Chapter 22
From Food Waste Management to a Holistic Global House

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ABSTRACT

This chapter is intended as "food for thought" for a holistic perspective on Food Waste Management, linking inductive research of an EU-project with the scope of an interdisciplinary vision combining aspects of macro-economics, ecology and ethics. The academic contribution is to demonstrate the broad variety of choices for decision-makers in different geographical and ethnic regions in a joint international effort to optimize the availability of harvested food through all the global/national food chains to the consumers; this includes those consumers who are for various reasons not able to pay the market-price at all. The original terminus "distribution" taken from the business administration literature is enlarged in this chapter by categories such as "food-recovery" and Food banks/charities.

INTRODUCTION

The growing population around the globe will need about 40 percent more food by the year 2050. On the other hand at the moment about 40 percent of the food volume intended for human consumption worldwide is lost at the fields /within the logistics or wasted in the distribution/at consumers. Scarce resources hit poor segments of the population first: within the countries as also seen on a global scale. Within an inductive study of applied sciences the EU-project Forward tries to optimize the total supply chain from farm to fork by focusing critical points of food waste with the solutions to return waste into the production or to pass on unsold products to charities / food banks. The result is a guide of awareness and training of food waste managers. Another result of that study is that optimization is still seen mainly under parameters of short-term economics/business while future models of equilibrium should also be aware of parameters of ecology and ethics.

DATA-FRAME AND ESTIMATES

Within the scope of this chapter, some selected macro- and micro-data will demonstrate the relevance of the topic for the economies, ecology and ethics.

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Macro-Data Concerning Food Availability

The first researcher creating a mathematical axiom to demonstrate the increasing gap between the growth of population and the growth of food was Thomas R. Malthus (1766-1834). In his publication of 1798 "An Essay on the Principle of Population" (Malthus, 1798), he stated that the population would grow in a geometric progression, while food supply would be increased only in a arithmetic progression. What Malthus could not know was the agro-chemical revolution in the following century which helped to increase the food-volume dramatically.

Nevertheless two hundred years later – and especially since the World Economic Crisis of this decade - the topic is gaining momentum again reflected, for example, by Jamann (2013):

- The FAO-Food Price Index shows the impact of price-volatility on market situations.
- The World Hunger Index shows how many countries in Africa suffer.
- PNAS-data of 2012 reveal in which degree poor countries sell their farm land to richer countries which try to secure its population against hunger in the long run (see Table 1).

Those activities and needs stimulated the EU-Commission to develop its own forecasts and counter-actions to stop the increasing gap between supply and demand and between the rich and the poor. The EU-Commission is now focusing its efforts on improving the environmental sustainability of the food chain towards food waste minimization and packaging optimization (Forward, 2013).

Table 1. Transfer of agricultural potential

- Papua-New Guinea:	90 percent to Malaysia
-Gabun:	74 percent to Singapore
- Mozambique:	69 percent to South Africa
- Ukraine:	66 percent to the USA
- Uruguay:	51 percent to Argentina
- Tanzania:	45 percent to Sweden

Source: Jamann/Welthungerhilfe/Presentation March 19th 2013

National Estimates

Trade structures are globally very different – and this is also true for the awareness of food waste (i.e. concerning the different levels where food waste appears). Even the terminus "food waste" is under discussion in the EU-Project "Fusions" and will be agreed upon most probably in 2014 (Fusions, 2013). In Germany, public discussions started after the film "Taste the Waste" (Thurn, 2011).The topic was highlighted in the print media and on TV – and, due to its extreme examples and its estimate of total waste, the discussion became very controversial in the food-sector.

At the present stage, the players of the different organizations follow the following scenario:

- In the film of Valentin Thurn a total waste of 20 million tons per year is estimated for Germany.
- Taking this data for granted and subtracting retail and consumer-waste data, this means estimated 13 million tons for the level of agriculture/processing (inclusive bakers, butchers and catering).
- According to an EHI-panel (EHI, 2012), in retail there are annually 310.000 tons in a total of 41.000 outlets. The main critical volumes are relating to:
  - **Bread/Cakes etc in Self-Service:** 10.4 percent of volume
  - **Instore Baking Shops:** 6.5 percent
  - **Fruit and Vegetables:** 5.1 percent
  - **Meat/Fish:** 2.1 percent
  - **Milk Products:** 1.6 percent