

Chapter 27

Food Waste Reduction Towards Food Sector Sustainability

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ABSTRACT

FAO estimates on average more than 1.3 billion tons of food loss and waste (FLW) along the whole food supply chain (equivalent to one-third of total food production) of which more than 670 million tons in developed countries and approximately 630 million tons in developing ones, showing wide differences between countries. In particular, EU data estimates an amount of more than 85 million tons of FLW, equal to approximately 20% of total food production. This research presents two main goals. First, to review the magnitude of FLW at a global and European level and its environmental, social and economic implications. Second, use Material Flow Analysis (MFA) to support and improve FLW management and its application in an Italian potato industry case study. According to the case study presented, MFA has demonstrated the advantages of tracking input and output to prevent FLW and how they provide economic, social, and environmental opportunities.

INTRODUCTION

Since each human being needs energy and chemical products to maintain his vital signs and produce cells, skin, and bones, food plays a fundamental role in human life becoming an essential commodity for human feeding (Nebbia, 1995). However, since a huge percentage of food is wasted daily, a critical question comes to mind: is food available for all people on Earth?

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According to Food and Agriculture Organization of the United Nations [FAO] (2018), nowadays the world population amounts to approximately over 7.5 billion people, divided between rural (45%) and urban (55%) population. Moreover, a huge percentage is employed in agriculture, even with a sharp decrease between 1995 (more than 40%) and 2016 (under 27%).

Worldwide, the food production value exceeds \$2.3 trillion with no homogeneous distribution (Table 1). More than 10% of the global population is undernourished because of severe food insecurity. Moreover, more than 22% of children under five suffer from stunting and more than 7% from wasting. Lastly, safely managed drinking water is used by approximately 70% of population. Thus, more than 30% people cannot access drinking water (FAO, 2018; FAO, International Fund for Agricultural Development [IFAD], United Nations International Children's Emergency Fund [UNICEF], World Food Programme [WFP], & World Health Organization [WHO], 2018).

Table 1. Worldwide food insecurity overview

Phenomena	Percentage	Million people
Undernourished people	10	750
Food insecure people	10	750
Obese people	13	975
Children under five years affected by wasting	7	50
Children under five years stunted	22	150
Children overweight under five years	5	40

Source: Authors' development based on FAO (2018)

Food insecurity presents different insecurity degrees. According to its meaning, the first indicator is uncertainty about obtaining food, followed by food quality and quantity reduction and meal skipping. In this phase of moderate food insecurity, people cannot afford a healthy diet because of insufficient money or resources. However, severe food insecurity means no food for one day or more (FAO, 2018).

These indicators focus the attention on food security and require several national and international policies to be adopted. According to the 1996 World Food Summit, food security represents a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. In order to better understand this problem, some definitions should be taken into account. Hunger represents a physical discomfort caused by lack of food and can be measured at the individual level. Underweight means individual anthropometric variables and regards two standard deviations below the global reference values. Undernutrition concerns insufficient caloric intake according to international standards. Malnutrition is related to undernutrition, obesity, and micronutrient deficiencies (Barrett, 2010).

Trying to answer the abovementioned question (Is food available to all people on Earth?), some key factors should be considered. As stated by FAO, IFAD, UNICEF, WFP, & WHO (2018), food security is a multi-layer concept based on four key pillars of equal importance, strictly linked and affected by different variables: food availability, food access, food utilization, and food stability.

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