

Assessing interactions between renewable energies and ecosystem services according to a sustainability perspective

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The Alpine area is supposed to have a great potential for the development of renewable energy plants, in the perspective of the European Union 2020 goals. However, this means also increasing pressures on nature. In order to help decision makers evaluating the synergies and trade-offs between renewable energies and ecosystem services (ES), the Alpine Space 'recharge.green' project aims at setting some guidelines and best practices while assessing and managing energy plans. The University of Padova contributed to the project with the assessment and evaluation of ES related to water resources, for the micro- and mini-hydroelectric power production, and to forest biomass, for energy purposes. The potential energy plants are conceived according to the rationalization of the systems and the promotion of short local supply chains, mostly based on principles of economically and environmentally sustainable management of timber resources, for the case of the forest biomass. The evaluation of ES requires a spatial analysis, of which outputs are thematic maps of the surveyed areas. We developed a multi-criteria approach for the geographical assessment of ES, basically considering the site capability and forest type suitability of the patches characterised by homogeneous forest typology. According to this, we produced three alternative maps on the study areas of the Mis and Maé Valleys (North-East of Italian Alps) considering the following services: hydro-geological regulation and hazard protection, ecology and biodiversity conservation, landscape and recreation. The level of locally perceived importance of the ES has been expressed through a Likert-type scale. For both the study areas, maps representing a ranked distribution of the services have been produced, in order to identify the prevalent service, according to the different sites. Such maps have been compared to the ranking of ES categories made by the local stakeholders during the focus groups organized in the frame of the project activities. In fact, social inclusion is a main issue to tackle while pursuing a decision process about land management. The association with an economic evaluation of the ES allows adding a quantitative connotation, which is useful in case of compensation activities.