



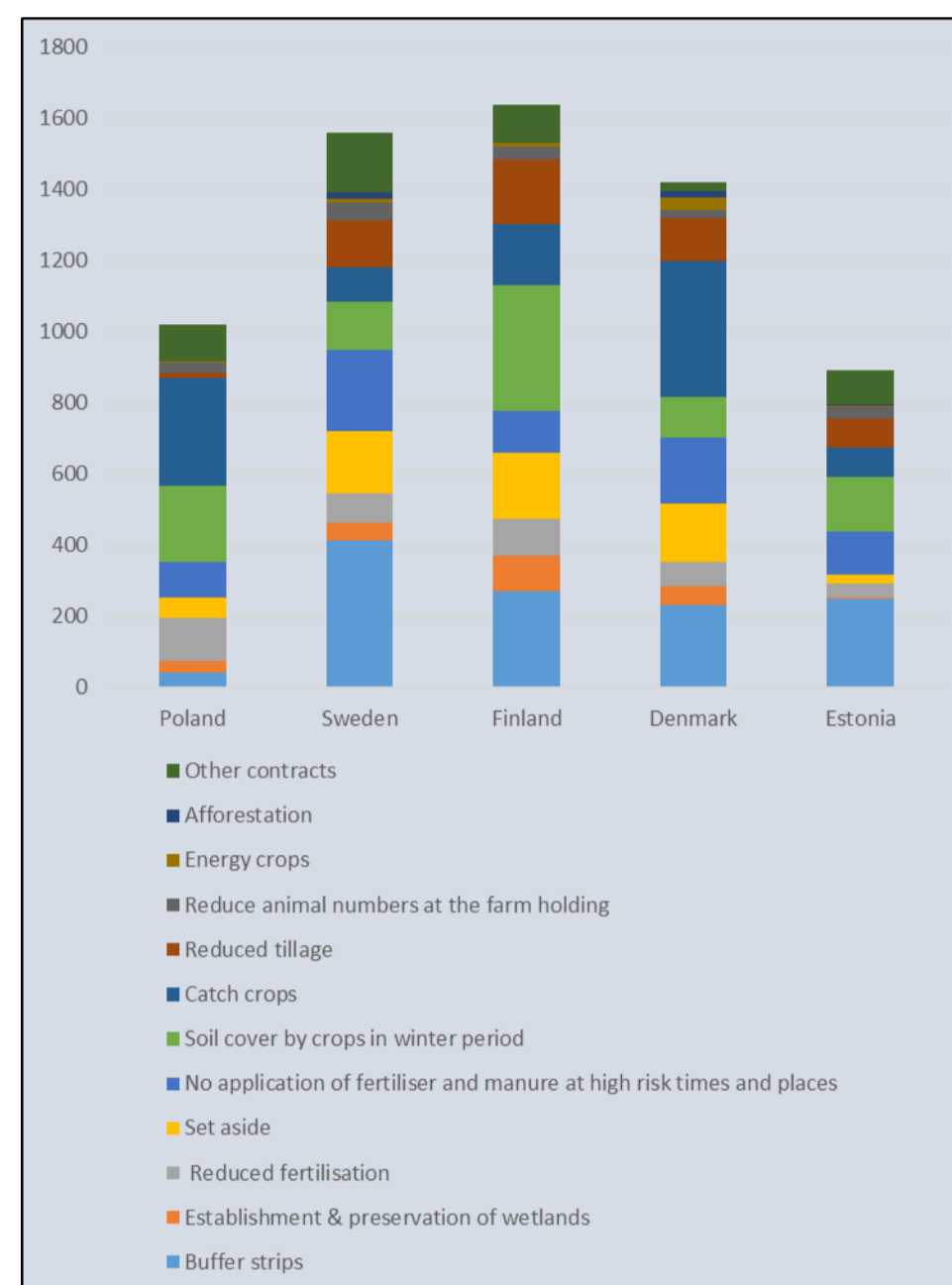
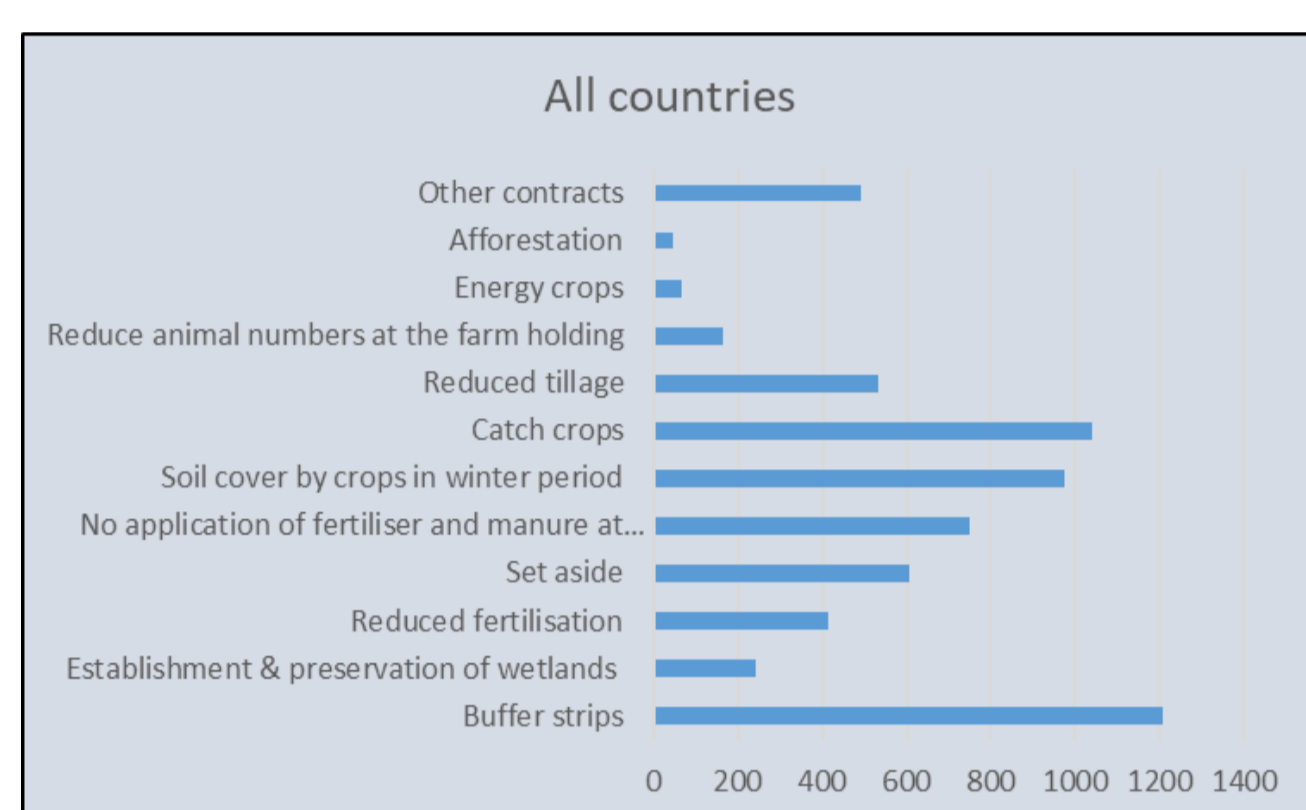
Exploring farmers' preferences for implementing agri-environmental schemes – a cross country study

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Farm survey in Denmark, Estonia, Finland, Poland and Sweden

A farm survey on practices influencing nutrient losses and green-house gas (GHG) emissions has been administered to farmers in Denmark, Estonia, Finland, Poland and Sweden, all being riparian countries to the Baltic Sea (See fig.1). The survey includes a choice experiment(CE), as well as questions on practices and attitudes to fertilizer policies among the responding farmers. One focus of the study is to investigate farmers' preferences for adopting agricultural environmental schemes (AES) aimed at reducing nutrient losses and GHG emissions. The results from this comparative experiment and analysis of the incentives to enter into AES in this region can be used to inform policy makers in EU and in the specific countries about factors influencing the uptake of the schemes, and hereby the schemes can be developed further. The study distinguishes itself from former AES studies in terms of the scale of the study, covering 5 countries and a large heterogeneity in farm types.

	PL	EE	SE	FI	DK
Buffer strips	X		X	X	X
Restoration/construction of wetlands		X	X	X	X
Reduce water abstraction		X		X	
Reduced fertilization			X		X
No spreading of fertilizer and manure at high risk times and places			X	X	
Plant cover in winter				X	
Catch crops			X		X
Application techniques of manure	X	X			
Provide capacity of manure storages		X	X		



Measure	PL	EE	SE	FI	DK
1 "Buffer strips"	6	106	75	34	19
2 "Establishment & preservation of wetlands"	1.1%	17.7%	14.2%	7.2%	6.3%
3 "Reduced fertilisation"	6	30	77	19	2
4 "Set aside"	18.2%	63.8%	77.0%	34.9%	66.7%
5 "No application of fertiliser and manure at high risk times and places"	39	9	40	22	5
6 "Soil cover by crops in winter period"	33.6%	10.6%	37.7%	33.3%	12.8%
7 "Catch crops"	24	80	107	38	6
8 "Reduced tillage"	41.4%	45.7%	57.5%	23.2%	25.0%
9 "Reduce animal numbers at the farm holding"	17	14	17	3	19
10 "Other contracts"	17.2%	6.2%	14.4%	1.6%	15.7%
11 "Afforestation"	111	31	251	6	70
12 "Energy crops"	51.6%	22.6%	74.1%	5.5%	45.2%
13 "Reduce animal numbers at the farm holding"	149	69	150	36	22
14 "Reduced tillage"	49.7%	71.1%	87.2%	9.4%	27.5%
15 "Catch crops"	5	27	115	2	10
16 "Soil cover by crops in winter period"	35.7%	20.9%	63.9%	1.7%	12.2%
17 "No application of fertiliser and manure at high risk times and places"	3	9	12	1	10
18 "Establishment & preservation of wetlands"	11.5%	18.4%	32.4%	5.9%	29.4%
19 "Buffer strips"					



Fig. 1: The 5 countries in the GO4BALTIC Farm Survey.

Fig. 2 a,b and c: AES contract options and uptake in all 5 countries. 2a: available AES schemes (JRC 2013), 2b: AES measures adopted among the farmers in the survey. 2c: Measures adopted in each of the 5 countries. Year: 2016.

Fig. 3: Share of the respondents who adopted a measure because they received a subsidy.

Method

The farm survey has been answered by a total of 2439 farmers in Poland(540), Sweden (600), Finland (528), Denmark (469) and Estonia (302). The dataset has been weighted to represent the farm population above 10 hectares in each of the countries and in the total dataset. The choice experiments has been applied to explore the incentives in AES contracts and to compare these incentives between the 5 countries. The choice experiment method has been applied in a number of previous studies in the literature, and the design built upon the experiences from these. The first step in the construction of the CE survey is the choice of scheme measure. As it is important that choice situations and attributes are familiar to the respondents it was decided to choose measures that are already in use in all of, or some of the member states, or which have been in use (see fig. 2,3,4 and 5) above.

The choices in the experiment consist of 3 types of contracts: Set side, improved fertilization and winter cover/catch crops. Set aside means to set aside part of the arable land, which cannot be plowed or cultivated for the entire period of contract duration, and should be covered by grass (grazed or cut). Improved utilization of implies precision farming technologies or use of injectors for the spreading of the manure. Catch crops are grass and legumes, crucifers and chicory, sown together with the main crop or before/after harvest of the main crop, Each of the contracts offered to the respondents in the choice experiment are characterized by an annual subsidy payment, a specified share of the farmed area to be enrolled in the contract, the number of years (contract length), the offer of advice from agricultural advisors; in some contracts there is a charge for the advice, in others it will be paid by the government (therefore free for the farmer) and flexibility to opt out of the contracts or not, possibly with a requirement to pay back the subsidies acquired.

	Set contract	Set aside	Catch crop contract	Fertiliser technology contract	None of these contracts
Area you will enroll in the contract, percentage of your farmed area inside rotation	10	15	100		
Length of contract, number of years	1	10	5		
Termination - Flexibility to cancel contract	Possible refund	with possible refund	without possible refund	Not possible refund	
Advisory assistance	Charged	Free	Free		
Subsidy	378	82	304		
Your ranking of the contracts from the most (1) to the least (4) preferred	1	4	3	2	

Fig. 4: Example of choice card in the CE.

Results and conclusions

We find which contracts are preferred and we are able to estimate minimum willingness to accept (WTA) levels for their adoption. These results vary substantially between countries. Surprisingly, we also find that farmers prefer shorter contracts and contracts that require enrolling lower areas of land. The WTA results can be seen in Fig. 5.

A number of additional analyses of interaction effects have been conducted, e.g. the effect of farm type, farm size as well as country of origin. These results are currently further analysed with a focus on identifying preference heterogeneity of farmers in terms of differences between countries, farm types and contracts. The results indicate that much of the heterogeneity can be explained by the farm characteristics. This suggests that differentiated contracts will have a higher probability of participation than uniform payment schemes, and the findings can be used to differentiate contracts to farmers within these countries. The results and data will be further explored to assess this.

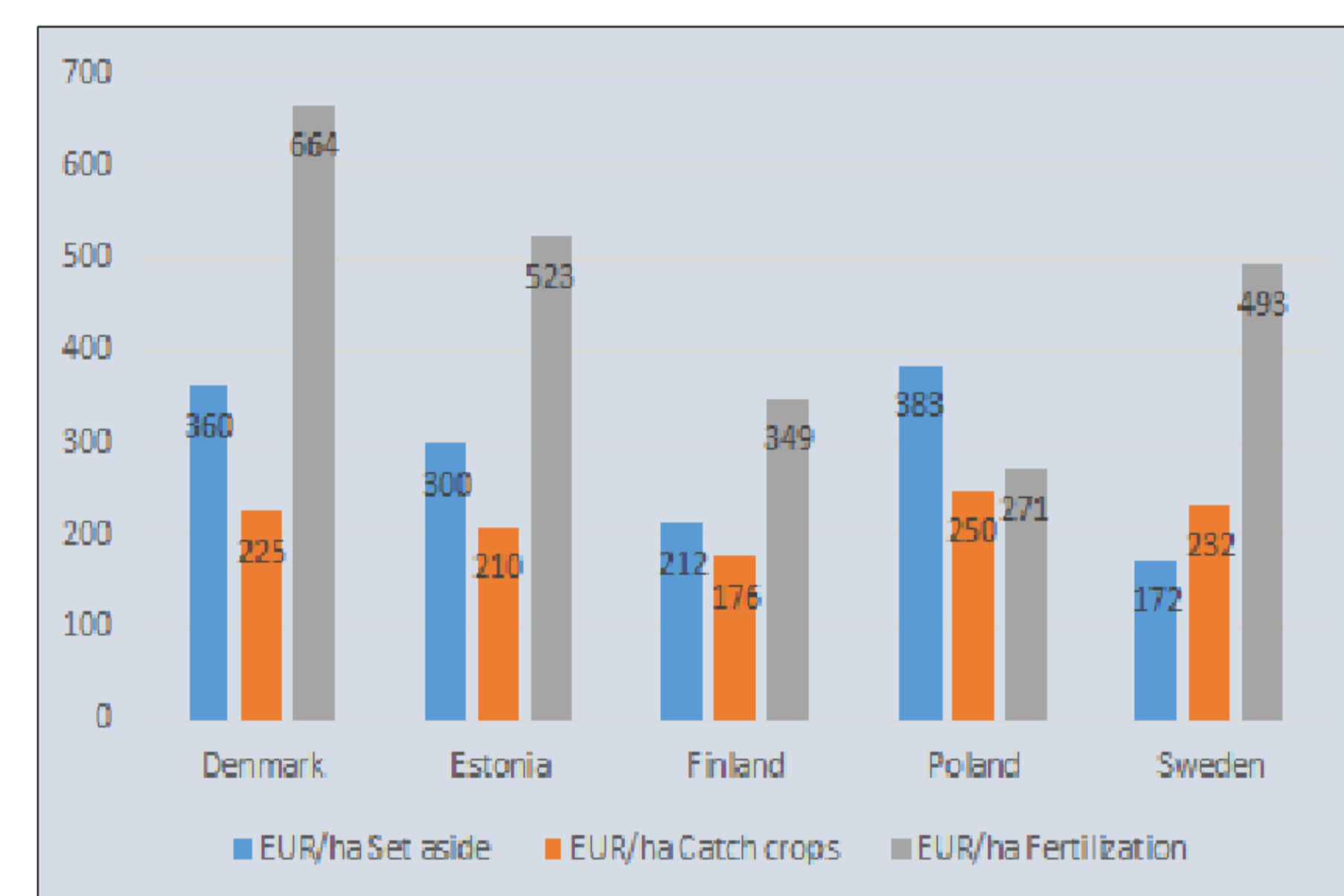


Fig. 5: WTA (ML results) for the three contracts, EUR/ha/year.

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