

Abstract

Sustainable forest management (SFM) considers the social and ecological aspects of forestry apart from the productive ones. However, the relative importance of its principles changes in each type of forest.

Criteria and indicators (C&I) extend the knowledge and understanding of SFM in each different situation. A set of C&I to be applied under Mediterranean conditions is proposed in this thesis. The scope was set for the forest management unit (FMU). The C&I proposed took into account the Spanish context and the Forestry Regional Plan for the region of Valencia (whose Spanish acronym is PATFOR) served as a reference.

The thesis is made of three papers, two of them published and one accepted. The first identified the requirements of SFM under Mediterranean conditions and analysed the Spanish situation. For that purpose, a strengths-weaknesses-opportunities-threats (SWOT) analysis was carried out and strategies for improvement were determined. The results of the SWOT analysis together with the strategies and the requirements identified by means of literature review were verified in a questionnaire sent to experts.

In the second paper, a group of criteria recommended to take into account for the success of a participatory process were established. A review of case studies which had developed decision support systems (DSSs) including elements of participation was completed. Conclusions were considered for the method applied in the third paper and they helped to identify indicators for the criterion “participatory processes”, which is one of the criteria proposed in this thesis. Besides, PATFOR recommends including participation in forestry decision-making.

The third paper started adapting various ecosystem services frameworks to Mediterranean conditions. PATFOR suggests that forestry is more sustainable if it stems from the provision of ecosystem services, even more in Mediterranean forests because they are not very productive in general. Management criteria which maintain and improve the provision of ecosystem services were identified. A participatory process took place in *Ayora* (a village in the region of Valencia); participants were asked to rank the criteria identified according their management preferences for *La Hunde y La Palomera*, a FMU near the village. A proposal of indicators was another output of this paper. The thesis includes another chapter which does not correspond to any published paper; it describes the elaboration of a questionnaire that was sent to experts. The questionnaire asked respondents to prioritise the indicators proposed in the third paper following the *Analytic Hierarchy Process* (AHP) methodology.

The result is a proposal of 15 criteria and 90 indicators. Criteria were inspired by the requirements of the first paper and the ecosystem services. 7 out of 15 criteria are social, noticeably increasing the weight of the social pillar in comparison with other existing C&I sets. Nevertheless, participants ranked ecological implications of forestry as the most preferred ones. However, they did not reject any of the criteria and this suggests that considering ecosystem services in forest management is realistic and desirable.

Although the AHP questionnaire sent to experts was different from the participatory process, both in appearance and content, some comparisons can be made. Experts search for feasibility in their answers. It may be recommended from these differences that forestry decision-making takes into account the views of affected people, but their preferences might pass an expert filter before carrying out actions. Regarding the indicators, some more work on them is still necessary, but they show a simple writing and they refer to a specific aspect of each criterion.