Report documenting the integration of science-based and value-based trade-off analysis methods
The aim of WP12 is to develop a spatial evaluation tool for the trade-off analysis of various land use options (qualitative exploration), integrating environmental and socio-economic indicators of sustainability, to assess whether the multifunctional land use system is sustainable. D12.1 aims at identifying (1) modes of application in the trade-off analysis sequence, (2) trade-off outputs for use in the Roadmap, (3) data issues, (4) scale issues, and (5) harmonized means of interpretation of results.

(a) Towards a tailored trade-off toolbox
A broad approach for trade-off analyses was conceptualized for VOLANTE. The division into science-based and value-based trade-off approach is a means to examine different trade-off mechanisms in different systems, at the same scale, providing a portfolio of instruments to understand about impacts and drivers, synergies and contrast in the future land-use in Europe. The final choice and design of trade-off analysis will depend on the development and scope of the Roadmap.

Figure: Integration of trade-off approaches in VOLANTE

(b) Comparative analysis
The diversity of expertise in trade-off analysis shall grant methodological progress by comparing approach and outcomes of science-based and value-based trade-off analyses. It is foreseen to apply:

- Regression analysis to compare results of both approaches, influence of single factors/indicators, redundancies, and identification of key indicators that might be used as proxies in more lighter evaluation approaches
- Rank correlation: by means of Kendall’s taub supports to comparison of trade-off results and to reveal potential contradiction in the interpretation of the two approaches
- Normalisation and standardization of indicators to prepare aggregation can be tested and compared for both approaches

(c) Integrated application
Aspects of fully or partially integrating both trade-off approaches are interesting from the scope of both methodological development and support of more complex interpretation of trade-off results. Two aspects should be in the core focus in this effort:

- An ES index in the science-based analysis remains un-weighted, and there is a debate on the weighting of factors of indices in the scientific literature. MCA input may help to generate weighting patterns and analyse the impact of these as compared to un-weighted algorithms.
- The identification of ES bundles carries important information on the compliance/exclusiveness of ES that may be crucial for spatial MCA as well. The application of ES indicators clusters will be tested in the spatial MCA.