

Bonn 2011 Conference: The Water, Energy and Food Security Nexus – Solutions for the Green Economy

Hot topic session

“Ending Food Waste from Field to Fork”

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1. Relevance of the issue for water, energy and food security

Researchers' estimate that between 30 – 50 % - approximately 1.3 billion tons per year¹ - of all food produced for human consumption is lost or wasted.²³ Thereby food losses or post-harvest losses refer to the first parts of the supply chain, whereas food waste usually refers to the throwing away of food that is 'perfectly fit for consumption' and occurs in the later stages of the supply chain (cp. Figure - 1). The food wasted annually in rich countries – some 222 million tonnes – almost equals the entire net food production of sub-Saharan Africa (230 million tonnes)⁴.

In medium- and high-income countries a significant share of food is wasted by suppliers and consumers even if it is still suitable for human consumption; Consumer behaviour, beauty- and aesthetic-standards set by the food industry, as well as trade and food labelling legislation (“best before dates”) contribute to food waste of an estimated 280-300 kg/year per capita⁵, in industrialized countries. In developing countries, however, a large proportion of the harvest is lost before it reaches the final consumer, either during production and harvesting or at other early

1Gustavson et al, 2011. *Global Food Losses and Waste*. Gothenburg, Rome: Swedish Institute for Food and Biotechnology (SIK) & FAO, 2011; p. 4.

2 Lundqvist, J. 2010. *Producing more or Wasting Less. Bracing the food security challenge of unpredictable rainfall*. In: Martínez-Cortina, L., Garrido, G. & López-Gunn, L. (eds.) *Re-thinking Water and Food Security: Fourth Marcelino Botín Foundation Water Workshop*. Taylor & Francis Group, London, UK; p. 82.

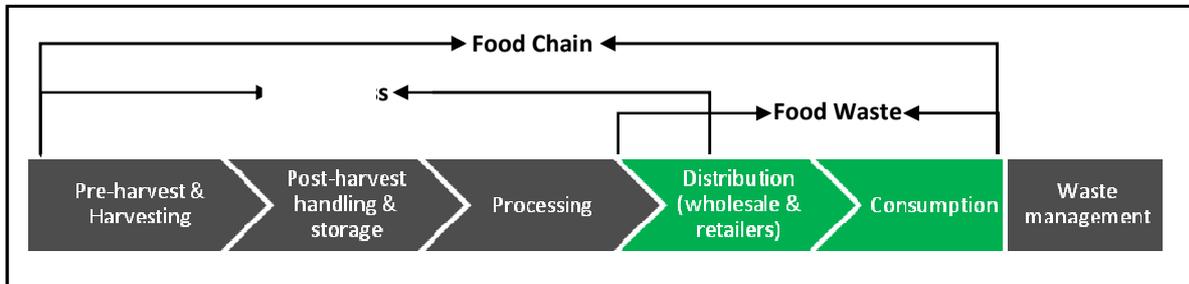
3 Cf.: Harald Grethe, Assa Dembélé, Nuray Duman, 2011. *How to Feed the World's Growing Billions*. WWF & Heinrich-Böll-Foundation; pp.35-36.

4 Gustavson et al., 2011. *Global Food Losses and Waste*; p.5.

5 Ibid.

stages in the supply chain. Post harvest losses can be attributed mainly to inadequate post-harvest technologies under difficult climatic conditions, poor infrastructure (roads, storage, processing facilities, means of transport) missing or difficult access to markets, border delays or inappropriate packaging.

Figure – 1: Food value-chain - From field to fork



In a wider sense food loss and waste cannot only be attributed to what is lost on the field or in the stable and what is discarded somewhere between harvest and consumption. For instance, land which is suitable for food production is competing with non-food uses (e.g. pharmaceuticals, cosmetics, fibres, bio-fuel). Overeating, i.e. food intake above what is justified from nutritional/health points of view, is a growing problem in many OECD countries but also in other rapidly developing societies. Current trends suggest a substantial increase in the demand for meat, which implies additional resource use. The production of 1 kg of meat requires in the order of 7–16 kg of grain or soy beans and about 15 tons of water. Furthermore many times water and energy use in agriculture are not efficient enough, so that actual yields remain below potential.

Food losses represent a waste of resources used in production such as land, water, energy and inputs. Producing food that will not be eaten leads to unnecessary greenhouse gas (GHG) emissions in addition to loss of economic, ecological and social value of the food produced. There is a growing awareness that food security cannot only be achieved by an increase in productivity. Against this background, it is a great challenge to provide a population of over 9 billion people in 2050 with sufficient, healthy food and at the same time find solutions for sustainable resource management.

The aim of this paper is to reveal causes of food waste and loss regarding the water-energy-food security nexus, but also to present solutions and policy recommendations on a basis of actions already being taken by authorities, private economy and civil society.

2. Implications – the Water-Energy-Food Security Nexus

The reduction of food waste and losses has a great potential to increase efficiency along the food chain. Population and economic growth, as well as changing dietary preferences result in an increasing pressure on available resources. For example, an estimated 70% of blue water withdrawals are going to irrigated agriculture. Food waste accounts for more than one quarter of

the total consumptive use of finite and vulnerable freshwater and more than 300 million barrels of oil per year, according to a recently released study⁶.

A huge amount of energy is used in agricultural production, food processing and preparation, for packaging, transport, cooling and storage. This energy is lost if fractions of the food products are later on wasted. Scarce resources like water and fossil fuels, fertilizer, agricultural land, but also labour and capital, are misused or not used effectively.

Further the overconsumption of food in the industrialized world, as well as food loss in developing countries, has impacts on food prices on the global markets. Food loss results in lower supply, which leads to higher prices.⁷ High food prices, however, are life-threatening for the poorest of the poor, who spend around 70% of their income on food. Thus food waste means not only a loss of economic, social and ecological value, but threatens food security.

Reducing losses and waste of food and other agricultural commodities could also be seen as a way to reduce the pressure on water resources or to enable society to use these saved resources for other purposes, in other sectors. Packaging waste and organic wastes could be avoided and emissions mitigated by reduction of GHG release. Reduction of food waste and losses could have a significant contribution to climate change mitigation. In a transformative process towards a green economy, a focus on the issue of food waste and losses is a requisite.

3. Key Approaches and Solutions

Multi-stakeholder approach

The approaches indicated above promise good results but need to be adjusted to various situations for optimal results. It is important to emphasize the necessity of developing policies for both, industrial and developing countries. Therefore approaches should consider all stakeholders: politicians, private economy, farmers, civil society and consumers. Policy recommendations should address every stage of the food chain, as well as waste management, whereby recommendations presumably differ between high-, middle- and low-income countries and climatic contexts.

Improve data and information

Reliable figures are generally not available and statistics vary depending upon food category, climate zone, etc.. The data that is available is often out-dated, assumptions and examples tend to be of an anecdotal character. A first step in approaching this issue is to improve the availability of information, relevant and accurate data and to develop a baseline of the actual situation⁸ in order to generate suggestions at which stages of the supply chain policy interventions would achieve best

⁶ Kevin D. Hall, et al., 2009. *The Progressive Increase of Food Waste in America and Its Environmental Impact*, Laboratory of Biological Modeling, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, Maryland, United States of America.

⁷ Harald Grethe, Assa Dembélé, Nuray Duman, 2011. *How to Feed the World's Growing Billions*. WWF & Heinrich-Böll-Foundation; pp.28-29, 42.

⁸ For further recommendations: Lundqvist, J., C. de Fraiture and D. Molden, 2008. *Saving Water: From Field to Fork – Curbing Losses and Wastage in the Food Chain*. SIWI Policy Brief: SIWI; p.6.

results. Moreover, a monitoring mechanism should deliver information about the impact of initiatives and solutions in relation to the baseline.

Support farmers

To optimize harvesting and reduce food losses it is necessary to strengthen farmers through capacity development. Investments in infrastructure are required to improve transportation and storage conditions and allow a faster and better shipment of products i.e. while they are still fresh. A strategy should be worked out for financial arrangements for these improvements, on farm and beyond, e.g. from where does the money come and what are the opportunities for payback. Processing facilities are becoming increasingly important since they provide an opportunity to prolong the life of vulnerable food items for which there is a growing demand. Processing also adds value to the product, although this does not automatically translate into improved incomes for farmers. Better access to markets beyond the local level, i.e. to markets at regional and national levels could play a significant role not only in improving food security but also give farmers an opportunity to improve income.

Take action in the business community and raise awareness among consumers

A central task is to raise awareness among industry and consumers about the potential gains for all parties, if the chain is organized and run to the mutual benefits of all involved. Information about the effects of monoculture, high meat and sugar consumption, unhealthy eating habits, as well as the meaning of best-before and sell-by dates, and the importance of buying and consuming what is really necessary, has to be spread among consumers. To influence consumer behaviour, supermarkets could reduce prices on products when they have reached the best before date. Retailers and food industry determine to a wide extent product specifications and process requirements their suppliers have to comply with. Beauty- and aesthetic standards on food products, which lead to high losses at the harvesting stage, should be abolished.

Enabling environment

Measures such as the development of fiscal or regulatory tools that prevent food loss and waste should be analysed and implemented by the appropriate agency. Phasing out counter-productive subsidies for certain products in a socially acceptable manner should be a policy goal. E.g. subsidies in the fishery sector have largely contributed to unsustainable practices resulting in a high percentage of fish discards (the proportion of total catch that is returned to the sea, in most cases dead, dying or badly damaged). International and national food standardization guidelines and mechanisms should be critically analyzed and appropriately adjusted since they determine what is harvested and what can be sold and, thus, consumed. A scrutiny of best-before, sell-by, use-by and expiration date regulations, as well as consumer advice related to the meanings and differences is warranted since this information may have a strong impact on food waste rates at the last steps of the supply chain.

Integrated waste management

Once food products and groceries are thrown away because farmers, food processing companies, suppliers, supermarkets, retailers and consumers cannot or will not use them for intended purposes,

these leftovers could be beneficially used. If the food is not deemed appropriate and safe for human consumption, an option is to use it as animal feed or for the production of animal feed. An efficient way of treating food waste that cannot be brought back into the supply chain is to recover the nutrients through composting or by utilizing the embodied energy for biogas production.

4. Existing Approaches

The issue of food waste and loss has been discussed by several organisations and groups during the last years. However, the relevance of this issue was only clear for a limited number of experts and activists, and early political tools are rare. Only few countries, mainly industrial economies, have developed approaches to reduce food waste. The problem of food waste in developing countries is still almost unknown. It is interesting to note, however, that FAO had these objectives during its initial period⁹.

Policy makers need to know the multiple costs of food waste and loss, as well as the potential benefits of their reduction. Once costs and benefits are estimated in monetary terms and in terms of water, energy, social and further ecological gains, priorities can be set accordingly. Some countries and institutions have started already and provide lessons learnt and good experiences from synergies:

The FAO put food waste and loss on the agenda of the international „Save Food!“-Congress in May 2011 in Düsseldorf, Germany. Governments in the UK, Denmark, Sweden, Norway, France, Austria and recently also Germany have taken steps to tackle the problem, starting with the collection of robust data followed by discussions of national options for solutions. For example, Norway is exploring the possibility for a central food facility to fully deploy food that cannot be sold in regular channels for practical reasons; Denmark considers legalizing food sales after best-before date; the UK government aims to reduce food waste by removing sell-by dates, aiming to cut the £12bn worth of food waste disposed every year. The packaging industry calls for public-private partnerships and innovative packaging solutions to reduce food waste in developing countries. Several initiatives and campaigns were born or are under construction, boosted by documentary films such as “Taste the Waste”.¹⁰ They tackle the problem from different angles (hunger, climate, trade, technologies, sustainable consumption and others). The furthest-reaching initiative is the “Joint Declaration against food waste”¹¹, driven by academics and researchers from universities around the world, Members of European Parliament, politicians and representatives of international organizations and the civil society. They urge the European Commission to take a position on food waste and request

⁹ Parfitt, J., M. Barthel and S. Macnaughton 2010. *Food waste within the supply chains: quantification and potential form change to 2050*. Phil. Trans. R. Soc. B 365, 3065 – 3081.

¹⁰ Thurn, V., Kreutzberger, S., 2011. *Kampagnen und Aktionen gegen Lebensmittelverschwendung - Taste the Waste - Frisch auf den Müll*.

¹¹ Last Minute Market, et al, 2011. *Joint declaration against food waste*.

URL: http://www.lastminutemarket.it/media_news/wp-content/uploads/2010/12/JOINT-DECLARATION-FINAL-english.pdf&sa=U&ei=sDexTsOrLorNsgbc26g5&ved=0CBIQFjAA&usg=AFQjCNHTq-T8TsFXOkcxUIqXlaldgFrvnw

that the reduction of food waste becomes one of the priority items on the agenda for the European Commission.

5. What is the next step?

To address this complex and cross-sectoral problem successfully, there is a window of opportunity due to the current high level attention on the international agenda around food losses and food waste. The attention to this problem has instigated the creation of several initiatives as described above and the development of a few promising policies in different countries. All of them are independently experimenting new approaches and are learning from the results achieved so far. A coordination of these initiatives, as well as an analysis of the different approaches would bring a holistic view of the real impacts these measures have on the problem.

At national level, creating a round table on food loss and food waste considering all relevant actors could be a first step. Many times a scientifically based study looking at the actual situation in an integrated way in a country could be a first step to estimate costs and potential benefits and the basis for the development of the adequate approaches and policy tools. It is important to continuously enhance and institutionalize the cooperation between different stakeholders in order to facilitate an improved efficiency and reduce food waste and losses throughout the supply chains. In a globalised world, such linkages extend beyond national borders.

Having in mind the existing diverse initiatives it would be a progress if all stakeholders could agree on a common principle goal, such as the reduction of 20% of food waste and losses by 2020, as proposed in the Stockholm Statement 2011.¹² Furthermore there is a need of a coherent monitoring system of the different initiatives to demonstrate the progress made over time referring to an established baseline in a transparent manner. Such a goal and monitoring system might be considered as a milestone of an international green economy roadmap as proposed by the European Union and its member states to the UN in the context of the Rio+20 summit preparations. Furthermore best practices and policies could be collected in a tool box and made available to the interested public.

¹² Stockholm-Statement, 2011.

URL: http://www.worldwaterweek.org/documents/WWW_PDF/2011/2011-Stockholm-Statement.pdf