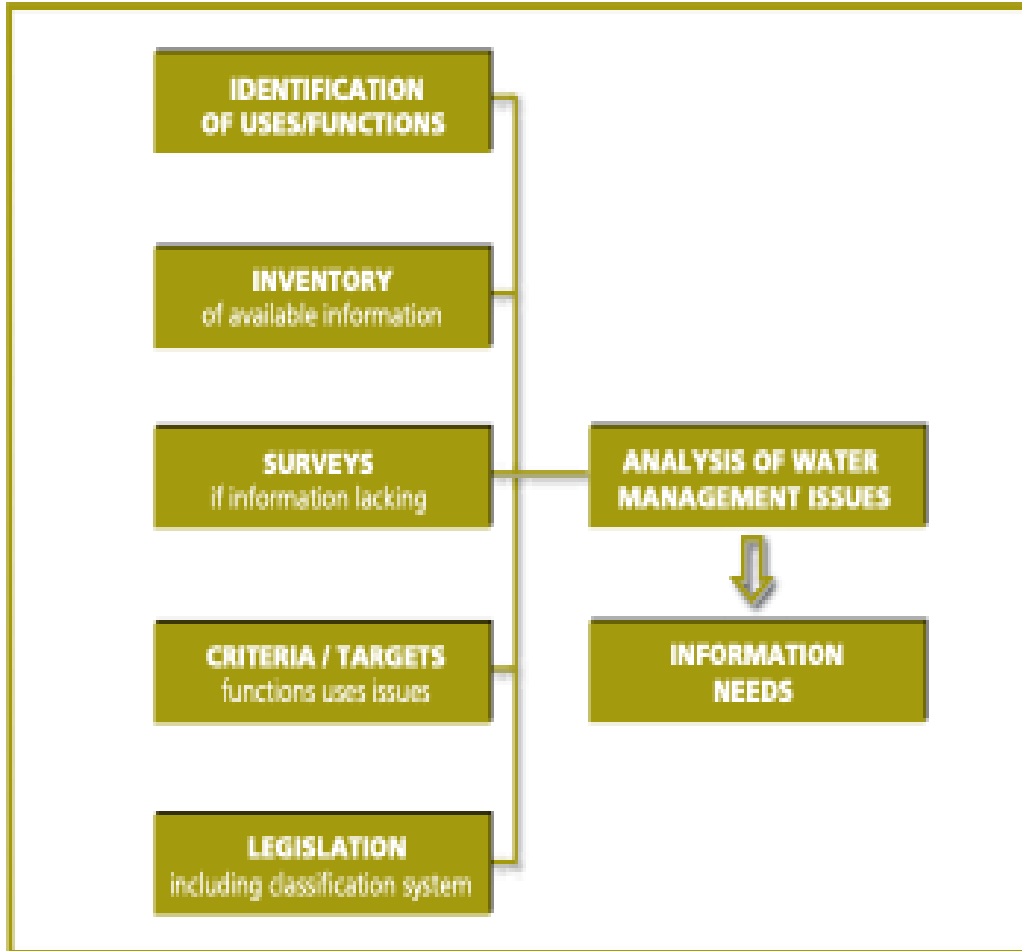
To specify information needs information users and producers should interact closely.

The institutions responsible for the protection and use of the transboundary watercourses, especially joint bodies, should be involved in the process of identifying and specifying information needs

Especially in defining information needs, close consideration of **gender issues** is needed

Inventories of available information should be merged, and their data harmonized, making sure to include the major aspects that are relevant to the identification of the issues (i.e. water uses and water quality). **Surveys** will be needed if the inventory does not provide sufficient data

Water balances or water accounts should be drawn up for (parts of) a basin (especially lakes and aquifers), when and where the careful sharing of available water resources for different water uses is of special importance

Water quality and quantity are of importance for ecosystems and should be included in the information needs

Chapter 7.2 – Information needs (part 2)

Information needs should be further specified so as to be able to design a monitoring and assessment programme.

The specified information needs should at least lead to:

- **Appropriate variables** determinands to be monitored;
- **Criteria for assessment** (e.g. indicators, early warning criteria for floods, droughts or accidental pollution);
- **Specified requirements for reporting and presenting information (**e.g. presentation in maps, GIS, degree of aggregation);
- **Relevant accuracy for each monitoring variable determinand**;
- **Degree of data reliability**;
- **Specified response time** (i.e. the period of time within which the information is needed), for example, for flood forecasts or early warning systems (e.g. minutes/ hours), for trend detection (e.g. number of weeks/months/years after sampling) and other tasks.

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Chapter 7 – Information strategy, monitoring & data collection and different data sourcing

Information strategy defines the best practical way of gathering data from various sources, such as:

- **Remote sensing and Geographical Information Systems (GIS)**
- **Emission registration**
- **Citizen's science**
- **Drones**
- **Sensors**
- **Environmental DNA**

It should culminate in **a monitoring plan and a plan for gathering data** from other a range of sources. It needs to be **adapted over the time** but with **continuity**

The main monitoring objectives for rivers, lakes and groundwaters as well as effluents are **to generate information**, to be used both in national and transboundary contexts, for Assessing the actual status of water resources; Detecting possible long-term trends in water levels or pollutant concentrations; Providing for hydrological forecasts; Assessing pollution loads from point and non-point sources; etc.

Important to use ISO Standard in Sampling, in situ physico-chemical analysis, hydrobiological and water-quantity-related measurements, and laboratory analysis **to ensure production of reliable and accurate data, improve quality and trust, enable exchange of data, increase comparability of measurements** and **improve understanding of uncertainty**

THANK YOU!