

RIVEAL PROJECT

RIPARIAN FOREST VALUES AND ECOSYSTEM SERVICES – RIVER REGULATION EFFECTS ON HUMAN-WATER SYSTEMS



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SOCIO-HYDROLOGY

The study and understanding of the dynamics and co-evolution of human-water systems. Relatively new science that has been changing the way scientific community looks at river systems and the paradigm of water management. In this sense, nature can be incorporated into sociological investigation as sensitizing concepts that possibly support sociological explanations.

BIOPHILIA

Also known as “ecophilia”, or simply “affinity for nature”, is the innate human desire to affiliate and affectively bond with other organisms and environments. It is related to people’s past direct experiences in nature, conditioning their environmental attitudes and the way they perceive their surrounding environment.

PERCEPTION

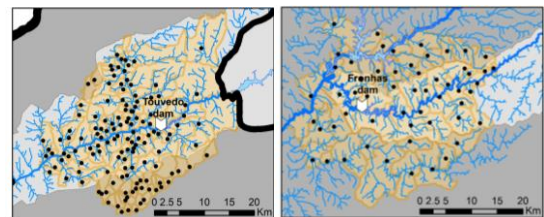
- ▶ A person’s form of cognitive contact with the surrounding world, apprehended by a worldview continuously built upon a personal experience history.
- ▶ Used to interpret the received sensorial information and formulate opinions.
- ▶ People have different perceptions about nature and ecosystems, as well as how these are responding to human disturbance.

STUDY’S RELEVANCE

- ▶ Communities with less affinity for nature tend to take less environmental participation. This relieves the necessity for improved sustainable management, thus leading to further environmental degradation and social inequality.
- ▶ The current detachment from nature and its destruction are happening at a greater pace than humans can adapt to it, posing a public health problem causing nature deficit disorders in modern humans.

OBJECTIVES

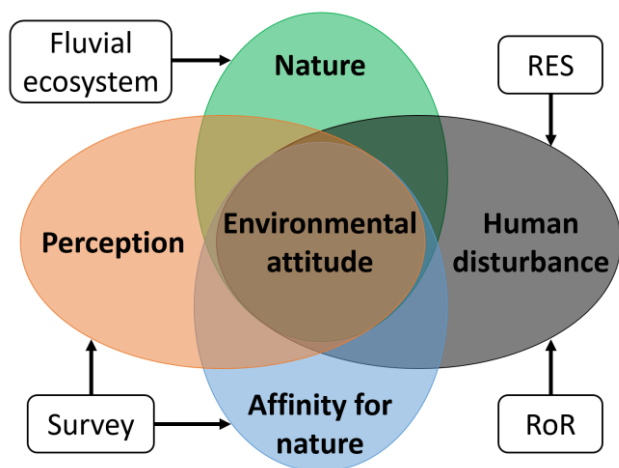
- ▶ Assess the affinity for nature of local populations and their perception of the regulation effects on river systems.
- ▶ Determine if there are dam operation schemes that are more detrimental to flow-human relationships.



Location of the study areas (orange) of Touvedo (RoR run-of-river dam, River Lima) and Fronhas (RES storage reservoir, River Alva) case studies. Orange polygons stand for Parish areas under influence of dams and black dots for Parish councils within the area (adapted from Rivaes et al., 2022; doi:10.1016/j.jenvman.2022.115992).

AFFINITY & PERCEPTION ASSESSMENT

- ▶ The assessment:
 - Telephone-assisted questionnaire survey;
 - Home telephone numbers selected randomly from the influence areas in both case studies;
 - Effort made to achieve a diverse sample, establishing a goal of at least 200 responses in each study area;
 - Questionnaires about *i)* Sociodemographic characteristics; *ii)* Affinity to river features related to supporting and intermediate ecosystem services; *iii)* People's perception of the river regulation effects.



Conceptual model supporting the assessment of the affinity for nature and perception of local populations about the regulation effects on the fluvial ecosystem. White boxes stand for the data inputs considered in the conceptual model (RoR – run-of-river dam; RES – storage reservoir) (from Rivaes et al., 2022;

doi:10.1016/j.jenvman.2022.115992).

- ▶ Collected data:
 - Encompassing a total of 192 parishes;
 - A total of 402 (201 in each case study) interviews performed during May 2020 on a population aged over 16;
 - Sample is representative of the sociodemographic characteristics of the resident population, according to the latest census of 2021;
 - Approximately 76% of the interviewees still use the river and the river margins;
 - More than half of these have a frequency of visits greater than four times a year, for recreation mainly;
 - Female gender prevalent;
 - Based on the statistical analyses, the communities were considered homogeneous and analyzed together.

AFFINITY FOR NATURE

- ▶ The people's affinity for nature responded firstly to a river ecology factor and secondly to river hydraulics.
- ▶ It is dependent on gender, age group, educational attainment and river regulation type.
- ▶ Women present less affinity than men for river hydraulics-related issues.
- ▶ Youngers have less affinity for non-intervened rivers.
- ▶ People with secondary education have on average less affinity for river ecology than people with only primary and basic education.
- ▶ Less affinity is found regarding river ecology and hydraulics in the Run-of-River dam-induced flow regime interviewees.

PERCEPTION OF RIVER FLOW REGULATION EFFECTS

- ▶ Perception is influenced by gender, educational attainment and river regulation type.
- ▶ Men perceive better the river regulation effects than women, particularly the provisioning ecosystem services.
- ▶ Educational attainment and age appear to have less influence on perceptions but come hand to hand.
- ▶ In storage dam-driven flow regimes people perceived greater loss of river ecosystem services as an effect of river regulation.

HUMAN PERCEPTION VERSUS SCIENTIFIC KNOWLEDGE

- ▶ Approximately the same general perception about the river regulation effects compared with the current scientific knowledge.
- ▶ In a few aspects there is a gender difference that may be acting as a barrier to the perception of the impact of river regulation on river ecosystems.
- ▶ Another important factor is the role to be played by education, providing conditions for dedication and time to nature and promoting knowledge through direct experience.

