



## **Correlation of water with carbon/energy footprints for effective agricultural and livestock products classification**

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World population is increasing and human diet is becoming of considerable concern for human welfare. Natural resources are overexploited and governments need policies for a good management of the environment. Sustainable agriculture can provide some solutions, as it minimizes inputs, wastes or pollution. The aim of the present study is to provide a combined analysis of different footprints approaches in order to allow comparison of different agricultural and livestock products in terms of efficiency of resource exploitation. Time is the real important variable that influences the footprint. Water use efficiency, greenhouse gas emissions and energy indexes are included in this study. The study takes advantage of indexes collected from a wide bibliography focused on different fresh agricultural products: the target is the definition of a time table of footprints for agricultural products. Starting from a top-down perspective, an analysis of the environmental footprint for different products is an approach to understand which products can be more sustainable for human diet. This study distinguishes different clusters in different sub-cluster of vegetable products and animal products. The classification is based on a comparison of water consumption in relation to yield, greenhouse gas emissions equivalent and energy for a given product quantity. Additionally time is considered, which affects sustainability, in terms of inputs caught for a period. The footprint is spread out in time, thus changing its relevance with respect to the exploitation of a resource. Ultimately, this work wants to propose a new original basis for sustainability metrics, allowing an effective quantitative comparison of food products for a more conscious human diet.