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The legitimacy of result-oriented and action-oriented agri-environmental schemes: A comparison of farmers' and citizens' perceptions

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ABSTRACT

Farmers' and citizens' perceptions of the legitimacy of the current action-oriented and the proposed result-oriented agri-environmental schemes (AES) are poorly known. To help fill this gap, this study analysed such perceptions in the context of Finnish citizens and farmers. Hypotheses on legitimacy, ecosystem service perceptions and environmental values were developed and empirically tested with nationwide surveys of Finnish citizens (n = 1,744) and farmers (n = 1,215) using *t*-test and multiple linear regression. The results demonstrated that Finnish citizens perceive the proposed result-oriented AES as more legitimate, whereas Finnish farmers attribute greater legitimacy to the current action-oriented AES. Among both groups, a preference for action-oriented AES, and reluctance to change them, was associated with the perception that Finnish agriculture has been successful in producing ecosystem services. Among both groups, environmental preferences were associated with the legitimation of both AES. The conclusion is that in order for a change in AES to be legitimate, that change should be perceived as necessary, justified and based on the values considered important by farmers and citizens.

1. Introduction

Farmers manage a significant portion of the world's natural capital (Tilman et al., 2002) as agricultural lands that provide several environmental benefits. At the same time, however, agriculture contributes to environmental biodiversity loss. Thus, farmers may potentially face a trade-off between the management of ecosystem services and farming objectives. In the European Union, agri-environmental schemes (AES) have been developed to compensate financially for these trade-offs and motivate farmers to adopt practices that maintain ecosystem services and biodiversity and produce fewer externalities, i.e. ecosystem services beyond agricultural lands. AES are important for farmland conservation because they preserve genetic diversity and the diversity of agro-ecosystems and reduce the environmental effects of food production, such greenhouse gas emissions and declines in water quality (Batáry et al., 2015). Nevertheless, even though AES have been shown to increase farmland biodiversity, that diversity continues to decrease in EU countries due to agricultural expansion and intensification (Pe'er et al., 2014), thereby creating a need to revise AES.

Currently, AES offer financial compensation for the costs of certain management actions that farmers perform in order to improve ecosystem services, and therefore they have been called action-oriented AES. Such schemes have been relatively easy to implement and monitor, and they are generally acceptable to farmers, which explains why they are the most common AES used today (Bernués et al., 2016). Nonetheless, these schemes have been criticized for failing to recognize the degree of improvement in ecosystem services on farms, and thus not motivating farmers to adopt those measures with the greatest potential benefit to biodiversity. Consequently, critics assert that current AES fail to deliver sufficient improvement in biodiversity (Dicks et al., 2013). For example, participation in AES is often higher in less intensively farmed areas, which have a lower risk of biodiversity loss (Velten et al., 2018). In addition, farmers often choose to take those actions that bring the least change to their management practices (Hodge and Reader, 2010). Moreover, there is little evidence that action-oriented AES promote long-term attitudinal change or commitment to environmental

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protection among farmers instead of superficial commitment (Burton and Schwartz, 2013; Herzon and Mikk, 2007). All this criticism implies that the cost-efficiency of these action-oriented measures is weak and that a new type of policy must be sought.

In the suggested new result-oriented AES, the compensation to the farmers would be dependent on the delivery of ecological improvements they make, instead of compensating the costs of defined management actions. While the current action-oriented schemes oblige farmers to take specific management actions, the novel result-oriented schemes would permit farmers to innovate, using their own experience and knowledge to achieve environmental outcomes (Burton and Schwartz, 2013). Experimental result-oriented AES, albeit often containing a mix of action-oriented and result-oriented components, have been implemented in some European countries, and both the ecosystem effects of these schemes (Burton and Schwartz, 2013) and farmers' views have generally been positive (Birge et al., 2017; Matzdorf and Lorenz, 2010; Osbeck et al., 2013; Schroeder et al., 2013).

One challenge for AES is implementability (Macnaghten and Jacobs, 1997; Velten et al., 2018). AES are voluntary, and therefore adoption of AES measures depends on the schemes' perceived legitimacy (Batáry et al., 2015; Fish et al., 2003; Sattler and Nagel, 2010). Indeed, farmers' attitudes and motivation to participate in AES are known to vary (Fish et al., 2003). Furthermore, there is evidence that farmers would prefer to maintain current management strategies (Espinosa-Goded et al., 2010) and that the productivist agricultural practices, norms and values still relatively influential in the farmer population are not necessarily compatible with agricultural policies that prioritize environmental (or other post-productivist) functions at the cost of efficient productive functions and virtues (Burton, 2004; Burton and Wilson, 2006; Burton et al., 2008; de Krom, 2017; Saunders, 2016). Moreover, more generally, public participation by different actors is essential for the overall societal legitimacy, and consequently the success, of conservation policies (Fischer and Young, 2007).

The multifunctional nature of agriculture as a producer of not only food but also environmental public goods has led to a need to better understand the role of consumers and citizens in the construction of agri-environmental policies (Renting et al., 2009). In addition to citizen perception and valuation of the different production methods and services provided by agriculture, citizen perceptions of policies that support and regulate agriculture must also be integrated into policy making. Incentives for governments or administrations to take citizen perceptions into account may include a desire to improve the social acceptance of political programmes among tax payers, increase the legitimacy and political awareness of citizens and avoid conflicts (Prager and Nagel, 2008; Renn et al., 1993; Valkeapää and Karppinen, 2013). Many citizens are expected to hold strong views on the management of conflicting goals (Valkeapää and Karppinen, 2013), especially concerning concrete issues such as food production and landscape. However, previous research has viewed citizens primarily as consumers of agricultural products who are interested either in production practices and their legitimacy, such as animal production or pest control (Vanhonacker et al., 2008; Weible et al., 2016), or in public goods (Ahtiainen et al., 2015). Hence, less research has been conducted into citizens' perceptions of the legitimacy of agricultural policy and its practices.

As a whole, the way both farmers and citizens perceive AES is still poorly understood (Bernuès et al., 2016). This study thus attempts to fill this research gap by analysing nationwide surveys of their perceptions of the legitimacy of the current action-oriented and the proposed result-oriented AES. Altogether five hypotheses on the legitimacy of AES and its association with ecosystem service perceptions and environmental values were developed and empirically tested based on survey data with corresponding measures for Finnish farmers and citizens.

2. Theoretical background and research hypotheses

In this study, we utilized Tyler (2006), 376) definition of legitimacy which he has defined as "the belief that authorities, institutions, and social arrangements are appropriate, proper, and just." Legitimacy is important for a policy because it encourages actors to follow the policy voluntarily rather than because of rewards or punishments (Matti, 2013; Tyler, 2006). Moreover, impressions of the new policy may also affect its perceived legitimacy after implementation (Jagers et al., 2016).

Previous research has shown that farmers display a preference for maintaining current agricultural practices (Espinosa-Goded et al., 2010). Research has also indicated that the long history of productivist agricultural policies (emphasizing, e.g., high agricultural productivity, efficiently and uniformly managed landscapes and farming resources) has resulted in a reluctance among farmers accustomed to productivist agricultural practices to engage in alternative farming practices (exemplified by variants of AES) that conflict with productivist norms, values, virtues and symbols (Burton, 2004; Burton and Wilson, 2006; de Krom, 2017; Pyysiäinen, 2010; Saunders, 2016). Moreover, previous research on legitimacy has shown that those individuals who are personally dependent on a system, such as a policy, tend to favour that existing policy and resist change (Jost, 2015; Kay and Friesen, 2011). As citizens are not dependent on AES in this way, we tested the hypothesis that farmers and citizens should exhibit differences in their legitimacy perceptions (H1).

In addition, the perceived legitimacy of AES is likely to be associated with individuals' perceptions of the level of ecosystem services from agricultural lands, which, in turn, are affected by focus. For example, in Spain, farmers have been found to focus more on statutory ecosystem services, economic sustainability at the farm level, and those regulatory frameworks that directly affect their activities, whereas citizens focus on the provision of quality food products and cultural ecosystem services (Bernuès et al., 2016). Furthermore, previous studies conducted in different countries have found that citizens tend to focus on more general socio-economic concerns, while farmers are more likely to concentrate on farm-level issues (Kelemen et al., 2013; Smith and Sullivan, 2014). Therefore, we also tested the hypothesis that differences exist between citizens' and farmers' satisfaction over the level of ecosystem services from agricultural lands (H2).

The perceived legitimacy of the current and planned AES is likely to be related to the perception of how well agricultural ecosystem services are currently managed (Jost et al., 2004; Vainio et al., 2014). On one hand, satisfaction with the way agriculture is managing ecosystem services is likely to strengthen perceptions that the current AES are legitimate, thus causing resistance to change. On the other hand, dissatisfaction with the management of agricultural ecosystem services is likely to be associated with increased support for policy change. Therefore, we tested the hypothesis that those actors who perceive agriculture as successful in managing ecosystem services are likely to be satisfied with the current action-oriented AES and be critical towards change, shown as higher preference for the action-oriented AES (H3).

Moreover, actors perceive a policy to be legitimate if they consider that the policy promotes shared values (Beetham, 1991; Matti, 2004). AES promote environmental values, and therefore those actors who endorse environmental values are likely to perceive AES as a legitimate way to manage agricultural ecosystem services. Based on this assumption, we tested the hypothesis that actors are likely to accept AES if they value the environmental effects of agriculture (H4).

Furthermore, actors' values can support either a change to AES or the status quo (Bernuès et al., 2016). Since one motive for revising AES is to reward farmers for achieving environmental results, we tested the hypothesis that actors' endorsement of environmental values should lead them to support a change in AES, which would be shown as higher preference for the result-oriented AES (H5).

3. Material and methods

3.1. Citizen data

The citizen data were collected using an internet questionnaire in the spring of 2016. The sample was drawn from the internet panel of an independent market research company, Taloustutkimus, which comprised over 30,000 respondents recruited to the panel using random sampling to represent the population. To test the questionnaire, we first conducted a pilot survey (n = 202). In the final survey, 2066 respondents completed the questionnaire (response rate 25 %). In Table 1, comparison of the socio-demographics of the sample with that of the population at large indicates that the data represented the population fairly well. However, the proportion of females was lower and the respondents were slightly older and more highly educated compared with the Finnish population in general. Respondents who were farmers (n = 322) were excluded from the analysis.

3.2. Farmer data

The farmer data were collected in January 2017 using an internet survey. The questionnaire was tested in a pilot survey ($n = 98$, response rate 10 %) and in several expert interviews. For the main study, an e-mail invitation was sent to a sample drawn from the farm business register of the Agency for Rural Affairs. The sample consisted of 10,000 farms, including 6898 primarily arable farms and 3102 farms focused on livestock. After two reminders, we received 1215 usable responses. The response rates of the arable farmers and livestock farmers were 13 % and 11 %, respectively.

Table 2 compares the descriptive statistics of the farmer sample with all farmers in Finland. Most of the statistics for the sample are close or equal to those of the farming population at large, and the representativeness of the sample was thus satisfactory.

3.3. Survey

The questions related to the legitimacy of action-oriented and result-oriented AES, as well as those related to the perceived success of Finnish agriculture in producing ecosystem services. The questions related to the perceived importance of the environmental effects of agriculture were formulated in different way for farmers and citizens, due to the two groups' contrasting relationship with agricultural ecosystem services: farmers manage ecosystem services, whereas citizens are mostly the users of those services. For the same reasons, the farmers were asked to evaluate the perceived possibilities for improving ecosystem services on one's own farm whereas the citizens were asked to evaluate the personal relevance of the ecosystem services produced by agriculture. These concepts were measured using several items in order to increase the reliability of the measures; consequently, the mean scores of those items were used.

3.3.1. Citizens

3.3.1.1. The legitimacy of action-oriented and result-oriented AES. Tyler and Jackson's (Tyler and Jackson, 2014) definition of legitimacy was used for measuring the legitimacy of action-oriented and result-oriented AES. According to this definition, legitimacy includes three dimensions: the obligation to obey, trust and confidence and moral alignment, which were operationalized with seven statements that the respondents were requested to assess using a 5-point scale (1 = totally disagree – 5 = totally agree): "AES is a good way to improve the state of the environment", "AES is fair", "AES is effective in improving the quality of the environment", "AES takes equally into account different parties", "AES is up-to-date", "AES treats all farmers equally", and "AES is easy for farmers to implement." Cronbach's alpha (α), which is a measure of scale reliability (Cronbach, 1951; Field, 2017) indicated a high reliability for both scales: α = .82 for the legitimacy of action-oriented AES and α = .88 for the legitimacy of result-oriented AES.

First, the respondents read a definition of action-oriented AES: "Under the current program, the farmer is reimbursed for the costs of implementing the measures of the program. The compensation does not depend on the environmental impact of the measure". After that they were requested to assess these schemes' perceived legitimacy. Then the respondents read a definition of result-oriented AES: "The compensation to the farmer would be based on the improvement of the environment, instead of the costs of the specific measures". After that, they were requested to assess the schemes' perceived legitimacy evaluating the same seven statements as above. These scales were used for testing Hypotheses 1, 3 and 5.

Table 1
Comparison of the sample of citizens ($n = 2,066$) and the Finnish population.

	Sample	Population *
Proportion of females, %	44	51
Mean age, years	53	42
Proportion of people with a higher educational level, %	37	30
Proportion of people with children (<18 years) in the family, %	26	31
Proportion of people living in Southern Finland, %	52	51

* Statistics Finland (2015).

Table 2
Comparison of the farmer sample ($n = 1,215$) and the whole farmer population of Finland ($N = 49,982$).

	Sample	Population*
Mean age, years	52	51
Mean acreage of agricultural land, ha	31	54
Organic farming	9%	9%**
Participating in an agri-environmental scheme	89%	88%
Crop production	45%	35%
Other plant production	14%	30%
Milk production	12%	15%
Beef production	4%	6%
Pig and poultry production	4%	2%
Other grazing livestock	5%	5%
Mixed production	9%	4%

* Natural Resources Institute Finland (2016).
** Finnish Organic Food Association Pro Luomu (2016).

3.3.1.2. Perceived success of Finnish agriculture in producing ecosystem services. In order to select the agricultural ecosystem services for survey, we utilized the Common International Classification of Ecosystem Services (CICES). The CICES classification was selected because it is a continuously developing, European-wide classification system (CICES, 2016). We used a literature review and the expert judgement of agri-environmental researchers and administrators to select the relevant ecosystem services from the CICES classification. The selected services were 1) agro-diversity, 2) bioenergy production, 3) pollination, 4) habitats for wild animals, 5) pest control, 6) soil productivity, 7) water quality, 8) the recreation environment, 9) landscape, 10) cultural heritage, and 11) the existence of species and ecosystems. The citizens were requested to evaluate the success of Finnish agriculture in producing these 11 ecosystem services using a 5-point scale (1 = very poorly – 5 = very well) (α = .89). This scale was used for testing Hypotheses 2 and 3.

3.3.1.3. Perceived importance of the environmental impacts of agriculture. The citizens were asked how important they considered the environmental impacts of agriculture on 1) traditional rural biotopes and threatened species, 2) the agricultural landscape, 3) climate effects, and 4) water quality effects using a 4-point scale (1 = not at all important – 4 = very important) (α = .72). This scale was used for testing Hypothesis

4.

The following variables were used as control variables in linear regression. *Personal relevance of the ecosystem services produced by agriculture* was measured by requesting the citizens to assess the personal relevance of the above-mentioned 11 ecosystem services produced by agriculture and agricultural environments using a 5-point scale (1 = very low – 5 = very high personal relevance) (α = .80). In addition, the following *background variables* were included: gender, age, voting for a candidate in parliamentary elections based on agricultural issues, currently living in an agricultural environment and monthly income before tax.

3.3.2. Farmers

3.3.2.1. The legitimacy of action-oriented and result-oriented AES. The same questions as those addressed to the citizens were used (see 3.2.1.). Cronbach's α for the legitimacy of action-oriented AES was .91, while the legitimacy of result-oriented AES was .94 (H1, H3 and H5).

3.3.2.2. Perceived success of Finnish agriculture in producing ecosystem services. The same questions as those addressed to the citizens were used (see 3.2.1.) (α = .91) (H2 and H3).

3.3.2.3. Perceived importance of the environmental impacts of agriculture. The farmers were asked whether they agreed or disagreed with the following five statements (a 5-point scale, 1 = totally disagree – 5 = totally agree) (α = .70): "Financial support to agriculture needs to focus more on measures that increase biodiversity", "Agri-environmental compensation should be more linked to improving the quality of the environment", "Agri-environmental compensation needs to focus more on measures that slow down climate change", "Agri-environmental compensation needs to focus more on the areas that produce the biggest stress on the water system" and "The diversification of farming reduces environmental damage" (H4).

The following variables were used as control variables in linear regression. *Perceived possibilities for improving ecosystem services on one's own farm* was measured by requesting the farmers to assess the extent to which the state of the 11 ecosystem services could be improved on their own farms using a 5-point scale (1 = little – 5 = a lot) (α = .94). In addition, the following *background variables* were included: gender, age, production type (arable vs. livestock), land area used for one's own cultivation, share of agricultural income from total household income (below 25 %, 25–49 %, 50–74 %, over 75 %), agricultural support area (AB = Southern Finland vs. C = Northern Finland) (Karhula, 2018) and being part of the agri-environmental subsidy system (yes vs. no).

3.4. Analyses

Preference for the result-oriented AES was measured by subtracting the mean score for the legitimacy of action-oriented AES from the mean score for the legitimacy of result-oriented AES. A positive value indicated that a respondent perceived the result-oriented AES as more legitimate than the action-oriented AES, and a negative value indicated that a respondent perceived the action-oriented AES as more legitimate than the result-oriented AES.

The citizens' and farmers' perceptions of the legitimacy of AES and the success of Finnish agriculture in producing ecosystem services (Hypotheses 1 and 2) were compared with a two-sample *t*-test, which is a statistical test of the differences between the average perceptions of the two groups (Field, 2017).

Hypotheses 3–5 were tested with three sets of multiple linear regression where the perceived legitimacy of action-oriented AES, result-oriented AES and preference for result-oriented AES were used as dependent variables. The following variables were used as explanatory variables: "Perceived success of Finnish agriculture in producing ecosystem services", "Perceived importance of the environmental impacts of agriculture", "Personal relevance of the ecosystem services produced by agriculture" (only for citizens), "Perceived possibilities for improving ecosystem services on one's own farm (only for farmers)" and socio-demographic background variables (Tables 5 and 6).

4. Results

4.1. The legitimacy of action-oriented and result-oriented AES (H1)

The citizens perceived the result-oriented AES as more legitimate than the action-oriented AES (Table 3). They considered that the result-oriented AES was a better way to improve the state of the environment, fairer, more effective in improving the quality of the environment, better at taking different parties equally into account, and more up-to-date than the action-oriented AES. On the other hand, they perceived the action-oriented AES as easier for farmers to implement than the result-oriented AES.

By contrast, the farmers perceived the action-oriented AES as more legitimate than the result-oriented AES in all but one item, in which the result-oriented AES was perceived to be more up-to-date than the action-oriented AES.

4.2. Perceived success of Finnish agriculture in producing ecosystem services (H2)

As a whole, the citizens' perceptions were slightly more positive than those of the farmers (Table 4). Moreover, differences were revealed between the groups in the perception of individual ecosystem services. The citizens were more positive than the farmers in evaluating the performance of Finnish agriculture in producing bioenergy, maintaining levels of pollinating insects, producing environments with the capacity to regulate pests, and maintaining the productivity of agricultural land. Conversely, the farmers were more positive than the citizens in evaluating the performance of Finnish agriculture in maintaining good water quality in water systems and improving the quality of recreational environments and the landscape.

4.3. The association between the legitimacy of AES, ecosystem perceptions, environmental values and socio-economic variables (H3-H5)

4.3.1. Citizens

Multiple linear regression indicated that among the citizens, the perceived legitimacy of the current action-oriented AES was associated with a perception that Finnish agriculture had succeeded in producing ecosystem services, the personal importance of ecosystem services produced by agriculture and the perceived importance of the environmental effects of agriculture (Table 5). Moreover, the legitimacy of action-oriented AES was associated with being older and male and with having voted for a candidate in parliamentary elections based on agricultural issues.

As the current action-oriented AES, also the perceived legitimacy of the proposed result-oriented AES was associated with a perception that Finnish agriculture had succeeded in producing ecosystem services. In addition, the result-oriented AES was associated with the perceived importance of the environmental effects of agriculture. Moreover, the legitimacy of result-oriented AES was associated with having voted for a candidate in parliamentary elections based on agricultural issues.

Preference for the result-oriented AES was associated with the perceived importance of the environmental effects of agriculture and having voted for a candidate in parliamentary elections based on agricultural issues. By contrast, preference for the current action-oriented AES was associated with being older and the perception that Finnish agriculture has succeeded in producing ecosystem services.

Table 3
The perceived legitimacy of action-oriented and result-oriented AES among citizens and farmers. Means, standard deviations and t-tests for the equality of means (A–R for both groups, and A-A and R-R between groups).

	Group:							
	Citizens			Farmers			Citizens vs farmers	
	Legitimacy of AES:							
	Action-oriented	Result-oriented	Action vs result-oriented	Action-oriented	Result-oriented	Action vs result-oriented	Action-oriented	Result-oriented
	M (SD)	M(SD)	*t* test (df)	M(SD)	M(SD)	*t* test (df)	*t* test (df)	*t* test (df)
AES is a good way to improve the state of the environment	3.56 (.92)	3.73 (.88)	−6.43*** (1743)	3.47 (1.07)	3.00 (1.14)	10.98*** (1049)	2.37* (2163)	18.23*** (1867)
AES is fair	3.13 (.92)	3.19 (.96)	−2.06* (1743)	2.98 (1.22)	2.60 (1.15)	7.67*** (999)	3.57*** (1889)	14.02*** (1908)
AES is effective in improving the quality of the environment	3.31 (.92)	3.58 (.89)	−10.26*** (1743)	3.04 (1.08)	2.86 (1.10)	4.33*** (1017)	7.16*** (2867)	17.99*** (1875)
AES takes equally into account different parties	2.94 (.91)	3.04 (.92)	−3.96*** (1743)	2.61 (1.16)	2.45 (1.11)	4.27*** (993)	8.40*** (2843)	14.36*** (1840)
AES is up-to-date	3.15 (.89)	3.52 (.91)	−14.38*** (1743)	2.85 (1.08)	2.88 (1.13)	-.40*** (994)	8.16*** (2833)	15.68*** (1829)
AES treats all farmers equally	3.01 (.94)	3.00 (.96)	.41 (1743)	2.53 (1.19)	2.29 (1.16)	5.66*** (1018)	11.27*** (1967)	16.67*** (1895)
AES is easy for farmers to implement	2.93 (.90)	2.81 (.86)	5.20*** (1743)	2.31 (1.11)	2.08 (1.11)	6.18*** (1023)	15.58*** (2043	18.29*** (1805)
Total (mean score)	3.15 (.63)	3.27 (.70)	−7.04*** (1743)	2.82 (.91)	2.59 (.98)	7.01*** (1121)	10.62*** (1900)	20.12*** (1867)

* $p < .05$, *** $p < .001$.

Table 4
Perceived success of Finnish agriculture in producing ecosystem services. Means and standard deviations among citizens and farmers, and t-tests for the equality of means between the two groups.

	Citizens		Farmers		*t* test	df
	Mean	SD	Mean	SD		
maintaining the diversity of crop varieties and animal breeds	3.36	.88	3.35	.88	.45	2484
bioenergy production	3.23	.89	2.37	.99	22.04***	1950
maintaining the levels of pollinating insects	3.18	.92	2.94	.90	6.24***	2165
preserving breeding and shelter places for wild animals	3.22	.92	3.20	.96	.62	2598
producing environments that have the capacity to regulate pests	3.25	.80	2.81	.89	12.46 ***	1983
maintaining the productivity of agricultural land	3.60	.84	3.01	.93	17.38***	2709
maintaining good water quality in water systems	2.90	1.05	3.47	.92	−15.18***	2595
improving the quality of recreational environments	3.39	.86	3.47	.87	−2.36*	2706
improving the landscape	3.40	.86	3.65	.88	−7.53***	2782
preserving cultural heritage	3.45	.90	3.46	.93	-.49	2770
promoting the preservation of plant and animal species and ecosystems	3.29	.91	3.34	.90	−1.39	2623
Total (mean score)	3.28	.63	3.21	.65	3.07**	2893

* $p < .05$, ** $p < .01$, *** $p < .001$.

4.3.2. Farmers

Multiple linear regression indicated that among the farmers, the perceived legitimacy of the current action-oriented AES, as well as the new result-oriented AES, were positively associated with the perception that Finnish agriculture had succeeded in producing ecosystem services, perceived possibilities for improving ecosystem services on their own farms and the perceived importance of the environmental effects of agriculture (Table 6). Moreover, the perceived legitimacy of the current action-oriented AES was associated with being older and male, practising arable farming (as compared to animal husbandry) and being part of the agri-environmental subsidy system.

Preference for the new results-based AES as compared to the current action-oriented AES was associated with the perceived importance of the environmental effects of agriculture and practising livestock farming. By contrast, preference for the current action-oriented AES was associated with a perception that Finnish agriculture had succeeded in producing ecosystem services. Moreover, preference for the current action-oriented AES was associated with being older and practicing arable farming. Participation in the current agri-environmental subsidy system was also associated with perceived legitimacy of action-oriented AES.

4.3.3. Hypotheses

We hypothesized that citizens and farmers would exhibit differences in their legitimacy perceptions (H1). As expected, the citizens generally perceived the result-oriented AES as more legitimate than action-oriented AES, whereas the farmers perceived action-oriented AES as more legitimate than result-oriented AES; thus H1 was confirmed. Further, we expected to find differences between citizens' and farmers' in their satisfaction of the level of ecosystem services from agricultural lands (H2). The citizens perceived Finnish agriculture as more successful in producing ecosystem services than did the farmers, thereby confirming H2.

The actors who perceive agriculture as successful in managing ecosystem services were expected to be satisfied with the current action-oriented AES and be critical towards change, which would be shown as higher preference for the action-oriented AES (H3). Among both citizens and farmers, a preference for action-oriented AES was found to be associated with the perception that Finnish agriculture had succeeded in producing ecosystem services, therefore confirming H3.

Hypothesis 4 suggested that actors are likely to accept AES if they value the environmental effects of agriculture. In both groups, the perceived importance of the environmental effects of agriculture was positively associated with the legitimacy of both action-oriented and

Table 5
The association between ecosystem perceptions, socio-economic variables and the legitimacy of action-oriented AES, result-oriented AES, and preference for result-oriented AES among citizens. Multiple linear regression, unstandardized and standardized coefficients and standard errors.

	Legitimacy								
	Action-oriented AES			Result-oriented AES			Preference for result-oriented AES		
	B	SE	β	B	SE	β	B	SE	β
(Constant)	.93***	.20		.95***	.22		.02	.24	
Perceived success of Finnish agriculture in producing ecosystem services	.30***	.02	.30	.11***	.03	.10	-.19***	.03	-.17
Personal relevance of ecosystem services produced by agriculture	.06	.03	.05	.01	.03	.01	-.05	.04	-.04
Perceived importance of the environmental impacts of agriculture	.23***	.03	.19	.48***	.03	.37	.25***	.04	.19
Chose a candidate in parliamentary elections based on agricultural issues (ref: not voted)	.14*	.06	.05	.29***	.07	.09	.15*	.08	.05
Gender: female (ref: male)	-.09**	.03	-.07	-.04	.03	-.03	.04	.03	.03
Age	.00***	.00	.09	.00	.00	-.03	-.01***	.00	-.11
Currently lives in agricultural environment	-.07	.04	-.04	-.07	.04	-.04	.00	.04	.00
Monthly income before tax	-.01	.01	-.03	.00	.01	-.01	.01	.01	.02
Adjusted R^2	.14***			.15***			.07***		

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 6
Associations between ecosystem perceptions, socio-economic variables and the legitimacy of action-oriented and result-oriented AES, and result-oriented AES preference among farmers. Multiple linear regression, unstandardized and standardized coefficients, standard errors.

	Legitimacy								
	Action-oriented AES			Result-oriented AES			Preference for result-oriented AES		
	B	SE	β	B	SE	β	B	SE	β
(Constant)	.44	.27		1.11***	.28		.56	.35	
Perceived success of Finnish agriculture in producing ecosystem services	.21***	.04	.15	-.06	.04	-.04	-.27***	.05	-.15
Perceived possibilities for improving ecosystem services on one's own farm	.11***	.03	.12	.14***	.03	.14	.03	.04	.02
Perceived importance of the environmental impacts of agriculture	.32***	.03	.28	.48***	.04	.40	.18***	.05	.13
Gender: female (ref: male)	-.18*	.08	-.06	-.12	.09	-.04	.07	.11	.02
Age	.01**	.00	.08	.00	.00	.00	-.01*	.00	-.07
Production type: livestock (ref: arable farming)	-.15*	.07	-.07	.08	.07	.04	.23**	.09	.09
Land area used for own cultivation	.00	.00	-.01	.00	.00	-.06	.00	.00	-.04
Share of agricultural income (ref: below 25%)									
25–49%	.06	.07	.03	-.13	.07	-.05	-.18	.10	-.07
50–74%	-.02	.08	-.01	-.02	.08	-.01	.00	.11	.00
over 75 %	-.01	.08	.00	-.09	.08	-.04	-.06	.11	-.02
EU agricultural subsidy area: C (ref: AB)	-.06	.05	-.03	-.01	.05	-.01	.05	.07	.02
Part of AES: yes (ref: no)	.36***	.09	.11	-.11	.10	-.03	-.46***	.12	-.11
Adjusted R^2	.16***			.23***			.07***		

* $p < .05$, ** $p < .01$, *** $p < .001$.

result-oriented AES; thus, H4 was also confirmed.

Finally, we expected to find that actors' endorsement of environmental values would lead them to support a change in AES, which would be shown as higher preference for the result-oriented AES (H5). The perceived importance of the environmental effects of agriculture was found to be associated with an increased preference for the result-oriented AES, as expected in both groups, thereby confirming H5.

5. Discussion and conclusions

This study explored the perceived legitimacy of the current action-oriented AES and the proposed result-oriented AES among citizens and farmers living in Finland. All hypotheses about the associations between legitimacy, ecosystem service perceptions and environmental values were confirmed.

As a whole, the study identified clear differences in perceived legitimacy between citizens and farmers. In general, the citizens in our sample perceived both AES as more legitimate and Finnish agriculture as more successful in producing ecosystem services than did the farmers. One reason for this difference may be that farmers have more specific knowledge and personal experience of these topics than do citizens. Moreover, previous research has found that farmers tend to think about ecosystem services in relation to their own farm, whereas citizens often focus on agriculture as a whole (Bernuès et al., 2016; Kelemen et al., 2013).

It is interesting to observe that even though the farmers in our study perceived current Finnish agriculture as only moderately successful in producing ecosystem services (it received a mean score of 3.21 on a 5-point scale, which was actually slightly less than the score from the citizens, who are often regarded as more critical), the farmers nevertheless regarded a policy change in the form of the proposed result-oriented AES as a *less* legitimate alternative than the existing action-oriented AES (mean scores 2.59 vs. 2.88). This indicates that the relatively low legitimacy of the result-oriented AES (as perceived by farmers) may be due to factors other than their estimated potential to produce ecosystem services. For example, the role of productivist farming practices and virtues, and their uneasy coupling with environmentally oriented policy schemes (Burton, 2004; Burton and Wilson, 2006; Burton et al., 2008; de Krom, 2017; Saunders, 2016), may well be a factor here. Farmers who align themselves with productivist practices may simply fear that the new result-oriented AES will grant them even fewer opportunities to demonstrate performance and success in terms of productivist skills and practices than the existing action-oriented AES (which are allegedly more straightforward and unambiguous to execute, monitor and reward).

Other factors may also contribute to explaining why the citizens in our study perceived the proposed result-oriented AES as more legitimate, whereas the farmers perceived the current action-oriented AES as more legitimate. On one hand, this finding is in line with previous legitimacy research suggesting that actors who are dependent on an

existing system tend to legitimize existing policy and resist change (Jost, 2015; Kay and Friesen, 2011). In Finland, about 90 percent of farmers are part of AES, which is higher than the average for EU countries (Eurostat, 2017); thus AES subsidies are an important source of income for Finnish farmers. Finnish farmers are therefore likely to be concerned that changes in AES may compromise their economic well-being, thereby causing them to oppose such changes. On the other hand, this finding is surprising because the policy revision is motivated, in part, by a desire to increase the autonomy of farmers who are willing to engage with AES; therefore, the revision had been expected to improve the acceptance and adoption of such AES by farmers. However, if farmers perceive the current AES as more legitimate than the proposed result-oriented AES, this may hinder the successful implementation of the new AES (Jagers et al., 2016).

Among both groups, a preference for action-oriented AES, and a reluctance to change them, was associated with the perception that Finnish agriculture had been successful in producing ecosystem services. This finding complements previous findings that legitimation of the status quo, and a reluctance to change it, are associated with the perception that the existing system is functioning well (Jost et al., 2004) and does not involve risks that need to be managed (Vainio et al., 2014). This finding suggests that policy change must be perceived as useful in order to be considered legitimate and that the psychological and motivational processes associated with the legitimacy perceptions of actors must be taken into account in the policy cycle.

The farmers in the present study made a larger distinction between the legitimacy of the two types of AES than did the citizens. Agricultural ecosystem services are personally more relevant to farmers than to citizens, and relevance has been found to correlate with the strength and polarization of views (Howe and Krosnick, 2017). Thus, this finding suggests that a high personal relevance of ecosystem services may be associated with relatively strong views about different AES and an increased relative difference in perceived legitimacy between the two schemes. Moreover, the perceptions of legitimacy of the AES schemes were more variable among farmers than among citizens. These findings suggests that important differences in the ecosystem service perceptions within farmers may exist, which needs to be explored in future studies.

Personal experience and relevance may also account for other findings. For example, the citizens in our study perceived bioenergy production as more successful than did the farmers. It is possible that citizens may be relatively unfamiliar with bioenergy production on farms whereas farmers may have a more realistic perception of it. By contrast, the farmers considered that agriculture had been more successful in maintaining water quality in water systems than did the citizens. This finding may reflect the recent active public debate over the euthropication of the Baltic Sea and the fact that many citizens in Finland have direct experience of the euthropication of their local water systems.

Among both groups, environmental preferences were associated with the legitimation of both AES. This finding is in line with previous research showing that policies need to promote shared values in order to be perceived as legitimate (Beetham, 1991; Matti, 2004). Moreover, respondents' environmental values were associated with the higher preference of the new result-oriented AES as compared to the current AES, suggesting that policy change needs to be effectively linked with citizens' and farmers' values in order to be perceived as legitimate.

The following limitations should nevertheless be borne in mind when interpreting the results. The survey was cross-sectional, and therefore causal associations between the variables cannot be made. Moreover, self-reported responses can be subject to social desirability bias, which means a tendency to respond in a socially acceptable way (Grimm, 2010). For example, the respondents may have exaggerated the personal relevance of environmental values, which are usually regarded as socially desirable values. However, the surveys provided high number of participants and good coverage of respondents across Finland allowing a good basis for valid statistical analysis. Due to large sample sizes, also small differences between the farmers and citizen were statistically significant.

We believe that the results are useful in the development and implementation of results-based AES, as they provide novel insights into the legitimacy of AES among citizens and farmers and into these actors' perceptions of ecosystem service perceptions, which, to date, have been poorly known. The farmers in the present study were relatively critical of results-based AES, which must be addressed in policy development and implementation. Farmers should therefore be sufficiently included and heard (Vainio, 2011) during the policy development phase, when legitimacy perceptions are formed that can potentially linger in other phases of the policy cycle (Jagers et al., 2016). Another key finding was that policy change should be perceived as necessary and based on shared values. AES explicitly promote environmental values, but they could also promote other values that are shared by farmers. Therefore, the diversity of farmers' and citizens' values should be incorporated into the AES in order to increase the implementability and voluntary adoption of this new policy tool.

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