

International Workshop on Food Loss and Waste Prevention targeting Mediterranean countries

November 4th, 2021; Summary

Introduction

This workshop on food loss and waste (FLW) was part of a series voluntarily organised by the Thünen Institute after the annual Meeting of the G20 Agricultural Chief Scientists (MACS-G20) in 2015 emphasized the decisive importance to reduce FLW. As a result of that decision, the [Collaboration Initiative Food Loss and Waste](#) was established under German coordination. The Johann Heinrich von Thünen Institute, as a German Federal Research Institute for Rural Areas, Forestry and Fisheries, hosts the [Initiative coordinator](#). Since 2017 annual regional workshops have been organised and are assigned each year to the respective G20 presidency country - which in 2021 is Italy - and the neighbouring region. The 2021 organisation team includes the FAO Rome (Italy), UN Environment (France), the University Bologna (Italy), the University Tuscia (Italy), RSC talent (Spain) and the Thünen Institute (Germany).

The aim of the workshop is to support the delivery of the Sustainable Development Goal 12.3 (SDG 12.3), halving food waste at retail, food service and household level, and reducing food loss across the supply chain as well as to facilitate the cooperation and network building among Mediterranean countries. Due to the pandemic, the length of the workshop was shortened to a one day virtual meeting. The topics therefore had to focus on selected issues which had been identified as relevant challenges in the region: Food Loss in Primary Production, Food surplus and waste from tourism activities as well as Addressing Food loss and waste in educational campaigns.

In total, 90 stakeholders from national and local policy makers, universities, private and public research institutions, social welfare organisations, food companies, waste management companies and consultants from 27 different countries joined us and shared their valuable experiences!

Welcome addresses

Mr Stefan Lange as Research Coordinator of the Thünen Institute (Germany) welcomed all participants and encouraged them to take the chance to get in contact with other experts from the Mediterranean region to start a cooperation in research and practice. Dr Benedetta Dell'Anno from the Italian Ministry of Ecological Transition highlighted that food loss and waste is one of the topics of the G20 Resource Efficiency Dialogue which was initiated by the G20 environmental ministers in 2017. Dr Rosa Rolle who is a Senior Enterprise Development Officer at FAO underlined the importance to act on the measurement and reduction of post-harvest losses and to scale up corresponding prevention measures. As one of the workshop co-organisers, Ms. Clementine O'Connor from UNEP motivated the participants to contribute to the SDG 12.3 with their own activities and to share their experiences in order to facilitate global impact.

The need to upscale and profit from available experiences was also underlined by Prof. Andrea Segrè from the Department of Agricultural and Food Sciences at the University Bologna. Their model of the Italian Last Minute Markets has served as a good practice example all over the world for the last 20 years and similar scientific-based knowledge is being developed at present for household food waste for subregional extrapolation. Prof Simone Severini as an expert for international relations at the University Tuscia also emphasised the necessity for collaboration to foster sustainability in general and food loss and waste reduction in detail. Ms Sonsoles Jiménez, founder of RSC talent from Spain, called the participants to join food loss and waste activities as a system change towards a more sustainable food supply chain that can be accelerated by each of us.

Session 1

This session was dedicated to *Food losses in primary production* and kindly chaired by Dr Rosa Rolle and Ms Carola Fabi, both from the FAO Rome. The first presentation “*Food Losses in agricultural businesses – experiences from practice*” given by Ms Sonsoles Jiménez (RSC talent/Spain) highlighted the opportunities which can be generated from restructuring common frameworks, production processes and marketing relationships. She presented her positive practical experiences with the upcoming Spanish Bill targeting the whole supply chain and calling for implementation of a hierarchical system for surpluses (donation, transformation, animal feed) which can lead to shorter supply chains, new business models and income sources. A more direct contact to consumers and regional collaboration was experienced as an incentive to attract young generations and establish new income options. Within his presentation “*Wheat losses in Egypt, Morocco and Jordan*”, Dr Yigezu Yigezu (ICARDA/Egypt) summarised the results of projects dedicated to the wheat supply chain including wheat loss and waste measurement protocols using different methods and the differences between the three assessed countries. It was highlighted that each country has its specific hot spots and that the overall wheat loss in Egypt made up half of the losses in Jordan and Morocco respectively. He highlighted that creating awareness in society in connection with tailor-made subsidies could facilitate a more efficient wheat supply system in the region. More emphasis should be laid on pre-harvest losses which should be included for total potential yield calculation. The plenary part of the first session was finalised by Dr Ali Abdelrahman (Faculty of Agriculture, Fayoum University/Egypt) with the issue of “*Socio-Economic and Environmental Impacts Assessment on Farm Food Losses – examples from Northafrica*”. His research focused on tomatoes and various stakeholders across the tomato supply and processing chain in Egypt. Beside the post-harvest loss quantification, a Life Cycle Assessment was conducted in order to make lost resources and environmental impacts of tomato losses visible. The results showed that losses occur mainly on farm level and at the retail stage and sum up to a significant amount of lost resources in the region. In particular, the framework and needs of small farmers has to be taken into consideration for prevention intervention design. Reduction of tomato post-harvest losses represent an economic and environmental opportunity for enhancing smallholders’ income and accelerate national and global sustainability.

The following three working groups were kindly facilitated by Prof Katia Lasaridi & Dr Christina Chroni (Harokopio university/Greece), Ms Sonsoles Jiménez (RSC talent/Spain) as well as Dr Ron Porat & Dr Victor Rodov (Volcani Center, Department of Postharvest Sciences/Israel). Each group discussed the three key questions, collected corresponding sticky notes on virtual whiteboards and presented the results after a break:

- a. Which utilisation methods are common in your country to prevent food losses from wastage (e.g. use as feed, industrial use) and which are planned?
- b. Are there specific burdens to implement those strategies on a large scale?

- c. How can traditional storage and modern technique be merged and contribute to loss reduction in Mediterranean countries?

Ad a.) Most common utilisation methods (ranked according to how often they have been named) are donations to people in need, animal feed, utilisation on the field, processing to juice, fibre or pigments, composting and energy production. Ad b.) As burdens the following were identified: lack of awareness in general, a lack of governance by public authorities, legal barriers for donation, lack of information flow and coordination between stakeholders; logistic challenges in rural areas. Ad c.) The joint use of traditional and modern techniques was identified as a benefit especially with respect to facilitating information flow and collaboration by block chain technology and/or other digital tools and to increase shelf life by using traditional materials and (semi)underground storage in combination with modern sensors to save energy and provide better control of moisture and temperature.

Session 2

This session was dedicated to Food surplus and waste from tourism activities and kindly chaired by Dr Clara Cicatiello from the University Tuscia in Italy. Ms Angela Frigo (Secretary General, European Food Banks Federation) presented the results of their activities *“Redirecting food surpluses from cruise ships – experiences from the European Food Banks Federation in European Mediterranean countries”*. While so far, surplus food has been discharged overboard at sea by the international shipping industry, as a result of the project in cooperation with Costa Crociere, recovery of ready-to-eat surplus food for human consumption is possible. Under the framework of the Italian so-called Gadda Law and in close cooperation with the Customs Office and the local Border Control Public Health Safety Agency, a procedure was developed in Italy. The project started in Italy (Bari, Civitavecchia, Genova, Napoli, Palermo, Savona), then replicated and transferred to different countries (France: Fort-de-France, Marseille, Point à pitre , Réunion; Spain: Barcelona). By November 2021, over 183,000 portions were redistributed in 11 ports through 14 charitable organisations. Another example was presented by Ms Fenia Galliou (School of Agricultural Science, Hellenic Mediterranean University/Greece) entitled *“Transforming Food Waste from Tourism to animal feed”*. She highlighted the challenges of seasonal increase of Municipal Solid Waste due to tourism for communities and the corresponding results from a LIFE funded project *“LIFE FOR FEED”*. Within the project, food waste from hotels was collected and transported to a pilot unit located in Heraklion/Crete for further processing into animal feed. Special attention was given to the handsorting, shredding, pulverizing and drying processing steps in order to generate high quality animal feed. Within the project, more than 550 t of FW were diverted from landfill while producing more than 150 t of feed components. The last input for this session was kindly provided by Dr Bendegul Okumus (Assistant Professor, UCF Rosen College of Hospitality Management/USA) and informed us about *“Quantification of Food Waste from all-inclusive resorts - the case of Turkey”*. Food waste from all-inclusive resorts has to be solved within conflicting issues such as high expectations of guest related to 24/7 food provision, low level of guests’ food waste awareness, high level food quality, under-skilled employees, variety of meals and poor reuse and recycling of surplus and leftovers. The outcome of the research included recommendations towards the implementation of communication to raise guests’ food waste awareness, provide smaller plates and portions, emphasize the flavor and taste of local food and drinks, increase internal collaboration between staff members from ordering to service, scale down menu varieties, train staff members and invest in technology from sourcing to storage to cooking and others.

The three working groups in session 2 were kindly facilitated by Ms Irene Ripamonti (Fondazione Banco Alimentare/Italy), *Mr Stefan Lange* (Thünen Institute/Germany) and Dr Mohamad G. Abiad (Faculty of

Agricultural and Food Sciences, American University of Beirut/Lebanon). Each group discussed the three key questions, collected corresponding sticky notes on virtual whiteboards and presented the outcomes after a break:

- d. How to educate international tourists in food waste prevention?
- e. How to establish cooperations between the tourist industry and stakeholders (e.g. social organisations) in Mediterranean countries? Legal, structural and organisational obstacles.
- f. How to roll out successful activities within Mediterranean countries?

Ad d.) As appropriate measures to educate international tourists were identified: to provide FW information for tourists (brief ones at buffets as well as more detailed information including impact and implemented prevention measures on-site), also include FW information into entertainment (quiz, games,...), positive motivation as an incentive to reduce FW, implement a deposit or charges in case a tourist wastes food, tell the story of used food to create individual context, use tourists' languages for communication, communicate relevance of sustainable resource use for this specific tourist region and the local tourist facilities, raise awareness for limited resources on ships/small islands, nudge them by using smaller plates, train staff on portion sizes, provide specific food items only on request and thus reduce number of items on the buffet, already address the issue at the airport, include e.g. social psychologists for proper prevention measure development.

Ad e.) Local collaboration systems, clear legal framework showing options, cross-sector collaboration, support from municipalities and other local authorities, inclusion of FW issue into tourism school curriculum, introduction of specific agreements or regulations on food waste from tourism, implementation of e-platforms, rethinking buffet strategies, setting up stakeholder committees, including religious issues as awareness incentive, establishing voluntary agreements with stakeholders, subsidies for investment into refrigerated trucks and storage for NGOs, harmonising cross-country regulations were identified as important issues to facilitate cooperations between the tourist industry and stakeholders.

Ad f.) For a successful roll out within Mediterranean countries the following prerequisites were named: developing a food handling standard and/or defining a global strategy taking local framework into account, setting up a technical working group to develop mechanisms and strategies which is also responsible for implementation and monitoring, motivating big companies to participate and act as frontrunners, connecting authorities and businesses from different countries to share experiences, including FW as one indicator of international sustainability labels for the hospitality sector, including local media for promotion, introducing a campaign to promote local food, financing further pilots as a basis, harmonising methods for monitoring, strengthening collaboration among researchers, conducting further annual workshops like the present.

Session 3

This session was dedicated to *Addressing Food loss and waste in educational campaigns* and kindly chaired by Dr Claudia Giordano from the University of Bologna in Italy.

The first presentation described the joint activity *“Roll out Do Good: Save Food! educational materials in Albania, Macedonia, Croatia, Slovenia, Turkey and France”* presented by Ms Oksana Sapiga (FAO Europe and Central Asia) and Mr Thomas Candéal (International Food Waste Coalition/Belgium). Aim of the Do good: Save Food! Project is to implement a joint activity in schools related to food waste awareness and prevention that includes education materials for working in classrooms as well as a Collaboration guide to engage and associate all stakeholders of school canteens. In a first step, the materials were developed and

tested in 2017 to 2018 in France, Belgium, Italy and England. In a next step, further collaboration partners were called in other European countries to participate in the roll out. After the inclusion of local authorities and the identification of potential partners, the materials were assessed according to their need for social and cultural adaptation by local technical and educational experts before translation took place. In the Mediterranean region the project was rolled out in Albania, Croatia, France, North Macedonia and Turkey in collaboration with authorities (national ministries, city governments), charities (food banks), food research foundations as well as with schools and kindergardens. Key elements for impactful programme implementation are the endorsement and the support of key national stakeholders and governments, teachers' engagement and interactive approach to drive behavioral change (through in-class activities, games, tasks). This roll out will educate various stakeholders connected to schools and aims to turn children from food wasters into food advocates!

The next presentation "*Impact of digital campaign on student perception and attitude towards food waste*" provided by Dr Sarra Jribi (Department of Agri-food Industries, National Institute of Agronomy of Tunisia/Tunesia) focused on university students. The research included an online student self-estimation of FW levels as well as an on- and offline awareness campaign, the impact of which was finally assessed. After the awareness campaign an additional 9 % of the students responded that they intend to change their FW behaviour due to the additional information they received on impact of FW. The main motivation was of ethical, economical and religious origin rather than of environmental concerns. The use of social media and digital tools are recommended in order to attract students to learn and reshape their behaviour.

The session's plenary input was concluded with "*Awareness raising campaign towards bread waste reduction – a privately driven activity from Palestine*" by Dr Iman AlHirsh (Jerusalem center for Women, Jerusalem Suburbs Directorate Education/Palestine). The participants learnt about the initiative which brings together different stakeholders around schools – students, teachers, mothers, NGOs and volunteering youth – with the aim to educate on bread waste in order to incentivize a reduction as well as to implement a recycling scheme. Information material was developed and spread showing how to reduce bread waste at home as well as how to participate in the collection of surpluses from other households. The students bring the surpluses from home, teachers and volunteers are busy with further handling. The Jerusalem farmer association takes care of the transport before the bread is ground, dried and stored. The bread is then further used as a feed component by local sheep, goat and chicken breeders. The main challenges beside the COVID-19 virus which still have to be solved, are avoiding that the bread gets moldy and financing the transport and specific containers that are suitable for bread transport.

The three working groups of session 3 were kindly facilitated by *Dr Laura Rossi* (head of the food waste observatory, CREA/Italy), *Dr Sharif Muhammad* (Sciences and Technology Sector, The Islamic World Educational, Scientific and Cultural Organization (ICESCO)/Morocco) and *Dr Hanen Ben Ismail* (Department of Agri-food Industries, National Institute of Agronomy of Tunisia/Tunisia). Each group discussed the three key questions, collected corresponding sticky notes on virtual whiteboards and presented the outcomes after a break:

- g. How to nudge the general public towards food waste reduction? Key issues and no gos.
- h. How could citizen science contribute to more data and better awareness in society? Note: Citizen Science is scientific research which includes amateur scientists, e.g. in counting number and species of birds within a given time in their own garden.
- i. How to benefit from other campaigns? How to address regional characteristics? Which role have the communities in FLW education?

Ad g.) Suggestions related to nudging the general public towards FW reduction included rethinking the pricing system for second grade and out of date produce in combination with retailers' special offer

strategies (e.g. BOGOF – buy one, get one free), transforming impact information into positive messages which are easy to understand and applicable in every-day life, reshaping the overall framework for decision-making in businesses, mobilising celebrities as FW ambassadors, relating and awarding preventative action directly to saved resources, including FW reduction action into existing certifications and labels for businesses, educating the youngest towards sustainable behaviour, the implementation of community food sharing fridges as focal points, getting FW prevention action into routines, using participatory approaches, making use of the International FW Awareness Day for joint actions. Obligatory legal restrictions which do not take local framework into account as well as negative messages and blaming were named as no gos.

Ad h.) Ideas for a special focus on citizen science were raised towards collecting data from population groups or areas which are excluded from conventional surveys, collecting more information on underlying causes, developing an appropriate app to measure and report FW in households and comparing their own results with others, enabling canteen users to take a picture of their tray after lunch, to post it on a digital platform and to benefit from gamification approaches.

Ad i.) Cross-cutting collaboration and making individuals feeling part of a strong community was summarised as a necessity to benefit from other campaigns as well as to adapt to local conditions and ethnographic context. Education on FW should be part of national strategies and policies which are implemented on different geographical scales. A holistic approach was seen as an important issue to a more efficient food system and sustainable consumption. Assessments of campaigns were mentioned as tools to learn from stakeholders perceptions and to include their recommendations into new campaigns. Facilitation of food sharing activities among different stakeholders was identified as one important role of municipalities. Inclusion of skilled individuals as facilitator or multiplier of FW prevention knowledge and encouraging them to spread their experiences to their families, friends and neighbourhood (e.g. through school, worship, community garden).

Session 4:

Session 4 as a summarising session was kindly facilitated by Ms Carola Fabi (FAO Rome). The discussion focussed on the importance to mobilise civil society - beginning with education of the youngest and facilitating their engagement as future heroes and leaders within their communities. The support through easy to use tools, clear regulatory framework, harmonised national strategies and policies as well as common sense by authorities is crucial. Implementation action should be framed by transparent economic benefit for food waste prevention and utilisation in comparison to wastage options.

The workshop was closed with taking a family photo! Thanks to all participants for their fruitful contributions and hopefully this workshop was the starting point of an active Mediterranean network on food loss and waste!

Please see the website for the agenda and some photos.

For further information please contact the coordinator of the [Collaboration Initiative Food Loss and Waste](#), Felicitas Schneider from Thünen Institute (felicitas.schneider@thuenen.de). You are welcome to register at our Global FLW expert and project data base [here](#).