

MACS-G20 Collaboration Initiative Food Loss and Waste

Annual update on deduced activities



December 31st, 2019

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Braunschweig/Germany, 31.12.2019

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1. Preface

In 2019, the MACS¹ Collaboration Initiative on Food Losses and Waste finished its fourth year and it is time to highlight the collaboration activities among participants in a more participative way. Thus, for this year's annual report, we - Stefan and Felicitas from Thünen Institute - invited our partners to contribute with information on their activities to the report. This makes the report a little bit more comprehensive but we also hope to increase information content for the readers in this way. Enjoy!

2. Introduction

The MACS-G20 Collaboration Initiative on Food Losses and Waste (in the following mentioned as MACS-G20 FLW Initiative) was launched in 2015 at the MACS-G20 in Izmir, Turkey. Germany took leadership of the Initiative and from 2015 until mid of 2017, Stefan Lange who is research coordinator of Thünen Institute and part of German MACS-G20 delegation, was responsible for the German contribution to MACS-G20 FLW Initiative. Since mid of 2017 he supervises the coordinator and takes part in selected activities. Since mid of 2017, Germany finances the position of a coordinator for four years until June 2021 on own expenses. The coordinator is located at the Federal Research Institute for Rural Areas, Forestry and Fisheries (Thünen Institute) in Braunschweig (Germany). The position is filled by [Felicitas Schneider](#).

The aim of this report is to summarise already finished and ongoing activities derived from the MACS-G20 FLW Initiative, to foster the sharing of knowledge and experience and to invite interested G20 and further countries and stakeholders to participate in joint activities. The present report provides a brief update and summarises the activities from 2019.

This report is published [online](#) and in addition sent out per mail to a selected group of interested people dealing with the issue of food loss and waste. Most of them participated in the kick-off workshop held from June 20th to 22nd, 2017 in Berlin where participants from 17 countries as well as from FAO, OECD and EU-Commission were present. If you are also interested to receive information on the activities, please do not hesitate to contact the coordinator by writing an e-mail to felicitas.schneider@thuenen.de and to visit the website of [MACS-G20 FLW Initiative](#). You are welcome!

Besides the annual report (the first one was published in 2017), there is also a newsletter which is sent out at irregular intervals after the MACS-G20 of the respective year (mostly in spring) as a brief summary of the main outcomes from the MACS-G20.

If you are interested to learn more about it and if you wish to contribute, please do not hesitate to contact the coordinator. Furthermore, if you have additional ideas or wish to cooperate with other members of the MACS-G20 FLW Initiative, to host a FLW workshop or contribute to the prevention of FLW with any other approach, please contact us, too!

The activities derived from the MACS-G20 FLW Initiative are focusing on G20 members but are not restricted to them. As the food supply chain is global, also our activities should be global and include also non-G20 members in order to consider inter- and transdisciplinary issues, interactions between different levels of the food supply chain and the corresponding actors as well as the impact of local framework conditions.

¹ MACS means Meeting of Agricultural Chief Scientists, more details see <https://www.macs-g20.org/>.

3. Overview of past and ongoing activities

Our activities - finished within this year as well as ongoing - are briefly described according to the main topics of the MACS-G20 FLW Initiative (Figure 1).

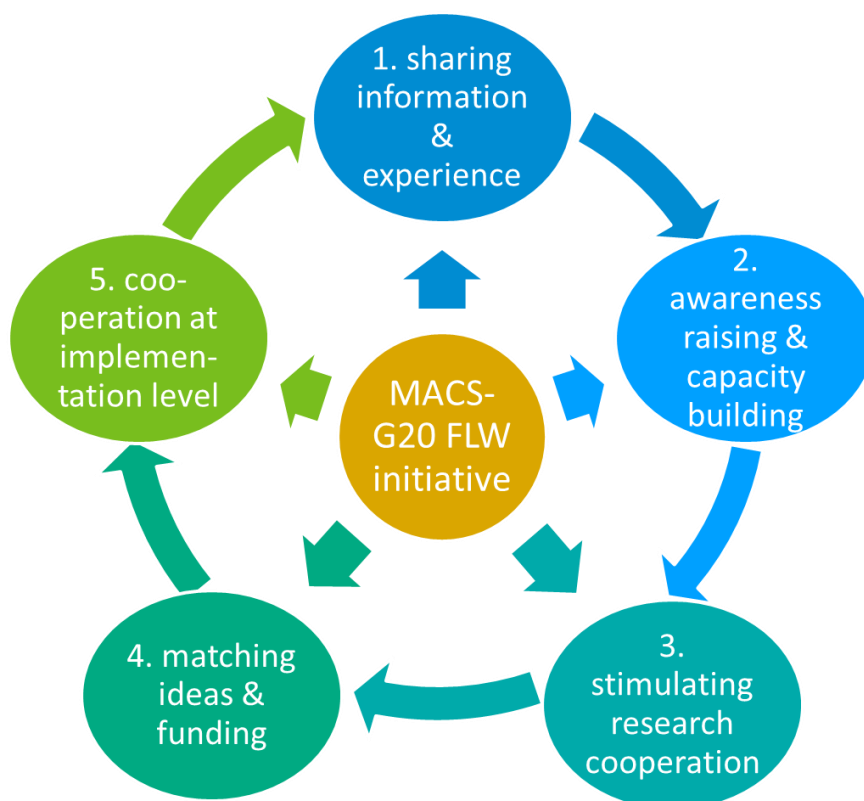


Figure 1 Scheme of the structure of main topics derived from MACS-G20 FLW initiative

Topic 1: Sharing information & experience

Global Food Loss and Waste Research Platform

The Global Food Loss and Waste Research Platform is an [online](#) data base where experts register in order to make their contact information and their FLW projects more visible on a global level. Aim of the Platform is to offer easy accessible and focused information to policy decision makers, companies and researchers to facilitate networks building, knowledge sharing and corresponding action.

Since its launch in spring 2016, 115 researchers from 24 countries entered their contact data into the data base and provided information on 95 projects related to FLW (see Figure 2). Most projects (54) deal with the question on how to reduce food waste by quantity. The most targeted food product groups are vegetables (69), fruits (66) as well as cereal products (63).

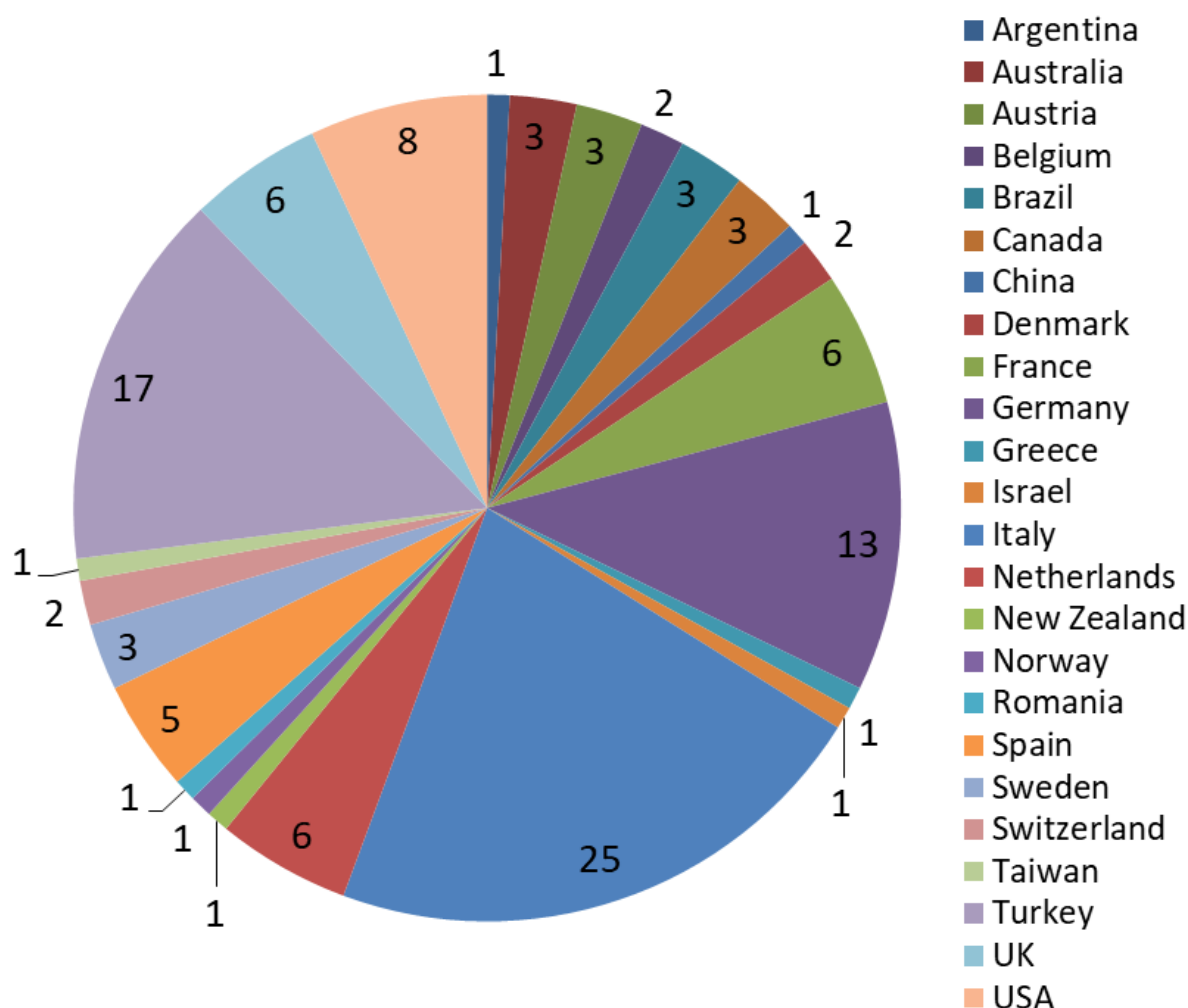


Figure 2 Distribution of researcher's profile in the Global Food Loss and Waste research Platform (as of December 06th, 2019).

All interested colleagues are welcome to contribute further knowledge to the database by inviting additional experts also from non-G20 countries to register and by using the content for own investigations and network establishment.

In order to obtain evidence of the Platform's recognition at global level, a set of facts were assessed in relation to the website's access rates. From early December 2018 to early December 2019, 997 accesses were counted for the website in total which represents an increasing access rate compared to 2018 (920) and 2017 (854). Figure 3 shows the visitors' countries of origin. The majority of the visitors came from Germany, USA, Italy, Japan, Brazil, China, UK, France and Mexico.

About 460 visitors (46 %) arrived directly on the website while 318 visitors (32 %) were redirected from other websites (mainly www.fao.org). 126 visitors (13 %) were directed to the website by using search engines which indicates a slight increase perhaps due to the search engine optimisation (SEO) which was done last year.

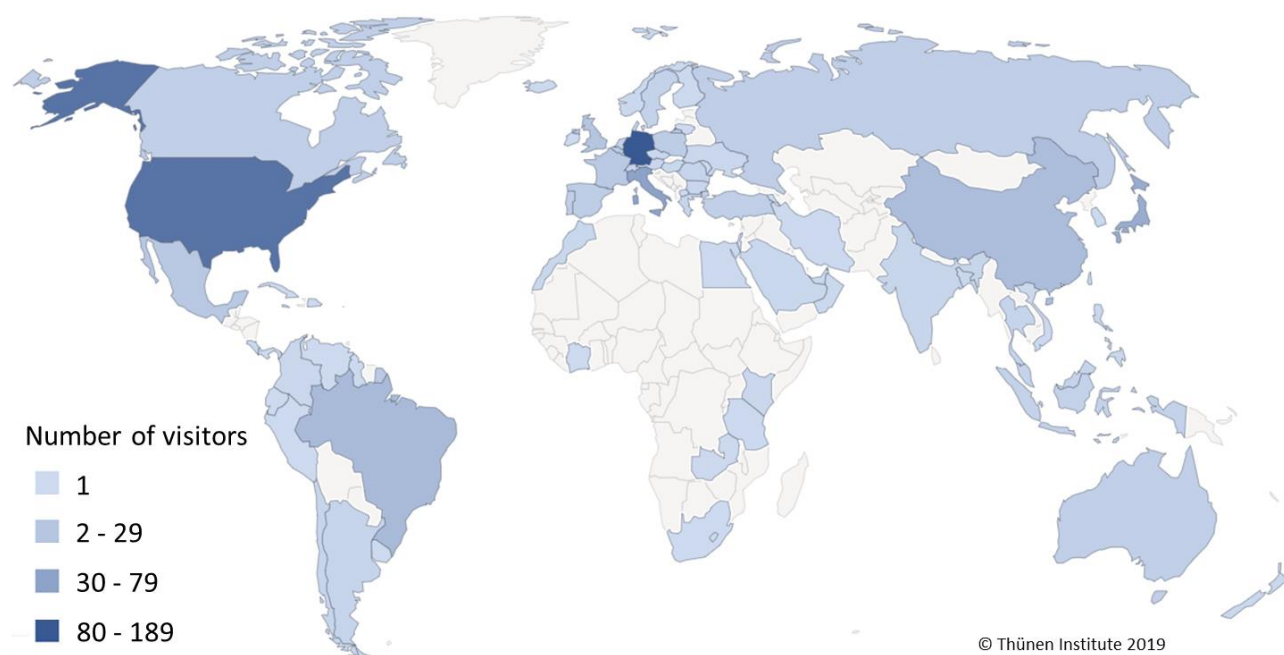


Figure 3 Numbers of visitors at the Global Food Loss and Waste Research Platform in 2019.

MACS-G20 2019 under presidency of Japan

This year's MACS-G20 was held from April 24th to 26th, 2019 in Tokyo, Japan. The first time since the founding meeting of MACS-G20 in 2012 in Mexico all G20 member countries were represented – a great success for the organisers! Starting with an excursion to Sendai, Miyagi, where agriculture had to be completely restructured and renewed after the catastrophic destruction of the tsunami in 2011, topics such as “Transboundary Plant Pests” and “Social Experiment-like Approaches to Facilitating On-site Adoption of Climate-Smart Technologies” were discussed. In addition, a new task force was formed related to discuss the strategic aim and positioning of all working groups originating from MACS. Of course, also the activities of the MACS-G20 FLW Initiative were presented briefly. All documents related to that MACS-G20 are provided [online](#). The next MACS-G20 will take place in Khobar, Saudi Arabia from February 18th to 19th, 2020.

The stay was also used by Stefan and Felicitas to meet potential partners for the planned FLW workshop for the East and Southeast Asian region in October 2019 in Tokyo. The visit of the food waste treatment facility located at [Kurokawa Field Science Centre](#) (Meiji University) and discussions with FAO Liaison Office Japan as well as colleagues from Teikyo University, Kyoto Prefectural University and Taisho University were very fruitful and inspiring.

FLW Workshop in Tokyo, Japan

One aim of our activities is to organise an international FLW workshop annually. The workshop series started with the [kick-off workshop](#) in Berlin in 2017 and was followed by a regional FLW workshop that was organised for Latin America and the Caribbean countries (LAC) in November 2018 in [Buenos Aires](#).

The "International Workshop on Food Loss and Waste Prevention targeting Southeast and East Asian region" as third event of the series took place in Tokyo from October 16th to 18th, 2019. It was implemented together with UN Environment Programme (UNEP) of regional capacity building workshops on FLW and the FAO's World Food Day 2019. The organisation team included the Ministry of Agriculture, Forestry and

Fisheries of Japan (MAFF) as the presidency holder of 2019 MACS-G20, FAO Liaison Office Japan, UNEP and Thünen Institute. The aim of the workshop was to support the delivery of SDG Target 12.3, halving food waste at retail and consumer level, and reducing food loss across the supply chain as well as to facilitate the cooperation and network building among countries in Asia with respect to sharing knowledge and experiences in measuring and reducing FLW at all levels. It provided guidance on setting baselines and measuring progress on FLW generation, defining a national strategy on FLW reduction, developing effective actions targeting households and the supply chain, and using FLW to raise ambition on greenhouse gas reduction in the 2020 Nationally Determined Contributions revision.

In total, 78 participants from Japan, Singapore, China, Macao Special Administrative Region of the People's Republic of China, Republic of Korea, Indonesia, Thailand, Taiwan, Saudi Arabia and Germany as well as from FAO and UNEP attended the workshop at United Nations University Headquarters (Figure 4). A special honour was the introductory presentation by Ms. Toshiko Takeya, Parliamentarian and Secretary General of the "Parliamentary League for the Reduction of FLW and the Support of food banks", which provided an in-depth insight into the specific legislation on FLW in Japan. Ms. Takeya took the opportunity to exchange technical knowledge and participated also in further sessions. All presentations as well as a workshop summary are provided to the public for further inspiration and networking at the Initiative's [website](#). The interactive character of the workshop with a balanced mix of plenary sessions and group working (including a "sorting analysis of household food waste items" using photos prepared by H. Yamakawa, T. Okayama, and K. Watanabe) was positive responded by participants.



Figure 4 Participants at the FLW Workshop in Tokyo in October 2019.

As an example, here the experience from the Japanese universities' collaboration team which contributed a valuable part including presentations and group working: *"We (H. Yamakawa, T. Okayama, and K. Watanabe) are a group of researchers based in Japan, now working on a project on methodologies for quantifying food waste from households. We were given the honour of presenting papers, arranging an interactive workshop, and chairing sessions at the 3rd MACS-G20 workshop on food loss and waste held in*

Tokyo, October 2019. This involvement provided us with a precious opportunity to meet and discuss with personnel from UN organisation (UNEP and FAO) as well as those from countries abroad in East and Southeast Asia. We were very happy that our presentations were well received, and moreover the participants found the interactive workshop useful and also enjoyable. We hope that this experience will lead to working together with organisations and individuals that took part in the Tokyo workshop.

Actually our collaboration with Dr Schneider dates back to 2007, when Watanabe met Schneider at a waste management conference organised by BOKU University, Vienna. Many of the ideas have been developed in cooperation since then. The prototype for the interactive workshop in Tokyo was developed and conducted by Dr Schneider and colleagues at the International Waste Management and Landfill Symposium in Sardinia in 2011. Towards the preparation for the Tokyo workshop, we had meetings in Braunschweig (Oct 2017) and Tokyo (Apr 2019) as well as a few virtual ones over Skype. We had conducted a "dress rehearsal" of the interactive workshop in the 2019 edition of the abovementioned Sardinia Symposium, just before the one in Tokyo with MACS-G20. It was good to see that our proposed framework worked for both groups (i.e., Sardinia: waste management experts mostly from Europe; Tokyo: food and agriculture experts mostly from Asia).

The aim of our current project is to develop a methodology for categorising and measuring household food waste that could be considered good practice in regards to producing data for SDG target 12.3. Following the waste hierarchy principle, we believe that the reduction potential (rather than recycling) must be clearly shown, hence a distinction of usually eaten parts (avoidable food waste) and intentionally removed parts is necessary. The framework for such a methodology should be internationally agreeable, and is 1) useful for planning policy and action, 2) reflect clearly the concept of avoidable food waste, and 3) easy to conduct. Our long-lasting collaboration with Thünen Institute has been very important in developing the concepts and disseminating them. We are very much looking forward to further cooperation."

The next FLW workshop of this series will take place in Saudi Arabia in October 2020 in cooperation with the Ministry of Environment, Water and Agriculture of Saudi Arabia (MEWA) and United Nations' Environmental Program (UNEP).

REFOWAS international FLW Workshop Berlin

On June 14th, 2019, an international FLW workshop was organised by [REFOWAS](#) project which is coordinated by Thünen Institute of Rural Studies. There, 47 food waste experts from 14 European countries as well as EU Commission and UNEP presented and discussed current challenges and national approaches for the monitoring, reporting and evaluation of food waste in the context of the SDG 12.3 in Europe. The aim of this workshop was an exchange of insights into national food waste data, monitoring approaches and evaluation of reduction measures in different EU countries. Documents are provided online in [English](#).

German National Strategy on Food Loss and Waste and Baseline 2015

On February 20th, 2019, the German Federal Cabinet adopted the National Strategy for Reducing Food Waste presented by German Federal Food Minister Ms. Julia Klöckner. The [document](#) is also available in English language. The aim is to halve per capita food waste in Germany at retail and consumer levels by 2030 and to reduce food waste along the production and supply chain, including post-harvest losses. This aim is provided for both in the German coalition agreement and the United Nations' Agenda 2030.

All actors along the German food value chain are to be involved by participating in dialogue forums per sector and in an overarching national dialogue forum. Concrete measures against food waste are to be

developed jointly and sector-specific targets set. The federal-state body (Germany consists of 16 states) is an important element in the implementation process. It builds on the already existing federal-state working group and assumes the tasks of a cross-departmental and cross-state steering instrument. Figure 4 provides an overview of the organisation design towards an effective implementation of measures.

Since then, the Dialogue Forum on Out-of-Home Catering was launched with two workshops and there is already a draft towards a voluntary agreement with Out-of-Home Catering companies available for review. The Wholesale and Retail Dialogue Forum started its work on November 6th, 2019. Thünen Institute is member of the Working Group Indicator SDG 12.3 and provides scientific input to the whole process.

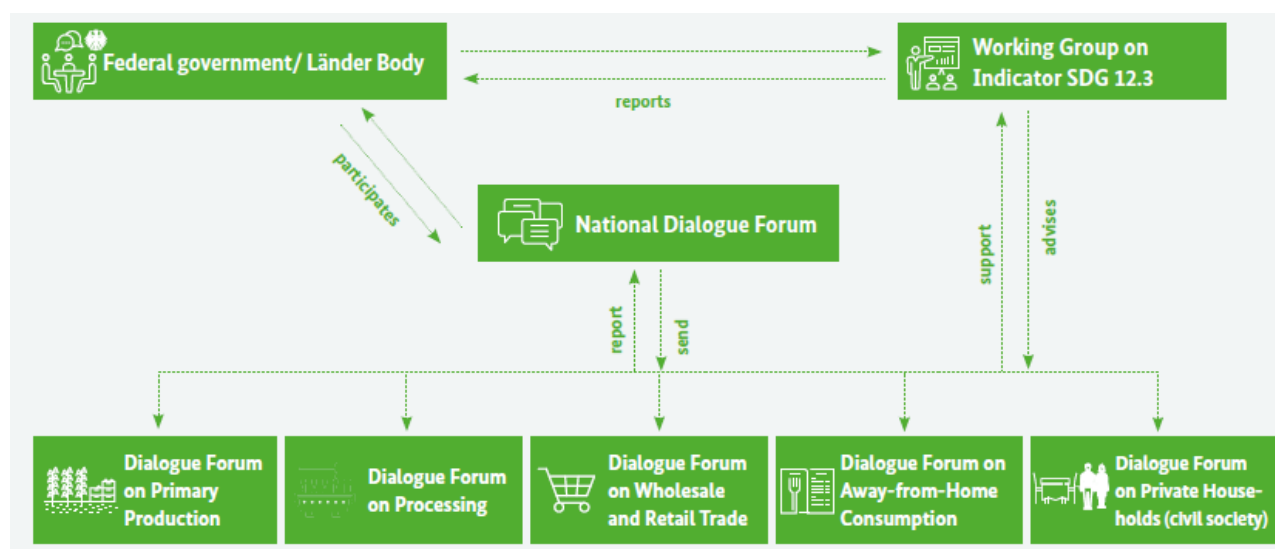


Figure 5 Structure of cooperation within German National Strategy for Reducing Food Waste (BMEL, 2019).

In September 2019, the German Ministry of Food and Agriculture published the German FLW Baseline setting the basis year in 2015. An English summary is available [online](#). The total amount of food waste in 2015 was about 11.86 million tons, of which around 6.68 million tons were theoretically avoidable. Primary production accounts for 12 % (1.36 million tons), processing for 18 % (2.17 million tons), trade for 4 % (0.49 million tons), out of house meals for 14 % (1.69 million tons), and households contribute with 52 % (6.14 million tons), which is equivalent to about 75 kg per capita in 2015. Across all sectors, about half of the waste would theoretically be avoidable. Uncertainties in the data exist above all in the areas of primary production, processing and trade.

A brief summary of the German situation related to FLW is provided as country profile “Situation in my country” attached to this report in the annex and online² in the cloud.

² If you do not have access to the cloud or lost that information, please contact felicitas.schneider@thuenen.de

Topic 2: Awareness Raising & Capacity Building

The German Chancellor Fellowship for Prospective Leaders (Alexander von Humboldt Foundation)

As already reported in the last annual report, Thünen Institute hosted a fellow from Russia on the topic of Food Loss and Waste. Thünen Institute provided its international network to FLW experts, organised joint meetings and excursions not only in Germany but also Austria, e.g. at Wiener Tafel. Ms. Patsko provided the following summary of her fellowship which ended in September 2019: *“In November 2018, Thünen Institute represented by Dr Felicitas Schneider became the host institute for Evgeniya Patsko from the Russian Federation – the fellow of the German Chancellor Fellowship for Prospective leaders funded by Alexander von Humboldt Foundation with the research topic ‘Promoting zero food waste ecosystem and adapting the best German innovative solutions and practices to the Russian market’.*

Russia is one of the countries signed SDGs 2030. Nevertheless, unlike in German society there is yet not enough awareness among the Russian people about food waste harmful global imprint as well as lack of expertise in various ways food waste can be tackled on multiple levels of food circulation from farm to fork. The goal of this project was to conduct a research on the varieties of the most sustainable and economically viable innovative solutions to the problem of food waste in Germany and other EU countries in the fields of non-profit, volunteer-based organizations and businesses focused on saving food, as well as educational programs aimed at bringing more awareness among the population. With the support of Thünen Institute Evgeniya Patsko has visited several farms, food banks, greenhouses, conferences and workshops related to the research objectives, as well as conducted interviews with the executives of businesses focused on saving or repurposing food products.

The kick-off result of this project will be the launch of an electronic catalogue for the Russian-speaking audience that would help navigate through the most modern food waste sustainable solutions collected in Germany, USA, the Netherlands, UK, Austria and other EU countries. The information and the catalogue will be available through the web site and is meant to bring more awareness about the global topic of food waste and trigger the interest of municipal organizations and business communities working in food retail sector and other food related enterprises.”

As soon as the mentioned website is available, we will inform you about the link.

International Day of Awareness of Food Loss and Waste

As previously reported, the Government of Argentina submitted an application to the Food and Agriculture Organisation (FAO) within their G20 presidency to create an International Food Waste Awareness Day on September 29th each year. After passing the FAO [Committee on Agriculture](#) in October 2018 and the FAO Council Session in December 2018, a draft resolution was prepared for the FAO Conference in June 2019. The [documents](#) are available in English, Arabic, Chinese, Spanish, French and Russian.

Finally, the 74th United Nations General Assembly designated September 29th as the [International Day of Awareness of Food Loss and Waste](#) on December 19th, 2019. We would like to thank the Argentinian colleagues for their engagement!

Cooperation with Brazil³

After Brazil published the “Intersectoral Strategy for the Reduction of Food Loss and Waste in Brazil” in early 2018, a lot of joint stakeholder activities have been developed and implemented. Unfortunately, the technical committee on FLW was suspended with the change of the national government and thus the progress of the national food loss and waste strategy is reduced significantly.

Nevertheless, there are further activities organised by different stakeholders towards a reduction of FLW in Brazil. Towards reduction of food loss at transport stage, Embrapa Food Technology in cooperation with Macromolecular Institute (IMA) of Federal University of Rio de Janeiro developed an innovative packaging which reduces postharvest losses to below 5 % and decreases energy use in lower cold chain. The packaging was awarded as [Diamond finalist](#) in 2019 Packaging Innovation Awards among nearly 250 submissions from more than 30 countries. Congrats!

A valuable cooperation was set up by the Brazilian Institute of Geography and Statistics, the Ministry of Agriculture (MAPA) and Embrapa with the aim to choose products to be worked on and quantify their losses from production to wholesale trade. The proposition is to start and take actions to map, quantify, record and create indicators to quantify losses. The present preselected products are grains (probably rice, beans and/or corn).

In practice, there is already measurement⁴ on food loss at retail level ongoing, mainly organized and conducted by Embrapa Vegetables. Next steps are to extend the research from retail level to “from field to fork”. In parallel, in cooperation with rural extension service, support material related to Brazilian vegetable postharvest losses is prepared to be used by extension officers in future. In parallel, the campaign Hortaliça não é só Salada⁵ is improved by offering additional materials that can be downloaded for free such as a [logo](#) with the website address to be printed in vegetables packages or a group of [leaflets](#) to be used in markets, schools and events related to healthy eating and FLW prevention.

As part of the Embrapa cooperation with the European Union Delegation in Brazil and WWF-Brazil, [educational materials](#) were produced and launched in November 2019 targeting elementary school students and teachers. The produced comic book, for instance, was developed by Mauricio de Sousa Institute. They are well-known in Latin America for the “Turma da Monica” characters, which have been around since the sixties in Brazil and are still incredible relevant and well known in the region, especially amongst young audiences. Children recognize and love these characters, which makes the comics an effective vehicle to communicate messages related to food waste mitigation to this young audience. Another educational guide for educators has been developed with step by step instructions for key activities to be implemented in schools, aimed at fostering sustainable consumption. Since Embrapa has a network of 43 research centres around Brazil, and several centres are involved in activities with students via the program Embrapa & School, the promotion events have just started in different Brazilian regions (in November in Rio Branco (Acre), Aracaju (Sergipe) and Brasília) to implement and present the educational materials to students and teachers (see Figure 6, left). The real challenge is related to budget constraints and without the support from the European Union and the partnership with WWF-Brazil the development of those materials and their promotion would not be possible.

³ Information for this section was kindly provided by Milza Lana, Gustavo Porpino and Murillo Freire from Embrapa/Brazil.

⁴ Please see also the publication section at the end of this report.

⁵ engl. “Vegetables are more than just salad”, details see <https://www.embrapa.br/en/hortalica-nao-e-so-salada>

Another campaign targeting Brazilian households is the #SemDesperdício⁶ initiative which was launched in October 2016 by Embrapa, WWF and FAO. With financial support of WWF Brazil, the operation of the website is feasible but on the long-term a more permanent funding for the platform should be secured. As part of the awareness raising campaign, an in-person workshop for twelve digital influencers was conducted in cooperation of WWF-Brazil, Embrapa and the Federal University of Brasilia targeting topics such as food production, FLW and food biodiversity as well as an excursion to an agro-ecological small farm that participates in a community supported agriculture model (see Figure 6, right). The idea was to engage and educate these influencers, so that they bring awareness to a larger audience on these topics, especially to young adults that are beginning to live alone or have a bigger influence on their households, and are forming individual home maintenance habits.

Furthermore, the topic of FLW was addressed in different conferences and seminars such one related to grain losses in Brazil of the Brazilian Congress of Agricultural Engineering (CONBEA). There is also continued exchange of experiences following our 2018 FLW workshop in Argentina such as “1st Latin American Summit on FLW” organized by FAO LAC and the Inter-American Development Bank in Colombia. Among others, Murillo Freire from Embrapa shared his experience there with other Latin American colleagues as presenter and participant of a working group aiming to discuss a Code of Conduct on FLW⁷ prepared by FAO in advance. The summit aimed to advance the methodology of quantifying food losses of the respective 10 lead products relevant for calculating the upcoming Food Loss Index.



Figure 6 Awareness raising campaigns targeting students (left) and digital influencers (right) in Brazil (G. Porpino, 2019).

In order to give the mutual willingness of Embrapa and Thünen Institute to cooperate a more official character in the future, a Memorandum of Understanding (MoU) is already being developed.

Capacity building in cooperation with Russia

As one of the first actions related to the MoU⁸ between Lomonosov Moscow State University and Thünen Institute, Mr. Artur Rykalin from the Eurasian Center for Food Security (ECFS) was guest scientist at Thünen Institute for two weeks in February 2019. Besides the topic of Food Loss and Waste Prevention also issues related to organic agricultural production, farmers' cooperatives, complementary currency systems,

⁶ see @semdesperdiciobr (Instagram); @SemDesperdicioBrasil (Facebook); and the website semdesperdicio.org.

⁷ Find more information within the last chapter of this report.

⁸ see Annual Report 2017

agricultural marketing strategies and rural development were addressed during his stay in Germany. In addition to meetings with NGOs (e.g. [Tafel Food Bank](https://www.berliner-tafel.de/), Berliner Tafel⁹, Braunschweiger Tafel¹⁰, Slow Food Germany¹¹) and businesses (e.g. To Good to Go¹², SirPlus¹³, Markthalle 9¹⁴) also excursions to the [Eberswalde University](https://www.ecf-farm.de/) for Sustainable Development (HNEE), [University Kassel-Witzenhausen](https://www.unikassel.de/), ECF Aquaponic farm¹⁵, to BioFach (the World's Leading Trade Fair for Organic Food in Nuremberg) as well as to the organic agricultural cooperative Brodowin¹⁶ were included into the program.

Mr. Rykalin contributed to the scientific discussion with short presentations during the meetings and a presentation on the subject of "Transition from Soviet Kolkhozes to cooperatives, example of an organic farm in Russia" at Thünen Institute's weekly colloquium.

The learnings from the visit were summarised by Mr. Rykalin into a series of journalistic notes about FLW projects in Germany using text and video format in Russian language and transferred to public via social media¹⁷. In addition, an analytical note on the comparison of the main projects for reducing FLW in Russia and Germany has been prepared in Russian. The established contact to German Foodsharing Movement was deepened in Moscow with the corresponding network which led to a saving of more than a ton of surplus food products distributed for human consumption instead of being wasted (Figure 7). Another consequence of the visit was the establishment of a network including the key leaders dealing with FLW topics in Russia, starting to track analytics and activity on FLW and to support popularizing FLW projects in Russia. There is also increasing interest of journalists to report about Moscow freeganism and foodsharing.

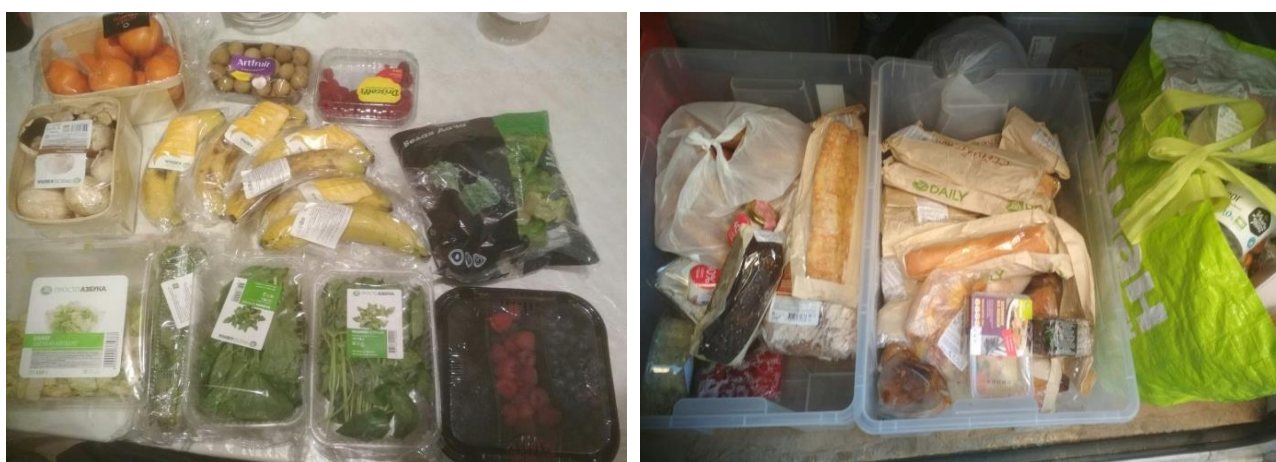


Figure 7 Surplus food products saved by Mr. Rykalin in cooperation with Foodsharing network Moscow (A. Rykalin, 2019).

⁹ <https://www.berliner-tafel.de/> (in German only)

¹⁰ <http://www.braunschweiger-tafel.de/> (in German only)

¹¹ <https://www.slowfood.de/> (in German only)

¹² <https://toogoodtogo.de/> (in German only)

¹³ <https://sirplus.de/> (in German only)

¹⁴ <https://markthalleneun.de/> (in German only)

¹⁵ <https://www.ecf-farm.de/> (in German only)

¹⁶ www.brodowin.de (in German only)

¹⁷ e.g. <https://www.youtube.com/channel/UCgWGwKbGRYWEq3fkjt67NoQ>

Mr. Rykalin was also one of the European experts invited to the REFOWAS international workshop in June 2019 in Berlin. In addition, he applied for an internship at a Bavarian Social Farming Demeter Initiative where he stayed for two months during summer 2019.

In July 2019, another 12-day internship took place in cooperation of the two institutions. Ms. Aleksandra Kosterina from Eurasian Center for Food Security (ECFS) focused on FLW issues only. In total, 11 colleagues from three different Thünen Institutes (Market Analysis, Rural Studies, Farm Economics) shared their experiences related to FLW measurement methodology and implementation in field, development of questionnaires and conducting interviews, cooperation with other stakeholders in FLW data collection, FLW reduction strategies and other aspects and discussed the practical implementation of that knowledge in another environment. In addition, two experts from Münster University of Applied Sciences joined a virtual meeting to discuss FLW data collection in the Out-of-Home catering sector. The collected information will serve as basis for further FLW research activities done by ECFS.

Continuing a Food Loss and Waste network with Saudi Arabia

The cooperation between the MACS-G20 representatives from Saudi Arabia and Thünen Institute was continued during MACS-G20 2019 and especially during the Tokyo FLW workshop. It was a great honour to welcome three participants from Saudi Arabia to that workshop in October. First drafts on the scheduled FLW workshop in 2020 in the Kingdom were discussed together with Clementine O'Connor from UNEP as third cooperation partner.

In addition, under the overarching topic of “Realizing Opportunities of the 21st Century for All”, the Saudi G20 Presidency proposes *“that the G20 steps up its efforts on food loss and waste and promote responsible agricultural investments.”*¹⁸ Thünen Institute will support the planning of corresponding action towards FLW prevention activities during the G20 presidency. The starting point will be a presentation given by the coordinator on the topic at the 1st G20 Agriculture Deputies Meeting in January 2020 in Riyadh.

Topic 3: Stimulating research cooperation

Cooperation with TempAg

TempAg is an international collaborative research network established to increase the political and societal impact of agricultural research in the world's temperate regions. In 2017, the idea to cooperate in the FLW area came up and a project was elaborated. The aim of that pilot activity is to identify further need for interdisciplinary research and policy on food loss and waste at global level in order to facilitate appropriate national and international funding programmes and government support. The financial support for this joint activity comes from TempAg. The expected results are useful for further TempAg activities as well as for facilitating aspired collaboration with the MACS-G20 Food Loss and Waste initiative.

At the beginning, Thünen Institute (Germany, as leader), INRA (France), LUKE (Finland), the Swedish University of Agricultural Sciences (SLU), Wageningen University & Research (The Netherlands) and the Norwegian Institute of Bioeconomy Research (NIBIO) agreed to join the project. A total of 265 review papers published from 2010 to mid of 2018 were selected for detailed assessment of identified needs for

¹⁸ For details please see the document “Safeguarding the planet” available at <https://g20.org/en/g20/Pages/agenda.aspx>.

further action in policy or gaps in research. The detailed assessment was conducted during August and September 2018. A preliminary report was discussed within the group but could not be finished yet due to time restrictions. The report will be finalised as soon as possible and published online.

Cooperation with Canada¹⁹ - A New Management-driven Initiative on FLW launched by the Science and Technology Branch of Agriculture and Agri-Food Canada

Canada recognizes FLW as a concern with implications for food security and safety, the environment, and the efficiency of the agriculture and food sector. A significant part of FLW is directly caused by inadequate food cold chain conditions. The cold chain plays a key role in the Canadian economy as it is the driver of fresh, refrigerated and frozen food exports to foreign markets, and also plays an essential role in food distribution within Canada. In this regard, Canada faces unique challenges in addressing FLW issues, in part because of its climate (succession of warm summer conditions and freezing winter conditions), its long transportation distances, and its hundreds of northern communities, most with fewer than 1,000 inhabitants, that are scattered across more than 4 million square kilometers of Canada's North and are not accessible year-round by road, rail or sea.

In 2019, a project entitled "Implementation of a technology platform to develop sustainable strategies in order to reduce Food Loss and Waste across the continuum of food distribution in Canada" was launched by the Science and Technology Branch of Agriculture and Agri-Food Canada (AAFC) to address this issue. This project is led by Dr. Sébastien Villeneuve, a scientist at AAFC and a professional engineer with a twenty-year background in the food cold chain. Other AAFC scientists collaborating in this project include Dr. Martin Mondor (Modelling), Dr. Evelyne Guevremont (Food Safety), Dr. Yves Arcand (Carbon footprint) and Mr. Stephane Gariépy (Knowledge Technology Transfer). Dr. Felicitas Schneider from Thünen Institute acts as facilitator for this project in order to share the findings that could also be useful for other countries in the MACS-G20 FLW Initiative.

The core project activities will be achieved at the Saint-Hyacinthe Research and Development Centre (Figure 7) which has a one-of-a-kind specialized equipment capacity in its pilot plant (Figure). This equipment can realistically simulate all the conditions (time, temperatures, depressurization, vibration) encountered during land and air transportation and tracking bacterial flora all along the distribution chain continuum. This technology platform simulating actual food distribution and export conditions will be validated and implemented to address the needs of the sector. This platform will investigate: cold chain management systems, improve food safety, and generate reliable indicators. This project will be an opportunity to develop sustainable strategies to reduce FLW in the food distribution continuum.

Agriculture and Agri-Food Canada, Science and Technology Branch, is developing and implementing a "Circular Agri-Food Systems" concept, which defines an innovative approach to optimizing value-addition. The Circular Agri-Food Systems approach integrates the principles of the Circular Economy and FAO's Sustainable Food Systems concept. The principles of the Circular Agri-Food Systems approach are minimizing food loss and waste, reducing pollution, reducing the environmental footprint while optimizing value-addition to the commodities that are grown in Canada. The Circular Agri-Food Systems approach adopts a holistic view of processing technologies with a focus on developing co-products, rather than single products with resultant by-product/waste streams. Advanced "green" processing technologies should aim

¹⁹ The following section was written by Dr. Sébastien Villeneuve from Saint-Hyacinthe Research and Development Centre in Quebec.

at generating many value-stream derived products while minimizing GHG emissions/effluents, and conserving soil, water and all other resources. In addition, these technologies should ensure the production of safe and healthy agri-food products for Canadians and for export markets.



Figure 7 St-Hyacinthe Research and Development Centre, one the 20 AAFC Research Centers in Canada.



Figure 8 Specialized equipment to simulate land and air transportation

Keeping in touch with Australia²⁰

The Australian Fight Food Waste Cooperative Research Centre (FFW CRC) is an AUD\$ 120 million (€75 million) 10-year industry-led food waste Research, Development and Extension (RD&E) Public Private Partnership that commenced on June 1, 2018. The Fight Food Waste CRC brings together industry, research and the community to capitalise on Australia's \$ 20 billion per annum food waste opportunities. The organisation involves 58 participants from across the food supply chain in Australia, as well as the Waste and Resource Action Programme (WRAP) from the United Kingdom. The FFW CRC purpose is for an Australia without food waste. It aims to achieve this by uniting science and industry to REDUCE food waste

²⁰ The chapter was provided by Dr. Steven Lapidge, Chief Executive Officer at Fight Food Waste CRC.

across the supply chain, TRANSFORM unavoidable food waste into innovative products, and ENGAGE with industry and consumers to deliver behavioural change. Through delivering on the above aims the FFW CRC will increase industry profitability, address food insecurity and enhance Australia's reputation as a sustainable food producer.

The overarching strategic objectives of the Fight Food Waste CRC are to deliver

- a transformation in the way Australian industry and consumers view food waste as well as contribute to food rescue,
- a suite of new tools and technologies for extracting the maximum value out of primary production, food manufacturing, supply chains and product sales, whether through supply chain innovation or waste transformation,
- reduction in food waste entering landfill and associated greenhouse gas emissions and
- future industry professionals skilled in capturing opportunities identified by industry.

To monitor its impact on food waste reduction and industry profitability the Fight Food Waste CRC has established an Industry Impact Committee. The objectives of the Industry Impact Committee are to:

1. Maximise the economic, environmental & social returns from food waste for industry participants and to develop the circular food economy.
2. Facilitate the achievement of UN Sustainable Development Goal 12.3.
3. Undertake regular reviews of stakeholder engagement.

In total the Fight Food Waste CRC expects to deliver risk adjusted, discounted (NPV) net economic benefit of AUD\$ 2.0 billion between 2018 and 2033 based on the economic impact tool completed as part of its 2017 Full Business Case that was reviewed by KPMG Australia.

If you are interested to read the latest news, you may subscribe for the [newsletter](#) or have a look at the [Annual Report 2018/19](#).

Topic 4: Matching ideas & funding

German Chancellor Fellowship for Prospective Leaders

The Alexander von Humboldt Foundation launches the “German Chancellor Fellowship for Prospective Leaders” for applicants from Brazil, China, India, Russia and the US. Each year, up to ten winners from each country are selected to carry out their individual projects in Germany for one year. The subjects of the projects are not restricted to a special topic but they should have societal relevance with respect to politics, economy, media, society, culture or administration. The fellows act as link between Germany and their home country. The Alexander von Humboldt Foundation pays a monthly grant, helps with administrative issues during their stay and offers additional excursions and courses for the selected “prospective leaders” of the program. The German host organisation receives a monthly financial support for its expenses.

The next round of application starts on March 15th, 2020. More information on the program is provided [online](#). If you have any ideas related to FLW, please do not hesitate to contact us!

Topic 5: Fostering cooperation at implementation level

EIP-AGRI focus group „Reducing food loss on the farm“

Felicitas as coordinator of the MACS-G20 FLW Initiative was selected as one of twenty experts for the agricultural European Innovation Partnership (EIP-AGRI) Focus Group „Reducing food loss on the farm“. More information on the topics and aims can be found [online](#). Two meetings were conducted (in September 2018 in Ireland, March 2019 in France) in order to have discussions on the topic which could be summarised within FLW-related mini-papers. As a result of the meetings, five different mini-papers have been elaborated by the group members dealing with the working titles:

- From by-product to a new product
- New business models and relationships between farmers, industry, retail and consumers
- Optimizing best practices at production, storage and transformation stages
- Knowledge and Access to Information on food losses on the farm
- ICT approaches to on-farm food loss reduction

Those mini-papers should serve as recommendation for the practical implementations and further work of the so-called Operational Groups within EIP-AGRI (these are regional stakeholder groups scheduling and realizing implementation projects on location). In addition, a final report of the group will be elaborated. At the moment, the deliverables are behind schedule. We will keep you updated on the final results!

Cooperation with FAO Latin America and the Caribbean (LAC)

The successful cooperation of Thünen Institute with the Regional Office of FAO in Chile, started with the 2nd FLW workshop in Argentina, was to be continued. According to previous discussions, we connected the International Food Waste Coalition (IFWC), FAO Rome and FAO Europe and Central Asia with interested partners in Latin America and the Caribbean under coordination of FAO LAC. Aim was to share information on the [Do Good: Save food! Initiative](#) and evaluate options for adaption of the corresponding available education material to Latin American Economies under consideration of cultural and social aspects.

Unfortunately, after the virtual meeting no further cooperation on that topic could be started due to several reasons such as limited financial and personal resources as well as a mismatch of specific regional focus.

Cooperation with International Food Waste Coalition (IFWC)

In partnership with the United Nations Food and Agriculture Organization (FAO), the International Food Waste Coalition (IFWC) launched the Initiative Do good: Save food! with the aim to link together all the actors in school catering to reduce food waste throughout the chain and reassert the value of food. In the course of the initiative, guides (teaching material) were prepared for four age groups in French and English targeting schools in EU-countries. After a testing period, the initiative will be rolled out to European countries and the corresponding elaborated educational material will be translated in further languages.

Thus, in parallel to the above mentioned attempt targeting Latin America and the Caribbean, there was also the aim to support Do Good: Save food! Initiative within Europe. Thünen Institute provided potential partners for German speaking countries who could make use of the education material for schools targeting teachers, canteen staff and kids and manage the implementation on-site at schools. So far, no

cooperation within German speaking countries could be set up, perhaps as there is already material in German available which was previously initiated by the German and Austrian Ministries.

Nevertheless, together with FAO Europe and Central Asia, IFWC is still working on the dissemination of Do good: Save food! and associated impact assessment scheme. In January 2020, IFWC will help the French city of Fresnes to implement Do good: Save food! in primary schools with a launch of the initiative.

Cooperation with FAO Europe and Central Asia²¹

As mentioned in the previous sections, there is a close cooperation between FAO Europe and Central Asia with IFWC related to the implementation of Do good: Save food! Together they started e.g. a cooperation with Too Good To Go Movement Against Food Waste²² for disseminating the education guides in Belgium, France and the UK. In addition, the guides will also be disseminated within schools in Albania, Croatia, Hungary, Romania and Turkey.

Furthermore, under the umbrella of SAVE FOOD Initiative, FAO in Europe and Central Asia has started implementing a comprehensive food loss and waste reduction programme in Europe and Central Asia. At regional level, the programme works to raise awareness on the impact of and solutions for food loss and waste through communication and outreach activities, dissemination of programme findings and results and organization of meetings and events. A regional [Community of Practice](#) on FLW reduction was established to improve sharing of information and resources, as well as to facilitate collaboration and partnerships in the region. Capacity building (training in agro-industry and agribusiness development) of food supply chain actors and organizations involved in FLW reduction is another important component of the programme.

At national level, the programme supports countries in Eastern Europe and Central Asia in developing and implementing national strategies to reduce FLW, adjusted to the specific needs in each country and as part of existing relevant national strategies on agricultural development, food security, climate change mitigation, etc. This includes conducting field studies and FLW assessment, analysis of policy and regulatory framework, formulation of strategic elements of FLW reduction strategy. In the long term, the programme will help reduce national contribution to climate change and mitigate the pressure on national food systems caused by increased production, urbanization and changing consumption preferences and patterns.

New literature from MACS-G20 Initiative participants

In this section, we introduce new literature related to FLW which was published by members of our network. If you would like to see your publication listed here, too, please give us a hint!

- Lana M.M., Moita A.W. (2019) Visual quality and waste of fresh vegetables and herbs in a typical retail market in Brazil. *Horticultura Brasileira* 37: 161-171 DOI - <http://dx.doi.org/10.1590/S0102-053620190206>. <https://ainfo.cnptia.embrapa.br/digital/bitstream/item/199714/1/1806-9991-hb-37-02-161.pdf>

²¹ Information in this section was provided by Oksana Sapiga from FAO REU.

²² Too Good To Go is a company which developed an App for buying surplus food at cheap prices from B2C.

- Barco H., Oribe-Garcia I., Vargas-Viedma M.V., Borges C.E., Martín C., Alonso-Vicario A. (2019) New methodology for facilitating food wastage quantification. Identifying gaps and data inconsistencies. *Journal of Environmental Management* 234 (2019) 512–524, <https://doi.org/10.1016/j.jenvman.2018.11.037>.
- Schneider F., Part F., Göbel C., Langen N., Gerhards C., Kraus G.F., Ritter G. (2019) A methodological approach for the on-site quantification of food losses in primary production: Austrian and German case studies using the example of potato harvest. *Waste Manag* 86:106-113, DOI:10.1016/j.wasman.2019.01.020.
- Schmidt T.G., Schneider F., Claupein E. (2019) Food waste in private households in Germany: analysis of findings of a representative survey conducted by GfK SE in 2016/2017. Braunschweig: Johann Heinrich von Thünen-Institut, 50 p, Thünen Working Paper 92a, DOI:10.3220/WP1558690073000. https://literatur.thuenen.de/digbib_extern/dn061022.pdf
- Leverenz D., Moussawel S., Maurer C., Hafner G., Schneider F., Schmidt T.G., Kranert M. (2019) Quantifying the prevention potential of avoidable food waste in households using a self-reporting approach. *Resources Conserv Recycl* 150:104417, DOI:10.1016/j.resconrec.2019.104417.
- Reynolds C., Soma T., Spring C., Lazell J. [Ed.] (2020) *Routledge Handbook of Food Waste*. 1. Edition, 516 pages, Routledge Handbooks, Taylor & Francis Group, ISBN 978-1-13-861586-1. <https://www.routledge.com/Routledge-Handbook-of-Food-Waste-1st-Edition/Reynolds-Soma-Spring-Lazell/p/book/9781138615861>
- Schmidt T.G., Schneider F., Leverenz D., Hafner G. (2019) *Food Waste in Germany - Baseline 2015*. Summary, Braunschweig: Johann Heinrich von Thünen-Institute, 103 p, Thünen Rep 71, DOI:10.3220/REP1563519883000. https://www.bmel.de/SharedDocs/Downloads/Ernaehrung/WvL/TI-Studie2019_Lebensmittelabfaelle_summary.pdf?__blob=publicationFile

International news

In October 2018, the FAO Committee on Agriculture (COAG) requested that FAO should take the lead to develop Voluntary **Codes of Conduct** (CoC) for the reduction of FLW for submission to the next session of COAG (COAG 27) in October 2020. In response to this request, from mid of July to mid of August 2019, the Global Forum on Food Security and Nutrition (FSN) organized an e-consultation process related to the [draft document](#) (available in English, Spanish, French and Russian). In parallel, consultation processes were started e.g. in the course of conferences (as reported by our colleagues from Brazil earlier in the present report).

The **REFRESH project** funded by the Horizon 2020 Framework Programme of the European Union finished in June 2019. The final conference took place in May in Barcelona/Spain including very interesting presentations and workshop sessions. Further information and all presentations can be found [here](#).

The present **Horizon 2020-Work Programme 2018-2020** call targets - beside others – the FLW topic within the Rural Renaissance Call “RUR-07-2020: Reducing food losses and waste along the agri-food value chain”. Proposals selected for financing should focus on innovation action in order to lead to a significant reduction of FLW along the entire agri-food chain, increase the capacity and engagement of actors, raise awareness on the value of food and increase shared responsibility, expand the portfolio of innovative technologies, added-value products, business models and modes of cooperation between actors, contribute to and/or

improve understanding of the root causes and support FLW measurement within EU member states. Final deadline for application is January 22nd, 2020. Good luck to all contributors!

In the course of 2019, FAO launched **Food Loss and Waste Database** which contains data and information from openly accessible literature measuring FLW across food products, stages of the value chain, as well as geographical areas. In October 2019, more than 480 international publications from various sources which have produced more than 20 thousand data points were included. The [database](#) can be used by anyone free of charge.

At the C40 World Mayors Summit in Copenhagen, 14 cities committed to the **C40 Good Food Cities Declaration**. Aim is to promote and preserve the health of citizens and the health of the planet by including citizens and use procurement power to change what kind of food is bought by cities. The reduction of FLW is also addressed by including the reduction of FLW by 50 % until 2030, starting from 2015 figures. At the [initial](#) stage, Barcelona, Copenhagen, Guadalajara, Lima, London, Los Angeles, Milan, Oslo, Paris, Quezon City, Seoul, Stockholm, Tokyo and Toronto signed in.

The World Bank Group published a [report](#) on “**Mexico - Conceptual Framework for a national strategy on food loss and waste**” as a result from co-operation and assistance of the different national and international public, private and civil society entities that provided feedback and valuable inputs.

4. Annex

Background information on FLW in Germany (as of December 2019)

1. FLW in Germany in general

a. Quantitative amount of FLW

In September 2019, the German Baseline of the food waste in 2015 was published. The calculation follows the definitions and requirements according to the EU legislation¹ which was finally set into force in October 2019. An English summary of the German Baseline 2015 Report can be found [here](#).

The German Baseline 2015 meaning food waste along the entire value chain, divided into five sub-sectors (primary production, processing, trade, out-of-home catering, private households) and using the indicator of total food waste in metric tons fresh mass. According to the European Union law,

- the food definition starts with post-harvest (pre-harvest and crop losses not included),
- agricultural material which is used directly on the farm (e.g. plough in, feed to animals, used for biogas production etc.) is not included to the food waste figures as it is not waste,
- materials which are defined as by-products from the production of food are not included to the waste figures as they are not waste,
- food waste drained as or with wastewater is not accounted (measured and reported voluntarily, s. Art. 3/footnote 1),
- surplus food which is redistributed to human consumption, e.g. by social charities, is not accounted as it is not defined as waste (may be accounted separately) and
- surplus food which is used for animal feed is not accounted as it is not defined as waste (measured and reported voluntarily).

In addition to the EU requirements, the German Baseline 2015 also calculated the share of avoidable food waste. Transferred to the German population, total food waste was about 75.2 kg per capita in 2015 in households, of which 32.9 kg would have theoretically been avoidable. Due to existing data gaps (especially related to primary production, food processing and trade) and the necessity to use assumptions or non-representative data sources, the statistical accuracy of the results could not be showed properly.

b. Development in the recent past

There was a previous study for Germany but using a slightly different definition, methodology and data sources in 2012² but excluding primary production which was content of a separate study. Due to this, the results cannot be used for comparison with the German Baseline 2015.

Earlier in 2019 another study³ was published with a wider definition of food waste which also calculated the total amounts of food waste for Germany. According to these calculations, the amount of food waste in 2015 in Germany is approximately 12.7 million tonnes, of which around 7.05 million tonnes would theoretically be avoidable. Primary production accounts for 13 % (1.36 million t), processing 17 % (2.17 million t), trade 4 % (0.49 million t) and out-of-home catering 13 % (1.64 million t). The largest share of food waste is generated in private

¹ Commission Delegated Decision (EU) 2019/1597 of 3 May 2019 supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste. Official Journal of the European Union, L 248/77, 27.9.2019. <https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=OJ:L:2019:248:TOC>

² Kranert M., Hafner G., Barabosz J., Schneider F., Lebersorger S., Scherhauser S., Schuller H., Leverenz D., Kölbig A. (2012) Determination of discarded food and proposals for a minimization of food wastage in Germany - Abridged Version. 40 pages, https://www.bmel.de/SharedDocs/Downloads/EN/Food/Studie_Lebensmittelabfaelle_Kurzfassung.pdf?__blob=publicationFile

³ Schmidt T.G., Baumgardt S., Blumenthal A., Burdick B., Claupein E., Dirksmeyer W., Hafner G., Klockgether K., Koch F., Leverenz D., Lörchner M., Ludwig-Ohm S., Niepagenkemper L., Owusu-Sekyere K., Waskow F. (2019) Wege zur Reduzierung von Lebensmittelabfällen - Pathways to reduce food waste (REFOVAS) : Maßnahmen, Bewertungsrahmen und Analysewerkzeuge sowie zukunftsfähige Ansätze für einen nachhaltigen Umgang mit Lebensmitteln unter Einbindung sozio-ökologischer Innovationen. Braunschweig: Johann Heinrich von Thünen-Institut, 290 p, Thünen Rep 73, Vol. 1, DOI:10.3220/REP1569247044000. https://www.thuenen.de/media/publikationen/thuenen-report/Thuenen_Report_71.pdf

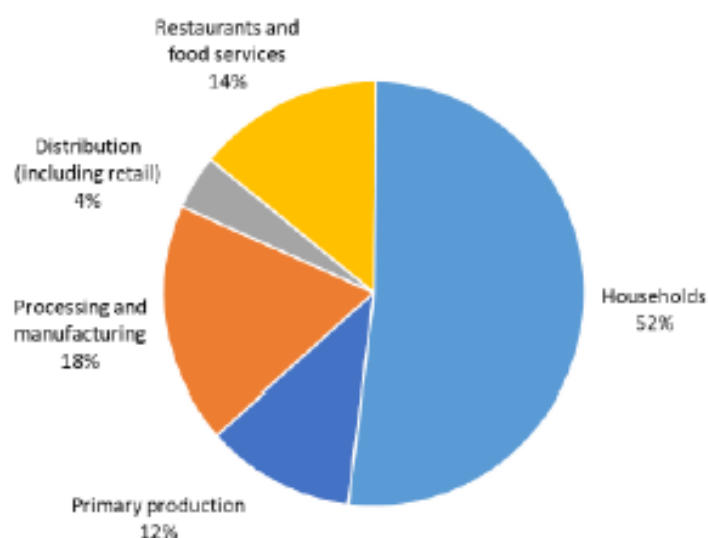
households at around 55 % (6.96 million t), which is equivalent to about 85.2 kg per capita in 2015. These quantities include liquid food waste and beverages.

2. If possible: proportion between several stages of value added chain: amount of FLW

The table below shows the range of total food waste amounts split into five levels of the food supply chain, a calculated mean value as well as the avoidable food waste amounts for each level. The graph displays the share of each level based on means. All data is calculated according to EU legislation.

Source: Schmidt T., Schneider F., Leverenz D., Hafner G. (2019) Food waste in Germany – Baseline 2015 – Summary Thünen Report 71. Braunschweig: Johann Heinrich von Thünen-Institut, 8 p.

2015	Food waste in million t			Avoidable food waste in million t		
	From	To	MW	From	to	MW
Primary Production	1.03	1.69	1.36	0.87	1.46	1.17
Food Processing	1.42	2.91	2.17	0.78	1.60	1.19
Trade	0.32	0.67	0.49	0.27	0.56	0.41
Out-of-home consumption	1.63	1.76	1.69	1.18	1.27	1.22
Households (exclusive drains)	5.87	6.40	6.14	2.57	2.80	2.69
Food waste	10.27	13.43	11.86	5.67	7.69	6.68



3. If possible: proportion between different product groups:

A further classification of food waste according to different food product groups is only available from non-representative studies.

4. Existence of a national reduction strategy – yes/no? If yes:

a. Since when is this strategy in force?

The German National Strategy on Food waste reduction⁴ was published in February 2019.

b. Does your strategy feature timed milestones in terms of concrete reduction goals?

The German Federal Government adopted the goals laid down in Agenda 2030 and thus, the strategy includes the aim of halving food waste at the retail and consumer levels and reducing food losses along production and supply chains, including post-harvest losses, by 2030.

⁴ BMEL (2019) [National Strategy for Food Waste Reduction](#). Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft), Berlin, February 2019, 20 pages.

c. What kind of measures are main tools of the strategy (e.g. consumer oriented campaigns, research programmes, public subsidies, legal guidelines/restrictions etc.)?

Four fields of actions are distinguished within the national strategy:

1. Policy framework: Within this field of action, the focus is laid on generation of various committees for future cooperation such as the Federal Government/federal states bodies, Working Group Indicator SDG 12.3, National Dialogue Forum and Dialogue fora per sector. Within the sector-related dialogue fora, voluntary agreements will be established to detail the contribution of each sector towards achievement of the reduction goal.
2. Process optimisation in the industry: The focus is improving of existing business processes.
3. Changes in the behaviour of all actors: Here the main action is to publicising the benefits of reducing food waste by e.g. further develop the government's Too good for the bin! initiative to become the umbrella brand for communicating the National Strategy.
4. Potential arising from research and the digital transformation: The last field of actions includes the development of innovative, digital solutions for complex logistics distribution. This includes among others support of digital logistic systems for redistribution, development of smart packaging, forecast models including artificial intelligence etc.

d. Results so far (successes, persisting challenges)

Federal Government/federal states bodies started their cooperation. Dialogue related to out-of-home sector and whole-sale/retail already started their work in the course of 2019. There was also a kick-off event for the National Dialogue Forum in November 2019. The Working Group Indicator SDG 12.3 meets on a regular basis and was already cooperating for the German Baseline 2015. In addition expert meetings on national and Federal-states level take place regularly.

5. Your personal estimation

a. Strengths and weaknesses of your national efforts?

Hopefully the national strategy will improve the cooperation among all relevant stakeholders. Negotiations towards voluntary agreements are scheduled for next 3 years which makes the remaining time until 2030 very short.

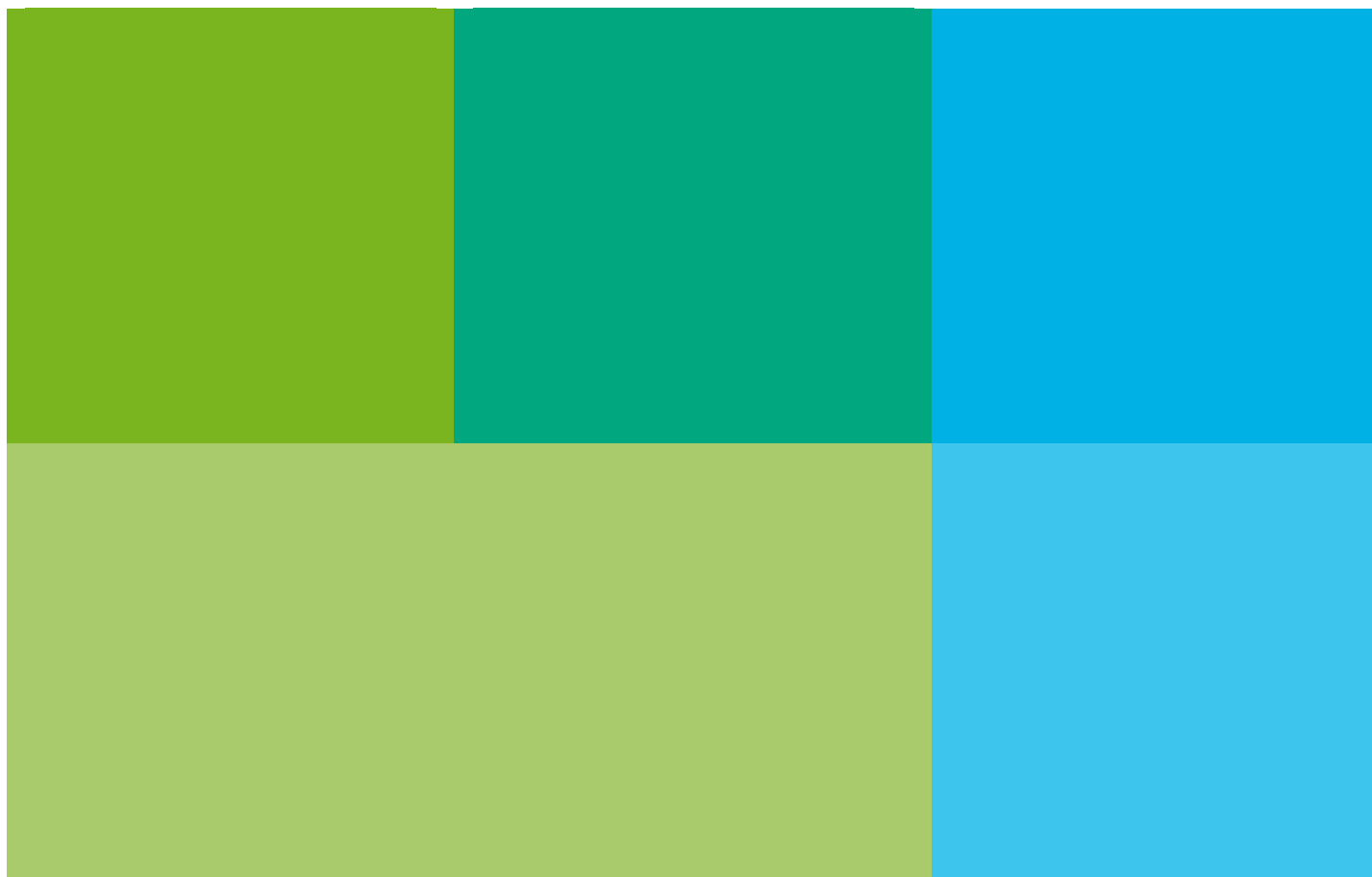
b. What should be maintained resp. changed and modified?

Speed up the processes for data collection and action implementation.

c. Lessons learnt – your recommendations concerning transferable experiences for partners abroad and for scheduled MACS driven FLW initiative?

There is already a lot of valuable experience available which should be used for speeding up the national process, to show best practice examples to sceptical stakeholders and to convince them towards participation.

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