Working paper,
January 2019

Data collection and sampling
BONUS GO4BALTIC FARM SURVEY

Authors:
Berit Hasler, Aarhus University, Contact: bh@envs.au.dk
Helle Ørsted Nielsen, Aarhus University, Contact: hon@envs.au.dk

This working paper describes the sampling procedures in the farm survey conducted in the countries Denmark, Estonia, Finland, Poland and Sweden, and provides descriptive statistics for the data. The questionnaire can be obtained by contacting the authors. The Farm Survey was supported by BONUS (Art 185), funded jointly by the EU and national funding institutions in Denmark (the Innovation Fund), Estonia (Estonian Research Council ETAG), Finland (Academy of Finland), Poland (NCBR) and Sweden (FORMAS), and BONUS GO4BALTIC is also supported by the Baltic Sea Center, Stockholm University.

The BONUS GO4BALTIC Farm survey

The GO4BALTIC Farm Survey samples information from farmers in Sweden, Finland, Poland, Estonia and Denmark, including questions to the farmers on their production, which agri-environmental measures they undertake, how they handle nutrients and utilize fertilizers in their agricultural production and which technologies they use as well as which they have been considering. Specific focus has been paid to the formulation of questions to farmers' use of technologiess to increase nutrient utilization at the farm, investments and how in-vestments might be encouraged and improved by subsidies and loans etc. A choice experiment where farmers' are asked to choose between agri-environmental contracts is also part of the survey, and this experiment has been developed in cooperation between the partners in order to provide new knowledge about farmers' preferences for such contracts in all the 5 countries. Literature analysis has been performed to ensure novelty and use of the experiences from the scarce, but increasing, number of experimental studies on agri-environmental contracts in the literature. The data sampling resulted in 2,439 responses, and the data have been used for further analyses in WP2, 3 and 4. The analyses and results are described there. A metadata-description has been made describing the dataset as a deliverable.

Sampling

Data were collected between May 2017 and December 2017.

For Sweden, Finland and Denmark the samples were drawn from the survey institute Aspecto's panels of farmers. For Sweden and Denmark additional sampling was based on public databases,

while the Finnish sample also drew on a registry used for the EU structure survey. In the case of Estonia the sample was drawn from Estonian University of Life Sciences' database of farmers, which builds on the Farm Accountancy Data Network (FADN), while in the case of Poland a random sample of farmers was generated from public databases of farmers with a VAT-number.[1]

We used stratified random sampling to ensure that samples represented the farm populations in each country with regards to farm type (livestock production, i.e. pig and cattle) and crop production, farm size and geographical distribution. However, in order to get responses from enough pig farmers we had to use quota sampling for this category. Moreover, the sample was restricted to farms greater than 10 hectares to avoid overrepresentation of small farms. This choice was made, firstly, because the focus in the study was on farm decisions that affect nutrient losses to air and water, and these losses correlate with the farmed area, not with the number of farms nor with farm gross margin. Thus, even though a large share of total farms in Poland are smaller than10 hectares (77 % of the farms), these small farms hold only 28% of the utilised agricultural area. In the other four countries only 2-5% of the utilized agricultural area is held at farms below 10 hectares (the shares are 2% in Denmark and Finland, and 5% in Sweden and Estonia). Secondly, the share of small farms is steadily decreasing in all five countries, which points to the policy relevance of focusing on farms larger than 10 ha (Eurostat 2013; Laurent 2016).

Table 1 provides an overview of the panels of farmers that was used for the sampling in each country.

Table 1. Descriptions of panels/additional information on sampling in each of the five countries

Denmark	
Company	Aspecto
How are farmers 'recruited'	Farmers are drawn randomly from the public registry of farmers (the CVR business register). These farmers receive a letter asking them to sign up for the panel.
No. of farmers in panel	The panel consists of 5200 farmers (for this survey additional farmers had to be recruited from the registry because too few farmers from the panel participated, see table A2).
Estonia	
Company/administrator	Estonian University of Life Sciences
How are farmers 'recruited'	This is not an ongoing panel. For surveys the University draws a sample based on the Farm Accountancy Data Network (FADN), a European system of sample surveys conducted every year, which again draws its sample from a VAT register. However, as this register includes only companies with an annual revenue larger than 40,000

[1] Please see below for a more detailed description of the panels.

	EUR the sample draws on other sources as well including private companies. Farmers were contacted by phone.
No. of farmers in panel	NA
Finland	
Company	Aspecto (plus in this case: contact information from the EU Structure Survey)
How are farmers 'recruited'	Farmers are drawn randomly from the public registry of farmers (the CVR business register). These farmers receive a letter asking them to sign up for the panel.
No. of farmers in panel	**NA**
Poland	
Company	Kynetec
How are farmers recruited	Not a standing panel. Farmers were drawn randomly for this survey from a register of businesses with a VAT no.
No. of farmers in the panel	NA
Sweden	
Company	Aspecto
How are farmers recruited	Farmers are drawn randomly from the public registry of farmers (the CVR business register). These farmers receive a letter asking them to sign up for the panel. For this survey additional contact addresses were purchased from the Swedish Statistics Central Bureau
No. of farmers in the panel	3,500 (and an additional 3,000 mail addresses were purchased)

Distribution and survey mode

The survey was administered by the same survey institute in all five countries, either online, as Computer Assisted Web Interviewing (CAWI), or as a combination of phone and mail (table 2).

Table 2: Survey modes

Country	Method
Denmark	CAWI
Sweden	CAWI
Finland	CAWI
Estonia	Phone-mail-phone
Poland	Phone-mail-phone

In Sweden, Finland and Denmark the invitations to participate were sent out by email including a link to an online version of the survey. In Estonia and Poland the invitation was sent out by a combination of e-mail, ordinary mail and phone due to a lack of access to email and internet among a share of farmers or lack of access to e-mail addresses.

In Poland and Estonia the phone-mail-phone data collection proceeded as follows:

1. The interviewer called a randomly selected farmer
2. If the farmer accepted – the interviewer started 1st interview of max 10 minutes
3. After the first interview, the interviewer asked for the farmer's address.
4. The farmer subsequently received a letter containing 8 questions in a discrete choice setup, which he must complete on his own.
5. After 4-5 days the interviewer called the farmer again for the 2nd part of the interview and collected the remaining answers, including the answers to the choice questions.

According to OECD (2018) 72% of the households in rural areas in Poland had access to internet in 2015, but there were large differences between regions, and in some regions the share was as low as 44%. In Estonia 88% of the population had access to internet in 2015, but no information is available regarding the share of farmers having access and some rural areas (especially islands) had bad connections. The main caveat for using e-mailing and internet for the sampling in Estonia was however that i) a farm panel with e-mail addresses was not available for the sampling and ii) e-mail addresses were not accessible for all farms that were identified for the panel used. Thus, while ideally the same mode should be used for surveys across several countries (Menegaki et al 2016), the different modes in this study served to ensure better representation in all five countries than if we had restricted samples to farmers with internet access. The response rates (table 3) are much lower in the three on-line survey countries than in Poland, but Estonian response rates are similar to the countries where the online mode was used, suggesting that mode did not determine response rates. This reduces concerns about mode induced selection bias.

The invitations and introduction to the survey

The invitation to the survey contained relatively sparse information and was written in a neutral language in order to appeal as widely as possible to farmers across professional and political interests, and in order to minimize self-selection. The introduction to the survey informed that the survey is about farmers' practices related to land use and the use of fertilisers, and about subsidy contracts for land use changes and investments related to agri-environmental decisions and practices at the farm. We furthermore stated in the invitation that it is important for us to learn how farmers perceive these issues. We explained that answers to the survey are confidential and that respondents will remain anonymous to us. We also explained that the survey is conducted by research institutes and universities in Denmark, Estonia, Finland, Poland, and Sweden, and that the results will be used for research as well as for advice to ministries and other decision makers, and aims to improve the knowledge of farmers' perceptions of the current agri-environmental policies, contracts and schemes.

Response rates

Table 3 shows the number of invitations and the number of respondents in each of the five countries and in the total survey.

Table 3 Sample size and response rates

Country	Denmark	Sweden	Finland	Estonia	Poland	
Method	Web	web	Web	Phone	phone	Total
Completes	469	600	528	302	540	2439
Screened out	114	107	85	64	912	1282
Started, not completed	248	1138	171	71	2	1630
Not started	5421	9743	7718	4853	0	27735
Brutto sample	6252	11588	8502	5290	1454	33086
Sent out in first round	*1850*	*2317*	*2144*	*658*	*1454*	*8423*
Completed in %	7.50%	5.18%	6.21%	5.71%	37.14%	7.37%

It is apparent from the overview in Table 3 that survey mode plays a role for the share of respondents who choose to start but who don't complete. This share is much lower in Poland than the other countries, and Estonia is also slightly below the other countries.

The first round of invitations were sent out to 8,423 farmers. To ensure adequate representation of all farm types and regions additional invitations were sent out. Each respondent received up to 7 reminders before he/she was removed from the panel and a replacement was contacted. Once the target number for a given category (e.g. pig farms of a certain size in a given region) was achieved, reminders were no longer sent out to farmers in that category. Sampling of pig farmers was particularly difficult in all countries. Altogether 33,086 farmers were contacted to achieve the 2,439 completed responses, ranging from 302 in Estonia to 600 in Sweden. The broad panel invitations used in the online surveys result in rather low response rates (5 to 7 pct.), while the Polish method of contacting farmers by phone is more efficient and results in a response rate of 37 pct. 'Screened' indicates that a respondent was screened out at the beginning because he did not meet the criterion of making farm management decisions. 'Started' indicates that a respondent started the survey but exited before completing it.

Follow up interviews conducted by the survey administrators with contacts in each country indicated that a general survey fatigue among farmers has led to declining response rates, while the timing of the survey (first contacts in May) also contributed to low response rates as farmers were busy in the field (Finland, Estonia, Sweden).

Descriptive statistics: Sample data vs. population data

As mentioned, we initially applied stratified sampling, but to get adequate representation of pig farms we switched to quota sampling for this group. Population data were not available for comparison on all parameters, farm type, farm size and region, in all countries. But based on the data available, it is clear that the final sample of respondents does not match the farming populations completely on all parameters.

The most complete population data are on farm size, and the comparison shows that there are more large farms in the samples compared with the population land holding distributions in each of the countries, except Finland which has both more small and large farms compared to the national distribution.

Table 4. Comparison of farm population data with sample data, size categories

Country and size classes	Data source for country	Sample %	Sample Number
Poland	Swaid.stat.gov.pl 2013	%	#
10.00 - 14.99 hectares	39%	10%	52
15.00 - 19.99 hectares	22%	8%	43
20.00 - 29.99 hectares	19%	20%	107
30.00 - 49.99 hectares	12%	29%	155
50.00 - 99.99 hectares	4%	24%	131
100.00 hectares and more	4%	10%	52
Total	100%	101%	540
Sweden	SCB 2016	%	#
10.00 - 14.99 hectares	31,15%	15%	90
15.00 - 19.99 hectares		6%	34
20.00 - 29.99 hectares	15%	10%	62
30.00 - 49.99 hectares	17%	15%	90
50.00 - 99.99 hectares	19%	23%	139
100.00 hectares and more	18%	31%	85
Total	100%	100%	600
Finland	LUKE 2016		
10.00 - 14.99 hectares	12%	19%	98
15.00 - 19.99 hectares	11%	8%	44
20.00 - 29.99 hectares	17%	12%	63
30.00 - 49.99 hectares	22%	17%	92
50.00 - 99.99 hectares	25 %	28%	146
100.00 hectares and more	12%	16%	85
Total	99%	100%	528

Denmark	DST 2016	%	#
10.00 - 14.99 hectares	14%	4%	20
15.00 - 19.99 hectares	10%	3%	16
20.00 - 29.99 hectares	13%	6%	26
30.00 - 49.99 hectares	15%	11%	53
50.00 - 99.99 hectares	18%	21%	100
100.00 hectares and more	29%	54%	254
Total	100%	99%	469
Estonia	EUROSTAT 2010	%	#
10.00 - 14.99 hectares	38%	13%	40
15.00 - 19.99 hectares		8%	23
20.00 - 29.99 hectares	17%	7%	21
30.00 - 49.99 hectares	13%	14%	42
50.00 - 99.99 hectares	32%	17%	176
100.00 hectares and more	19%	42%	126
Total	100%	101%	302

For farm type population data are available for Denmark and Finland only. For these two countries pig farms are significantly overrepresented, which is not surprising since pig farms were quota sampled specifically to ensure adequate numbers of pig farms for the analysis, while pig farms in numbers constitute less than 10 % of the farms in these two countries. Sample shares are closer to the population shares for cattle farms, although still a little higher for Denmark.

Table 5 Comparison of farm types

	Denmark	Estonia	Finland	Poland	Sweden
Pigs, % in sample (# of farms)	26% (120)	21% (64)	23% (120)	32% (154)	20% (121)
Pigs % in farm population (above 10 ha.)	7 %.	NAv.	3%	NAv.	NAv.
Cattle % in sample (# in sample)	32% (151)	43% (129)	25% (134)	68% (322)	32% (190)
Cattle % in population	26%	NAv.	26%	NAv	NAv.
Total # in samples	467	302	527	540	600

Table 6 Sample descriptions

	Denmark	Estonia	Finland	Poland	Sweden
Size					
Average area managed (ha)	189	220	95	49	121

Parttime or fulltime farmer %					
1 "I am a full-time farmer "	60	49	58	88	38
2 "I am a part time farmer without other income "	4	4	2	2	5
3 "I am a part time farmer with other income "	31	33	34	9	45
4 "I am a hobby farmer "	4	13	5	1	10
5 "Other, specify: "	0.6	1	1	0	2
Income categories (Denmark had more, higher income categories)					
1 "Less than 4000 EURO"	6	22	11	6	20
2 "4000-7999 EURO"	5	15	13	19	10
3 "8000-14999 EURO"	7	12	11	19	10
4 "15000-29999 EURO "	8	9	21	18	13
5 "30000-49999 EURO"	11	3	12	9	12
6 "50000-75000 EURO"	9	3	10	6	7
7 "75000-100000 EURO"		8	10	2	6
8 ">100000 EURO"				3	8
9. DK: 75000-133.000 EURO	14				
10. 134.000- 266.000 EURO	13				
11.> 266.000 EURO	19				
12. Do not wish to answer	7	16	8	4	8
13. Don't know	1	13	3	14	6
Farm type					
Pigs, % in sample (# of farms)	26 (120)	21 (64)	23 (120)	32 (154)	20 (121)
Cattle % in sample (# in sample)	32 (151)	43 (129)	25 (134)	68 (322)	32 (190)

References:

Eurostat 2013

Laurent, P. 2016 Recent trends in the distribution of farm sizes in the EU. Paper prepared for presentation at the 149th EAAE Seminar 'Structural change in agri-food chains: new relations between farm sector, food industry and retail sector' Rennes, France, October 27-28, 2016

OECD 2018: OECD Rural Policy Reviews: Poland.

Menegaki, Angeliki, N. & Olsen, Søren Bøye & Tsagarakis, Konstantinos P., 2016. "Towards a common standard – A reporting checklist for web-based stated preference valuation surveys and a critique for mode surveys," Journal of choice modelling, Elsevier, vol. 18(C), pages 18-50.