

Cooperative Research Programme:
Biological Resource Management for Sustainable Agricultural Systems

Fellowship Summary Report:

Name: **Kohei Watanabe**

Subject Title: Food waste in Japan, and Europe - detailed grasp of the magnitude, and analyses on the formation of awareness

Host Institution: Institute for Waste Management, BOKU University Vienna (ABF-BOKU)

Host Collaborator: Prof Stefan Salhofer

Fellowship Dates: 20 Nov 2017 to 9 Apr 2018

I consent to my report being posted on the Co-operative Research Programme's website, or alternatively, a short paragraph about my fellowship which could be used anonymously.

1. What were the objectives of the research project? Why is the research project important?

The objectives were first, to make an estimation on the amount of food wastage for Austria that would be comparable with the estimation for Japan and USA, and second, to explore and compare the citizen's attitudes towards food waste. Reduction of food waste is of global importance as stated in the Sustainable Development Goals 12.3 (50% reduction of food waste by 2030), and the outcome of this project can provide useful information for assessing current practices and formulating effective measures addressing wastage of food.

2. Were the objectives of the fellowship achieved?

The persons in charge of statistics that could be used to quantify food waste has been interviewed, information was gathered and we have discussed on the definitions and methodologies regarding the statistics. According to the current figures we have and the calculations we made, Austria wastes ca.2.5 times more food than Japan, but there are a few more aspects that we need to consider further before concluding that this estimation describes the situation most accurately.

ABF-BOKU has conducted an extensive survey on Austrian citizens' attitudes and behaviours on food waste just before Watanabe's arrival, and the analyses of survey responses were jointly conducted so that the results could be compared with the survey that Watanabe conducted in the USA prior to arrival in Vienna. Some relevant contrasts as well as similarities were found between the Austrian and USA sample. For example, around half of the people in both countries would throw away food if they have passed the use-by date, while when it comes to the best-before date, 35% of Americans and only 5% of Austrians would do so. People who composted food waste at home tend to waste more food in America, while those in Austria who do so tend to waste less.

On-line questionnaire sheet for surveys to students in Austria was developed with ABF-BOKU researchers. The surveys Watanabe et al have conducted in Japan and USA were used as reference. This survey is now at the stage of collecting responses, and analyses will follow.

I have attended several international meetings relating to the subject, including three STREFOWA (STrategy for REducing FOod WASTE - EU Interreg research project) meetings. Through these experiences, I gained information on current situations and activities on food waste in various locations in Central Europe, new research methods and campaign approaches. I contributed to the discussions based on findings from my fellowship activities.

I have taken part in several food waste sorting analyses in Vienna and other research activities that were part of ABF-BOKU's on-going projects. Through these experiences I learned about the details and logistics of the analysis methods developed and adapted at the institute.

I made a presentation on the interim findings from the project at the ABF-BOKU research lecture series, which was open to the public. This was titled "Attitudes towards food waste in Japan, US, and Austria" and was well attended by students and staffs at BOKU as well as people from outside university.

3. What were the major achievements of the fellowship? (up to three)

Found about the working customs at the institute and built good rapport with researchers at ABF-BOKU which will be beneficial, if not crucial, for further collaboration.

Through the interviews with external experts and discussion with ABF researchers, the problems and implications of different definitions for food waste became clear; e.g. the difference in measuring in weight or calorific value presents a drastically different picture.

4. Will there be any follow-up work?

- Is a publication envisaged? Will this be in a journal or a publication? When will it appear?

Currently we are working on a joint author journal paper on the comparison of survey results in Austria and USA which will probably be submitted to the Journal of Cleaner Production. After the responses for Austrian students are gathered, we will analyse them, and will publish as another journal article on the comparison of Japan, USA, Austria, and UK students' attitudes on food waste. Beyond that, we have discussed the possibility of jointly holding a working session on food waste at the 17th International Waste Management Symposium in Sardinia, 2019.

- Is your fellowship likely to be the start of collaboration between your home institution and your host?

As shown above, there is a list of collaboration items and my fellowship will definitely be the start of collaboration between myself and my hosts in ABF-BOKU.

- Is your research likely to result in protected intellectual property, novel products or processes?

No, as this project is more focused on researching and analysing the status quo, not much on development of new technologies or products. We also intend to make any outcome from this project freely accessible to the public domain.

5. How might the results of your research project be important for helping develop regional, national or international agro-food, fisheries or forestry policies and, or practices, or be beneficial for society? Please express this in terms of environmental/food security/food safety/economic/health (human and livestock and plant) benefits, etc.

We are identifying differences in attitudes towards food waste and also factors affecting the attitudes between Japan, Austria, US, and UK. Such research outcomes can contribute to more effective policies and campaigns for reduction of food waste, providing information on which groups to target and aspects to focus on.

I believe that the summary I have made on different aspects and resulting definition on what is and what is not included in "food waste" either it is avoidable or unavoidable, would assist the discussion on establishing an index for SDG 12.3 which is currently in tier III: "No internationally established methodology or standards are yet available for the indicator". My attempts on quantifying the wastage of food from various definition and in terms of different units (weight, calories, nutrient) should also be useful in this aspect.

Reduction of food waste means more efficient use of food, and thus would enable feeding the world population with a smaller agricultural production, resulting in mitigating the environmental impacts and enhancing food security.

6. How was this research relevant to:

- The objectives of the CRP?

Regarding strengthening scientific knowledge, this research has contributed to broaden the perspective of waste management research. Waste management research has traditionally looked into safe disposal and utilisation of waste. Prevention and reduction of waste is a relatively new challenge tackled by engineers as well as social scientists. Food especially has a wide social and cultural context, and by setting up a basis for international collaboration, further achievements are expected.

Regarding the provision of relevant scientific information and advice that will inform future policy decisions related to the sustainable use of natural resources, in the areas of food, agriculture, forests and fisheries, the reduction of food waste is very much important in the aspects of environmental sustainability and global food security. The outcome of this project would provide practical information for policy making by identifying target groups and effective aspects to focus on.

- The CRP research theme?

This research is relevant to the CRP research theme, anticipating, pre-empting, coping with and managing risks that impact on the potential of agricultural systems to achieve food security. Food production does not come without environmental impacts. For example, natural areas are turned into agricultural use, whereby reducing wildlife habitats and impacting the biodiversity. From the social and economic aspect, there is a concern that developed economies buying up food in the international food market to continue their wasteful ways may mean that the global market price of food is escalated and thus depriving access to food for the poorer population in the world. These are risks associated with food supply and food security. On the other hand, if food waste is directly landfilled, it will anaerobically degrade and become a source of methane gas emission, a greenhouse gas 20 times more potent than CO₂. Food waste contains a large amount of moisture, and this will deteriorate the efficacy of waste treatment by incineration. These are risks caused by food waste

related to waste management. Reducing the amount of food waste and improving the supply efficiency of food is a pre-empting measure that would manage and reduce both of these risks.

7. Satisfaction

- o Did your fellowship conform to your expectations?

Yes, this was mostly thanks to the kindness and support of people at ABF-BOKU. Of course, OECD programme's support was essential in making this happen.

- o Will the OECD Co-operative Research Programme fellowship increase directly or indirectly your career opportunities? Please specify.

Recently a further research funding on food waste project with ABF-BOKU et al has been accepted. More future collaboration / joint projects with ABF-BOKU are expected. Jointly authored journal publications will enhance the list of my academic achievements, which then may connect to a better job or a promotion.

- o Did you encounter any practical problems?

No significant practical problem was encountered.

- o Please suggest any improvements in the Fellowship Programme.

No specific ideas.

8. Advertising the Co-operative Research Programme

- o How did you learn about the Co-operative Research Programme?

If I remember correctly, I came across this programme through a web search.

- o What would you suggest to make it more "visible"?

A regular newsletter on the appointments and achievements of fellowship recipients will at least make the programme more visible to the "alumni". Starting from there, the alumni may be inspired to advertise the programme to relevant potential candidates for the fellowship

- o Are there any issues you would like to record?

n/a