**Expertise of Environmental Sciences department of Earth and Life Institute (ELIe) of the Université catholique de Louvain (UCL) in relation to CLIMWAR-LAC and WATER SECURITY.**

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The Environmental Sciences department of the Earth and Life Institute of UCL encompasses four research teams that jointly develop fundamental and applied research programmes supporting the sustainable management of natural resources (soil, water, air, ecosystems) and that can be integrated in the CLIMWAR and WATER SECURITY programmes of UNESCO.

The environmetrics and geomatics team (P. Defourny / C. Lamarche /F. Jonard /…) develop expertise in environmental geomatics at the regional and global scale. At the regional scale, the CENNIC project aimed to develop methodological schemes to update the hydrological network of the Walloon region by consistent cartographic integration of existing databases.  In the ORTHOWATCH project, the team was in charge of the annual mapping of water surfaces at submetric resolution (25 cm) using aerial imagery. Results will shortly be used in the context of the distribution of subsidies from the European Common Agricultural Policy. On a global scale, the team has experience in time series analysis and processing of large amount of data. In the EU FP7 Geoland2 project, the team focused on the monitoring of the surface water dynamics over Africa using medium resolution daily imagery and the detection of anomalies in nearly real time. Finally, in the framework of the European Space Agency Climate Change Initiative (ESA CCI), the team was involved in the mapping of permanent surface water bodies using existing water bodies’ datasets. This product was selected to be used across all essential climate variables tackled by the ESA CCI.

The soil and water engineering team (M. Vanclooster / C. Bielders / M. Javaux / S. Lambot) develop research in the fields of ecohydrology, soil and water conservation, soil hydrology and hydrogeophysics to support soil and water engineering and management in temperate and drought prone subtropical areas (in particular arid and semi arid regions: Northern Africa (Morocco, Algeria, Tunisia) – West Africa (Niger / Burkina Faso / Senegal)). They are strongly involved in research programmes related to soil and irrigation water management in Morocco, soil and water conservation in Algeria and Tunisia, and were involved in EU-FP7 CLIMB project dealing with the evaluation of impacts of climate change on the local hydrology of Mediterranean catchments. In these research programmes, they particularly look for structural resilient pathways to manage scarce water resources and enhance water security through appropriate soil and water conservation, the use of alternative water resources and the optimal use of groundwater. The group recently published the pan-African vulnerability map of groundwater systems, which is essential to understand the role of groundwater systems in large scale water security enhancing programs.

The forest and ecosystem research team (Q. Ponette / C. Vincke / M. Jonard / C. Farcy) focus on forest ecosystem research and forest management, as barriers to environmental degradation. They consider forest planning and management as a vehicle for reducing land and water degradation. They are also involved in interdisciplinary research on forestry, and the links between social and natural sciences, and science and policy cross-fertilization. They are involved in many forestry processes and organizations (FAO European Forestry Commission, EFI, Silva Mediterranea, ONF, etc), in particular the Great Green Wall Initiative, supported by FAO.

The ELIe-UCL of can contribute to Unesco CLIMWAR-LAC and WATER SECURITY by providing various water bodies datasets, technical advice and recommendations related to water and climate.