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Geosciences for sustainability

A.J.D. Ferreira
CERNAS, IPC, Escola Superior Agrária de Coimbra, Bencanta, P-3040-316 Coimbra, Portugal

The world is facing overwhelming challenges with implications on the socio-economic performance and the quality of life around the planet. New solutions are needed to prevent, overcome or mitigate the turmoil processes caused by global change, resources exhaustion, and the procession of induced socio-economic impacts.
To this end, solutions to optimize natural resources management, find new ways of using geophysical processes and properties as resources, and to use geosciences knowledge to find new, more sustainable ways to use earth resources, has to be sought for.
This work is based on a literature review and on the building of a sustainable development strategy currently being prepared at the Portuguese Centro Region by the author, as part of a Research Centre strategy towards the improvement of environmental performance, of organizations, products and infrastructures.
The strategy is based on the optimal use of environmental services, to which the role of geosciences and is a key element. Harnessing the abiotic milieu and processes and mimicking the multiple scale interactions of ecosystem to improve the organization and the productivity and value of man ventures.
Geosciences provide the matrix where activities occur; therefore, their judicious management will optimise resources use, providing the best solutions. In addition, geosciences and their relation with ecosystem research can be managed to improve yields, by optimizing the agriculture and forestry practices.
One way to proceed, that is in the forefront of research towards sustainability is by developing ways to include geosciences and ecosystems factors in novel Environmental Management tools such as Life Cycle Assessments or Environmental Management Systems.
Furthermore, the knowledge on geosciences cycles and processes is of paramount importance in any planning process and in the design of infrastructures, which has a key direct or indirect role in the optimization of energy management.