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## **How can we manage water, food and energy? DAFNE has the answer**

*Milan, 27 June 2017* - Water, food and energy are the three resources at the centre of the European **Horizon 2020 DAFNE** project, united by the close bond of a continually growing global demand, and the need for sustainability makes their management a major global challenge. DAFNE (Use of a Decision – Analytic Framework to explore the water – energy – food NExus in complex and trans–boundary water resources systems of fast-growing developing countries) accepts this challenge with the aim of defining methods and tools for analysing and supporting decisions in international contexts where there is tough competition for use of water as a resource for energy and food.

DAFNE will, in practice, be a **decision-making model** that integrates systems analysis tools originating from various disciplines (mathematical models, optimisation algorithms, climatic and socio-economic scenario forecasting, satellite images and high-resolution survey campaigns using drones), combines the economic, social and environmental dimensions and involves the stakeholders.

Indeed, institutions, experts in various fields and civil society organisations in the territories of the **two case studies** selected are invited to participate in the project, bringing their wealth of knowledge and having the opportunity to guide its choices according to a methodological approach developed by the research group headed by **Andrea Castelletti** of the Politecnico di Milano's Department of Electronics, Information and Bioengineering.

The two case studies, both in Africa, were chosen in strongly developing regions: **the Omo and Zambezi River basins**. These two rivers present similar problems: large-scale infrastructural works have significantly altered and will continue to alter the hydrological regime and use of water as a resource, with both positive and negative effects unequally distributed among the bordering countries.

The characteristic features of the two cases, which make them complementary and suitable for testing the tools developed by the Politecnico di Milano, on the other hand, concern the institutional context in which the players operate.

The Omo River, which rises and runs entirely in Ethiopia, then flowing into Lake Turkana, mainly in Kenya, is a fast-evolving context in which a programme for construction of large dams is still in progress, apparently with no transnational coordination measures in place.

In contrast, the waters of the Zambezi, Africa's fourth longest river, are used for hydroelectrical, drinking and irrigation purposes, and there is a supranational authority which considers and coordinates the opposing interests. The principal infrastructures have been built and operational since the early 1960s, but future plans for works by the eight nations through which it flows include new dams and a significant increase in energy production capacity. There is, therefore, a real risk of the area's current balance being upset, and careful planning action is required.

The project will also consider various future scenarios in which climatic projections will be combined with the expected infrastructural works options and the demographic and economic trends in the areas to which the study relates.

All the data collected and information generated will converge in a **Virtual Negotiation Workshop** in which the project's participants will be able to analyse the social, economic and environmental impacts, over time, of the different scenarios for distribution and production of water, food and energy, and assess appropriate adaptation measures. DAFNE may, obviously, be adapted to other contexts as well.

Participating in the project, besides the Politecnico di Milano, are ETH Zurich (coordinator), the University of Zambia, Eduardo Mondlane University, ACCESS, KU Leuven, the University of Aberdeen, the University of Osnabreuck, ICRE8, IWMI, ATEC-3D, EIPCM and VISTA gmbH.

**For further information:** <http://dafne-project.eu/>

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