**Summary**

Organisations and individuals rely on a variety of mechanisms and support systems to collect, store and share data, with the ultimate aim of turning into information, knowledge, and wisdom. Information sharing and gathering networks are motors for capacity building and play a significant role in advancing IWRM implementation. This Tool introduces the concepts of knowledge pyramid, data value chain model, data use framework, learning-by-doing approach, 5E' learning cycle, and Delphi technique.

**Knowledge Pyramid: Turning Data into Wisdom**

Gathering and sharing wide-range and appropriate information for water and other professionals across sectors is the initial step in creating a rigorous knowledge exchange. The concept of knowledge in the knowledge management field is based on the knowledge pyramid (Figure 1) which depicts the hierarchy of the four following categories, thus differentiating between them (Riepl, 2012; Ackoff, 1999):

- Data: symbols reflecting the properties of objects and events, also perceived as raw facts and numbers. In regard to the water sector, these may be quantifiable and qualitative facts about the characteristics of water resources (such as quality, volumes, frequency of occurrence, spatial variability) (Tools C1; C2.02; C2.05).

- Information: this category increases the usefulness of the previous one by processing it. It demonstrates how data can be assembled into meaningful patterns for specific purposes.

- Knowledge: processed information, which helps to answer "how" questions and imply trends and values discovered with the help of data. Both information and knowledge are distinguished from data as they stimulate change, unlike merely presenting raw facts (Henry, 1974).

- Wisdom: this category entails operating with values and judgement. It can be seen as an agreement about commonly accepted methods of using water resources to ensure sustainability.
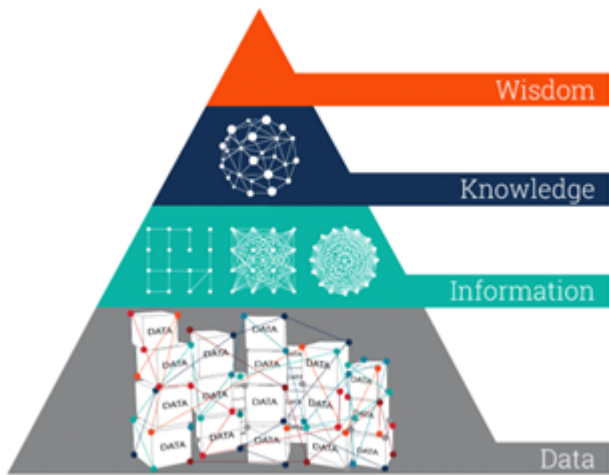
**Image**

Figure 1. Data-Information-Knowledge-Wisdom Pyramid. Source: Ontotext (2021).

**Information Gathering**

According to the data value chain (Figure 2), the first collection stage includes identifying what data to collect and how to use it to ensure that data gathering leads to tangible impacts. Throughout the process of data creation, use, and possible reuse, the environment for feedback provision between stakeholders should be facilitated (Open Data Watch, 2021).
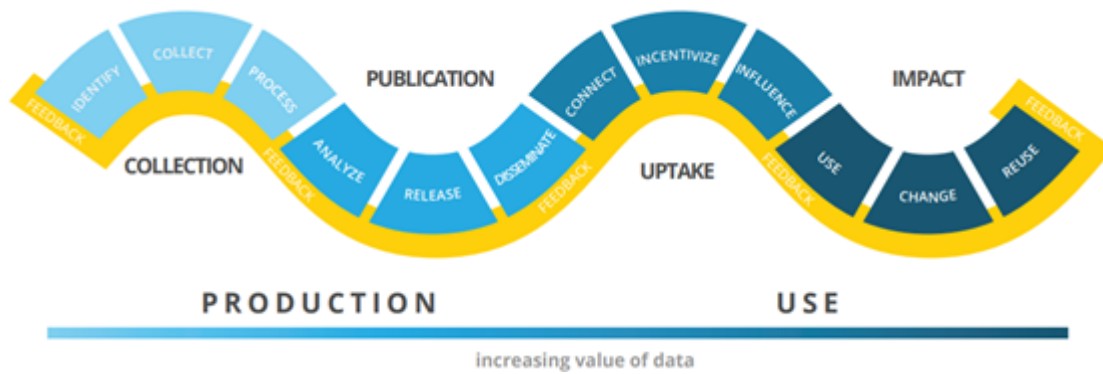
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Figure 2. Data Value Chain Model. Source: Open Data Watch (2021).

Information may be gathered for different sectors and actors, including water-resource planning and use, water governance, management of water services, as well as for government officials, aid agencies, development banks, citizens, civil society organisations (Tool B3.03), water service providers (Tools B2), businesses (Tool C5.05), and investors. For those involved in decision making, data use framework may be considered identifying (WaterAid, 2020):

- Purpose: mapping potential stakeholders to define whose data needs should be taken into account.

- Context: use of data should be placed within broader institutional arrangements, public financial management processes and priority targets.

- Data: types of data and information needed for the targets identified.

- Processes: arrangements for data verification, sharing, analysis and performance review create opportunities and incentives for data use.

**Knowledge Sharing**

The role of collecting information may be attributed to national level bodies (Tool B3.02), other governmental and non-governmental bodies, such as monitoring and evaluation bodies (Tool B1.03), independent agencies, private companies, local communities (Tool B2.03; Tool B3.03), and general public, representing citizen science (Buytaert et al., 2014). Regardless of which actors are held accountable, mechanisms and channels for knowledge sharing should exist to ensure success of knowledge management initiatives (Wang & Noe, 2010). The SECI principles showcase how tacit and explicit knowledge interact creating a cycle of socialisation, externalisation, combination, and internalisation (Figure 3). In the organisational setting, tacit knowledge can be socialised via mentoring or emulation. Externalisation takes place when there is a dialogue between people transforming tacit knowledge into explicit one when combination is a result of knowledge exchange per se. Finally, internalisation stands for "learning by doing" when the knowledge gained may be exercised in the field (Ramalingam, 2006).
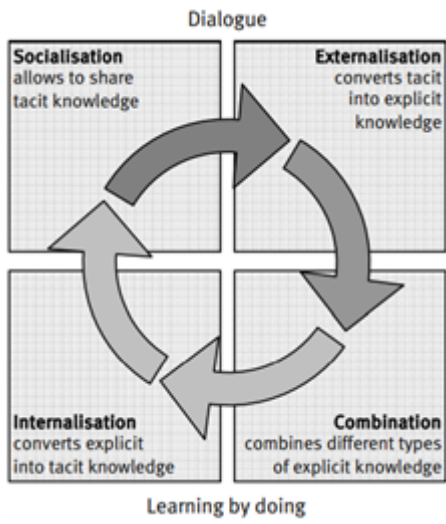
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Figure 3. SECI approach. Source: Ramalingam (2006).

**5E' Learning Cycle**

Training of water professionals (Tool B4.02; Tool C5.01), either on organisational or formal education level, should build on the fact that people construct knowledge from experiences, which may be gained via 5-phase process (Figure 4). The cycle starts with engagement when the learners' prior knowledge is accessed provoking curiosity and commitment. Exploration stage helps identifying existing concepts and misconceptions together with generating new ideas. Explanation part of the cycle facilitates exchange between learners and instructors when the latter introduce the concept and the former share their understanding of it. On the elaboration stage students would be challenged to broaden their conceptual understanding and skills. Evaluation in its turn encourages both sides assess their own and each other's understanding and abilities (Bybee et al., 2006).

**Image**

Figure 4. 5E' Learning Cycle. Source: Science Resource Center (2021).

**Delphi Technique**

To secure effective knowledge exchange between decision makers aimed at achieving consensus and reducing bias (Tool B1.05) (De Carvalho et al., 2017) Delphi technique may be applied. The technique is "a carefully designed program of sequential individual interrogations interspersed with information and opinion feedback" (Helmer, 1967, 7). The approach helps map experts' perceptions to reach a consensus on various subjects, such as water security (Assubayeva, 2021), regulatory impact assessment in the water sector (De Carvalho et al., 2017), detection of flood influence criteria (Boulomytis et al., 2019) and others. The key features of a Delphi procedure include anonymity; iteration secured via several rounds of discussions, interviews, and questionnaires; controlled feedback, and aggregation of group response with a goal to reach convergence of opinions (Rowe & Wright, 1999).

**Knowledge Networks in the Water Sector**

Various stakeholders in the water sector feed on each other to generate knowledge, creating valuable knowledge ecosystems (Tool B3.05; Tool B4.03) (GWP, 2021), examples of which can be found below. Designing new networks should not substitute developing existing ones (Smits et al., 2007).

- Cap-Net is a capacity development network for sustainable water management. Multi-stakeholders platforms for water governance course facilitated by Cap-Net virtual campus provides opportunities for knowledge exchange between different stakeholders involved in water governance.
- The Water Network is a knowledge sharing platform for water professionals, which can be used by individuals and organisations to connect, exchange knowledge, advertise and find opportunities.
- Water Youth Network is made up of community of students and young professionals promoting connection of young individuals and organisations across sectors to foster initiative and innovation via knowledge exchange.
- Rural Water Supply Network is a global network for rural water supply professionals used as a

platform for knowledge sharing and collaboration in the water sector focused on achieving universal access to safe water supplies.

- Pratique Network by Inter Aide was created to share experiences and methods to improve development practices, including WASH.



**Thematic Tagging**
Water services

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