SHERPA
Rural Science-Society-Policy Interfaces

MAP Position Paper

CHANGE IN PRODUCTION AND DIVERSIFICATION OF THE RURAL ECONOMY

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https://rural-interfaces.eu/maps/lithuania/

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Contents

Topic and headline messages

The key strategies of the development of the rural areas in Lithuania are currently concerned with a diversification of the economic activity in rural areas. It highly depends on the selected approach towards diversification itself and the state of common understanding of the critical concepts in the context of rural development, namely 'smart rurality', 'smart communities', 'digitalisation', 'bio-economy', 'sustainable management of resources', 'food chain'. The ability to take part in the diversification of the rural economy highly differs in Lithuania between big and small farmers due to many reasons, with legislative imperfections and political lobbying ahead. The lack of appropriate infrastructure in the three-fold economic potential (resources, infrastructure, and skills and/or abilities) for the diversification of the rural economy of Lithuania is the most problematic. Moreover, the consumer needs to be educated further to compose the necessary demand for improvements in the diversification of the rural economy in Lithuania concerning all discussed dimensions. Smart rurality, bio-economy, sustainable management of resources and food chains are just at the beginning of the development phase in Lithuania, but they are about making a great change in the future development of rural areas, and therefore should be accelerated by involving all relevant stakeholders from society, science, and government at local, regional and national levels.

Problem being addressed and key questions

The Lithuanian MAP "CBioLit" analysed the key scientific evidence on the following dimensions of *diversification of the rural economy*:

1. Entrepreneurship, employment and new business models.
2. Smart rurality, smart communities, and digitalisation.
3. Bio-economy and sustainable management of resources.
4. Farm diversification and food chains.

The key questions addressed in discussions for each dimension are :

1) What are the key needs for the development of the diversification of the rural economy in Lithuania, and how can they be addressed most effectively?

2) How can policy interventions support positive changes in the diversification of the Lithuanian rural economy, considering solutions that are needed at the local and national levels, and any implications for the wider policy framework (European Union level or others)? What can public administrations (at all levels) do to facilitate and encourage positive changes in the diversification of the rural economy?

3) What are the research needs and gaps in the field in Lithuania?

1. Diversification of the rural economy: Entrepreneurship, employment & new business models

1.1. Key scientific evidence

The state of entrepreneurship, employment, and new business models in Lithuanian rural areas is first related to several dramatic development trends of the Lithuanian countryside, especially concerning the changes in the total number of farms, their structure, income from the agricultural activity, as well as differences among separate Lithuanian regions.

During the period 2010–2016 there was a rapid decrease in the total number of farms operating in Lithuania - by almost a quarter, i.e. from 199.9 to 150.3 thousand farms (Agricultural Census of the Republic of Lithuania, 2020). While analysing the changes in the structure of farms according to the area of utilised agricultural land, the two significant changes of the recent decade are critical to the issue:

- there is a significant increase (by 39%) in the number of large farms with more than 100 hectares;
- there is a significant decrease (by 31%) in the number of small farms with less than 10 hectares.

In Lithuania, the income of agricultural entities is the most important factor determining their decision to make entrepreneurial activity in the rural areas, as well as to consider the preconditions for sustainable farming and food security for the population. Since the number of farms is declining, it becomes vitally important to ensure the attractiveness of agricultural activity in terms of income. It is becoming increasingly difficult to ensure income stability, as economic performance in rural areas depends not only on unpredictable production prices but also increasingly on extreme natural phenomena. The declining number of farms threatens to worsen food security in the country.

According to recent research, the driving force in the diversification of the rural economy and change in production is the young generation of farmers, who come with a new education and a new understanding of farming philosophy and the overall quality and way of life in rural areas. New initiatives need financial resources/support, which is critical for the younger generation when starting any kind of business activity. In the Lithuanian case, the overview of data shows the need for investment support for young farmers through subsidies exceeded the available budget. In the period 2014-2020 about 50% of applications from young farmers who applied for support for setting up a farm were rejected. In Lithuania, the rejection rate of farmers' loan applications is also very high, mainly due to the rejection of loans to small farms. The main reasons why financial institutions reject loan applications from agricultural entities are excessive investment risk (65% of respondents indicated this reason), too risky new farm business (39% of respondents indicated this reason), and lack of credit history (32%). These reasons are major barriers to accessing finance for young farmers and other new entrants (Fi-compass, 2020). There also exist particular restrictions in Lithuania for different groups of rural residents to access public funds for various needs, which are available only for particular groups of rural residents. For instance, the access to separate rural funding schemes is restricted to being a rural citizen for a particular period, e.g. to apply for funding to start a small business in a rural area the applicant must be a rural citizen in the declared rural place of residence for at least 3 years. This composes restrictions to newcomers to rural areas, normally young people, who want to start a business just after they arrive in the rural area.

Differences in natural conditions of separate regions of Lithuania also lead to significant differences in agricultural production volumes and income levels. One-third (33.2%) of utilised agricultural land used in the country is occupied by areas with significant natural and specific handicaps. Lithuania is interested in continuing agricultural activities in these areas to maintain their viability and attractiveness and to preserve the landscape and biodiversity. In Lithuania, farms operating in less favourable agricultural lands make up a relatively large share of all farms in the country (54.7% in 2016). In farms operating in less favourable

agricultural lands, as in farms operating in favourable agricultural lands, a decrease in net value added per conditional employee in the period 2010–2016 was observed for 4 out of 7 years.

In the years 2012-2017, the income of the Lithuanian family farm per one conditional employee of the family averaged €8 700 per year (FADN, SE430, 2021). This income was on average 115 times lower than on the farm of the largest economic size farmer in Lithuania. The smallest family farms (economic size of 4 to 8 thousand euros and from 8 to 25 thousand euros) income per family contingent was lower than the national average income (26% and 62%, respectively), and the largest family farms (economic size of 500 thousand euros and more) was 27 times higher than the national average income.

The overall situation concerning the entrepreneurship, employment, and new business models in Lithuanian rural areas demonstrate particular strengths and weaknesses, and threats in the field:

Weaknesses:

- The income of agribusiness is lower than wages in all sectors of the country's economy.
- Large income disparities between small and large farms.
- Low on-farm risk measures.
- Unequal distribution of direct payments between farms by size.
- Low income of herbivorous livestock and dairy farms compared to the income of farms of other farming directions.
- Large annual fluctuations in farm incomes.
- Large differences in farm incomes between regions in terms of locality favourability.

Threats:

- Rising wages in other sectors of the economy, reducing the attractiveness of farming.
- Increasing natural disasters, increasing farm income instability.
- Large fluctuations in agricultural prices on world markets.

At the same time, implemented analysis helps identify several *strengths*: first, large farms have been formed with the financial capacity to operate efficiently under market conditions, and second, the rapid growth of the cereals sector. The observed strengths might be utilised for political *opportunities* for further development in the field:

- Application of new technologies, including digitalisation, to reduce farm costs and increase efficiency.
- Emergence and development of new risk instruments.
- Wider availability of advice and training to increase farmers' knowledge.

Good practice

Local food movement 'Viva Sol' (www.vivasol.lt) - new form of rural entrepreneurship via diversified rural economy

Foundation
Association "Viva Sol" (in short as AVS) was founded on 15 Sept 2006 in Dargužiai village, Varėna Municipality, Lithuania.

Objectives
The overall aim of the Association is to strive for the vitality of the rural areas. This is intended to be achieved through increasing the economic and social well-being of small-scale farmers, amateurs and other rural inhabitants and preserving rural environment and building of social links between local people and organisations. Also, the AVS aims to join rural and urban people through local food and local development initiatives and learning from each other.

Motto
To keep the village alive!

The main initiator for the creation of a local food movement for cheese products in Lithuania is Valdas Kavaliauskas, who decided to move from Vilnius to Darguziai Village in 2008 to raise goats and to produce goat cheeses. He was looking forward to collaboration with supporters in this region that would strengthen cooperative ties between the rural and urban population and support the idea of a local food movement, and would offer outstanding dairy products to urban citizens. Valdas Kavaliauskas and other cheese producers from this region who joined this activity founded Viva Sol, which means "long live the earth" in French, an association to address relations between producers and consumers and between urban and rural areas. In 2008–2009 they decided to set up a Cheese Farm Market in one of the cafés of the capital city and a Cheese House in Darguziai Village. Every year more and more activities were proposed, such as: (1) tasting festival aiming to create strong relation with consumers, (2) collaboration with restaurants in different cities and towns, (3) pick-up points of cheese production in 8 cities and towns (in food market, restaurants, small food shops), (4) cheese school in Darguziai village, (5) production of supplements to produce cheese. Later Valdas Kavaliauskas moved to another village where he continues his work together with other members of the association. Later association Viva Sol have started to focus more on broad topics related to the development of rural areas, sustainability of rural communities, climate change, environment, etc.

Motivation to create the local food movement from dairy products was based on the need for high quality and delicious food. Conventional food systems did not satisfy the needs for fresh locally-produced food. This was one of the most important aspects that led to the decision to create a movement of local food, to move to the countryside and to turn to farming. On top of that, the initiators put forward another important factor – the urge to be closer to nature and to enjoy the feeling of freedom. Such needs can be effectively met by the pattern of their life in the countryside where they practise small farming. Valdas Kavaliauskas, the initiator and pioneer of cheese-makers' activities, says that his participation in Darguziai Village community action and his experience to a certain degree empowered him, acted as a driving force, and encouraged him to develop his activities and to bring like-minded people together. Another two important aspects are changes in the needs of Lithuanian food consumers and foreign experience. They strengthened confidence that such pattern of relationship between the producers and the consumers may exist.

The main goal of local food movement Viva Sol is to improve livelihoods through rural areas and to create new forms of accessibility to food for consumers, changing the farmers and consumer relationships. The association assists the survival and establishment of small farms by inviting urban citizens to come to the

village and to join the activities organised in rural areas, their festivals and farm work. Furthermore, rural people are encouraged to visit the city, to learn about city life, the activities of urban people and to understand what people distanced from the natural environment think. These actions create a closer link between rural and urban areas. Different tools used in pursuance of this objective include various events in rural settings, lectures, discussions, and farmers' meetings with urban consumers when they sell their products in the urban environment.

The underlying concept of the association, which has already become a propelling slogan, is 'May the Rural Areas be Alive'! The members of the association describe their philosophy in five sentences:

1. Relationship between the consumer (an urban citizen) and producer/grower (a rural citizen).
2. Solidarity between all members of the association and supporters of the association members' ideas.
3. Certainty and stability, i.e. the consumer should know how and where to obtain a real homegrown and handmade product.
4. Trust among consumers and producers. The members of the association believe that it is highly important for the producer to know the consumer, and vice versa, as this gives birth to something highly important, which is trust.
5. And therefore the association is always ready to talk about its activities.

The main goal remained unchanged from the establishment of the association until 2020. Association Viva Sol has 18 members, including 2 organisations (Baltic Environment Forum, Vocational School 'Garden masters'), 5 farmers, and 11 end consumers.

The increase of the membership of the local food movement by Viva Sol was very natural and based on activities proposed by the association. Producers – one part of members of the association – were willing to cooperate on the distribution of production from cheese with the involvement of consumers aiming to create strong relationships with producers. Strong relations with consumers are created by various events and initiatives organised by initiators of the association Viva Sol. For example, the Cheese House in Darguziai village organises celebrations of public holidays, community volunteering, open door days, discussions, encourages sharing of farming and life experience, and invites volunteers, who are willing to learn about farming and cheese-making processes.

The birth, development, and implementation of this idea were set in motion by a similar world-view of the participants, and examples of comparable practices in other countries. Here the initiators of the idea relied on the French practice. You could say that the Lithuanians did not only bring home French cheese-making secrets but also adopted the idea of solidarity and openness. They long to see rural areas alive with their own crafts, businesses, and agriculture. Moreover, the cheese-makers believe that rural viability highly depends on the relationship between rural and urban citizens. Association Viva Sol was founded by both rural and urban people, who cherish similar values. Initially, they were encouraging others to develop the relationship between urban and rural citizens.

Members of movements are producers and consumers. The part of producers includes small farmers from rural areas, who work towards producing high-quality and tasty food.

The Cheese House in Darguziai village has a considerable number of partners that can be broken down into 3 groups:

1. Small partnership of *Cheese Experts* engaged in cheese wholesale and retail and organisation of events and tasting.
2. Cooperative '*Our Cheeses*'.
3. Farmers cheese-makers.

The group of consumers embraces mostly urban citizens with various professions who appreciate and look for high-quality and tasty food. The target group of users includes urban citizens. Consumers of cheese products are medium-aged from 35 to 55 years.

Every year is the continuous growth of new members of consumers who firstly participate in the Cheese Festival to try various species of cheeses and then continue to consume them. The remaining part of members – producers – is stable with no changes from the establishment of the association.

This social movement has an impact on society by proposing: (1) a new form of accessibility to food for consumers that changes farmer and customer relationships; (2) advocating for new small-scale family farming, (3) helps to get a better price both for farmers and consumers; (4) creating and/or strengthening new food consumption habits and making high-quality food accessible.

1.2. Summary of position of the regional Multi-Actor Platform

Obstacles and enablers supporting the success

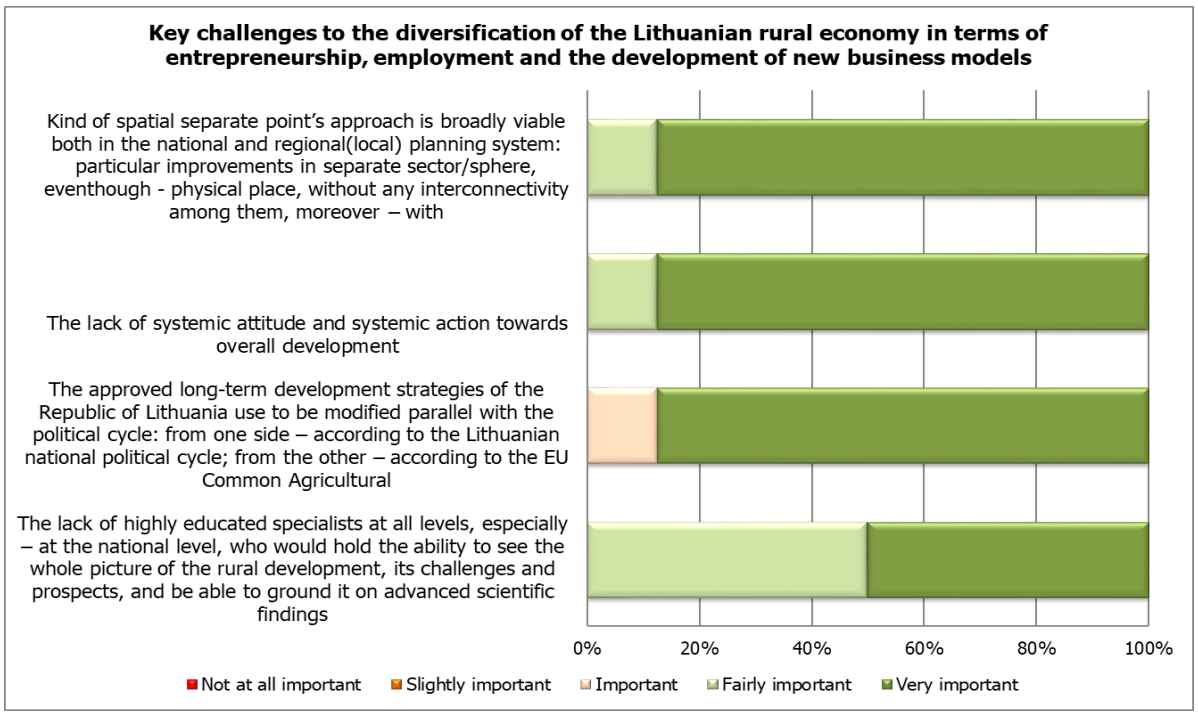
The key obstacle in the field of overall diversification of the rural economy in Lithuania, which greatly hinders the progress of Lithuanian rural areas, is the lack of systemic attitude and systemic action towards overall development. The longer democratic pathway in Western European countries demonstrates advancement in systemic rural development through programming and implementation, which goes without mentioning 'systemic' literally in particular development discussions; the systemic thinking is already integrated and realised in the planning decisions for regional development and its implementation for the wealth of rural community and the whole country at large.

Hence, the Lithuania-specific young thirty-year-old democracy cannot see the whole picture yet, its continuous systemic development in turn. The approved long-term development strategies of the Republic of Lithuania use to be modified parallel with the political cycle: from one side – according to the Lithuanian national political cycle; from the other – according to the EU Common Agricultural Policy programming cycle. The Parliament elections are organised every 4 years in Lithuania, so every new political power strives to create a new Government programme, which defines new aims and new measures to be achieved, instead of continuing the previously working programmes, by fulfilling them with necessary measures, to reach the long-term priorities of the country. A kind of spatial separate point's approach is broadly viable both in the national and regional(local) planning system, by making particular improvements in separate local sector/spheres, without any interconnectivity among them, and without any reference to the approved long-term common vision of the overall long-term development. However, implemented spatial initiatives are insufficient to change the overall situation in the field of diversification of the rural economy.

This tightly interconnects with the second challenge - the lack of highly educated specialists at all levels, especially at the national level, who have the ability to see the whole picture of rural development, its challenges and prospects, and be able to ground it on advanced scientific findings, on scientific advice.

Expert evaluation on the above-identified challenges to the diversification of the Lithuanian rural economy in terms of entrepreneurship, employment, and the development of a new business model is provided in Table 1, using a scale from 1 (not at all important) to 5 (very important).

Table 1. Key challenges to the diversification of the Lithuanian rural economy



Source: calculated by authors according to survey results.

Lithuanian MAP experts identified the following enablers to overcome the observed challenges, starting from the most helpful in the field:

- The *lack of highly educated rural development specialists*, able to see the whole picture, *should be solved* by preparing a sufficient amount of new generation rural developments experts for all levels – national, regional, and local.
- Rural economy diversification solutions should be *based on scientific grassroots*.
- *Diversification vision and measures* for the Lithuanian rural economy should necessarily come by aligning *'bottom-up' and 'top-down' approaches* through the dialogue between revitalised local action groups and national governing bodies, harmonised local development strategies (LDSs), and principles of the LEADER approach, which is forgotten and diminishing.
- *All stakeholders*, firstly including the local rural community and local action groups, *should have a right to be heard* and enabled to make the change (legislatively approved role) in programming and implementation of the rural development at the territorial level.
- *Horizontal and vertical partnership and cooperation for long-term strategic planning*, by involving all relevant stakeholders in the process.

Concerning the highly-educated specialists, it was additionally stated, that the main concern is gathering highly educated specialists and taking their expertise into account. Or, in other words, more problems exist in organising effective collaboration between the highly-educated specialists and policymakers to make the expertise used for rural policy formation and implementation. Another issue is that high-level specialists are not sufficiently valued in Lithuania in terms of financial remuneration, which is inadequate for the work performed; therefore such specialists move to other countries.

Key Research Gaps

The lack of research is observed in the field of region-specific statistics and research when there is no possibility to have particular measures regarding the actual situation in different Lithuanian regions at the municipality level (the territory of Lithuania is divided into 60 municipalities), often only country-level generalised data is available. Specifically in the case of rural development and agriculture, such data is convenient for the current rural development programming under the common agricultural policy, implemented in the EU, concerning the direct payments to farmers. A huge uneven distribution of support received by small and large farmers is observed, and there is huge lobbying for not changing the situation.

Recommendations for the local/regional/national level

The situation should be urgently changed by implementing the following recommendations:

- Horizontal and vertical partnership and cooperation for long-term strategic planning, by involving all relevant stakeholders in the process.
- Diversification vision and measures for the Lithuanian rural economy should necessarily come by aligning 'bottom-up' and 'top-down' approaches through the dialogue between revitalised local action groups and national governing bodies, harmonised local development strategies (LDSs), and principles of the LEADER approach, which is forgotten and diminishing.
- All stakeholders, firstly including the local rural community and local action groups, should have a right to be heard and enabled to make the change (legislatively approved role) in programming and implementation of the rural development at the territorial level (might be implemented using the precise public management through POSDCORB (Planning, Organising, Staffing, Directing, Co-Ordinating, Reporting and Budgeting) methodology).
- Rural economy diversification solutions should be based on scientific grassroots; the lack of highly educated rural development specialists, able to see the whole picture, should be solved by preparing a sufficient amount of new generation rural developments experts and employing them in all levels – national, regional and local.

2. Smart rurality, smart communities and digitalisation

2.1. Key scientific evidence

The most-importance issue for assessing the readiness for smart rurality, smart communities, and digitalisation in Lithuania, is the overall understanding of the concept and its clearness, and its acceptance in the region at national, regional, and local levels. In the Lithuanian case, the question of rural 'smartness' is far away from just simply the 'digitalisation' and 'spread of the internet' in geographic area terms, speed of the internet, etc. In Lithuania, smart rurality and smart communities are first associated with innovative solutions for rural livelihoods and readiness for innovations. The European understanding of 'smart' villages, as proposed by the 'EU Action for Smart Villages' (2017), include:

- using digital technologies;
- thinking beyond the village itself;
- building new forms of cooperation and alliances;
- thinking for yourself.

In the Lithuanian case, smart rurality, currently emphasised mostly by the statistical count of digitalisation, envisages quite a good internet spread in the whole country: in 2021, 81% of Lithuanian households had personal computers at home, and 87% of households had internet access. This is a clear increase, compared to 2020 when 77% of households had personal computers and 82% of households had internet access (Digital Economy and Society in Lithuania, 2021).

The spread of digitalisation further calls for a shift in the understanding of the quality and way of life and competitiveness of the rural areas. Concerning the competitiveness potential of overall Lithuanian agriculture, it must be acknowledged that recent trends in food consumption are changing the trade flows of agricultural and food products, which are produced as an output of the main economic activity in Lithuanian rural areas, and which is recently shaped by the spread of digitalisation. Consumer responsibility for the sustainable use of natural resources is growing. They are increasingly concerned that long-distance transport of food increases CO_2 emissions. Food transported from a distance has to be long-lasting, so it is produced with a variety of preservatives, and fruits and vegetables are treated with chemicals. Food choices of Lithuanian consumers increasingly depend on the freshness and naturalness of the food. When buying the local food, consumers feel socially responsible and contribute to strengthening the economic potential of rural communities. The consequences of the new consumer priorities are the popularisation of food purchased directly from farmers and the emergence of a new concept of food as a service to farmers. In such a market, importers do not have the opportunity to compete with domestic producers. In such a situation the readiness of a farmer to innovate is of total importance.

There are specific changes in farmers' ages and readiness for farming during the period 2010-2016. The largest share in these structures was occupied by farmers aged 55 and over, and with only practical experience. Still, positive developments were also observed, with an increase in the number of farmers under 35 in the year 2016 compared to 2010. The share of farm managers with basic and full readiness for farming (after graduating from a university or other relevant educational institution, higher agricultural school) has been constantly increasing. These changes are important because younger and more educated farm owners are more willing to innovate than older and less educated farm owners.

The precise analysis of the state regarding the smart rurality in Lithuania helped identify the following weaknesses and threats:

Weaknesses:

- Declining capital productivity.
- The production of innovative higher value-added products is underdeveloped.
- Declining attractiveness of livestock farming as a branch of the country best suited to the country's natural advantages.
- Outdated and worn-out drainage systems.

Threats:

- The rise in input prices.
- Shortage of labour, especially skilled, in rural areas.
- Loss of export markets due to the food security capacity of other countries.
- Political and economic instability in third countries.
- Rising volumes of low-cost imports of agricultural and food products produced abroad.

Throughout the overview of the situation concerning the issue in Lithuania particular *strengths* were found: first, a significant share of agricultural and food production in the structure of Lithuanian exports; second, exports of agricultural and food products are geographically and productively diversified; third, increasing

labour and land productivity, and finally, a high level of farm solvency. And particular *possibilities* had been highlighted during the analysis:

- Growth in demand for organic, authentic, high-quality agricultural and food products.
- Application of new technologies, including digitalisation, for efficient use of agricultural resources.
- Development of existing and new foreign markets.
- Development of bio-economy and circular economy.

Good practices / projects / tools / methods

No matured good practice/tools/methods had been developed yet concerning the smart rurality and smart communities in Lithuania, which would be an exemplar case in the field. It is still the beginning phase of 'Smart Villages' concept development in Lithuania, which is currently concerned with the following issues (Smart Rural Areas, 2021):

- There is no final model yet for Smart Villages support; it is expected that LEADER and Smart Villages will be directly interlinked. Smart village strategies might be a part (or replace some) of the Local Development Strategies (LDSs) in an experimental way.
- There are currently discussions about the scope and support for the development of smart village strategies (and their linkages to LEADER and LDSs). One possibility might be – although no decision is taken yet – to support smart village strategies in some 'pilot' areas that would either complement or replace some of the LDSs.

The Lithuanian Ministry of Agriculture runs the activities of the National Rural Network (NRN) in Lithuania, which is aware of the Smart Villages concept. NRN members have the opportunity to make an input to this thematic area through implementing their communication projects financed from the NRN budget. Among others, the Lithuanian Rural Communities Union and the LEADER Local Action Group (LAG) Network ("Towards Smart Village" seminars) were supported to carry out such activities.

Lithuanian rural Local Action Groups (LAGs) association, founded in 2007, unites 49 local action groups in Lithuania. The mission of the LAG Network is to promote national and international cooperation between LAGs, to represent common interests to successfully implement the LEADER approach and innovative rural development at the European, national and regional levels. Collect and disseminate information, solve problems related to the activities of LAG network members, share knowledge, experiences, achievements, and ideas. The association implemented a project that included "Towards a Smart Village" seminars in all Lithuanian counties, with the participation of rural development entities (including representatives of municipalities, rural communities, other NGOs, local businesses, LAGs). The project aims to identify local projects that could be adapted and implemented in various rural areas of Lithuania (Smart Rural Areas, 2021).

Lithuanian Rural Communities Union (LRCU) is an independent union (association) of rural communities in Lithuania founded in 2002, coordinating and carrying out the tasks assigned by the members and representing their interests. Rural areas in Lithuania are defined as villages and towns that are outside the administrative boundaries of the city. One-third of the Lithuanian population lives in rural areas that make up for 97% of the whole Lithuanian territory. LRCU is uniting 41 regional associations (unions, LAGs) of (approx. 1 300) rural communities (out of a total of more than 2 000 rural communities in Lithuania). Key initiatives, carried out by the LRCU, concerning the smart rurality in Lithuania, are (Smart Rural Areas, 2021):

- Started informal discussions with the Ministry of Agriculture on the possibilities of preparation and financing of the Smart Villages programme in 2018.
- Lithuanian Rural Parliament (October 2019), including a presentation on 'Smart Villages – Co-creating Rural Territories for the Future' (by Clive Peckham) and discussions on Smart Villages.

- Promotes the idea of Smart Villages at various events among its members. Chairperson contributing to the Smart Rural 21 (EU) project.

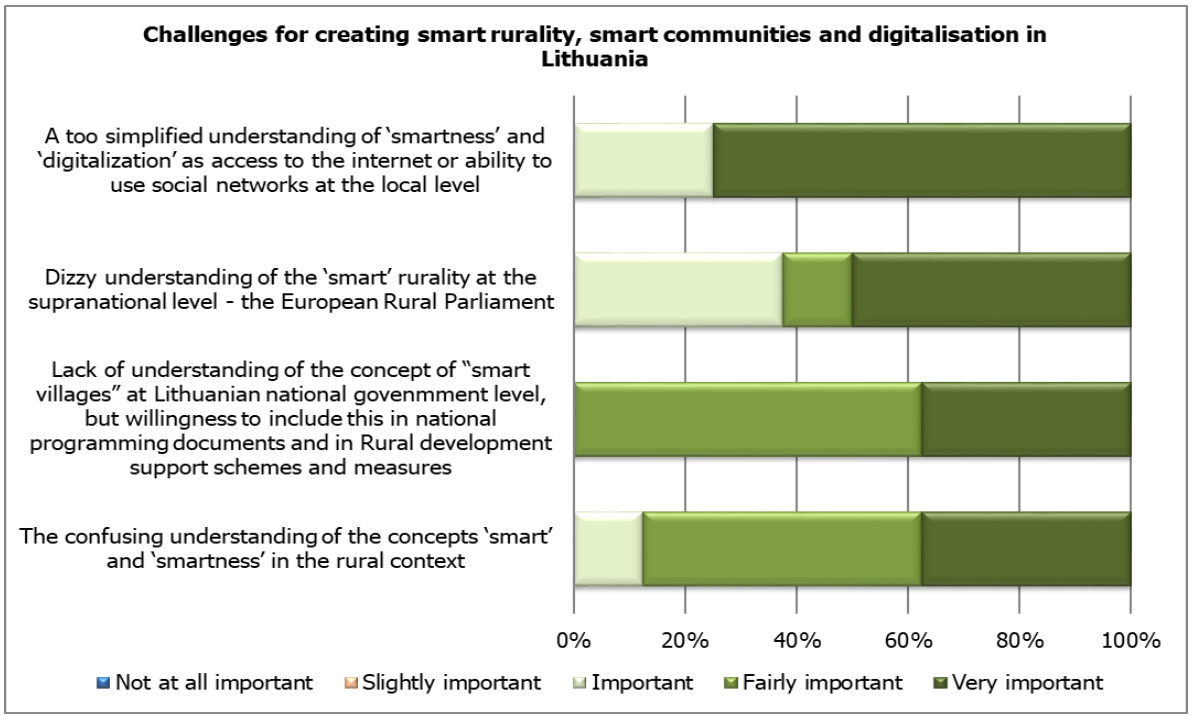
2.2. Summary of position of the regional Multi-Actor Platform

Obstacles and enablers supporting the success

The key obstacle for assessing the 'smartness' and digitalisation of Lithuanian rural areas and its impact on the diversification of the rural economy, is the confusing understanding of the concept 'smart' and 'smartness' in the rural context. The challenging situation had been observed not only at the Lithuanian local (i.e. community) level, but also at the national (e.g. Lithuanian executive government bodies lack the understanding of the concept of "smart villages", but striving inclusion in national programming in Rural development programme support schemes and measures), as well as supranational (i.e., unclear understanding of the 'smart' rurality in the European Rural Parliament) levels. In Lithuania, 'smart' ruralities and 'smart' communities are often understood as those who simply have access to the internet. Another popular understanding of 'smartness' is the ability to have skills and use them for enabling modern information and communication technologies in everyday life, including the ability to use electronic public services (e-government, e-health, etc.), to work remotely, etc. The main challenge to fight in the field is to develop a common understanding of "smartness" in the rural context. This would be a key driver in association with innovative solutions for rural livelihoods and the overall readiness for innovations, at national, regional and local levels; for example, 'Smart Villages' revitalising rural services (ENRD, 2018).

Expert survey results on the above-identified challenges for smart rurality, smart communities, and digitalisation in Lithuanian rural areas on a scale from 1 (not at all important) to 5 (very important), are provided in Table 2.

Table 2. Challenges for creating smart rurality, smart communities, and digitalisation in Lithuania



Source: calculated by authors according to survey results.

Lithuanian MAP experts identified the following enablers to overcome the observed challenges, starting from the most helpful in the field:

- to discuss and clearly define the common meaning of 'smart' rurality and 'smart' communities in collaboration between the national government, science representatives, and local communities;
- to establish a model for smart rurality and smart community development support by interlinking LEADER and Smart Villages programmes and making 'Smart Villages' part of the local development strategies (LDSs);
- to arrange and continuously spread the knowledge concerning 'smart' rurality and 'smart' communities in the national (Lithuanian) language to increase overall understanding of the issue in the whole country;
- to improve the European Innovation Partnership (EIP) programme implementation rules at the national level (to simplify them and make them more flexible) and accelerate joint initiatives between science, business, and farmers.

It was stressed by experts, that a smart village starts with community and partnership whereas in Lithuania it is quite often limited to digitalisation and short food supply chains.

Key Research Gaps

The key research gaps regarding smart rurality and smart communities in Lithuania are found in the limited understanding of the concept, its spread, and acceptability in Lithuania. This leads to the lack of data in the field: what is the state of 'smart' rurality in Lithuania? Are Lithuanian rural communities 'smart'? Since there is no common understanding of 'smartness' in the rural context, there is no possibility to define the state of the art, and set the development objectives.

Hence, digitalisation is gaining importance in a rural context in Lithuania from an agricultural innovations point of view, which are moved forward through the European Innovation Partnership (EIP) program and other agriculture and rural development support schemes. Thus the country is starting its pathway to *precision agriculture*, and then there is also an extreme lack of research in the field concerning the issue.

Recommendations for the local/regional/national level

Key Lithuanian MAP "CBioLit" recommendations concerning smart rurality, smart communities, and digitalisation:

- Discuss and clearly define the common meaning of 'smart' rurality and 'smart' communities in collaboration between the national government, science representatives, and local communities.
- Arrange and continuously spread the knowledge concerning 'smart' rurality and 'smart' communities in the national (Lithuanian) language to increase overall understanding of the issue in the whole country;
- Establish a model for smart rurality and smart community development support by interlinking LEADER and Smart Villages programmes and making 'Smart Villages' part of the local development strategies (LDSs).
- Improve the European Innovation Partnership (EIP) programme implementation rules at the national level (to simplify them and make them more flexible) and accelerate joint initiatives between science, business, and farmers.

3. Bio-economy and sustainable management of resources

3.1. Key scientific evidence

Up till now, the fields of bio-economy and sustainable management of resources development in Lithuania have lacked a common long-term green innovation and/or environmental strategy for all economic sectors. Despite the fact that Lithuanian National Strategy for Sustainable Development was approved in 2003, it has not been further implemented due to the changes in the political arena. For a long time, the dominant understanding was that sustainable management of resources and bio-economy is the sole responsibility of the Ministry of the Environment of the Republic of Lithuania. The presentation of the European Green Deal in 2019 by the European Commission greatly accelerated discussions in all sectors in Lithuania concerning the bio-economy and more sustainable management of resources, from the environment, economy, transportation and agriculture, to education and many other fields. Due to this, at the beginning of 2021, public consultations were held regarding the implementation of the European Green Deal in Lithuania. Five Government Ministers – Minister of Environment, Agriculture, Transport and Communications, Energy, and Economy and Innovation, and two vice-ministers – vice-minister of Education, Science and Sport, and vice-minister of Energy organised a national-level public consultation on the implementation of the Government Programme and the Economic Recovery and Resilience Building Plan on the European Green Deal. This was the very first public consultation in Lithuania regarding public policy issues. The event attracted more than 200 stakeholders, from NGO's, to private and public sector organisations. However, the public consultation revealed that each ministry sees and understands the importance of the European Green Deal, but in a very fragmentary and Ministry-specific way; there is no common vision on the overall implementation of the European Green Deal in Lithuania.

Hence, there are plenty of issues, related to bio-economy and sustainable management of resources in Lithuania, which are already stressed in the Lithuanian rural development programme for the coming period. For instance, according to the Lithuanian Biomass Energy Association 'Litbioma', the largest annual potential of biomass suitable for biofuel production is firewood (0.505 million tonnes), and other renewable energy resources are not used very efficiently, taking into account the amount of energy produced:

- wastes from the wood industry (0.28 million tonnes),
- deforestation waste (0.185 million tonnes),
- wastes from landscaping, gardens, packets, ditches (0.16 million tonnes),
- stumps (about 0.1 million tonnes),
- energy crops (about 0.014 million tonnes),
- straw (0.81 million tonnes),
- municipal waste (0.09 million tonnes).

In the Lithuanian case, measures to encourage farmers to use fertilisers properly, use soil-friendly tillage methods, and crop rotations must be first taken into account.

Another important country-specific aspect concerning the bio-economy and sustainable management of resources is related to the territories of the European ecological network "Natura 2000" located on agricultural land. In Lithuania, such territories account for 4.5% of all utilised agricultural land (10.9% in the EU-28). Territories located on forest land account for 23.6% of total forest land (29.5% in the EU-28) (Preserved territories, 2021). It should also be stressed, that in Lithuania the average number of landscape elements was lower than the EU average; in 2014–2018 as much as 9% was ploughed meadows and habitats close to them.

Analysis of the overall situation concerning bio-economy and sustainable management of resources and its trends in Lithuania helped identify particular weaknesses and threats:

Weaknesses:

- Increased GHG emissions from crop production due to increased crop area and the associated use of mineral fertilisers.
- Decreased amount of organic carbon in arable land due to narrow specialisation of farms, narrow crop rotations, non-cultivation of perennial grasses.
- High GHG emissions from drained wetlands.
- Low supply of irrigation equipment to farms.
- Low use of biomass, especially waste, for energy production.
- Use of a small proportion of livestock manure for biogas production.

Threats:

- Increasing production intensity and GHG emissions as global food demand grows.
- Emergence and spread of new plant and animal diseases and pests due to climate change.
- Extreme meteorological phenomena due to climate change.

At the same time, there were found particular *strengths* of Lithuania in the field: first, forests occupying a large part of the territory of Lithuania and are the main GHG absorber; and second, low energy consumption in agriculture and forestry. These and other strengths might help exploit further *possibilities* concerning the bio-economy and sustainable management of resources of Lithuania:

- Implementation of international political agreements, national commitments on climate change and energy.
- Improvements in agricultural technologies to mitigate climate change.
- Achievements in breeding new plant species and animal breeds adapted to the changing climate.
- More efficient technologies from renewable energy sources, technology, and energy cheapening.
- Growing consumer demands for climate-neutral production methods.

Good practice

Joint stock company "Cesta", Lithuania (www.cesta.lt). Biogas production from biomass and slaughter residues.

JSC "CESTA" Biogas production from biomass and slaughter residues.

Main activity – production of Lithuanian meat products from livestock and poultry, grown in Lithuania

- Initial farm was built in 1977.
- JSC "Cesta" established in 1999.
- Old barns reconstructed in the year 2011-2015.
- 800 Employees in network; 364 direct employees in meat production.
- Pig farm – currently 19 thousand pigs.

Biogas plants – additional activity:

- established in 2015, 1 MW.
- reason – environmental restictions for business enlargement.

CESTA is a Lithuanian capital joint-stock company (JSC). Its main activity is the production of Lithuanian meat products from livestock and poultry, grown in Lithuania. The initial farm was built and the pig complex was established in Soviet times in 1977. At that time it acted as a form of inter-collective farm association "Neris", which was changed into the stock company "Gaukštonys" after privatisation. In 2004 the number of shareholders reduced and the company was reorganised into a private joint-stock company "Cestos Maistas" (hereinafter - CESTA). Currently, there are 800 employees in the CESTA network and 364 direct employees in meat production.

The main pig complex with 19 000 pigs is set up in a non-residential rural area, almost 30 km from the capital city of Lithuania. The CESTA private property area comprises 52.2 ha. The closest inhabitants are located in the western, eastern, southern and southeast directions of the farm. Distances from the boundaries of the company's plot to the several nearest residential houses are up to 1 km. Pig farm barns and administrative buildings are located on the right side of the regional road Nemencine - Paberze, in the area of the Great Kabiškiai. The complex from the west and northwest sides is surrounded by the Eitminiškiai forest, in the south is the forest of Šakiškės, which is surrounded by a second biggest Lithuanian river Neris loop. There are two villages situated in the radius of 2 km from the pig complex. There are no hospitals, sanatoriums around the radius of 5 km. The only Kabiškiai village elementary school, distanced by about 3 km is closest to the object.

The activity of CESTA includes the production of pigs in full cycle, including seeding of sows, their pregnancy, parsing, slaughter and fattening up to 100 kg of beef bacon. A proportion are raised to 20 kg and sold as piglets. The previous capacity of the company before reconstruction was 12 000 stands, an additional 16 000 units was planned to increase in livestock, for a projected capacity of 28 000 units at a time. It is planned that capacity of the company will reach 35 800 pigs (bacon) per year and 41 800 piglets per year for sale and cultivation.

Before the reconstruction, it was identified that barns were used inefficiently, with a lot of space devoted to ventilation-heating units, wide corridors, and so on. Upgrading the stands and introducing modern livestock technologies that meet the requirements of animal welfare were used more efficiently in space barracks and a large number of livestock will be available in the same livestock buildings, therefore, new livestock buildings were not planned to be built in the company's livestock increase.

Pollutants such as particulate matter (PM) and ammonia (NH_3) were emitted into the atmosphere during the production of pigs from cages. Before reconstruction, the ammonia concentration in the atmosphere from the barns exceeded the permissible concentration outside the complex territory, but the living areas were not in contact. Upon modernisation of the farm, the introduction of new animal husbandry technologies in stables, with the installation of a new extraction of pollutants from the stands by raising the chimneys to a higher altitude, reduced pollution to the atmosphere. According to the data of the pollutant dispersion model, ammonia exceedances within the territory of the company were foreseen, but only under the most unfavourable meteorological conditions. To reduce pollution into the atmosphere, it was planned to adopt measures that will reduce emissions by 30%. Ammonia emissions were reduced by reducing the protein content of the feed.

Calculations of the predicted soil solids' concentration have shown that the level of soil contamination in both livestock production and biogas does not exceed the limit values set for them. Before reconstruction, the river Neris water was used for washing manure in barns. Upgrading the farm did not require slurry washing. Water for animal husbandry and technological purposes (washing) is currently used only from the existing water well (borehole), no additional capacity is required. Before reconstruction, slurry produced by livestock was accumulated in sedimentation tanks, the settled liquid fraction was deposited in agricultural fields, and the solid was transported to its own or rented cultivated fields. Upon modernisation of the farm, slurry became the main raw material for the production of biogas in a cogeneration plant to produce heat and electricity from biogas.

Other biogas raw material is received from bird and pig slaughterhouse waste coming from the complexes belonging to CESTA group, and grain cleaning wastes.

After the modernisation and installation of biofuel plants, the situation in the complex improved from an environmental point of view. Natural resources are saved, pollution is reduced to ambient air, slurry, and other vegetables and animal waste are used to generate energy, and the residual substrate after biogas production became a valuable fertiliser. No adverse effects on soil or biodiversity are expected during the farm's economic activity.

3.2. Summary of position of the regional Multi-Actor Platform

Obstacles and enablers supporting the success

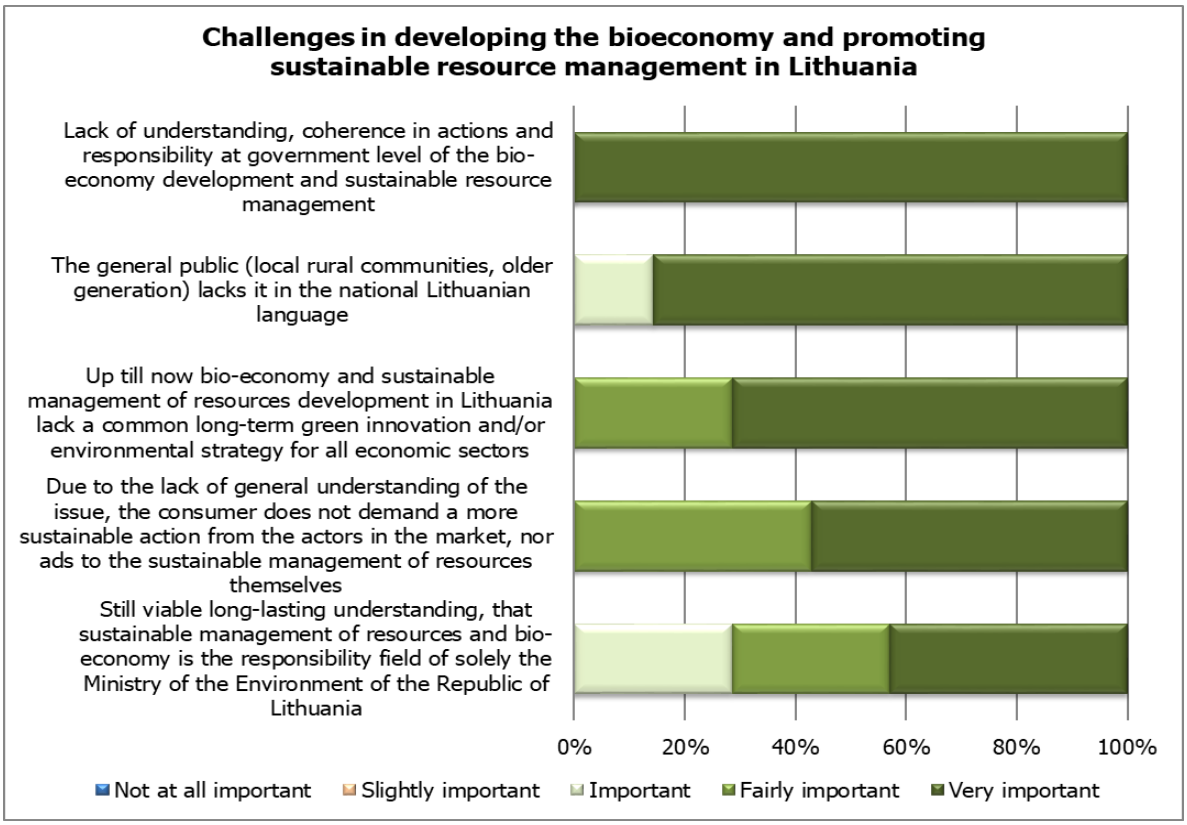
The more intensive process towards bio-economy and sustainable management of resources in a form of green transformation in Lithuanian has started a decade ago with the involvement of various stakeholders in this process – business, science, policy, and NGOs. In this transformation, the roles were different among mentioned stakeholders depending on their functions and activities. *Public organisations* have initiated various discussions internally and with social partners and organised meetings for reflection of various EU documents on green transformation as the Paris Agreement on Climate Change and other documents on climate change before the European Green Deal was adopted. The *business sector* in Lithuania (particularly the engineering industry) has initiated technological changes concerning green transformation as a result and input from corporate partners. *Science* is focusing research on green transformation, implementing national and international research projects, focusing on the EU and global trends on green transformation, trying to reflect on the prepared documents, and finding ways to implement them successfully. *NGOs* are less active in the field, but also searching for their role in the green transformation, both by acting individually at the micro-level, and by collaborating with stakeholders from different sectors. Cooperation promoting green transformation between various actors is active at different levels in Lithuania.

Among the key obstacles for the bio-economy and sustainable management of resources development in Lithuania is the non-existence of a common long-term green innovation and/or environmental strategy for all economic sectors. It is important to involve all Ministries of the Republic of Lithuania in the development of such a strategy since up till now it is treated as the area of responsibility of solely the Environmental Ministry of the Republic of Lithuania. To strengthen the transformation towards bio-economy and sustainable management of resources, it is necessary to ensure continuous education of public servants of the ministries of Lithuania, concerning the issue.

Wider society also feels a huge information gap regarding the bio-economy and sustainable management of resources; especially the general public (local rural communities, older generation) who lack it in the national Lithuanian language. Due to the lack of general understanding of the issue, the consumer does not demand a more sustainable action from the actors in the market, nor adds to the sustainable management of resources themselves. Lithuania is very dependent on the market, so the lack of consumption of more sustainable production leads to less production meeting sustainability concerns.

Expert survey results on the above-identified challenges in developing the bio-economy and promoting sustainable resource management in Lithuanian rural areas on a scale from 1 (not at all important) to 5 (very important) are provided in Table 3.

Table 3. Key challenges in developing the bio-economy and promoting sustainable resource management in Lithuania



Source: calculated by authors according to survey results.

Lithuanian MAP experts identified the following enablers to overcome the observed challenges, starting from the most helpful in the field:

- to mobilise business, science, and government actors in the acceleration of the bio-economy development and sustainable management of resources; the government (public organisations) must be the primary initiator and accelerator of green transformation;
- to strengthen the transformation towards bio-economy and sustainable management of resources, it is necessary to ensure continuous education of public servants of the ministries of Lithuania;
- to educate society, as well as the consumer, by preparing sufficient amounts of information, including in the national language, and working continuously on this topic in collaboration;
- to participate in various platforms and networks to ensure a quick circulation of the newest information in the field of bio-economy and sustainable management of resources;
- to develop/rejuvenate the common long-term strategy for bio-economy and sustainable management of resources on the national government level with the equally shared responsibility of all ministries of the Republic of Lithuania.

Key Research Gaps

There is a huge gap in research concerning the importance of collaboration among actors in the field of bio-economy and sustainable management of resources. The mechanisms for the effective involvement of all three groups of actors – science, society, and government into collaboration processes for bio-economy and sustainable management of resources are underresearched and underdeveloped in Lithuania. The starting points are made for networking in the field by creating innovation platforms to share good practices in the

field, however, the platforms are drifting instead of making an actual change. The research should be done on the actual needs of the Lithuanian population concerning their knowledge of the bio-economy and sustainable management of resources, as well as the most acceptable ways of receiving information of good practices in the field, which would accelerate the implementation of the practices by rural people themselves.

Recommendations for the local/regional/national level

Aiming to enlarge support for the bio-economy and sustainable management of resources, the following recommendations are provided:

- to develop/rejuvenate the common long-term strategy for bio-economy and sustainable management of resources on the national government level with the equally shared responsibility of all ministries of the Republic of Lithuania;
- to mobilise business, science, and government actors in the acceleration of the bio-economy development and sustainable management of resources. The government (public organisations) must be the primary initiator and accelerator of green transformation;
- to ensure continuous education of public servants of the ministries of Lithuania, aiming to strengthen the transformation towards bio-economy and sustainable management of resources;
- to educate society, as well as the consumer, by preparing sufficient amounts of information, including in the national language, and working continuously on this topic in collaboration;
- to participate in various platforms and networks to ensure a quick circulation of the newest information on the bio-economy and sustainable management of resources.

4. Farm diversification and food chains

4.1. Key scientific evidence

Changing consumer needs have led to the search for new ways to participate in the market. Farmers have become increasingly active in processing the products grown on their farms and selling these products directly to consumers. In Lithuania, there have been many initiatives to develop the local food system and short food supply chains using various methods of direct sales of agricultural and food products - mobile and stationary farmers' markets, farm shops, direct sales from farms, pre-ordering and delivery systems and other partnerships between producers and consumers.

Younger farmers with higher professional training in farming became more and more involved in direct sales: in 2016, compared to 2013, more than half of farmers under 45 were selling directly; while the share of farmers with full readiness for farming increased from 18.7% to 21.9 (Evaluation of Lithuanian Agriculture and Rural Economic, Social and Environmental Situation, 2021).

Direct sales are not high. Their development is hindered by various obstacles, the most important of which are:

- lack of knowledge, initiatives, and skills to start new activities related to direct sales;
- shortcomings in legal regulation;
- high veterinary requirements, limited access to funding sources;
- limited range of products and insufficient quantities, seasonal nature of production;
- lack of cooperation and collaboration;

- complex regulation of public procurement for the supply of agricultural and food products to public sector bodies and institutions.

The overview of the overall state concerning the farm diversification and food chains and key trends in the field help identify the following weaknesses and threats:

Weaknesses:

- Low bargaining power of agricultural producers.
- Declining share of value-added of agricultural producers.
- The level of cooperation between farmers is low - the number of cooperatives and the number of farmers involved in their activities is small compared to other EU countries.
- A small proportion of farmers processing the agricultural and food products grown on their farms.

Threats:

- Increase in concentration in the food processing industry and the retail sector.
- Rising requirements for the implementation of sanitary and environmental standards for agricultural and food products.
- Legal obstacles and requirements for the establishment of producer organisations and cooperatives.

At the same time, situation analysis helped define particular *strengths* concerning the farm diversification and food chains in Lithuania: first, the increase in farmers' initiatives to develop direct sales, and second, the involvement of young and more skilled farmers in direct sales. These promising strengths might help exploit the following *possibilities* in the field in Lithuania:

- The government's programme includes provisions to provide support to small and medium-sized farms, encourage farmers to join cooperatives, and participate in short food supply chains.
- Increasing demand for locally-grown agricultural and food products in the domestic market as consumer priorities change.
- Development of bio-economy and circular economy.
- Networking of producers and consumers of agricultural and food products.
- Increasing supply of local, seasonal, and organic agriculture and food products to public sector bodies and institutions.
- Apply effective measures to protect agricultural producers from unfair trading practices and increase market transparency.

Good practice project and tool

A successful example from Lithuania regarding the development of a short food supply chain is the initiative "Village to Home".

National platform "Village to your home" (in Lithuanian – www.kaimasinamus.lt) is a network of consumers and farmers established in 2013. The creation of this two-sided network in Lithuania was stimulated by the increased demand for local food produced by farmers on their farms. Many Lithuanian people are no longer satisfied with just what large food processing enterprises offer.

The idea is to encourage cooperation of farmers and consumers using an innovative interactive communication platform for the creation of the network, which was initiated by researchers of the Lithuanian Institute of Agrarian Economics (currently – Institute of Economics and Rural Development, Lithuanian Centre for Social Sciences).

The main goal of the network platform was an essential change of the character of the relationships between producers and users of their products. Instead of the seller-buyer relationship, the network members should seek to interact as service providers-customers. The experience of the researchers of the Institute has shown that the success of the cooperation with the farmers depends on the ability to organise a food basket of sufficient size for a farmer and in this way to reduce the product transportation costs per unit.

Main stakeholders and beneficiaries of the practice: producers (farmers) and consumers. The target group of producers includes small farmers, who work towards producing high-quality and tasty food. The target group of the consumers embraces urban citizens who appreciate and look for high-quality and tasty food.

Resources needed. Project budget €57 000. Duration of the project 2 years. 17% - administration, 44% - programming, 39% - marketing (events for farmers how to join this platform, how to work in this platform, etc.). In total 10 persons were working on the project. Currently expenditures: updating costs.

Evidence of success. High participation of farmers and consumers in the platform. In 2016 - 200 producers (farmers) were members of this platform. At the beginning of 2019 - 329 producers (farmers), increase by 40%. Groups of consumers include mostly urban citizens, amounting to 796 in 2019. Comparing to 2016, the number increased by 47% (420 in 2016). The platform helped to introduce and apply principles of a short supply chain in Lithuania. Every week many purchases are initiated by various consumer groups.

Difficulties encountered. At the beginning it was challenging to create a platform that meets the need of consumers and farmers – user-friendly, easy to find products and agree on time and place of delivery. Also it was not an easy task to attract other people to create or join communities to have a sufficient number of people.

Potential for learning or transfer. A similar two-sided network of farmers and consumers can be easily created and used in other countries, to help introduce principles of a short supply chain in their countries between producers (farmers) and consumers (consumer groups). If the concept of a short supply chain is one of the tasks in recent policy agenda in the country, initiation, and implementation of similar practice can give results for improvement of public policy related with functions of Ministries of Agriculture, Ministry of Health, and others. Initial tasks for start of the work: 1) determining who should be responsible for the organisation of creating this platform; 2) searching for financial mechanisms; 3) initiation and implementation of the project for the creation of the platform.

4.2. Summary of position of the regional Multi-Actor Platform

Obstacles and enablers supporting the success

The key obstacles in the field of farm diversification and food chains in Lithuania are: first, the lack of a common understanding of the 'food chain' as a complex system; second, the lack of systemic thinking at national, regional, and local levels; and third, the lack of institutional (legal basis) infrastructure to implement farm diversification and short food supply chains. It began almost a decade ago, however, it is still more of a small pathway than a quality highway. There is a huge gap in understanding the short food supply chains among the central and local government, local action groups, local rural communities, matured businesses, young businesses initiated by young people, despite the fact, that this is on the rural development agenda for more than a decade. Local action groups try to avoid participating in the implementation of short food supply chains, which is completely logical since there are only duties prescribed without the resources and the right to take part in decision-making in the field. There are 10 Regional Development Councils established in Lithuania, intending to solve the development issues in the regions of Lithuania. Local action groups, which represent the 'bottom-up' interests of local communities, take part in Regional Development Councils on adviser's rights, without the ability to interrupt the decision-making process.

The key challenges regarding farm diversification and short food supply chains firstly address the overall selected approach towards diversification: one farm with a wide range of products with high prime costs versus farms in cooperation for a short food supply chain. It is of course necessary to take into account the Lithuanian historical pathway of Soviet times, which put negative attitudes towards cooperation itself. This negative approach is still evident among the older farmers, so sometimes it seems to be challenging to start diversification in their farm and/or join the short food supply chain.

At the same time there exists a huge gap between the possibilities to diversify and act in short food supply chains for large and small farms, due to the legislative restrictions as well as lobbying power on the creation of legislative basis.

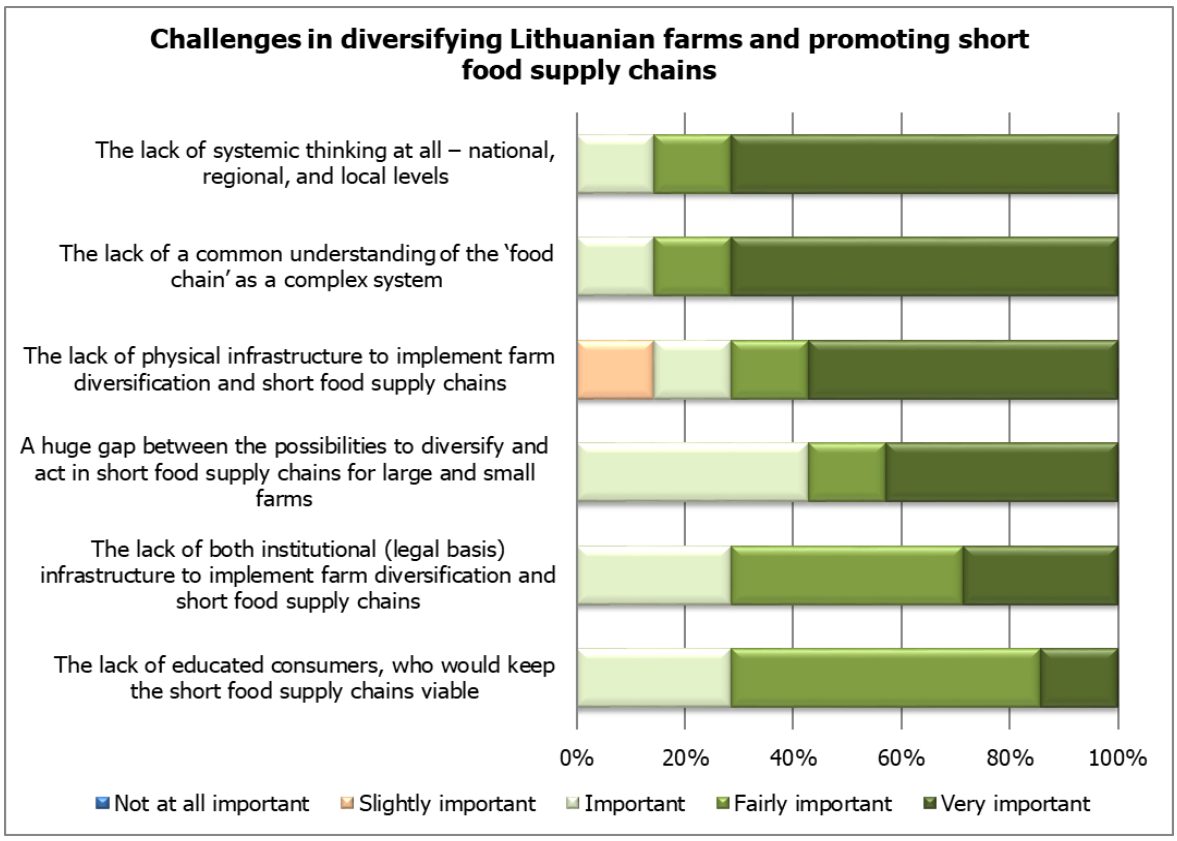
At the same time, the lack of appropriate infrastructure is most problematic, when taking into account the three-fold economic potential (resources, infrastructure, and skills and/or abilities) for the diversification of the rural economy of Lithuania by fostering short food supply chains: no appropriate places defined, no convenient infrastructure, etc.

Moreover, the understanding of the consumer is still quite limited in the short food supply chains. Among the three types of business models in short food supply chains (business-to-consumer B2C, business-to-business B2B, business-to-government B2G), only B2C is already developed in the field in Lithuania. And this is mostly the political responsibility of Lithuanian politicians to solve these issues and create favourable conditions for farm diversification and short food supply chains, firstly focusing on the following issues:

- territorial government: the law of local government and its responsibility for the local economy, shared with regional councils and local action groups - responsibility for rural/territorial development changes),
- public procurement (the ability of farmers to take part in public procurement).

Expert survey results on the above-identified challenges in diversifying Lithuanian farms and promoting short food supply chains on a scale from 1 (not at all important) to 5 (very important), is provided in Table 4.

Table 4. Key challenges in diversifying Lithuanian farms and promoting short food supply chains



Source: calculated by authors according to survey results.

Lithuanian MAP experts identified the following enablers to overcome the observed challenges, starting from the most helpful in the field:

- to deepen the understanding and foster systemic thinking in the field of farm diversification and short food supply chains, thus creating the grassroots for the systemic changes in the field at national regional and local levels;
- to create appropriate infrastructure for implementing a short food supply chain;
- to close the legislative gap concerning the ability of big and small farmers to apply diversification strategy and take part in short food supply chains;
- to establish a new role of local action groups by the law in the Regional Development Councils, shifting from the advisory role to the decision-making role on equal rights to the rest of the council members.

Experts stated that the proper functioning of this system requires both financial and human resources. Maybe we should start with pilot projects that would implement a real short-chain. Here we need the involvement of farmers, processors, scientific institutions, municipalities, and the national government must create the conditions for this, by adjusting the legal framework.

Key Research Gaps

The critical research gap for the development of farm diversification and short food supply chains is related to sustainable development phenomena in Lithuania. Even though it is addressed in many Lithuanian scientific studies and scientific articles, its research results and their applicability are poorly communicated to the public, especially in the national language. Moreover, there are many currently ongoing initiatives and projects concerning the new formulation of the concept 'smart village', rejuvenation of the local action groups

conception, implemented both at regional and municipal levels. So, there is a great need to vitalise communication about the ongoing activities by presenting and thus spreading as much information around as possible, initiating public discussions, and thus adding to the better understanding of the critical concepts for further developments in the field.

Recommendations for the local/regional/national level

The key recommendation regarding farm diversification and food chains are:

- to establish a new role of local action groups by the law in the Regional Development Councils, shifting from the advisory role to decision-making role on equal rights to the rest of council members;
- to close the legislative gap concerning the ability of big and small farmers to apply diversification strategy and take part in short food supply chains;
- to create appropriate infrastructure for implementing a short food supply chain;
- to deepen the understanding and foster systemic thinking in the field of farm diversification and short food supply chains by introducing and clearly defining the concepts of 'food system', 'local food system', 'regional food system', and thus creating the grassroots for the systemic changes in the field at national, regional, and local levels.

Recommendations and Conclusions

Diversification of the rural economy in Lithuania in terms of **entrepreneurship, employment, and new business models helped identify** several *strengths*: first, large farms have been formed with the financial capacity to operate efficiently under market conditions, and second, the rapid growth of the cereals sector. The observed strengths might be utilised for political *opportunities* for further development in the field:

- Application of new technologies, including digitisation, to reduce farm costs and increase efficiency.
- Emergence and development of new risk instruments.
- Wider availability of advice and training to increase farmers' knowledge.

Lithuanian MAP issued the following recommendations to be implemented at different levels to foster the development of the issue:

- Horizontal and vertical partnership and cooperation for long-term strategic planning, by involving all relevant stakeholders in the process.
- Diversification vision and measures for the Lithuanian rural economy should necessarily come using a 'bottom-up' approach through revitalised local action groups, local development strategies (LDSs), and principles of the LEADER approach, which is forgotten and diminishing.
- All stakeholders, firstly including the local rural community and local action groups, should have a right to be heard and enabled to make the change (legislatively approved role) in programming and implementation of the rural development at the territorial level (might be implemented using the precise public management through POSDCORB (Planning, Organising, Staffing, Directing, Co-Ordinating, Reporting and Budgeting) methodology).
- Rural economy diversification solutions should be based on scientific grassroots; the lack of highly educated rural development specialists, able to see the whole picture, should be solved by preparing a sufficient amount of new generation rural developments experts for all levels – national, regional, and local.

Smart rurality, smart communities and digitalisation in Lithuania perform difficulties regarding the overall understanding of the concept and its clearness, acceptance in the region at all – national, regional, and local levels. The spread of digitalisation further calls for a shift in the understanding of the quality and way of life and competitiveness of the rural areas. The readiness of a farmer and any rural resident to innovate is of total importance in fostering the issue. Particular *possibilities* had been highlighted during the analysis of key scientific evidence:

- Growth in demand for organic, authentic, high-quality agricultural and food products.
- Application of new technologies, including digitalisation, for efficient use of agricultural resources.
- Development of existing and new foreign markets.
- Development of bio-economy and circular economy.

Lithuanian MAP "CBioLit" issued the following recommendations concerning smart rurality, smart communities, and digitalisation in Lithuania:

- Discuss and clearly define the common meaning of 'smart' rurality and 'smart' communities in collaboration between the national government, science representatives, and local communities.
- Arrange and continuously spread the knowledge concerning 'smart' rurality and 'smart' communities in the national (Lithuanian) language to increase overall understanding of the issue in the whole country.

- Establish a model for smart rurality and smart community development support by interlinking LEADER and Smart Villages programmes and making 'Smart Villages' part of the local development strategies (LDSs).
- Improve the European Innovation Partnership (EIP) programme implementation rules at the national level (to simplify them and make them more flexible) and accelerate joint initiatives between science, business, and farmers.

The field of **bio-economy and sustainable management of resources** in Lithuania lacks a common long-term green innovation and/or environmental strategy for all economic sectors. The long-lasting understanding, that sustainable management of resources and bio-economy is the responsibility field of only the Ministry of the Environment of the Republic of Lithuania greatly hinders the development in the field. There were found particular *strengths* of Lithuania in the field: first, forests occupying a large part of the territory of Lithuania and are the main GHG absorber; and second, low energy consumption in agriculture and forestry. These and other strengths might help exploit further *possibilities* concerning the bio-economy and sustainable management of resources of Lithuania:

- Implementation of international political agreements, national commitments on climate change and energy.
- Improvements in agricultural technologies to mitigate climate change.
- Achievements in breeding new plant species and animal breeds adapted to the changing climate.
- More efficient technologies from renewable energy sources, technology, and energy cheapening.
- Growing consumer demands for climate-neutral production methods.

Aiming to enlarge support for the bio-economy and sustainable management of resources in Lithuania, MAP "CBioLit" gives the following recommendations:

- to develop/rejuvenate the common long-term strategy for bio-economy and sustainable management of resources on the national government level with the equally shared responsibility of all ministries of the Republic of Lithuania;
- to mobilise business, science, and government actors in the acceleration of the bio-economy development and sustainable management of resources. The government (public organisations) must be the primary initiator and accelerator of green transformation;
- to ensure continuous education of public servants of the ministries of Lithuania, aiming to strengthen the transformation towards bio-economy and sustainable management of resources;
- to educate the society, as well as the consumer, by preparing sufficient amounts of information, including in the national language, and working continuously on this topic in collaboration;
- to participate in various platforms and networks to ensure a quick circulation of the newest information in the field of bio-economy and sustainable management of resources.

Farm diversification and food chains had been spreading during recent years in Lithuania. More initiatives arise to develop the local food system and short food supply chains using various methods of direct sales of agricultural and food products - mobile and stationary farmers' markets, farm shops, direct sales from farms, pre-ordering and delivery systems, and other partnerships between producers and consumers. There had been identified particular *strengths* concerning the farm diversification and food chains in Lithuania: first, the increase in farmers' initiatives to develop direct sales; and second, the involvement of young and more skilled farmers in direct sales. These promising strengths might help exploit the following *possibilities* in the field in Lithuania:

- The government's programme includes provisions to provide support to small and medium-sized farms, encourage farmers to join cooperatives, and participate in short food supply chains.
- Increasing demand for locally-grown agricultural and food products in the domestic market as consumer priorities change.
- Development of bio-economy and circular economy.
- Networking of producers and consumers of agricultural and food products.
- Increasing supply of local, seasonal, and organic agriculture and food products to public sector bodies and institutions.
- Apply effective measures to protect agricultural producers from unfair trading practices and increase market transparency.

Lithuanian MAP "CBioLit" formulated the following recommendations regarding the further development of farm diversification and food chains in Lithuania:

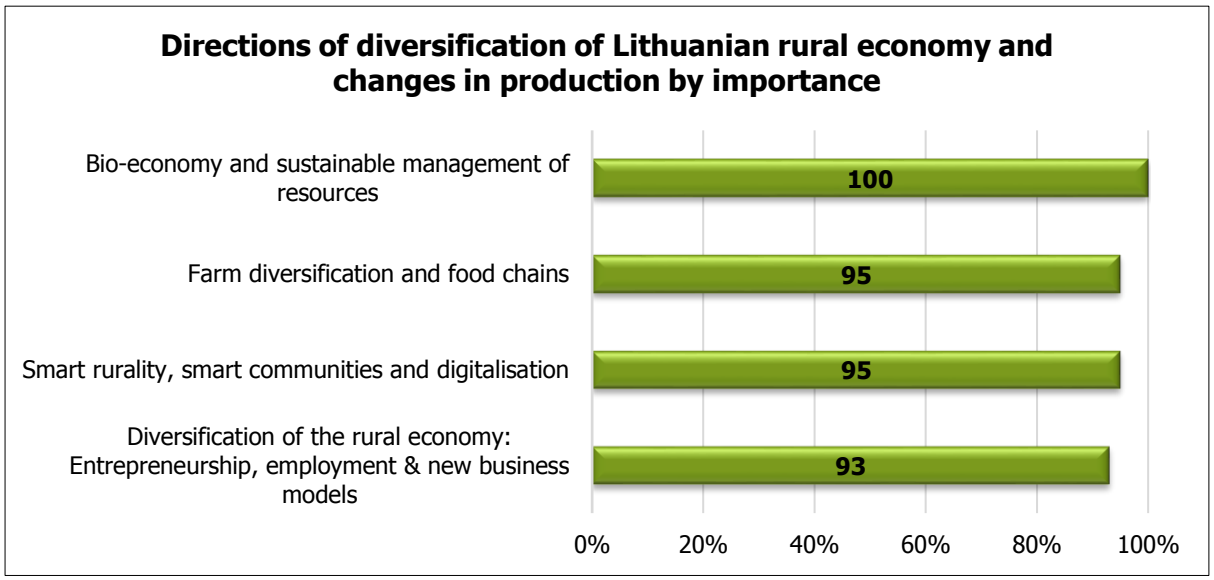
- to establish a new role of local action groups by the law in the Regional Development Councils, shifting from the advisory role to decision-making role on equal rights to the rest of council members;
- to close the legislative gap concerning the ability of big and small farmers to apply diversification strategy and take part in short food supply chains;
- to create appropriate infrastructure for implementing a short food supply chain;
- to deepen the understanding and foster systemic thinking in the field of farm diversification and short food supply chains by introducing and clearly defining the concepts of 'food system', 'local food system', 'regional food system', and thus creating the grassroots for the systemic changes in the field at national, regional, and local levels.

Overall analysis and discussions in Lithuanian MAP "CBioLit" concerning the change in production and diversification of the rural economy in Lithuania led to the following **conclusions**:

1. Diversification of the rural economy in Lithuania suffers from the lack of *a long-term vision* of rural development in Lithuania and its continuous implementation despite the changing directions due to the political cycle both at national and supranational levels.
2. There is a lack of overall *empowerment* of actors in Lithuania – local action groups, who are the direct initiators and performers of actual life in Lithuanian rural areas and the demanders for particular change according to the needs of particular rural communities. Their voice is not currently heard and taken into account both at regional and national rural development programming and implementation.
3. *Engagement* of all actors who are indifferent to the changes in rural life concerning the issues of diversification of the rural economy performs difficulties in Lithuania. The approach had been taken to invite 'convenient' partners to particular discussions and to share the resources among 'right thinking' stakeholders is still viable in Lithuania. There is still a lack of transparency and publicity in public decisions regarding the diversification of the rural economy.
4. The *hierarchy* in rural development decisions as well as concerning the diversification of the rural economy is still very static. There is a great need of flattering the hierarchical decision-making structure in national strategic planning, concerning the state of regional and local actors in the overall process. Currently, they remain without a vote when deciding the most urgent questions of their everyday life and activity in rural areas.
5. The *continuous learning*, education, acquisition, and spread of new knowledge, concerning the modern diversification of the rural economy, especially in terms of smart rurality, smart community,

digitalisation, smart villages, bio-economy, sustainable management of resources, farm diversification, and short food supply chains is of crucial importance for further development of Lithuanian rural areas. The lack of knowledge is observed at all – national, regional, and local levels. Special demand for literature regarding the core conceptions and good practices was identified in the national language, to broaden accessibility to the newest knowledge for the people from local communities, especially the elderly. Revitalisation of the earlier established organisation, i.e. the Lithuanian Rural Network, might greatly add to the demanded developments in the field.

Finally, the implemented activities of the Lithuanian MAP "CBioLit" during the 2nd MAP cycle, including the final expert survey results and consensus meeting, suggest a particular Lithuania-specific rating concerning the importance of all four suggested topics in the field of diversification of rural economy and change in production, starting from the top-important position:



Source: calculated by authors according to survey results.

Lithuanian MAP "CBioLit" in the final MAP2 phase concludes with the rating of directions for the diversification of rural economy of Lithuania and recommends policymakers to focus firstly on the most important direction of diversification of Lithuanian rural economy and change in production - bio-economy and sustainable management of resources. Further urgent changes are needed in the field of farm diversification and food chains, as well as smart rurality, smart communities, and digitalisation. And the final focus in rural development policy in the field should be given to common issues of entrepreneurship, employment, and new business models in diversifying the rural economy of Lithuania.

Hence, the differences among the key directions for the diversification of the rural economy and change in production in Lithuania was found to be so poor, that finally the consensus was reached that all directions are recognised of top importance, fulfilling each other interdependently, for reaching overall progress in the field through collaboration and partnership. Diversification of the rural economy in terms of entrepreneurship, employment, and new business model might be accelerated by adapting the bio-economy principles and sustainable management of resources, which will further lead to collaborative smart rurality and smart communities and help foster farm diversification and short food chains in cooperation among stakeholders.

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Annex 1: Key scientific evidence or activities cited by the Multi-Actor Platform

Responsibility: Facilitator and Monitor

The key scientific evidence concerning the diversification of the rural economy and change in production in Lithuania highly depends on the selected approach towards diversification itself and the state of common understanding of the critical concepts in the context of rural development. The following scientific evidence are greatly shaping the issues of diversification in Lithuania:

- Dramatic development trends of the Lithuanian countryside, especially concerning the changes in the total number of farms, their structure, income from the agricultural activity, as well as differences among separate Lithuanian regions (Agricultural Census of the Republic of Lithuania, 2020).
- The most important issue for assessing the readiness for smart rurality, smart communities, and digitalisation in Lithuania, is the lack of overall understanding of the concept and its clearness, and acceptance in the region at national, regional, and local levels (EU Action for Smart Villages, 2017; Digital Economy and Society in Lithuania, 2021).
- The fields of bio-economy and sustainable management of resources development in Lithuania lack a common long-term green innovation and/or environmental strategy for all economic sectors (Lithuanian National Strategy for Sustainable Development, 2003; European Green Deal, 2021).
- In Lithuania, there have been many initiatives to develop the local food system and short food supply chains using various methods of direct sales of agricultural and food products - mobile and stationary farmers' markets, farm shops, direct sales from farms, pre-ordering and delivery systems, and other types of partnership between producers and consumers (Evaluation of Lithuanian Agriculture and Rural Economic, Social and Environmental Situation, 2021).

Annex 2: Key scientific evidence or activities provided by the Multi-Actor Platform

Responsibility: Facilitator and Monitor

Diversification of the rural areas in Lithuania and chage in production is firstly hindered due to the lack of long-term vision, lack of continuous education in the field; secondly, engagement, empowerment, networking and consultancy are observed being of high demand in LT rural areas, more precisely:

- The key obstacle in the field of overall diversification of the rural economy in Lithuania, in terms of entrepreneurship, employment and new business models, which highly hinders the modern progress of Lithuanian rural areas, is the lack of systemic attitude and systemic action towards overall development.
- The key obstacle for assessing the 'smartness' and digitalisation of Lithuanian rural areas and its impact on the diversification of the rural economy, is the confusing understanding of the concept 'smart' and 'smartness' in the rural context, observed not only at the Lithuanian local level, but also at the national, as well as supranational levels.
- The key obstacle for bio-economy and sustainable management of resources is huge gap of information at all levels. The more intensive process towards bio-economy and sustainable management of resources in a form of green transformation in Lithuanian has started a decade ago with the involvement of various stakeholders in this process – business, science, policy, and NGOs.
- The key obstacles in the field of farm diversification and food chains in Lithuania are: first, the lack of a common understanding of the 'food chain' as a complex system; second, the lack of systemic thinking at all levels – national, regional, and local; and third, the lack of institutional (legal basis) infrastructure to implement farm diversification and short food supply chains.

Annex 3: Expert survey questionnaire

Diversification of economic activities and changes in production in rural areas of Lithuania - challenges, opportunities and obstacles

We kindly invite you to participate in the survey under the ongoing Horizon 2020 project SHERPA

EXPERT SURVEY QUESTIONAIRE

Dear Respondent,

The Sherpa project (rural-interfaces.eu) team invites you to participate in a survey to identify challenges, opportunities and obstacles to the diversification of economic activities in rural areas of Lithuania.

There are 10 questions during the survey, which will take you about 10 minutes to answer.

Your answers are anonymous and will remain confidential. They will be analyzed and presented to a group of Lithuanian experts - the Multi-Actor Platform (MAP). We will also share the results with the European Commission and this will contribute to the programming of Europe's rural development perspectives.

Your answers are very important, so thank you for taking the time to complete this survey.

Thank You in advance !

5. Which of the following best describes your background? Choose only one option

- ○ Public sector
- ○ NGO / Society / Business
- ○ Research

The Lithuanian SHERPA expert group and public figures from various fields from the Lithuanian Stakeholder Platform discussed four main topics that are relevant to the diversification of economic activities and changes in production in Lithuanian rural areas. Below are systematised topics discussed, highlighting the main challenges and opportunities to overcome them.

First of all, we would ask you to indicate to what extent you consider each of the above topics to be important for changes in production and diversification of economic activities in rural areas of Lithuania.

6. To what extent do you think each of the following topics is relevant in terms of diversification of the Lithuanian rural economy and changes in production?

	Not at all important	Slightly important	Important	Fairly important	Very important
Diversification of the rural economy: Entrepreneurship, employment & new business models	○	○	○	○	○
Smart rurality, smart communities and digitalisation	○	○	○	○	○
Farm diversification and food chains	○	○	○	○	○
Bio-economy and sustainable management of resources	○	○	○	○	○
Other (please, fill-in):					

Diversification of the rural economy: Entrepreneurship, employment & new business models

7. How important is it to overcome these challenges in order to diversify the Lithuanian rural economy in terms of entrepreneurship, employment and the development of new business models?

Rate on a scale of 1 (not important at all) to 5 (very important)

	Not at all important	Slightly important	Important	Fairly important	Very important
The lack of systemic attitude and systemic action towards overall development	○	○	○	○	○
The approved long-term development strategies of the Republic of Lithuania use to be modified parallel with the political cycle: from one side – according to the Lithuanian national political cycle; from the other – according to the EU Common Agricultural Policy programming or other field policy cycle.	○	○	○	○	○
Kind of spatial separate point's approach is broadly viable both in the national and regional(local) planning system: particular improvements in separate sector/sphere, eventhough - physical place, without any interconnectivity among them, moreover – without any reference to the approved long-term common vision of the overall picture of the long-term development and its change in turn.	○	○	○	○	○
The lack of highly educated specialists at all levels, especially – at the national level, who would hold the ability to see the whole picture of the rural development, its challenges and prospects, and be able to ground it on advanced scientific findings, on scientific advice.	○	○	○	○	○
Other (please, fill-in):					

8. To what extent would the indicated political intervention measures help to overcome the above-mentioned challenges in order to diversify the Lithuanian rural economy?

	Not helpful at all	Neither helpful nor hindering	Very helpful
Horizontal and vertical partnership and cooperation for long-term strategic planning, by involving all relevant stakeholders in the process	○	○	○
Diversification vision and measures for the Lithuanian rural economy should necessarily come using 'bottom-up' approach through revitalized local action groups, local development strategies (LDSs), and principles of the LEADER approach, which is forgotten and diminishing	○	○	○
All stakeholders, firstly including the local rural community and local action groups, should have a right to be heard and enabled to make the change (legislatively approved role) in programming and implementation of the rural development at the territorial level	○	○	○
Rural economy diversification solutions should be based on scientific grassroots; the lack of highly educated rural development specialists, able to see the whole picture, should be solved by preparing sufficient amount of new generation rural developments experts for all levels – national, regional and local.	○	○	○
Other (please, fill-in):			

Smart rurality, smart communities and digitalisation

9. How important is it to overcome these challenges aiming to foster smart rurality, smart communities and digitalisation in Lithuania?

Rate on a scale of 1 (not important at all) to 5 (very important)

	Not at all important	Slightly important	Important	Fairly important	Very important
The confusing understanding of the concepts 'smart' and 'smartness' in the rural context	○	○	○	○	○
Lack of understanding of the concept of "smart villages" at Lithuanian national govenmment level, but willingness to include this in national programming documents and in Rural development support schemes and measures	○	○	○	○	○
Dizzy understanding of the 'smart' rurality at the supranational level - the European Rural Parliament	○	○	○	○	○
A too simplified understanding of 'smartness' and 'digitalization' as access to the internet or ability to use social networks at the local level	○	○	○	○	○
Other (please, fill-in):					

10. To what extent would the indicated political intervention measures help to overcome the challenges in fostering smart rurality, smart communities and digitalisation?

	Not helpful at all	Neither helpful nor hindering	Very helpful
To discuss and clearly define the common meaning of 'smart' rurality and 'smart' communities in collaboration between the national government, science representatives, and local communities	○	○	○
Arrange and continuously spread the knowledge concerning 'smart' rurality and 'smart' communities in the national (Lithuanian) language to increase overall understanding of the issue in the whole country	○	○	○
To establish a model for smart rurality and smart community development support by interlinking LEADER and Smart Villages programmes and making	○	○	○

'Smart Villages' part of the local development strategies (LDSs)			
To improve the European Innovation Partnership (EIP) program implementation rules at the national level (to simplify them and make them more flexible) and accelerate joint initiatives between science, business, and farmer	○	○	○
Other (please, fill-in):			

Farm diversification and food chains

11. How important is it to overcome these challenges by diversifying Lithuanian farms and promoting short food supply chains?

Rate on a scale of 1 (not important at all) to 5 (very important)

	Not at all important	Slightly important	Important	Fairly important	Very important
The lack of a common understanding of the 'food chain' as a complex system	○	○	○	○	○
The lack of systemic thinking at all – national, regional, and local levels	○	○	○	○	○
The lack of both institutional (legal basis) infrastructure to implement farm diversification and short food supply chains	○	○	○	○	○
A huge gap between the possibilities to diversify and act in short food supply chains for large and small farms	○	○	○	○	○
The lack of physical infrastructure to implement farm diversification and short food supply chains	○	○	○	○	○
The lack of educated consumers, who would keep the short food supply chains viable	○	○	○	○	○
Other (please, fill-in):					

8. To what extent would the indicated policy interventions help diversify farms and develop short food supply chains in Lithuania?

	Not helpful at all	Neither helpful nor hindering	Very helpful
To establish a new role of local action groups by the law in the Regional Development Councils, shifting from the advisory role to decision-making role on equal rights to the rest of council members	○	○	○
To close the legislative gap concerning the ability of big and small farmers to apply diversification strategy and take part in short food supply chains	○	○	○
To create appropriate infrastructure for implementing a short food supply chain	○	○	○
To deepen the understanding and foster systemic thinking in the field of farm diversification and short food supply chains, thus creating the grassroots for the systemic changes in the field at national regional and local levels.	○	○	○
Other (please, fill-in):			

Bio-economy and sustainable management of resources

9. How important is it to overcome these challenges in developing the bioeconomy and promoting sustainable resource management in Lithuania?

Rate on a scale of 1 (not important at all) to 5 (very important)

	Not at all important	Slightly important	Important	Fairly important	Very important
Up till now bio-economy and sustainable management of resources development in Lithuania lack a common long-term green innovation and/or environmental strategy for all economic sectors	○	○	○	○	○
Still viable long-lasting understanding, that sustainable management of resources and bio-economy is the responsibility field of solely the Ministry of the Environment of the Republic of Lithuania	○	○	○	○	○

Lack of understanding, coherence in actions and responsibility at government level of the bio-economy development and sustainable resource management	○	○	○	○	○
The general public (local rural communities, older generation) lacks it in the national Lithuanian language	○	○	○	○	○
Due to the lack of general understanding of the issue, the consumer does not demand a more sustainable action from the actors in the market, nor ads to the sustainable management of resources themselves	○	○	○	○	○

Other (please, fill-in):

10. To what extent would the indicated policy intervention measures help to develop the bioeconomy and promote sustainable resource management in Lithuania?

	Not helpful at all	Neither helpful nor hindering	Very helpful
To develop/rejuvenate the common long-term strategy for bio-economy and sustainable management of resources on the national government level with the equally shared responsibility of all ministries of the Republic of Lithuania.	○	○	○
To mobilize business, science, and government actors in the acceleration of the bio-economy development and sustainable management of resources. The government (public organizations) must be the primary initiator and accelerator of green transformation	○	○	○
To strengthen the transformation towards bio-economy and sustainable management of resources, it is necessary to ensure continuous education of public servants of the ministries of Lithuania	○	○	○
To educate the society, as well as the consumer, by preparing sufficient amounts of information, including national language, and working continuously on this topic in collaboration	○	○	○
To participate in various platforms and networks to ensure a quick circulation of the newest information in the field of bio-economy and sustainable management of resources	○	○	○

Other (please, fill-in):

10. What would you like to add?

Maybe you would like to add something important that was not mentioned in the survey?

Diversification of economic activities and changes in production in rural areas of Lithuania - challenges, opportunities and obstacles

THANK YOU !

Thank you for your time!

The results of the study will be available in September 2021.

Do you have any questions? Contact: Živilė Gedminaitė-Raudonė: zivile.gedminaite@laei.lt

Annex 4: List of best practices

Table 1 Compilation of noteworthy projects / initiatives / tools / methods implemented

Name	Time of implementation	Contact & Internet address
Association "Viva Sol" – a new form of rural entrepreneurship via a diversified rural economy	Since the year 2006 up till now	Darguziai village, Varėna Municipality, Lithuania https://vivasol.lt/IN-ENGLISH/
Joint-stock company "Cesta" - biogas production from biomass and slaughter residues	Since the year 1999 up till now	JSC "CESTA", Riešės st. 10, Riešė, LT-14266, Vilnius district. www.cesta.lt
"Village to Home" – project for the two-sided short food supply chain platform	Since the year 2013 up till now	https://www.kaimasinamus.lt/

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