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Land degradation in a semi-urban catchment in Burkina Faso: monitoring land use change and soil erosion with earth observations and field surveys

Irene Angeluccetti (1,3), Velio Coviello (2,3), Paolo Vezza (3), Stefania Grimaldi (3), Sara Steffenino (1), and Alain Magloire Koussoubé (4)

(1) ITHACA, Torino, Italy (irene.angeluccetti@polito.it), (2) CNR IRPI, Torino, Italy, (3) Primo Principio Coop, Alghero, Italy, (4) CISV NGO, Torino, Italy

Soil erosion is currently menacing the availability of arable land in various countries worldwide. In particular the countries located in the Sahel area of Sub-Saharan Africa are extremely prone to this type of environmental degradation. The same countries rely traditionally upon subsistence farming, which makes the population more vulnerable to environmental changes. The study here presented exploits remote sensed data for identifying the main degradation processes occurring in a small catchment of central Burkina Faso (i.e. Boulbi watershed). This catchment, approximately 100 square km large, is characterized by the presence of a 30 years old dam, whose reservoir feeds 80 ha of rice-fields. This produce contributes up to 13% of the regional rice production. Nonetheless other crops, along with rain-fed rice, are grown all across the Boulbi catchment during the rainy season. Both the increasing gully erosion and the urbanization of the capital city pushing from the North are significantly threatening the farming activities. By using aerial frames acquired with a 16 years' time interval (i.e. 1996, 2012), free satellite imagery, and field surveys, the base cartography of the investigated area was updated and the most active gullies were identified. Moreover a change detection analysis was performed on both artifacts and land use features. More than 200.000 square m of erosion areas and an increase of nearly 90% in built-up areas were detected. In addition, the importance of producing up-to-date base data was proven by the exploitation of the outcomes for the production of a catchment land and water management plan.