

## Integrating TRIZ and MCDM for Innovative and Sustainable Decision-Making: A Case Study in the Life Cycle of Olive Oil

Keskes Mohamed Amir<sup>1,2</sup>[0000-0003-4979-7228], Remy Houssin<sup>1</sup>[0000-0003-4807-0270], Alaeddine Zouari<sup>2</sup>[0000-0003-4807-0270], Diala Dhouib<sup>2</sup> Jean Renaud<sup>3</sup>

<sup>1</sup> University of Strasbourg, 3 rue de l'université, 67084, Strasbourg, France

<sup>2</sup> University of Sfax, ISGIS, Cité El-Ons, 3021, Sfax, Tunisia.

<sup>3</sup> INSA of Strasbourg , 24 Boulevard de la Victoire, 67084, Strasbourg, France  
mohamed-amir.keskes@etu.unistra.fr

**Abstract.** The combination of the Theory of Inventive Problem Solving (TRIZ) and Multi-criteria decision-making methods (MCDM) has the ability to support decision-making and make innovative solutions in different fields. One such field is the production of olive oil, which has a complex life cycle involving multiple phases. This study involved the evaluation and selection of different scenarios for improving the sustainability of olive oil production, using multiple criteria such as environmental impact, cost, and social acceptance. Then TRIZ approach was used to identify innovative solutions that meet the criteria and offer additional benefits such as reduced waste generation and increased efficiency. The results of the case study demonstrate the effectiveness of the integrated TRIZ-MCDM approach in generating innovative solutions that meet multiple criteria and address conflicting objectives in the life cycle of olive oil. The approach enabled decision-makers to identify solutions that not only met the criteria but also provided additional benefits such as reduce water consumption, reduce greenhouse gas emissions, and increase social acceptance.

**Keywords:** TRIZ, MCDM, Olive Oil, Life Cycle, Inventive Scenario.