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ACCEPTABILITY AND WILLINGNESS OF FARMERS TO IMPLEMENT MEASURES FOR REDUCTION OF AGRICULTURAL POLLUTION: RESULTS OF SURVEY IN VENTA AND LIELUPĖ RIVER BASINS

Report

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LITHUANIAN AGRICULTURAL ADVISORY SERVICE

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Monitoring of Rivers and Environmental Survey of Farmers in Lielupe and Venta River Basin Districts

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Abbreviations

CGAP	Code of Good Agricultural Practice
LATLIT	Latvia–Lithuania Cross Border Cooperation Programme under the European Territorial Cooperation Objective 2007–2013
LT	Lithuania
LV	Latvia
RBMP	River Basin Management Plan
RBD	River Basin District
WISE	WFD database, which contains data from River Basin Management Plans reported by EU Members States according to article 13 of the Water Framework Directive
WFD	Directive 2000/60/EC of 23 October 2000 establishing a framework for the Community action in the field of water policy (Water Framework Directive)

SUMMARY

Latvia and Lithuania share Lielupe and Venta river basins. Both countries contribute to the pollution of the rivers; therefore, common actions are needed to combat the pollution and to improve the ecological status of water bodies. The EU Water Framework Directive 2000/60/EC (WFD) requires managing waters on the basis of river basins. In 2010, River Basin District Management Plans were prepared (for the first six-year planning cycle) and approved in Latvia and Lithuania for the national parts of Lielupe and Venta River Basin Districts (RBDs). Insufficient coordination between the countries has left a number of water management issues to be resolved in the next river basin management cycles.

Agricultural pollution is one of the main pressures on water bodies in both Lielupe and Venta RBDs and in both countries.

The objective of the project was to clarify the opinion and willingness of farmers in Lielupe and Venta river basin districts to implement measures for reduction of diffuse pollution from agricultural sources. To this end, two types of surveys were carried out:

- Survey of specialists, which aimed at providing better understanding of how specialists see agricultural pollution problems in Lielupe and Venta RBDs, what their attitude toward various agri-environmental measures designed to reduce water pollution is, and how decisions on these measures should be taken. The opinion of the specialists was taken into account when developing a questionnaire for farmers;
- Survey of farmers, which aimed at providing better understanding of farmers' opinion on water protection and environmental protection in general, their views on their role in the improvement of the water quality, reasons for failing to implement environmental requirements, as well as the acceptability of various existing measures (i.e. mandatory agri-environmental measures or measures meeting the requirements for good agricultural practice) and potential new agri-environmental measures (so-called supplementary measures).

Specialists and farmers were interviewed face-to-face in order to obtain as informal answers as possible. The interviews were taken from 32 specialists/decision makers from Latvian and Lithuanian agricultural and environmental institutions; the surveys were carried out on 602 Latvian and Lithuanian farmers in Lielupe and Venta river basins.

The specialists and farmers were asked about mandatory and supplementary measures. Supplementary measures might be needed to achieve good ecological status of waters in accordance with the WFD.

The mandatory measures include the following:

- Construction of manure and slurry storages meeting environmental requirements (which reduces nutrient leaching to the soil and water);
- Development and implementation of fertilisation plans meeting environmental requirements (these plans reveal optimal fertilisation norms and help to balance the ratio of nutrients in the soil);
- Application of fertilisation norms meeting environmental requirements (fertilisation norms indicate the minimum amount of fertilisers needed by plants, thus preventing surplus nutrients which usually leach into deeper soil layers);

- Application of fertilisers in a proper time (avoiding spreading mineral fertilisers or manure at times of high risk, thus reducing nitrate leaching and loss of nitrogen through surface run-off);
- Establishment of winter or perennial plant cover in the winter (as recommended in the Code of Good Agricultural Practice) (a plant cover helps take up residual nitrate and other nutrients from the soil after the main crop has been harvested in the summer or early autumn, leaving less nitrate available for leaching over the winter);
- Crop rotation to prevent erosion in hilly areas (as recommended in the Code of Good Agricultural Practice).

Supplementary measures would be needed if mandatory measures were not sufficient to reach good ecological status of water resources:

Measures related to fertilisation

- Development and implementation of fertilisation plans (also include soil analysis);
- Application of reduced fertilisation norms compared to norms for highest yields;
- Preparation of nutrients (nitrogen and phosphorous) balance, allowing long-term planning of fertiliser use (when fertilisation plans are not developed);
- Replacement of mineral fertilisers with green manure crops (green manure crops could be sown in spring and ploughed in the middle of summer; other types of green manure could be used as well).

Other supplementary measures

- Construction of manure and slurry storages meeting environmental requirements (this measure would be relevant for those farmers for whom it was not mandatory so far);
- Construction of artificial wetlands between fields and water bodies (wetlands can help capture nutrients from agricultural run-off before entering water bodies);
- Conversion of cultivated fields into extensive grassland (this measure reduces nutrient leakage to waters due to lower inputs in the soil);
- Allowing renaturalisation (re-meandering) of natural, previously straightened, riverbeds in farmers' fields (after re-meandering, rivers usually become longer resulting in better conditions for self-purification);
- Improvement of fertilisation technology (machinery/equipment; it would improve fertiliser insertion into soil and reduce nutrient leaching into water);
- Sowing catch crops for the winter (catch crops take up nutrients; therefore, after harvesting the main crops, lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest);
- Conversion from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm);
- Leaving unploughed fields with crop stubbles over the winter (this measure helps prevent soil erosion);
- Establishment of an additional vegetation buffer strip, located on an arable field next to a watercourse (stream, river, or lake) (such strip may reduce losses of mineral nutrients and prevent contamination of water with pesticides);
- Application of crop rotation, including legumes and green manure crops (a growing crop that is ploughed under the soil to improve soil fertility and reduce nutrients leaching).

Results of the survey of specialists

Two thirds of the specialists in both countries (23 out of 32 respondents) think that mandatory agri-environmental measures are not sufficient to combat agricultural pollution of waters. In order to achieve good status of water bodies, supplementary measures are required as well. The level of usefulness of potential supplementary measures according to the Latvian and Lithuanian specialists is provided in Table 1.

Table 1. Opinion of specialists (those who think that the existing measures are not sufficient) on the usefulness of potential supplementary measures, number of respondents

Measure	Not useful*	Could be useful*	Highly useful*
Improve fertilisation technology		3	20
Develop and implement fertilisation plans according to the approved Methodology for the Development of Fertilisation Plans		4	19
Establish a 5 m wide additional vegetation buffer zone, located on an arable field next to watercourse (stream, river or lake)		7	15
Plant sandy and mixed land with catch crops	2	10	10
Prepare nutrients (nitrogen and phosphorous) balance, allowing long-term planning of fertiliser use (when fertilisation plans are not developed)	2	13	8
Replace mineral fertilisers with green manure crops for improving soil fertility and plant growing conditions	4	9	8
Leave unploughed fields with crop stubbles over the winter	4	11	7
Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds	8	6	6
Convert from conventional to organic farming	7	11	4
Construct artificial wetlands between fields and water bodies	2	16	3
Convert cultivated fields into extensive grassland	9	10	3
Apply reduced fertilisation norms compared to optimal ones	11	10	1

*Note: Not all respondents answered to all sub-questions on each proposed measure.

Results of the survey of farmers

The questionnaire for farmers contained questions about their socio-economic background, types and activities of farms, water pollution problems, application of agri-environmental measures, barriers preventing the successful implementation of environmental requirements, farmers' willingness to implement mandatory and supplementary agri-environmental measures for reduction of water pollution, and their opinion on the effectiveness of these measures. The farmers had also to indicate reasons for not willing to implement supplementary measures.

Farmers' opinion on water pollution problems

All farmers in both countries recognise the importance of agricultural activities for groundwater and surface water quality. A little more than one third of the farmers think that the application of agri-environmental measures, such as fertilisation timing, use of mineral fertilisers, and leaching from manure storages, affects the water quality to some extent. However, quite a big part of the farmers in Latvia think that agricultural pollution contributes

only up to 10% of the total water pollution. 53% of the Lithuanian farmers think that agriculture contributes to water pollution by 10-50%.

Results of the implementation of mandatory measures

A detailed analysis of the implementation of mandatory agri-environmental measures or measures meeting requirements for good agricultural practice showed that actions in this area leave much to be desired, since the measures had not been implemented in all farms yet.

Table 2. Share of the respondents who have already implemented mandatory measures or measures meeting requirements for good agricultural practice, %

Measure	Latvia	Lithuania
Manure storage meeting environmental requirements	43.0%	60.9%
Slurry storage meeting environmental requirements	21.5%	65.6%
Fertilisation plan meeting environmental requirements	63.6%	32.5%
Fertilisation norms meeting environmental requirements	84.3%	87.7%
Application of fertilisers in a proper time	83.6%	95%
Winter or perennial plant cover in the winter (as recommended in the Code of Good Agricultural Practice (CGAP))	77%	32.0%
Crop rotation to prevent erosion in hilly areas (as recommended in the Code of Good Agricultural Practice)	32%	22%

The situation still has to be improved in both countries. The biggest gap relates to the construction of manure and slurry storages and preparation of fertilisation plans. Implementation of these measures seems to be difficult due to too high costs of the measures.

The level of the implementation of other mandatory measures, such as application of fertilisation norms meeting environmental requirements or application of fertilisers in a proper time, is quite good in both countries, but needs some improvement as well.

Measures of good agricultural practice have been implemented by a small number of farmers, except for the requirement to establish a winter or perennial plant cover in the winter, which has been met by 77% of the Latvian respondents.

The farmers of both countries pointed out insufficient national financial support for the implementation of environmental measures and stated that this was the main reason for non-compliance. Excessive red tape for obtaining compensations was indicated as quite an important reason by the Lithuanian farmers as well. The Lithuanian farmers who have already been applying mandatory measures and measures meeting requirements for good agricultural practice noted that they were able to do this due to the EU financial assistance. Meanwhile the Latvian farmers who have been implementing related measures expressed their environmental concerns and gave priority to the environmental protection reason.

The farmers also indicated that they lacked knowledge about local environmental problems and their obligations regarding the compliance with environmental matters. As noted by the farmers themselves, raising environmental awareness could be very helpful in protecting the water bodies.

Farmers' opinion on the effectiveness of various agri-environmental measures

The opinion of Latvian and Lithuanian farmers on the effectiveness of various measures was basically alike. The construction of manure and slurry storages, improvement of fertilisation technology, application of reduced fertilisation norms, and development and implementation of fertilisation plans were indicated as the most effective measures by most of the farmers surveyed in both Lielupe and Venta RBDs. It should be noted that the improvement of fertilisation technology and development of fertilisation plans was rated as highly useful by the specialists as well.

Implementation of supplementary measures

The survey showed that more farmers have already been applying supplementary measures in Latvia than in Lithuania.

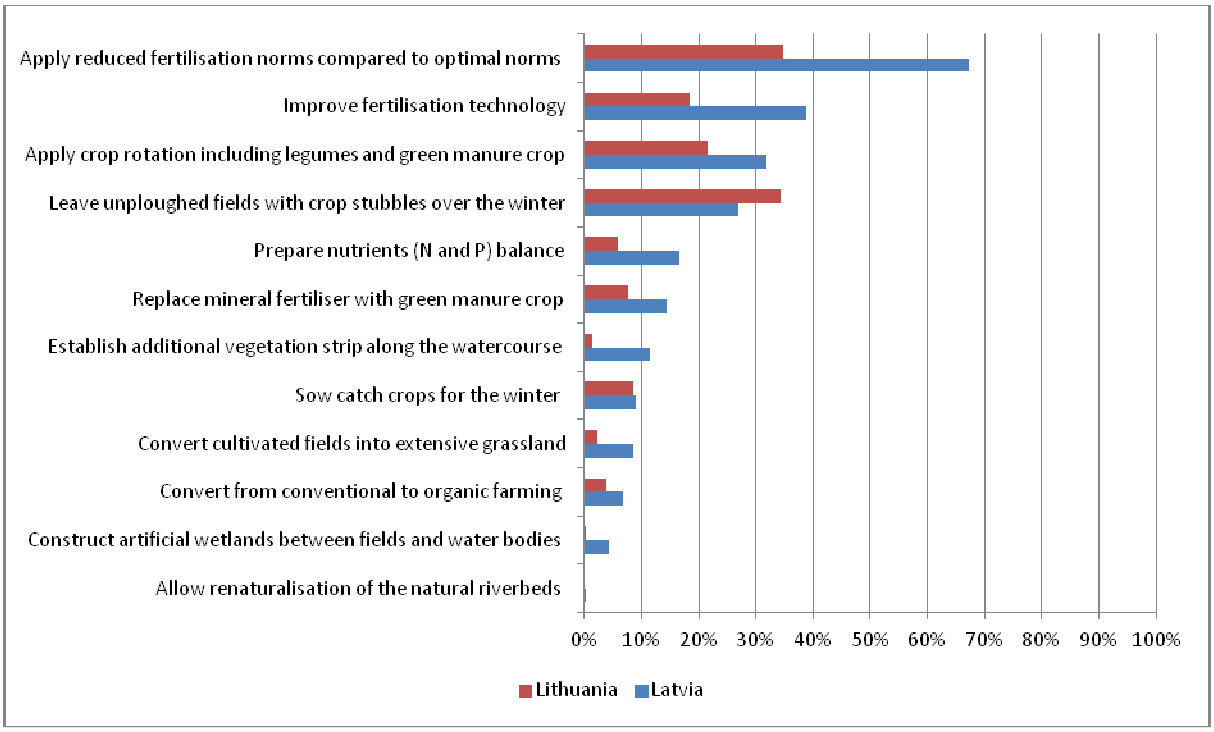


Figure 1. Share of the respondents who have already implemented supplementary agri-environmental measures

The most popular measure among Latvian and Lithuanian farmers was the application of reduced fertilisation norms compared to the norms for highest yields (implemented by 67% and 35% of the respondents, respectively). About one third of the Latvian farmers said that they were improving fertilisation technology, applying crop rotation, and developing fertilisations plans. Reduced fertilisation norms and leaving unploughed fields with crop stubbles over the winter were applied by approximately one third of the Lithuanian farms.

As to the willingness to implement supplementary measures, the largest share of Latvian farmers would apply crop rotation and prepare nutrients balance (24% of the respondents) without getting financial support. Lithuanian farmers mostly support sowing of catch crops for the winter (28% of the respondents) and improvement of fertilisation technology (27% of the respondents).

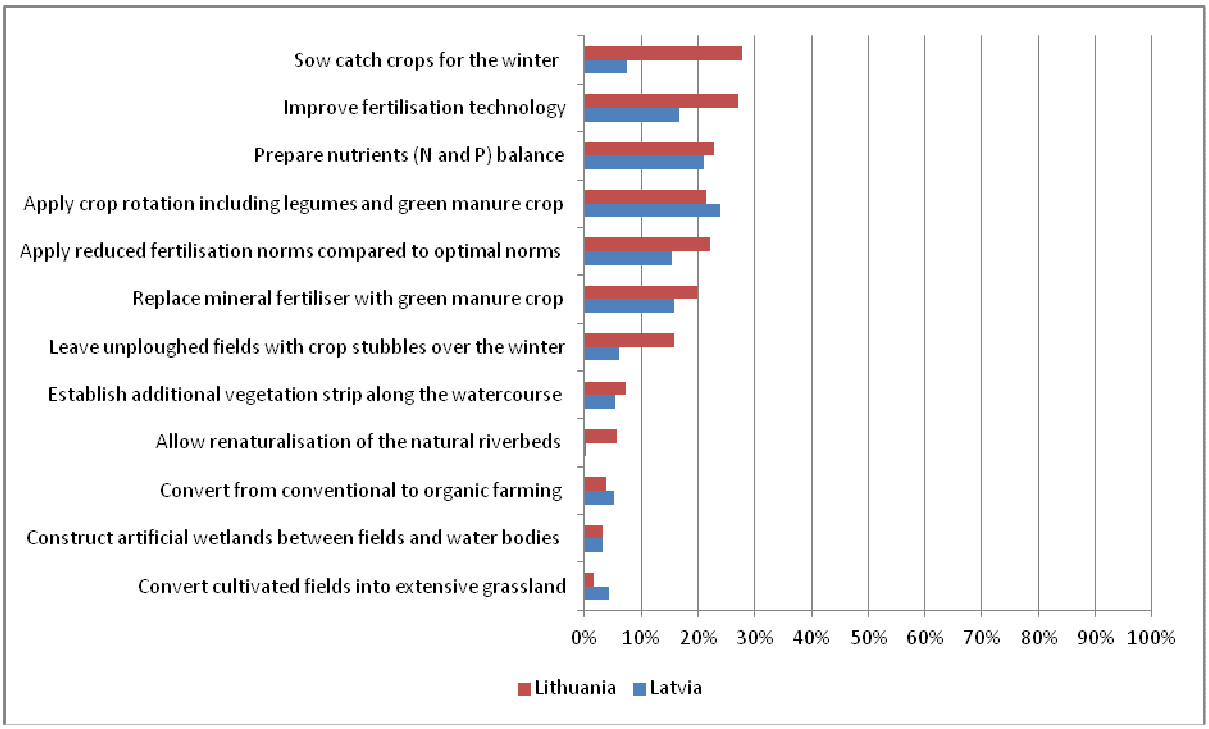


Figure 2. Share of the respondents who would be ready to implement supplementary agri-environmental measures

Lithuanian farmers would generally be more eager to implement environmental measures if they received compensations. The share of those who demonstrated their willingness to implement the measures exceeded the Latvian one for all types of supplementary measures. This result could be explained by the fact that Latvian farmers are not sure about the effectiveness of some measures (for example, establishment of additional vegetation strips along watercourses, leaving crop stubbles over the winter and construction of artificial wetlands between fields and water bodies) and they do not want to reduce their agricultural land area without being confident that certain measures would be beneficial to the environment.Usually, the financial support does not cover all construction and maintenance expenses of a measure. The measure which would be implemented by the largest number of Lithuanian (53%) and Latvian (32%) farmers if they received compensation is establishment of vegetation buffer strips along a watercourse.

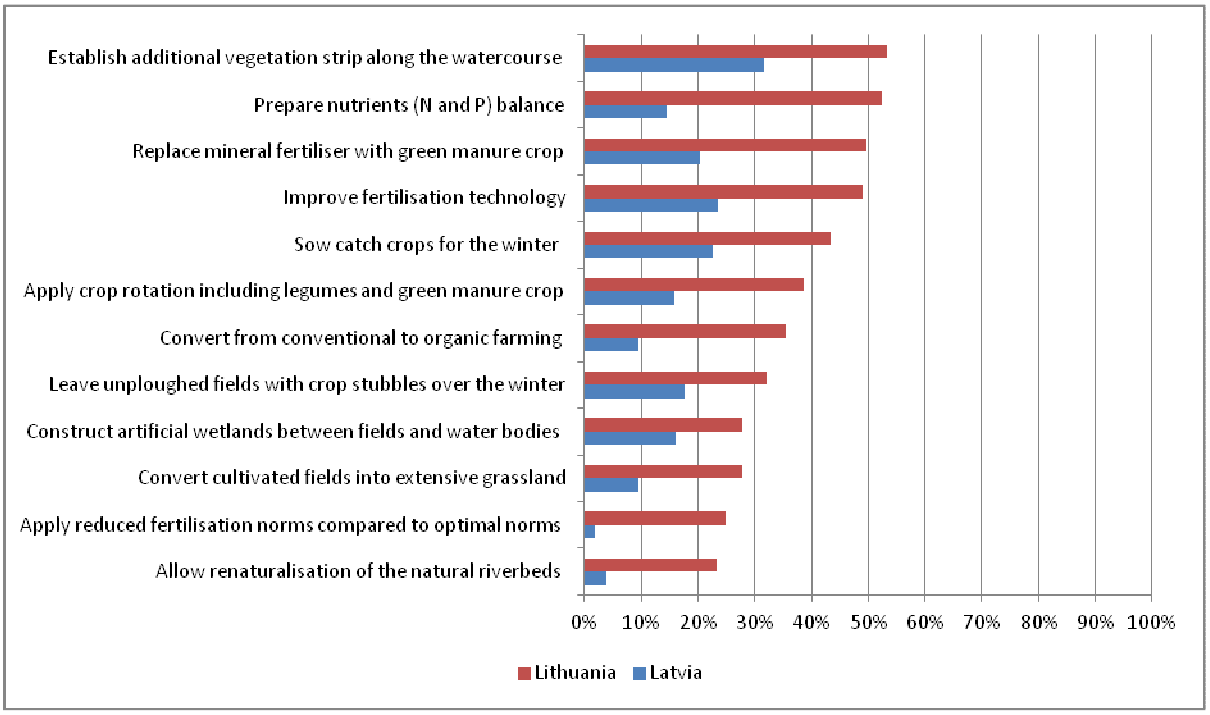


Figure 3. Share of the respondents who would implement supplementary agri-environmental measures only if they received compensation

A higher percentage of Latvian farmers compared to Lithuanians expressed their unwillingness to implement any supplementary measures. More than half of the respondents would not agree to convert from conventional to organic farming, from cultivated fields into extensive grasslands, to allow renaturalisation of the natural riverbeds, to construct artificial wetlands between fields and water bodies, and to sow catch crops for the winter (50-65% of the respondents). Approximately one third of the farmers would not replace mineral fertilisers with green manure crops, would not leave unploughed fields with crop stubbles over the winter, and would not prepare nutrient balance (33-39% of the respondents). More than half of the Lithuanian farmers would not agree to convert cultivated fields into extensive grassland (53% of the respondents), more than one third would not allow renaturalisation of the natural riverbeds in their fields, would not convert from conventional to organic farming, and would not construct artificial wetlands between fields and water bodies (43-39% of the respondents).

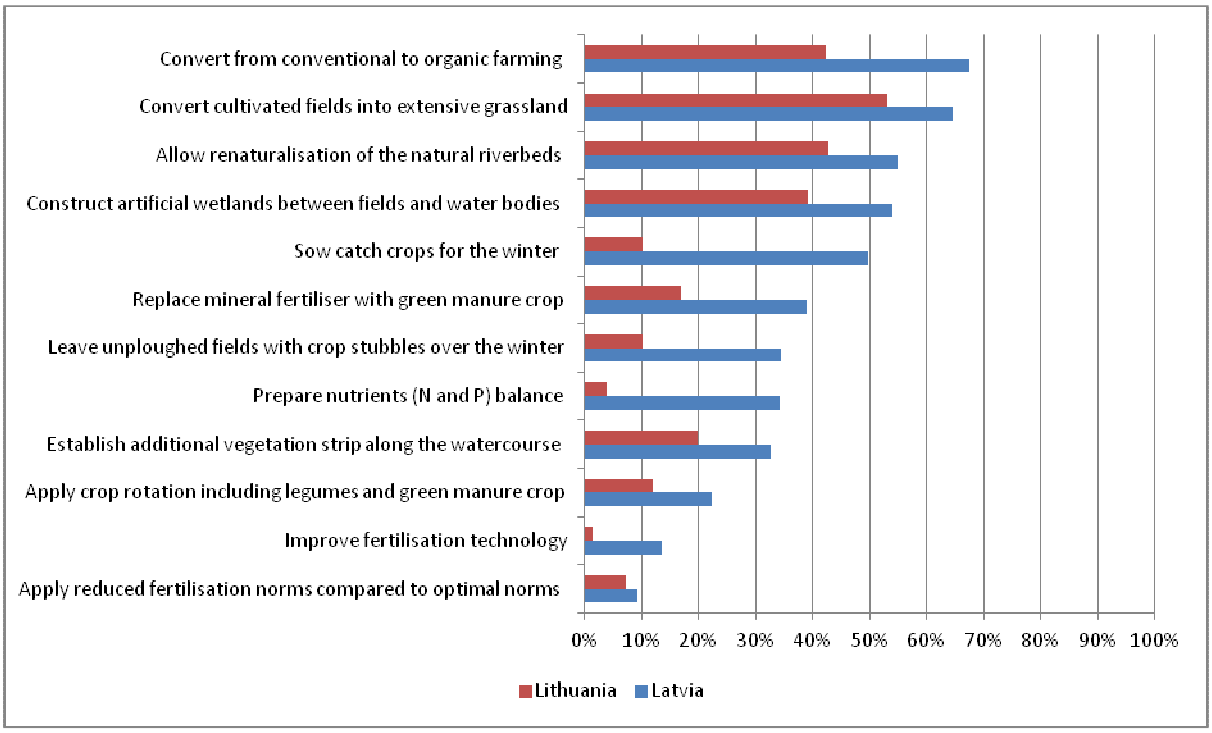


Figure 4. Share of the respondents who would not implement supplementary agri-environmental measures

Conclusions and Recommendations

The findings of the surveys of specialists and farmers revealed a number of shortcomings and allowed suggesting appropriate recommendations that should be taken into account for increasing the effectiveness of water protection management:

- The use of mineral fertilisers has not been regulated in Lithuania; this is a very important drawback in the system of agricultural pollution reduction.
- There is a lack of mixed crop and animal farming in Lithuanian part of Lielupe and Venta RBDs. Crop production is the most common farming activity. This leads unbalanced and highly polluting activities.
- Implementation of agri-environmental measures requires an integral approach. There is a lack of evaluation of environmental benefits that could be achieved through supportive measures under the Rural Development Programme.
- Pollution rising from fishing ponds in the Venta RBD should be properly accounted for. More detailed information is required on the amount of feed supplied to fish, its nutritional composition, concentration of chemical substances in fisheries production, and quantities of production.
- There is also a need to change methods for assessing pollution loads from large livestock farms and leaching of biogens in the Lielupe RBD. It is not correct to evaluate only annual average leachate concentrations – instead, different periods should be looked at taking into consideration the water content in the soil during a certain year.
- There is a lack of training and education of farmers. They should learn more about opportunities to apply modern technologies and new agri-environmental measures. It is important that farmers receive information about the specific situation in the area

where they conduct farming activities. Advisory services should be adjusted to the areas and local needs.

- Relationship between controlling authorities and farmers should be improved, focusing on the advisory and supportive character of such relationship. On the other hand, more control should be secured in vegetation periods when pesticides are spread.
- More attention should be paid to the slurry problem in pig farms.
- Lack of political will continues to be an important obstacle for environmental improvements in the agricultural sector.
- Financial support should be awarded only to farmers who meet requirements for good agricultural practices. On the other hand, the red tape surrounding compensations should be minimised.
- Information on and inventory of the actual quantities of fertilisers and pesticides should be considerably improved.
- Scientific knowledge and research activities should be expanded, initiating collaboration between ecologists and agronomists.
- More extensive monitoring of water and soil in agricultural areas is required.

The outputs of the project are of great interest both for Lithuanian and Latvian environmental authorities responsible for river basin management and will contribute to the improvement of the water quality in the Venta and Lielupe River Basin Districts. Surveys of specialists and farmers on environmental measures to reduce water pollution from agricultural sources have a multiple effect. The survey findings help prioritise and justify agri-environmental measures in river basin management plans and inform farmers (the public) on the importance of agricultural pollution and measures to combat it. Moreover, such surveys bring Latvian and Lithuanian specialists together and provide key expertise for the development of international Lielupe and Venta River Basin District Management plans in the future.

KOPSAVILKUMS

Lielupes un Ventas upju baseinu apgabali aptver Lietuvas un Latvijas teritorijas. Tā kā upes piesārņošana notiek abu šo valstu teritorijās, lai cīnītos pret ūdenstilpju piesārņošanu un uzlabotu ekoloģisko situāciju tajās, ir nepieciešama kopīga rīcība. Padomes Direktīva 2000/60/EK ar ko izveido sistēmu Kopienas rīcībai ūdens resursu politikas jomā (Ūdeņu struktūrdirektīva) nosaka, ka ūdens resursu apsaimniekošana jāveic, balstoties uz upju baseinu iedalījuma principu. 2010. gadā Latvijā un Lietuvā tika sagatavoti un apstiprināti katras valsts teritorijā esošo Lielupes un Ventas upju baseinu apgabalu apsaimniekošanas plāni (sešu gadu plānošanas periodam). Nepietiekamas starpvalstu sadarbības rezultātā tajos netika iekļauti vairāki ar ūdens resursu apsaimniekošanu saistīti jautājumi, kurus paredzēts iekļaut nākamā plānošanas perioda upju baseinu apgabalu apsaimniekošanas plānos.

Lauksaimnieciskās darbības izraisītais piesārņojums ir viens no lielākajiem piesārņojumiem gan Lielupes, gan Ventas upju sateces baseinu apgabalos (turpmāk tekstā – apgabali) abu valstu teritorijās.

Projekta uzdevums bija noskaidrot Lielupes un Ventas apgabalos saimniekojošo lauksaimnieku viedokli par lauksaimnieciskās darbības izraisīto difūzo piesārņojumu un gatavību īstenot tā samazināšanai nepieciešamos pasākumus. Lai īstenotu šo uzdevumu, tika veiktas divu veidu aptaujas:

- *speciālistu aptauja*, kuras mērķis bija noskaidrot speciālistu viedokli par Lielupes un Ventas apgabalu piesārņojumu, ko izraisa lauksaimnieciskā darbība, attieksmi pret dažādiem agrovides pasākumiem, kas vērsti uz ūdens piesārņojuma samazināšanu, un saņemt priekšlikumus par lēmumu pieņemšanu attiecībā uz šiem pasākumiem. Speciālistu viedoklis tika ņemts vērā, sastādot lauksaimniekiem paredzētās anketas.
- *lauksaimnieku aptauja*, kuras mērķis bija noskaidrot lauksaimnieku viedokli attiecībā uz ūdeņu aizsardzību un vides aizsardzību kopumā, viņu izpratni par to, kāda ir viņu loma ūdens resursu kvalitātes uzlabošanā, atklāt iemeslus, kāpēc netiek ievērotas vides aizsardzības prasības, un noskaidrot, cik pieņemami viņiem šķiet šobrīd īstenojamie (t.i., pamata agrovides pasākumi vai labas lauksaimniecības prakses nosacījumi) un potenciāli īstenojamie agrovides pasākumi (tā dēvētie papildus pasākumi).

Speciālistu un lauksaimnieku aptaujas bija konfidenciālas (anketu aizpildīšanā nepiedalījās trešās personas), lai no respondenta iegūtu pēc iespējas atklātākas atbildes. Kopā aptaujās piedalījās 32 Latvijas un Lietuvas lauksaimniecības nozares un vides pārraudzības institūcijās strādājošie speciālisti, kas iesaistīti lēmumu pieņemšanā, un 602 lauksaimnieki no Latvijas un Lietuvas, kas saimnieko Lielupes un Ventas upju baseinu teritorijās.

Speciālistiem un lauksaimniekiem bija jāsniedz atbildes uz jautājumiem par pamata un papildus pasākumiem. Lai sasniegtu labu ūdens resursu ekoloģisko kvalitāti, kā to paredz Ūdeņu struktūrdirektīva, būtu jāīsteno papildus pasākumi.

Pamata pasākumi ietver šādus papildus pasākumus:

- kūtsmēslu un vircas uzglabāšanas krātuvju izbūve atbilstoši vides aizsardzības prasībām (lai samazinātu barības vielu noplūdi augsnē un ūdenī);
- vides aizsardzības prasībām atbilstošu mēslošanas plānu izstrāde un realizēšana;

- vides aizsardzības prasībām atbilstošu mēslojuma normu izmantošana (mēslojuma norma ir augiem minimāli nepieciešamais mēslojuma daudzums, kuru augi izmanto pilnībā, neatstājot augu barības elementus augsnē, no kuras tās parasti nonāk dziļākajos zemes slāņos);
- mēslošanas līdzekļu lietošana tikai piemērotā laika periodā (izvairoties no minerālmēslu lietošanas vai kūtsmēslu izkliedēšanas augsta barības elementu izskalošanās riska laikposmos, samazinās riski, kas saistīti ar nitrātu noteci no augsnes virskārtas un slāpekļa samazināšanos augsnē);
- ziemāju un daudzgadīgo augu segas nodrošināšana ziemas periodā, kā to paredz „Labas lauksaimniecības prakses nosacījumi" (augu sega izmanto pēc galvenās kultūras novākšanas vasarā vai agrā rudenī augsnē atlikušos nitrātus un citas augu barības vielas, un nodrošina to, ka samazinās nitrātu noplūde ziemas periodā);
- augsekas ievērošana paugurainās teritorijās, lai novērstu augsnes eroziju (saskaņā ar rekomendācijām „Labas lauksaimniecības prakses nosacījumos").

Ja pamata pasākumu īstenošanas rezultātā nav sasniegts ūdens resursu labs ekoloģiskais stāvoklis, nepieciešams īstenot papildus pasākumus.

Pasākumi, kas saistīti ar mēslojuma izmantošanu

- Mēslošanas plānu izstrāde un realizēšana (tajos iekļaujot arī augsnes analīžu veikšanu).
- Mēslojuma normu samazināšana, salīdzinot ar augstāko iespējamo ražu iegūšanai paredzētajām optimālajām mēslojuma normām.
- Augu barības vielu (slāpekļa un fosfora) bilances sastādīšana mēslošanas līdzekļu lietošanas plānošanai ilgtermiņā (ja nav sastādīti mēslošanas plāni).
- Minerālmēslu aizstāšana ar zaļmēslojumu (zaļmēslojumam piemērotus kultūras var iesēt pavasarī un vasaras vidū ieart augsnē; iespējams izmantot arī cita veida zaļmēslojumu).

Citi papildu pasākumi

- Kūtsmēslu un vircas krātuvju izbūve atbilstoši vides aizsardzības prasībām (šis pasākums attiecas uz tiem lauksaimniekiem, kuriem šis pasākums līdz šim nebija obligāts).
- Mākslīgo mitrāju izveidošana starp laukiem un ūdenstilpēm (mitrāji var palīdzēt uztvert augu barības vielas, ko satur lauksaimniecības noteces, pirms tās nonāk ūdenstilpēs).
- Aramzemju pārveidošana par ekstensīvi izmantotiem ilggadīgiem zālājiem (īstenojot šo pasākumu, mēslošanai tiek izmantots mazāks barības vielu daudzums, līdz ar to arī ūdenī nonāk mazāks barības vielu daudzums).
- Lauksaimniecības platībās veicināt iepriekš iztaisnotām upēm atgriezties to dabiskajā gultnē (pēc upes līkumu atjaunošanas parasti palielinās upes kopējais garums, un līdz ar to palielinās ūdens pašattīrīšanās spējas).
- Mēslošanas tehnoloģiju (tehnikas/iekārtu) uzlabošana (tiek uzlabota mēslojuma iestrādes kvalitāte un samazinās barības vielu noplūdes ūdenī).
- Uztvērējaugu sēšana pirms ziemas perioda (pēc pamatkultūras ražas novākšanas uztvērējaugi uzņem atlikušās barības vielas, tāpēc ziemas periodā, kad barības vielu noplūde no augsnes virskārtas ir visintensīvākā, augsnē ir mazāks barības vielu daudzums).
- Konvencionālo saimniecību pārveidošana par bioloģiskajām saimniecībām (bioloģiskajās saimniecībās, salīdzinot tās ar konvencionālajām saimniecībām, barības

vielas tiek izmantotas efektīvāk, un līdz ar to arī barības vielu zudumi apkārtējā vidē ir mazāki).
- Rugaiņu neuzaršana un saglabāšana ziemas periodā (šis pasākums palīdz izvairīties no augsnes erozijas).
- Papildu veģetācijas joslas izveidošana uz aramzemēm, kas atrodas blakus ūdenstilpēm (strautam, upei vai ezeram) (tas var samazināt minerālvielu zudumus un izvairīties no ūdens piesārņošanas ar pesticīdiem).
- Augsekas ievērošana, iekļaujot tajā pākšaugus un zaļmēslojuma kultūras (laukaugu zaļmasu iear augsnē, lai uzlabotu augsnes auglību un samazinātu barības vielu noplūdi).

Speciālistu aptaujas rezultāti

Divas trešdaļas speciālistu (23 no 32 respondentiem) abās valstīs uzskata, ka, īstenojot tikai pamata agrovides pasākumus, nav iespējams cīnīties pret ūdeņu piesārņošanu no lauksaimnieciskās darbības. Lai sasniegtu labu ūdens kvalitāti ūdenstilpēs, nepieciešams īstenot papildu pasākumus. 1. tabulā atspoguļots Latvijas un Lietuvas speciālistu viedoklis attiecībā uz potenciālo papildus pasākumu efektivitāti.

1. tabula. Speciālistu (kuri uzskata, ka pašlaik īstenotie pasākumi nav pietiekami efektīvi) viedokļu par potenciālo papildus pasākumu efektivitātes pakāpi, izejot no vērtējuma „ļoti efektīvs", skaitliskais sadalījums.

Pasākums	Ne-efektīvs*	Daļēji efektīvs*	Ļoti efektīvs*
Mēslošanas tehnoloģiju uzlabošana (uzlabotu mēslošanas tehnoloģiju izmantošana var samazināt barības vielu noplūdes ūdenī).		3	20
Mēslošanas plānu sastādīšana un realizēšana saskaņā ar "Kultūraugu mēslošanas plāna izstrādes metodiku".		4	19
Papildu veģetācijas buferzonas (5 m) izveidošana uz aramzemes, kas atrodas blakus ūdenstilpei (strautam, upei vai ezeram). (Buferzona var samazināt minerālvielu zudumus un pasargāt no ūdens piesārņošanas ar uz lauka izkliedētajiem pesticīdiem).		7	15
Uztvērējaugu audzēšana smilšainās un jaukta tipa augsnēs. (Uztvērējaugi arī pēc pamatkultūras ražas novākšanas turpina uzņemt barības vielas, tāpēc augsnē ziemas periodā, kad notece no augsnes virskārtas ir visintensīvākā, ir mazāks barības vielu daudzums).	2	10	10
Augu barības vielu (slāpekļa un fosfora) bilances sagatavošana, kas ļauj plānot mēslošanas līdzekļu lietošanu ilgtermiņā (ja netiek sastādīti mēslošanas plāni).	2	13	8
Minerālmēslu aizstāšana ar zaļmēslojuma kultūraugu audzēšanu augsnes auglības un augu audzēšanas apstākļu uzlabošanas nolūkā.	4	9	8
Lauku neuzaršana un rugāju saglabāšana ziemas periodā.	4	11	7
Iztaisnotu upju dabīgo gultņu atjaunošana uz lauksaimniecības zemēm. (Pēc upes līkumu atjaunošanas parasti palielinās upes kopējais garums, līdz ar to palielinās ūdens pašattīrīšanās spējas).	8	6	6
Konvencionālo saimniecību pārveidošana par bioloģiskajām saimniecībām. (Bioloģiskajā	7	11	4

Pasākums	Ne-efektīvs*	Daļēji efektīvs*	Ļoti efektīvs*
saimniekošanas sistēmā, salīdzinot ar konvencionālo lauksaimniecību, barības vielas tiek izmantotas efektīvāk, tāpēc arī barības vielu zudumi apkārtējā vidē ir mazāki).			
Mākslīgo mitrāju izveidošana starp laukiem un ūdenstilpēm (mitrāji var palīdzēt uztvert augu barības vielas, ko satur lauksaimniecības noteces, pirms tās nonāk ūdenstilpēs).	2	16	3
Aramzemju pārveidošana par ekstensīvi izmantotiem ilggadīgiem zālājiem. (Īstenojot šo pasākumu, augsnē tiek iestrādāts mazāks barības vielu daudzums, līdz ar to arī ūdenī nonāk mazāks barības vielu daudzums).	9	10	3
Noteikto optimālo mēslojuma normu vietā tiek izmantots samazināts mēslojuma daudzums.	11	10	1

*- Jāņem vērā, ka ne visi respondenti atbildēja uz visiem papildjautājumiem par katru no piedāvātajiem pasākumiem.

Lauksaimnieku aptaujas rezultāti

Lauksaimnieku aptaujas anketās bija iekļauti jautājumi par viņu sociāli ekonomisko stāvokli, saimniecības tipu un lauksaimnieciskās ražošanas nozarēm, problēmām saistībā ar ūdens piesārņošanu, agrovides pasākumu īstenošanu, šķēršļiem, kas traucē ievērot vides aizsardzības prasības, kā arī jautājumi, kas palīdzēja noskaidrot lauksaimnieku viedokli attiecībā uz gatavību īstenot pamata un papildu agrovides pasākumus, kas vērsti uz ūdens piesārņojuma samazināšanu. Lauksaimniekiem bija arī jāatklāj iemesli, kāpēc tie nevēlas izpildīt papildu pasākumus.

Lauksaimnieku viedoklis par ūdens piesārņošanu

Visi lauksaimnieki abās valstīs atzina to, ka lauksaimnieciskā darbība būtiski var ietekmēt pazemes un virszemes ūdeņu kvalitāti. Mazliet vairāk nekā viena trešdaļa lauksaimnieku uzskata, ka tādi agrovides pasākumi, kā mēslošana piemērotā laika periodā, minerālmēslu lietošana un noplūdes no kūtsmēslu krātuvēm, vairāk vai mazāk ietekmē ūdens kvalitāti. Tomēr liela daļa lauksaimnieku Latvijā uzskata, ka piesārņojums no lauksaimnieciskās darbības veido ne vairāk kā 10 % no kopējā ūdens piesārņojuma. 53 % no Lietuvā aptaujātajiem lauksaimniekiem uzskata, ka lauksaimniecības radītais ūdens piesārņojums veido 10-50% no kopējā ūdens piesārņojuma.

Pamata pasākumu īstenošanas rezultāti

Detalizēti analizējot, kā saimniecībās tiek īstenoti pamata agrovides pasākumi vai pasākumi, kas atbilst labas lauksaimniecības prakses nosacījumiem, atklājās, ka minētie pasākumi ir īstenoti tikai daļā saimniecību.

2. tabula. Respondentu, kuri īstenojuši pamata agrovides pasākumus vai pasākumus, kas atbilst labas lauksaimniecības prakses nosacījumiem, sniegto atbilžu procentuālais sadalījums.

Pasākums	Latvija	Lietuva
Ierīkota kūtsmēslu krātuve atbilstoši vides aizsardzības prasībām	43.0%	60.9%
Ierīkota vircas krātuve atbilstoši vides aizsardzības prasībām	21.5%	65.6%
Sastādīts mēslošanas plāns atbilstoši vides aizsardzības prasībām	63.3%	32.5%

Pasākums	Latvija	Lietuva
Tiek izmantotas mēslojuma normas atbilstošas vides aizsardzības prasībām	84.3%	87.7%
Kultūraugu mēslošana tiek veikta piemērotā laika periodā	83.6%	95%
Ziemāju vai ilggadīgo kultūraugu segas veidošana ziemā (atbilstoši "Labas lauksaimniecības prakses nosacījumiem" (LLPN))	77%	32.0%
Augsekas ievērošana, lai izvairītos no augsnes erozijas apvidos ar paugurainu reljefu (atbilstoši "Labas lauksaimniecības prakses nosacījumiem" (LLPN))	32%	22%

Situācijas uzlabošana ir nepieciešama abās valstīs. Visbūtiskākā problēma ir kūtsmēslu un vircas krātuvju un mēslošanas plānu neesamība. Šķiet, ka šo pasākumu realizēšana sagādā grūtības pārāk augsto izmaksu dēļ.

Citu pamata pasākumu, piemēram, vides aizsardzības prasībām atbilstošu mēslošanas normu izmantošana vai mēslojuma izmantošana piemērotā laika periodā, īstenošana notiek pietiekami labā līmenī abās valstīs, tomēr uzlabojumi vēl ir nepieciešami.

Procentuāli maz lauksaimnieku Latvijā ievēro labas lauksaimniecības prakses nosacījumus, izņemot ieteikumu ziemas periodā uz augsnes veidot ziemāju vai ilggadīgo kultūraugu segu, ko īsteno 77% respondentu Latvijā.

Abu valstu lauksaimnieki atzina, ka valsts piešķirtais finansējums agrovides pasākumu īstenošanai nav pietiekams, un tas ir galvenais iemesls, kāpēc pasākumi netiek īstenoti. Arī Lietuvas lauksaimnieki kā būtisku iemeslu minēja pārlieku lielās birokrātiskās prasības, kas jāizpilda, lai saņemtu kompensācijas. Tie Lietuvas lauksaimnieki, kas īsteno pamata pasākumus vai pasākumus, kas atbilst labas lauksaimniecības prakses nosacījumiem, atzīmēja, ka šie pasākumi tiek īstenoti tikai, pateicoties ES atbalstam. Latvijas lauksaimnieki, kas īstenojuši attiecīgos pasākumus, lielā mērā apšaubīja, ka vides aizsardzība, varētu būt prioritārais iemesls, kāpēc viņi īstenojuši šos pasākumus.

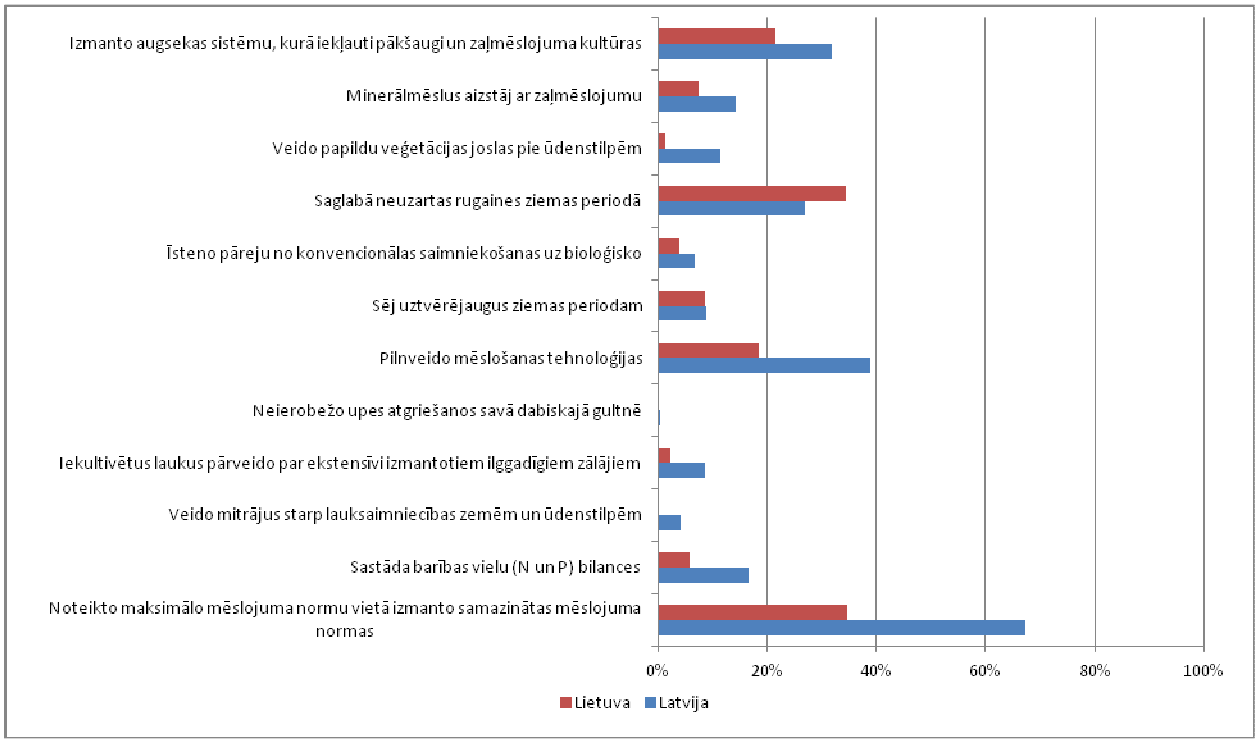
Tāpat lauksaimnieki atzīmēja, ka viņiem trūkst zināšanu par lokālajām vides problēmām un to, kādi ir viņu pienākumi saskaņā ar vides aizsardzību regulējošajiem normatīvajiem aktiem. Kā norādīja paši lauksaimnieki, lai nodrošinātu ūdeņu aizsardzību, ļoti lietderīga varētu būt sabiedrības plašāka informēšana par vides jautājumiem.

Lauksaimnieku viedoklis par dažādu agrovides pasākumu efektivitāti

Jautājumos par dažādu pasākumu efektivitāti Latvijas un Lietuvas lauksaimnieku paustie viedokļi īpaši neatšķīrās. Lielākā daļa gan Lielupes, gan Ventas apgabalā aptaujāto lauksaimnieku par visefektīvākajiem pasākumiem atzina kūtsmēslu un vircas krātuvju izbūvi, mēslošanas tehnoloģiju uzlabošanu, samazinātu mēslošanas normu izmantošanu, kā arī mēslošanas plānu sastādīšanu un realizēšanu. Jāatzīmē, ka arī speciālistu vērtējumā kā ļoti efektīvi pasākumi tika atzīmēti mēslošanas tehnoloģiju uzlabošana un mēslošanas plānu sastādīšana.

Papildus pasākumu īstenošana

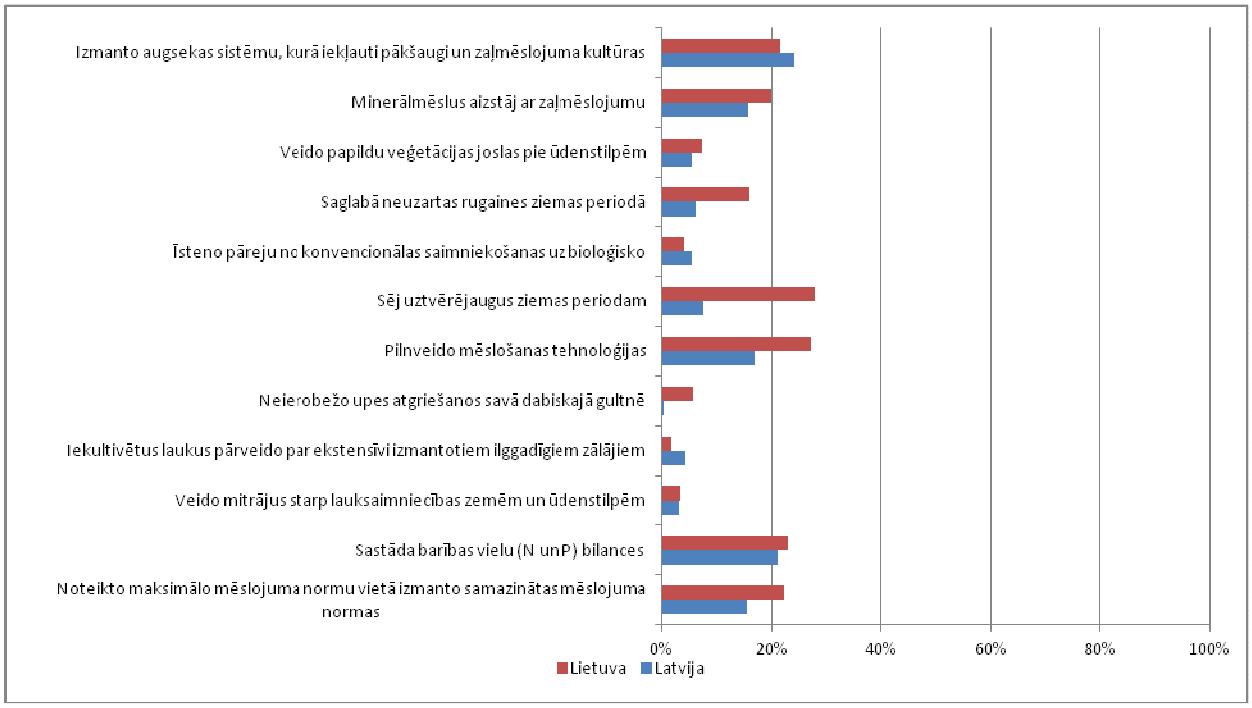
Aptaujā tika noskaidrots, ka Latvijā biežāk nekā Lietuvā lauksaimnieki jau īsteno papildus pasākumus.



1. attēls. Respondentu, kuri jau īsteno dažādus papildu agrovides pasākumus, procentuālais sadalījums.

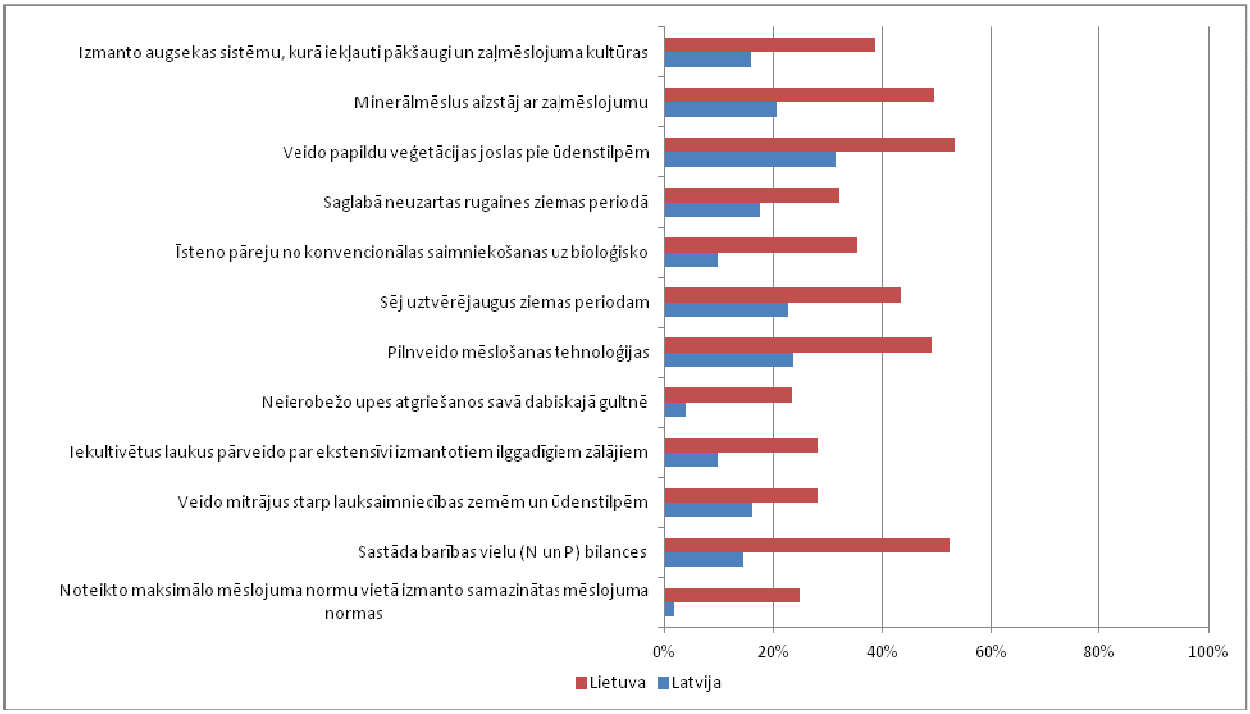
Tika noskaidrots, ka vispopulārākais pasākums Latvijas un Lietuvas lauksaimnieku vidū (to atzīmēja attiecīgi 67% un 35% respondentu) ir samazinātu mēslojuma normu izmantošana augstāko ražu iegūšanai noteikto maksimālo mēslojuma normu vietā. Aptuveni viena trešdaļa Latvijas lauksaimnieku bija veikusi mēslošanas tehnoloģiju uzlabošanu, ieviesusi augsekas sistēmu un sastādījusi mēslošanas plānus. Aptuveni viena trešdaļa Lietuvas lauksaimnieku norādīja, ka viņi izmanto samazinātas mēslojuma normas un atstāj neuzartas rugaines ziemas periodā.

Lielākā daļa Latvijas lauksaimnieku (24% respondentu) jautājumā par papildus pasākumu īstenošanas iespējām, nesaņemot finansiālu atbalstu, pauda gatavību veikt augsekas ieviešanu un barības vielu bilances sastādīšanu. Lietuvas lauksaimnieki galvenokārt atbalstīja uztvērējaugu sēšanu ziemas periodam (28% respondentu) un mēslošanas tehnoloģiju uzlabošanu (27% respondentu).



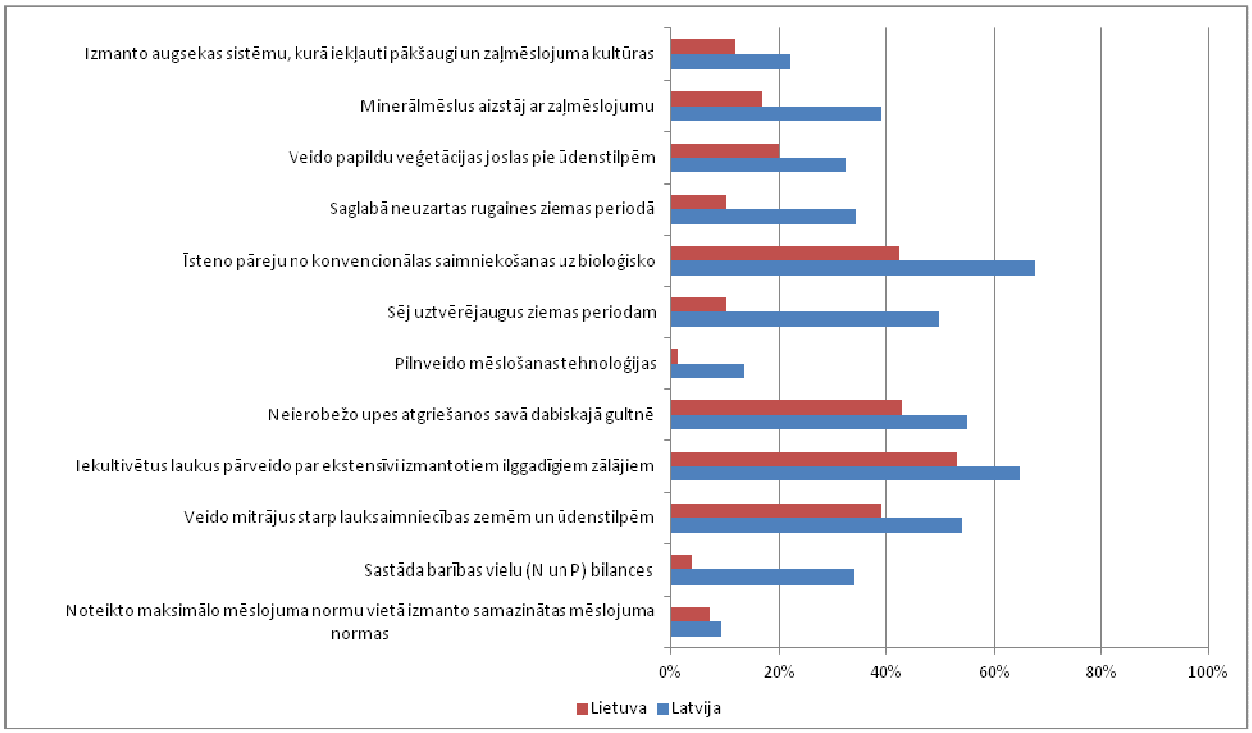
2. **attēls**. Respondentu, kuri gatavi īstenot papildus agrovides pasākumus, procentuālais sadalījums.

Tika noskaidrots, ka Lietuvas lauksaimnieki ir vairāk ieinteresēti īstenot agrovides pasākumus, ja tiem tiek maksātas kompensācijas. Attiecībā uz atsevišķiem papildus pasākumiem visos gadījumos procentuāli vairāk Lietuvas lauksaimnieku pauda gatavību tos īstenot. Rezultātu varētu izskaidrot ar to, ka Latvijas lauksaimniekiem nav pārliecības par dažu agrovides pasākumu efektivitāti (piemēram, buferjoslu ierīkošanu, rugāju lauku ziemas periodā, mitrzemju būvniecību) un tie nevēlas samazināt ražošanas platības, nepārliecinoties par pasākuma efektivitāti. Parasti atbalsts nesedz visas agrovides pasākuma ieviešanas un uzturēšanas izmaksas. Ja būtu iespējams saņemt kompensācijas par papildu pasākumu īstenošanu, tad lielākā daļa Lietuvas (53%) un Latvijas (32%) lauksaimnieku būtu gatavi izveidot veģetācijas joslas gar ūdenstilpēm.



3. **attēls**. Respondentu, kuri ir gatavi īstenot papildu agrovides pasākumus, ja tie saņemtu kompensācijas, procentuālais sadalījums.

Procentuāli to lauksaimnieku, kuri pauduši nevēlēšanos īstenot jebkādus papildus pasākumus, daudzums Latvijā ir lielāks nekā Lietuvā. Vairāk nekā puse respondentu [Latvijā] nevēlas no konvencionālās saimniekošanas pāriet uz bioloģisko saimniekošanu, iekultivētos laukus pārveidot par ekstensīviem ilggadīgiem zālājiem, ļaut upēm atgriezties to dabīgajās gultnēs, veidot mākslīgus mitrājus starp lauksaimniecības zemēm un ūdenstilpēm un sēt uztvērējaugus ziemas periodam (50-65% respondentu); aptuveni viena trešdaļa respondentu nevēlas minerālmēslus aizstāt ar zaļmēslojumu, atstāt uz ziemu neuzartas rugaines un sastādīt barības vielu bilanci (33-39%) utt. Vairāk nekā puse lietuviešu nepiekristu iekultivēto lauku pārvēršanai par ekstensīvi izmantotiem ilggadīgiem zālājiem (53%), vairāk nekā trešdaļa nevēlētos ļaut upēm atgriezties to dabīgajās gultnēs, no konvencionālās saimniekošanas pāriet uz bioloģisko saimniekošanu, veidot mākslīgus mitrājus starp lauksaimniecības zemēm un ūdenstilpēm (39-43%) utt.



4. **attēls**. Respondentu, kuri nevēlas īstenot papildu agrovides pasākumus, procentuālais sadalījums.

Rekomendācijas

Ņemot vērā speciālistu un lauksaimnieku aptauju rezultātus, tika izstrādātas rekomendācijas ūdens aizsardzības un apsaimniekošanas efektivitātes palielināšanai.

- Minerālmēslu lietošana Lietuvā netiek regulēta, un tas ir ļoti būtisks šķērslis lauksaimniecības radītā piesārņojuma samazināšanas sistēmā.
- Lielupes un Ventas apgabalos nav jaukta tipa saimniecību, kurās nodarbojas gan ar augkopību, gan lopkopību Lietuvā. Visizplatītākā nozare ir augkopība. Tas nozīmē, ka nepastāv līdzsvars, un piesārņojošās lauksaimnieciskās ražošanas īpatsvars ir ievērojami lielāks.
- Agrovides pasākumu īstenošanā nepieciešams ievērot integrētu pieeju. Trūkst izvērtējuma, cik liela būtu Lauku attīstības programmas atbalsta pasākumu īstenošanas pozitīvā ietekme uz vidi.
- Nepieciešams precīzi noteikt zivju dīķu radītā piesārņojuma apmēru Ventas apgabalā. Ir nepieciešams iegūt precīzu informāciju par to, kāds ir zivīm izbarotās barības daudzums un tās sastāvs, kāda ir ķīmisko vielu koncentrācija zivju produkcijā un kāds ir iegūtās produkcijas apjoms.
- Nepieciešams arī mainīt metodoloģiju, pēc kādas tiek aprēķināta lielo lopkopības fermu radītās biogēno vielu noteces Lielupes apgabalā. Nav pareizi noteikt tikai gada noteces vidējās koncentrāciju vērtības. Nepieciešams novērtēt piesārņojumu dažādos laika periodos, ņemot vērā ūdens saturu augsnē attiecīgajā gadā.
- Lauksaimniekiem trūkst praktisko un teorētisko zināšanu. Viņiem būtu plašāk jāskaidro iespējas, ko var sniegt moderno tehnoloģiju pielietošana un jauno agrovides pasākumu īstenošana. Ir svarīgi, lai lauksaimniekiem būtu zināms, kāds ir vides [ekoloģiskais] stāvoklis vietā, kurā viņi īsteno lauksaimniecisko darbību. Konsultāciju un izglītības dienestiem būtu jāpielāgojas teritoriālajām un vietējām vajadzībām.

- Būtu nepieciešams uzlabot kontrolējošo iestāžu un lauksaimnieku savstarpējo sadarbību, vairāk fokusējoties uz padomu un atbalsta sniegšanu. Tomēr veģetācijas periodā, kad tiek izsmidzināti pesticīdi, kontroles pasākumi būtu jāveic biežāk.
- Lielāka uzmanība būtu jāpievērš ar vircu saistītajām problēmām cūku fermās.
- Nopietns šķērslis vides situācijas uzlabošanai lauksaimniecības sektorā joprojām bieži ir politiskās gribas trūkums.
- Finansiālo atbalstu vajadzētu sniegt tikai tām saimniecībām, kurās tiek ievēroti labas lauksaimniecības prakses nosacījumi. Taču būtu arī jāsamazina birokrātiskais slogs kompensāciju saņemšanai.
- Būtiski uzlabojumi jāveic attiecībā uz informētību par to, kā aprēķināt faktiski nepieciešamo minerālmēslojuma un pesticīdu daudzumu.
- Nepieciešams pilnveidot zinātnes atziņas un paplašināt zinātniskos pētījumus; rosināt ekologu un agronomu sadarbību.
- Nepieciešams paplašināt ūdens un augsnes monitoringu lauksaimniecībā izmantojamās zemēs.

Projekta rezultātos īpaši ieinteresētas ir par upju baseinu apsaimniekošanu atbildīgās Latvijas un Lietuvas vides institūcijas, tāpat šos rezultātus būs iespējams izmantot, lai uzlabotu ūdens kvalitāti Ventas un Lielupes upju sateces baseinu apgabalos. Speciālistu un lauksaimnieku aptaujām par vides pasākumiem, kas vērsti uz lauksaimnieciskās darbības izraisītā ūdens piesārņojuma samazināšanu, ir daudzpusīga ietekme. Iegūtie rezultāti palīdzēs agrovides pasākumus upju baseinu apsaimniekošanas plānos sakārtot prioritārā secībā, balstoties uz apstiprinātiem faktiem, un tie būs noderīgi, lai informētu lauksaimniekus (sabiedrību) par lauksaimniecības izraisītā piesārņojuma nozīmīgumu un pasākumiem, kas veicami, lai novērstu šādu piesārņojumu. Turklāt pētījuma ietvaros satiekas Lietuvas un Latvijas speciālisti, un tiek veikta Lielupes un Ventas upju baseinu apgabalu pārrobežu apsaimniekošanas plāna izstrādāšanai nepieciešamā ekspertīze.

SANTRAUKA

Lielupės ir Ventos upių baseinai išsidėstę Latvijos ir Lietuvos teritorijose. Abi šalys prisideda prie upių taršos, todėl reikalingi bendri abiejų šalių veiksmai siekiant šią taršą įveikti ir pagerinti vandens telkinių ekologinę būklę. Pagal Europos Sąjungos bendrąją vandens politikos direktyvą 2000/60/ES upių baseinų rajonas (UBR) yra pagrindinis vandens išteklių valdymo vienetas. 2010 m. Latvijoje ir Lietuvoje buvo parengti ir patvirtinti nacionaliniai Lielupės ir Ventos UBR valdymo planai (pirmajam šešerių metų ciklui). Keletas vandens valdymo klausimų liko neišspręsti dėl nepakankamo koordinavimo tarp šalių, todėl tai reikės padaryti per kitus vandens telkinių kokybės gerinimo ciklus.

Žemės ūkio veikla yra viena iš pagrindinių vandens telkinių taršos šaltinių Lielupės ir Ventos UBR abiejose šalyse.

Šio projekto tikslas – išsiaiškinti, kaip Lielupės ir Ventos UBR ūkininkai vertina žemės ūkio taršą ir kiek jiems yra priimtinos pasklidosios taršos iš žemės ūkio šaltinių mažinimo priemonės. Tam atliktos dvi apklausos:

1. Specialistų apklausa, siekiant nustatyti, kaip jie vertina žemės ūkio veiklos keliamas problemas Lielupės ir Ventos UBR bei įvairias aplinkos apsaugos priemones šioms problemoms spręsti ir kaip galėtų būti priimti sprendimai dėl šių priemonių. Į specialistų nuomonę buvo atsižvelgta rengiant klausimyną ūkininkams.

2. Ūkininkų apklausa, siekiant sužinoti jų nuomonę apie vandens ir aplinkos apskritai apsaugą, supratimą apie žemės ūkio vaidmenį gerinant vandens kokybę, priežastis, dėl kurių jie neįgyvendina aplinkos apsaugos reikalavimų, taip pat įvairių privalomų ar rekomenduojamų pagal Pažangaus ūkininkavimo taisykles ir potencialiai naujų aplinkos apsaugos priemonių (vadinamųjų papildomų priemonių) jiems priimtinumą.

Specialistų ir ūkininkų apklausa atlikta *tête-à-tête*, siekiant gauti kiek galima labiau neformalius atsakymus. Iš viso apklausti 32 specialistai / sprendimų priėmėjai, atstovaujantys Latvijos ir Lietuvos žemės ūkio ir aplinkos apsaugos institucijoms, bei 602 ūkininkai iš Latvijos ir Lietuvos Lielupės bei Ventos UBR.

Specialistų ir ūkininkų buvo klausiama apie privalomas ir papildomas aplinkos apsaugos priemones žemės ūkyje. Papildomų priemonių gali prireikti gerai vandens telkinių būklei pagal Bendrąją vandens politikos direktyvą 2000/60/ES pasiekti.

Privalomos priemonės yra šios:

- Aplinkos apsaugos reikalavimus atitinkančių mėšlo saugyklų įrengimas (tai sumažina maisto medžiagų nuotėkį į dirvožemį ir vandenį).
- Aplinkos apsaugos reikalavimus atitinkančių tręšimo planų parengimas (tręšimo planai nurodo optimalias tręšimo normas ir padeda subalansuoti maisto medžiagų santykį dirvožemyje).
- Aplinkos apsaugos reikalavimus atitinkančių tręšimo normų laikymasis (tręšimo normomis nurodomas minimalus augalams reikalingas trąšų kiekis, kurį panaudojus dirvožemyje nesusidaro maistinių medžiagų perteklius, paprastai išplaunamas į gilesnius dirvožemio sluoksnius).

- Trąšų skleidimas tinkamu laiku (vengiant skleisti mineralines trąšas ar mėšlą didelės rizikos laiku, su paviršinio vandens nuotėkiu mažiau išsiplauna nitratų ir mažiau prarandamas azotas).
- Daugiamečių augalų sėja žiemai (kaip rekomenduojama Pažangaus ūkininkavimo taisyklėse ir patarimuose) (augalų danga padeda iš dirvožemio surinkti nitratus ir kitas maisto medžiagas, kai nuimamas pagrindinių kultūrų derlius vasarą ar vėlyvą rudenį, paliekant mažiau nitratų, kurie galėtų būti išplauti į dirvožemį žiemą).
- Priešerozinės sėjomainos taikymas kalvoto reljefo žemėje (kaip rekomenduojama Pažangaus ūkininkavimo taisyklėse ir patarimuose).

Papildomos priemonės būtų reikalingos, jei nepakaktų privalomų priemonių gerai vandens telkinių būklei pasiekti. Skiriamos su tręšimu susijusios ir kitos papildomos priemonės.

Su tręšimu susijusios papildomos priemonės yra šios:

- Tręšimo planų parengimas ir įgyvendinimas (kartu atliekant ir dirvožemio tyrimus).
- Tręšimas mažesne nei didžiausių derlių tręšimo norma.
- Maisto medžiagų (azoto, fosforo) ūkyje balanso, leidžiančio planuoti, kiek ateityje reikės trąšų, sudarymas (tais atvejais, kai nerengiami tręšimo planai).
- Žaliųjų trąšų naudojimas vietoje mineralinių trąšų (tai gali būti pavasarį sėjami, o vasaros viduryje užariami augalai; taip pat gali būti kitų rūšių žaliosios trąšos).

Kitos papildomos priemonės:

- Aplinkos apsaugos reikalavimus atitinkančių mėšlo ir srutų saugyklų įrengimas (ši priemonė būtų aktuali ūkininkams, kuriems ji iki šiol nėra privaloma).
- Dirbtinių šlapynių įrengimas tarp lauko ir vandens telkinių (šlapynės padeda nufiltruoti maisto medžiagas iš gretimų dirbamų laukų atitekančio vandens, prieš jam pasiekiant vandens telkinius).
- Dirbamos žemės pavertimas ekstensyviomis pievomis (prižiūrint pievas, mažiau kišamasi į dirvos sluoksnį, dėl to sumažėja maisto medžiagų nuotėkis į vandenis).
- Natūralių anksčiau ištiesintų upių vagų atkūrimas ūkininkų laukuose (atkūrus upių vagas, jos paprastai pailgėja, todėl atsiranda sąlygos geresniam savaiminiam apsivalymui).
- Tręšimo technikos (mašinų / įrengimų) patobulinimas (tai padeda geriau įterpti trąšas į dirvožemį ir sumažinti maisto medžiagų nuotėkį į vandenis).
- Tarpinių augalų sėjimas žiemai (tarpiniai augalai naudoja maisto medžiagas ir nuėmus pagrindinį derlių, dėl to mažiau azoto lieka dirvožemyje žiemai, kai jo išplaunama daugiausia).
- Perėjimas nuo įprasto prie ekologinio ūkininkavimo (ekologiškai ūkininkaujant, maisto medžiagos pasisavinamos efektyviau ir jų nuostoliai į aplinką yra mažesni nei įprastinėmis gamybos sąlygomis).
- Neapartų ražienų laukų palikimas per žiemą (ši priemonė padeda apsaugoti dirvą nuo erozijos).
- Papildomų augalų filtracinių apsaugos juostų ariamoje žemėje išilgai upių, upelių, ežerų įrengimas (taip galima sumažinti maisto medžiagų nuostolius dirvožemyje ir apsaugoti vandenis nuo taršos pesticidais).
- Sėjomainos, naudojant ankštines kultūras ir žaliąsias trąšas, taikymas (t. y. auginimas augalų, kurie, nesulaukę brandos, yra apariami; taip pagerinamas dirvožemio derlingumas, mažiau išplaunama maisto medžiagų).

Specialistų apklausos rezultatai

Du trečdaliai Lietuvos ir Latvijos specialistų (23 iš 32 respondentų) mano, kad kovojant su žemės ūkio veiklos keliama vandenų tarša privalomų aplinkos apsaugos priemonių nepakanka. Siekiant užtikrinti gerą vandens telkinių būklę, reikalingos papildomos priemonės. Atliktos apklausos, kaip specialistai vertina galimų papildomų priemonių naudą, rezultatai pateikti 1 lentelėje.

1 lentelė. Specialistų (manančių, kad privalomų priemonių nepakanka) nuomonė dėl papildomų priemonių naudingumo (respondentų skaičius*)

Priemonė	Nenaudinga	Galėtų būti naudinga	Labai naudinga
Tręšimo technologijos patobulinimas		3	20
Tręšimo planų parengimas ir įgyvendinimas pagal patvirtintą tręšimo planų rengimo metodiką		4	19
Papildomos 5 m pločio augalų filtracinės apsaugos juostos ariamoje žemėje išilgai upių, upelių, ežerų įrengimas		7	15
Smėlingų ir mišrių žemių užsodinimas tarpiniais augalais	2	10	10
Maisto medžiagų (azoto, fosforo) ūkyje balanso, leidžiančio planuoti, kiek ateityje reikės trąšų, sudarymas (tais atvejais, kai nerengiami tręšimo planai)	2	13	8
Mineralinių trąšų pakeitimas žaliosiomis trąšomis, taip pagerinant dirvožemio derlingumą ir augalų augimo sąlygas	4	9	8
Neapartų ražienų laukų palikimas per žiemą	4	11	7
Anksčiau ištiesintų natūralių upių vagų atkūrimas	8	6	6
Perėjimas nuo įprasto prie ekologinio ūkininkavimo	7	11	4
Dirbtinių šlapynių (pelkių) tarp lauko ir vandens telkinių įrengimas	2	16	3
Dirbamų žemių pavertimas ekstensyviomis pievomis	9	10	3
Tręšimas mažesnėmis nei optimalios tręšimo normomis	11	10	1

* Ne visi respondentai atsakė į visus klausimus apie kiekvieną siūlomą priemonę.

Ūkininkų apklausos rezultatai

Apklausiant ūkininkus, buvo pateikti klausimai apie jų ūkių tipą ir veiklą, vandens taršos problemas, taikomas aplinkos apsaugos priemones, kliūtis, trukdančias sėkmingai įgyvendinti aplinkos apsaugos reikalavimus, ūkininkų norą įgyvendinti privalomas bei papildomas aplinkos apsaugos priemones ir tų priemonių efektyvumą bei socialinę ekonominę ūkininkų padėtį. Ūkininkai taip pat turėjo nurodyti priežastis, dėl kurių jie nenorėtų įgyvendinti papildomų priemonių.

Ūkininkų nuomonė apie vandens taršos problemas

Visi abiejų šalių ūkininkai pripažino žemės ūkio veiklos įtaką požeminio ir paviršinio vandens kokybei. Šiek tiek daugiau nei trečdalis ūkininkų teigė, kad tam tikras tręšimo laikas,

mineralinių trąšų naudojimas ir nuotekos iš mėšlo saugyklų turi įtakos vandens kokybei. Tačiau gana didelė dalis Latvijos ūkininkų mano, kad žemės ūkio tarša tik 10 proc. prisideda prie bendros vandenų taršos, o 53 proc. Lietuvos ūkininkų galvoja, kad žemės ūkio įtaka sudaro 10–50 proc. bendros taršos.

Privalomų priemonių įgyvendinimo rezultatai

Ne visi apklausti ūkininkai savo ūkiuose jau įgyvendino privalomas aplinkos apsaugos priemones arba priemones, atitinkančias Pažangaus ūkininkavimo taisyklių reikalavimus.

2 lentelė. Respondentų, kurie jau įgyvendino privalomas priemones arba priemones, atitinkančias Pažangaus ūkininkavimo taisyklių reikalavimus, atsakymų pasiskirstymas (proc.)

Priemonė	Latvija (proc.)	Lietuva (proc.)
Aplinkos apsaugos reikalavimus atitinkančios mėšlo saugyklos	43,0	60,9
Aplinkos apsaugos reikalavimus atitinkančios srutų saugyklos	21,5	65,6
Aplinkos apsaugos reikalavimus atitinkantys tręšimo planai	63,6	32,5
Aplinkos apsaugos reikalavimus atitinkančios tręšimo normos	84,3	87,7
Tręšimas tinkamu laiku	83,6	95
Žiemojančių (žieminių ir daugiamečių) augalų sėja žiemai (kaip rekomenduojama Pažangaus ūkininkavimo taisyklėse ir patarimuose	77	32,0
Priešerozinė sėjomaina kalvoto reljefo žemėje (kaip rekomenduojama Pažangaus ūkininkavimo taisyklėse ir patarimuose	32	22

Prasčiausi yra mėšlo ir srutų saugyklų įrengimo bei tręšimo planų parengimo priemonių įgyvendinimo rezultatai. Panašu, kad pagrindinė priežastis, neleidusi sėkmingai įgyvendinti šių priemonių, yra aukšta jų įgyvendinimo kaina.

Kitų privalomų priemonių, tokių kaip aplinkos apsaugos reikalavimus atitinkančių tręšimo normų taikymas ar tręšimas tinkamu laiku, įgyvendinimo lygis yra gana aukštas abiejose šalyse, tačiau vis tiek dar nesiekia 100 proc.

Pažangaus ūkininkavimo taisyklių reikalavimus įgyvendino maža dalis ūkininkų, išskyrus žiemojančių augalų sėją žiemai, – šią priemonę taikė 77 proc. Latvijos respondentų.

Abiejų šalių ūkininkai teigė, kad nacionalinė finansinė parama aplinkos apsaugos priemonėms įgyvendinti buvo nepakankama ir tai buvo pagrindinė priežastis, dėl ko jie nesilaikė reikalavimų. Taip pat kaip gana svarbią priežastį Lietuvos ūkininkai nurodė per didelius biurokratinius trukdžius kompensacijoms gauti. Tie Lietuvos ūkininkai, kurie taiko privalomas priemones ir priemones, atitinkančias Pažangaus ūkininkavimo taisyklių reikalavimus, pažymėjo, kad tai galėjo padaryti dėl to, jog gavo paramą iš Europos Sąjungos. Šias priemones įgyvendinę Latvijos ūkininkai kaip pagrindinę jų taikymo priežastį nurodė aplinkosauginį aspektą.

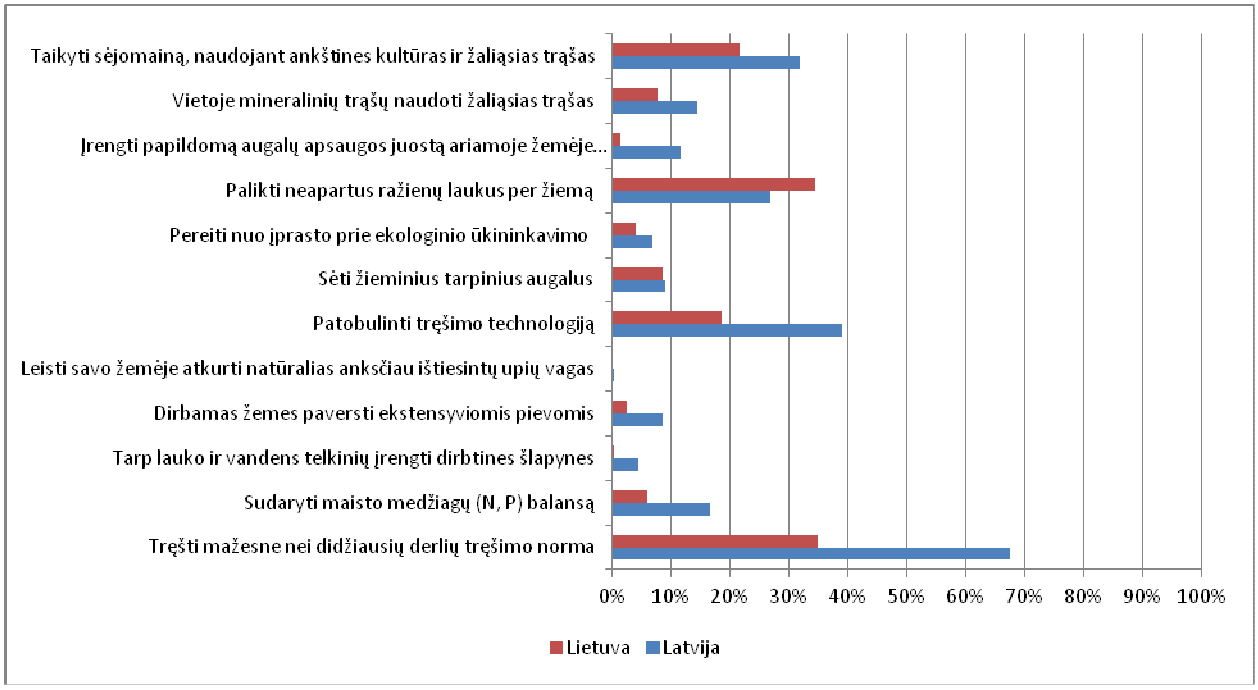
Ūkininkai taip pat pripažino, kad jiems vis dar trūksta informacijos apie aplinkos apsaugos reikalavimus ir apie vietines aplinkos apsaugos problemas.

Ūkininkų nuomonė apie įvairių aplinkos apsaugos priemonių efektyvumą

Apklaustų Latvijos ir Lietuvos ūkininkų nuomonė dėl įvairių aplinkos apsaugos priemonių efektyvumo buvo gana panaši. Didžioji dalis abiejų šalių Lielupės ir Ventos ūkininkų efektyviausiomis priemonėmis įvardijo mėšlo ir srutų saugyklų įrengimą, tręšimo technologijų patobulinimą, mažesnių tręšimo normų taikymą ir tręšimo planų parengimą bei įgyvendinimą. Pažymėtina, kad ir specialistai tręšimo technologijų patobulinimą bei tręšimo planų parengimą įvertino kaip labai naudingas priemones.

Papildomų priemonių įgyvendinimas

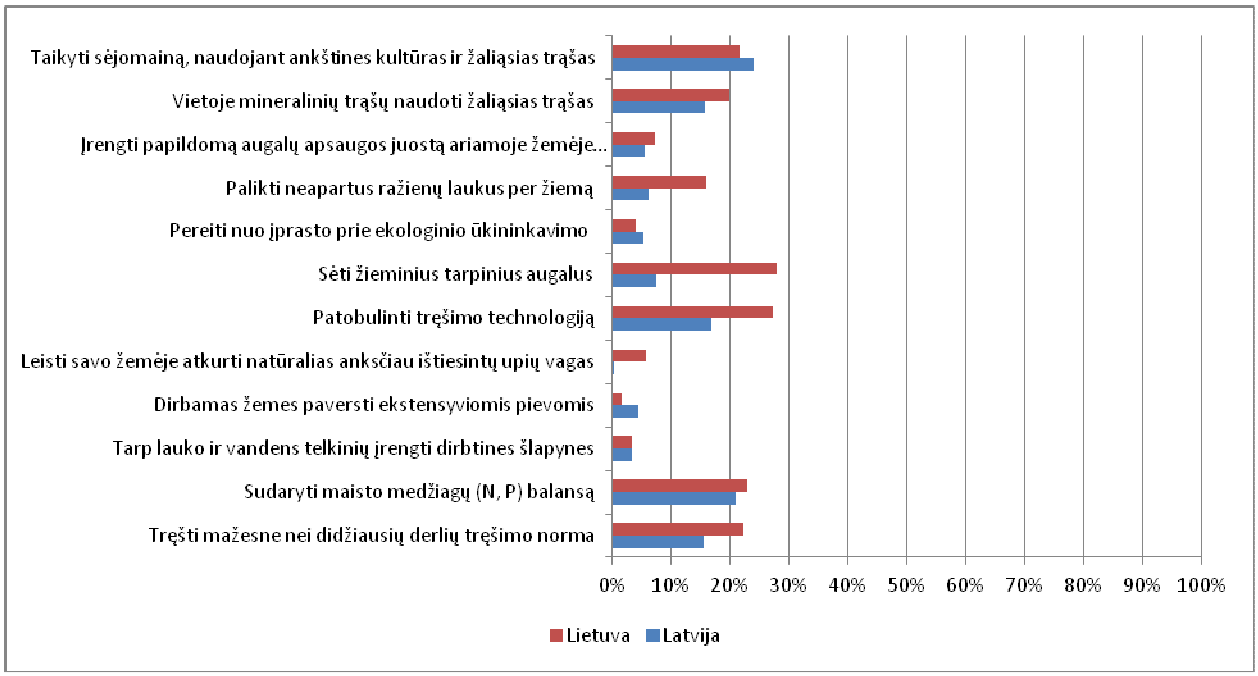
Apklausos rezultatai atskleidė, kad Latvijoje daugiau ūkininkų nei Lietuvoje jau yra įgyvendinę papildomas priemones.



1 paveikslas. Respondentų, kurie jau įgyvendino įvairias papildomas aplinkos apsaugos priemones, atsakymų pasiskirstymas

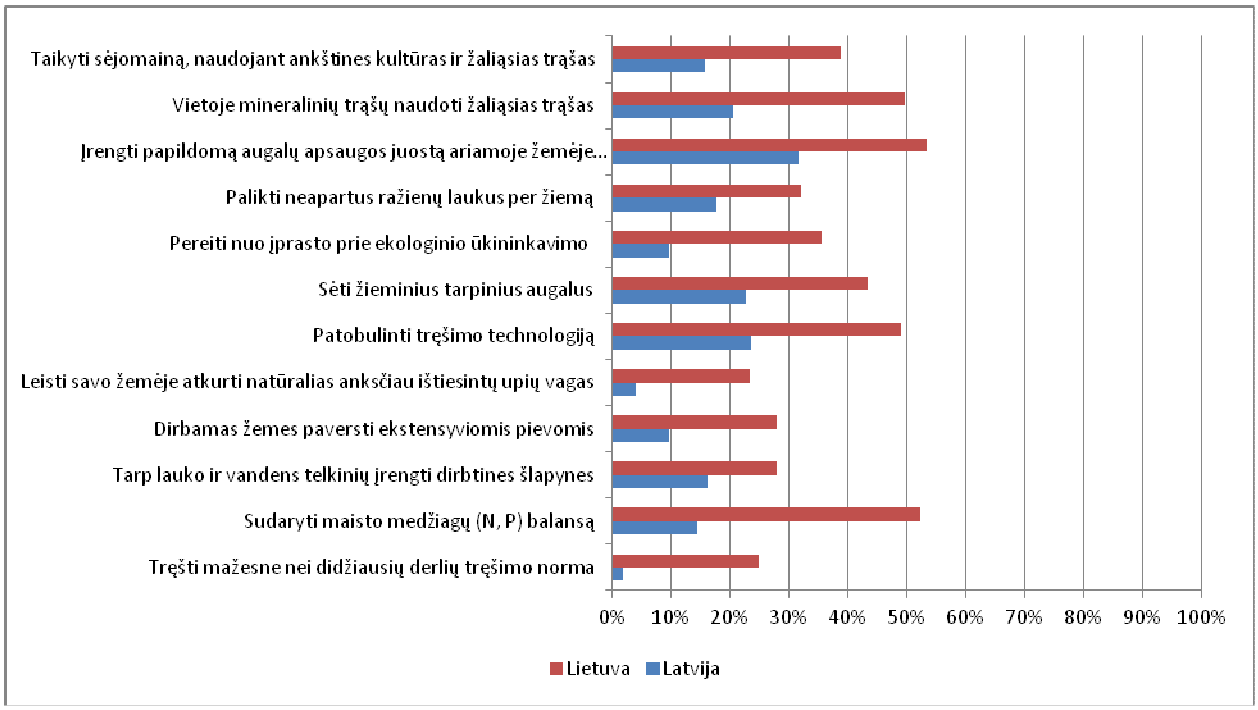
Populiariausia priemonė tarp Latvijos ir Lietuvos ūkininkų buvo tręšimas mažesnėmis nei didžiausių derlių tręšimo normomis (ją įgyvendino atitinkamai 67 proc. ir 35 proc. respondentų). Maždaug trečdalis Latvijos ūkininkų patobulino tręšimo technologijas, pritaikė sėjomainą ir įsigijo tręšimo planus. Maždaug trečdalis Lietuvos ūkininkų tręšia mažesnėmis normomis ir per žiemą palieka neapartus ražienų laukus.

Atsakymų dėl noro įgyvendinti papildomas priemones analizė parodė, kad didžioji dalis Latvijos ūkininkų taikytų sėjomainą ir sudarytų maisto medžiagų balansą (24 proc. respondentų), net jei ir negautų už tai kompensacijų. Lietuvos ūkininkai labiausiai būtų linkę sėti žieminius tarpinius augalus (28 proc. respondentų) ir patobulinti tręšimo technologijas (27 proc. respondentų).



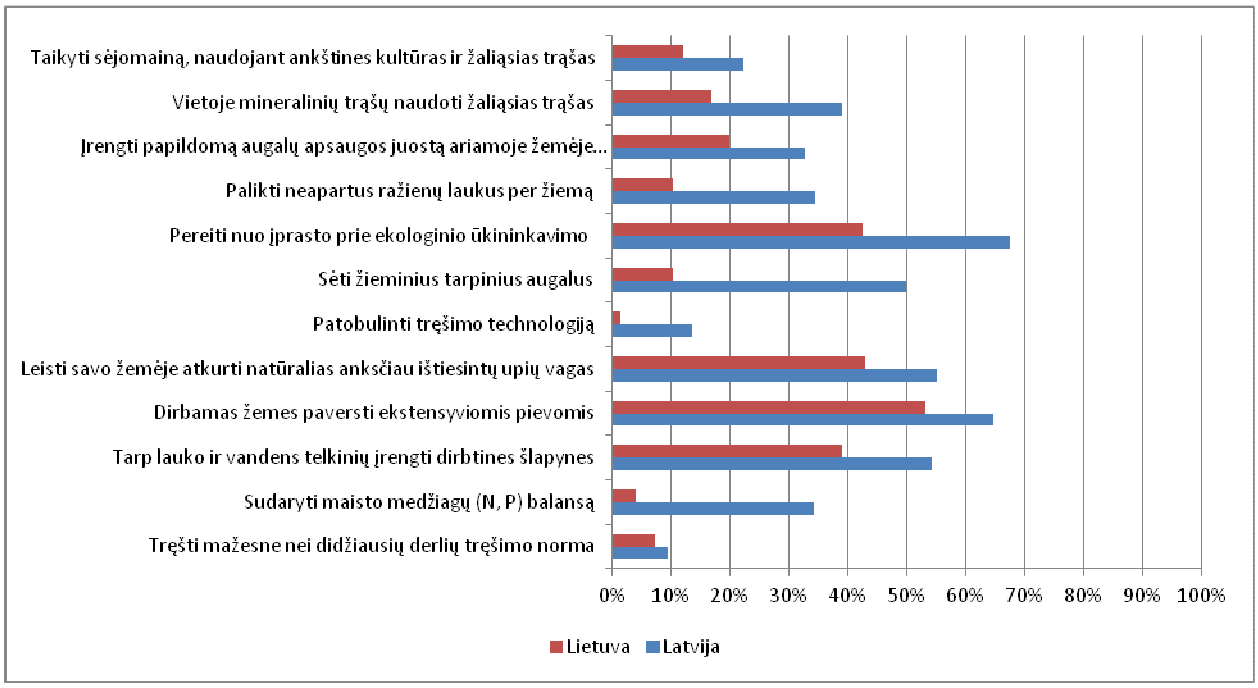
2 paveikslas. Respondentų, kurie sutiktų įgyvendinti įvairias papildomas aplinkos apsaugos priemones, atsakymų pasiskirstymas

Lietuvos ūkininkai apskritai yra labiau nusiteikę įgyvendinti aplinkos apsaugos priemones, jei už tai gautų kompensacijas. Dalis tų Lietuvos respondentų, kurie išreiškė norą įgyvendinti aplinkos apsaugos priemones, viršijo Latvijos respondentų skaičių pagal visus papildomų priemonių, kurias jie sutiktų taikyti, tipus. Toks rezultatas galėtų būti paaiškintas tuo, jog Latvijos ūkininkai nėra tikri dėl kai kurių priemonių efektyvumo (pavyzdžiui, papildomų augalų apsaugos juostų įrengimo išilgai vandens telkinių, neapartų ražienų laukų palikimo per žiemą ir dirbtinių šlapynių įrengimo tarp laukų ir vandens telkinių). Taip pat jie nenori mažinti dirbamos žemės plotų, nebūdami įsitikinę, kad šios įgyvendintos priemonės turės teigiamų pasekmių aplinkai. Be to, finansinė parama paprastai nepadengia priemonių įrengimo bei išlaikymo išlaidų. Priemonė, kurią sutiktų įgyvendinti didžioji dalis Lietuvos (53 proc.) ir Latvijos (32 proc.) ūkininkų, jei už tai gautų kompensaciją, yra papildomų augalų apsaugos filtracinių juostų ariamoje žemėje išilgai upių, upelių ir ežerų įrengimas.



3 paveikslas. Respondentų, kurie sutiktų įgyvendinti įvairias papildomas aplinkos apsaugos priemones, jei gautų kompensacijas, atsakymų pasiskirstymas

Didesnė dalis Latvijos ūkininkų, palyginti su Lietuvos, parodė nenorą įgyvendinti papildomas priemones. Daugiau nei pusė apklaustų ūkininkų nesutiktų pereiti nuo įprasto prie ekologinio ūkininkavimo, dirbamas žemes paversti ekstensyviomis pievomis, leisti savo žemėje atkurti natūralias anksčiau ištiesintas upių vagas, tarp lauko ir vandens telkinių įrengti dirbtines šlapynes ir žiemai sėti tarpinius augalus (50–65 proc. respondentų). Maždaug trečdalis ūkininkų nesutiktų vietoje mineralinių trąšų naudoti žaliąsias trąšas, palikti neapartus ražienų laukus per žiemą, sudaryti maisto medžiagų balansą (33–39 proc. respondentų). Daugiau kaip pusė Lietuvos ūkininkų nesutiktų dirbamas žemes paversti ekstensyviomis pievomis (53 proc. respondentų), daugiau kaip trečdalis neleistų jų žemėje atkurti natūralias anksčiau ištiesintas upių vagas, nesutiktų pereiti nuo įprasto prie ekologinio ūkininkavimo, tarp lauko ir vandens telkinių įrengti dirbtines šlapynes (43–39 proc. respondentų) ir t. t.



4 paveikslas. Respondentų, kurie nesutiktų įgyvendinti įvairių papildomų aplinkos apsaugos priemonių, atsakymų pasiskirstymas

Išvados ir rekomendacijos

Remiantis specialistų ir ūkininkų apklausos rezultatais, galima daryti tokias išvadas ir teikti rekomendacijas vandens telkinių kokybei gerinti:

- Mineralinių trąšų naudojimas Lietuvoje nereglamentuojamas; tai yra labai svarbus žemės ūkio taršos mažinimo sistemos trūkumas.
- Lietuvoje esančiuose Lielupės ir Ventos UBR trūksta mišraus ūkininkavimo (augalininkystės ir gyvulininkystės) ūkių. Čia augalininkystė yra labiausiai paplitusi ūkininkavimo forma, dėl to žemės ūkio veikla yra nesubalansuota, per daug tarši.
- Aplinkos apsaugos priemonių įgyvendinimas reikalauja integralaus požiūrio. Trūksta naudos, kurią būtų galima gauti taikant Kaimo plėtos programos palaikymo priemones, įvertinimo aplinkos apsaugos kontekste.
- Trūksta tinkamos apskaitos dėl Ventos UBR esančių žvejybos tvenkinių sukeliamos taršos. Būtina turėti išsamesnę informaciją apie žuvims pateiktų pašarų kiekius, jų maistinę sudėtį, cheminių medžiagų žuvininkystės produktuose kiekius ir produkcijos apimtis.
- Taip pat reikia keisti apkrovos iš didelių gyvulininkystės ūkių ir biogeninių medžiagų išsiplovimo Lielupės UBR įvertinimo metodiką. Vertinti tik vidutinę metinę koncentraciją filtrate nėra teisingas būdas. Būtina įvertinti taršą skirtingais laikotarpiais, atsižvelgiant į vandens kiekį dirvožemyje tam tikrais metais.
- Trūksta ūkininkų mokymo ir švietimo. Jie turėtų daugiau sužinoti apie galimybes taikyti modernias technologijas, naujas aplinkos apsaugos priemones. Svarbu, kad ūkininkai būtų susipažinę su konkrečia padėtimi teritorijoje, kurioje jie vykdo savo ūkinę veiklą. Konsultavimo paslaugos turėtų būti pritaikytos vietovei ir vietos poreikiams.
- Turėtų būti gerinami kontroliuojančių institucijų ir ūkininkų santykiai. Kontroliuojančios institucijos turėtų daugiau patarti ir padėti ūkininkams. Kita vertus, daugiau kontrolės reikia augalų vegetacijos laikotarpiu, kai naudojami pesticidai.

- Daugiau dėmesio turi būti skiriama srutoms iš kiaulių fermų valdyti.
- Politinės valios stoka vis dar dažnai yra svarbi kliūtis aplinkos kokybei žemės ūkio sektoriuje gerinti.
- Finansinė parama turėtų būti skiriama tik tiems ūkininkams, kurie atitinka Pažangaus ūkininkavimo taisyklių reikalavimus. Tačiau kartu turi būti sumažinti biurokratiniai trukdžiai kompensacijoms gauti.
- Faktinių trąšų ir pesticidų naudojimo kiekių apskaita turėtų būti gerokai patobulinta.
- Turėtų būti tęsiamos mokslo žinių ir mokslinių tyrimų veiklos, inicijuojamas ekologų ir agronomų bendradarbiavimas.
- Vandenų ir dirvožemio žemės ūkio sektoriuje turi būti plečiama stebėsena.

Projekto rezultatai yra labai svarbūs Lietuvos ir Latvijos aplinkos apsaugos institucijoms, atsakingoms už upių baseinų valdymą, ir turėtų prisidėti prie vandens kokybės Lielupės ir Ventos UBR gerinimo. Specialistų ir ūkininkų apklausos apie vandens taršos iš žemės ūkio mažinimo priemones rezultatai gali padėti pagrįsti upių baseinų rajonų planuose pateiktas agrarines aplinkos apsaugos priemones ir informuoti ūkininkus (visuomenę) apie žemės ūkio taršos svarbą bei šiai taršai įveikti skirtas priemones. Be to, apklausos suburia Latvijos ir Lietuvos specialistus ir suteikia esminę informaciją rengiant tarptautinius Lielupės ir Ventos vandens valdymo planus ateityje.

1. INTRODUCTION

Latvia and Lithuania share Lielupe and Venta river basins. Both countries contribute to the pollution of rivers therefore common actions are needed to combat the pollution and improve ecological status of water bodies. The EU Water Framework Directive 2000/60/EC requires managing waters on the basis of river basins. In 2010 River Basin District Management Plans (for the first six-year planning cycle) were prepared and approved in Latvia and Lithuania for the national parts of Lielupe and Venta River Basin Districts. Insufficient coordination between the countries left a number of water management issues to be resolved in the next cycles of the river basins management.

Agricultural pollution is one of the main pressures on water bodies in both Lielupe and Venta RBDs and both countries.

The task of the project was to carry out a large scale, well structured and scientifically based Survey of Farmers in Lithuanian and Latvian parts of Lielupe and Venta river basins to find out opinion of farmers on a feasibility and willingness to implement environmental measures. The survey itself also plays a significant role in informing public on the status of water environment and measures to improve it. Before this large-scale survey the Specialists Survey was conducted to investigate opinion of specialists on agri-environmental measures and get professional background for the Farmers Survey.

Outputs of the project are of great interest for Lithuanian and Latvian environmental authorities, responsible for river basin management and will contribute to the improvement of the water quality in the Venta and Lielupe river basin districts. Surveys of specialists and farmers on environmental measures to reduce water pollution from agriculture have a multiple effect. Results help to prioritise and justify agri-environmental measures in the river basin management plans and inform farmers (public) on the importance of agricultural pollution and measures to combat this pollution. Moreover, surveys bring Latvian and Lithuanian specialists together and provide key expertise for the development of international Lielupe and Venta RBMPs in the future.

This part of the broader LATLIT project “Monitoring of Rivers and Environmental Survey of Farmers in Lielupe and Venta River Basin Districts” was implemented by three partners: Center for Environmental Policy (LT), Latvian Rural Advisory and Training Centre and Lithuanian Agricultural Advisory Service.

2. DESCRIPTION OF VENTA AND LIELUPE RIVER BASINS

Venta is a river in north-western Lithuania and western Latvia. Its source is near Kuršėnai in the Lithuanian Šiauliai County. It flows into the Baltic Sea at Ventspils in Latvia. The basin area is 11,800 km² and 67% of it belongs to Latvia and 33% to Lithuania.

Venta River Basin District (RBD) consists of Venta, Bartuva and Šventoji subbasins in Lithuania and of Venta as well as of small rivers‘ subbasins entering both the Baltic Sea and Gulf of Riga including subbasins Barta and Irbe rivers in Latvia (***Figure 1***). Area of the Venta RBD in Lithuanian part is 6277,3 km^2 (9,6 % of the total area of the country), in Latvian part – 15625,24 km^2 (24,2 % of the total area of the country).

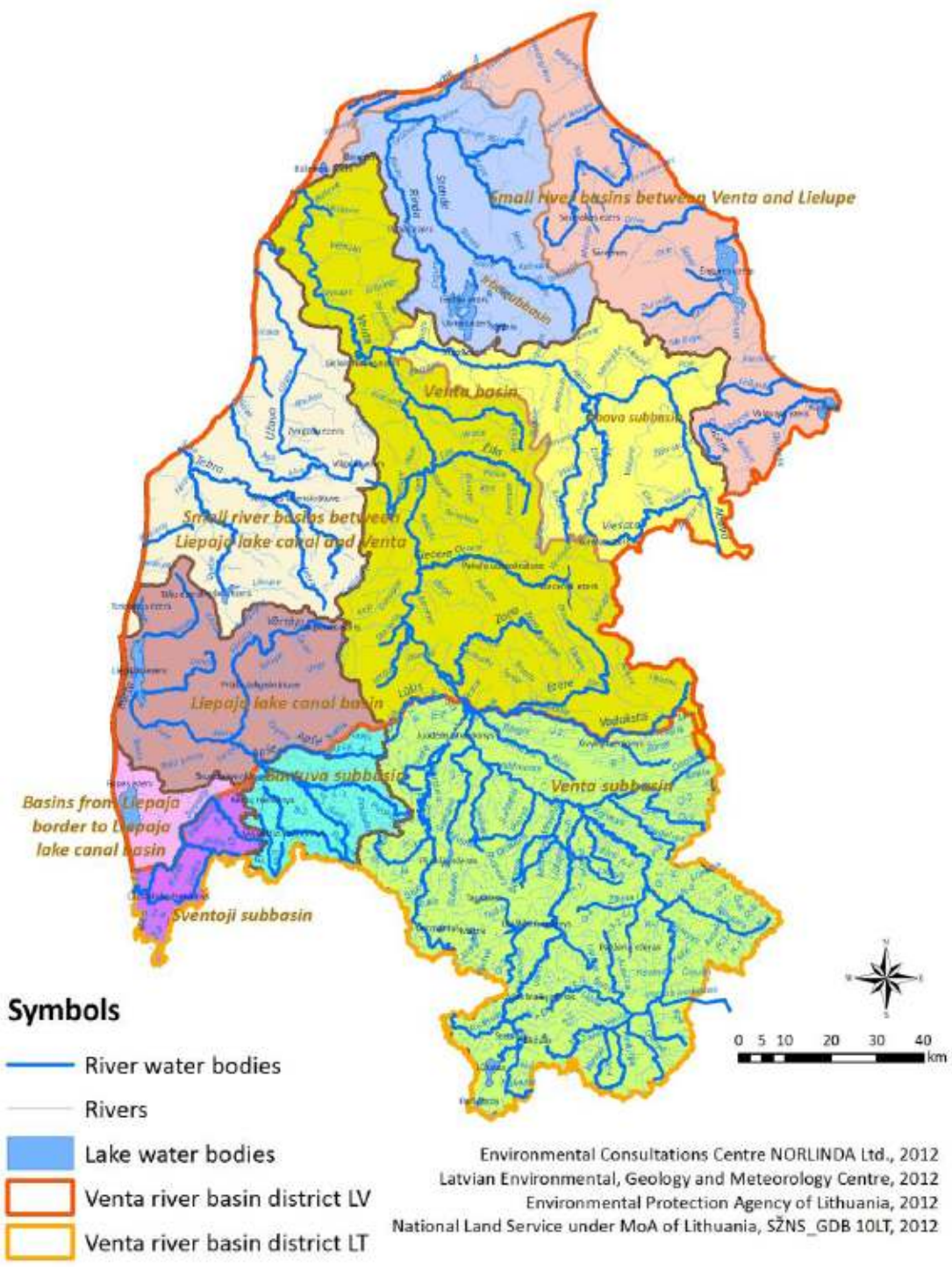


Figure 1. *Subbasins of the Venta RBD.* Source: Venta River Basin Cross Border Management Plan, 2012

Lielupe is a river in central Latvia. Its length is 119 km. The surface area of its basin is 17,600 km². Half of the basin belongs to Lithuania and half to Latvia. In Latvia Lielupe RBD comprises 13,4 % of the total area of the country and in Lithuania 13,7 % of the total area of the country. In the territory of Lithuania there are Musa, Nemunelis and Lielupe Small Tributaries subbasins.

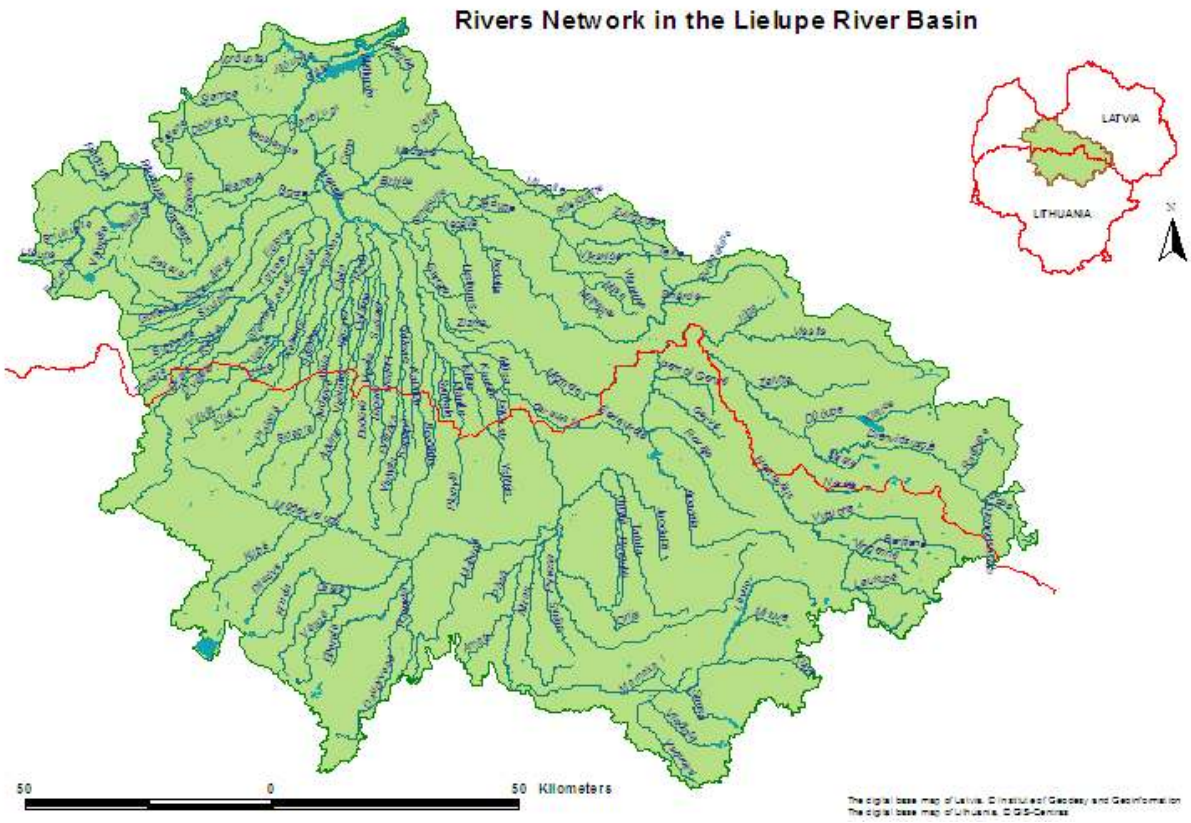


Figure 2. Rivers' network in Lielupe RBD. *Source: Latvian-Lithuanian Lielupe River Basin management plan, 2001*

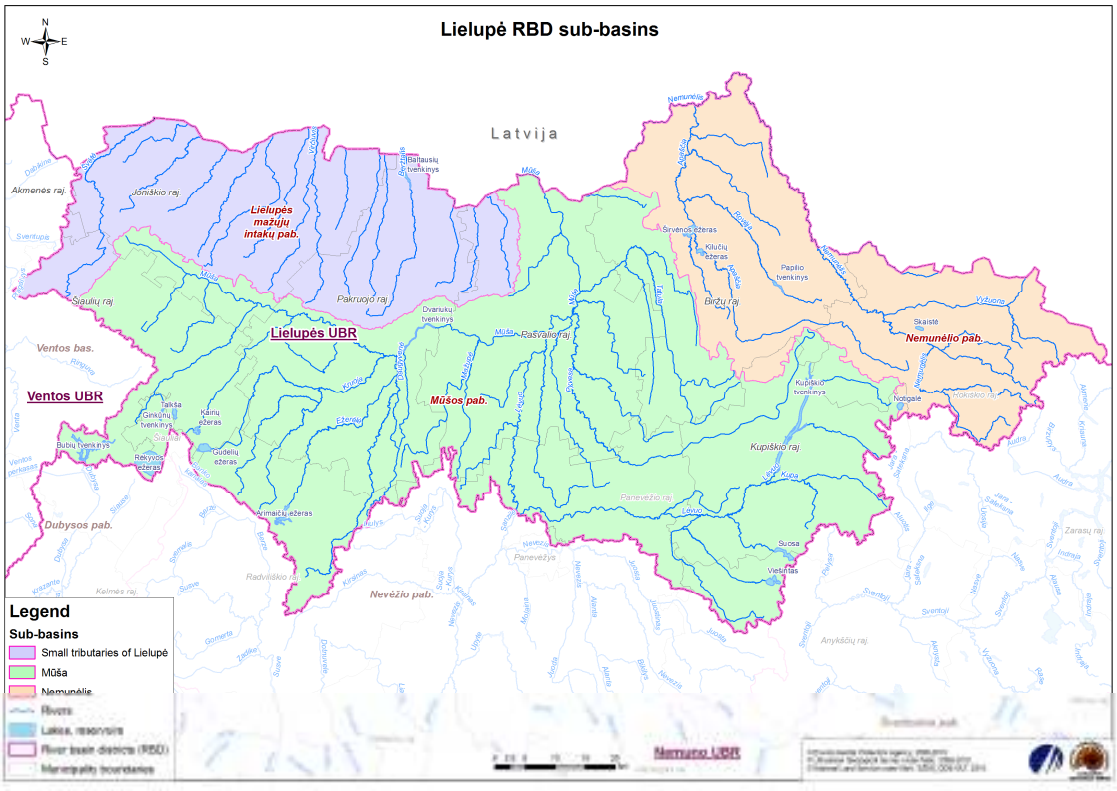


Figure 3. Lielupe RBD subbasins in Lithuanian territory. *Source: Lielupe river basin ditrict management plan, 2010*

Pressures on waters in Latvia and Lithuania are to some extent lower than the EU average. Low population density, large share of forests and unmodified floodplains together ensure moderate impact on the environment. However, agricultural pressure plays an important role; moreover, it is to some extent different in Latvia and Lithuania. In Latvia the percentage of agricultural land makes 38% (as indicated in the Report from the Commission on the implementation of the WFD) while in Lithuania, according to data from Statistics Lithuania, it makes 45% of the whole territory. In Venta and in particular Lielupe RBDs the share of agricultural land is higher than in average in both countries. For example, in Lithuania the largest part of the Venta RBD territory is covered by agricultural areas (65%), from which approximately 70 % are used for agricultural activities. On the contrary, Latvian part of the Venta RBD is mostly covered by forests (55 %) and agricultural areas are occupying a 40% of the land. Approximately 40 % of the agricultural area consists of arable land and other 60 % - of grassland and pastures.

Following the Water Framework Directive 2000/60/EC (WFD), the evaluation of status of all water bodies was carried out in 2010. According to WISE, out of 38 natural surface water bodies in Lielupe RBD in Latvia only 6 or 16% was of good ecological status. 42% of water bodies were assessed as being of bad ecological status. Significant pressure on 16% of water bodies comes from diffuse pollution.

In Venta RBD, Latvia, out of 89 natural surface water bodies 48 or 54% were of high or good ecological status. Here only 4% of water bodies are affected by significant pressure from diffuse sources.

In Lithuania the significant pressure from diffuse pollution in Lielupe RBD is higher. In Lielupe RBD out of 101 natural surface water bodies only 14 or 14% were of high or good ecological status. Here 75% of water bodies are influenced by significant pressures from diffuse sources.

In Venta RBD, Lithuania, out of 99 natural surface water bodies 47 or 48% were of high or good ecological status. 11% of water bodies are influenced by diffuse sources.

Agriculture has been estimated to be the major source of diffuse pollution in both countries (Table 1). In Latvia's Venta basin it is, though, less important than the pressures by point sources and river management.

Hydromorphological modifications due to drainage of agricultural lands (melioration) and diffuse pollution are mentioned as a significant pressures related to agriculture. The water use for agriculture is not indicated as a significant pressure.

Table 1. Number and percentage of surface water bodies affected by significant pressures

Latvia			**Lithuania**		
Pressure	Water bodies		Pressure	Water bodies	
	Number	Percentage		Number	Percentage
Venta RBD					
Water flow regulations and morphological alterations	9	9.38	Diffuse sources	14	11.29
Point sources	6	6.25	Point sources	3	2.42
River management	6	6.25	Water	2	1.61

			abstraction		
Diffuse sources	4	4.17			
Lielupe RBD					
Water flow regulations and morphological alterations	14	31.11	Diffuse sources	106	75.18
Diffuse sources	7	15.56	Point sources	14	9.93
Point sources	4	8.89			
River management	4	8.89			

Source: WISE

According to calculations made by the Latvian Environmental, Geology and Meteorology Centre, a significant part of diffuse nitrogen pollution comes from arable lands (42 %) and livestock farming (30 %). The main part of diffuse phosphorus pollution results from livestock farming (41 %) as well as forestry (21 %).

In Table 2 the main anthropogenic diffuse sources in the Venta RBD are presented.

Table 2. Relative impact of main diffuse pollution sources in the Venta RBD

Indicator	**Latvia**				**Lithuania**			
	Arable land, %	**Livestock farming, %**	**Forestry, %**	**Population, %**	**Arable land, %**	**Livestock farming, %**	**Forestry, %**	**Population, %**
Total nitrogen	**42** (1617 t/y)	**30** (1143 t/y)	**22** (842 t/y)	**6** (225 t/y)	**61** (15151.5 t/y)	**36** (8955.77 t/y)	**1** (181 t/y)	**2** (440.7 t/y)
Total phosphorus	**2** (2.94 t/y)	**38** (47.78 t/y)	**24** (31.04 t/y)	**36** (45.24 t/y)	**64** (2853.4 t/y)	**34** (1522.44 t/y)	**0** (6.7 t/y)	**2** (90.1 t/y)

Source: Venta River Basin Cross Border Management Plan, 2012

Potentially, in other countries the largest user of surface water in agriculture is irrigation. However, according to data of the Ministry of Agriculture of the Republic of Lithuania and the State Land Planning Institute, there were no areas irrigated with surface water in both Lielupė and Venta RBDs.

Lielupe RBD has the worst water quality compared to other river basin districts of both Latvia and Lithuania. Lielupe RBD encloses large areas of agriculturally cultivated lands belonging to the most fertile lands of both countries and diffuse agricultural pollution with nitrate nitrogen is one of the major sources of pollution. Without Latvian caused pollution, Lithuanian pollution enters the river as well, which is about 50 % of nitrogen and 30 % of the phosphorus total load[1].

Lithuanian part has higher average percentage of farmland. Cultivated agricultural land in the Mūša Sub-basin constitutes about 53%, in the Nemunėlis Sub-basin – about 48%, and in the

[1] *Ekonomika ir vadyba: aktualijos ir perspektyvos. 2011. 4 (24). P. 189-197*

Lielupe Small Tributaries Sub-basin – as much as 70% of the total area of the respective sub-basins. Arable land occupies the major part of the total agricultural land in all sub-basins. The share of arable land in the Nemunėlis Sub-basin totals to approximately 60%, in the Mūša Sub-basin – to around 73% and in the Lielupe Small Tributaries Sub-basin – to as much as 87% of the total declared agricultural land. Grasslands and pastures make up 23%, 40% and 13% of the total declared agricultural land in the Mūša Sub-basin, Nemunėlis Sub-basin and the Lielupė Small Tributaries Sub-basin, respectively. In Latvia approximately 49 % of all agricultural land is occupied by arable land.

Diffuse pollution loads entering the soil from different diffuse pollution sources in Lithuanian part of Lielupe RBD are summarised in Table 3 below. The table data demonstrates that pollution by non-sewered population accounts for a minor share of diffuse pollution. The main source of diffuse pollution is agriculture. It is estimated that up to 30% of diffuse total nitrogen and total phosphorus loads may be entering water bodies within the Lielupė RBD with animal manure.

Table 3. Diffuse pollution loads from different pollution sources in Lithuanian part of Lielupe RBD

Subbbasin	Total nitrogen, t/y			Total phosphorus, t/y		
	Manure	Mineral fertiliser	Population	Manure	Mineral fertiliser	Population
Lielupė	2 730.5	9 273	117.5	464.2	2 087.1	24.0
Mūša	7 625.7	17 955	414.6	1 296.4	3 795.2	84.8
Nemunėlis	1 962.2	4 924	91.5	333.6	939.2	18.7

Source: Lielupe river basin management plan, 2010

Mathematical modelling results, received for the WFD planning for 2010-2015, showed that concentrations of nitrate nitrogen fail good ecological status criteria due to agricultural pollution in all rivers of the Lielupė Small Tributaries Sub-basin: the concentrations, which are about 4-6 mg/l, exceed the good ecological status requirements (2.3 mg/l) two and more times. Concentrations of nitrate nitrogen in the Mūša Sub-basin are lower (3-4 mg/l) but still fail the good ecological status requirements. The impact of diffuse pollution is less significant in the Nemunėlis Sub-basin, where concentrations of nitrate nitrogen may be failing the good ecological status requirements only in one river – the Apaščia, but even here they are close to the limit value of good ecological status. The exceedance of the allowable concentrations of nitrate nitrogen in the rivers Laukupė and Nemunėlis in the Nemunėlis Sub-basin may be determined by the aggregate impact of point and diffuse pollution.

Diffuse pollution from agriculture cause significant pressures in particular in Lielupe RBD both in Latvia and Lithuania, thus understanding of farmers and willingness of them to implement agri-environmental measures reducing this pollution could be a very important factor in seeking better water quality and thus protecting environment from worsening.

3. SET UP OF THE SURVEY

3.1 Specialists' and Farmers' Surveys

During the project two types of surveys were conducted:

- Specalists' survey. 30 specialists / decision makers from Lithuanian and Latvian agricultural and environmental institutions were questioned.
- Farmers' survey. In total 602 farmers were surveyed in Latvia and Lithuania.

Specialists' survey was aimed at better understanding of how representatives of related authorities see agricultural pollution problems in Lielupė and Venta RBDs, what is their attitude toward various agri-environmental measures for the reduction of water pollution and how decisions on these measures would be taken. Target group of respondents comprised agricultural and environmental specialists representing law issuing and implementing institutions, such as ministries of agriculture and environment, Environmental Protection Agency in Lithuania, State Environmental Service in Latvia, regional environmental protection departments, county councils, municipalities, agricultural advisory services and training centres.

Another, farmers' survey was carried out among farmers of the pilot area, i.e. Lielupė and Venta RBDs in Latvia and Lithuania, seeking to understand their opinion on water protection and environmental protection in general, their understanding on their role in the improvement of the water quality, reasons for failing to implement environmental requirements, as well as their acceptability of various existing and potentially new agri-environmental measures.

Specialists and farmers were interviewed tete-a-tete seeking to obtain as informal answers as possible.

The respondents of the survey were selected from both Venta and Lielupė RBDs located in Latvian and Lithuanian parts. Results of the Specialists' Survey were taken into consideration while constructing questionnaire for the Farmers' Survey.

Results of the surveys are an important input in the development of the river basin management plans for the next river basin management cycle by 2021.

3.2 Sampling

3.2.1. Sampling of Specialists' Survey

Specialists of the main state and regional institutions and other science and training organisations, dealing with agriculture, were selected for the Specialists' Survey. The following organisations were represented during the Specialists Survey in Lielupe and Venta RBDs:

- Ministries of Environment of Latvia and Lithuania
- Ministries of Agriculture of Latvia and Lithuania
- State Environmental Service of Latvia
- Environmental Protection Agency of Lithuania
- Aleksandras Stulginskis (Agricultural) University (Lithuania)

- Latvian Rural Advisory and Training centre
- Lithuanian agricultural advisory service
- Chamber of Agriculture of the Republic of Lithuania
- Panevėžys and Šiauliai Regional Environmental Protection Departments
- Jelgava, Ozolnieki, Bauska and Kuldiga county councils
- Jelgava and Liepaja regional environmental services
- Municipalities

3.2.2. Sampling of Farmers' Survey

To ensure a representativeness during the Farmers' Survey, statistical data from Venta and Lielupe RBDs, received from the Lithuanian Statistics via a special request, was used for the construction of the sample of the Farmers' Survey. Data on types of farms (farmers' farms, family farms, agricultural companies, etc.), main activities (production of crop, livestock, production of crop and livestock), plots of cultivated lands and average number of livestock units in farms operating in related RBDs was the background for the selection of interviewees.

Data obtained from the Lithuanian Statistics and adjusted to the Survey categories are provided in Table 4.

Table 4. Percentage of farms according to type, activities, plot of farm tilth and livestock units in Lielupe and Venta RBDs in Lithuania, 2010

Indicator			**Lielupė RBD**	**Venta RBD**	**Lielupė/ Venta RBD**
Total number of farms - 48074 (100%)			49%	43%	8%
Percentage of farms according to type of farm		Farmers's farms	41,37%	36,26%	32,76%
		Family farms	58,02%	63,51%	66,64%
		Agricultural companies	0,33%	0,06%	0,16%
		Partnerships			
		Private investment companies	0,17%	0,12%	0,34%
		State enterprises	0,00%		0,03%
		Municipal enterprises			
		Cooperative companies	0,04%	0,02%	0,03%
		Individual enterprises	0,01%		
		Other enterprises	0,06%	0,03%	0,05%
Percentage of farms according to activities		Production of crop, %	49.9%	44.5%	51.9%
		Livestock, %	27.8%	36.3%	22.3%
		Production of crop and livestock, %	22.3%	19.2%	25.8%
Percentage of farms according to plot of a farm tilth	do not have	Number of farms	0,18%	0,08%	0,21%
		Plot of tilth, ha			
	(0-10)	Number of farms	73,91%	71,70%	79,63%
		Plot of tilth, ha	12%	21%	13%
	(10-20)	Number of farms	10,21%	14,51%	7,69%
		Plot of tilth, ha	6%	14%	5%
	(20-50)	Number of farms	7,59%	8,80%	5,49%
		Plot of tilth, ha	11%	19%	8%
	(50-200)	Number of farms	6,25%	4,27%	5,39%

		Plot of tilth, ha	25%	26%	24%
	(200-500)	Number of farms	1,35%	0,49%	1,07%
		Plot of tilth, ha	18%	10%	15%
	(500-1000)	Number of farms	0,26%	0,10%	0,31%
		Plot of tilth, ha	8%	5%	11%
	>=1000	Number of farms	0,25%	0,04%	0,21%
		Plot of tilth, ha	20%	4%	24%
	total	Number of farms	100,00%	100,00%	100,00%
		Plot of tilth, ha	530227	294525	79856
Percentage of farms according to number of livestock units in a farm	do not have	Number of farms	35,20%	33,33%	36,00%
		Number of livestock units			
	(0-5)	Number of farms	53,60%	48,62%	55,24%
		Number of livestock units	13,67%	19,07%	23,03%
	(5-10)	Number of farms	6,05%	8,74%	4,52%
		Number of livestock units	6,18%	13,18%	7,77%
	(10-300)	Number of farms	4,91%	9,26%	4,08%
		Number of livestock units	23,89%	59,98%	40,65%
	>=300	Number of farms	0,24%	0,04%	0,16%
		Number of livestock units	56,25%	7,77%	28,54%
	total	Number of farms	100%	100%	100%
		Number of livestock units	100%	100%	100%

Source: Data from Agricultural census in Lithuania, 2010, recalculated by the consultant

As it can be seen from Table 4, percentage of farms according to the plot of farm tilth and percentage of plot of farm tilth according to different groups of farms does not coincide. For example, in Lielupe RBD number of farms having less than 10 ha of cultivated land comprises 74% of all farms, however, the plot they hold makes only 12% of all cultivated land. Vice versa, big farms over 1000 ha make only 0,25% of overall number of farms, but hold 20% of cultivated land.

Therefore, selection of farms of different categories to be surveyed was not straightforward.

Tables 5 and 6 provide information on the theoretical number of farms according to type of farms and farm activities adapted to the number of Lithuanian farmers (300) to be questioned.

Table 5. Theoretical number of farms to be surveyed in Lithuania according to type of farms and farm activities

Indicator	**Category**	**Lielupė RBD**	**Venta RBD**	**Lielupė/Venta RBD**
Total number of farms	300	146	130	24
Number of farms according to type of farm	Farmers's farms	60	47	8
	Family farms	85	83	16
	Agricultural companies	0.5	0.1	0.04
	Partnerships	-	-	-
	Private investment companies	0.2	0.1	0.1
	State enterprises	0.01	-	0.01
	Municipal enterprises	-	-	-
	Cooperative companies	0.1	0.03	0.01

	Individual enterprises	0.02	-	-
	Other enterprises	0.1	0.04	0.02
Number of farms according to farm activities	Production of crop	73	58	12
	Livestock	41	47	5
	Production of crop and livestock	33	25	6

Table 6. Theoretical number of farms according to plot of farm tilth and number of livestock units in a farm and number of farms based on the percentage of plot of farm tilth and livestock units in different categories of farms, to be surveyed in Lithuania

Indicator	Category	Lielupė RBD	Venta RBD	Lielupė/ Venta RBD	Indicator	Category	Lielupė RBD	Venta RBD	Lielupė/ Venta RBD
Total number of farms	300	146	130	24	Total number of farms	300	146	130	24
Number of farms according to plot of farm tilth	Less than 10 ha	108	93	19	Number of farms based on the percentage of plot of farm tilth according to different groups of farms	Less than 10 ha	17	27	3
	10-20 ha	15	19	2		10-20 ha	9	19	1
	20-50 ha	11	11	1		20-50 ha	16	25	2
	50-200 ha	9	6	1		50-200 ha	37	34	6
	200-500 ha	2	0,6	0,3		200-500 ha	26	14	4
	500-1000 ha	0,4	0,1	0,1		500-1000 ha	12	6	3
	More than 1000 ha	0,4	0,0	0,1		More than 1000 ha	29	6	6
Number of farms according to number of livestock units in a farm	Less than 5 LU	130	107	22	Number of farms based on the percentage of livestock units in farms	Less than 5 LU	20	25	6
	5-10 LU	9	11	1		5-10 LU	9	17	2
	10-300 LU	7	12	1		10-300 LU	35	78	10
	More than 300 LU	0,3	0,1	0,0		More than 300 LU	82	10	7

It can be seen that, based on different criteria, number of farms of different categories to be surveyed is very different. For example, if we select criteria of number of farms falling in the category "Less than 10 ha", 108 farms would need to be surveyed in Lielupė RBD. However, if we select criteria of plot of land, which farms less than 10 ha hold, only 17 farms would need to be questioned etc.

The interviewers were suggested being flexible and select number of farms to be surveyed based on both 1) number of farms and 2) overall plot and livestock unit criteria, using simple average. Thus, number of respondents in certain categories of farms should be within the intervals provided above, i.e., for example, within category of farms having 10-300 livestock units in Lielupė RBD approximately 21 farm could be questioned (this is simple average of 7 and 35).

Table 7 presents number of farms to be surveyed in accordance with the approach described above.

Table 7. Agreed number of farms of different categories to be surveyed in Lithuania

Indicator	Category	Lielupė RBD	Venta RBD	Lielupė/ Venta RBD
Total number of farms	300	146	130	24
Number of farms according to type of farm	Farmers' farms	58	45	6
	Family farms	82	81	13
	Agricultural companies	1	1	1

	Partnerships	-	-	-
	Private investment	1	1	1
	State enterprises	1	-	1
	Municipal enterprises	-	-	-
	Cooperative companies	1	1	1
	Individual enterprises	1	-	-
	Other enterprises	1	1	1
Number of farms according to farm activities	Production of crop	73	58	12
	Livestock	41	47	5
	Production of crop and livestock	33	25	6
Number of farms according to plot of farm tilth	Less than 10 ha	63	60	11
	10-20 ha	12	19	2
	20-50 ha	13	18	2
	50-200 ha	23	20	4
	200-500 ha	14	7	2
	500-1000 ha	6	3	1
	More than 1000 ha	15	3	3
Number of farms according to number of livestock units in a farm	Less than 5 LU	75	66	14
	5-10 LU	9	14	1
	10-300 LU	21	45	5
	More than 300 LU	41	5	3

The above approach was discussed among project specialists and it was agreed that this was just a preliminary interpretation of statistical data to be applied for the Survey and it would not be possible to exactly meet all the criteria, so the above table was indicative. Real numbers of farmers questioned would be different.

3.3 Questionnaire design

The questionnaire for specialists contained eight questions about:

- Main problems, related to agricultural pollution in Lithuania and Latvia in general and specifically in Lielupė and Venta river basin districts.
- Pollution management measures currently in place and their effectiveness.
- Most important part of the questionnaire was targeted at sorting out whether existing measures are sufficient to combat agricultural pollution and what supplementary measures could be applied in the case they are not sufficient.
- The latter question contained the list of various possible supplementary measures.

Specialists expressed their opinion on the applicability of those measures in Lithuania or Latvia, as well as recommended other measures. They also provided other comments, requests or suggestions regarding the agricultural pollution management issues in Venta and Lielupė river basins.

The questionnaire for farmers contained 30 questions about:

- their socio-economic background,
- types and activities of farms,
- water pollution problems,
- role of farmers in water pollution,
- application of agri-environmental measures,
- barriers preventing the successful implementation of environmental requirements,
- farmer's opinion about the effectiveness of agri-environmental measures for reduction of water pollution
- farmer's acceptability of new agri-environmental measures.

The average time of the interview was 40 minutes.

4. SPECIALISTS SURVEY RESULTS

Specialists of various institutions (as listed in section 3.2.1.) were surveyed in order to understand how they see agricultural pollution problems in Lielupė and Venta RBDs, what is their attitude toward various agri-environmental measures for the reduction of water pollution and how decisions on these measures would be taken.

What are the main problems, related to the agricultural pollution in Lithuania/Latvia and Lielupė/Venta RBDs?

All the answers could be grouped into several blocks, as different types of problems of agricultural water pollution were indicated. Some answers were related to the final consequences of agricultural pollution, such as eutrophication, some to legal deficiencies, such as insufficient regulation of fertiliser use, some to behavioural aspects of farmers, such as inadequate attitude of farmers etc. The answers are summarized in a few blocks as follows:

1. Consequences of agricultural pollution:

1) Excessive amount of nutrients (nitrogen and phosphorus) reaching surface waters.
2) Eutrophication of water bodies and the Baltic Sea.
3) Soil degradation, erosion due to over-intensive agricultural activities and hence reduction of biodiversity.
4) Biodiversity loss not only due to intense agricultural activity, but also due to abandoned (uncultivated) land.
5) Decline of natural and semi-natural grassland areas and biodiversity loss.
6) Ambient air pollution with ammonia (NH3 and carbon dioxide (CO2) (this was mentioned by one respondent).

2. Legal and control block:

7) Lack of regulation of the use of mineral fertilisers.
8) Collaboration between ecologists and agronomists should be ensured when setting the environmental standards.
9) Insufficient protection belts (zones) along watercourses.
10) Complicated control of diffuse pollution.

3. Technological block:

11) Problems with existing manure/slurry storages and spreading equipment: lack of the capacity; if exist, not comply with environmental requirements; equipment outdated.

4. Behavioural, research and information block:

12) Lack of scientific research on the topic
13) Lack of soil agrochemical analyses
14) Lack of information on fertilisers and their composition. Farmers are not obliged to report the amount of used fertilisers.
15) Agricultural pollution is not properly assessed, therefore there are no specific measures defined.
16) Lack of knowledge on agri-environmental measures.

17) Inadequate attitude and inappropriate behaviour of farmers, mostly related to the unbalanced use of fertilisers (inadequate application time, location and quantities).
18) Lack of public information.
19) Lack of information on pesticides use.
20) Lack of professionals issuing fertilisation plans. More intensive involvement of agronomists is required.

In addition, domestic wastewater of non sewered inhabitants was noted as a problem related to diffuse pollution.

It is interesting that there was an answer about "excessive" requirements of the EU, meaning that farmers of Lithuania and Latvia cannot compete with farmers from other (third) countries, where these requirements are not in effect.

Main agricultural pollution management measures in effect in Lithuania/Latvia and in Lielupe/Venta RBDs.

Most respondents mentioned requirements in accordance with the Nitrates Directive and related measures, such as fertilisation plans, manure and slurry storages, fertilisation norms, proper time for fertilisation, water protection belts and zones, optimisation of animal density, etc.

Usage of authorised plant protection products, more stringent requirements in karst region, crop rotation, requirements for farms to declare fields for application of manure, limitations for application of liquid manure, water management plans, IPPC permits; environmental monitoring, requirements for mineral fertiliser use (in crop production farms), chemicals use accounting (for those farmers who get support), stubble field in winter period and organic farming, catch crops, construction of biogas factories, measures for wastewater pollution and flood risk reduction were also mentioned, however, some of these measures/requirements are not really mandatory.

Most Latvian specialists noted that all Lielupe river basin district in Latvia, in contrary to Venta RBD, is designated as a nitrate vulnerable zone and thus more stringent requirements are in effect there in comparison to the requirements for the Venta RBD in Latvia. Some specialists listed these requirements very precisely.

In general, it could be concluded that not all specialists working in the agricultural sector could distinguish the mandatory, i.e. existing, measures/requirements for reduction of agricultural pollution and the potential ones.

Are the existing measures sufficient to combat the agricultural pollution in Venta and Lielupė RBDs?

Nine specialists out of 32 told the existing agri-environmental measures were sufficient to combat agricultural pollution and the rest two thirds were claiming that more measures would be needed.

What measures would you like to see in the list of supplementary measures, required for the reduction of agricultural pollution? Specialists had to rate the usefulness of a proposed measure specifying whether it would be not useful, to some extent useful or highly useful.

The following table presents opinion of specialists on the potential supplementary measures.

Table 8. Opinion of respondents (those who think existing measures are not sufficient) on the usefulness of potential supplementary measures, - number of respondents

Measure	Not useful*	Could be useful*	Highly useful*
Improve fertilisation technology (improved fertilisation technology can reduce nutrient leakage into waters)		3	20
Develop and implement fertilisation plans according to the approved Methodology for the Development of Fertilisation Plans.		4	19
Establish a 5 m wide additional vegetation buffer zone, located on an arable field next to watercourse (stream, river or lake). (Buffer zones may reduce losses of mineral nutrients and prevent contamination of water with pesticides which are spread on the field.)		7	15
Plant sandy and mixed land with catch crops (catch crops uptake nutrients, therefore after harvesting main crops lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest.	2	10	10
Prepare nutrients (nitrogen and phosphorous) balance, allowing long term planning of fertiliser use (when fertilisation plans are not developed)	2	13	8
Replace mineral fertilisers with green manure crop for improving soil fertility and plant growing conditions	4	9	8
Leave unploughed fields with crop stubbles over the winter	4	11	7
Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds in your fields (after re-meandering rivers usually become longer resulting in better conditions for the self-purification)	8	6	6
Convert from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm)	7	11	4
Construct artificial wetlands between fields and water bodies (wetlands can help to capture nutrients from agriculture run-off before entering water bodies)	2	16	3
Convert cultivated fields into extensive grassland (this measure reduces nutrients' leakage to waters due to lower inputs in the soil)	9	10	3
Apply reduced fertilisation norms compared to optimal norms	11	10	1

*-Note that not all respondents answered to all sub-questions on each proposed measure

Specialists suggested other potential new measures:

1) use of probiotics to improve soil properties and to reduce amount of required fertilisers;
2) monitoring system for water quality in all rivers;
3) mandatory fertilising plans for large farms;
4) farmers education is very important;
5) improved rules and control for slurry spreading in large animal farms;
6) take into consideration crop rotation and include in crop rotation legumines and green manure crop.

These measures were taken into consideration while constructing questionnaire for Farmers Survey. Moreover, specialists indicated some problems which need to be paid attention at while developing strategies on agri-environmental measures:

- The mineral fertilisers' usage in Lithuania is not regulated; this is a very important drawback in the system of agricultural pollution reduction.
- In Lithuanian part of Lielupe and Venta RBDs there is a lack of mixed crop and animal farming. Crop production is the most common.
- Implementation of agri-environmental measures requires an integral approach. There is lack of the evaluation of environmental benefits that could be achieved through supportive measures under the Rural Development Programme.
- Needed proper accounting of pollution rising from fishing ponds in Venta RBD. It is necessary to have more detailed information on amount of feed supplied to fish, its nutritional composition, concentration of chemical substances in fisheries production and quantities of production.
- There is also a need to change methods for the assessment of the load from large livestock farms and of biogens' leaching in Lielupe RBD. Evaluation of only annual average leachate concentrations is not correct way. It is necessary to evaluate pollution in different periods taking into consideration the water content in the soil during the certain year.
- There is a lack of training and education of farmers. They should learn more about modern technologies application opportunities. It is important that farmers are acquainted with the specific situation in a particular area where they conduct farming activities. It was noted that short clips on TV would be a powerful instrument.
- Relationship between controlling authorities and farmers should be improved, focusing on advising and supportive character of such a relationship. On the other hand, more control should be secured in vegetation periods when pesticides are being spread.
- More attention should be paid at slurry problem of pig farms.
- Lack of political will is still often an important obstacle for environmental improvements in the agricultural sector.
- Financial support should be awarded only to farmers who meet requirements of good agricultural practices.
- Information, accounting of actual quantities of fertilisers and pesticides should be considerably improved.
- Scientific knowledge and research activities should be extended; collaboration between ecologists and agronomists initiated.
- Monitoring of water and soil in agricultural area needs to be broadened.

It was interesting that there was an opinion of a specialist, who to some extent "justified" agricultural pollution saying that "it is better to use fertilisers and pesticides here than to eat

chemisized products from abroad", i.e. it was suggested to find a middle way for fertiliser and pesticide use and conservation of water resources.

5. FARMERS' SURVEY RESULTS

5.1 Descriptive statistics of the sample

Majority of respondents in both RBDs in Latvia and Lithuania represented farmers' farms, the rest – family farms and agricultural companies. In Latvia partnerships and cooperative companies were represented as well. Respondents, occupied in the production of crop, comprised the greatest part in both RBDs. In Latvia, in Venta RBD, quite a significant part of respondents are involved in the production of both crop and livestock. Detailed statistics on respondents is provided in Table 9 below. It should be noted that some farms spread over both Lielupe and Venta RBDs, so such a category of farms was introduced as well, though making a very small portion of all farms surveyed.

Table 9. Number and percentage of the sample farms according to their type, activities, plot of farm tilth and livestock units in Latvia and Lithuania

Indicator	Group (type) of farm	Lithuania			Latvia		
		Lielupė RBD	Venta RBD	Lielupė/ Venta RBDs	Lielupė RBD	Venta RBD	Lielupė/ Venta RBDs
Total number of farms surveyed	302 Lithuania, 280* Latvia	176	87	39	149	127	4
		58.3%	28.8%	12.9%	53.2%	45.4%	1.4%
Number of farms according to type of farm	Farmers's farms	149	81	34	90	79	3
		84.7%	93.1%	87.2%	60.4%	62.2%	75.0%
	Family farms	23	6	5	46	34	1
		13.1%	6.9%	12.8%	30.9%	26.8%	25.0%
	Agricultural companies	4	0	0	0	0	0
		2.3%	0.0%	0.0%	0.0%	0.8%	0.0%
	Individual enterprises	0	0	0	1	2	0
		0.0%	0.0%	0.0%	0.7%	1.6%	0.0%
	Partnerships	0	0	0	12	10	0
		0.0%	0.0%	0.0%	8.1%	7.9%	0.0%
	Private, investment company	0	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Municipal enterprise	0	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cooperative company	0	0	0	0	1	0
		0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
	State and other enterprise	0	0	0		1	0
		0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
	Other	0	0	0	0	0	0
		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Number of farms according to farm activities	Production of crop	107	46	29	71	42	2
		60.8%	52.9%	74.4%	47.7%	33.1%	50.0%
	Livestock	8	4	2	24	37	0

	Production of crop and livestock	4.5%	4.6%	5.1%	16.1%	29.1%	0.0%
		61	37	8	54	48	2
		34.7%	42.5%	20.5%	36.2%	37.8%	50.0%
Number of farms based on the percentage of plot of farm tilth according to different groups of farms	Less than 10 ha	13	3	1	29	12	1
		7.4%	3.4%	2.6%	19.5%	9.4%	25.0%
	10-20 ha	19	5	6	22	19	0
		10.8%	5.7%	15.4%	14.8%	15.0%	0.0%
	20-50 ha	35	20	6	38	36	0
		19.9%	23.0%	15.4%	25.5%	28.3%	0.0%
	50-200 ha	72	39	17	34	43	1
		40.9%	44.8%	43.6%	22.8%	33.9%	25.0%
	200-500 ha	30	15	8	15	7	1
		17.0%	17.2%	20.5%	10.1%	5.5%	25.0%
	500-1000 ha	2	5	1	9	5	1
		1.1%	5.7%	2.6%	6.0%	3.9%	25.0%
	More than 1000 ha	5	0	0	2	5	0
		2.8%	0.0%	0.0%	1.3%	3.9%	0.0%
Number of farms based on the percentage of livestock untits in farms	Less than 5 LU	24	10	1	26	24	0
		13.6%	5.7%	0.6%	17.4%	16.1%	0.0%
	5-10 LU	13	6	1	20	18	0
		7.4%	3.4%	0.6%	13.4%	12.1%	0.0%
	10-300 LU	30	25	7	34	46	2
		17.0%	14.2%	4.0%	22.8%	30.9%	1.3%
	More than 300 LU	1	0	1	3	2	0
		0.6%	0.0%	0.6%	2.0%	1.3%	0.0%

* - 20 from 300 Latvian cases (questionaires) were removed after data review. In most cases these questionaires were found unreliable due to inconsistencies, illogical or missing answers.

In terms of land plots cultivated by farmers, the latter were asked to indicate a category (range) within which their cultivated land falls (for example, 20-50 ha, 200-500 ha, etc.). The exact area of cultivated land is not known, therefore it is difficult to indicate the total area, which fell under the Survey. It can be said, based on the minimum (if all farms falling in one category had the minimum number of hectares) and maximum (if all farms falling in one category had the maximum number of hectares) scenarios, that the Survey covered from 1.2 to 8.1 percent of the total agricultural land in the Venta and Lielupe RBDs.

Majority of respondents – 67 % in Latvia and 57 % in Lithuania – were not familiar with the river basin districts, their management plans and programmes of measures. The rate of respondents representing organic farming in both countries was low: approximately 6 % in Latvia and 5 % in Lithuania.

Surveyed farmers of both countries were rather experienced in farming (Figure 4).

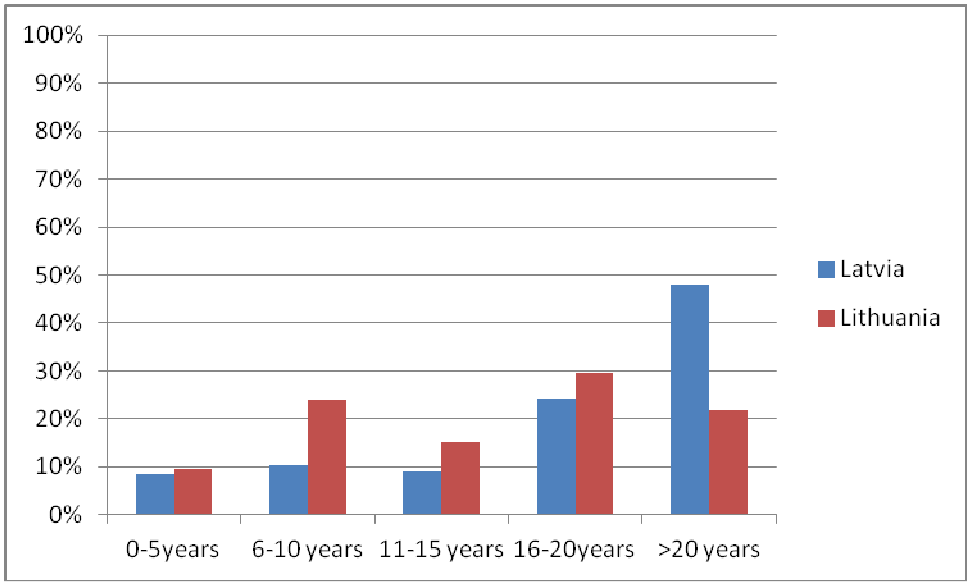


Figure 4. Farming experience among Latvian and Lithuanian farmers

Men comprised 66 % of all respondents in Latvia and 78 % in Lithuania. The mean age of Latvian respondents was 48,8 years, the median - 48,5 years; accordingly the mean and median ages of Lithuanian respondents was 44,6 and 45 years.

The size of households varies from one person to 14 in Latvia and up to seven in Lithuania. The average household size among Latvian respondents was 3,66 persons, among Lithuanian – 3,48 persons. Table 10 presents distribution of households according to their size in both countries.

Table 10. Distribution of household size among Latvian and Lithuanian respondents in the survey

Household size, persons	**Latvia**	**Lithuania**
1	8.6%	3.7%
2	22.5%	24.3%
3	19.6%	23.6%
4	22.5%	28.2%
5	10.4%	12.0%
6	8.6%	6.3%
7	6.1%	2.0%
8	1.1%	0.0%

12	0.4%	0.0%
14	0.4%	0.0%

Education of respondents varied from primary school to a university degree. Majority of them in both countries had a technical background (60.2 % of Latvian respondents and 58.3 % of Lithuanian respondents).

Table 11. Education level of Latvian and Lithuanian respondents

Level of education	Latvia	Lithuania
Primary school	0.7%	0.3%
Basic school	5.4%	1.7%
Secondary school	11.8%	12.6%
Technical school	60.2%	58.3%
University	21.9%	27.2%

Level of the average yearly household income was a sensitive issue to the respondents, nevertheless, majority of them stated their income within the scale proposed in the questionnaire. The percentage of Latvian respondents who did not agree to reveal their income was 32 % and of Lithuanian – almost 22 %. Distribution of respondents across the income classes is provided in Table 12.

Table 12. Distribution of the average yearly income of business or individual activity, which a respondent spends for his(her) household purposes

Yearly income, EUR	Latvia	Lithuania
Less than 580	2.2%	3.7%
581-1450	7.6%	8.6%
1451-2900	13.3%	9.3%
2901-5800	21.6%	14.6%
5801-11600	15.8%	20.3%
11601-20300	4.7%	9.6%
20301-29000	1.1%	6.6%
More than 29000	1.8%	5.3%
I do not want to respond	32.0%	21.9%

Quite some part of respondents had difficulties to separate income of their businesses which could be assigned to the direct income of their households.

5.2 Attitudes and use of water resources by farmers

This section of the questionnaire contained question about purposes for which respondents use water resources in Venta and/or Lielupė river basins.

5.2.1. Usage of water resources by farmers

Majority of Latvian respondents answered that they use water for drinking purposes: 75 % respondents of Venta and Lielupė/Venta RBDs and 58 % respondents of Lielupė RBD. Slightly lower percentage of

respondents, i.e. 54 % in Lielupė RBD and 47 % in Venta RBD like to go to water sites for swimming. 48 % respondents from Lielupė RBD and 46% from Venta RBD use water for spraying on their fields. The lowest percentage of respondents fish and irrigate fields. Distribution of Latvian answers is provided in Figure 5.

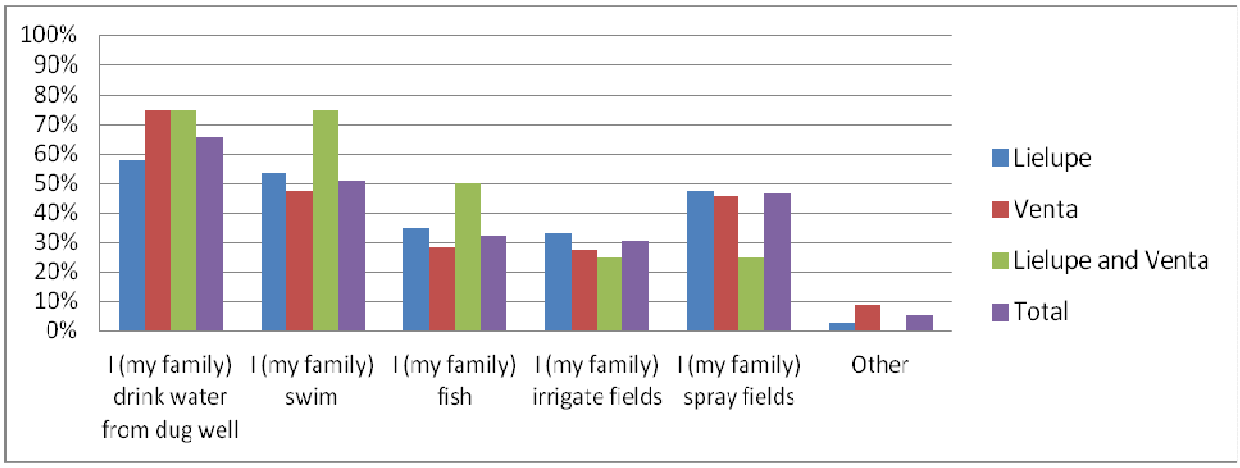


Figure 5. Use of water resources in Lielupe and Venta RBDs in Latvia, share of total respondents in the group

Lithuanian statistics is a little different. The highest percentage of respondents answered that they used water sites for swimming: 71 % in Lielupė RBD and 87 % in Venta RBD. Water use for drinking purposes was in the second place: 59 % in Lielupė RBD and 71 % in Venta RBD. Spray of fields was in the third place: 49 % in Lielupė RBDand 62 % in Venta RBD. Distribution of answers among Lithuanian respondents is provided in Figure 6.

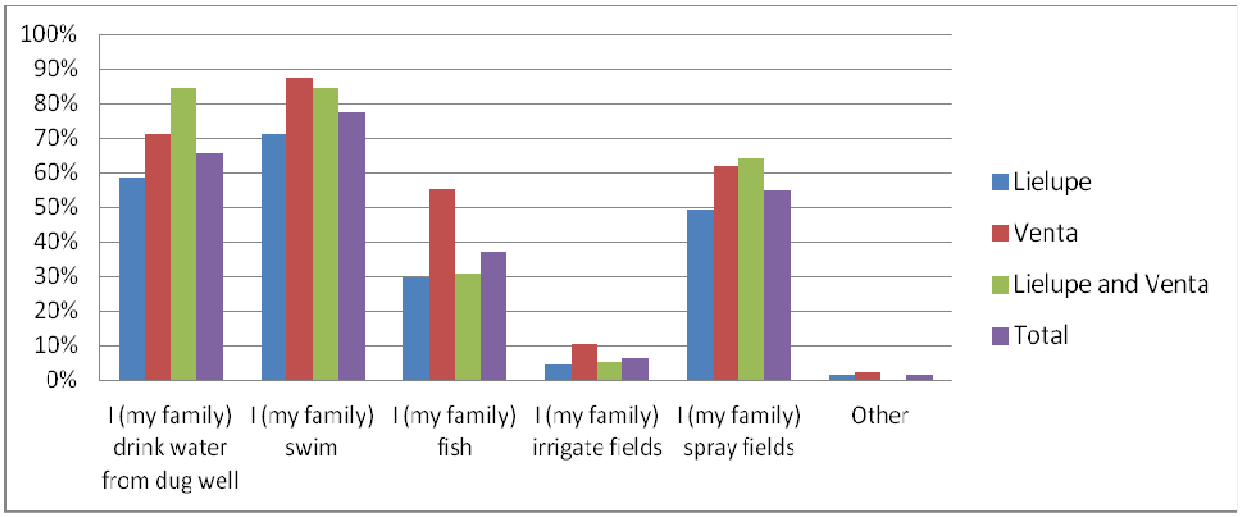


Figure 6. Use of water resources in Lielupe and Venta RBDs in Lithuania, share of total respondents in the group

Based on the results we can say that the majority of respondents in both countries think that water in Lielupe and Venta RBDs is of good quality, otherwise they would not use it for drinking and swimming.

5.2.2. Opinion of farmers on the impact of agricultural activities on the water quality

Farmers were also asked to evaluate the effect of agricultural activities on water in general, seeking to understand whether they consider themselves responsible for water pollution. Lithuanian respondents appeared feeling more responsible compared to Latvian respondents.. 53 % of them answered that agriculture contributes to water pollution by 10-50 %, whereas 57 % of Latvian respondents think that agriculture contributes to water pollution only by 10 % (Figure 7).

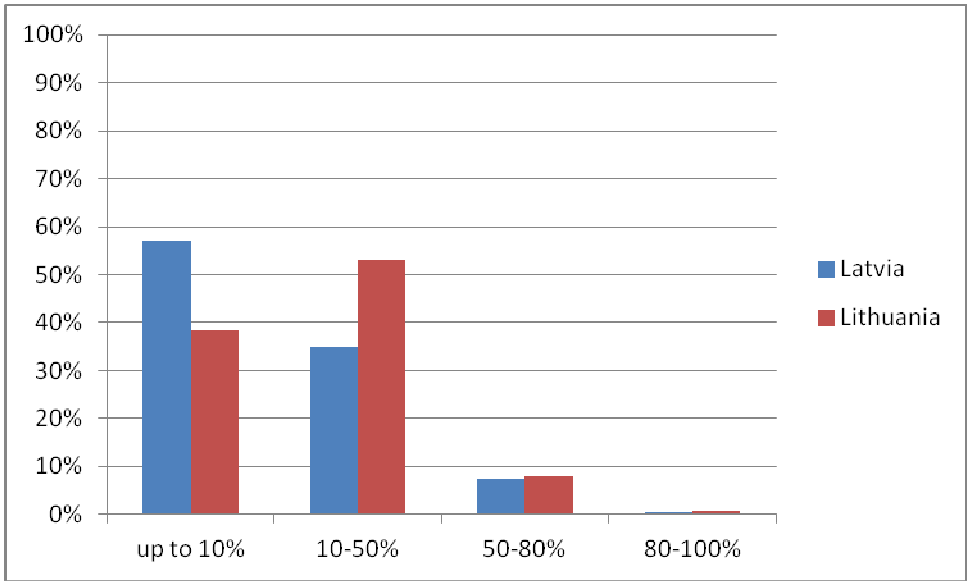


Figure 7. Extent of agriculture contribution to water pollution in general

Further respondents were asked about the impact of certain agricultural activities on water pollution. Majority respondents of both countries recognized fertilisation timing to be an important factor contributing to water quality (Figure 8).

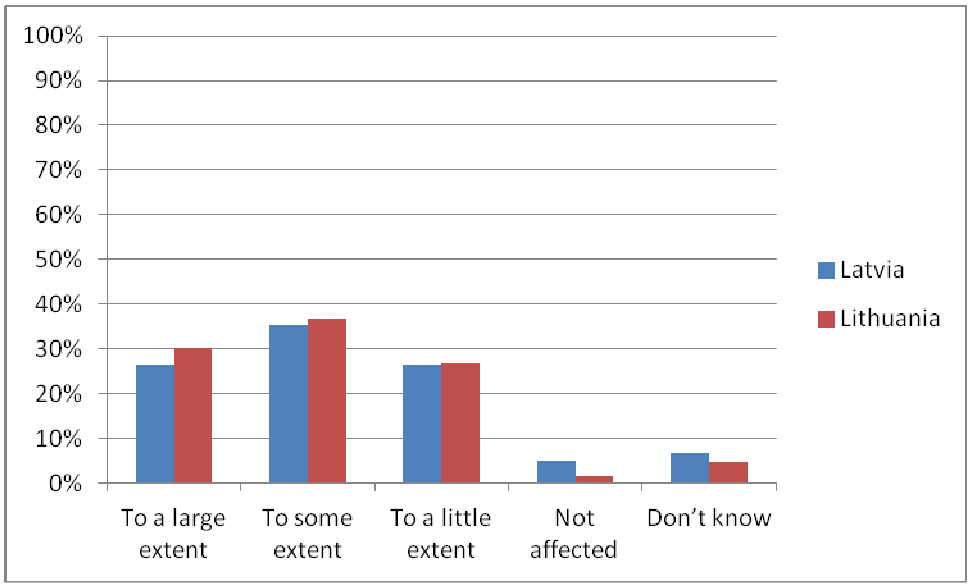


Figure 8. Extent of fertilisation timing (month, weather conditions) contribution to water quality

Respondents' opinion regarding mineral fertilisers' use contribution to water quality was different. Majority of Latvians answered that mineral fertilisers' use to some extent contributes to water quality, whereas majority of Lithuanians found it contributing to a little extent. However, almost all respondents recognise the importance of fertilisers as polluters of water resources.

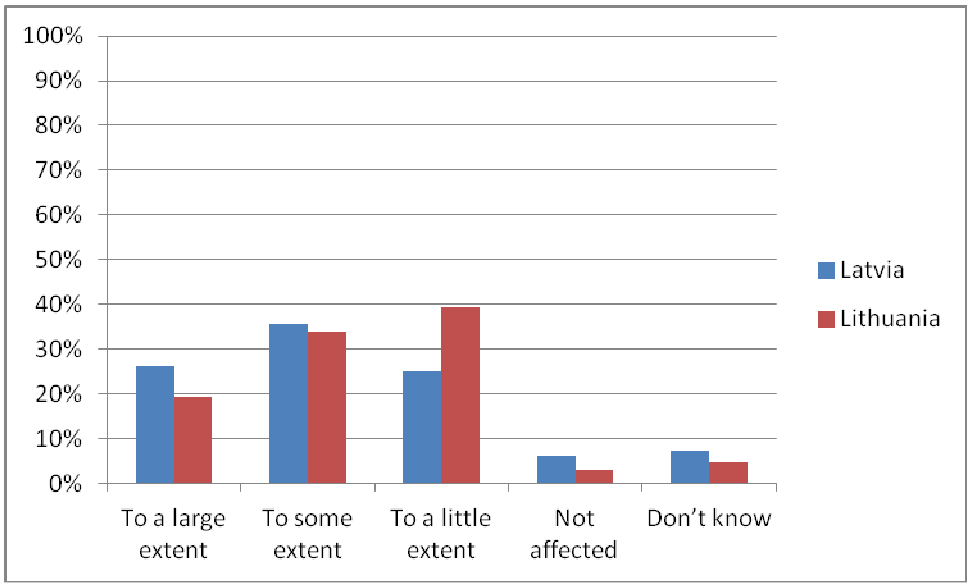


Figure 9. Extent of mineral fertilisers' use contribution to water quality

Leakage from manure storages was considered to some extent contributing to water quality by Latvian and Lithuanian respondents. Share of Lithuanian respondents which indicated importance of leakages from manure storages 'To some extent' and 'To a large extent' was equal. As a conclusion we can say, that the majority of respondents recognise leakage of manure storages as a very important factor affecting quality of water resources.

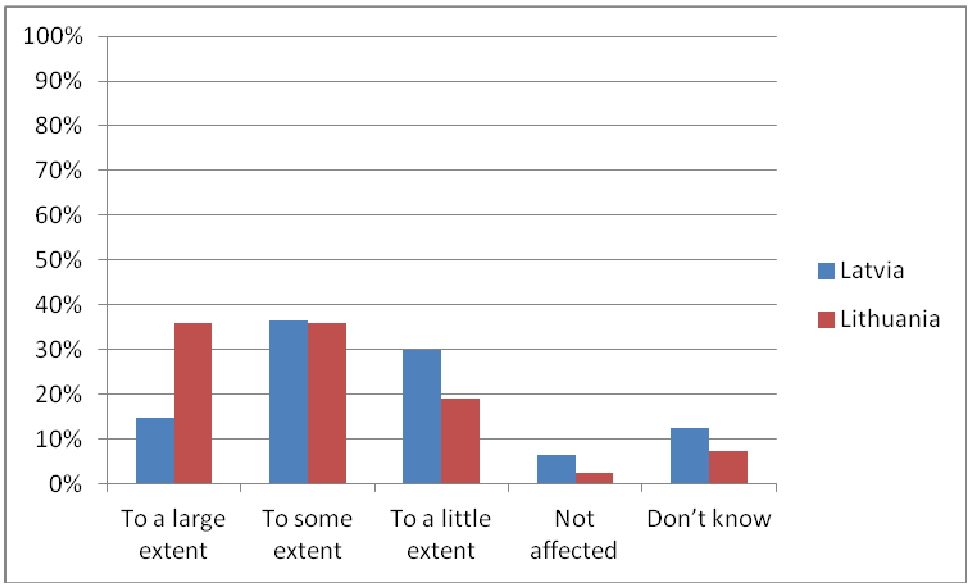


Figure 10. Extent of leakage from manure storages contribution to water quality

5.3. Role of farmers in improvement of water quality

5.3.1. Implementation of mandatory measures

Respondents were asked whether they had already implemented mandatory environmental measures or measures meeting requirements for the good agricultural practice. The list of selected measures, for which farmers had to give their answers, is provided in Table 13.

Table 13. Environmental measures, mandatory according to national legislations

Measure	Latvia	Lithuania
Manure storage meeting environmental requirements	Yes for farms having 10 and more animal units (5 animal units in nitrate vulnerable zone, i.e. Lielupė basin)	Yes for farms having 10 and more animal units (farms keeping at the same site from 10 to 100 animal units, are allowed to accumulate solid manure in solid manure stacks located by barns and equipped with leakproof layer which ensures that slurry does not flow to the environment)
Slurry storage meeting environmental requirements	Yes for farms having 10 and more animal units (5 animal units in nitrate vulnerable zone, i.e. Lielupė basin)	Yes for farms having 10 and more animal units
Fertilisation plan meeting environmental requirements	Yes for farms in nitrate vulnerable zones, i.e. Lielupė basin, depending on hectares (from 20 ha for field crops, 3 ha for growing vegetables and orchards)	Yes for farms using manure in more than 50 ha of agricultural land
Adopted fertilisation norms meeting environmental requirements	Yes	Yes for farms using manure
Application of fertilisers in a proper time	Yes	Yes for farms using manure
Winter or perennial plants cover in winter (as recommended in the Code of Good Agricultural Practice)	Yes for farms in nitrate vulnerable zone, i.e. Lielupė basin, must grow winter crop or perennial grass or fallow in more than 50 % of arable land	NO, recommended in the CGAP
Crop rotation to prevent erosion in hilly areas (as recommended in the Code of Good Agricultural Practice)	NO, recommended in the CGAP	NO, recommended in the CGAP

Manure storages are considered to be one of the most effective measures in reducing the amounts of nutrients run-off to water bodies. For 64 surveyed farmers from Lithuania and 107 surveyed farmers from Latvia this measure is mandatory. Results of the survey revealed that manure storages have not been constructed in all farms where they had to be constructed (Table 14).

Table 14. Answers of respondents who are obliged to construct manure storages, number

Group of farm	Latvia			Lithuania		
	Respondent state that measure is not relevant on his farm	The measure has been implemented	The measure has not been implemented	Respondent state that measure is not relevant on his farm	The measure has been implemented	The measure has not been implemented
5-10 LSU Lielupė	4	10	6	NA	NA	NA
10-300 LSU	8	31	43	5	37	20
More than 300 LSU	0	5	0	0	2	0
Total, %	11.2%	43.0%	45.8%	7.8%	60.9%	31.3%

This measure was implemented only in 43 % of farms in Latvia. In Lithuania the situation was better – the measure was implemented in 61 % of farms above 10 AU. Besides that, 11.2 % of Latvian respondents and 7.8 % of Lithuanian respondents stated that this measure was not relevant to them. However, some deviation from the real results can not be eliminated since farms, keeping at the same site from 10 to 100 animal units, are allowed to accumulate solid manure in solid manure stacks located by barns and equipped with leakproof layer ensuring that slurry does not flow to the environment. The main reason for not implementing the measure, indicated by Latvian and Lithuanian respondents, was too expensive execution of the measure. Reasons for the implementation of the measure were different: for Lithuanians first of all was possibility to use EU assistance funds, then environmental protection, fear of control/penalties; a few respondents also indicated a possibility to improve organization and accounting of their work. The main reason for the implementation of this measure by Latvians was environmental protection; the second reason was an easy execution of the measure and only in the third place the possibility to use EU assistance funds was mentioned.

Slurry storages, like manure storages, have a very important input in reducing the amounts of nutrients run-off to water bodies. For 64 surveyed farmers from Lithuania and 107 surveyed farmers from Latvia this measure is mandatory.

Situation with slurry storages in Latvia is even worse than with manure storages; this measure was implemented only in 21.5 % of farms where it had to be implemented (Table 15). Like in the previous case, situation was better in Lithuania – slurry storages were constructed in 65.6 % of farms. Moreover, 44.9 % of Latvian farmers stated that this measure was not relevant to them. Percentage of Lithuanians was the same as in the case with manure storages – 7.8 % stated that measure was not relevant to them. The main reason for implementation the measure among Latvians again was environmental protection, then possibility to use the EU assistance funds and easy execution of the measure. Lithuanians, like in the previous case, first of all indicated possibility to use the EU assistance, then environmental protection; quite significant percentage also indicated the fear of control/penalties, while the main reason for not implementing the measure was the same among respondents of both countries – too expensive execution of the measure.

Table 15. Answers of respondents who are obliged to construct slurry storages, number

Number of animal units	Latvia			Lithuania		
	Respondent state that measure is not relevant on his farm	The measure has been implemented	The measure has not been implemented	Respondent state that measure is not relevant on his farm	The measure has been implemented	The measure has not been implemented
5-10 LSU Lielupė	7	3	10	NA	NA	NA
10-300 LSU	38	19	25	5	40	17
More than 300 LSU	3	1	1	0	2	0
Total, %	44.9%	21.5%	33.6%	7.8%	65.6%	26.6%

Preparation of a **fertilisation plan** requires knowing nutrient stocks in the soil in a particular field. These plans reveal optimal fertilisation norms and help to balance the ratio of nutrients (N, P, K). For 194 surveyed farmers in Lithuania and 129 farmers in Latvia this measure is mandatory.

Table 16. Answers of respondents who are obliged to have fertilisation plans meeting environmental requirements, number

Plot of cultivated land	Latvia			Lithuania		
	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented
Less than 10 ha	4	5	13	NA	NA	NA
10-20 ha	2	2	5	NA	NA	NA
20-50 ha	2	22	14	NA	NA	NA
50-200 ha	1	31	2	72	35	21
200-500 ha	0	13	2	22	24	7
500-1000 ha	0	7	2	6	1	1
>1000 ha	0	2	0	2	3	0
Total	7.0%	63.6%	29.5%	52.6%	32.5%	14.9%

This measure was implemented in 32.5 % of Lithuanian farms. However, currently this measure is mandatory only for farms using organic fertilisers in more than 50 ha of agricultural land, but not required for farms using mineral fertilisers. The survey did not specify whether farmers apply organic fertilisers or mineral, so some deviation from the real results can not be eliminated. Majority of farmers indicated easy execution of the measure as the main reason of its implementation. Reasons why this measure was not implemented were indicated two: one part of farmers noted that execution of measure was too expensive whereas others thought that this measure was not effective.

In Latvia this measure is mandatory only in the nitrate vulnerable zone, i .e. Lielupė RBD, for farms having 20 ha or more of field crops, also growing 3 ha or more of vegetables and orchards. 63.6 % of Latvians have implemented this measure. Possibility to improve organisation and accounting of work, environmental protection were indicated by the major group of farmers as reasons for implementing the measure. The main reason for not implementing the measure was expensiveness of its execution.

Fertilisation norms indicate the amount of fertilisers that would be the minimum amount needed by plants, without leaving surplus nutrients in the soil which usually leach into deeper soil layers.

Fertilisation norms meeting environmental requirements are mandatory for all Latvian and Lithuanian farms. As indicated in Table 17, 84.3 % of farmers in Latvia and 87.7 % in Lithuania have implemented the measure. However, like in the case described previously, some deviation from the real results can not be eliminated due to the lack of information regarding the kind of fertiliser applied by Lithuanian farmers. Easy execution of the measure was indicated as the main reason for its implementation by farmers of both countries. High percentage of Latvian farmers also indicated environmental protection. The main reason for not implementing the measure, according to farmers of both countries, is expensiveness of the measure.

Table 17. Answers of respondents who are obliged to comply with fertilisation norms meeting environmental requirements, number

Plot of cultivated land	Latvia			Lithuania		
	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented
1 - Less than 10 ha	8	33	1	2	14	1
2- 10-20 ha	11	30	0	7	21	2
3 - 20-50 ha	10	58	6	3	54	4
4 - 50-200 ha	3	71	4	11	113	4
5 - 200-500 ha	1	22	0	2	50	1
6 - 500-1000 ha	0	15	0	0	8	0
7 - >1000 ha	0	7	0	0	5	0
Total, %	11.8%	84.3%	3.9%	8.3%	87.7%	4.0%

Application of fertilisers in a proper time. By avoiding the spreading of mineral fertilisers or manure at high risk times, the nitrate leaching and loss of nitrogen through surface run-off is diminished. High risk times include when there is a high risk of surface flow, rapid movement to field drains from wet soils or when there is little or not crop uptake.

Application of fertilisers in a proper time is mandatory for all Latvian and Lithuanian farms. . Level of the implementation of this measure in both countries is also quite high – 95 % of farmers in Lithuania and 83.6 % in Latvia have already implemented the measure. The main reason of its implementation, indicated by farmers in both countries, was easy execution of the measure.

Table 18. Answers of respondents who are obliged to apply fertilisers in a proper time, number

Plot of cultivated land	Latvia			Lithuania		
	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented	Respondent stated that measure is not relevant on his farm	The measure has been implemented	The measure had not been implemented
1 - Less than 10 ha	10	32	0	2	15	0
2- 10-20 ha	13	26	2	3	27	0
3 - 20-50 ha	11	60	3	3	58	0
4 - 50-200 ha	4	73	1	4	122	2
5 - 200-500 ha	2	21	0	0	52	1
6 - 500-1000 ha	0	15	0	0	8	0
7 - >1000 ha	0	7	0	0	5	0
Total, %	14.3%	83.6%	2.1%	4.0%	95.0%	1.0%

A **winter plants cover** is planted in late summer or fall to provide soil cover during the winter. A plants cover helps to take up residual nitrate and other nutrients from the soil after the main crop has been harvested in the summer or early autumn, leaving less nitrate available for leaching over winter. Ensuring that the land is not left exposed helps reduce soil erosion and the mobilisation of associated pollutants. For 149 surveyed farmers in Latvia this measure is mandatory, but it is only recommendable in Lithuania.

Winter or perennial plants cover in winter is mandatory only for Latvian farmers in Lielupė RBD. This measure was implemented by 77% of farmers. Easy execution of the measure was the main reason of its implementation, whereas according to the opinion of farmers, who have not implemented the measure, this measure was not effective.

Table 19. Share of answers of Latvian respondents who are obliged to apply winter or perennial plants cover in winter in Lielupė RBD

Respondent state that measure is not relevant on his farm	The measure has been implemented	The measure has not been implemented	Total
10%	77%	13%	100%

5.3.2. Implementation and costs of agri-environmental measures during the last three years

Respondents were also asked what agri-environmental measures were implemented in their farms during the last 3 years. As it can be seen from Figure 11, in general, implementation of related measures was more intensive in Latvia (166 of Latvian farmers and 153 of Lithuanian farmers surveyed implemented agri-environmental measures during 2011-2013), in particular in the Lielupė RBD, where farmers have more restrictions and greater responsibility.

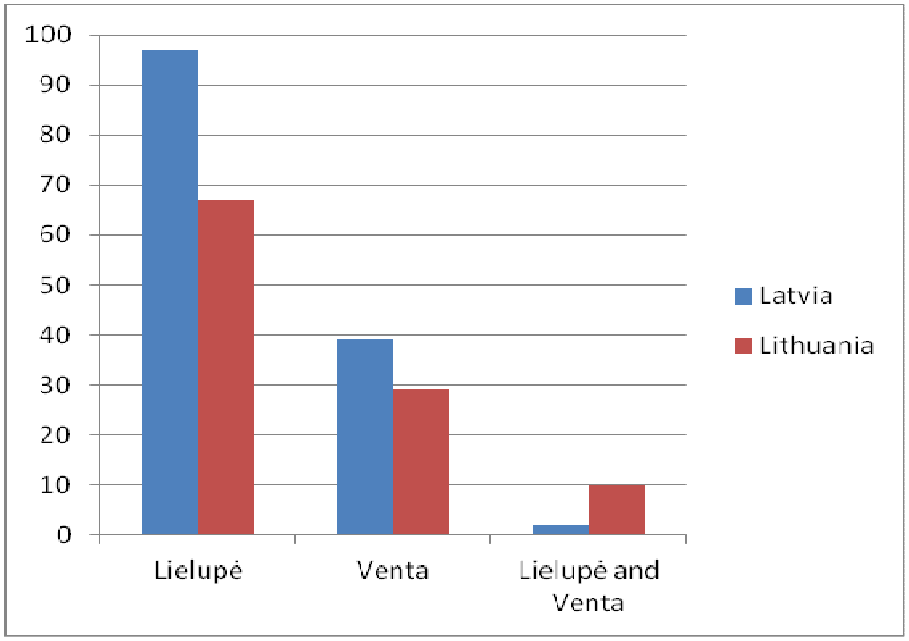


Figure 11. Implementation of agri-environmental measures during the last 3 years

Detailed analysis of implemented agri-environmental measures revealed that the most popular measure among farmers in Latvia and Lithuania, notably in Lielupė RBD, was preparation of fertilisation plans meeting environmental requirements. Construction of manure storages was in the second place. In Lithuania, in Venta RBD, the majority of farmers noted that implemented other measures, such as crop rotation, acquisition of slurry and manure spreaders, storages of fuel or converting land into grassland.

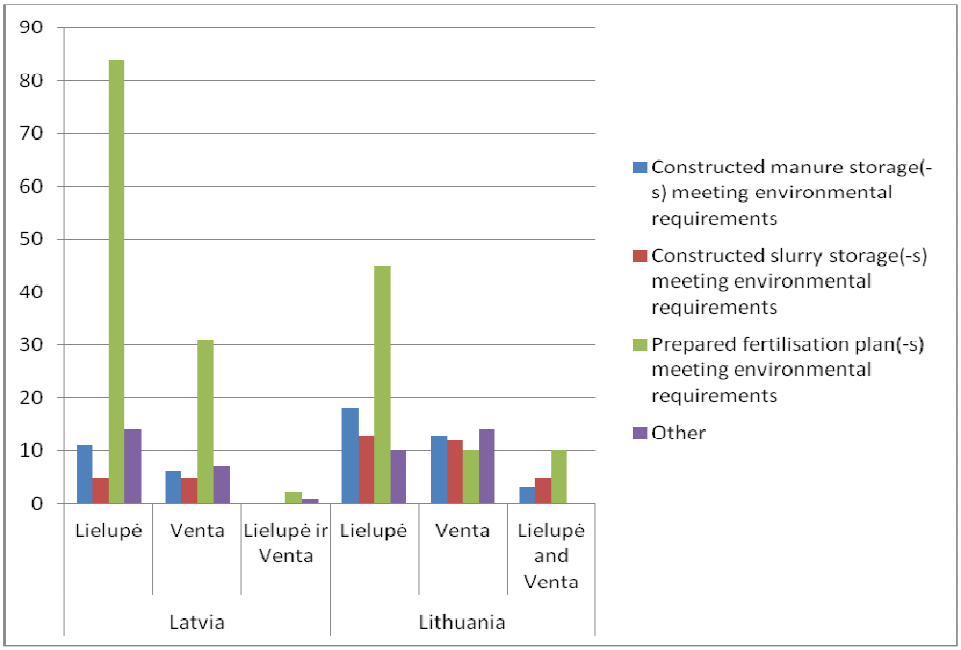


Figure 12. Number of farmers, who implemented agri-environmental measures in the last 3 years

As regards expenses for the agri-environmental measures‘ implementation (Figure 13), the major group of Lithuanian farmers in Lielupė RBD comprised those who had spent 146-580 EUR (13 respondents), in Venta RBD – more than 29000 EUR (8 respondents). In Latvia the majority did not want to respond, but the major group of those farmers who responded in Lielupė RBD had spent 146-580 EUR (21 respondent), in Venta RBD – 30-145 EUR (6 respondents). The higher proportion of farmers who had expenses in Lielupė RBD is, first of all, due to the higher number of farmers operating in this basin compared to the other and,

secondly, bigger environmental problems farmers face in this RBD and therefore need to implement more measures in order to comply with environmental requirements. Quite low expenses show that not very costly measures have been implemented. In general, Latvian farmers have spent more money for environmental measures during the last year than Lithuanian ones. This could be explained by the fact that in Lithuania some mandatory measures were implemented earlier than during the last three years.

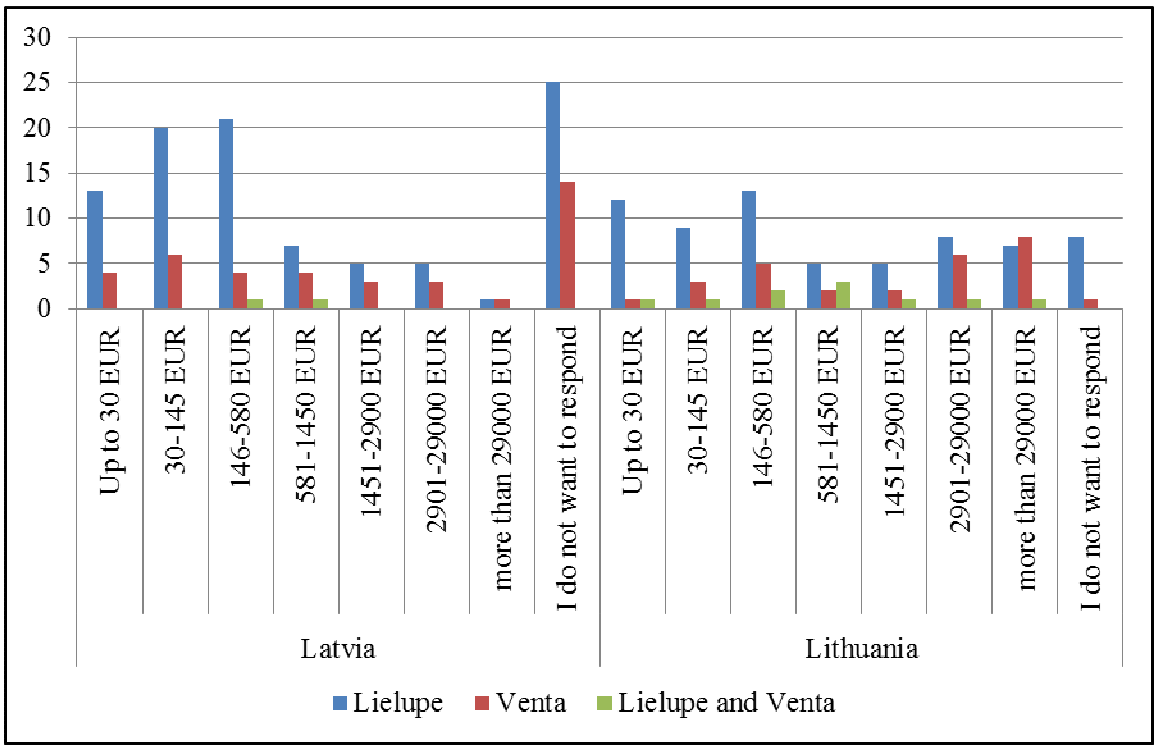


Figure 13. Distribution of expenses spent by a farmer on agri-environmental measures over the last 3 years

Farmers were asked about the barriers that prevent successful implementation of all environmental requirements. Not sufficient national financial support for the implementation of environmental measures was the top priority for the majority of respondents in both countries. Excessive bureaucracy for obtaining compensation was indicated as quite an important reason by Lithuanian farmers as well. Environmental education, as noted by farmers themselves, is highly needed to improve farmers‘ awareness about the environmental protection in both countries.

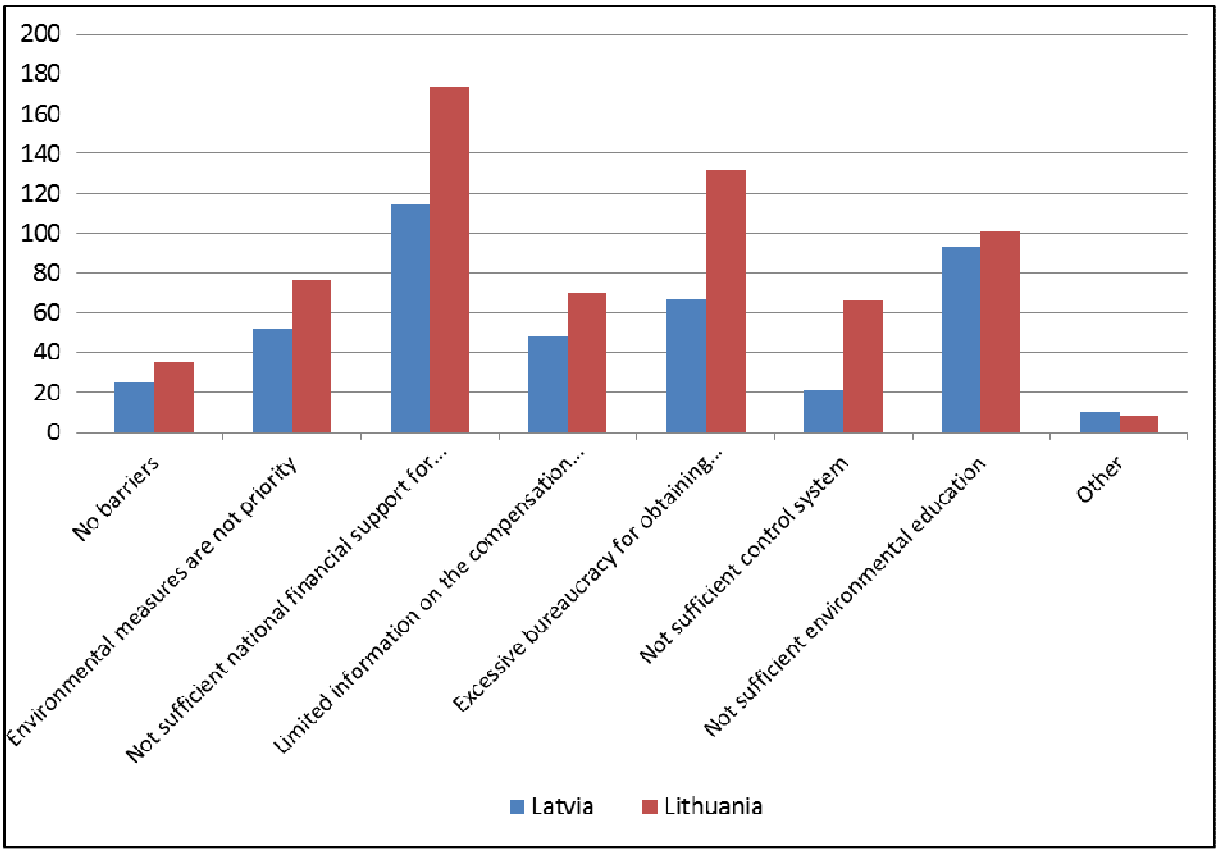


Figure 14. Barriers that prevent successful implementation of environmental requirements

5.3.3. Conclusions on implementation of mandatory measures

It can be concluded that higher percentage of farmers who have implemented mandatory measures was in Lithuania. However, improvement of the situation is still needed in both countries. The biggest gap is the construction of manure and slurry storages and preparation of fertilisation plans. Implementation of these measures seems to be difficult due to the too expensive execution of the measure. Not sufficient national financial support for the implementation of environmental measures was the main reason for not implementing the mandatory measures in both countries. Excessive bureaucracy for obtaining compensation was indicated as quite an important reason by Lithuanian farmers as well.

Lithuanian farmers stated that they could implement the mandatory and the CGAP measures because received assisstance from the EU. Latvian farmers, who implemented measures, showed their high concern giving priority for the environmental protection reason. The level of the implementation of fertilisation norms meeting environmental requirements as well as application of fertilisers in a proper time and application of winter or perennial plants cover in winter is quite good, but needs some improvement as well.

Results of the survey also revealed that farmers lack knowledge about the local environmental problems and their obligations regarding compliance with the environmental matters. Environmental education, as noted by farmers themselves, is highly needed to improve farmers‘ awareness about the environmental protection in both countries.

5.4 Acceptability and effectiveness of agricultural measures

According to the assessment of the status of water bodies, conducted during preparation of the RBMPs, some water bodies will fail to meet good water status requirements not only in 2015, but also later. So called basic measures (i.e. those, which need to be implemented in accordance with all the EU water sector directives except the WFD) for improvement of water quality are not sufficient, therefore supplementary measures are required. One of the main aims of the survey was to clarify acceptability and willingness of farmers to implement supplementary agri-environmental measures.

5.4.1. Acceptability of fertilisation related measures

Two questions in the questionnaire were related to supplementary measures. The first question was devoted to the potential measures regulating fertilisation. The latter was specified by Specialists Survey as one of the main reasons of agricultural diffused pollution. The following supplementary measures were proposed to farmers:

1) Develop and implement fertilisation plans (also include soil analysis)
2) Apply reduced fertilisation norms compared to norms for highest yields
3) Prepare nutrients (nitrogen and phosphorous) balance, allowing long term planning of fertiliser use (when fertilisation plans are not developed)
4) Replace mineral fertiliser with green manure crop (green manure crop could be sown in the spring and in the middle of summer could be ploughed; could be also other types of green manure)

Below a short analysis of the answers is summarised.

Develop and implement fertilisation plans (also include soil analysis)

It should be noted that only answers of the farmers for whom development and implementation of fertilisation plans is not mandatory (i.e. Lithuanian farmers having up to 50 of agricultural land and Latvian farmers in Lielupė RBD having up to 20 ha of crop fields) were analysed. There are 108 such surveyed farms in Lithuania and approx. 150 such farms in Latvia.

Results show that half of these Latvian farmers have already implemented this measure. Quite a big part of farmers are also ready to implement it. The biggest part of Lithuanian farms would implement it if they received compensation (Figure 15).

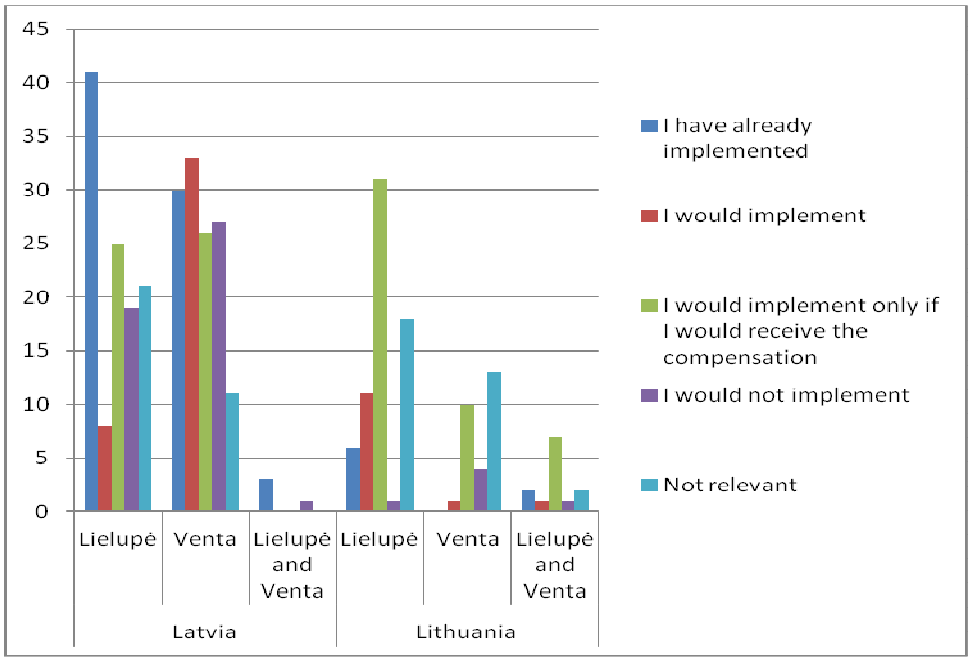


Figure 15. Number of respondents (from those who are not yet obliged to implement this measure) who have implemented, would or would not prepare fertilisation plans in their farms

Apply reduced fertilisation norms compared to norms for highest yields

Reducing amounts of nitrogen and phosphorus fertilisers by a certain percentage below the economic optimum can help to reduce the residual nitrate in the soil after harvest and in the short term the amount of soluble phosphorus. In the long term reducing phosphorus fertilisers can reduce the amount lost as particulate phosphorus.

Reduced fertilisation norms compared to norms for highest yields are already being implemented by quite many farmers in Latvia and Lithuania.

Around 70 Lithuanian farmers would implement this measure if received compensation, while compensation for Latvian farmers is not so attractive. The reason is that because of the price of fertilisers farmers, in particular small ones, cannot afford them.

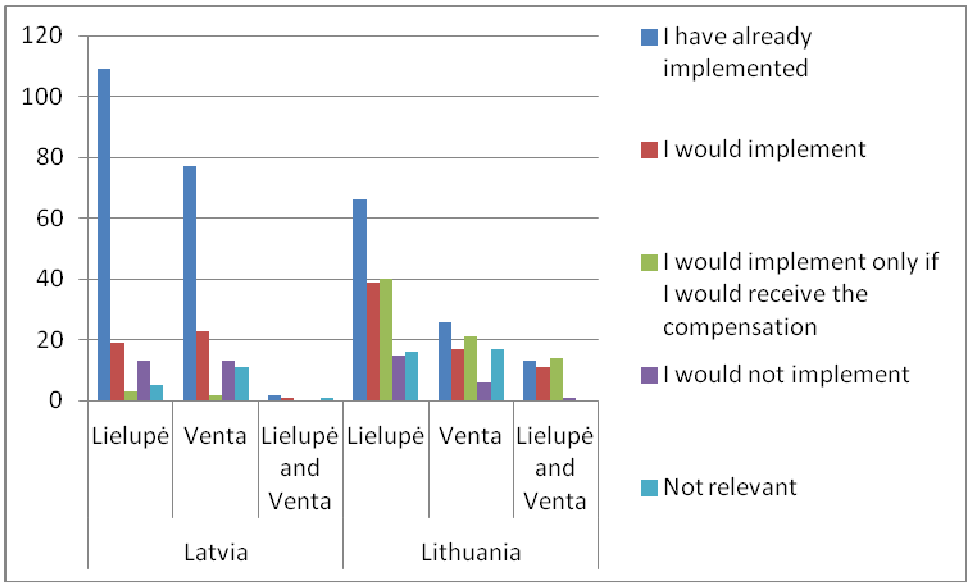


Figure 16. Number of respondents who have implemented, would or would not implement reduced fertilisation norms compared to norms for highest yields

Prepare nutrients (nitrogen and phosphorous) balance, allowing long term planning of fertiliser use (when fertilisation plans are not developed)

Creating a nutrient balance helps to accurately account for fertiliser use to decrease application; this helps to keep excess nutrients in the soil to a minimum. It also maximises efficient use of nutrients already in the soil by ensuring that the soil is in a sufficiently fertile state. Accurate fertiliser application, which is based on the crop type, its yield and the characteristics of the parcel to the economic optimum, can ensure that the necessary quantities of the essential crop nutrients are only available when required for uptake by the crop.

Preparation of nutrients (nitrogen and phosphorous) balance (when fertilisation plans are not developed) is not widely known among Latvian and Lithuanian farmers, however, some of them (47 Latvians and 18 Lithuanians) think that they have already implemented this measure. 40 Latvians and 158 Lithuanians would implement this measure if they received compensation. Those Latvian farmers who are not willing to implement this measure state that it is neither necessary nor useful. Only 12 farmers in Lithuania in total would not implement this measure because it is too complex to calculate or there is a lack of knowledge.

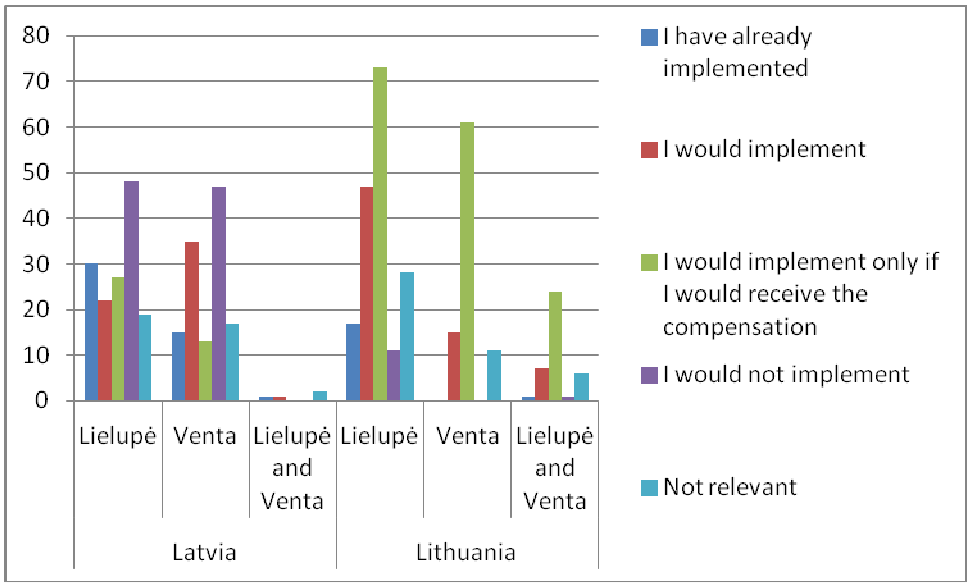


Figure 17. Number of respondents, who have implemented, would or would not implement nutrients balance calculations

Replace mineral fertiliser with green manure crop (green manure crop could be sown in the spring and in the middle of summer could be ploughed; could be also other types of green manure)

Mineral fertiliser replacement with green manure crop is useful due to their potential for biological nitrogen fixation. Additionaly, it protects the soil against erosion and prevents weed spreading.

The biggest part of Latvian farmers would not implement this measure. Some of them, who indicated the reason, did not think that the measure could be effective or they were afraid to get reduced yield. Majority of Lithuanans would implement the measure if they received compensation.

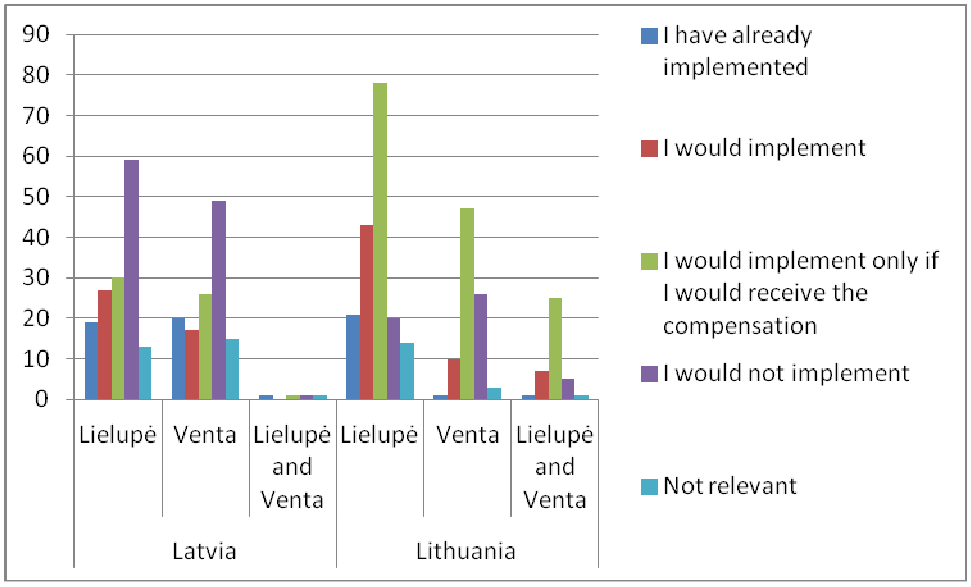


Figure 18. Number of respondents who have already implemented, would or would not implement replacement of mineral fertiliser with green manure crop

5.4.2. Acceptability of other agri-environmental measures

The second question on supplementary agri-environmental measures dealt with 10 measures. Farmers had to indicate whether they were willing to implement these measures:

1. Construct manure and slurry storages meeting environmental requirements (it would reduce nutrients leakage to the soil and water) (this measure would be relevant for the farmers for whom it was not mandatory so far)
2. Construct artificial wetlands between fields and water bodies (wetlands can help to capture nutrients from agriculture run-off before entering water bodies)
3. Convert cultivated fields into extensive grassland (this measure reduces nutrients' leakage to waters due to lower inputs in the soil)
4. Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds in your fields (after re-meandering rivers usually become longer resulting in better conditions for the self-purification)
5. Improve fertilisation technology (machinery/equipment; it would improve fertiliser insertion into soil and reduce nutrient leakage into water)
6. Sow catch crops for the winter (catch crops uptake nutrients, therefore after harvesting main crops lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest).
7. Convert from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm)
8. Leave unploughed fields with crop stubbles over the winter (this measure helps in preventing soil erosion)
9. Establish additional vegetation strip, located on an arable field next to watercourse (stream, river or lake) (it may reduce losses of mineral nutrients and prevent contamination of water with pesticides)
10. Apply crop rotation including legumes and green manure crop (a growing crop that is ploughed under the soil to improve soil fertility and reduce nutrients leakage)

Answers to this question are summarized below:

1. *Construct manure and slurry storages meeting environmental requirements (it would reduce nutrients leakage to the soil and water) (this measure would be relevant for the farmers who have not implemented it so far)*

Only answers of those farmers, who are not obliged to implement this measure so far (i.e. having up to 10 animal units in both countries, except up to 5 animal units in Lielupė RBD in Latvia), were analysed. Majority of Latvian farmers stated that they would not implement the measure because it is too expensive. Smaller group is willing to implement this measure or would implement it only if they would receive compensation. Majority of Lithuanian farmers would implement the measure if they would get compensation. Quite a big share of Lithuanian farmers stated that the measure was not relevant, as majority of farms in Lielupe and Venta RBDs are crop production farms.

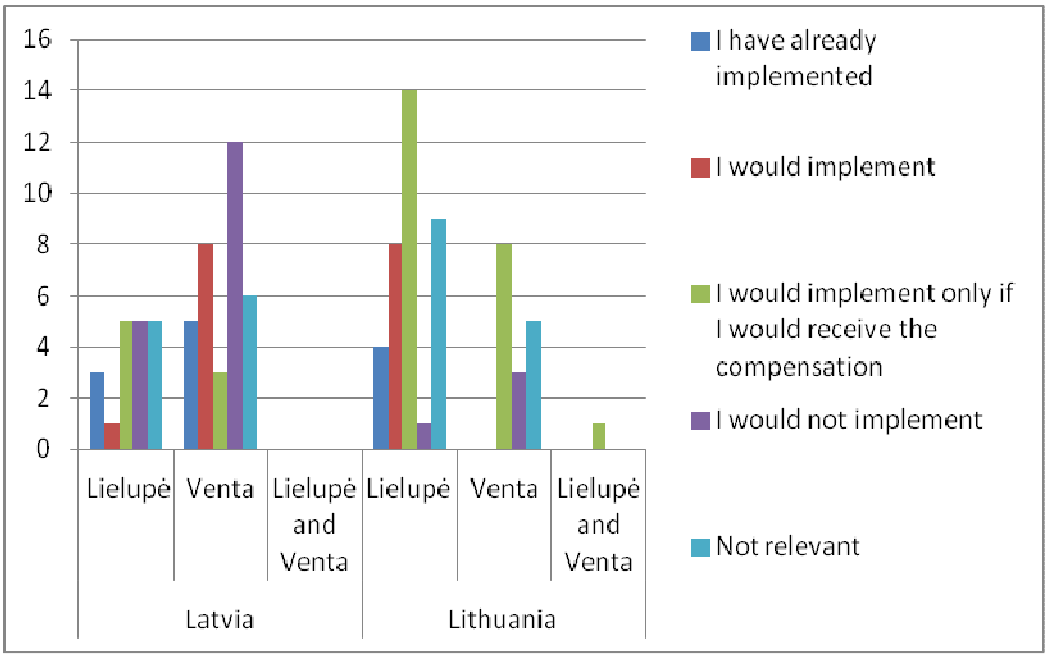


Figure 19. Number of respondents, who have already constructed, would or would not construct manure and slurry storages

2. *Construct artificial wetlands between fields and water bodies (wetlands can help to capture nutrients from agriculture run-off before entering water bodies)*

Established wetlands can help to capture nutrients from agriculture run-off before entering water bodies. However, this measure was not acceptable for the biggest part of farmers in both countries. The main reason for this for Lithuanians was potential reduction of agricultural land; others did not think that this measure could be effective. Latvian farmers presume that the measure is very expensive or is not suitable for their lands.

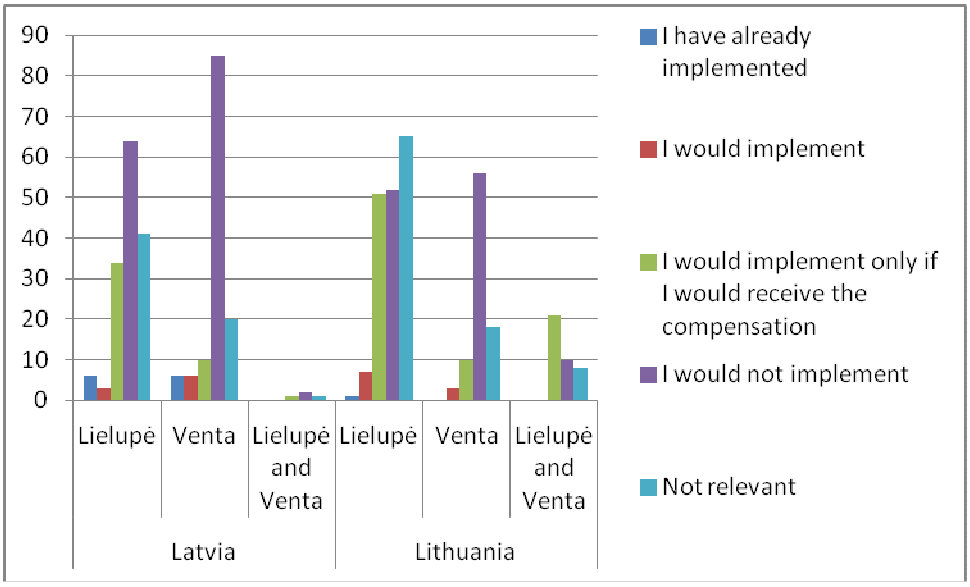


Figure 20. Number of respondents, who have already established, would or would not establish artificial wetlands between fields and water bodies

3. *Convert cultivated fields into extensive grassland (this measure reduces nutrients' leakage to waters due to lower inputs in the soil)*

Convertion of cultivated fields into extensive grasslands can help to reduce nitrogen and phosphorus losses due to lower inputs in the area. Majority of farmers in both countries did not show willingness to apply this measure. Loss of a profit was indicated as the main reason for this.

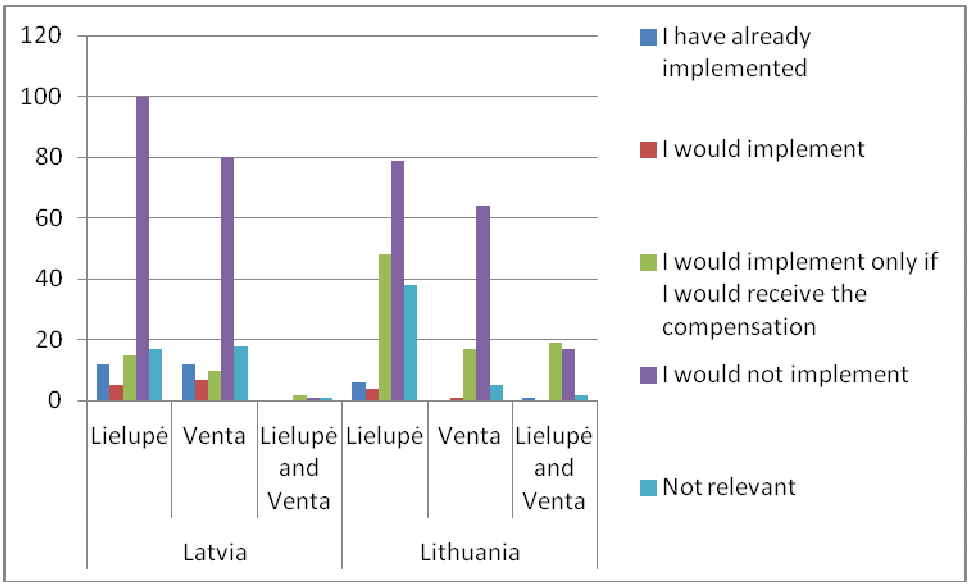


Figure 21. Number of respondents, who have already implemented, would or would not implement conversion of cultivated fields into extensive grasslands

4. *Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds in your fields (after re-meandering rivers usually become longer resulting in better conditions for the self-purification)*

Renaturalisation of a river helps to reduce non-point nutrient pollution through retention and transformation processes, resulting from rising groundwater levels and increased flooding potential.

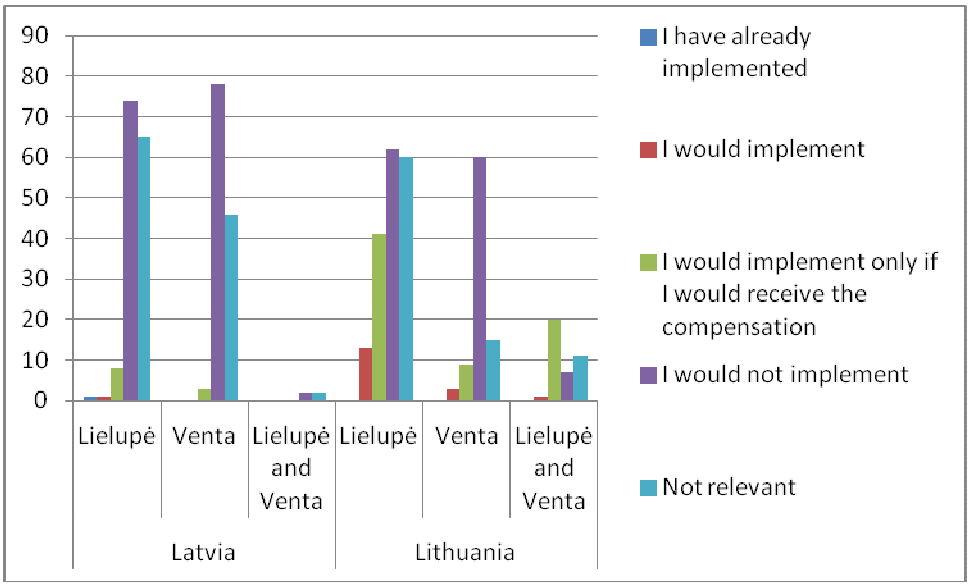


Figure 22. Number of respondents, who have already implemented, would or would not implement renaturalisation of the natural, previously straightened, rivers

As could be seen from Figure 22, majority of both Latvian and Lithuanian farmers would not implement this measure in their fields. Those Latvians, who indicated reasons, mainly stated that there were no rivers in their lands, whereas the main reason indicated by Lithuanians was disbelief that this measure could be effective.

5. *Improve fertilisation technology (machinery/equipment; it would improve fertiliser insertion into soil and reduce nutrient leakage into water)*

Decreasing surface application of manure and promoting injection techniques and mulching can immediately decrease leaching into water bodies as well prevent the exposure of manure to the surface run-off and drain flow losses. Eutrophication, resulting from emissions, can be avoided by applying manure more effectively into the soil. It can reduce groundwater and surface water pollution from nitrate leaching and phosphate run off.

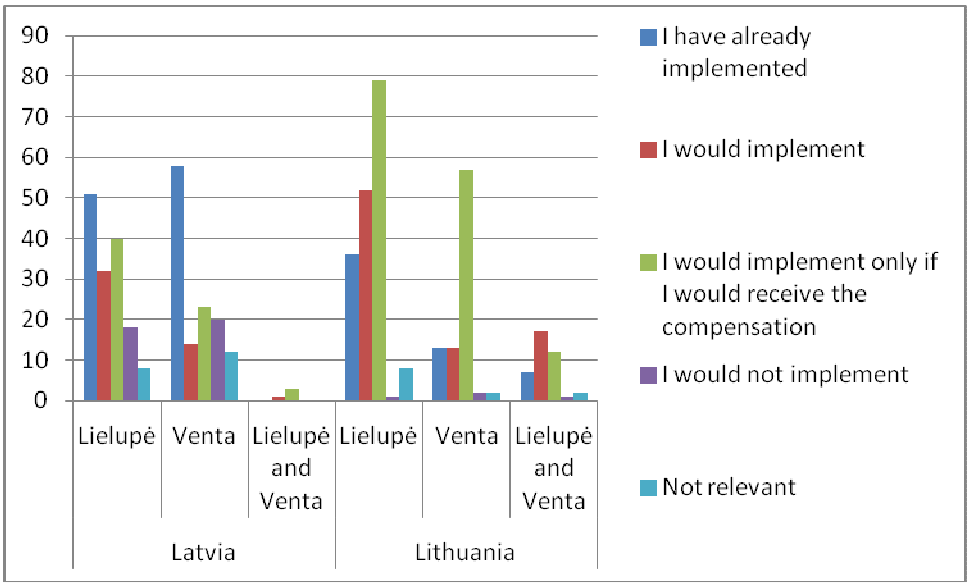


Figure 23. Number of respondents, who have already improved, would or would not improve fertilisation technology

The Survey results revealed that quite a lot of Latvian farmers already improved fertilisation technology mainly due to financial support obtained. The majority of Lithuanian farmers indicated that they would implement this measure if received financial support.

6. *Sow catch crops for the winter (catch crops uptake nutrients, therefore after harvesting main crops lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest).*

Catch crops help to reduce the mobilisation of agricultural pollutants by increasing nutrient uptake and reducing surface run-off and soil erosion. Catch crops are fast-growing crops that are grown simultaneously with or between successive plantings of a main crop.

Approximately half of Latvian farmers would not implement this measure since they think that it is not effective, whereas the biggest part of Lithuanian farmers are willing to implement the measure with or without compensation.

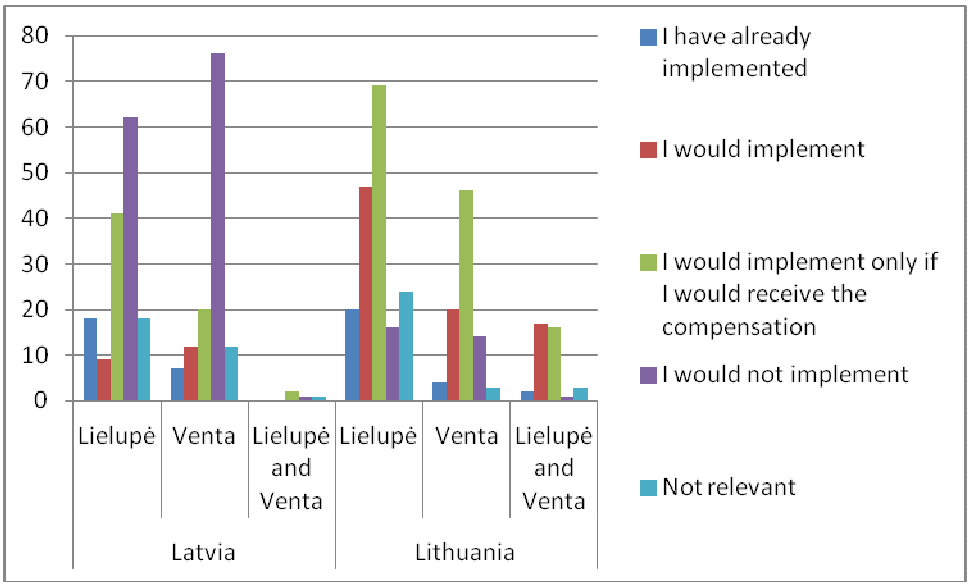


Figure 24. Number of respondents, who have already implemented, would or would not implement measure of catch crops

7. *Convert from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm)*

Organic farming is expected to reduce risk of N and P losses to the environment, including water bodies. Eutrophication risk is reduced in nearby water systems. For example, organic farming in the Baltic Sea has shown to reduce nutrient and pesticide loads in the drainage basin of the Baltic Sea. Paulsen et al (2002) found that the current organic farming area in the Baltic Sea drainage basin would reduce nitrogen input in the region by 2.3% and 1.8% for phosphorus (EU catalogue of agricultural measures, 2008).

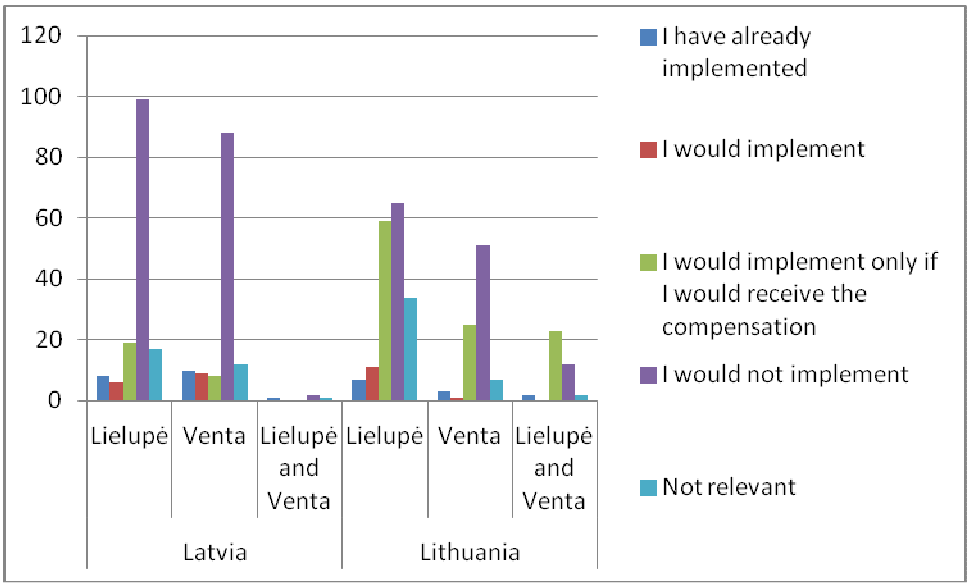


Figure 25. Number of respondents, who have already converted, would or would not convert from conventional to organic farming

Majority of farmers in both countries have not showed readiness to convert from the conventional to organic farming. Latvian farmers are just not interested in this type of farming, others are afraid of lower yields or

lack of knowledge. Lithuanian farmers stated that it is complicated because of surplus bureaucracy. Anyway, quite many Lithuanian farmers would implement this measure if they received compensation for it.

8. *Leave unploughed fields with crop stubbles over the winter (this measure helps in preventing soil erosion)*

Unploughed fields with crop stubbles left over the winter help in reducing soil erosion, maintenance of natural soil fertility, thus reducing the need for fertiliser application.

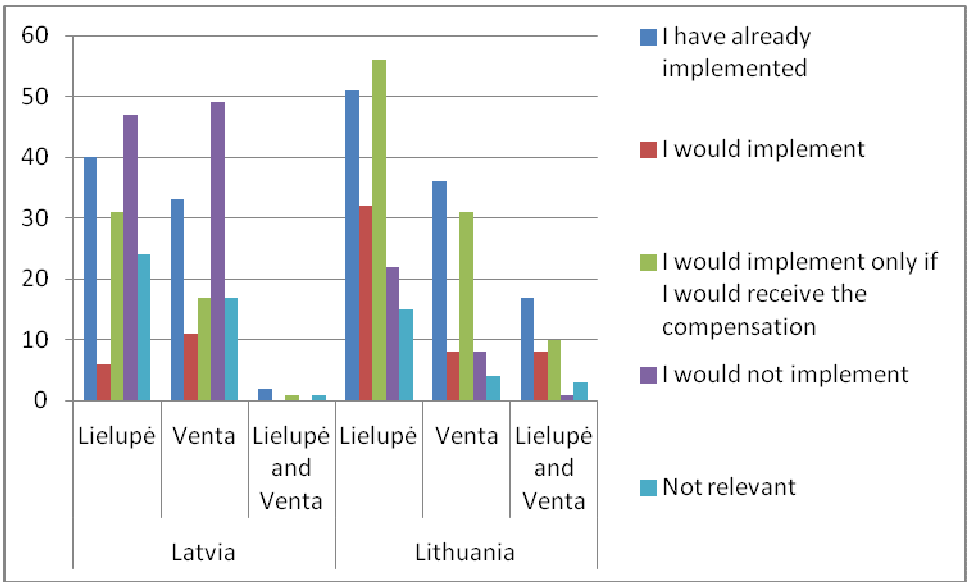


Figure 26. Number of respondents, who have already implemented, would or would not implement measure of unploughed fields with crop stubbles over the winter

Quite a big part of Lithuanian farmers have already implemented this measure and almost the same proportion of respondents would implement it if received compensation. The major part of Latvian farmers is not willing to implement this measure. Some of them are not sure whether this measure can be effective or whether it is suitable for their lands.

9. *Prepare additional vegetation strip, located on an arable field next to watercourse (stream, river or lake) (it may reduce losses of mineral nutrients and prevent contamination of water with pesticides)*

Establishing vegetated and unfertilised buffer zones along watercourses decreases the movement of nutrients into watercourses. Buffer zones can reduce pollution by changing land use (i.e. they stop agricultural activity), thereby reducing direct pollution from inorganic fertilisers and organic manure additions. Quite many Latvian farmers in Venta RBD would not implement this measure mainly because they think the measure is not effective. Lithuanian farmers as well as quite a big part of Latvians would implement it if they received compensation for this (Figure 27).

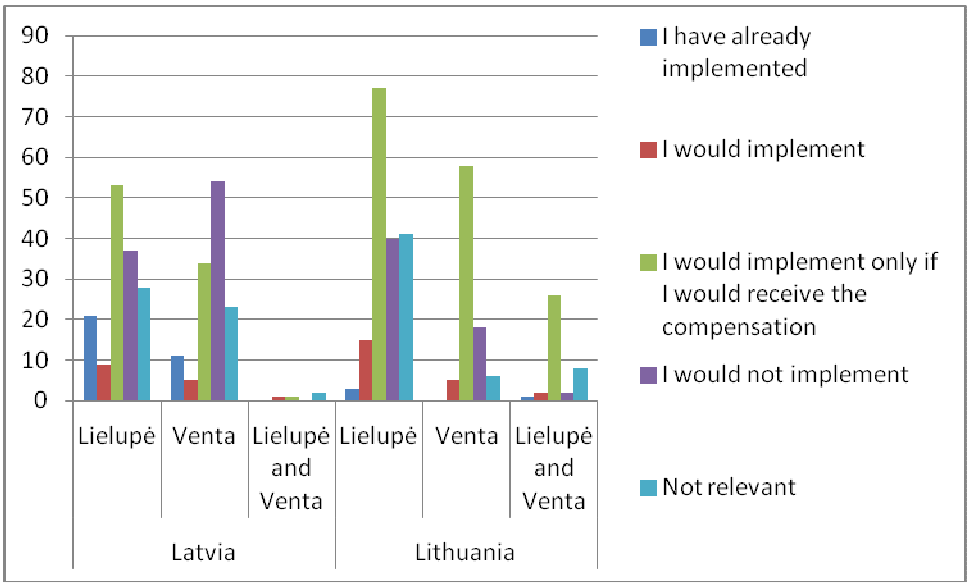


Figure 27. Number of respondents, who have already implemented, would or would not implement measure related to additional buffer vegetation strips, located on arable field next to watercourse

10. Apply crop rotation including legumines and green manure crop (a growing crop that is ploughed under the soil to improve soil fertility and reduce nutrients leakage)

Crop rotation means that succeeding crops is of a different genus, species, subspecies, or variety than the previous crops. It helps to reduce nutrient leakage, soil erosion as well as reliance on mineral fertilisers.

This measure is acceptable for almost third of Latvian farmers surveyed and they have already implemented it. Some of them indicated that for the crop rotation they use legumines, some use clover or field beans. Quite many of Lithuanian farmers have implemented this measure as well; however, the bigger part would implement it if they received compensation.

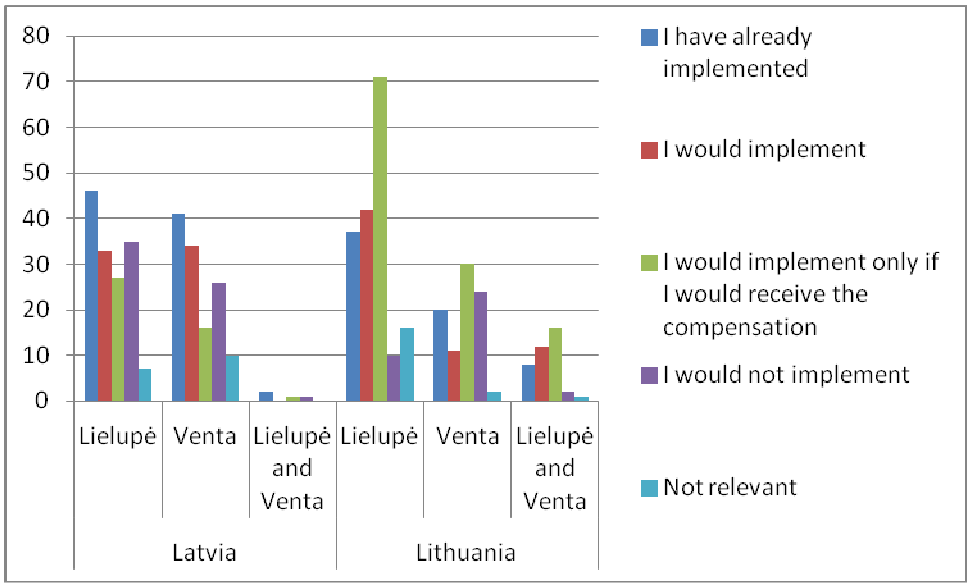


Figure 28. Number of respondents, who have already implemented, would or would not implement crop rotation including legumines and green manure crop

5.4.3. Summary of acceptability of other agri-environmental measures

Already implemented agri-environmental measures

Application of reduced fertilisation norms was the most popular measure among the Latvian and Lithuanian farmers; it was implemented by 67% of Latvian and 35% of Lithuanian respondents who participated in the Survey. In general, it seems that more Latvian farmers already apply non mandatory measures than Lithuanian ones.

Share of Latvian respondents, who have implemented other measures, was lower: 39% improved fertilisation technology, 32% apply crop rotation and 30% have fertilisation plans, 27% leave unploughed fields with crop stubbles over the winter, 14% replaced mineral fertilisers with green manure crop, 17% prepared nutrients balance. Other measures were applied by less than 10% of Latvian farmers.

Survey of Lithuanian farmers showed that almost the same share of them applies reduced fertilisation and leaves unploughed fields over the winter, i.e. 35% and 34% accordingly. 22% of Lithuanian farmers apply crop rotation, 19% improved fertilisation technology; other measures are applied by less than 10% of farmers. Note that farmers could apply a few measures. (Figure 29).

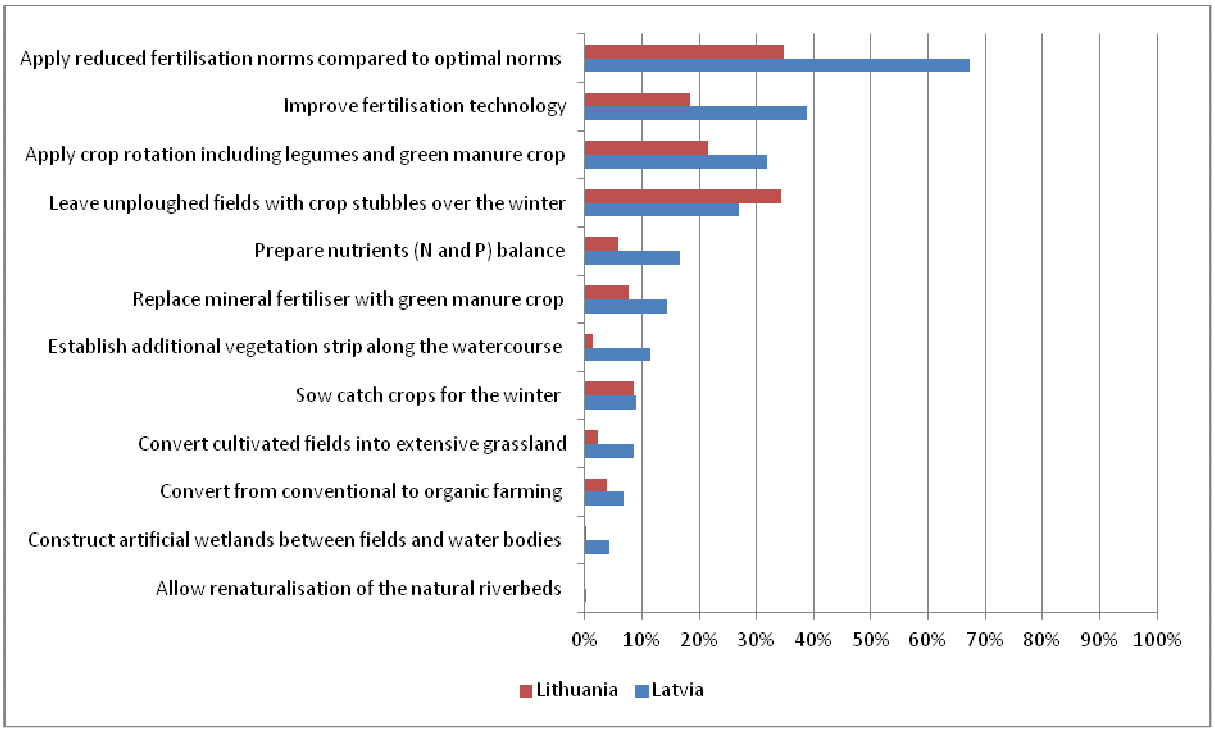


Figure 29. Share of respondents who have already implemented supplementary agri-environmental measures.

Measures, which farmers would implement

As regards willingness to implement agri-environmental measures, sowing catch crops and improving fertilisation technology was the most popular among Lithuanian farmers - 28% would sow catch crops for the winter and 27% would improve fertilisation technology. 23% would prepare nutrients balance, 22%

would apply reduced fertilisation norms and crop rotation, 20% would replace mineral fertiliser with green manure crop etc.

Application of crop rotation was the most popular among Latvian farmers – 24%. 21% of Latvians would prepare nutrients balance and share of those, who would develop and implement fertilisation plans, improve fertilisation technology, replace mineral fertiliser with green manure crop, apply reduced fertilisation norms and construct manure and slurry storages, was in a range between 12-19%., etc.

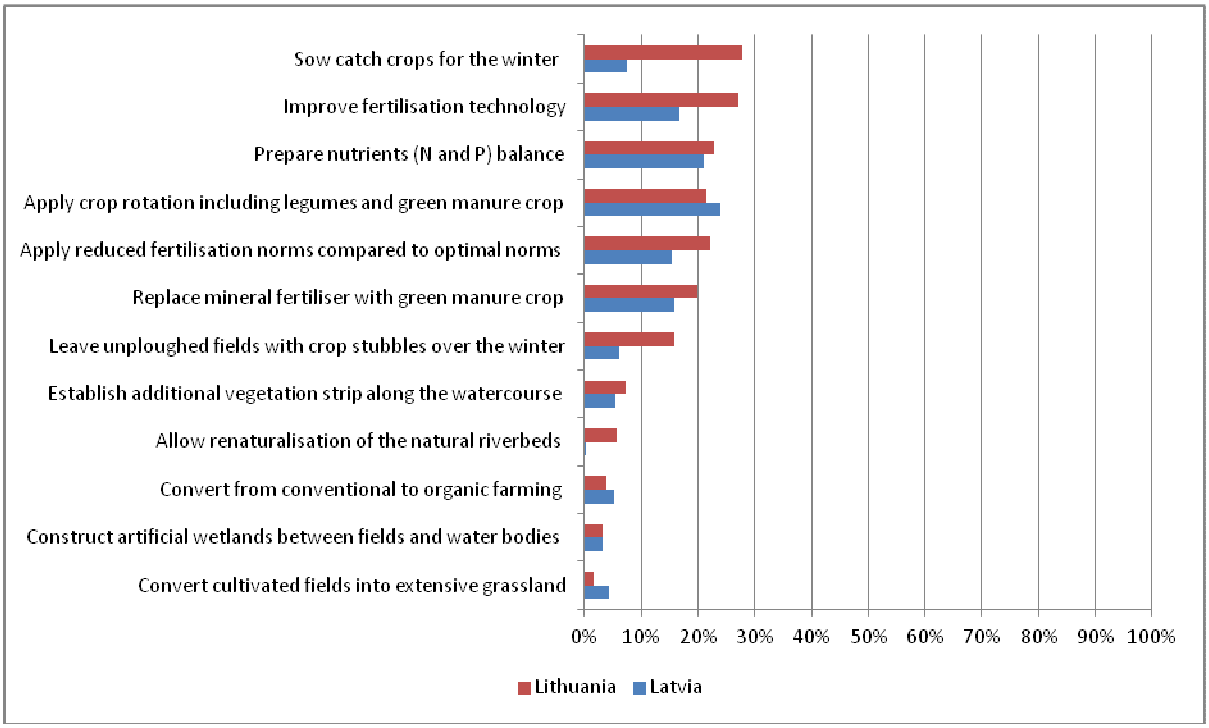


Figure 30. Share of respondents who would implement supplementary agri-environmental measures

Measures which farmers would implement if received compensation

Share of Lithuanian farmers who would implement various agri-environmental measures if received compensation for it was prevailing compared to Latvian farmers. More than half of respondents would establish additional vegetation strips along the watercourses as well as nutriens balance. A slightly smaller proportion – between 43% and 50% – would replace mineral fertiliser with green manure crops, improve fertilisation technology, develop fertilisation plans and sow catch crops for winter. Share of answers regarding implementation of other measures was in a range of 25%-39%.

Getting compensation was not so attractive for the Latvian farmers. The highest part of them, i.e. 32%, would prepare additional vegetation strip along the watercourse. Improvement of fertilisation technology, sowing catch crops and replacement of mineral fertiliser with green manure crops was within the range of 20%-24%. Willingness to implement other measures was expressed by less than 20% of respondents.

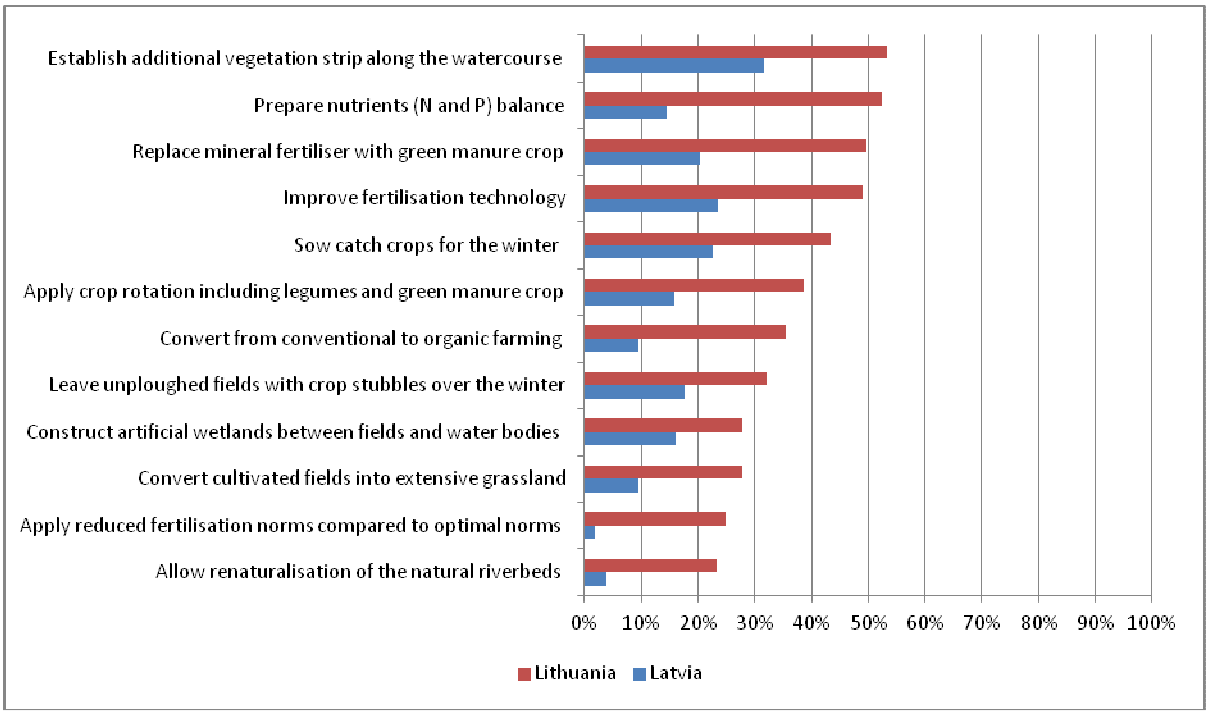


Figure 31. Share of respondents who would implement supplementary agri-environmental measures only if received compensation

Measures which farmers would not implement

Higher proportion of Latvian farmers compared to Lithuanians has not demonstrated willingness to implement all measures proposed in the questionnaire (Figure 32). More than half respondents within the range of 50%-68% would not agree to convert from conventional to organic farming, convert cultivated fields into extensive grasslands, allow renaturalisation of the natural riverbeds, construct artificial wetlands between fields and water bodies and sow catch crops for the winter. Other part within a range 33%-39% is not willing to replace mineral fertiliser with green manure crop, leave unploughed fields over the winter, prepare nutrients balance and establish additional vegetation strip along watercourses.

53% of Lithuanian respondents expressed their unwillingness to convert cultivated fields into extensive grassland, 43% would not alow renaturalisation of the natural riverbeds in their fields, 42% would not agree to convert from conventional to organic farming, 39% would not construct artificial wetlands between fields and water bodies. Share of answers regarding implementation of the rest measures ranged 1%-20%.

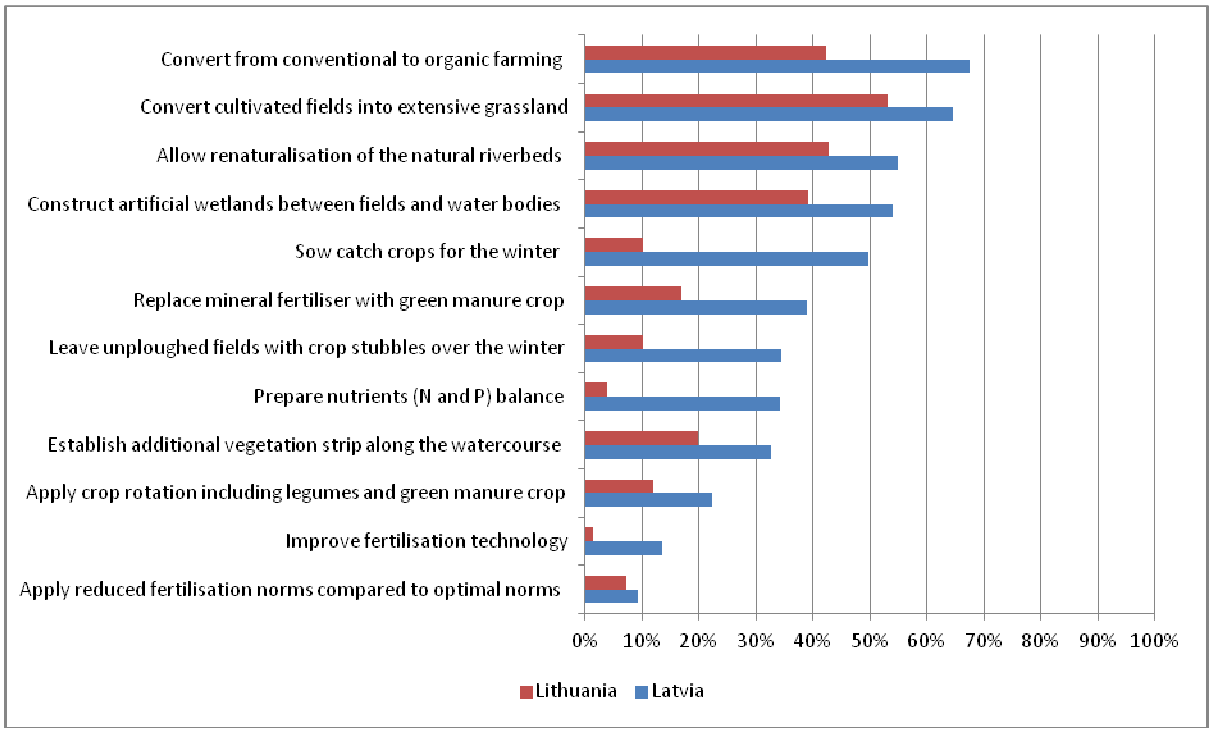


Figure 32. Share of respondents who would not implement supplementary agri-environmental measures

5.4.4. Opinion on effectiveness of agri-environmental measures

Farmers were asked their opinion on the effectiveness of various agri-environmental measures. They had to rank measures in a scale of 6, from absolutely ineffective to the most effective.

Results show that Latvian farmers consider construction of manure and slurry storages the most effective measure in Lielupė RBD. Application of reduced fertilisation norms compared to norms for highest yields was ranked as the second one, improvement of the fertilisation technologies – the third, and development and implementation of fertilisation plans – the fourth.

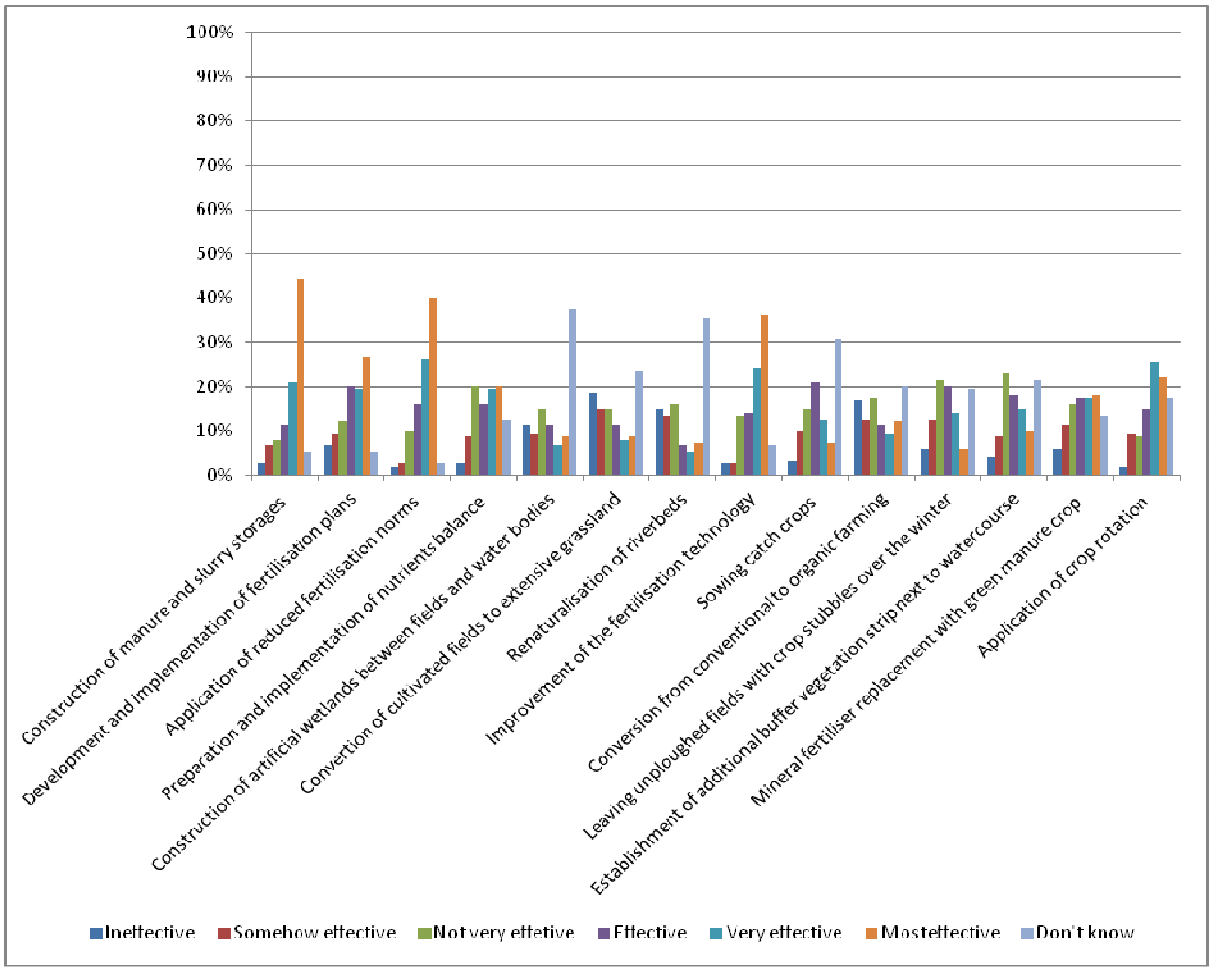


Figure 33. Latvian farmers' perception of the effectiveness of various agri-environmental measures in Lielupė RBD, responses

Lithuanian farmers' opinion regarding effectiveness of agri-environmental measures in Lielupė RBD was not very different from Latvians. Construction of manure and slurry storages was ranked as the most effective measure; improvement of the fertilisation technology was the second one, application of crop rotation – the third and application of reduced fertilisation norms – the fourth. However, they more clearly expressed also their opinion on ineffectiveness. Construction of artificial wetlands, conversion of cultivated fields to grassland and renaturalisation of riverbeds were recognized as least effective.

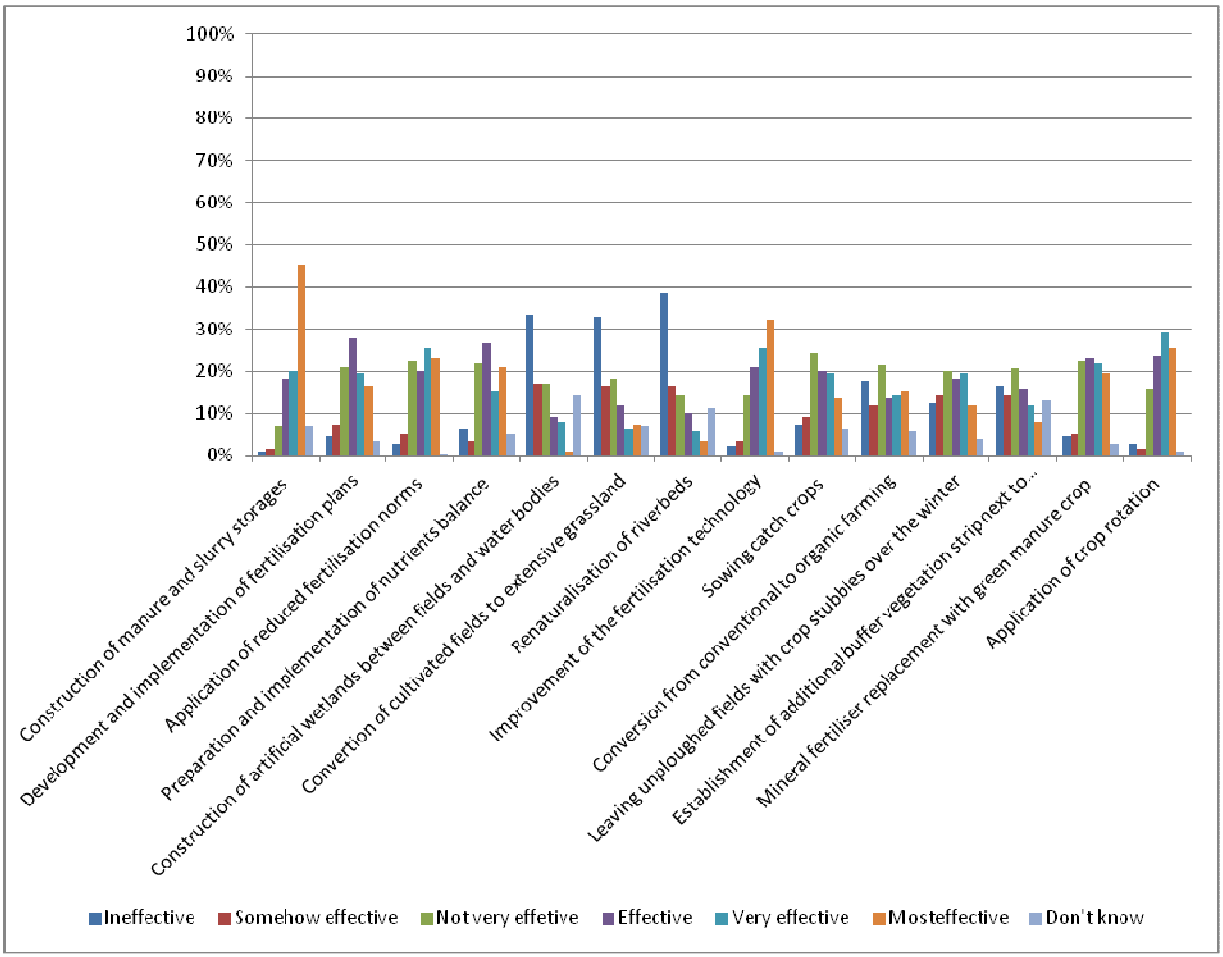


Figure 34. Lithuanian farmers' perception of the effectiveness of various agri-environmental measures in Lielupė RBD, responses

Only distribution of measures according to their effectiveness in Venta RBD was little different, but in general priority by Latvian farmers was given to the same measures. Improvement of fertilisation technology was ranked as the most effective measure, construction of manure and slurry storages – the second one, application of reduced fertilisation norms – the third.

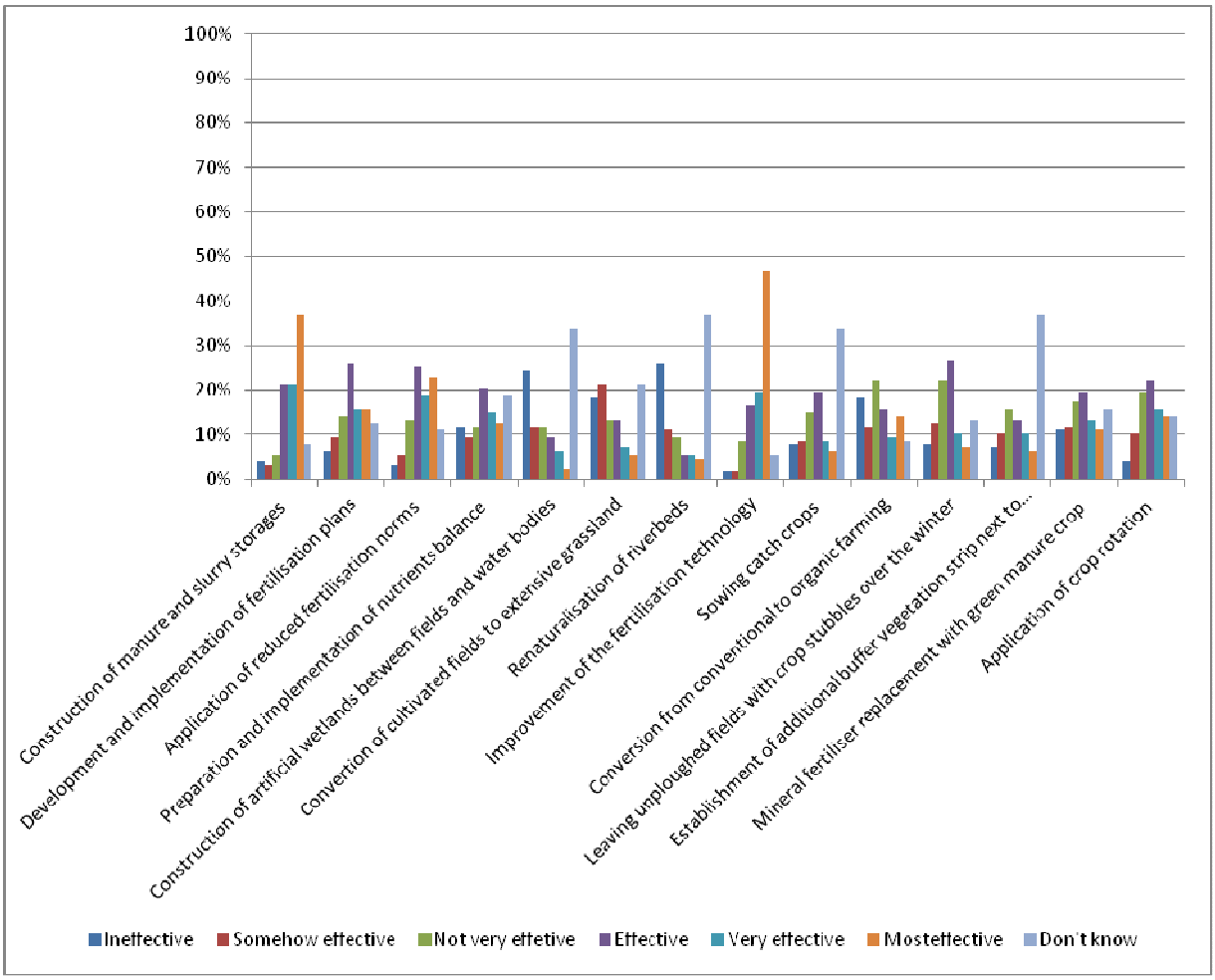


Figure 35. Latvian farmers' perception of the effectiveness of various agri-environmental measures in Venta RBD, responses

Lithuanian farmers in Venta RBD again gave priority to the construction of manure and slurry storages. Improvement of the fertilisation technology was ranked as the second effective measure, development and implementation of fertilisation plans – the third one, and application of reduced fertilisation norms – the fourth.

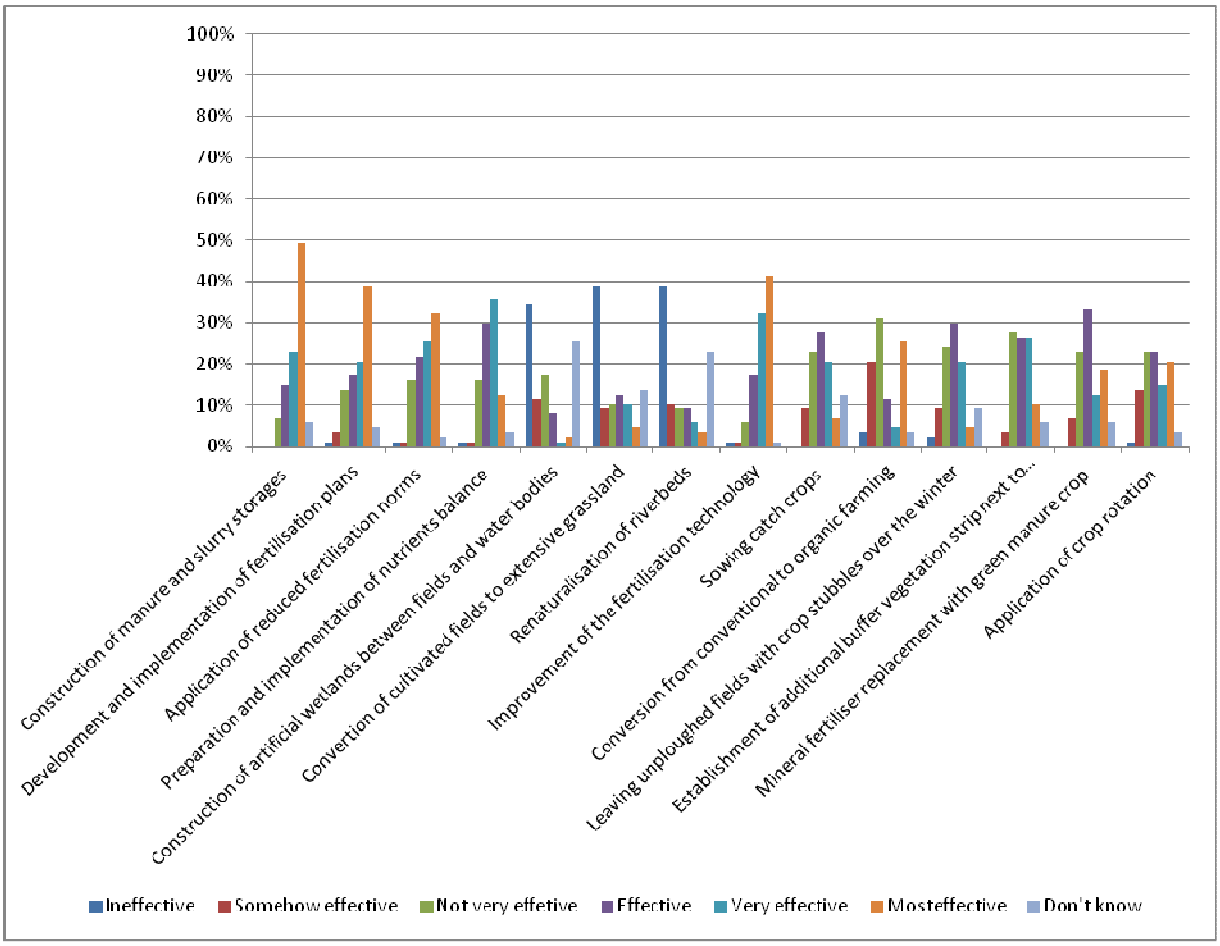


Figure 36. Lithuanian farmers' perception of the effectiveness of various agri-environmental measures in Venta RBD, responses

5.4.5. Ranging of willingness to apply agri-environmental measures

Measures which farmers have implemented already

Some agri-environmental measures are quite widely used among the farmers in both countries who participated in the survey; however, the majority of those are mandatory. Mostly applied measure both in Latvia and Lithuania is application of fertilisers in a proper time.

Table 20. Range of agri-environmental measures that Latvian and Lithuanian respondents have already implemented

Latvia		**Lithuania**	
Agri-environmental measure	**Share farmers who already implemented the measure**	**Share of farmers who already implemented the measure**	**Agri-environmental measure**
Apply fertilisers in a proper time	84%	96%	Apply fertilisers in a proper time

Latvia		Lithuania	
Agri-environmental measure	**Share farmers who already implemented the measure**	**Share of farmers who already implemented the measure**	**Agri-environmental measure**
Apply fertilisation norms meeting environmental requirements*	84%*	91%*	Apply fertilisation norms meeting environmental requirements*
Winter plants cover*	77%*	66%*	Construct slurry storages meeting environmental requirements*
Apply reduced fertilisation norms compared to optimal norms	67%	61%*	Construct manure storages meeting environmental requirements*
Construct manure storages meeting environmental requirements*	43%*	35%	Apply reduced fertilisation norms compared to optimal norms
Improve fertilisation technology	39%	34%	Leave unploughed fields with crop stubbles over the winter
Prepare fertilisation plan meeting environmental requirements*	33%*	33%*	Prepare fertilisation plan meeting environmental requirements*
Apply crop rotation including legumines and green manure crop	32%	32%	Winter plants cover
Leave unploughed fields with crop stubbles over the winter	27%	22%	Apply crop rotation including legumines and green manure crop
Construct slurry storages meeting environmental requirements*	22%*	19%	Improve fertilisation technology
Prepare nutrients (N and P) balance	17%	9%	Sow catch crops for the winter
Replace mineral fertiliser with green manure crop	14%	8%	Replace mineral fertiliser with green manure crop
Establish additional vegetation strip along the watercourse	11%	6%	Prepare nutrients (N and P) balance
Convert cultivated fields into extensive grassland	9%	4%	Convert from conventional to organic farming
Sow catch crops for the winter	9%	2%	Convert cultivated fields into extensive grassland
Convert from conventional to organic farming	7%	1%	Establish additional vegetation strip along the watercourse
Construct artificial wetlands between fields and water bodies	4%	0%	Construct artificial wetlands between fields and water bodies
Allow renaturalisation of natural riverbeds	0%	0%	Allow renaturalisation of natural riverbeds

**-Measures which are mandatory to some part of farmers; in this case a share of that part, not of all farmers surveyed, is provided.*

Measures which farmers would implement

As regards willingness to implement agri-environmental measures (Table 21), 24% of Latvian respondents gave priority to the application of crop rotation and 21% to the preparation of nutrients balance. The biggest percentage from Lithuanians was given to sowing catch crops for the winter (28%) and improvement of fertilisation technology (27%).

Table 21. Range of supplementary agri-environmental measures that Latvian and Lithuanian respondents would implement

Latvia		**Lithuania**	
Agri-environmental measure	**Share of farmers who are willing to apply the measure**	**Share of farmers who are willing to apply the measure**	**Agri-environmental measure**
Apply crop rotation including legumines and green manure crop	24%	28%	Sow catch crops for the winter
Prepare nutrients (N and P) balance	21%	27%	Improve fertilisation technology
Improve fertilisation technology	17%	23%	Prepare nutrients (N and P) balance
Replace mineral fertiliser with green manure crop	16%	22%	Apply reduced fertilisation norms compared to optimal norms
Apply reduced fertilisation norms compared to optimal norms	15%	22%	Apply crop rotation including legumines and green manure crop
Sow catch crops for the winter	8%	20%	Replace mineral fertiliser with green manure crop
Leave unploughed fields with crop stubbles over the winter	6%	16%	Leave unploughed fields with crop stubbles over the winter
Convert from conventional to organic farming	5%	7%	Establish additional vegetation strip along the watercourse
Establish additional vegetation strip along the watercourse	5%	6%	Allow renaturalisation of the natural riverbeds
Convert cultivated fields into extensive grassland	4%	4%	Convert from conventional to organic farming
Construct artificial wetlands between fields and water bodies	3%	3%	Construct artificial wetlands between fields and water bodies
Allow renaturalisation of the natural riverbeds	0%	2%	Convert cultivated fields into extensive grassland

Measures which farmers would implement if received compensation

Understandably bigger proportion of farmers would be willing to implement agri-environmental measures if received compensations for that. Designation of additional vegetation strips along watercourses would be acceptable for one third of Latvian and more than half of Lithuanian respondents if they received compensation. Moreover, Lithuanian respondents within the range 25-50% would agree to implement all the other measures proposed.

Table 22. Range of supplementary agri-environmental measures that Latvian and Lithuanian respondents would implement if received compensation

Latvia		**Lithuania**	
Agri-environmental measure	**Share of farmers who would apply measure with compensation**	**Share of farmers who would apply measure with compensation**	**Agri-environmental measure**
Establish additional vegetation strip along watercourse	32%	53%	Establish additional vegetation strip along watercourse
Improve fertilisation technology	24%	52%	Prepare nutrients (N and P) balance
Sow catch crops for the winter	23%	50%	Replace mineral fertiliser with green manure crop
Replace mineral fertiliser with green manure crop	20%	49%	Improve fertilisation technology
Leave unploughed fields with crop stubbles over the winter	18%	43%	Sow catch crops for the winter
Construct artificial wetlands between fields and water bodies	16%	39%	Apply crop rotation including legumines and green manure crop
Apply crop rotation including legumines and green manure crop	16%	35%	Convert from conventional to organic farming
Prepare nutrients (N and P) balance	14%	32%	Leave unploughed fields with crop stubbles over the winter
Convert cultivated fields into extensive grassland	10%	28%	Construct artificial wetlands between fields and water bodies
Convert from conventional to organic farming	10%	28%	Convert cultivated fields into extensive grassland
Allow renaturalisation of the natural riverbeds	4%	25%	Apply reduced fertilisation norms compared to optimal norms
Apply reduced fertilisation norms compared to optimal norms	2%	23%	Allow renaturalisation of the natural riverbeds

Measures which farmers would not implement

Higher proportion of Latvian respondents compared to Lithuanians showed their unwillingness to implement agri-environmental measures. More than half of them would not agree to convert from conventional to organic farming, convert cultivated fields into extensive grasslands, allow renaturalisation of the natural riverbeds, construct artificial wetlands between fields and water bodies and sow catch crops for the winter. About half of Lithuanian respondents are not willing to convert cultivated fields into extensive grassland, 43% would not alow renaturalisation of the natural riverbeds in their fields, 42% would not agree to convert from conventional to organic farming, 39% would not construct artificial wetlands between fields and water bodies.

Table 23. Range of supplementary agri-environmental measures that Latvian and Lithuanian respondents would not implement

Latvia		**Lithuania**	
Agri-environmental measure	**Share of farmers who would not implement measure**	**Share of farmers who would not implement measure**	**Agri-environmental measure**
Convert from conventional to organic farming	68%	53%	Convert cultivated fields into extensive grassland
Convert cultivated fields into extensive grassland	65%	43%	Allow renaturalisation of the natural riverbeds
Allow renaturalisation of the natural riverbeds	55%	42%	Convert from conventional to organic farming
Construct artificial wetlands between fields and water bodies	54%	39%	Construct artificial wetlands between fields and water bodies
Sow catch crops for the winter	50%	20%	Establish additional vegetation strip along the watercourse
Replace mineral fertiliser with green manure crop	39%	17%	Replace mineral fertiliser with green manure crop
Prepare nutrients (N and P) balance	34%	12%	Apply crop rotation including legumines and green manure crop
Leave unploughed fields with crop stubbles over the winter	34%	10%	Sow catch crops for the winter
Establish additional vegetation strip along the watercourse	33%	10%	Leave unploughed fields with crop stubbles over the winter
Apply crop rotation including legumines and green manure crop	22%	7%	Apply reduced fertilisation norms compared to optimal norms
Improve fertilisation technology	14%	4%	Prepare nutrients (N and P) balance
Apply reduced fertilisation norms compared to optimal norms	9%	1%	Improve fertilisation technology

5.4.6. Ranging of farmers opinion on effectiveness of agri-environmental measures

Construction of manure and slurry storages, application of reduced fertilisation norms and improvement of fertilisation technology were rated as the most effective measures by both Latvian and Lithuanian farmers in Lielupė RBD.

Table 24. Range of supplementary agri-environmental measures that Latvian and Lithuanian respondents value as most effective to reduce water pollution in Lielupe RBD

Latvia		**Lithuania**	
Agri-environmental measure	**Share of farmers who think that measure is most effective**	**Share of farmers who think that measure is most effective**	**Agri-environmental measure**
Construction of manure and slurry storages	44%	45%	Construction of manure and slurry storages
Application of reduced fertilisation norms	40%	32%	Improvement of the fertilisation technology
Improvement of the fertilisation technology	36%	26%	Application of crop rotation
Development and implementation of fertilisation plans	27%	23%	Application of reduced fertilisation norms
Application of crop rotation	22%	21%	Preparation and implementation of nutrients balance
Preparation and implementation of nutrients balance	20%	19%	Mineral fertiliser replacement with green manure crop
Mineral fertiliser replacement with green manure crop	18%	16%	Development and implementation of fertilisation plans
Conversion from conventional to organic farming	12%	15%	Conversion from conventional to organic farming
Establishment of additional buffer vegetation strip next to watercourse	10%	14%	Sowing catch crops
Construction of artificial wetlands between fields and water bodies	9%	12%	Leaving unploughed fields with crop stubbles over the winter
Conversion of cultivated fields to extensive grassland	9%	8%	Establishment of additional buffer vegetation strip next to watercourse
Renaturalisation of riverbeds	7%	7%	Conversion of cultivated fields to extensive grassland
Sowing catch crops	7%	3%	Renaturalisation of riverbeds
Leaving unploughed fields with crop stubbles over the winter	6%	1%	Construction of artificial wetlands between fields and water bodies

Mainly the same measures were indicated by respondents as the most effective in Venta RBD (Table 25).

Table 25. Range of supplementary agri-environmental measures that Latvian and Lithuanian respondents value as most effective to reduce water pollution in Venta RBD

Latvia		Lithuania	
Agri-environmental measure	**Share of farmers who think that measure is most effective**	**Share of farmers who think that measure is most effective**	**Agri-environmental measure**
Improvement of the fertilisation technology	46%	49%	Construction of manure and slurry storages
Construction of manure and slurry storages	37%	41%	Improvement of the fertilisation technology
Application of reduced fertilisation norms	23%	39%	Development and implementation of fertilisation plans
Development and implementation of fertilisation plans	16%	32%	Application of reduced fertilisation norms
Conversion from conventional to organic farming	14%	25%	Conversion from conventional to organic farming
Application of crop rotation	14%	21%	Application of crop rotation
Preparation and implementation of nutrients balance	13%	18%	Mineral fertiliser replacement with green manure crop
Mineral fertiliser replacement with green manure crop	11%	13%	Preparation and implementation of nutrients balance
Leaving unploughed fields with crop stubbles over the winter	7%	10%	Establishment of additional buffer vegetation strip next to watercourse
Conversion of cultivated fields to extensive grassland	6%	7%	Sowing catch crops
Sowing catch crops	6%	5%	Conversion of cultivated fields to extensive grassland
Establishment of additional buffer vegetation strip next to watercourse	6%	5%	Leaving unploughed fields with crop stubbles over the winter
Renaturalisation of riverbeds	5%	3%	Renaturalisation of riverbeds
Construction of artificial wetlands between fields and water bodies	2%	2%	Construction of artificial wetlands between fields and water bodies

5. CONCLUSIONS AND RECOMMENDATIONS

The survey gathered information on how Lithuanian and Latvian agricultural and environmental specialists and farmers operating in the Lielupė and Venta RBDs value agri-environmental aspects and new agri-environmental measures; to what extent farmers comply with the existing environmental obligations and how they are ready to implement supplementary agri-environmental measures. The following findings could be highlighted:

Farmers' knowledge of river management plans

- Majority of respondents – 67 % in Latvia and 57 % in Lithuania – were **nonfamiliar** with the river basin districts, their management plans and programmes of measures. More information about the importance of agri-environmental measures should be delivered to the farmers.

Opinion of farmers on water pollution problems

- Majority of farmers in both countries **value water resources** in Venta and Lielupe RBDs **well**. They use dug well water for drinking (75% of Latvian respondents in Venta RBD and 58% in Lielupė RBD; 71% of Lithuanian respondents in Venta RBD and 59% in Lielupė RBD), they swim in lakes and rivers (54% of Latvian respondents in Lielupė RBD and 47 % in Venta RBD; 87% of Lithuanian respondents Venta RBD and 71% in Lielupė RBD).

Opinion of farmers on the impact of agricultural activities on the water quality

- Farmers understand that agricultural activities impact ground and surface water quality, however, quite a big part of them in Latvia **think that agricultural pollution contributes only up to 10% of total water pollution**. 53% of Lithuanian farmers think that agriculture contributes to water pollution by 10-50%.
- 35% and 37% of respondents in Latvia and Lithuania accordingly see fertilisation time *to some extent* contributing to water quality. 36% of Latvian farmers see mineral fertilisers' use *to some extent* contributing to water quality, whereas the biggest part of Lithuanian farmers see it contributing to water quality *to a little extent* (39% of respondents).
- The biggest part of Latvian and Lithuanian farmers see leakage from manure storages *to some extent* contributing to water quality (36% of respondents), however, the same proportion of Lithuanian farmers (36% of respondents) see it contributing to water quality *to a large extent*.

Role of farmers in the improvement of the water quality

- **Mandatory agri-environmental measures have been implemented not in all farms** where they had to be implemented so far. The most important gap is the construction of manure and slurry storages (manure storages were constructed in 43% of Latvian farms and 61% of Lithuanian farms, slurry storages – in 22% of Latvian farms and in 66% of Lithuanian farms), and preparation of fertilisation plans (fertilisations plans had approx. one third of farms in both countries). The level of the implementation of fertilisation norms meeting environmental requirements as well as application of fertilisers in a proper time and application of winter or perennial plants cover in winter was higher, but still not sufficient (required fertilisation norms have been applied in 84% of Latvian farms and 88% of Lithuanian farms; fertilisers have been applied in a proper time in 84% of Latvian farms and 95% of Lithuanian farms; winter or perennial plants cover in winter has been applied in 77% of Latvian farms (for Lithuanians this measure is not mandatory)).

Opinion of farmers on the reasons for failing to implement environmental requirements

- **Not sufficient national financial support** for the implementation of environmental measures as the **top reason** was mentioned by the majority of respondents in both countries. Excessive bureaucracy for obtaining compensation was also indicated as quite an important reason by Lithuanian farmers. Moreover, **not sufficient environmental education** was stressed and recognised as highly needed to improve farmers‘ awareness about the environmental protection in both countries.

Farmers' willingness to contribute to water quality improvement

- Application of reduced fertilisation norms compared to norms for highest yields is the most popular supplementary measure already implemented by the Latvian farmers (applied by 67% of respondents). Approximately one third of them improved fertilisation technology, applied crop rotation and obtained fertilisations plans. Reduced fertilisation norms and leaving unploughed fields with crop stubbles over the winter was applied among approx. one third of Lithuanian farms.
- **The biggest support by Latvian farmers without getting financial support gets crop rotation and preparation of nutrients balance** (24% of respondents). **Lithuanian farmers mostly support sowing of catch crops for the winter** (28% of respondents) **and improvement of fertilisation technology** (27% of respondents).
- Understandably, receiving compensation increases willingness to implement measures. The measure, which **would be implemented by the biggest part of Lithuanian (53%) and Latvian (32%) farmers, is preparation of vegetation strips along a watercourse if received compensation.** Lithuanian respondents in general are more eager to receive compensations – the share of willingness to implement measures ((25-53% of respondents) exceeded Latvian one for all types of supplementary measures. This result could be explained by the fact that Latvian farmers are not sure about the effectiveness of some measures (for example, establishment of additional vegetation strips along watercourses, leaving crop stubbles over the winter and construction of artificial wetlands between fields and water bodies) and they do not want to reduce their agricultural land area without being confident that certain measures would be beneficial to the environment.Usually, the financial support does not cover all construction and maintenance expenses of a measure.
- Consequently a higher percentage of Latvian farmers compared to Lithuanians showed their unwillingness to implement supplementary measures. More than half would not agree to convert from conventional to organic farming, from cultivated fields into extensive grasslands, allow renaturalisation of the natural riverbeds, construct artificial wetlands between fields and water bodies and sow catch crops for the winter (50-65% of respondents), approx. one third would not replace mineral fertiliser with green manure crop, leave unploughed fields with crop stubbles over the winter, prepare nutrients balance (33-39% of respondents) etc. More than half of Lithuanians would not agree to convert cultivated fields into extensive grassland (53% of respondents), more than one third would not alow renaturalisation of the natural riverbeds in their fields, would not convert from conventional to organic farming, would not construct artificial wetlands between fields and water bodies (43-39% of respondents) etc..

Farmers' opinion on effectiveness of measures to reduce water pollution

- Latvian farmers **at Lielupė RBD** rated **construction of manure and slurry storages, application of reduced fertilisation norms and improvement of fertilisation technology as the most effective measures** (44%, 40% and 36% of respondents accordingly). Lithuanian farmers of the same RBD indicated construction of manure and slurry storages, improvement of fertilisation technology and application of **crop rotation** as the most effective measures (45%, 32% and 26% of respondents accordingly).

- Latvian farmers at Venta RBD consider **improvement of fertilisation technology and construction of manure and slurry storages** as the most effective measures (46% and 37% of respondents accordingly). According to Lithuanian farmers, construction of manure and slurry storages, improvement of fertilisation technology and **development and implementation of fertilisation plans are the most effective measures in Venta RBD** (49%, 41% and 39% of respondents accordingly).

The above findings, as well as results of Specialists' Survey indicate some problems and recommendations which need to be paid attention at while developing strategies on agri-environmental measures:

- The mineral fertilisers' usage is not regulated in Lithuania; this is a very important drawback in the system of agricultural pollution reduction.
- There is a lack of mixed crop and animal farming in Lithuanian part of Lielupe and Venta RBDs. Crop production is the most common. This causes not balanced, too much polluting activities.
- Implementation of agri-environmental measures requires an integral approach. There is lack of the evaluation of environmental benefits that could be achieved through supportive measures under the Rural Development Programme.
- Needed proper accounting of pollution rising from fishing ponds in Venta RBD. It is necessary to have more detailed information on amount of feed supplied to fish, its nutritional composition, concentration of chemical substances in fisheries production and quantities of production.
- There is also a need to change methods for the assessment of the load from large livestock farms and of biogens' leaching in Lielupe RBD. Evaluation of only annual average leachate concentrations is not correct way. It is necessary to evaluate pollution in different periods taking into consideration the water content in the soil during the certain year.
- There is a lack of training and education of farmers. They should learn more about modern technologies application opportunities, new agri-environmental measures. It is important that farmers are acquainted with the specific situation in a particular area where they conduct farming activities. Advisory services should be adjusted to the areas and local needs.
- Relationship between controlling authorities and farmers should be improved, focusing on advising and supportive character of such a relationship. On the other hand, more control should be secured in vegetation periods when pesticides are being spread.
- More attention should be paid at slurry problem of pig farms.
- Lack of political will is still often an important obstacle for environmental improvements in the agricultural sector.
- Financial support should be awarded only to farmers who meet requirements of good agricultural practices. On the other hand, bureaucracy to receive compensations should be minimized.
- Information, accounting of actual quantities of fertilisers and pesticides should be considerably improved.
- Scientific knowledge and research activities should be extended; collaboration between ecologists and agronomists initiated.
- Monitoring of water and soil in agricultural area needs to be broadened.

REFERENCES

Agricultural census in Lithuania, 2010, available at: https://osp.stat.gov.lt/en/temines-lenteles56;jsessionid=D6918CAC4C8390296C3CDEF0701A871B, retrieved 2014-02-03

EU catalogue of agricultural measures, 2008, available at: http://rbn-water-agri.jrc.ec.europa.eu/Prb-agri/documents/open-section/catalogue-of-measures, retrieved 2013-09-25

Latvian-Lithuanian Lielupe River Basin management plan. Analises of situation. Lielupe River Watershed Demonstration Project Within The Baltic Sea / Great Lakes Partnership, 2001

Lielupe river basin district management plan, approved by Resolution No. 1618 of the Government of the Republic of Lithuania of 17 November 2010 available at: http://vanduo.gamta.lt/files/Lielupe%20river%20management%20plan.pdf, retrieved 2014-07-10

Programme of measures for achieving water protection objectives within the Lielupe River Basin District, 2010, available at: http://vanduo.gamta.lt/files/Programme%20of%20Measures%20Lielupe.pdf, retrieved 2014-07-14

Programme of measures for achieving water protection objectives within the Venta River Basin District, 2010, available at: http://vanduo.gamta.lt/files/Programme%20of%20Measures%20Venta.pdf, retrieved 2014-07-19

Report from the Commission to the European Parliament and the Council on the implementation of the WFD COM (2012) 670 final, Brussels 14.11.2012, available at: http://ec.europa.eu/environment/water/water-framework/pdf/CWD-2012-379_EN-Vol2.pdf, retrieved 2014-07-22

Rumbeniece I., 2011. Effect of investments on water quality changes in the Lielupe river basin. *Ekonomika ir vadyba: aktualijos ir perspektyvos*, 4 (24). P. 189-197

Venta River Basin Cross Border Management Plan, 2012, available at: http://www.kurzemesregions.lv/userfiles/files/1339588505_Title%20page.pdf, retrieved 2014-07-21

Venta river basin district management plan, approved by Resolution No. 1617 of the Government of the Republic of Lithuania of 17 November 2010. Available at: http://vanduo.gamta.lt/files/Venta%20river%20management%20plan.pdf, retrieved 2014-07-17

ANNEX I. QUESTIONNAIRE TO SPECIALISTS (ENGLISH, LATVIAN, LITHUANIAN)

Monitoring of Rivers and Environmental Survey of Farmers in Lielupe and Venta River Basin Districts
QUESTIONNAIRE TO SPECIALISTS

Name:

Job title:

Institution:

Department:

Telephone:

E-mail:

Thank you for taking the time to complete this survey.

The Monitoring of Rivers and Environmental Survey of Farmers in Lielupe and Venta River Basin Districts project, funded by the EU Latvian-Lithuania cross-border cooperation programme, aims at improvement of the river basin management in Lielupe and Venta international river basin districts and ensuring active cooperation as well as involvement of the public in the management of natural resources.

The function of this survey is to better understand how decision makers see agricultural pollution problems in Lielupė and Venta RBDs, what role they attach to various agro-environmental measures and how decisions on these measures will be taken.

The results of this questionnaire are essential input for the development of the RBMPs for Lielupė and Venta RBDs. Before that, results of this survey will be used for the large scale, well-structured and scientifically based survey of farmers in Lithuanian and Latvian parts of Lielupė and Venta river basins to find out their opinion on feasibility and willingness to implement environmental measures. The survey itself will play a significant role in informing public on status of water environment and measures to improve it.

1.1. Which ministries or administrative bodies in Lithuania/Latvia are dealing with the agricultural pollution and agro-environmental measures in Lielupė and Venta RBDs?

[Insert text here. Use as much space as you need.]

1.2. What are the main problems, related to the agricultural pollution in Lithuania/Latvia?

[Insert text here. Use as much space as you need.]

1.3. What are the main problems related to the agricultural pollution in Venta and Lielupė RBDs?

[Insert text here. Use as much space as you need.]

1.4. Could you list the main agricultural pollution management measures in effect in Lithuania/Latvia?

[Insert text here. Use as much space as you need.]

1.5. Could you list the main agricultural pollution management measures in effect in Venta and Lielupė RBDs?

[Insert text here. Use as much space as you need.]

1.6. Are the existing measures sufficient to combat the agricultural pollution in Venta and Lielupė RBDs?

- Yes (*go to Question 1.8)*
- No

1.7. What measures would you like to see in the list of supplementary measures, required for the reduction of agricultural pollution? *(Please rate the usefulness of a measure by ticking one box for each row and add any additional measures you think could be useful)*

	Measures	Not useful	Could be useful	Highly useful	**Comments** (*Use as much space as you need*)
1.	Develop and implement fertilisation plans according to the approved Methodology for the Development of Fertilisation Plans	☐	☐	☐	
2.	Apply reduced fertilisation norms compared to optimal norms	☐	☐	☐	
3.	Prepare nutrients (nitrogen and phosphorous) balance, allowing long term planning of fertiliser use (when fertilisation plans are not developed)	☐	☐	☐	
4.	Construct artificial wetlands between fields and water bodies (wetlands can help to capture nutrients from agriculture run-off before entering water bodies)	☐	☐	☐	
5.	Convert cultivated fields into extensive grassland (this measure reduces nutrients' leakage to waters due to lower inputs in the soil)	☐	☐	☐	

	Measures	Not useful	Could be useful	Highly useful	**Comments** (*Use as much space as you need*)
6.	Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds in your fields (after re-meandering rivers usually become longer resulting in better conditions for the self-purification)	☐	☐	☐	
7.	Improve fertilisation technology (improved fertilisation technology can reduce nutrient leakage into waters)	☐	☐	☐	
8.	Plant sandy and mixed land with catch crops (catch crops uptake nutrients, therefore after harvesting main crops lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest)	☐	☐	☐	
9.	Convert from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm)	☐	☐	☐	
10.	Leave unplowed fields with crop stubbles over the winter (this measure helps in preventing soil erosion)	☐	☐	☐	
11.	Prepare a 5 m wide vegetation buffer zone, located on an arable field next to watercourse (buffer zones may reduce losses of mineral nutrients and prevent contamination of water with pesticides which are spread on the field)	☐	☐	☐	
12.	Replace mineral fertiliser with green manure crop (it can improve soil fertility and plant growing conditions)	☐	☐	☐	
13.	[*insert another measure*]	☐	☐	☐	
14.	[*insert another measure*]	☐	☐	☐	

1.8. If you have any other comments, recommendations, requests or wishes regarding the agricultural pollution management issues in Venta and Lielupė river basins that do not fit into the categories above, please let us know:

[Insert text here. Use as much space as you need.]

Thank you very much!

Lielupes un Ventas upju baseinu apgabala lauksaimnieku aptauja vides jomā un upju monitorings

Ekspertu aptaujas anketa

Vārds, uzvārds:

Amats:

Organizācija:

Nodaļa:

Tālrunis:

E-pasts:

Paldies, ka atvēlējāt laiku šīs anketas aizpildīšanai.

Latvijas – Lietuvas pārrobežu sadarbības programmas 2007. – 2013.gadam projekta „Lielupes un Ventas upju baseina apgabala lauksaimnieku aptauja vides jomā un upju monitorings" mērķis ir uzlabot Lielupes un Ventas upju baseina teritorijā esošo apgabalu pārvaldību un nodrošināt sabiedrības aktīvu sadarbību, kā arī iesaistīšanu dabas resursu pārvaldīšanā.

Šīs aptaujas mērķis ir labāk izprast lēmumu pieņēmēju viedokli lauksaimnieciskās darbības izraisītā piesārņojuma problēmu risināšanā Lielupē un Ventā, agrovides pasākumu izvēlē un ieviešanā.

Anketas rezultātiem ir būtiska loma Lielupes un Ventas upju baseina apgabalu apsaimniekošanas plānu realizācijā. Aptaujas rezultāti tiks izmantoti, lai sastādītu labi strukturētu un zinātniski pamatotu aptaujas anketu lauksaimniekiem Latvijas un Lietuvas teritorijas Ventas un Lielupes ūdens baseinu apgabalos ar mērķi noskaidrot lauksaimnieku vēlmi un iespējas ieviest agrovides pasākumus. Pētījums būs nozīmīgs sabiedrības informēšanai par ūdens kvalitātes stāvokli un pasākumiem tās uzlabošanai.

1.1. Kura ministrija vai iestāde risina jautājumus saistītus ar lauksaimniecības radīto piesārņojumu un agrovides pasākumiem Lielupes un Ventas upju baseina teritorijās?

1.2. Kādas Latvijā ir galvenās problēmas, kas saistītas ar lauksaimniecības radīto piesārņojumu?

1.3. Kādas ir galvenās problēmas ar lauksaimniecības radīto piesārņojumu Ventas un Lielupes upju baseina teritorijās?

1.4. Vai jūs varētu nosaukt galvenos šobrīd pielietotos no lauksaimniecības radītā piesārņojuma mazināšanas pasākumus Latvijā?

1.5. Vai jūs varētu nosaukt galvenos šobrīd pielietotos lauksaimniecības piesārņojuma mazināšanas pasākumus Ventas un Lielupes baseina teritorijās?

1.6. Vai pašreiz pielietotie pasākumi ir efektīvi lauksaimniecības piesārņojuma ierobežošanai Ventas un Lielupes baseina teritorijās?

- ○ Jā (*tālāk uz jautājumu 1.8)*
- ○ Nē

1.7. Kādi pasākumi būtu jāievieš papildus, lai samazinātu lauksaimniecības radīto piesārņojumu (lūdzu atzīmējiet pēc noderīguma pasākumus atzīmējot kādu no atbilžu variantiem vai arī pierakstiet jaunu pasākumu, ja tāds ir)

	Pasākumi	Nav noderīgs	Varētu palīdzēt	Ļoti noderīgs	**Komentāri**
1	Sagatavot un ieviest kultūraugu mēslošanas plānu.	☐	☐	☐	
2	Optimālu mēslojuma normu vietā lietot samazinātas mēslojuma normas.	☐	☐	☐	
3	Aprēķināt barības vielu (slāpekļa un fosfora) bilanci saimniecībā, ņemot vērā mēslojuma lietošanu ilgtermiņā (ja netiek izstrādāts mēslošanas plāns).	☐	☐	☐	

	Pasākumi	Nav noderīgs	Varētu palīdzēt	Ļoti noderīgs	**Komentāri**
4	Veidot mitrzemes starp laukiem un ūdens baseiniem (mitrzeme aiztur barības vielu no lauksaimniecībā pielietotā mēslojuma nonākšanu ūdens baseinos)	☐	☐	☐	
5	Pārveidot iekultivētus laukus ekstensīvos zālājos (samazināsies barības vielu ieskalošanās ūdeņos zemāku mēslojuma normu lietošanas rezultātā)	☐	☐	☐	
6	Atjaunot dabisku, iepriekš iztaisnotu upes gultni (upju meandru atjaunošana veicinās upes pašattīrīšanos)	☐	☐	☐	
7	Uzlabot mēslošanas izkliedes tehnoloģiju, tehniku (tiek samazināta barības vielu notece ūdenī)	☐	☐	☐	
8	Ieviest uztvērējaugu audzēšanu (uztrvērējaugi efektīgi samazina barības vielu izskalošanās apjomu, jo tie patērē augsnē esošās barības vielas pēc kultūrauga novākšanas rudens un ziemas periodā, laikā, kad notiek intensīvs izskalošanās process.	☐	☐	☐	
9	Konvencionālu saimniecību pāreja uz bioloģisko saimniekošanu (barības vielu izmantošanās ir labāka, un barības vielu zudumi apkārtējā vidē ir mazāki bioloģiskajās saimniecībās salīdzinot ar konvencionālajām).	☐	☐	☐	

	Pasākumi	Nav noderīgs	Varētu palīdzēt	Ļoti noderīgs	**Komentāri**
10	Saglabāt neiestrādātas kultūraugu pēcpļaujas atliekas ziemas periodā. (veicina augsnes virskārtas aizsardzību pret augsnes degradācijas procesiem, samazina barības vielu noteci).	☐	☐	☐	
11	Ierīkot un apsaimniekot veģetācijas buferjoslu 5 m platumā gar virszemes ūdensobjektu (buferjosla var samazināt virszemes noteci un ūdens piesārņojumu ar pesticīdiem).	☐	☐	☐	
12	Aizstāt minerālmēslojuma lietošanu ar zaļmēslojuma augu audzēšanu. (Zaļmēslojuma augu audzēšana paaugstina augsnes auglību un uzlabo kultūraugu audzēšanas apstākļus).	☐	☐	☐	
	Citi:	☐	☐	☐	
		☐	☐	☐	

1.8. Ja jums ir kādi citi komentāri, ieteikumi, prasības vai vēlējumi sakarā ar lauksaimniecības piesārņojuma samazināšanas jautājumiem Ventas un Lielupes upju baseinos, kas nav iepriekš pieminēti, lūdzu dariet mums to zināmu:

Upių monitoringas ir Lielupės bei Ventos upių baseinų rajonams priklausančių ūkininkų apklausa aplinkos apsaugos klausimais KLAUSIMYNAS SPECIALISTAMS

Vardas, pavardė:

Pareigos:

Įstaiga:

Departamentas:

Telefono nr.:

Elektroninio pašto adresas:

Ačiū Jums už sugaištą laiką klausimyno užpildymui.

Projektas „Lietuvos ir Latvijos upių monitoringas ir Lielupės bei Ventos upių baseinų rajonams priklausančių ūkininkų apklausa aplinkos apsaugos klausimais“ yra finansuojamas Latvijos ir Lietuvos bendradarbiavimo per sieną programos lėšomis. Projekto tikslas yra patobulinti Lielupės ir Ventos tarptautinių upių baseinų rajonų valdymą ir užtikrinti visuomenės aktyvų bendradarbiavimą bei įtraukimą į gamtos išteklių valdymą.

Šios apklausos tikslas yra išsiaiškinti sprendimų priėmėjų požiūrį į žemės ūkio veiklos keliamas problemas Lielupės ir Ventos upių baseinų rajonuose, taip pat išsiaiškinti kaip jie vertina įvairias aplinkosaugines priemones ir kaip sprendimai dėl šių priemonių bus priimti.

Šios apklausos rezultatai bus labai svarbūs rengiant Lielupės ir Ventos upių baseinų rajonų valdymo planus. Prieš tai šios apklausos rezultatai bus panaudoti atliekant gerai struktūrizuotą ir moksliškai pagrįstą Lielupės ir Ventos upių baseinų rajonams priklausančių Lietuvos ir Latvijos ūkininkų apklausą, siekiant išsiaiškinti jų galimybes ir norą įgyvendinti aplinkos apsaugos priemones. Pati apklausa atliks svarbų vaidmenį informuojant ūkininkus apie vandens būklę ir priemones jai pagerinti.

1. **Kurios ministerijos ar administracinės įstaigos Lietuvoje sprendžia klausimus, susijusius su žemės ūkio tarša ir aplinkos apsaugos priemonėmis Lielupės ir Ventos upių baseinų rajonuose?**

2. **Kokios yra pagrindinės problemos, susijusios su žemės ūkio tarša Lietuvoje?**

3. **Kokios yra pagrindinės problemos, susijusios su žemės ūkio tarša Ventos ir Lielupės UBR?**

4. **Gal galėtumėte išvardinti pagrindines žemės ūkio taršos mažinimo priemones, taikomas Lietuvoje?**

5. **Gal galėtumėte išvardinti pagrindines žemės ūkio taršos mažinimo priemones, taikomas Ventos ir Lielupės UBR?**

6. **Ar esamų priemonių pakanka žemės ūkio keliamos taršos suvaldymui Ventos ir Lielupės UBR?**

   - Taip (*pereiti prie 8 klausimo*)
   - Ne

7. Kurias priemones, skirtas dar labiau sumažinti taršą iš žemės ūkio, Jūs norėtumėte matyti papildomų priemonių sąraše? *(Prašom įvertinti priemonės svarbą kiekvienoje eilutėje pažymint vieną langelį ir pridėti bet kokias papildomas priemones, kurios, Jūsų manymu, būtų naudingos)*

	Priemonė	Nenaudinga	Galėtų būti naudinga	Labai naudinga	**Komentarai**
1.	Tręšimo planų parengimas ir įgyvendinimas	☐	☐	☐	
2.	Tręšimas mažesnėmis nei optimalios tręšimo normos	☐	☐	☐	
3.	Maisto medžiagų (azoto, fosforo) ūkyje balanso, leidžiančio planuoti kiek ateityje reikės trąšų, sudarymas (tais atvejais, kai nerengiami tręšimo planai)	☐	☐	☐	
4.	Dirbtinių šlapynių (pelkių) tarp lauko ir vandens telkinių įrengimas (šlapynės padeda nufiltruoti maisto medžiagas iš gretimų dirbamų laukų atitekančio vandens prieš jam pasiekiant vandens telkinius)	☐	☐	☐	
5.	Dirbamų žemių pavertimas ekstensyviomis pievomis (prižiūrint pievas mažiau kišamasi į dirvos sluoksnį, dėl to sumažėja maisto medžiagų nuotėkis į vandenis)	☐	☐	☐	
6.	Anksčiau ištiesintų upių natūralių vagų atkūrimas (atkūrus upių vagas jos paprastai pailgėja, dėl to atsiranda sąlygos geresniam savaiminiam apsivalymui)	☐	☐	☐	
7.	Tręšimo technologijos patobulinimas (patobulinus tręšimo technologiją galima sumažinti maisto medžiagų nuotėkį į vandenis)	☐	☐	☐	
8.	Smėlingų ir mišrių žemių užsodinimas tarpiniais augalais (tarpiniai augalai naudoja maisto medžiagas ir nuėmus pagrindinių augalų derlių, dėl to mažiau azoto lieka dirvožemyje žiemai, kai jo išplaunama daugiausia)	☐	☐	☐	
9.	Perėjimas nuo įprasto prie ekologinio ūkininkavimo (ekologiškai ūkininkaujant maisto medžiagų naudojimas yra efektyvesnis ir jų nuostoliai į aplinką mažesni nei įprastinėmis gamybos sąlygomis)	☐	☐	☐	
10.	Neapartų ražienų laukų palikimas per žiemą (ši priemonė padeda apsaugoti dirvą nuo erozijos)	☐	☐	☐	
11.	5 m pločio augalų filtracinė juosta ariamoje žemėje išilgai upių, upelių ežerų krantų (buferinė zona gali sumažinti maisto medžiagų nuostolius dirvožemyje ir apsaugoti vandenis nuo taršos ant laukų barstomais pesticidais)	☐	☐	☐	

	Priemonė	Nenaudinga	Galėtų būti naudinga	Labai naudinga	**Komentarai**
12.	Augalų, skirtų žaliajai trąšai, panaudojimas vietoje mineralinių trąšų (tai pagerintų dirvožemio derlingumą ir augalų augimo sąlygas)	☐	☐	☐	
13.	[*įrašykite kitą priemonę*]	☐	☐	☐	
14.	[*įrašykite kitą priemonę*]	☐	☐	☐	

8. Jeigu turite dar kokių nors komentarų, rekomendacijų ar pageidavimų žemės ūkio taršos valdymo klausimais Ventos ir Lielupės upių baseinų rajonuose, prašome juos nurodyti:

Labai ačiū!

ANNEX II. QUESTIONNAIRE ON ACCEPTABILITY AND WILLINGNESS OF FARMERS TO IMPLEMENT MEASURES FOR REDUCTION OF AGRICULTURAL POLLUTION (ENGLISH, LATVIAN, LITHUANIAN)

Questionnaire on acceptability and willingness of farmers to implement measures for reduction of agricultural pollution

According to the European Union and Lithuanian legislation, good status of water bodies should be achieved by 2015. Status of all water bodies in river basin districts was evaluated in 2010. In the Lielupe river basin district, located in the territory of Lithuania, 90% of rivers, 82% of lakes and 50% of ponds while in the Venta river basin district 48% of rivers, 50% of lakes and 50% of ponds were considered as water bodies at risk.

Water bodies at risk are those that are likely to fail achieving good water status by 2015 because of negative effects of human activities even after implementation of mandatory protection measures. Good surface water status means the status when it's both organic and chemical status is estimated as good or very good according to criteria set up by the legislation.

This questionnaire aims to find out to what extent programmes of measures to achieve good water status are acceptable for you (farmers) and to what extent you have already implemented or are ready to implement them. Results of the survey will be taken into account when developing river basin management plans for the next river basin management cycle by 2021.

We guarantee complete confidentiality of your answers. The data will be analysed only after summarising all the answers.

(SHOW THE MAP „WATER BODIES AT RISK" AND EXPLAIN THAT BLUE COLOUR INDICATES WATER BODIES THAT ARE NOT CONSIDERED AS WATER BODIES AT RISK AND RED COLOUR INDICATES WATER BODIES AT RISK. The map represents situation in 2010)

CODE:_____

I. Information about the agricultural entity

1. In which ward do you live?

.....

(PLEASE SPECIFY THE WARD AND THE VILLAGE).
(SHOW THE MAP „WARDS" AND ASK RESPONDENT TO SHOW IN WHICH WARD HE LIVES AND TO TELL THE NAME OF THE VILLAGE)

2. In which river basin district is located your farm?

1) Lielupė ☐ 2) Venta ☐ Lielupė and Venta ☐

3. Have you ever heard about river basin districts, their management plans and programmes of measures?

Yes ☐ No ☐

4. What type of a farm do you represent?

1) Family farm ☐ Farmer's farm ☐ 2) ☐

3) Agricultural company ☐ 4) Individual enterprise ☐

5) Partnership ☐ 6) Public, private, investment company ☐

7) Municipal enterprise ☐ 8) Cooperative company ☐

9) State and other enterprise ☐

5. Your farm main activities:

1) Production of crop ☐

2)Livestock ☐

3) Production of crop and livestock. ☐

6. Plot of your tilth (cultivated land)?

1) Less than 10 ha ☐ 2) 10-20 ha ☐

3) 20-50 ha ☐ 4) 50-200 ha ☐

5) 200-500 ha ☐ 6) 500-1000 ha ☐

7) >1000 ha ☐

7. What crops are grown in your farm?

1) winter cereal ☐ 2) spring cereal ☐ 3) rape ☐

4) legume crops ☐ 5) sugar beet ☐ 6) potatoes ☐

7) vegetables ☐ 8) flax ☐ 9) grassland ☐

10) pasture ☐ 11) orchard ☐ 12) berries ☐

13) feeding plants ☐ 14) feeding roots ☐ 15) corn ☐

16) other ☐ *(PLEASE SPECIFY* .....

(IF QUESTIONED ONLY CROPS FARM OWNER, GO TO QUESTION 9)

8. What is average annual number of livestock units (LSU) in your farm:

1) Less than 5 AU ☐

2) 5-10 AU ☐

3) 10-300 AU ☐

4) More than 300 AU ☐

IF YOU DO NOT KNOW THE NUMBER IN LIVESTOCK UNITS, PLEASE TELL AMOUNT

No.	Livestock species and age group	Amount
1.	Sow with piglets, boars	
2.	Piglets (7 – 32 kg) (3 month)	
3.	Pigs (3-8 month)	
4.	Pigs from 8 month	
5.	Cows, bulls	
6.	Heifer (up to 12 months of age)	
7.	Livestock (get) (from 1 to 2 years)	
8.	Red deer	
9.	Fallow Deer, Sika Deer	
10.	Bison, Wisent	
11.	Sheep, goat	
12.	Horse from 1 year	
13.	Foal up to 1 year	
14.	Laying hen	
15.	Broiler	
16.	Turkey (up to 70 days)	
17.	Turkey (up to 133 days)	
18.	Duck	
19.	Goose	
20.	Rabbit	
21.	Chinchilla	
22.	Mink, marten (older than 10 month)	
23.	Fox (older than 10 month)	
24.	Ostrich (mature)	

9. Is your farm organic?

1) Yes ☐ 2) No ☐

3) Transitional ☐ 4) Partial ☐

10. How many years of farming experience (all kinds of agricultural activities) do you have?

1) 0-5years ☐ 2) 6-10 years ☐ 3) 11-15 years ☐

4) 16-20years ☐ 5) >20 years ☐

II. Opinion of farmers on water pollution problems

11. For which purposes do you use water resources of Venta and/or Lielupė river basins? *(YOU CAN MARK MORE THAN ONE ANSWER)*

1) I (my family) drink water from dug well ☐

2) I (my family) swim ☐

3) I (my family) fish ☐

4) I (my family) irrigate fields ☐

5) I (my family) spray fields ☐

6) Other ☐

.....

(PLEASE SPECIFY

12. To what extent do you think agriculture contributes to water pollution in general?

1) up to 10% ☐ 2) 10-50% ☐

3) 50-80% ☐ 4) 80-100% ☐

III. Opinion of farmers on the impact of agricultural activities on the water quality in general

13. To what extent do you think, in general, is the water quality affected by fertilisation timing (month, weather conditions)?

1) To a large extent ☐

2) To some extent ☐

3) To a little extent ☐

4) Not affected ☐

5) Don't know ☐

14. To what extent do you think, in general, is the water quality affected by the use of mineral fertilisers (kg/ha)?

1) To a large extent ☐

2) To some extent ☐

3) To a little extent ☐

4) Not affected ☐

5) Don't know ☐

15. To what extent do you think, in general, is the water quality affected by the leakage from manure storages?

1) To a large extent ☐

2) To some extent ☐

3) To a little extent ☐

4) Not affected ☐

5) Don't know ☐

IV. Role of farmers in the improvement of the water quality

16. Do you apply the following measures in your farm?

(YOU CAN MARK MORE THAN ONE ANSWER)

	Yes and reasons of application	No and reasons of not application	Not relevant
1. **I have manure storage(s) meeting environmental requirements**	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) Fear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	
2. **I have slurry storage(s) meeting environmental requirements**	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	

3. I have a fertilisation plan meeting environmental requirements	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	
4. I apply fertilisation norms meeting environmental requirements	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	
5. apply fertilisers in a proper time	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	

6. I have winter or perennial plants cover in winter (as recommended in the Code of Good Agricultural Practice)	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	
7. I apply crop rotation to prevent erosion in hilly areas (as recommended in the Code of Good Agricultural Practice)	☐ A) Easy execution of the measure (not expensive, does not require substantial investments) ☐ B) Possibility to use EU assistance funds ☐ C) Low workload ☐ D) This is the possibility to improve organisation and accounting of my work ☐ E) Because of environmental protection ☐ F) ear of control/penalties ☐ G) Other	☐ H) Execution of the measure is too expensive (require substantial investments) ☐ I) Too big workload ☐ J) I think this measure is not effective ☐ K) Other	

17. What agri-environmental measure(-s) were implemented in your farm during the last 3 years? *(YOU CAN MARK MORE THAN ONE ANSWER)*

1) Constructed manure storage(-s) meeting environmental requirements ☐

2) Constructed slurry storage(-s) meeting environmental requirements ☐

3) Prepared fertilisation plan(-s) ☐

4) Other *(PLEASE SPECIFY)*..... ☐

5) No one ☐

18. What were agri-environmental measure(-s) implementation expenses (over the last 3 years)?

1) Up to 100 Lt ☐

2) 100-500 Lt ☐

3) 500-2000 Lt ☐

4) 2000-5000 Lt ☐

5) 5000-10000 Lt ☐

6) 10000-100000 Lt ☐

7) more than 100000 Lt ☐

8) I do not want to respond ☐

V. Opinion of farmers on the reasons for failing to implement environmental requirements

19. What do you think, in general, are barriers that prevent the successful implementation of all environmental requirements in the country? *(YOU CAN MARK MORE THAN ONE ANSWER)*

1) No barriers ☐
2) Environmental measures are not priority ☐
3) Not sufficient national financial support for implementation of environmental measures ☐
4) Limited information on the compensation mechanisms ☐
5) Excessive bureaucracy for obtaining compensation ☐
6) Not sufficient control system ☐
7) Not sufficient environmental education ☐
8) Other *(PLEASE SPECIFY)*..... ☐

VI. Farmers' willingness to contribute to water quality improvement

According to the scientific forecast, some water bodies will fail to meet good water status requirements not only in 2015, but also later. *SEE THE MAP*

(SHOW THE MAP „PROGNOSIS_2015" AND EXPLAIN THAT BLUE COLOUR INDICATES WATER BODIES NOT CONSIDERED AS WATER BODIES AT RISK IN 2015 AND RED COLOUR INDICATES WATER BODIES THAT WILL BE CONSIDERED AT RISK IN 2015)

Therefore, in order to improve status of water bodies supplementary measures are required. The following questions are designed to find out your affordability or willingness to implement supplementary measures listed below.

Fertilisation

The main problem of diffuse pollution in Lithuania is unbalanced fertilisation. Some fields are not fertilised at all, whereas in other locations the spread of fertiliser is much too high. Analysis of the amounts of nutrients (i.e. nitrogen and phosphorus) in the soil could help to calculate the optimal fertiliser norm for a particular field. The application of optimal fertilisation norms allows using such amount of fertiliser that is needed by plants without leaving surplus nutrients leaching into deeper soil layers.

20. Which of the following measures, targeted at fertiliser use regulation, would you implement in your farm, seeking to prevent surplus nutrients in the soil?

Measure	I have already implemented	I would implement	I would implement only if I would receive the compensation	I would not implement	Not relevant	Reasons (for acceptance/non acceptance)*
1. Develop and implement fertilisation plans (also include soil analysis)						
2. Apply reduced fertilisation norms compared to norms for highest yields						
3. Prepare nutrients (nitrogen and phosphorous) balance, allowing long term planning of fertiliser use (when fertilisation plans are not developed)						
4. Replace mineral fertiliser with green manure crop (green manure crop could be sown in the spring and in the middle of summer could be ploughed; could be also other types of green manure)						

*(*IF RESPONDENT DOES NOT KNOW WHAT TO SAY, HELP HIM BY PROPOSING SOME REASONS, SUCH AS „A MEASURE SEEMS NOT EFFECTIVE" OR „THERE ARE SOME TECHNICAL, FINANCIAL OR OTHER OBSTACLES OF IMPLEMENTATION")*

21. Which of the other measures would you implement in your farm?

Measure	I have already implemented	I would implement	I would implement only if I would receive the compensation	I would not implement	Not relevant	Reasons (for acceptance/non acceptance)*
1. Construct manure and slurry storages meeting environmental requirements (it would reduce nutrients leakage to the soil and water) (this measure would be relevant for the farmers who have not implemented it so far)						
2. Construct artificial wetlands between fields and water bodies (wetlands can help to capture nutrients from agriculture run-off before entering water bodies)						
3. Convert cultivated fields into extensive grassland (this measure reduces nutrients' leakage to waters due to lower inputs in the soil)						
4. Allow renaturalisation (re-meandering) of the natural, previously straightened, riverbeds in your fields (after re-meandering rivers usually become longer resulting in better conditions for the self-purification)						
5. Improve fertilisation technology						

Measure	I have already implemented	I would implement	I would implement only if I would receive the compensation	I would not implement	Not relevant	Reasons (for acceptance/non acceptance)*
(machinery/equipment; it would improve fertiliser insertion into soil and reduce nutrient leakage into water)						
6. Sow catch crops for the winter (catch crops uptake nutrients, therefore after harvesting main crops lower amounts of nutrients are left in the soil for the winter, when the surface run-off is the highest).						
7. Convert from conventional to organic farming (nutrient use efficiency is higher and nutrient losses to the environment are lower in an organic than in a conventional farm)						
8. Leave unploughed fields with crop stubbles over the winter (this measure helps in preventing soil erosion)						
9. Prepare additional vegetation strip, located on an arable field next to watercourse (stream, river or lake) (it may reduce losses of mineral nutrients and prevent contamination of water with pesticides)						
10.Apply crop rotation						

Measure	I have already impleme nted	I would implem ent	I would impleme nt only if I would receive the compens ation	I would not implem ent	Not relevant	Reasons (for acceptance/non acceptance)*
including legumines and green manure crop (a growing crop that is ploughed under the soil to improve soil fertility and reduce nutrients leakage)						

*(*IF RESPONDENT DOES NOT KNOW WHAT TO SAY, HELP HIM BY PROPOSING SOME REASONS, SUCH AS „A MEASURE SEEMS NOT EFFECTIVE" OR „THERE ARE SOME TECHNICAL, FINANCIAL OR OTHER OBSTACLES OF IMPLEMENTATION")*

22. Which of the following measures do you think can have the most significant impact on the reduction of water pollution? Please use the scale from 1 to 6, where 6 on your opinion is the most effective measure and 1 is absolutely ineffective measure.

Measure	Ineffective ⟷ Most effective						I don't know
	1	2	3	4	5	6	
1. Construction of manure and slurry storages meeting environmental requirements							
2. Development and implementation of fertilisation plans							
3. Application of reduced fertilisation norms compared to norms for highest yields							
4. Preparation and implementation of nutrients (nitrogen and phosphorous) balance (when fertilisation plans are not developed)							

Measure	Ineffective ⟷ Most effective						I don't know
	1	2	3	4	5	6	
5. Construction of artificial wetlands between fields and water bodies							
6. Convert cultivated fields to extensive grassland							
7. Renaturalisation of the natural, previously straightened riverbeds							
8. Improvement of the fertilisation machinery/equipment							
9. Sow catch crops							
10. Conversion from conventional to organic farming							
11. Leaving unploughed fields with crop stubbles over the winter							
12. Prepare additional buffer vegetation strip next to watercourse							
13. Mineral fertiliser replacement with green manure crop							
14. Application of crop rotation including legumines and green manure crop							

23. Which other environmental measures could you implement in your farm?

(PLEASE SPECIFY).....

VII. Background information about the respondent

Finally a few questions about yourself:

24. How old are you?

.....

(PLEASE SPECIFY)

25. What is your gender?

1) Primary school ☐

2) Basic school ☐

3) Secondary school ☐

4) Technical school ☐

- Is it associated with agriculture? Yes ☐ No ☐

5) University ☐

- Is it associated with agriculture? Yes ☐ No ☐

6) Other ..... ☐

27. How many persons live in your household, including yourself?

.....

(PLEASE SPECIFY)

28. How many of these persons are younger than 18 years?

.....

(PLEASE SPECIFY)

29. What is average yearly level of income of your business, individual activity, which you spend for your household purposes? (If you do not know average income, tell income of 2012 or 2011)

1) Less than 2000 Lt	
2) 2001-5000 Lt	
3) 5001-10000 Lt	
4) 10001-20000 Lt	
5) 20001-40000 Lt	
6) 40001-70000 Lt	
7) 70001-100000 Lt	
8) More than 100000 Lt	
9) I do not want to respond	

30. Would you have any other comments?

.....

(PLEASE SPECIFY)

Thank you very much!

Aptaujas anketa
par lauksaimnieku iespējām un vēlēšanos ieviest pasākumus lauksaimniecībā radītā piesārņojuma samazināšanai

Saskaņā ar Eiropas Savienības un Latvijas likumdošanu ūdnesobjektos līdz 2015.gadam jāsasniedz laba ekoloģiskā kvalitāte. 2010. gadā visiem ūdnesobjketiem tika novērtēts ūdens stāvoklis. Latvijas teritorijā kā piesārņojuma riska objekti tika noteikti Lielupes upes baseina apgabalā – 51 % upes, 20 % ezeri un 16 %dīķi, bez tam Ventas upes baseina apgabalā – 35 % upes, 55 % ezeri un 29 % dīķi.

Ieviešot ūdens aizsardzības pasākumus, kas ierobežo cilvēku negatīvo darbību, ūdens objektiem ar piesārņojuma risku 2015.gadā būtu jāsasniedz laba ūdens kvalitāte. Labs virszemes ūdens kvalitatīvais stāvoklis ir gadījumos, ja ekoloģiskā un ķīmiskā kvalitāte ir laba vai ļoti laba saskaņā ar normatīvos aktos noteiktām prasībām.

Aptaujas anketas mērķis ir noteikt cik un kādi pasākumi Jums (lauksaimniekiem) ir pieņemami un kādā apjomā tos ieviešiet vai būtu gatavi ieviest, lai sasniegtu ūdensobjektos labu ūdens kvalitāti. Aptaujas anketas rezultāti tiks ņemti vērāizstrādājot upju baseinu apsaimniekošanas plānus nākošā ūdens baseina apsaimniekošanas periodā līdz 2021. gadam.

Mēs garantējam atbilžu konfidencialitāti. Apkopotie rezultāti tiks analizēti pēc visu atbilžu saņemšanas.

(Iepazīstināt ar karti "Virszemes ūdensobjektu ekoloģiskā un ķīmiskā kvalitāte".
Kartē atspoguļota situācija 2010. gadā.)

Kods:_____

I. Lauksaimniecības uzņēmuma raksturojums

2. Kurā novadā atrodas Jūsu saimniecība?

.....

(Lūdzu norādīt novadu un pagastu).

(Skatīt novada atrašanās vietas upju baseina apgabalā karti, lai noteiktu, kurā upju baseina apgabalā atrodas saimniecība)

2. Kurā upju baseina apgabalā atrodas Jūsu saimniecība?

1) Lielupes ☐ 2) Ventas ☐ 3) Lielupes un Ventas ☐

3. Vai Jūs esat dzirdējis par upju baseinu apsaimniekošanas plāniem?

Jā ☐ Nē ☐

4. Kāda veida saimniecību Jūs pārstāviet?

1) Zemnieku saimniecība ☐

2) Piemājas saimniecība ☐

3) Akciju sabiedrība ☐ 4) Individuālais komersants ☐

5) Sabiedrība ar ierob. atbildību ☐ 6) Biedrība, sabiedriska organizācija ☐

7) Pašvaldības uzņēmums ☐ 8) Kooperatīva sabiedrība ☐

9) Valsts vai cita veida uzņēmums ☐

5. Saimniecības specializācija:

1) Augkopības ☐

2) Lopkopības ☐

3) Augkopības un lopkopības ☐

6. Lauksaimniecībā izmantojamās zemes platība:

1)Līdz 10 ha ☐ 2) 10-20 ha ☐

3)20-50 ha ☐ 4) 50-200 ha ☐

5)200-500 ha ☐ 6) 500-1000 ha ☐

7)›1000 ha ☐

7. Kādus kultūraugus audzē saimniecībā?

1) ziemāju graudaugus ☐ 2) vasarāju graudaugus ☐ 3) rapsi ☐
4) tauriņziežus ☐ 5) cukurbietes ☐ 6) kartupeļus ☐

7) dārzeņus ☐ 8) linus ☐ 9) zālaugus ☐

10) pastāvīgās pļavas ☐ 11) augļu dārzs ☐ 12) ogas ☐

13) lopbarības augus ☐ 14) lopbarības saknes ☐ 15) kukurūzu ☐

16) cits ☐ *(lūdzu uzskaitīt)*.....

(augkopības saimniecība tālāk uz 9 jautājumu))

8. Cik dzīvnieku vienības (DV) ir Jūsu saimniecībā:

1) Līdz 5 DV ☐
2) 5-10 DV ☐
3) 10-300 DV ☐
4) Virs 300 DV ☐

Ja nevariet nosauktt dzīvnieku vienības, lūdzu atzīmējiet dzīvnieku skaitu.

Nr.p.k..	Lauksaimniecības dzīvnieku veids un vecums	Skaits
1.	Slaucama govs	
2.	Zīdītājgovs ar teli	
3.	Vaislas bullis (no 12 mēnešu vecuma)	

Nr.p.k..	Lauksaimniecības dzīvnieku veids un vecums	Skaits
4.	Tele (līdz 6mēnešu vecumam) 1 dzīvnieks 1 vieta kūtī gadā	
5.	Tele (no 6–12 mēnešu vecuma)	
6.	Vaislas tele (no 12 mēnešu vecuma)	
7.	Nobarojamais jaunlops (līdz 6 mēnešu vecumam)	
8.	Nobarojamais jaunlops (no 6 mēnešu vecuma)	
9.	Sivēnmāte ar sivēniem 1 dzīvnieks 1 metiens 1 vieta kūtī gadā	
10.	Sivēnmāte bez sivēniem	
11.	Nobarojamā cūka (30–100 kg) 1 dzīvnieks 1 vieta kūtī gadā	
12.	Kuilis	
13.	Jauncūka (85–180 kg) 1 dzīvnieks 1 vieta kūtī gadā	
14.	Atšķirtais sivēns (7,5–30 kg) 1 dzīvnieks	
15.	Kaza ar kazlēniem	
16.	Aita ar jēriem	
17.	Zirgs	
18.	Dējējvista	
19.	Broilers 1 broilers 1 vieta kūtī gadā	
20.	Tītars, zoss	
21.	Trusis	

9. Vai Jūsu saimniecība ir bioloģiska?

1) Jā ☐ 2) Nē ☐

2) Pārejas ☐ 4) Daļēji ☐

10. Cik liela Jums ir saimniekošanas pieredze (visa veida lauksaimniecības darbi)?

1) 0-5 gadi ☐ 2) 6-10 gadi ☐ 3) 11-15 gadi ☐

4)16-20 gadi ☐ 5) ›20 gadi ☐

II. Lauksaimnieka viedoklis par ūdens piesārņojuma problēmām

11. Kādiem mērķiem Jūs izmantojat ūdens resursus Ventas un/vai Lielupe upju baseinos? *(var atzīmēt vairākus variantus)*

1) Dzeramā ūdens ieguvei ☐

2) Peldēšanai ☐

3) Makšķerēšanai ☐

4) Laistīšanai un apūdeņošanai ☐

5) Kultūraugu smidzināšanai ☐

6) Cits ☐

.....

(Lūdzu precizēt)

12. Kā Jūs domājiet, cik lielā mērā lauksaimniecība ietekmē ūdens piesārņojumu?

1) līdz 10% ☐ 2) 10-50% ☐

3) 50-80% ☐ 4) 80-100% ☐

III. Lauksaimnieka viedoklis par lauksaimnieciskās darbības ietekmi uz ūdens piesārņojumu

13. Kā Jūs domājiet, cik liela ietekme uz ūdens kvalitāti ir mēslojuma lietošanas laikam (mēnesis, meteoroloģiskie apstākļi)?

1) Liela ☐
2) Vidēja ☐
3) Maza ☐
4) Neietekmē ☐
5) Nezinu ☐

14. Kā Jūs domājiet, cik liela ietekme uz ūdens kvalitāti ir minerālmēslojuma lietošanai (kg/ha)?

1) Liela ☐
2) Vidēja ☐
3) Maza ☐
4) Neietekmē ☐
5) Nezinu ☐

15. Kā Jūs domājiet, cik liela ietekme uz ūdens kvalitāti ir no barības elementu izskalošanās kūtsmēslu uzglabāšanas laikā (valstī kopumā)?

1) Liela ☐
2) Vidēja ☐
3) Maza ☐
4) Neietekmē ☐
5) Nezinu ☐

IV. Lauksaimnieka loma ūdens kvalitātes uzlabošanā

16. Vai Jūs realizējiet saimniecībā sekojošus pasākumus?

(var atzīmēt vairākas atbildes)

	Jā un kāpēc	Nē un kāpēc	Neatti ecas
1. Saimniecībā ir kūtsmēslu krātuve atbilstoša vides prasībām	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
2. Saimniecībā ir šķidrmēslu krātuve atbilstoša vides prasībām	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
3. Tiek sagatavots mēslošanas plāns atbilstoši vides prasībām	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
4. Tiek ievērotas minerālmēslu normas atbilstoši vides prasībām	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums)	

	☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
5. Minerālmēsli mēslošanai tiek lietoti atbilstošā laikā	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
6. Ziemas periodā tiek audzēti ziemāji un daudzgadīgie zālaugi (saskaņā ar Labas lauksaimniecī bas prakses nosacījumiem - LLPN)	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	
7. Es ievēroju augumaiņu erozijas ierobežošanai stāvās nogāzēs (saskaņā ar LLPN)	☐ A) Vienkārši realizējams pasākums (lēts, nav nepieciešami būtiski ieguldījumi) ☐ B) Iespēja izmantot ES finansējumu ☐ C) Nav darbietilpīgs pasākums ☐ D) Sniedz iespēju uzlabot darba organizāciju un uzskaiti ☐ E) Vides aizsardzībai ☐ F) Bailes no kontroles/soda ☐ G) Cits	☐ H) Pasākuma realizācija ir pārāk dārga (nepieciešams papildus finansējums) ☐ I) Pārāk darbietilpīgs ☐ J) Pasākums nav efektīvs ☐ K) Cits	

17. Kādi agrovides pasākumi ir realizēti Jūsu saimniecībā pēdējo 3 gadu laikā? *(var atzīmēt vairākas atbildes)*

1) Ierīkota kūtsmēslu krātuve saskaņā ar vides prasībām ☐

2) Ierīkota šķidrmēslu krātuve saskaņā ar vides prasībām ☐

3) Sagatavots kultūraugu mēslošanas plāns ☐

4) Cits *(Lūdzu precizēt)*..... ☐

5) Nav realizēti ☐

18. Cik lieli izdevumi agrovides pasākumu realizēšanai bijuši pēdējo 3 gadu laikā?

1) Līdz 30 EUR ☐

2) 31-150 EUR ☐

3) 151-600 EUR ☐

4) 601-1500 EUR ☐

5) 1501-3000 EUR ☐

6) 3001-30000 EUR ☐

7) Vairāk kā 30001 EUR ☐

8) Nevēlos atbildēt ☐

V. Lauksaimnieka viedoklis par iemesliem, kas kavē ieviest vides prasības

19. Kā Jums liekas, kas ierobežo veiksmīgu agrovides pasākumu ieviešanu valstī? *(var atzīmēt vairākas atbildes)*

1)	Nav ierobežojumu	☐
2)	Vides pasākumi nav prioritāri	☐
3)	Nav pietiekams nacionālais finansiālais atbalsts	☐
4)	Nepietiekama informācija par kompensāciju mehānismu	☐
5)	Pārlieku liela birokrātija kompensāciju saņemšanai	☐
6)	Nepietiekama kontroles sistēma	☐
7)	Nepietiekama izglītošana vides jomā	☐
8)	Cits	☐

(Lūdzu precizēt).....

VI. Lauksaimnieka vēlme iesaistīties ūdens kvalitātes uzlabošanā

Pēc zinātnieku prognozēm daži ūdensobjekti līdz 2015.gadam nesasniegs labu ūdens kvalitāti.

(skatīt karti "2015.gada prognoze")

Tādējādi, lai uzlabotu ūdens objektu kvalitāti, nepieciešams ieviest atbilstošus pasākumus. Turpmākie jautājumi saistīti ar Jūsu vēlmi ieviest atbilstošus zemāk minētos pasākumus.

Mēslošana

Galvenā difūzā piesārņojuma problēma Latvijā ir nesabalansēta laukaugu mēslošana. Daži kultūraugi netiek mēsloti pietiekami, citiem mēslošanas normas ir pārāk augstas. Augu barības elementu (slāpekļa un fosfora) noteikšana augšņu analīzēs palīdzēs aprēķināt optimālo mēslojuma devu konkrētam kultūraugam. Optimālu mēslojuma normu lietošana nodrošina augam nepieciešamās barības vielas neveidojot pārpalikumu, kas ieskalojas dziļākos augsnes slāņos.

20. Kurus no zemāk minētajiem pasākumiem saistībā ar mēslojuma lietošanas ierobežojumiem, Jūs ieviestu savā saimniecībā, lai ierobežotu barības vielu paŗpalikumu augsnē?

Pasākums	Es mu jau ieviesis	Iev iesīšu tuvākā laikā	Iev iesīšu ja saņemšu kompen sāciju	N eieviesī šu	Ne attiecas	Iemesli (apstiprinot/noraidot)*
1. Sagatavot un realizēt kultūraugu mēslošanas plānu (iekļaujot augšņu analīzes)						
2. Maksimālu mēslojuma normu vietā lietot plānotai kultūraugu ražai atbilstošu mēslojuma normu.						
3. Aprēķināt barības vielu (slāpekļa un fosfora) bilanci saimniecībā, ņemot vērā mēslojuma lietošanu ilgtermiņā (ja netiek izstrādāts mēslošanas plāns).						
4. Aizstāt minerālmēslojuma lietošanu ar zaļmēslojuma augu audzēšanu. (Zaļmēslojuma augi, kas sēti pavasarī un vasaras vidū tiek iearti, vai cita veida zaļmēslojuma augi).						

21. Kādus cita veida pasākumus Jūs vēlētos ieviest saimniecībā?

Pasākums	Esmu jau ieviesis	Ievi esīšu tuvākā laikā	Ievi esīšu, ja saņemšu kompens āciju	Neievie sīšu	Neattieca s	Iemesli (apstiprinot/noraidot)*
1. Izveidot kūtsmēslu un vircas krātuvi saskaņā ar vides prasībām (tas varētu samazināt barības vielu noteci augsnē un ūdenī)						
2. Veidot mitrzemes starp laukiem un ūdens baseiniem (mitrzeme aiztur barības vielu no lauksaimniecībā pielietotā mēslojuma nonākšanu ūdens baseinos)						
3. Pārveidot iekultivētus laukus ekstensīvos zālājos (samazināsies barības vielu ieskalošanās ūdeņos zemāku mēslojuma normu lietošanas rezultātā)						
4. Atjaunot dabisku, iepriekš iztaisnotu upes gultni (upju meandru atjaunošana veicinās upes pašattīrīšanos)						
5. Uzlabot mēslošanas izkliedes tehnoloģiju, (tehniku/aprīkojumu; tas uzlabos mēslojuma iestrādi augsnē un samazinās barības vielu izskalošanos ūdenī)						

Pasākums	Es mu jau ieviesis	Ievi esīšu tuvākā laikā	Ievi esīšu, ja saņemšu kompens āciju	N eievie sīšu	N eattieca s	Iemesli (apstiprinot/noraidot)*
6. Sēt uztvērējaugus (tie samazina barības vielu izskalošanos ziemas periodā, jo patērē augsnē esošās barības vielas pēc kultūrauga novākšanas).						
7. Konvencionālu saimniecību pāreja uz bioloģisko saimniekošanu (barības vielu izmantošanās ir labāka un notece apkārtējā vidē ir mazāka bioloģiskajās saimniecībās nekā konvencionālās).						
8. Saglabāt neiestrādātas kultūraugu pēcpļaujas atliekas ziemas periodā. (tiek ierobežota augsnes eroziju)						
9. Ierīkot veģetācijas buferjoslu gar virszemes ūdensobjektu (buferjosla var samazināt virszemes noteci un ūdens piesārņojumu).						
10. Ieviest augu maiņā tauriņziežus un zaļmēslojuma augus						

22. Kurš pasākums pēc Jūsu domām ir nozīmīgākais ūdens piesārņojuma samazināšanai? Lūdzu izmantojiet skalu no 1 līdz 6, kur 6 – visefektīvākais pasākums pēc Jūsu domām un 1 – neefektīvs pasākums.

Pasākums	Neefektīvs ⟷ Ļoti efektīvs						Nezinu
	1	2	3	4	5	6	
1. Izveidot kūtsmēslu un vircas krātuvi atbilstoši vides prasībām							
2. Sagatavot un realizēt kultūraugu mēslošanas plānu							
3. Maksimālu mēslojuma normu vietā lietot plānotai kultūraugu ražai atbilstošu mēslojuma normu.							
4. Aprēķināt barības vielu (slāpekļa un fosfora) bilanci saimniecībā, ņemot vērā mēslojuma lietošanu ilgtermiņā (ja netiek izstrādāts mēslošanas plāns).							
5. Veidot mitrzemes starp laukiem un ūdens baseiniem							
6. Pārveidot iekultivētus laukus ekstensīvos zālājos							
7. Atjaunot dabisku, iepriekš iztaisnotu upes gultni							
8. Uzlabot mēslošanas izkliedes tehnoloģiju							
9. Uztvērējaugu sēšana							
10. Konvencionālu saimniecību pāreja uz bioloģisko saimniekošanu							
11. Saglabāt neiestrādātas kultūraugu pēcpļaujas							

Pasākums	Neefektīvs ⟷ Ļoti efektīvs						Nezinu
	1	2	3	4	5	6	
atliekas ziemas periodā							
12. Ierīkot veģetācijas buferjoslu gar virszemes ūdensobjektu							
13. Aizstāt minerālmēslu lietošanu ar zaļmēslojumu							
14. Ieviest augu maiņā tauriņziežus un zaļmēslojuma augus							

23. Kādus vēl agrovides pasākumus Jūs varētu ieviest savā saimniecībā?

.....

(Lūdzu precizēt)

VII. Pamatinformācija par respondentu

Noslēgumā daži jautājumi par Jums:

24. Vecums?

.....

25. Jūsu dzimums?

Vīrietis ☐ Sieviete ☐

26. Izglītības līmenis?

1) Sākumskolas ☐

2) Pamatskolas ☐

3) Vidusskolas ☐

4)Vidējā speciālā (arodskolas) ☐
- vai izglītība ir saistīta ar lauksaimniecību? Jā ☐ Nē ☐

5)Augstākā ☐
- vai izglītība ir saistīta ar lauksaimniecību? Jā ☐ Nē ☐

6) Cita ..... . ☐

27. Cik cilvēki, ieskaitot Jūs, dzīvo Jūsu mājsaimniecībā?

.....

28. Cik no tiem ir jaunāki par 18 gadiem?

.....

29. Cik Jūs iztērējiet mājsaimniecības vajadzībām aptuveni gadā?

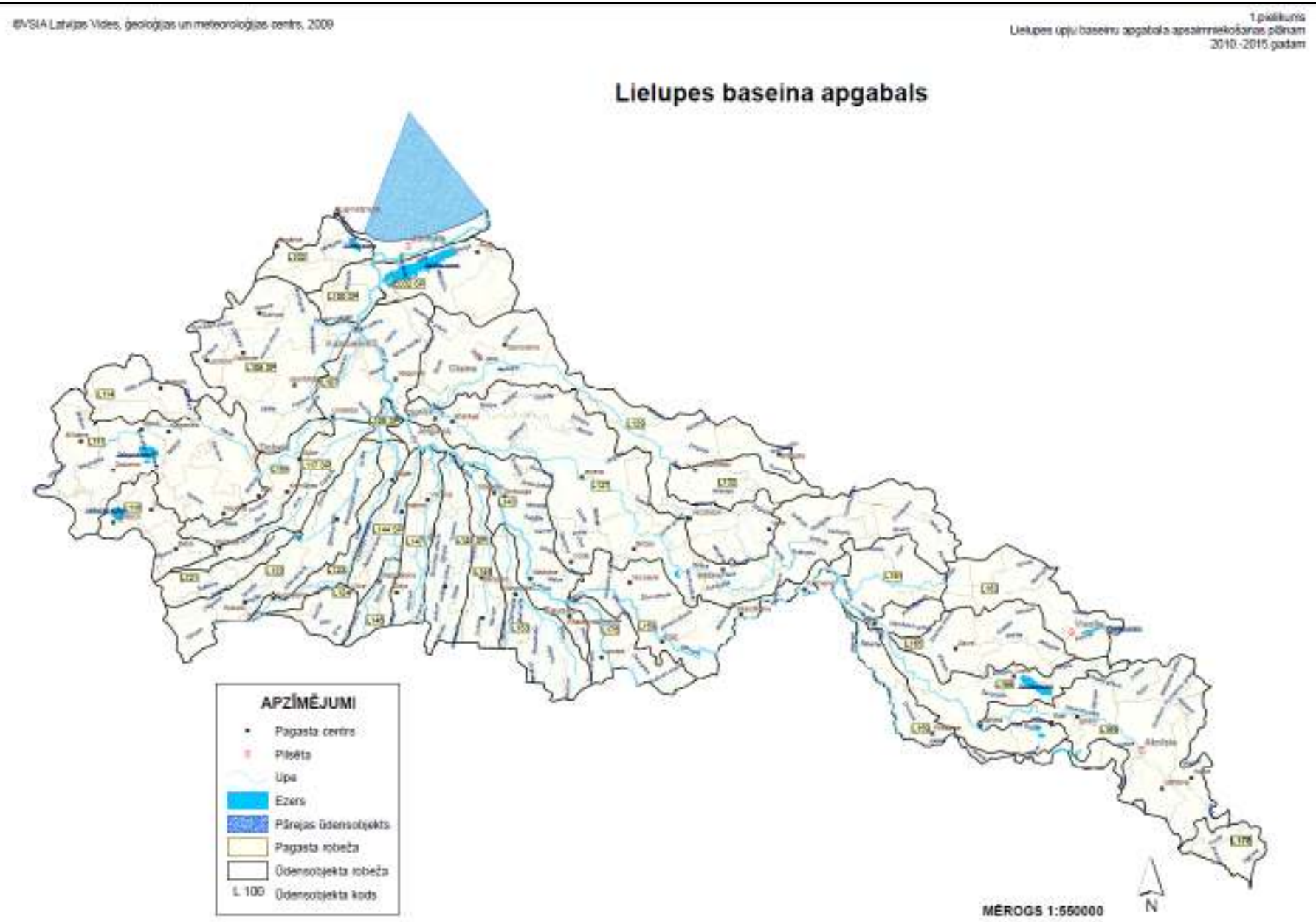
1) Mazāk par 600 EUR	
2) 600–1500 EUR	
3) 1501–3000 EUR	
4) 3001–6000 EUR	
5) 6001–12000 EUR	
6) 12001–20000 EUR	
7) 20001–30000 EUR	
8) Vairāk par 30000 EUR	
Nevēlos atbildēt	

30. Vai Jums ir kādi komentāri?

.....

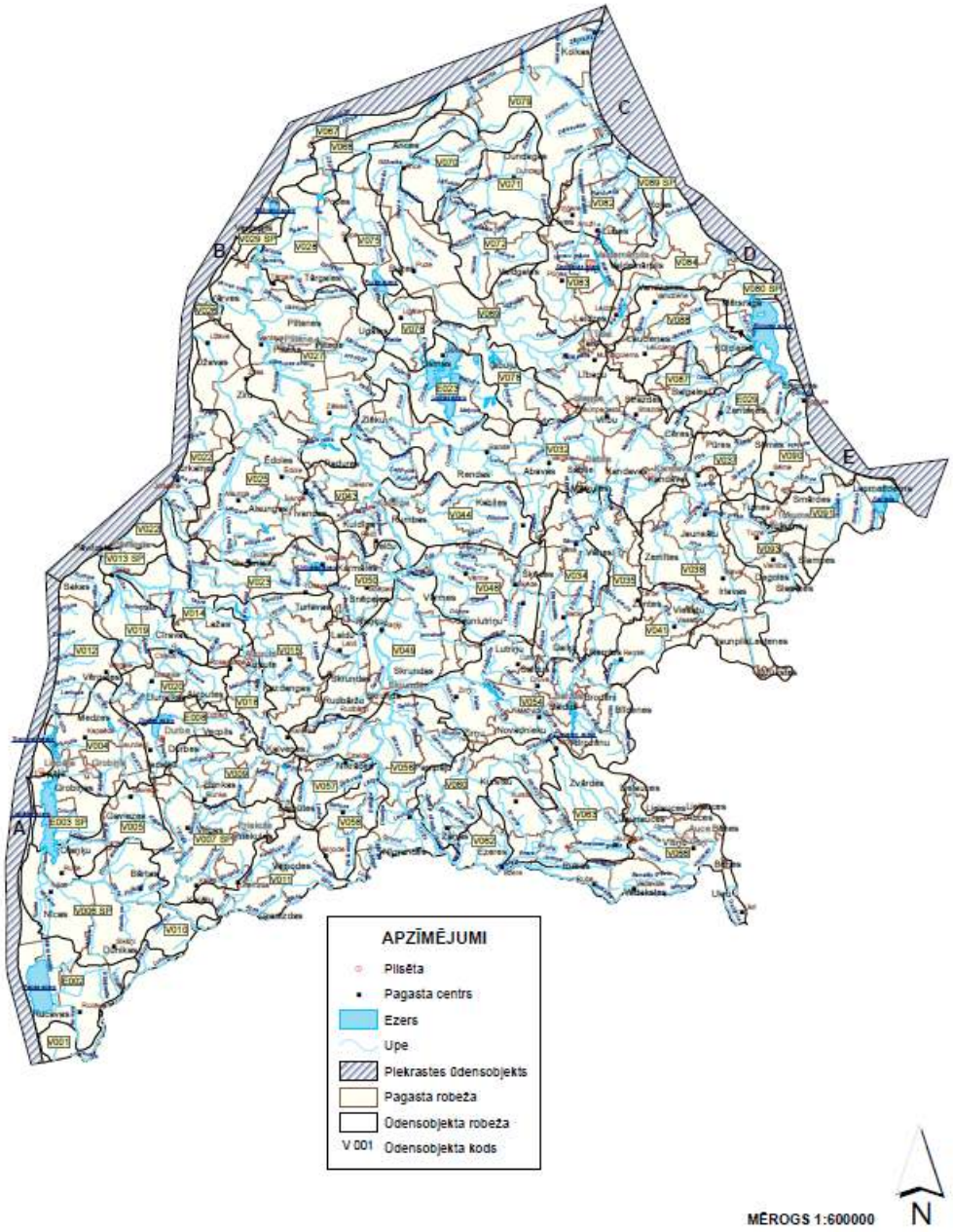
Aizpildīšanas datums _____

Liels paldies!

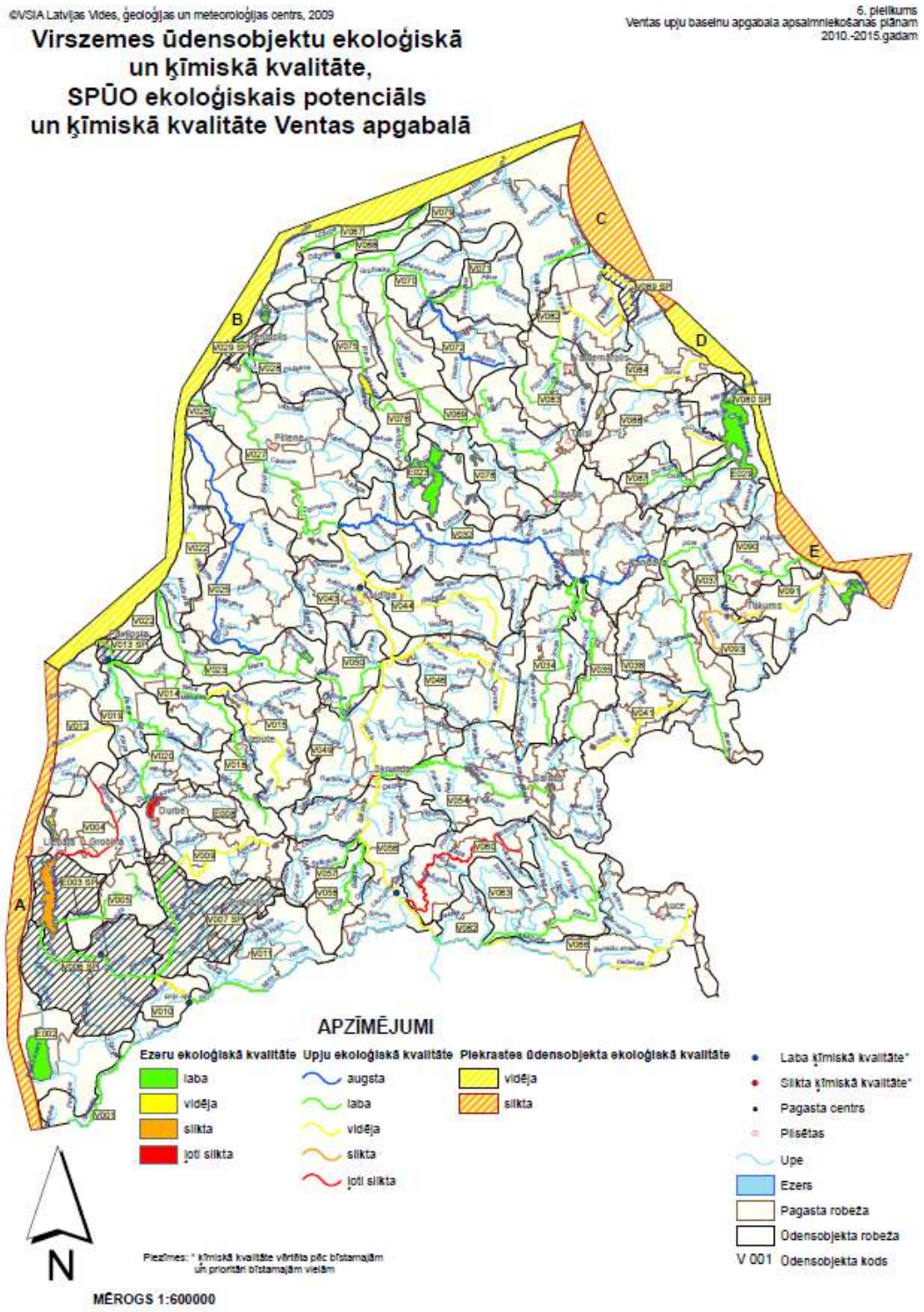

©VSIA Latvijas Vides, ģeoloģijas un meteoroloģijas centrs, 2009
1.pielikums
Lielupes upju baseinu apgabala apsaimniekošanas plānam
2010.-2015.gadam
Lielupes baseina apgabals
APZĪMĒJUMI
Pagasta centrs
Pilsēta
Upe
Ezers
Pārejas ūdensobjekts
Pagasta robeža
Ūdensobjekta robeža
L 100 Ūdensobjekta kods
MĒROGS 1:550000
N

1.pielikums
Ventas upju baseinu apgabala apsaimniekošanas plānam
2010.2015.gadam

Ventas baseina apgabals




©VSIA Latvijas Vides, ģeoloģijas un meteoroloģijas centrs, 2009
6.pielikums
Lielupes upju baseinu apgabala apsaimniekošanas plānam
2010.-2015.gadam
Virszemes ūdensobjektu ekoloģiskā
un ķīmiskā kvalitāte,
SPŪO ekoloģiskais potenciāls
un ķīmiskā kvalitāte Lielupes apgabalā
APZĪMĒJUMI
Ezeru ekoloģiskā kvalitāte
Upju ekoloģiskā kvalitāte
laba
vidēja
slikta
ļoti slikta
SPŪO
Laba ķīmiskā kvalitāte*
Slikta ķīmiskā kvalitāte*
Pagasta centrs
Pilsēta
Upe
Ezers
Pagasta robeža
Ūdensobjekta robeža
L 100 Ūdensobjekta kods
Pārejas ūdensobjekta (vidēja ekoloģiskā kvalitāte)
Piezīmes: * ķīmiskā kvalitāte vērtēta pēc bīstamajām un prioritāri bīstamajām vielām
MĒROGS 1:550000
N


©VSIA Latvijas Vides, ģeoloģijas un meteoroloģijas centrs, 2009
6. pielikums
Ventas upju baseinu apgabala apsaimniekošanas plānam
2010.-2015.gadam
Virszemes ūdensobjektu ekoloģiskā un ķīmiskā kvalitāte, SPŪO ekoloģiskais potenciāls un ķīmiskā kvalitāte Ventas apgabalā
A
B
C
D
E
APZĪMĒJUMI
Ezeru ekoloģiskā kvalitāte
laba
vidēja
slikta
ļoti slikta
Upju ekoloģiskā kvalitāte
augsta
laba
vidēja
slikta
ļoti slikta
Plekrastes ūdensobjekta ekoloģiskā kvalitāte
vidēja
slikta
Laba ķīmiskā kvalitāte*
Slikta ķīmiskā kvalitāte*
Pagasta centrs
Pilsētas
Upe
Ezers
Pagasta robeža
Ūdensobjekta robeža
V 001 Ūdensobjekta kods
N
Piezīmes: * ķīmiskā kvalitāte vērtēta pēc bīstamajām un prioritāri bīstamajām vielām
MĒROGS 1:600000

Ūkininkų apklausa dėl jų galimybių ir noro įgyvendinti priemones, skirtas mažinti žemės ūkio keliamą aplinkos taršą atliekama įgyvendinant Europos teritorinio bendradarbiavimo tikslo Latvijos ir Lietuvos bendradarbiavimo per sieną programos 2007-2013m. lėšomis finansuojamą projektą LLIV-230 "Lielupės ir Ventos upių baseinų rajonuose esančių upių monitoringas ir ūkininkų apklausa aplinkos apsaugos klausimais"

Ūkininkų apklausa dėl jų galimybių ir noro įgyvendinti priemones, skirtas mažinti žemės ūkio keliamą aplinkos taršą

Pagal galiojančius Europos Sąjungos ir Lietuvos teisės aktus 2015 metais visi vandens telkiniai turėtų būti geros būklės. 2010 metais upių baseinų rajonuose buvo įvertinta visų vandens telkinių būklė. Lietuvos teritorijoje esančiame Lielupės upių baseinų rajone 90% upių, 82% ežerų ir 50% tvenkinių, o Ventos upių baseinų rajone 48% upių, 50% ežerų ir 50% tvenkinių buvo priskirti rizikos vandens telkiniams.

Rizikos vandens telkiniais vadinami tokie telkiniai, kuriems yra grėsmė dėl neigiamo žmogaus veiklos poveikio iki 2015 metų, net ir pritaikius privalomas apsaugos priemones, nepasiekti geros būklės. Gera paviršinio vandens telkinio būklė yra tokia, kai jo ekologiniai ir cheminiai rodikliai atitinka teisės aktuose nustatytus kriterijus.

Šio klausimyno tikslas yra išsiaiškinti kiek jums (ūkininkams) yra priimtinos gerai vandens telkinių būklei pasiekti parengtos priemonių programos ir kiek Jūs jas jau įgyvendinote ar esate pasiruošę įgyvendinti. Į apklausos rezultatus bus atsižvelgta, rengiant upių baseinų rajonų planus kitam vandens telkinių gerinimo etapui iki 2021 metų.

Pabrėžiame, kad Jūsų atsakymai bus konfidencialūs. Jie bus panaudoti tik apibendrintų duomenų pateikimui.

(RODYTI ŽEMĖLAPĮ „RIZIKOS TELKINIAI“ IR PAAIŠKINTI, KAD MĖLYNA SPALVA PAŽYMĖTI RIZIKOS GRUPEI NEPRISKIRTI VANDENS TELKINIAI, O RAUDONA SPALVA – RIZIKOS GRUPEI PRISKIRTI VANDENS TELKINIAI. Žemėlapis atspindi 2010 metų situaciją)

Kodas:_____

I. Informacija apie ūkį

3. Kurioje seniūnijoje Jūs gyvenate?

.....

(ĮRAŠYTI SENIŪNIJĄ IR GYVENVIETĘ)
(RODYTI ŽEMĖLAPĮ „SENIŪNIJOS“ IR PAPRAŠYTI RESPONDENTO, KAD PARODYTŲ, KURIOJE SENIŪNIJOJE JIS GYVENA BEI PASAKYTŲ GYVENVIETĖS PAVADINIMĄ).

2. Į kurį upių baseinų rajoną patenka Jūsų ūkis?

1) Lielupės ☐ 2) Ventos ☐ 3) Lielupės ir Ventos ☐

3. Ar Jums teko kada nors anksčiau girdėti apie upių baseinų rajonus, jų valdymo planus ir priemonių programas?

Taip ☐ Ne ☐

4. Kokią ūkio kategoriją atstovaujate?

1) Ūkininko ūkis ☐
2) Šeimos ūkis ☐
3) Žemės ūkio bendrovė ☐
4) Individuali įmonė ☐
5) Ūkinė bendrija ☐
6) Akcinė, uždaroji akcinė, investicinė bendrovė ☐
7) Savivaldybės įmonė ☐
8) Kooperatinė bendrovė ☐
9) Valstybės ar kita įmonė ☐

5. Kokiomis veiklomis užsiimate?

1) Augalininkystė ☐
2) Gyvulininkystė ☐
3) Augalininkystė ir gyvulininkystė ☐

6. **Koks yra Jūsų dirbamos žemės plotas?**

1) Mažiau kaip 10 ha ☐ 2) 10-20 ha ☐

3) 20-50 ha ☐ 4) 50-200 ha ☐

5) 200-500 ha ☐ 6) 500-1000 ha ☐

7) Daugiau kaip 1000 ha ☐

7. Kokie augalai yra auginami Jūsų ūkyje?

1) žieminiai javai ☐ 2) vasariniai javai ☐ 3) rapsai ☐

4) ankštiniai augalai ☐ 5) cukriniai runkeliai ☐ 6) bulvės ☐

7) daržovės ☐ 8) linai ☐ 9) pievos ☐

10) ganyklos ☐ 11) vaismedžiai ☐ 12) uogynai ☐

13) pašariniai augalai ☐ 14) pašariniai šakniavaisiai ☐ 15) kukurūzai ☐

16) kita ☐ (*PRAŠOM PASAKYTI*).....

*(JEIGU APKLAUSIAMAS AUGALININKYSTĖS ŪKIO SAVININKAS,PEREITI PRIE **9**KLAUSIMO)*

8. Kiek ir kokių sutartinių gyvulių (SG) yra Jūsų ūkyje vidutiniškai per metus?:

1) Mažiau kaip 5 SG ☐

2) 5-10 SG ☐

3) 10-300 SG ☐

4) Daugiau kaip 300 SG ☐

JEIGU NEŽINOTE SUTARTINIŲ GYVULIŲ SKAIČIAUS, PASAKYKITE VIENETAIS:

Nr.	Gyvulių rūšis ir amžiaus grupė	Kiekis
1.	Paršavedės (su paršeliais žindukliais), kuiliai	
2.	Paršeliai nuo 7 kg iki 32 kg (3 mėn.)	
3.	Kiaulės nuo 3 iki 8 mėn.	
4.	Kiaulės nuo 8 mėn.	
5.	Karvės, buliai	
6.	Veršeliai iki 1 m.	
7.	Galvijai (prieauglis) nuo 1 iki 2 m.	
8.	Taurieji elniai	
9.	Danieliai, dėmėtieji elniai	
10.	Bizonai, stumbrai	
11.	Avys, ožkos	
12.	Arkliai nuo 1 m.	
13.	Kumeliukai iki 1 m.	
14.	Vištos (dedeklės)	
15.	Broileriai (mėsiniai)	
16.	Kalakutai (auginami iki 70 d. amžiaus)	
17.	Kalakutai (auginami iki 133 d. amžiaus)	
18.	Antys	
19.	Žąsys	
20.	Triušiai (patinai ir patelės su prieaugliu iki atjunkymo)	
21.	Šinšilos	
22.	Audinės / kiaunės (vyresnės kaip 10 mėn.)	
23.	Lapės (vyresnės kaip 10 mėn.)	
24.	Stručiai (suaugę gyvūnai)	

9. **Ar Jūsų ūkis yra ekologinis?**

1) Taip ☐ 2) Ne ☐

3) Pereinamojo laikotarpio ☐ 4) Dalinis ☐

10. Kokia yra Jūsų bendra ūkininkavimo patirtis?

1) 0-5 metai ☐ 2) 6-10 metai ☐ 3) 11-15 metų ☐

4) 16-20 metų ☐ 5) > 20 metų ☐

II. Ūkininkų nuomonė apie vandens taršos problemas

11. Kaip naudojate Ventos ir/ar Lielupės upių baseinų vandens išteklius? *(GALITE ŽYMĖTI DAUGIAU NEI VIENĄ ATSAKYMĄ)*

1) Aš (mano šeima) geria šachtinių šulinių vandenį ☐

2) Aš (mano šeima) maudosi ☐

3) Aš (mano šeima) žvejoja ☐

4) Aš (mano šeima) drėkina laukus ☐

5) Aš (mano šeima) purškia laukus ☐

6) Kita ☐

……

(PRAŠOM NURODYTI)

12. Kiek, Jūsų nuomone, žemės ūkio veikla apskritai prisideda prie bendros vandenų taršos?

1) iki 10% ☐ 2) 10-50% ☐

3) 50-80% ☐ 4) 80-100% ☐

III. Ūkininkų nuomonė apie žemės ūkio veiklos įtaką vandens telkiniams

13. Kiek, Jūsų nuomone, laukų tręšimo laikas (mėnuo, oro sąlygos) apskritai daro įtaką vandens kokybei?

1) Daro didelę įtaką ☐

2) Daro vidutinę įtaką ☐

3) Daro nedidelę įtaką ☐

4) Neturi įtakos ☐

5) Nežinau ☐

14. Kiek, Jūsų nuomone, mineralinių trąšų naudojimas (kg/ha) apskritai daro įtaką vandens kokybei?

1) Daro didelę įtaką ☐

2) Daro vidutinę įtaką ☐

3) Daro nedidelę įtaką ☐

4) Neturi įtakos ☐

5) Nežinau ☐

15. Kiek, Jūsų nuomone, nuotekos iš mėšlo saugyklų apskritai daro įtaką vandens kokybei?

1) Daro didelę įtaką ☐

2) Daro vidutinę įtaką ☐

3) Daro nedidelę įtaką ☐

4) Neturi įtakos ☐

5) Nežinau ☐

IV. Ūkininkų indėlis į vandens telkinių kokybės gerinimą

16. Ar savo ūkyje taikote šias priemones?

(GALITE ŽYMĖTI DAUGIAU NEI VIENĄ ATSAKYMĄ)

Priemonė	**Taip** ir įgyvendinimo priežastys	**Ne** ir neįgyvendinimo priežastys	**Neaktualu**
1. Turiu aplinkos apsaugos reikalavimus atitinkančias mėšlo saugyklas	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
2.Turiu aplinkos apsaugos reikalavimus atitinkančius srutų kauptuvus	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
3.Turiu aplinkos apsaugos reikalavimus atitinkantį parengtą tręšimo planą	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
4.Laikausi	☐ A) Priemonę įgyvendinti nesudėtinga	☐ H) Priemonę įgyvendinti	

Priemonė	**Taip** ir įgyvendinimo priežastys	**Ne** ir neįgyvendinimo priežastys	**Neaktualu**
tręšimo normų reikalavimų	(nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
5.Savo laukus tręšiu tinkamu laiku	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
6.Sėju žiemojančius (žieminius ir daugiamečius) augalus, kaip nurodyta Pažangaus ūkininkavimo taisyklėse ir patarimuose	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	
7.Kalvoto reljefo žemėje taikau priešerozines sėjomainas, kaip nurodyta Pažangaus ūkininkavimo taisyklėse ir patarimuose	☐ A) Priemonę įgyvendinti nesudėtinga (nebrangu, nereikia didelių investicijų) ☐ B) Galimybė pasinaudoti ES parama ☐ C) Nedidelės darbo sąnaudos ☐ D) Galimybė patobulinti darbo organizavimą ir apskaitą ☐ E) Aplinkosauginis aspektas ☐ F) Baimė būti patikrintam/nubaustam ☐ G) Kita *(PRAŠOM NURODYTI)*…… ……	☐ H) Priemonę įgyvendinti labai brangu (reikia daug investicijų) ☐ I) Didelės darbo sąnaudos ☐ J) Aš manau, kad ši priemonė neefektyvi ☐ K) Kita *(PRAŠOM NURODYTI)* …… ……	

17. Kokias aplinkos apsaugos priemones įgyvendinote savo ūkyje per paskutinius 3 metus? *(GALITE ŽYMĖTI DAUGIAU NEI VIENĄ ATSAKYMĄ)*

1) Įrengiau aplinkos apsaugos reikalavimus atitinkančią mėšlo saugyklą(-as) ☐

2) Įrengiau aplinkos apsaugos reikalavimus atitinkantį srutų kauptuvą(-us) ☐

3) Parengiau tręšimo planą(-us) ☐

4) Kita *(PRAŠOM NURODYTI)*..... ☐

5) Nė vienos ☐

18. Kiek Jums kainavo šių aplinkos apsaugos priemonių įgyvendinimas (per pastaruosius 3 metus)?

1) Mažiau kaip 100 Lt ☐

2) 101-500 Lt ☐

3) 501-2000 Lt ☐

4) 2001-5000 Lt ☐

5) 5001-10000 Lt ☐

6) 10001-100000 Lt ☐

7) Daugiau kaip 100001 Lt ☐

8) Nenorėčiau atsakyti ☐ *)

V. Ūkininkų nuomonė dėl aplinkos apsaugos reikalavimų neįgyvendinimo priežasčių

19. Kokios, Jūsų manymu, yra priežastys, neleidžiančios sėkmingai įgyvendinti visų aplinkos apsaugos reikalavimų Lietuvoje? *(GALITE ŽYMĖTI DAUGIAU NEI VIENĄ ATSAKYMĄ)*

1) Nėra priežasčių ☐
2) Aplinkos apsaugos priemonės nėra prioritetas ☐
3) Nepakankama nacionalinė finansinė parama aplinkos apsaugos priemonėms įgyvendinti ☐
4) Nepakanka informacijos apie siūlomus kompensacijos mechanizmus ☐
5) Per didelė biurokratija kompensacijų gavimui ☐
6) Nepakankamai efektyvi kontrolės sistema ☐
7) Nepakankamas aplinkosauginis švietimas ☐
8) Kita *(PRAŠOM NURODYTI)*..... ☐

VI. Kaip ūkininkai prisidėtų prie vandens telkinių vandens kokybės gerinimo

Prognozuojama, kad net ir laikantis dabar galiojančių teisės aktų reikalavimų dalis vandens telkinių ne tik 2015 m., bet ir vėlesniais metais vis tiek nepasieks geros būklės. *ŽIŪRĖKITE ŽEMĖLAPĮ.*
(RODYTI ŽEMĖLAPĮ „Prognozė_2015“ IR PAAIŠKINTI, KAD MĖLYNA SPALVA PAŽYMĖTI VANDENS TELKINIAI, KURIE 2015 M. NEBUS PRISKIRIAMI RIZIKOS GRUPEI, O RAUDONA SPALVA – VANDENS TELKINIAI, KURIE 2015 M. BUS PRISKIRIAMI RIZIKOS GRUPEI).

Todėl vandens telkinių būklės gerinimui reikalingos papildomos priemonės. Toliau pateikiami klausimai yra skirti išsiaiškinti, kurias iš žemiau išvardintų papildomų priemonių galėtumėte ar norėtumėte įgyvendinti savo ūkyje.

Trąšų naudojimas
Pagrindinė pasklidosios taršos problema Lietuvoje yra nesubalansuotas tręšimas. Kai kurie plotai yra visai netręšiami, o kai kuriose vietose trąšų pilama gerokai perdaug. Nustačius maisto medžiagų (tai yra azoto ir fosforo) kiekį dirvožemyje, galima apskaičiuoti optimalias tręšimo normas konkrečiam sklypui. Tai sudaro sąlygas naudoti tiek trąšų, kiek reikia augalams, dirvoje nepaliekant maisto medžiagų pertekliaus, kuris paprastai yra išplaunamas į gilesnius dirvožemio sluoksnius bei požeminį vandenį.

20. Kurias iš šių trąšų naudojimo reguliavimui skirtų priemonių sutiktumėte įgyvendinti savo ūkyje, siekiant išvengti maisto medžiagų pertekliaus dirvožemyje?

Priemonė	Jau įgyvendinau	Sutikčiau įgyvendinti	Sutikčiau tik jei gaučiau kompensaciją	Nesutikčiau įgyvendinti	Neaktualu	Priežastys (sutikimo ar nesutikimo)*
1.Parengti ir įgyvendinti tręšimo planus (kartu atliekant ir dirvožemio tyrimus)						
2.Tręšti mažesne nei didžiausių derlių tręšimo norma						
3.Sudaryti maisto medžiagų (azoto, fosforo) ūkyje balansą, leidžiantį planuoti kiek ateityje reikės trąšų (tais atvejais, kai nerengiami tręšimo planai)						
4.Vietoj mineralinių trąšų naudoti žaliąsias trąšas (t.y. augalus, kurie, nesulaukus brandos, pasėjus juos pavasarį ar rudenį, yra užariami) (tai pagerintų dirvožemio derlingumą ir augalų augimo sąlygas).						

(JEIGU RESPONDENTAS NEŽINOTŲ KĄ ATSAKYTI, PADĖTI JAM SAKANT, KAD GALBŪT ŠI PRIEMONĖ JAM ATRODO NEEFEKTYVI ARBA YRA KOKIŲ NORS TECHNINIŲ, FINANSINIŲ AR KT. KLIŪČIŲ, NELEIDŽIANČIŲ JĄ ĮGYVENDINTI)*

21. Kurias kitas aplinkos apsaugos priemones sutiktumėte įgyvendinti savo ūkyje?

Priemonė	Jau įgyvendinau	Sutikčiau įgyvendinti	Sutikčiau tik jei gaučiau kompensaciją	Nesutikčiau įgyvendinti	Neaktualu	Priežastys (sutikimo ar nesutikimo)*
1.Įrengti mėšlo saugyklas ir srutų kauptuvus, atitinkančius aplinkos apsaugos reikalavimus mėšlui tvarkyti (taip sumažinamas maisto medžiagų nuotėkis į dirvą ir vandenis) (ši priemonė būtų taikoma jos dar neįgyvendinusiems ūkiams)						
2.Tarp lauko ir vandens telkinių įrengti dirbtines šlapynes (pelkes) (šlapynės padeda nufiltruoti maisto medžiagas iš gretimų dirbamų laukų atitekančio vandens prieš jam pasiekiant vandens telkinius)						
3.Dirbamas žemes paversti ekstensyviomis pievomis (prižiūrint pievas mažiau kišamasi į dirvos sluoksnį, dėl to sumažėja maisto medžiagų nuotėkis į vandenis)						
4.Leisti savo žemėje atkurti natūralias anksčiau ištiesintų upių vagas (atkūrus upių vagas jos paprastai pailgėja, dėl to atsiranda sąlygos geresniam savaiminiam apsivalymui)						
5.Patobulinti tręšimo techniką (taip pagerinamas trąšų įterpimas ir sumažinamas maisto medžiagų nuotėkis į vandenis)						

Priemonė	Jau įgyvendinau	Sutikčiau įgyvendinti	Sutikčiau tik jei gaučiau kompensaciją	Nesutikčiau įgyvendinti	Neaktualu	Priežastys (sutikimo ar nesutikimo)*
6.Žiemai sėti tarpinius augalus (tarpiniai augalai naudoja maisto medžiagas ir nuėmus pagrindinių augalų derlių, dėl to mažiau azoto lieka dirvožemyje žiemai, kai jo išplaunama daugiausia)						
7.Pereiti nuo įprasto prie ekologinio ūkininkavimo (ekologiškai ūkininkaujant maisto medžiagų naudojimas yra efektyvesnis ir jų nuostoliai į aplinką mažesni nei įprastinėmis gamybos sąlygomis)						
8.Palikti neapartus ražienų laukus per žiemą (ši priemonė padeda apsaugoti dirvą nuo erozijos)						
9.Įrengti papildomą augalų filtracinę apsaugos juostą ariamoje žemėje išilgai upių, upelių, ežerų (taip galima sumažinti maisto medžiagų nuostolius dirvožemyje ir apsaugoti vandenis nuo taršos pesticidais)						
10. Taikyti sėjomainą, naudojant ankštines kultūras ir žaliąsias trąšas (t.y. augalus, kurie, nesulaukus brandos, yra užariami; taip pagerinamas dirvožemio derlingumas ir sumažinamas maistingųjų medžiagų išplovimas)						

(JEIGU RESPONDENTAS NEŽINOTŲ KĄ ATSAKYTI, PADĖTI JAM SAKANT, KAD GALBŪT ŠI PRIEMONĖ JAM ATRODO NEEFEKTYVI ARBA YRA KOKIŲ NORS TECHNINIŲ, FINANSINIŲ AR KT. KLIŪČIŲ, NELEIDŽIANČIŲ JĄ ĮGYVENDINTI)*

22. Kuri iš šių priemonių, Jūsų nuomone, gali daryti didžiausią įtaką vandens telkinių taršos mažinimui? Vertinimui reikėtų naudoti skalę nuo 1 iki 6, efektyviausiai Jūsų nuomone priemonei priskiriant 6, o visai neefektyviai 1.

Priemonė	Neefektyvi ⟷ Efektyviausia						Nežinau
	1	2	3	4	5	6	
1.Aplinkos apsaugos reikalavimus atitinkančių mėšlo saugyklų ir srutų kauptuvų įrengimas							
2.Tręšimo planų parengimas ir įgyvendinimas							
3.Tręšti mažesne nei didžiausių derlių tręšimo norma							
4.Sudaryti maisto medžiagų (azoto, fosforo) ūkyje balansą, leidžiantį planuoti kiek ateityje reikės trąšų (tais atvejais, kai nerengiami tręšimo planai)							
5.Tarp lauko ir vandens telkinių įrengti dirbtines šlapynes (pelkes)							
6.Dirbamas žemes paversti ekstensyviomis pievomis							
7.Leisti savo žemėje atkurti natūralias anksčiau ištiesintų upių vagas							
8.Patobulinti tręšimo techniką							
9.Žiemai sėti tarpinius augalus							
10. Pereiti nuo įprasto prie ekologinio ūkininkavimo							
11. Palikti neapartus ražienų laukus per žiemą							
12.Įrengti papildomą augalų filtracinę apsaugos juostą ariamoje žemėje išilgai upių, upelių, ežerų							
13. Vietoj mineralinių trąšų naudoti žaliąsias trąšas							
14. Taikyti sėjomainą, naudojant ankštines kultūras ir žaliąsias trąšas							

23. Kokias kitas aplinkos apsaugos priemones galėtumėte įgyvendinti savo ūkyje?

(PRAŠOM NURODYTI).....

VII. Informacija apie respondentą

Galiausiai noriu užduoti keletą klausimų apie Jus*:*

24. Kiek Jums metų?

.....
(PRAŠOM NURODYTI)

25. Jūs esate

Vyras ☐ Moteris ☐

26. Koks yra Jūsų pasiektas aukščiausias išsilavinimas?

1) Pradinė mokykla ☐

2) Pagrindinė mokykla ☐

3) Vidurinė mokykla ☐

4) Profesinė mokykla (technikumas) ☐
   - Ar susijusi su žemės ūkiu? Taip ☐ Ne ☐

5) Universitetas ☐
   - Ar susijęs su žemės ūkiu? Taip ☐ Ne ☐

6) Kita ..... ☐

27. Kiek asmenų, įskaitant Jus, gyvena Jūsų namų ūkyje?

.....
(PRAŠOM NURODYTI)

28. Kiek iš šių asmenų yra jaunesni kaip 18 metų?

.....
(PRAŠOM NURODYTI)

29. Kokios yra vidutinės metinės Jūsų verslo, individualios veiklos metinės pajamos, skirtos Jūsų namų ūkio reikmėms? (Jei nežinote vidutinių pajamų, pasakykite 2011 ar 2012 metų pajamas, skirtas namų ūkio reikmėms)

1) Mažiau kaip 2000 Lt	
2) 2001-5000 Lt	
3) 5001-10000 Lt	
4) 10001-20000 Lt	
5) 20001-40000 Lt	
6) 40001-70000 Lt	
7) 70001-100000 Lt	
8) Daugiau kaip 100000 Lt	
9) Nenorėčiau atsakyti	

30. Gal turite dar kokių nors komentarų?

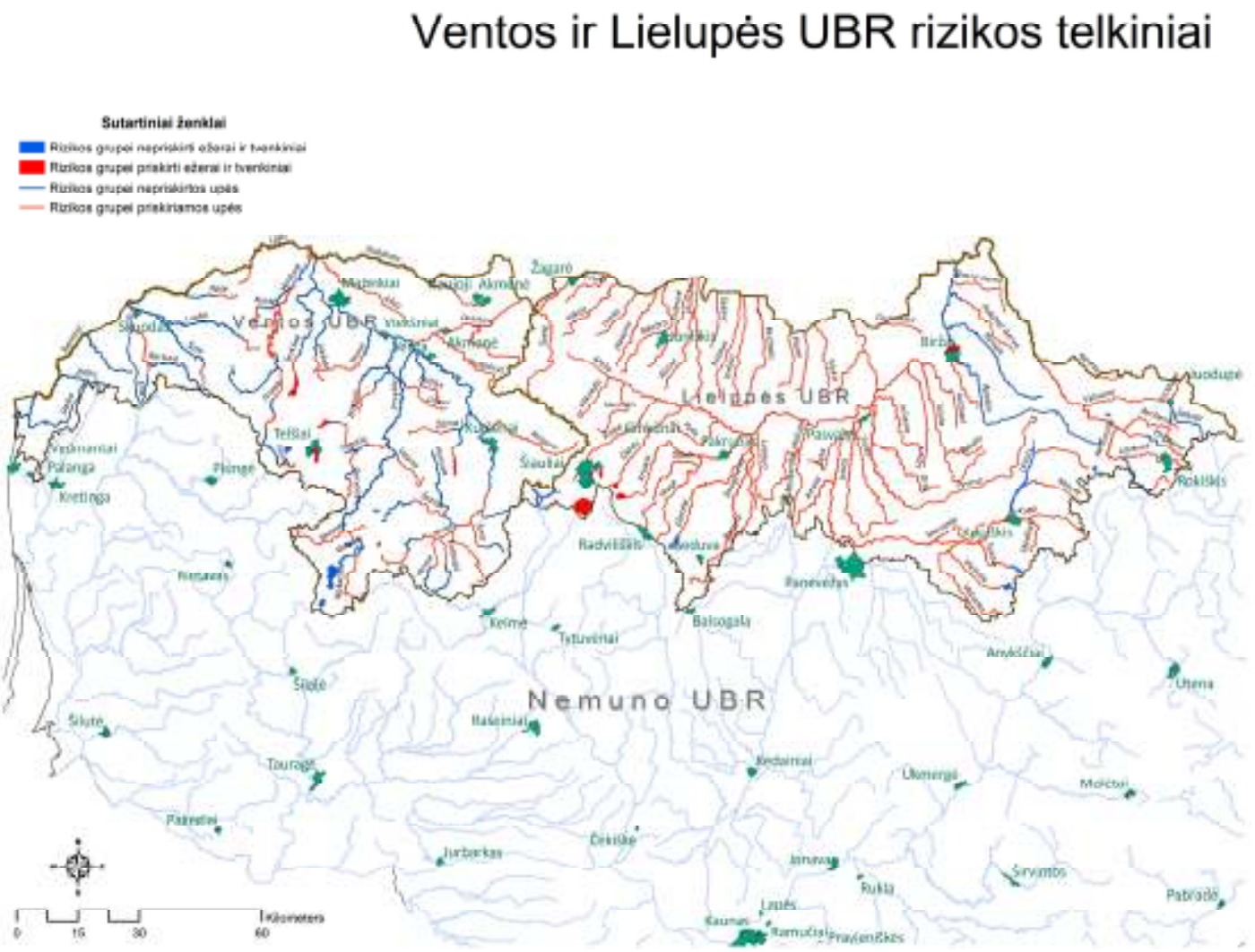
……

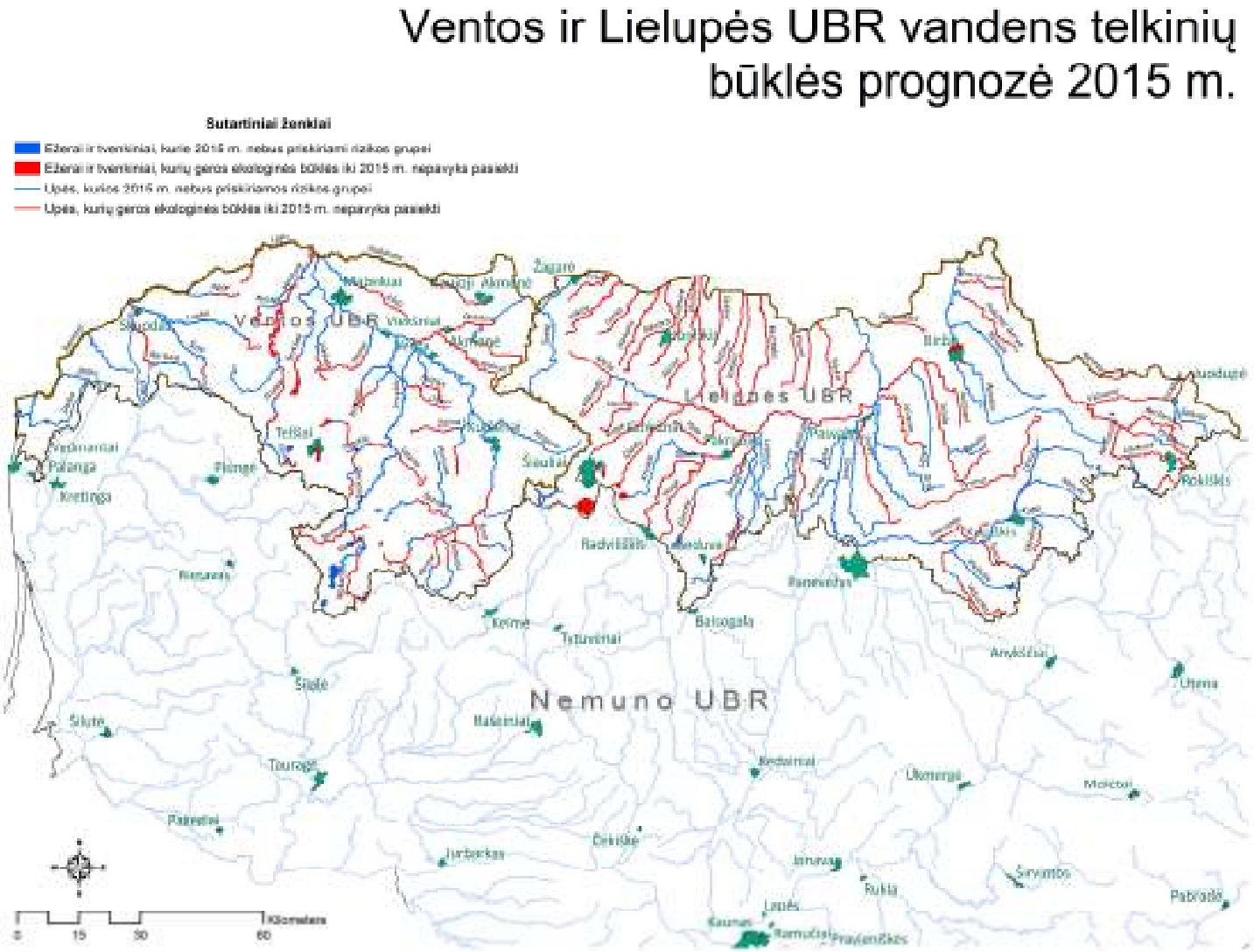
……

(PRAŠOM NURODYTI)

Labai ačiū!

Ventos ir Lielupės UBR seniūnijos


Ventos ir Lielupės UBR rizikos telkiniai
Sutartiniai ženklai
Rizikos grupei nepriskirti ežerai ir tvenkiniai
Rizikos grupei priskirti ežerai ir tvenkiniai
Rizikos grupei nepriskirtos upės
Rizikos grupei priskiriamos upės
Ventos UBR
Lielupės UBR
Nemuno UBR
Žagarė
Mažeikiai
Akmenė
Šiauliai
Telšiai
Plungė
Kretinga
Palanga
Radviliškis
Panevėžys
Biržai
Rokiškis
Kelmė
Tytuvėnai
Šilalė
Šilutė
Tauragė
Raseiniai
Jurbarkas
Ukmergė
Molėtai
Utena
Ignalina
Rukla
Širvintos
Pabradė
Kaunas
Lapės
Ramučiai
Pravieniškės
Kilometers
0
15
30
60


Ventos ir Lielupės UBR vandens telkinių būklės prognozė 2015 m.
Sutartiniai ženklai
Ežerai ir tvenkiniai, kurie 2015 m. nebus priskiriami rizikos grupei
Ežerai ir tvenkiniai, kurių gera ekologinė būklė iki 2015 m. neįsivyks pasiekti
Upės, kurios 2015 m. nebus priskiriamos rizikos grupei
Upės, kurių gera ekologinė būklė iki 2015 m. neįsivyks pasiekti
Ventos UBR
Lielupės UBR
Nemuno UBR
Žagarė
Mažeikiai
Telšiai
Plungė
Palanga
Kretinga
Šiauliai
Radviliškis
Panevėžys
Biržai
Kupiškis
Rokiškis
Joniškis
Kelmė
Tytuvėnai
Šilalė
Šilutė
Raseiniai
Tauragė
Pagėgiai
Jurbarkas
Čekiškė
Jonava
Rukla
Kaunas
Lapės
Ramučiai
Pravieniškės
Ukmergė
Molėtai
Širvintos
Pabradė
Utena
Anykščiai
Kilometers
0
15
30
60