

## Sustainable project selection: A novel MCDA method

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### Abstract

Project selection in sustainable development context is one of the major concerns of governmental departments whose are seeking to develop best approaches and innovative methods to deal with such complex decision-making problem. This work is concerned with sustainable project selection, which must guarantee a long-term balance between the integrity of the environment, the social equality and the economic efficiency. For this context, we propose a novel multi-criteria multi-period outranking approach which solves multi-criteria decision-making problems, considering not only their immediate consequences but also their future impact in the short, medium and long term horizons. The proposed approach consists of the following three phases: i) problem structuring and preference modeling, ii) multi-criteria aggregation at each period using an outranking method and iii) multi-period aggregation using a measure of distance between preorders in order to aggregate the results of the multi-criteria aggregation phase at each period. The proposed approach can be used with all outranking methods. In this paper, we illustrate the approach using ELECTRE II but any other outranking method could be used alternatively. The proposed approach is then applied for sustainable forest management decisions.

### Keywords

Multi-criteria decision aid, outranking methods, sustainable development, and forest management.

### Biography

**Dr. Anissa Frini** is professor in management science at *Université du Québec à Rimouski*. She holds a Ph.D in operations and decision support systems and MBA in Information Systems from Laval University. She has expertise with Multi-criteria decision aiding, dynamic and sequential decisions, uncertainty management, project selection and sustainable development. Dr. Frini research interest fields included developing decision support methods and algorithms for project selection in a sustainable development context, evaluating sustainable forest management options, evaluating the quality of polypharmacy using multi-criteria sorting methods and developing multi-criteria multi-period approach for assessment of sustainability.

**Dr. Sarah BenAmor** is professor at *Université d'Ottawa*. She holds an MSc and a PhD in Business Administration, specialising in operations and decision support. Her research is focused on multi-criteria decision making. It looks mainly at uncertainty modelling, information imperfections and how they are treated in multi-criteria decision analysis. Her expertise in model building and uncertainties associated with multi-criteria analysis has benefited various R&D projects for Defence R&D Canada – Valcartier, particularly with regard to risk analysis. She also has numerous applications in different fields such as finance, innovation and healthcare systems.