PRACTICAL APPLICATION OF MULTI-CRITERIA ANALYSIS IN PARTICIPATIVE ECOLOGICAL RESTORATION

1-day course, SER Europe Conference 2016

Teachers: Mchich Derak[1] and Jordi Cortina[2]

[1]Direction Régionale des Eaux et Forêts et de la Lutte Contre la Désertification du Rif, Tétouan, Morocco; [2]University of Alicante, Spain

Targeted audience: Restoration, conservation and planning students and practitioners

Date: Friday, August 25, 2016 - full day

Location: TBA (seminar room on TUM Campus Freising)

Course fee: 50,- €

Multi-criteria analysis (MCA): Benefits and state-of-the art

Land use planning and natural resource management issues are complex, uncertain and multi-scale, and involve a variety of social needs and interests, sometimes complementary but often conflictive. Environmental decisions may affect or be affected by different groups of stakeholders. The active involvement of stakeholders is increasingly considered as necessary for efficient and democratic environmental management. This is particularly true for environmental strategies aiming at combating land degradation and enhancing human well-being such as ecological restoration programs.

Multi-criteria analysis (MCA) is a suitable tool for participative planning that helps decision makers in structuring and justifying their decisions. MCA facilitates the classification of a set of environmental alternatives according to a certain number of criteria. Furthermore, MCA offers the possibility to consider marketable and no marketable goods and services, it can incorporate a mixture of quantitative and qualitative information, and it integrates the opinion of different stakeholder groups.

In general, MCA includes five main steps: structuration, standardization, weighting, integrated evaluation and sensitivity analysis. In practical cases, the achievement of these steps is not easy, and precautions should be taken regarding a series of factors: choice of alternatives and criteria, suitable structuring of the decisional problem, adoption of a weighting procedure appropriate for all stakeholders, analysis of the consistency of the preferences, aggregation of individual stakeholder preferences, and exploration of MCA outputs, among others. If these factors are not controlled through appropriate methodological adaptations, the accuracy and harmony of the MCA results are affected, which may lead to imprecise and even erroneous conclusions.

Numerous models deal with MCA problems, such as DEFINITE, ELWIS, EXPERT CHOICE, etc. These programs follow the fore-mentioned five steps but each one has a different interface and different ways to upload data and produce MCA outputs. Handling these programs allows practitioners to quickly and consistently solve MCA problems.

In studies and projects linked to environmental management such as those dealing with ecological restoration, carrying out a MCA exercise involving a multitude of stakeholders, with different sources of knowledge and different needs and interests, require theoretical concepts but also practical abilities that allow facing with professionalism different decisional problems.

Course objective

During the course, participants will be given a synthesis on the decision support techniques, as well as the MCA methods. Participants will also carry out practical exercises using MCA, as a simulation of practical analysis with stakeholders, with special emphasis on weighting procedures and verification of stakeholder preferences' consistency. Furthermore, participants will be given practical advices to interpret MCA outputs and the way to validate them, together with stakeholders.

At the end of the course, participants will have acquired practical abilities:

- To bring appropriate methodological adaptations to deal with a wide range of stakeholders.
- To use suitable MCA methods for a given decisional context.
- To avoid typical errors when achieving each MCA step.
- To understand the concept of inconsistency of preferences, control its different sources and bring acquired rectifications.
- To collectively interpret and validate MCA outputs.

Schedule

1. Introduction (3h)

1.1 Basic concepts on decision support techniques

1.2. Review of available MCA methods

1.3. MCA steps

2. Simulation exercise. MCA of land uses using the ecosystem services framework (3h)

2.1. Weighting exercise

2.2. Detection and correction of inconsistencies

2.3. Integrated evaluation of the assessed land uses

3. Collective interpretation and validation of MCA outputs (2h)

3.1. Practical advices

3.2. Errors to avoid

3.3. Final discussion

Lecturer profile

Mchich DERAK is a forest engineer who works since 2003 at the Regional Forest Administration of The Rif, Tétouan, Morocco. In 2011, he obtained a Master of Science title in Integrated Planning for Rural Development and Environmental Management from the Mediterranean Agronomic Institute of Zaragoza. Currently, he is a PhD student at the University of Tétouan (Morocco) and the University of Alicante (Spain) and works on multi-criteria and participative approaches to support ecological restoration in Moroccan semiarid areas.

He has participated in several research projects dealing with natural resources management: PRACTICE Project (Prevention and Restoration Actions to Combat Desertification), UNCROACH (Dynamics of woody vegetation in dry and semi-arid landscapes facing global change; Implications for the provision of ecosystem services), SEMER (Optimization of Goods and services' provision in Degraded Forest Landscapes in Morocco through Ecological Restoration) and RESEP2B (Participative Ecological restoration for Sustainable Development in Béni Boufrah Area, N Morocco).

His relevant publications in the field of ecological restoration and participative environmental management are:

- Derak. M., Taiqui, L., Aledo, A., Cortina, J., 2016. Similarities in stakeholder identification of restoration targets in a semiarid area. J. Arid. Environ. 128: 30-39.
- Derak, M., Cortina, J., 2014. Multi-criteria participative evaluation of *Pinus halepensis* plantations in a semiarid area of southeast Spain. Ecol. Indic. 43: 56-68.
- Cortina J, Ruiz-Mirazo J, Amat B, Amghar F, Bautista S, Chirino E, Derak M, Fuentes D, Maestre FT, Valdecantos A, Vilagrosa A, 2012. Bases para la restauración ecológica de espartales. Gland, Suiza y Málaga, España: UICN.
- Cortina J, Amat B, Derak M, Joao Ribeiro Da Silva M, Disante KB, Fuentes D, Tormo J, Trubat R, 2011. On the restoration of degraded drylands. Sécheresse 22: 69-74.
- Rojo L, Bautista S, Orr BJ, Vallejo R, Cortina J, Derak M, 2012. Prevention and restoration actions to combat desertification. An integrated assessment: The PRACTICE Project. Sécheresse 23: 219-26.