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Abstract

This paper gives an account of the development of agri-environmental policy conducted by the national government of Japan and Shiga Prefecture. Although the national government used the term "environmentally-friendly agriculture" as early as the 1990s, it is after the enactment of the Food, Agriculture and Rural Areas Basic Act that concrete agri-environmental policies were put forth in Japan. Shiga Prefecture introduced the Agri-environmental Direct Payment Scheme in 2004, under which grants were paid to farmers who engage in environmentally-friendly farming practices. This scheme served as a precedent for the national agri-environmental payment program, which started in 2007. Changes in the national program in 2011 made requirements more stringent, which lead to fewer participating farmers. Comparing each payment scheme from the viewpoint of rationale for the payment rate, Shiga's scheme is transparent: the rate is set to the additional cost for halving chemical inputs. On the other hand, the reference level (the base line which farmers are to attain by meeting their own costs) is ambiguous in the former national program, and the level in the current national program is difficult to understand.

Keywords: agri-environmental payments, reference level, payment rate, policy development

JEL Classification: Q15, Q18, Q53, Q57, Q58

1. Introduction

This paper gives an account of the development of agri-environmental policy conducted by the national government of Japan, as well as the policy of Shiga Prefecture, the forerunner in this field. The focus of the policy instrument is direct payment to farmers (agri-environmental payment), and the schemes differ in time and administrative body (national government or prefecture). These schemes are compared with each other. This paper treats developments since the 1990s, when the Ministry of Agriculture, Forestry and Fisheries (MAFF) started using the term "environmentally-friendly agriculture (Kankyo Hozengata Nogyo)."

We overview the policy development by MAFF (Chapter 2), and describe Measures to Conserve and Improve Land, Water, and Environment, which includes agri-environmental payments, and its subsequent scheme in detail (Chapter 3). We then look at the policy of Shiga Prefecture, which introduced the agri-environmental payments in the first place at the prefectural level (Chapter 4), and compare these payment schemes in light of the reference level (Chapter 5). Concluding remarks follow in Chapter 6.

2. Development of agri-environmental policy by MAFF

(1) Before enactment of the Food, Agriculture and Rural Areas Basic Act

MAFF used the term "environmentally-friendly agriculture" for the first time in *The Direction for New Policy for Food, Agriculture, and Rural Areas* (hereafter *New Policy*), in June 1992. This policy document was the starting point for the renewal of the Agriculture Basic Act (Kishi, 2007). *New Policy* set out agricultural policies for environmental conservation, as well as policies for production, rural areas, the food industry and consumers, research and development, and other major related fields. This document also appealed to the need for environmentally-friendly agriculture, defining it as "sustainable agriculture which takes the reduction of environmental burdens into consideration, using the material recycling function of agriculture and improving productivity."

Two years later, MAFF elaborated on environmentally-friendly agriculture in some degree. MAFF set up the Headquarters for Promotion of Environmentally-Friendly Agriculture, headed by the Deputy Vice-Minister, and released *Basic Concepts of Promoting Environmentally-Friendly Agriculture* in April 1994. This document explained environmentally-friendly agriculture as "sustainable agriculture which takes the reduction of environmental burdens into consideration, such as chemical fertilizer and agrichemicals through the maintenance of soil condition and so on, using the material recycling function of agriculture and improving productivity." It also argued that since there were various kinds of environmentally-friendly agriculture, from farming with some reduction in the use of fertilizer and chemicals to organic farming, stepwise promotion was needed, and short- and medium-term targets would be formulated to build a social consensus on environmentally-friendly agriculture, extending and establishing the practices, beefing up and following up on measures, and creating a systematic technology.

Measures for environmentally-friendly agriculture at this phase were the invention of environmentally-friendly farming practices, dissemination of these to farmers and the promotion of farmer awareness of the environment. It was after the enactment of the Food, Agriculture and Rural Areas Basic Act and the Three Acts on Agri-environment in 1999 that more serious promotion and regulation began.

(2) The Food, Agriculture and Rural Areas Basic Act and the Three Acts on Agri-environment

The Food, Agriculture and Rural Areas Basic Act has four fundamental principles: securing a stable food supply (Article 2), fulfillment of a multifunctional role (Article 3), sustainable agricultural development (Article 4), and development of rural areas (Article 5). Of these, fulfillment of a multifunctional role and sustainable agricultural development are relevant to the environment. The act does not use the term "environmentally-friendly agriculture", but "maintenance and promotion of the cyclical function of agriculture," which has practically the same meaning.[1]

The Three Acts on Agri-environment consist of the Act for Promoting the Introduction of Sustainable Agricultural Production Practices (Sustainable Agriculture Act), the Act on the Appropriate Treatment and the Promotion of Utilization of Livestock Manure (Livestock Manure Act), and the Revised Fertilizer Regulation Act.

A brief overview of the Sustainable Agriculture Act is as follows. First, prefectures shall establish a guideline for introducing highly sustainable farming practices. Following the guideline,

[1] Article 32 of the Food, Agriculture and Rural Areas Basic Act states as follows. "The State shall take necessary measures such as securing the proper use of agricultural chemicals and fertilizers and improving soil fertility through effective use of livestock manure, in order to maintain and promote the cyclical function of agriculture."

farmers shall draw up a plan in which they address technology in three fields: (1) maintaining the soil in good condition (applying organic materials such as manure), (2) reducing the use of chemical fertilizers, (3) reducing the use of agricultural chemicals. If a plan submitted by a farmer is certified by the prefecture, the farmer will be called an eco-farmer. The redemption period for the Agricultural Improvement Fund (interest-free loan) for eco-farmers is 12 years, whereas it is 10 years otherwise. Eco-farmers also receive a special depreciation or tax credits for certain machines.

The Livestock Manure Act requires farmers to comply with the following management standard for livestock manure. Some small farmers are exempt from this regulation.

- Disposing/storage facilities for solid manure must have an impervious floor such as a concrete floor, with cover and fences.
- Liquid manure such as urine and slurry must be kept in storage tanks constructed with impervious materials.
- Farmers must record the annual amount of produced manure, the method of disposal, and the amount disposed.

Farmers were given a five-year transition period to comply with this standard. Therefore, the requirement started in November 2004.

The Revised Fertilizer Regulation Act changed the status of sludge fertilizer from a notification system to a registration system with preliminary review, and set the standards of quality labelling for manure.

(3) Basic Plan for Food, Agriculture and Rural Areas

MAFF set out *The Basic Principle for Environmental Policy in Agriculture, Forestry and Fisheries: Transition of Agriculture, Forestry and Fisheries into those Emphasizing Environmental Conservation (the Basic Principle for Environmental Policy)* at the end of 2003. This includes five basic understandings and ten basic strategies, where the fifth and sixth strategies, "establishing guidelines for agriculture emphasizing environmental conservation" and "emphasizing environmental conservation in subsidy and loan programs," directly relate to concrete measures. These strategies were more clearly stated in *The Basic Plan for Food, Agriculture and Rural Areas* (*New Basic Plan*) in 2005. The fifth strategy in *the Basic Principle for Environmental Policy* materialized as Good Agricultural Practices and the sixth as cross compliance. In addition, *the Basic Principle for*

Table 1. Development of agri-environmental policy and the related incidents

1992. 6	Direction for New Policy for Food, Agriculture, and Rural Areas
1994. 4	Basic Concepts of Promoting Environmentally-Friendly Agriculture
1999. 7	Food, Agriculture and Rural Areas Basic Act
	Three Acts on Agri-environment
2000. 3	First Basic Plan for Food, Agriculture and Rural Areas
2001. 3	Shiga's Vision for Agriculture and Forestry
2003. 3	Shiga Prefecture Ordinance Promoting Environmental Conservation Agriculture
2003. 1	Basic Principle for Environmental Policy of Agriculture, Forestry and Fisheries
2004. 4	Agri-environmental Direct Payment Scheme in Shiga Prefecture
2005. 3	Second Basic Plan for Food, Agriculture and Rural Areas
	Code of Good Agricultural Practice Harmonious with the Environment
2005. 4	Introduction of cross compliance
2005.10	Outlines for Measures to Stabilize Operation and Income of Farming
2007. 4	Measures to Conserve and Improve Land, Water, and Environment
2010. 3	Third Basic Plan for Food, Agriculture and Rural Areas
2011. 4	Direct Assistance for Environmentally-Friendly Agriculture
2014. 4	Japanese Style Direct Payment
2014. 6	Act on the Promotion of Realizing Multifunctional Role of Agriculture

Environmental Policy regarded that it was necessary to consider in the near future measures for local resources such as farmland and water, and measures for enabling environmental conservation at a higher level. As we can see below, this document announced the concept of Measures to Conserve and Improve Land, Water, and Environment for the first time.

Following the *New Basic Plan*, which delineated forthcoming policies to address environmental conservation, MAFF introduced several measures. The Code of Good Agricultural Practices Harmonious with the Environment (Good Agricultural Practices) was released in March 2005. The code consists of seven points for crop production and six points for livestock production, although these are nothing but qualitative statements. MAFF began to require farmers to follow this code if they received some subsidies in fiscal year 2005 (FY2005). This is what is called cross compliance. In FY2013, cross compliance was introduced in 38 programs.

3. Programs of agri-environmental payments by MAFF

(1) Measures to Conserve and Improve Land, Water, and Environment

Measures to Conserve and Improve Land, Water, and Environment were found in *The Outlines for Measures to Stabilize the Operation and Income of Farming*. This document, published in October 2005, set forth three policies: (1) changes in measures from price control of each crop to subsidies to targeted farmers, (2) reform of rice production control policy, and (3) Measures to Conserve and Improve Land, Water, and Environment. MAFF explained that policies (1) and (3) are complementary, and regarded (1) as agricultural policy and (3) as regional development policy.

Measures to Conserve and Improve Land, Water, and Environment is a subsidy program, where action groups receive financial aid for collaborative action aimed at maintaining and improving farmland and water resources and farming action reducing chemical inputs (i.e., chemical fertilizers and agricultural chemicals such as pesticides). This program started in FY2007 as a five-year program.

(2) Assistance for Collaborative Action

Collaborative action includes maintenance of local resources such as farmland, farm roads, water for agriculture, and reservoirs, ecosystem management, and rural-urban interaction. Action groups must have members who are non-farmers and must conclude an agreement with municipalities. The agreement must include the action plan for the action area designated by the action group. The action area could be a single community, several communities, an area of a farmland consolidation project, or a watershed.

The amount of grants paid for collaborative action was based on the acreage of farmland in the action area. An action group could receive 200,000 or 400,000 yen as promotion costs for higher engagement in environmental and resource conservation. Grants must be used for the costs of collaborative action, i.e., for material costs or manpower costs for maintenance or renewal of facilities and staff costs for other kinds of action. In other words, farmers and landowners do not receive grants according to their land area, but are disbursed money from the action group as compensation for participating action.[2]

(3) Assistance for Farming Action

Farmers who are members of any action group could receive grants when they substantially reduce environmental burdens from agriculture. There were two further requirements. First, more than

[2] For more information on this program, see Yamada (2011).

Table 2. Payment rates of Assistance for Advanced Farming Practices

Crop	Payment rate (yen/hectare)*
Rice	60,000
Wheat, barley, pulse	30,000
Potato, sweet potato, root vegetables	6,000
Leaf and stem vegetables	100,000
Fruit vegetables	180,000
Tomato, cucumber, green pepper, eggplant, strawberry in greenhouse	400,000
Fruits and tea	120,000
Flowers	100,000
Others	30,000

* Ratio of payment burden:
National government 50%, Prefectures 25%, municipalities 25%.
Source: MAFF

80% of farmers in a target area must somehow reduce environmental burdens. The target area could be a part of the action area, but at least at the community level. Second, some coherent group of farmers must, in principle, halve chemical inputs. These farmers must be eco-farmers. A coherent group means that the majority of growers for a crop commit to reducing, or 30% of growers reduce chemical inputs by half, and that this amounts to more than 20% of the planted area.

When these requirements are met, farmers receive grants as Assistance for Advanced Farming Practices. The payment rates are showed in Table 2. In addition, farmers could receive 200,000 yen per year as Assistance for Basic Farming Practices for running training workshops, setting up demonstration fields, producing technical manuals and so on.

As just described, Assistance for Farming Action is similar to agri-environmental payments in EU. However, this program has more requirements. Farmers must join in with collaborative action, reduce environmental burdens in a group, and be certified as eco-farmer.

(4) Direct Assistance for Environmentally-Friendly Agriculture

Measures to Conserve and Improve Land, Water, and Environment was modified in the fifth year, 2011, even though the program was a five-year program. This was due to the change of administration from the Liberal Democratic Party to the Democratic Party of Japan in 2009. The manifesto of the Democratic Party of Japan in the 2009 general election stated that they would radically overhaul the program.[3] In response to the manifesto, Assistance for Collaborative Action and Assistance for Farming Action were separated and revised to "Agricultural Land and Water Conservation Management Grants" and "Direct Assistance for Environmentally-Friendly Agriculture" respectively. The two programs became independent, and thus farmers do not have to form a group to receive grants under Direct Assistance for Environmentally-Friendly Agriculture. Commercial farmers who are certified as eco-farmers and follow Good Agricultural Practices are eligible to receive the assistance. Community farming groups with joint sales accounts and organic farmers qualify for this program with certain requirements even though they are not eco-farmers.

On the other hand, the government requires farmers to engage in a higher level of conservation practices. Efforts other than halving the application of chemical inputs also became required except

[3] The manifesto declares that they would enact a law and introduce the following three payment programs: (1) Resource Conservation and Management Payment to rural communities, (2) Environmental Conservation Payment for environmentally friendly agriculture, (3) Direct Payment for Hilly and Mountainous Areas to less favored areas. However, no law concerning payment programs was enacted during the administration of the Democratic Party of Japan.

for organic farmers who grow crops without chemical inputs.[4] Those efforts should contribute to mitigating climate change or conserving biodiversity. In 2011, farmers were required to engage in one of the following practices: a cover crop, living mulch on arable land and orchards, and winter flooding of paddy fields. The payment rate is 80,000 yen per hectare irrespective of the crop. This amount is not increased even if farmers conduct multiple practices. While grants in the former program were paid for each crop, the new grants are a one-time payment even for the multiple cropping of fields.

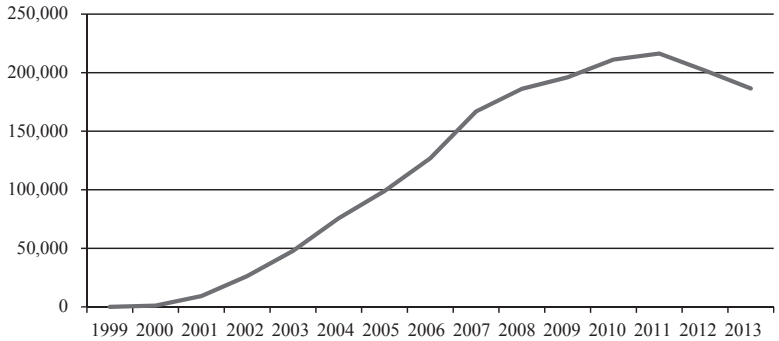
Prefectures can also add special practices with the agreement of MAFF from 2012, since some of the above practices are difficult to apply in some regions and other practices may have similar effects. Payment rates for special practices differ depending on the practices. As of 2014, practices common to all prefectures are cover crops, manure application, and organic farming, and the payment rate for manure application is 44,000 yen per hectare.

(5) Performance of agri-environmental measures

According to the Agricultural Census, the share of commercial farmers who answered that they engaged in either reducing chemical inputs or applying manure was 21.5% in 2000, 46.8% in 2005 and 49.8% in 2010. Therefore, nearly half the commercial farmers conduct some kind of environmentally-friendly farming.

The number of eco-farmers continued to increase up to FY2011, amounting to 216,000 (Figure 1). This corresponded to 14.4% of commercial farmers in February 2012. However, the number of eco-farmers decreased for the first time in FY2012, declining to 201,000. The eco-farmer certification is valid for five years, after which farmers have to reapply. One of the reasons for the declining numbers of eco-farmers might be that it became more difficult to receive grants under the new Direct Assistance for Environmentally-Friendly Agriculture resulting in a decline in incentive for farmers to gain eco-farmer certification as a requirement of the grants.

Records of Assistance for Collaborative Action in Measures to Conserve and Improve Land, Water, and Environment are shown in Table 3. Action groups number more than 19,000, and more than 30% of farmland is involved in this program. On the other hand, the number of action groups receiving the Assistance for Advanced Farming Practices grants is less than 3,000, 15% of all action groups. Acreage of farmland involved in Assistance for Farming Action is 84,000 hectares, only



Source: MAFF

Figure 1. The number of eco-farmers

[4] Farmers who have concluded the agreement on Assistance for Advanced Farming Practices were able to receive grants in 2011 at the same rate as in 2010, since the agreement was still effective in 2011.

Table 3. Records of Measures to Conserve and Improve Land, Water, and Environment and Direct Assistance for Environmentally-Friendly Agriculture

	2007	2008	2009	2010	2011	2012	2013
Assistance for Collaborative Action							
Number of municipalities involved	1,241	1,282	1,251	1,254	1,248	1,189	1,198
Number of action groups (A)	17,122	18,973	19,514	19,658	19,677	18,662	19,018
Acreage engaged (hectare) (B)	1,160,430	1,361,364	1,425,144	1,433,293	1,429,826	1,455,049	1,474,379
Amount of grants paid (milion yen)	18,616	20,827	21,679	21,928	48,356*	23,637*	25,905*
Assistance for Advanced Farming Practices							
Number of action groups engaged (C)	2,029	2,573	2,858	2,941	2,803		
C/A (%)	11.9	13.6	14.6	15.0	14.2		
Acreage engaged (hectare) (D)	43,276	61,409	75,223	83,539	77,919		
D/B (%)	3.7	4.5	5.3	5.8	5.4		
Direct Assistance for Environmentally-Friendly Agriculture							
Number of municipalities involved					773	885	918
Number of entity paid					6,622	12,985	15,241
Acreage engaged (hectare)					17,009	41,439	51,114
Amount of grants paid (milion yen)					1,331	2,996	3,082

* Including newly introduced Assistance for Improvement Action.
Source: MAFF

5.8% of that is under the Assistance for Collaborative Action.

Records of Direct Assistance for Environmentally-Friendly Agriculture started in FY2011 also appear in Table 3. Acreage involved in the program in FY2013 is 51,114 hectares, less than that under the former program in FY2010. The number of entities receiving grants was 15,241, which is 8% of certified eco-farmers.

4. Environmental Conservation Agriculture in Shiga Prefecture

(1) Water quality protection in Lake Biwa and measures for agricultural runoff

Shiga Prefecture Ordinance Pertinent to the Protection of Eutrophication in Lake Biwa was established in 1979. Lake Biwa, the largest lake in Japan and located in the center of Shiga Prefecture, has an area of 670 km^2 and is a source of water for 14 million people in the Kansai area. Incidents such as mold odor in 1969 and freshwater red tide in 1977 raised public awareness of water quality, which lead to the ordinance. The ordinance regulates discharges of nitrogen and phosphorus from factories and other facilities, and prohibits the use, sale and giving of detergents containing phosphorus. Following the ordinance, the Ordinance Pertinent to the Protection of Eutrophication in Lake Kasumigaura, Ibaraki Prefecture in 1981 and the Act on Special Measures for Protecting Water Quality in Lakes and Reservoirs in 1984 were also enacted.

In 1980, the Department of Agriculture and Forestry of Shiga Prefecture released *Clean & Recycling Agriculture*, showing the eutrophication policy in the agricultural sector, while the above ordinance obliges farmers to use fertilizers appropriately, manage water, and dispose of animal manure only as good faith efforts. After that, measures for agricultural effluent were introduced such as knowledge diffusion, promotion of changes in farming practice, and the construction of infrastructure (Tomioka, 2005). If you look at the water quality of Lake Biwa during the 1980s and 1990s, however, the concentration of total nitrogen remained steady or slightly increased, whereas that of phosphorus declined. More effective measures were therefore desired.

(2) Promotion of Environmental Conservation Agriculture and the Agri-environmental Direct Payment Scheme

Shiga Prefecture formulated *Shiga's Vision for Agriculture and Forestry* in March 2001, which came up with Environmental Conservation Agriculture (Kankyo Kodawari Nogyo). The Vision is a long-term plan by the prefecture for the promotion of agriculture, forestry and fisheries which is updated every 5 to 10 years. The second section of the second chapter, "Policy Direction" is named "The Development of Environmental Conservation Agriculture" and encourages the broad use of techniques for reducing the application of chemical inputs and helping farming adhere to environmental conservation.

Shiga Prefecture started the Certification System of Environmental Conservation Agricultural Products in the following year. Under this system, the prefecture certifies crops as Environmental Conservation Agricultural Products if they are produced using techniques which reduce environmental burdens. These techniques include the reduction of chemical inputs by more than 50% relative to conventional farming, and the control of effluents from paddy fields. Crops can be labeled as certified.

Shiga Prefecture Ordinance Promoting Environmental Conservation Agriculture was enacted in March 2003. This ordinance stipulates the certification system, whereas the system was based on an internal regulation up until that time. The limit of application of organic materials was added to the requirement of certification. More importantly, the ordinance provides that the prefecture is able to give financial and other assistance to farmers if they make a five-year agreement with the prefecture to engage in Environmental Conservation Agriculture. Based on the ordinance, the Agri-environmental Direct Payment Scheme started in 2004, which precedes that of the program by MAFF. Payment rates are shown in Table 4.

Most of the farmers who participated in the scheme made the transition to the MAFF program of Measures to Conserve and Improve Land, Water, and Environment when the program started in 2007. Farmers could remain in the scheme in FY2007 and FY2008 if they did not fill the requirements for the MAFF program.

Table 4. Payment rates of Agri-environmental Direct Payment Scheme

(yen per hectare)

Crop		Chemical inputs reduction by 50%	Chemical inputs reduction by 30%
Rice	Less than 3 hectare	50,000	10,000
	3 hectare or more	25,000	5,000
Vegetables	Grown in greenhouse: asparagus, tomato, cucumber, cantaloupe, strawberry.	300,000	60,000
	Other vegetables	50,000	10,000
Fruits	Grape, pear, peach, fig	300,000	60,000
	Plum, persimmon, chestnut, bleuberry	100,000	20,000
Tea		100,000	20,000
Rapeseed		20,000	n.a.*

* For rapeseed, conventional farming uses only one kind of pesticide, which leads to no difference between 50% reduction and 30% reduction.

Source: Shiga Prefecture.

(3) Performance of the Agri-environmental Direct Payment Scheme

Crop acreage of Environmental Conservation Agricultural Products increased up to 2011 (Table 5). *Shiga Prefecture Basic Plan for Promoting Environmental Conservation Agriculture* was developed based on the ordinance. The plan set out a number of numerical targets. The first Basic Plan in December 2003 set a target of crop acreage of Environmental Conservation Agricultural Products at 4,890 hectares in FY2007, which was achieved in 2006. The second Plan in April 2007 set the target at 12,000 hectares in FY2010, which was attained in 2008. The third and current Plan in March 2011 set the target at 18,000 hectares in FY2015, of which rice would be 15,850 hectares, half the total planted area of rice for food. While the crop acreage in 2012 declined 6% from the previous year due to the change in the scheme to Direct Assistance for Environmentally-Friendly Agriculture, the acreage again increased in 2013.

The number of eco-farmers in Shiga Prefecture rapidly increased in 2007, the first year of Measures to Conserve and Improve Land, Water, and Environment (Table 5), since eco-farmer certification was required to participate in the Assistance for Farming Action program. The number of eco-farmers was about 9,700 in March 2014, ranking as the prefecture with the fifth largest number of eco-farmers in the country.

The number of action groups and the acreage of farmland involved were 791 and 33,949 hectares, respectively, in the last year of Measures to Conserve and Improve Land, Water, and Environment. Of these, 560 groups participated in the Assistance for Farming Action with 12,197 hectares in total. This means that Shiga Prefecture had the largest number of action groups engaged in the Assistance for Farming Action in the country, with 71% of action groups participating in the Assistance for Farming Action and 36% of farmland involved in the Measures to Conserve and Improve Land, Water, and Environment. These shares far exceed the national average.

Farmers who receive the Direct Assistance for Environmentally-Friendly Agriculture grants are fewer than in the former program since the level of requirements has risen. Shiga Prefecture actively introduced special practices in the Direct Assistance for Environmentally-Friendly Agriculture,

Table 5. Records of Agri-environmental Policies in Shiga Prefecture

	Crop acreage of Environmental Conservation Agricultural Products (hectare)					
Year	Agri-environmental Direct Payment Scheme	Assistance for Advanced Farming Practice	Direct Assistance for Environmentally Friendly Agriculture	No direct payment (certification only)	Total	Number of eco-farmers
2000						23
2001				393.7	393.7	25
2002				664.7	664.7	29
2003				1,224.8	1,224.8	40
2004	2,537.6			30.5	2,568.1	75
2005	4,505.5			26.5	4,532.0	107
2006	5,960.2				5,960.2	116
2007	1,437.2	8,737.9		192.2	10,367.3	8,310
2008	1,348.7	10,441.9		273.1	12,063.7	9,186
2009		11,746.5		1,402.3	13,148.8	9,551
2010		12,562.7		1,610.0	14,172.7	9,765
2011		12,638.7	288.6	1,528.0	14,455.3	9,979
2012	3,950*		8,253.5	1,353.2	13,556.7	9,328
2013	3,855*		9,560.0	741.0	14,156.0	9,682

* Since 2012, Shiga Prefecture pays grants to farmers for commitments which are not approved as special practices by MAFF.

Source: Shiga Prefecture.

partly because of the fixed target acreage for Environmental Conservation Agricultural Products. In FY2013, 11 special practices were stipulated, which led to 1,466 entities and 9,154 hectares being involved. Both numbers are the highest of all 47 prefectures.

5. Rationale for the payment rate: Reference level of each agri-environmental payment scheme

The reference level is the baseline which represents the boundary for payments. Farmers are to attain the baseline by meeting their own costs. They will be rewarded if their commitments exceed the baseline. In the case of the agri-environmental payment scheme, farmers receive additional costs to the degree that they exceed the reference level. Therefore, the government has to decide where to set the reference level before it sets the payment rate. This chapter compares the payment rate of each agri-environmental payment scheme in Japan in light of the reference level.[5]

(1) Agri-environmental Direct Payment Scheme in Shiga Prefecture

As for the Agri-environmental Direct Payment Scheme, Shiga Prefecture set the payment rates based on research on farm income and expenditure and a questionnaire survey (Kishi, 2005). The research showed that the yield of rice labeled as Environmental Conservation Agricultural Products was 4.2% less than that of conventional farming, while the retail price of rice labeled as Environmental Conservation Agricultural Products was 4.7% higher than that of conventionally-produced rice. The difference in the production cost of rice amounted to 52,280 yen per hectare. Based on the result, the payment rate for rice was set to 50,000 yen per hectare. The research also revealed that the production cost of rice labeled as Environmental Conservation Agricultural Products declined substantially if the acreage exceeded three hectares. Therefore, the rate was halved in cases where the acreage extended to three hectares or more. In the cases of wheat, barley, and soybeans, the cost difference between Environmental Conservation Agriculture and conventional farming was small, and alternative methods for agricultural chemicals and chemical fertilizers are scarce, which implied a loss in quality. The prefecture excluded wheat, barley, and soybeans from the payment (Akiyama, 2004). The rates for vegetables and fruits were set according to the questionnaire survey to growers (Kishi, 2005).

In addition, the prefecture asked the Policy Research Institute of the Ministry of Agriculture, Forestry and Fisheries to evaluate the benefit of the Environmental Conservation Agricultural Products. The institute and the prefecture sent out questionnaires to 2,000 residents in Shiga, and estimated the annual benefit of the increase in the acreage of Environmental Conservation Agricultural Products from 1,000 hectares to 7,500 hectares as 378 million yen by contingent valuation and conjoint analysis. The prefecture stated in parliament that this amount would be the maximum level of public expense from local tax (Kishi, 2005).

It can be concluded that conventional farming is the reference level in the payment scheme of Shiga Prefecture. The payment rate was set to the additional cost of engaging in Environmental Conservation Agriculture, such as decreasing chemical inputs by half.

(2) Assistance for Advanced Farming Practices in the national program

According to a document by MAFF, the payment rate of Assistance for Advanced Farming Practices in Measures to Conserve and Improve Land, Water, and Environment was set in consideration of the additional cost of introducing practices which reduce the environmental burden (MAFF, 2007).

[5] Nomura et al. (2013) discusses other issues.

MAFF held Technical Review Meetings on Assistance for Advanced Farming Practices in 2006, and compiled an interim report in August. The report calculated the additional costs of materials and the additional labor time for each crop category based on interviews with farmers engaging in reduction of chemical inputs by half. The report stated that "the payment rate will be set based on the additional cost with due consideration for the division of roles between national and local governments, and farmers' self-reliant efforts," but no concrete figure was given. Shobayashi, Kinoshita and Takeda (2012, p.130) stated that the payment rate for rice was set at 6,000 yen per decare, by reason of equal cost bearing among farmers, national government, and local governments, with the estimation that the additional cost and the decrease in revenue amount to 9,000 yen per decare.

Therefore, the grants cover two-thirds of the additional cost and the rest has to be borne by farmers. Although the Assistance for Advanced Farming Practices is a scheme based on grants per unit area, it is actually designed as a subsidy which covers only a part of the cost.

The reference level of this scheme is ambiguous. It might be interpreted as the level where chemical inputs are reduced by 16.6% (=50/3). Few farmers, however, understand this rationale, since it is not clarified by any official notice or brochure from MAFF (Shobayashi, 2012).

(3) Direct Assistance for Environmentally-Friendly Agriculture

Although speculative, it would be valid to assume that the reference level of Direct Assistance for Environmentally-Friendly Agriculture moved to the level where chemical inputs are reduced by half. Under this scheme, farmers are required a higher level of engagement with the environment than halving chemical inputs. The reasons for the above speculation are as follows. First, the payment rate became indifferent to the crops. Second, some payment rates for special practices are lower than the rate under the former Assistance for Advanced Farming Practices scheme. Third, the grants are paid once a year irrespective of how many times the farmer harvests crops. Therefore, it could be concluded that the grants do not include the cost of reducing chemical inputs by half.

It is difficult to justify why the cost of halving chemical inputs was excluded from the viewpoint of the reference level. MAFF does not explain the rationale for the payment rate of Direct Assistance for Environmentally-Friendly Agriculture. If this cost is to be borne by farmers, it turns out to be the case that those farmers are treated differently from conventional farmers. This problem could be solved by mandating the reduction of chemical inputs by half, or as Shobayashi (2012) suggested, making the reduction a requirement for other grants (i.e., cross compliance), which would scarcely gain farmers' consent at this time.

In sum, the rationale for the payment rate of the scheme in Shiga is transparent in light of the reference level: The rate is set to the additional cost for halving chemical inputs. On the other hand, the reference level in the Assistance for Advanced Farming Practices is ambiguous and the level in the Direct Assistance for Environmentally-Friendly Agriculture is difficult to understand.

6. Concluding remarks

We point out here three issues regarding the current Direct Assistance for Environmentally-Friendly Agriculture scheme other than the problem of the reference level.

First, the budget is small: 2,646 million yen in FY2014, which is less than half of the actual payment amount of Assistance for Advanced Farming Practices in FY2011. On the other hand, in FY2014, the budget for the new program, Payment for the Multifunctional Role of Agriculture[6] is

[6] The Payment for the Multifunctional Role of Agriculture includes the former program of Agricultural Land and Water Conservation Management Grant.

48,251 million yen and that of the Direct Payment for Hilly and Mountainous Areas is 28,474 million yen. The budget of the Measures to Stabilize Farming Income (payments pertaining to arable farming) is even larger: 395 billion yen. The Agri-environmental payment is still minor in Japan in terms of fiscal scale. MAFF set the target of the cumulative number of certified eco-farmers at 340,000 in March 2015, whereas the actual record was 286,000 in March 2014. It will be hard to achieve the target because of the high requirement level and the low budget level of the agri-environmental payment. The agri-environmental payment is the important driver for farmers to apply for eco-farmer certification.

Second, the agri-environmental payment scheme lacks continuity. Measures to Conserve and Improve Land, Water, and Environment was introduced as a five-year program, but was revised in the fifth year and the requirement level raised. The current scheme is also a five-year program and FY2015 is the final year. If the next scheme demands an even higher level of commitment, it will be very difficult to spread and mainstream environmentally-friendly agriculture.

The third point is the problem of red tape. Farmers have to do so large amounts of paperwork. This situation remains from Measures to Conserve and Improve Land, Water, and Environment, but at that time it was action groups that used to do such work. In the current scheme, however, each farmer has to prepare all the documents. This is also troublesome for municipalities, since they need to communicate with more recipients.

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