ENVIRONMENTAL IMPACT

When we talk about impact on the environment it doesn't only mean talking about tons of wasted food.

Talking about waste impact on the environment means taking into account all those resources that end up in the dustbin together with the waste. So if in order to estimate the impact on the environment we take an apple as an example, it is essential to consider all that is needed to produce it: soil, water, energy, work, fertilizers and anti-parasitic, resources that will be wasted once the apple ends up in the dustbin. Not only that, if we consider the different phases that take an apple from the field to the table, that is production, transformation and distribution, there are impacts on the environment linked to each one of the steps.

This is why it's wrong to think that the impact on the environment of a discarded product in a landfill is equal to just the quantity of CO2 emitted by the incinerator. To establish the value of the impact on the environment of a product is a much more complicated process because we must consider all the resources used and all the consequences that the different phases of production, transformation and distribution have on the environment.

This is why it is essential to consider the whole life cycle of a product, commonly called, "from the cradle to the grave".

To do a comprehensive evaluation of the impact on the environment it is essential to resort to three indicators which are representative of resources usage (soil and water) and of the CO2 emissions associated to the life cycle of the wasted product taken under consideration. The three chosen indicators are: carbon footprint, ecological footprint and water footprint. Every indicator gives a measure of a consumed resource (soil or water) or of the effect on the environment linked to the production of a type of food (for instance how much equivalent of CO2 is emitted into the atmosphere).

Every indicator alone allows us a partial view of the phenomenon and of all the environmental impacts of the products. It would be ideal to consider the three indicators together in order to build a more complete picture of the effects of waste on our environment. But not always research and data allow us to get useful information to build this picture therefore we can only offer a spotted shot of the situation.

In 2011 in Great Britain a study from WRAP (2001) quantifies the CO2 emissions per year, through Carbon Footprint, in 25,7 millions of tons, of which 78% attributed to avoidable waste, whereas 22% is linked to those who are sometimes avoidable.

Waste that determine a bigger impact on the environment (higher Carbon footprint) are those linked to animal produces, mainly milk that produces 1.963 millions of tons of CO2, beef meat with 709 millions of tons per year, pork meat with 828 millions of tons per year, poultry with 6.10 millions of tons per year, but also wheat with 1.347 millions of tons per year and coffee with 1.008 millions. With regards to Water Footprint, WRAP estimates that the impact linked to wasted food at home amounts to 6.262 millions of m3 virtual water per year, of which 5.368 millions coming from avoidable waste and 894 millions from sometimes avoidable waste (which represent 5% and 1% of the total English Water

Footprint). This waste of virtual water, if compared to a single consumer, corresponds to 284 litres of virtual water per day.

A study conducted by Venkat (2011), underlines that in the USA CO2 emissions during the stages of production, transformation, packaging, distribution and disposal of the wasted food, correspond to about 112,9 millions of tons per year.

In the Usa as well, the greater responsibility for environmental impact goes to animal waste. Beef meat is the main cause for green house gas emissions with more than 18 millions of CO2 equivalent every year (16% of the total emissions), though only 2% of its quantity gets wasted. Then it's pork meat with about 14 millions, poultry with about 11 millions. The first vegetable is in 12th place (dried fruits) with about 2 millions of tons.

In Italy, considering the stages of production, transformation and distribution, and waste in the stage of final consumption, CO2 equivalent emissions linked to waste, correspond to greenhouse gases emissions that goes from 10,1 to 13,6 Mt of CO2eq, depending on disposal being included or not.

If we compare them with the national emissions measured by Ispra (2012), here in Table 1, it is possible to state that waste and garbage coming from food are responsible for an emission value that goes from 2,02 and 2,73% of the total.

Table 1: Greenhouse gas emissions linked to food losses and waste produced in Italy

Supply chain	**Food waste in Italy(t/year)**		**Greenhouse gases emissions disposal excluded (Mt CO2 eq/year)**	**Greenhouse gases emissions included disposal (Mt CO2 eq/year)**
Farming production	1.547.260		0,57	1,27
Transformation	1.786.137		2,25	3,05
Distribution	379.087		0,58	0,75
Household consumption	4.154.330	6,73	8,60	
Total	7.866.814	10,13	13,67	

Source: data LMM, Eurostat, EC, 2010

Sill in Italy, but focussing on the water impact of waste in the fields, measured through water footprint, leaving 12,5 millions of quintals of food produces in the fields, meant using resources and water for products that were left to rot. This means that we used resources, often limited ones, to produce waste. These resources could have been used elsewhere or preserved for future generations.

Going back to virtual water, having thrown away 12,5 millions of quintal of food produces means that in 2012 slightly less than 1,1 billion of m3 of virtual water have been wasted. If we consider only the blue and grey fractions of virtual water, equal to 16,7% of the total amount of waste, this is

a quantity that would have satisfied the need of 2.944.212 people for a year, 5% of the Italian population.

It is clear that in a situation where a large part of the world population doesn't have access to clean water, this sort of waste cannot be tolerated, nor economically neither ethically. We must unequivocally pay more attention to what we consume, we must be more aware of waste consequences because this can be of great benefit to all and done without efforts.

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