

## **Ecological Footprint & Food Security of the Mediterranean Region**

According to a study on the ecological footprint of 15 Mediterranean countries' food consumption by Galli et al. (2017), the Mediterranean region is in a situation of severe ecological deficit, consuming around 40% more renewable natural resources and ecosystem services than it provides. The study reveals that household food consumption accounts for 28% of the Mediterranean region's Ecological Footprint. In the majority of the analyzed countries food consumption is the largest of the COICOP categories considered, while in France, Slovenia, Italy, Greece, Israel and Cyprus it represents the second highest share of the Ecological Footprint after transportation.

Food consumption is therefore a key area to consider when searching for means to reduce the environmental impacts of consumption in the region. Addressing these impacts entails dealing with increasing resource use efficiency and productivity (through sustainable intensification of food production), reducing food losses and waste, and moderating diets (especially the demand for meat and animal products) (Davis et al., 2016).

Moreover, several studies have demonstrated that solely increasing agricultural productivity might not be sufficient to reduce the environmental pressure of humanity's growing food demand (e.g., Davis and D'Odorico, 2015; Davis et al., 2016).

Thus, according to Galli et al. (2017), there are three potential strategies for Ecological Footprint reductions, which can be seen as elements of a sustainable consumption and production (SCP) program: 1) reducing calorie intake through moderating diets, 2) reducing food waste, and 3) increasing resource use efficiency via changes in diets' composition. Reductions in both caloric intake and food waste decrease the food Ecological Footprint. It is important to mention here that a substantial portion of the food Footprint represents waste or discarded food in the supply chain or by households. The FAO estimates that approximately one-third of food supply is lost or wasted (Kummu et al., 2012). Thus, a reduction in calorie consumption can entail both a moderation of diets and a decrease in waste by efficiency improvements in supply change as well as behavior change by households.

Overall, the analysis of the food-related Footprint saving options found that by shifting to a calories adequate diet the Mediterranean area (considered here as the weighted-average of 15 countries analyzed) could potentially be reduced by 28%. This would lead to an overall reduction of 7.7% in the Ecological Footprint of the region. If all countries adopt the least Footprint intensive diet, the food Footprint of the Mediterranean region could be reduced by 30% and the region's overall Footprint by 8.3%. If each country implements the best strategy to reduce its respective food Footprint, the region's overall Ecological Footprint would be reduced by 10% (Galli et al., 2017).



Such a reduction could improve the region's food security in aggregate by lowering the environmental externalities associated with the consumption of food: other things being equal, diets that require less biocapacity imply less demand for agricultural land whose scarcity and degradation (Zdruli, 2012) is a key issue for the region's future food security, alongside water scarcity and biodiversity loss.

Nevertheless, the implementation of the three mentioned strategies would only address some of the multiple threats to future food security in the Mediterranean region. In addition to the issue of changing diets, agricultural intensification and increasing resource use and sustainability should be considered.

Also, the current issue of food security in the Mediterranean is a complex sustainable development issue, linked to health through malnutrition, but also to economic development, environment, and issues of food-trade (e.g. food trade policies). There is a great deal of debate around food security (WHO, 2012; CFS, 2012) and in particular the absence of food security, which can have significant consequences for individuals and for society (e.g. including malnutrition, obesity, disease, and poverty). Many in the Mediterranean region still lack vitamins and other micronutrients and many countries in the eastern and southern Mediterranean still have precarious food situations or are just overcoming food insecurity (Padilla et al., 2005). National food security may not be sufficient to ensure food security at the individual level but arguably can improve food availability at the household and individual levels. Moreover Galli et al. (2017) acknowledge that the pressure on the region's land resources also depends on food trade policies.



For example, food self-sufficiency might expose countries to domestic food supply disruption: countries with extreme self-sufficiency policies (e.g., import barriers, exports bans, and a complete reliance on domestic production), could be hit by supply disruption harder than countries with diversified food sourcing profiles. On the contrary, dependence on imports can expose countries to external shocks such as those arising from production shocks affecting key commodity exporters and the policy responses that may follow (e.g. the grain export bans announced by several countries during the 2007–08 food price crisis).

Concluding, it is important in this regard to recognize that a substantial portion of the food Footprint represents waste or discarded food in the supply chain or by households. The FAO estimates that approximately one-third of food supply is lost or wasted (Kummu et al., 2012). Thus, a reduction in calorie consumption can entail both a moderation of diets and a decrease in waste by efficiency improvements in supply change as well as behavior change by households (Davis et al., 2016).

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