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Agricultural practices and ecosystem services provision to ensure the food, water and energy security

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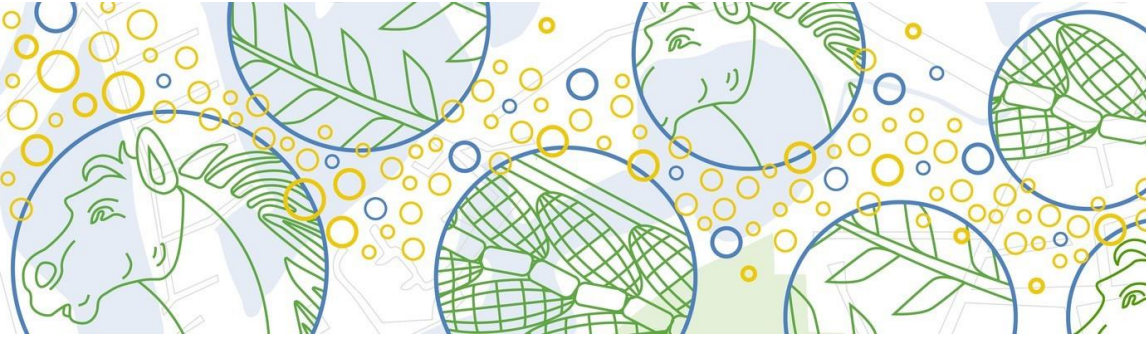
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By 2030, it is estimated that the world population will be 8.3 billion people, increasing the pressure in energy, water, food, land use and mineral extraction, especially in the developing world. These estimates indicate the immediate need to adopt interventions that can minimize these impacts. There is a lot of talk about sustainability, but it is still rare to make the results of integrated evaluations available on various topics. When considering the integrated Nexus Food–Water–Energy (F–W–E) assessment, this fact is even more challenging.

Considering the importance of the agricultural sector in Brazil and the existence of areas in different stages of degradation, it becomes strategic for interventions that can generate socio-economic and environmental benefits and positive impacts to the tripod F–W–E. Thus, the present study is based on the Ribeirão das Lajes dam (RJ), a core area for the water supply of the second largest city in Brazil – Rio de Janeiro. A methodological approach will be developed that will generate an integrated assessment tool to evaluate the impact of agriculture practices and its potentiality to ecosystem services provision in the Nexus F–W–E approach.

Thus, the first stage of the project consists in an expert's consultation. To support the experts, a meta-analysis regarding the performance of different agricultural practices (no tillage; minimum tillage; crop rotation; terraces; spring recovery, and others) were presented.



The results of this first stage were very promising. The project data base was criticized and validated by the experts; a set of landscape attributes as well as the indicators to monitoring it was defined; and, the level of impact of each agricultural practice in F-W-E was established. All the information will be used to modelling to generate a decision-making tool, based on the evaluation of a land use intervention – which may be technical or political.

Keywords: agriculture ecosystem services provision; water, food and energy security; multifunctionality of agriculture