

Untangling the role of Ecosystems and their Services in the Water-Energy-Food Nexus: an interdisciplinary hybrid workshop

Monday September 5th, 2022, 09:00 – 12:00 (GMT+2), University of Oulu and online

1. Rationale

Innovative solutions and approaches are needed to meet current and future demand for freshwater, energy and food while maintaining the integrity of ecosystems and ensuring equitable access to natural resources. The Water-Energy-Food (WEF) Security Nexus concept has been brought forward in the last decade as a cross-sectoral approach to understand, analyse, and manage complex trade-offs and synergies among the global resource systems (Hoff, 2011). Since its conceptualization, the Nexus thinking has evolved to embrace interactions among an increasing number of elements, i.e. climate, land, waste, health and ecosystems.

The inclusion of ecosystems in the Nexus is of particular interest since it has received different, but complementary, interpretations and applications (Hoff, 2011; ICIMOD, 2012; UNECE, 2015). Despite the increasing research and implementation of the Water-Energy-Food-Ecosystem (WEFE) Nexus in international case studies, some aspects remain under debated and confined to disciplinary silos:

- **Definition of Ecosystems and Ecosystems Services** within the Nexus debate
- **Role of Ecosystems and their Services** in the Water-Energy-Food Nexus
- **Approaches to integrate Ecosystems and Ecosystems Services** in all Nexus layers: biophysical, socio-economic and governance.

2. The Workshop

The University of Oulu is gathering researchers and practitioners from the fields of “**Water-Energy-Food Nexus**”, “**Ecosystems / Ecology**” and “**Ecosystems Services**” for a **collaborative** and **interdisciplinary** hybrid workshop.

The workshop will be held **in person** at the University of Oulu (Linnanmaa Campus, Tellus Stage) and **online** via video conferencing on Monday 5th September, 2022, 09:00 – 12:00 (GMT+2).

Registration: <https://forms.gle/mUFHBhRQo2KWdx3E6> (Registration deadline: 19th August)

The aim of the workshop is to leverage different perspectives on the Water-Energy-Food-**Ecosystems** Nexus to further define the key research and practical questions on the inclusion of Ecosystems in the Nexus, and to create a shared strategy for future research efforts.

3. Expected Outcomes

This 3-hour workshop shall promote a collaborative scientific dialogue among several research groups leading to the production of a collaborative synthesis paper¹ on the role of Ecosystems in the Nexus and the organisation of a WEFE Nexus session in an upcoming international conference (i.e. Dresden Nexus Conference, EGU 2023). The results of the workshop will also feed into the joint work of the COST Action [Nexus-Net](#)², which is currently developing a survey to gather insights on Nexus definition and applications from real-world case studies.

¹ The following special issue could be targeted for the publication of the manuscript: [All Earth \(taylorandfrancis.com\)](#)

² The workshop is being organised as part of a short-term scientific mission opportunity offered by Nexus-Net CA.

4. Information

For any information on the workshop, you can contact the organisers:

- Mr. Enrico Lucca, enrico.lucca@unifi.it (Water Harvesting Lab, Department of Agriculture, Food, Environment and Forestry, University of Florence)
- Dr. Tamara Avellán, tamara.avellan@oulu.fi (Water, Energy and Environmental Engineering Research Unit, University of Oulu)
- Mr. Sahand Ghadimi, sahand.ghadimi@oulu.fi (Water, Energy and Environmental Engineering Research Unit, University of Oulu)

Some key references

Bidoglio, G., Vanham, D., Bouraoui, F., Barchiesi, S., 2019. The Water-Energy-Food-Ecosystems (WEFE) Nexus, in: Encyclopaedia of Ecology. Elsevier, pp. 459–466.

Carvalho, P.N., Finger, D.C., Masi, F., Cipolletta, G., Oral, H.V., Tóth, A., Regelsberger, M., Exposito, A., 2022. Nature-based solutions addressing the water-energy-food nexus: Review of theoretical concepts and urban case studies. *J. Clean. Prod.* 338, 130652.

Hoff, H., 2011. Understanding the Nexus. Background Paper for the Bonn2011 Conference: The Water, Energy and Food Security Nexus., in: Environmental Research Letters. Stockholm Environment Institute, Stockholm.

Hülsmann, S., Sušnik, J., Rinke, K., Langan, S., van Wijk, D., Janssen, A.B., Mooij, W.M., 2019. Integrated modelling and management of water resources: the ecosystem perspective on the nexus approach. *Curr. Opin. Environ. Sustain.* 40, 14–20.

ICIMOD, 2012. Contribution of Himalayan Ecosystems to Water, Energy, and Food Security in South Asia: A nexus approach. ICIMOD, Kathmandu, Nepal.

UNECE, 2015. Reconciling resource uses in transboundary basins: assessment of the water-food-energy-ecosystems nexus. United Nations, Geneva, Switzerland.

Preliminary agenda (TBC)

Time	Activity		
09:00 – 09:15	Welcome and Introduction		
09:15 – 10:00	Setting the scene keynote speech, ice-breaking		
10:00 – 10:15	Break		
10:15 – 11:00	WG1: Definition of ecosystems and ecosystem services within the Nexus debate	WG2: Role of ecosystem and ecosystem services in the Nexus	WG3: Integrating Ecosystem and Ecosystem services in the Nexus biophysical, socio-economic and governance layers
11:00 – 11:30	Debrief from the Working Groups and plenary discussion		
11:30 - 11:50	Discussing way-forward (drafting of manuscript, session in international conference)		
11:50 – 12:00	Closure, round of thanks		