



FELLOWSHIP SUMMARY REPORTS

- ❖ Please submit this Summary Report in Word, in Times New Roman, font size 11, using UK English spellings.

Cover page – which should include:

- Your name:
Mitsuyasu Yabe
- The subject title and theme number of your research fellowship:
Estimating Consumer Preferences for Non-chemical Agricultural Products: A Multinational Analysis
Theme 3, Transformational Technologies and Innovation
- Your host institution:
Cambridge University, Cambridge, United Kingdom
- The name of your host collaborator:
Professor Andreas Kontoleon
- The dates of your fellowship:
21 September – 30 November, 2017
- I consent to my report being posted on the Co-operative Research Programme's website.

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

This research project involves manufacturing a high-quality concentrated liquid fertilizer (HCLF) and producing agricultural products using HCLF in a plant factory where pesticides are not used. This HCLF is made from anaerobic digestion and supplied to the plant factory instead of chemical fertilizers. Therefore, non-chemical agricultural products (NCAPs) will be produced without using pesticide and chemical fertilizers in the next few years.

The objective of this research is to discover if there is a global market for NCAPs and evaluate the potential for increases in their demand as a new category of agricultural product. Gaining a basic understanding from the perspectives of the social and economic sciences about how people's food safety concerns, food-related risk avoidance, and attitudes to nutrition and the environment influence demand will be extremely valuable in constructing a Green Growth Strategy.

Another objective is to provide a basic understanding of how the popularization of NCAPs that use HCLF could impact sustainable natural resource management. For example, reducing the excessive scattering of livestock manure slurry and anaerobic digestion will improve water quality and help conserve biodiversity, while combatting global warming by providing renewable energy through organic waste matter recycling. This could all be achieved through "waste reduction technology" known as methane fermentation.

2. Were the objectives of the fellowship achieved?

The objectives of the fellowship were on the way to being achieved, for the original plan was 24 weeks but the term of fellowship given to me was 10 weeks. Now we are conducting an international comparative survey between Japan and UK based on the discussion with Professor Kontoleon and this survey is on the way.

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

- 1) We have collected 360 sample of consumer's preference for NCAPs produced by using HCLF in Japan and will collect similar data in UK within the next a few weeks.
- 2) Japanese consumer data show that more than 50% of respondents would like to buy non-pesticide and bio-liquid fertilizer (NP&BLF) vegetables produced in plant factory, if the price is the same as organic vegetables. This means there is a potential market for NP&BLFs as a new category of agricultural products instead of organic ones.
- 3) As BLF consists of various materials, consumer prefers to grass and stalks most, and then food waste and garbage, animal waste, and sewage slurry and human waste. This means BLF technology and agricultural production could contribute to reduction of carbon biocide through municipal organic waste matter recycling especially.

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?
Yes. We expect to publish research results from the OECD-funded fellowship in a peer-reviewed journal within the next 18 months.
- Is your fellowship likely to be the start of collaboration between your home institution and your host?
Yes. During the fellowship period, I established a productive collaboration with Professor Kontoleon. We have been in contact via email since I returned to Japan.
- Is your research likely to result in protected intellectual property, novel products or processes?



Yes. This research project pushes the development of manufacturing HCLF and producing NCAPs using HCLF in a plant factory where pesticides are not used.

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?

From a socioeconomic perspective, the results of this project will describe the market impact of the emergence of NCAPs, a new category of agricultural product different from the mere reduced use of pesticides and chemical fertilizers as well as from organic agricultural products. At a micro level, we can expect a positive impact on the income of farmers who produce concentrated liquid fertilizers. The study will show the effects on the profitability of plant factories where NCAPs are produced. At a macro level, the study will measure the impact on agricultural production in the vegetable exporting nations as well as on international trade.

From the perspective of the food and supply chain, these results will see how HCLF enables the long-distance transportation of such organic fertilizers. Since HCLF can be used on common crops (i.e., that are not produced in plant factories), the study will provide basic perspectives on their potential contribution to food security achieved through self-sufficiency by way of regionally supplied fertilizers and expanded nutritional sources as well as food safety through lowered food consumption risks via reduced pesticide usage.

From the perspective of natural capital conservation, the possibility of the sustainable use of natural resources will become clearer through such contributions as a reduction in the excessive piling of livestock manure or anaerobic digestion and the prevention of ground water contamination. Providing renewable energy can also be discussed, as we can calculate the amount of carbon dioxide that could be reduced and estimate its potential effect on combatting global warming, as well as the contribution it could make to the conservation of biodiversity through reduced pesticide use.

Therefore, these results provide a new insight useful for creating policy options in a variety of agricultural and environmental settings. Furthermore, the content covered by this application will directly impact the creation of policies relating to NCAPs, which will come to market in the near future. This study would thus be highly beneficial to policymakers.

6. How was this research relevant to:

○ The objectives of the CRP?

This study aims to address agri-food and agri-environmental problems through research on methane fermentation, liquid fertilizers, and plant factories and by utilizing state-of-the-art scientific knowledge. Through the use of novel and innovative technologies, HCLF will be created and high value-added NCAPs supplied. This research is multidisciplinary and will provide information valuable for making policy decisions regarding NCAPs and the food chain. Additionally, through a series of global comparative studies, this research will also contribute to the promotion of international scientific and economic understanding among OECD countries and others. This research will further contribute to the sustainable use of natural resources such as water and biodiversity in the agriculture sector. Moreover, the development of self-sufficient supply for fertilizers will have a considerable global impact, especially on global fertilizer strategies and agricultural policymaking against phosphorus depletion and its stakeholder groups.

○ The CRP research theme?

This research contributes to sustainable agriculture through a new category of agricultural products, non-chemical agricultural products, which is founded in a novel waste reduction technology based on methane fermentation, and evaluates the market value of these high-value products. Furthermore, the results of this research will promote and support an agricultural production system that does not use pesticides or chemical fertilizers, and thus contribute to food safety and the reduction of food-related risk within the food chain. This



research will also advance the sustainable use of natural capital, provide a way to supply nutrition in harsh natural environments, and help formulate Green Growth Strategies. Thus, this research meets the criteria set out under Innovations in Social Science, Economics and Education, as follows: “Such innovations will be important to facilitate the translation of science knowledge into outcomes and change at the level of policy development, policy implementation and adoption of new practices by stakeholders to achieve productivity growth and protection of natural capital. Addressing these areas will allow the CRP directly to support the Green Growth Strategy and similar global initiatives.”

7. Satisfaction

- Did your fellowship conform to your expectations?
Yes. It was a great opportunity to build good relationship and collaborate work with one of the best universities.
- Will the OECD Co-operative Research Programme fellowship increase directly or indirectly your career opportunities? Please specify.
Yes, This programme gave me a chance to enlarge my international human network.
- Did you encounter any practical problems?
No.
- Please suggest any improvements in the Fellowship Programme.
Regarding substitute adaption, it is better to let know an applicant as soon as possible.

8. Advertising the Co-operative Research Programme

- How did you learn about the Co-operative Research Programme?
I learned about the programme by e-mail sent from Ministry of Agriculture, Forestry and Fisheries, Japan.
- What would you suggest to make it more “visible”?
How about sending advertising emails to academic societies related to agriculture in OECD countries?
- Are there any issues you would like to record?
No.

