AgriLink

AgriLink. Agricultural Knowledge: Linking farmers, advisors and researchers to boost innovation

Deliverable 2.2: Synthesis Country Report (Version 1.0)
Partner: Baltic Studies Centre, Latvia

The role of advisory services in farmers' decision making for innovation uptake. Insights from case studies in *Latvia*

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List of contents

List of Boxes

List of Figures

List of Tables

List of acronyms

AgriLink	Agricultural Knowledge: Linking farmers, advisors and researchers to boost innovation
AOS	Advisory Organisation Supplier
AKIS	Agricultural Knowledge and Innovation System
DoA	Description of the Action
EU	European Union
Micro-AKIS	Micro-level Agricultural Knowledge and Innovation System
NGO	Non-Governmental Organisations
NUTS	Nomenclature of Territorial Units for Statistics
R&D	Research and Development
R-FAS	Regional Farming Advisory System
TCM	Trigger-Cycle Model
WP	Work package
LRATC	Latvian Rural Advisory and Training Centre

Executive Summary

This report looks at biological pest control in the Vidzeme region and direct marketing in the Pierīga region of Latvia. A total of 70 interviews with farmers and 10 interviews with experts and AKIS organisations were conducted to determine the role of agricultural advisors in farmers' decision-making. The innovations we chose can directly contribute to the resilience of rural areas by making them more environmentally friendly and prosperous places to live. However, in both cases success is contingent upon a productive application of knowledge that is obtained both formally (e.g. from advisory organisations) and informally (e.g. via peer-to-peer learning).

The two case studies illustrate differences in the way advisors are involved in the process of making farmers aware of an innovation and helping farmers assess and implement it. In Latvia, suppliers of advice play various roles in a farmer's decision-making process, and the role largely depends on the type of innovation chosen. Specifically, advisory organisations played a prominent role in the case of biological pest control, but they were considerably less significant in the case of direct marketing. Consequently, the case of biological plant protection methods suggests that innovations that involve significant amounts of technical and agricultural knowledge require assistance throughout the innovation cycle. Conversely, in the case of direct marketing formal advisory organisations and advice providers were more prominent in relation to general farming and management issues, while peer-to-peer and other informal learning practices were more important in the context of assessing and implementing the innovation.

Both case studies underline the importance of informal learning. Biological pest control and direct marketing are both practices that continually evolve, combining old tricks with new knowledge and insights that are often learned in informal exchanges between peers and relatives. While this seemed to be more prominent in the case of direct marketing, interviews on biological pest control also indicated that pre-existing social relations played an important role in the farmers' microAKIS and contributed to the spread of knowledge about biological pest control.

Contextual factors, practical considerations and philosophical outlooks have considerable influence on whether an innovation will be taken up. There are many factors that contribute to a successful uptake of innovations, and the availability of advice from formal advisory organisations is only one part of the process. It was apparent that some objective characteristics of the farm and/or farmer determined the nature and frequency of their interactions with advisory organisations and other institutions or agents that provide advice. Our interviews also suggest that familiarity with successful examples of implementation appropriate material and infrastructural conditions for implementation, a corresponding philosophical outlook and familiarity with the innovation as such are also important factors for stimulating the uptake of innovations that can contribute to the sustainability of agricultural practices.

The main advisory organisation was approached often regarding general farming issues. There were differences in the extent to which the largest advisory organisation, the Latvian Rural Advisory and Training Centre (LRATC), was involved in relation to the innovations we looked at. However, the interviews indicate that LRATC was by far the most popular organisation advising farmers on general matters pertaining to the management of the farm.

Both biological pest control and direct marketing show signs of retro-innovation. We note that the innovations we looked at involve a mix of knowledge and skills that requires a constant influx of new insights and techniques that allow farmers to adapt to changing circumstances and make use of recent developments (e.g. pheromone traps, online sales). In short, they involve the combination of "old" and "new" knowledge.

1 Introduction

The general goal of WP2 (Innovation case studies in Focus Regions: micro to meso analysis) is twofold. Firstly, WP2 aims at understanding why, how and from whom European farmers and farm managers gather and exchange information to underpin their decision-making on development and /or implementation of different types of innovation. A second aim of WP2 is to analyse the role played by advisors in these processes accounting for the range of advisory services available in a series of focus regions across Europe. The Focus Region is a key concept adopted by AgriLink and was defined as a farm census region supplying the socio-demographical and farm structural context that might help to explain the farmer's micro-AKIS diversity and its implications to innovation up-take and the role played by advisors.

The conceptual framework (Deliverable D1.1) underlying the implementation of these goals relied on three major assumptions. The first was that the diversity of farmers and farms leads to different decision-making processes and influences the type of advisors and the roles they play on them. Second assumption consisted in assuming that innovation might not be in convergence with the sustainable development purposes, meaning that innovation can affect negatively or be indifferent regarding the sustainability dimension. Hence our willingness to investigate both adoption and non-adoption situations. Finally, a third assumption establishes that the diversity and the transformation in advisory landscape in European countries and regions is a relevant variable explaining the role advisors play (or not) in the farmer's decision-making processes related with the innovation uptake.

AgriLink developed an integrated research framework (Deliverable D2.1) aimed at gathering empirical data for the micro-scale concept of AKIS (Agricultural Knowledge and Information System), the farmer micro-AKIS, and for the mesoscale concept of R-FAS (Regional Farming Advisory System), in relation with the up-take processes of diverse types of innovation by farmers across the EU. This deliverable (D2.2) prepared by the 13 partners involved in WP2 offers a synthesis of the qualitative insights on the farmer's micro-AKIS and the role played by advisors in the selected case studies. These were delimitated at the census region level and focused on a group of farmers representative of a specific innovation (e.g. biologic pest control), comprising both adopters and non-adopters.

1.1 Introduction to AKIS and selected innovations in Latvia

This report looks at biological pest control in the Vidzeme region and direct marketing in the Pierīga region. Latvian agriculture has witnessed a notable expansion of integrated and organic farming over the last two decades, and, according to the Central Statistical Bureau of Latvia[1], the Vidzeme region has the highest share (7.47%) of organic farms (relative to all farms in the region). Direct sales are a major marketing channel for small farmers and small food processors in Latvia. The Pierīga region was chosen as it is a predominantly urban region located near the capital city of Latvia (Riga), which gives farmers access to a larger pool of customers with higher purchasing power. The farmers we interviewed were chosen based

[1] Number of agricultural holdings and areas of agricultural crops in organic farming by statistical region (ha): https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__zeme__laukstrukt_13/LSSA13_II09.px/; Number of agricultural holdings and land area by statistical region: https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__visp__laukstrukt_13/LSSA13_I01.px/, accessed on 31/03/2019.

on a combination of different methods (see Section 4 for more details), though the sample has limitations that have to be borne in mind.

An increasing number of agents and organisations are involved in providing advice to farmers in Latvia. Farmers have diverse knowledge needs, and there are various agricultural knowledge institutions operating in the public, private and third sectors. In addition to traditional knowledge institutions, knowledge and innovations are created and disseminated in various formal and informal learning and innovation networks.

Previous research[2] has indicated that, in Latvia, the FAS, and AKIS more generally, is internally diverse and remains fragmented. Very few AKIS members perceive the Latvian AKIS as a coherent and unified system, and this was corroborated in the interviews with experts and farmers carried out for the purposes of this report. The Latvian AKIS is structured and governed via various policies, and is, consequently, poorly coordinated. The national AKIS remains poorly integrated at the planning level, and the potential of research and education establishments may not be sufficiently encouraged and appreciated in the context of agricultural development.

Remuneration was mentioned as a potential issue affecting AKIS in Latvia. Compensation for providing advisory services is not perceived as competitive, and this may hamper the development of the profession and the ability of advisory organisations to attract knowledgeable professionals. Of note is the fact that a significant portion of advisors is composed by women, which may reflect the general trend that lower paid positions are mainly occupied by women.

Advice provision is often perceived as inadequate for large-scale farming. Financially intensive commercial farms require advice on technologically and scientifically complex matters that could yield practical solutions appropriate for their scale of farming. However, such advice is often unavailable in Latvia due to the lack of local experts or their lack of expertise regarding a particular knowledge need (e.g. biological pest control methods appropriate for large-scale farming).

There is a perceived lack of readily available advice about agricultural policy, though there are annual seminars. Our interviews suggest that many farmers experience a lack of information and knowledge about public regulations of agricultural production, and agricultural policy in general. The implementation of specific requirements is of crucial importance for farmers, their advisors and others with an interest in the sector.

Organic farming and direct marketing have become increasingly popular in Latvian agriculture. The growing significance and visibility of organic farming was largely induced by the growing consumer demand of organic (clean, environment-friendly) food. Growing EU and state support for organic farming has accordingly spurred farmers' interest in, and use of, biological pest control methods on their farms. Likewise, the growing significance of local and farmers' markets has contributed to the proliferation of direct selling. This practice is generally perceived as having a positive impact on rural areas and the livelihoods of farmers.

Our interviews with experts suggest that public discourse about direct marketing and biological pest control tends to be positive, but there are obvious limits in the extent to which

[2] See Šūmane, S., Grīviņš, M., Tisenkopfs, T. (2014). *AKIS and advisory services in Latvia*. Report for the AKIS inventory (WP3) of the PRO AKIS project. PRO-AKIS project report.

negative side-effects can be appreciated and considered collectively. Specifically, in the context of biological pest control it was suggested there is an uncritical acceptance of positive claims regarding environmental sustainability, whilst ignoring the dangers associated with excessive use of plant decoctions (extractions) and insects that are natural enemies of particular pests. In the case of direct marketing, the labour and time investments necessary to sustain this practice often go unnoticed, as does the fact that farmers may find it challenging to become good marketers of their products.

There are few structured forms and formal agents that provide farmers with advice on direct marketing at all stages of engaging with the innovation. All forms of direct marketing require professional advice, and the education of farmers, consumers and traders would greatly contribute to the stability and resilience of direct marketing, but such assistance is only sporadically available. The available advice provision and procurement mechanisms are not structured and are not sufficiently tailored to different forms of direct marketing, relying on the ingenuity and initiative of individual farms.

There is a lack of specialised, impartial experts in biological pest control, even though many organisations provide advice. Experts noted that impartial advice on the merits and shortcomings of biological pest control methods is required. "Paid" advisors have squeezed out the independent advisors. Not all farmers have the necessary knowledge to competently and critically assess the (biological) method in question, so they just assume that using more of the product in question will be enough. The advisors representing input suppliers encourage this as it increases sales.

Wider adoption of biological pest control and direct marketing has the potential to contribute to environmental and social sustainability. The innovations we have chosen can directly contribute to the resilience of rural areas by making them more environmentally friendly and prosperous places to live. However, in both cases success is contingent upon a productive application of knowledge that is obtained both formally (e.g. from advisory organisations) and informally (e.g. via peer-to-peer learning).

The report follows the official structure. In Section 2, the key concepts and research questions are outlined. In Section 3, the overall methodology is described. In Section 4, the report outlines the reasons for choosing these innovations in Latvia and the sampling methods employed. Section 5 provides an overview of the empirical data, which is consolidated in Section 6 to answer the overall research question.

2 AgriLink key concepts and research questions

AgriLink key concepts which are relevant for data collection in WP2 comprise the: Focus Region, farmers' micro-level Agricultural Knowledge and Information System (micro-AKIS), mesoscale concept of R-FAS (Regional Farming Advisory System), and the trigger-cycle model (TCM). These concepts were established in the AgriLink Description of the Action (DoA) and elaborated by the project conceptual framework (see Deliverable D1.1).

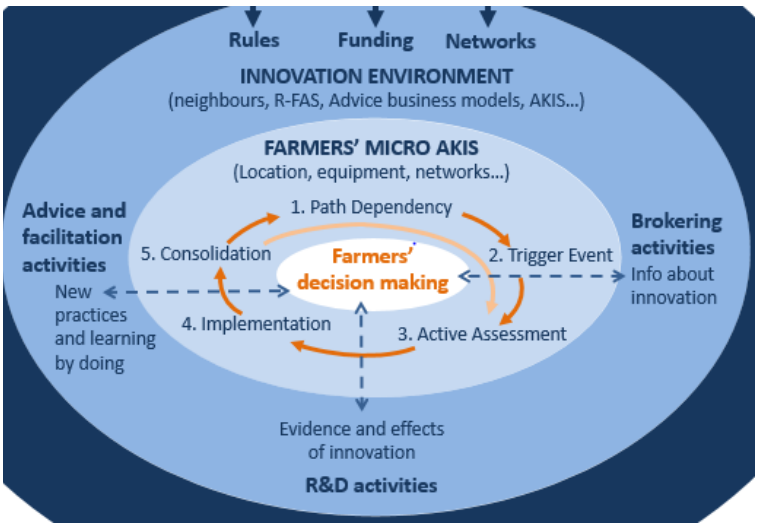
The Focus Region is as a farm census region that establishes the boundaries of the case study for data collection on micro-AKIS and R-FAS. Preferential geographical region is defined at NUTS 3, which is in certain cases replaced by NUTS 2 to achieve a better case study delimitation.

The micro-AKIS describes the micro scale knowledge-system that farmers personally assemble, including the range of individuals and organisations from whom they seek service and exchange knowledge with, the processes involved, and how they translate this into innovative activities (or not). Empirical uptake of this concept entails answering two questions: a) who influences farmers (and farm households) in decision-making on adopting or choosing to not adopt innovations; and, b) how, i.e., what are the processes describing the knowledge assemblage by the farmers and role played by the different sources involved (see D2.1).

AgriLink defines the R-FAS as the set of organisations that enable farmers to develop farm-level solutions, enhance skills and coproduce knowledge with advisors. These are envisaged by AgriLink in a pluralist view, including traditional advice providers (chambers of agriculture, public bodies, etc.), farmer-based organisations (unions, associations, cooperatives, etc.), independent consultants, NGOs, upstream or downstream industries, and high-tech sectors. Hence, R-FAS covers the full range of these organisations in a given region, and their connection to wider AKIS organisations, and as well as a range of services, including research, advice and brokering, meaning they can be active at different steps of the farmers' decision-making processes, and use different methods at these different steps.

The trigger-cycle model established that farmer's decision-making regarding the innovation uptake is driven by a triggering event that initiates a path-dependency break cycle composed by three main phases, that can be described to account for the advisors role: a) farmer's awareness of the innovation, encompassing brokering activities developed by advisors to disseminate the innovation and to (co-)create trigger events influencing farmers' decision-making processes; b) active assessing innovation entailing advisors assemblage of information on the innovation costs, benefits, and side-effects by developing and involving in R&D activities; c) supporting farmers in innovation implementation by delivering advice and carrying out facilitation activities. The Figure 1 offers an integrated view of the TCM and the key concepts that were implemented in WP2 through the case studies delimitation and the data collection at farm micro-level and at the R-FAS meso-level.

Figure 1: Integrated view of the TCM and AgriLink key concepts



Source: AgriLink

The research questions to be answered with the empirical approach of WP2 are synthesised in Box 1. The research questions aim at responding the WP2 goals through the empirical approach delineated in D2.1 build on the AgriLink conceptual framework (presented by the deliverable D1.1).

Box 1: AgriLink empirical research questions for WP2

1. ***What roles do advisory services play in the cycles of farmers' decision making?***
   - The cycles comprising the trigger-cycle model developed by the AgriLink conceptual framework to understand farmers' decision-making processes regarding innovation up-take and to describe respective micro-AKIS; Advisor's role is investigated at three phases of this model: a) Farmer's awareness of the innovation, encompassing brokering activities developed by advisors to disseminate the innovation and to (co-)create trigger events influencing farmers' decision-making processes; b) active assessing innovation entailing advisors assemblage of information on the innovation costs, benefits, and side-effects by developing and involving in R&D activities; c) supporting farmers in innovation implementation by delivering advice and carrying out facilitation activities.
2. ***What is the relationship between different types of farmer and advisory service suppliers in the decision-making process?***
   - Comprising heterogeneity in farmers profile, farm structural features and farm business models; the nature of the innovation; regional context; R-FAS landscape and business models (including models associated to digitization of agriculture); role of advisory services in different stages of farmers' decision-making cycles and if these are creating new advisory service supply opportunities and /or new functions, and as well as new forms of path dependency.
3. ***How does the transformation of advisory service suppliers landscape influence farmers' decision-making and uptake of innovation?***
   - Accounting for R-FAS history and on how new configurations of R-FAS (generally depicted as more fragmented and pluralistic) play on the relation between farmers and advice, and respecting this relation: a) allow for more creativity, triggers, and a diversity of knowledge and information channels for farmers; b) influence farmers' access to information and knowledge, and equity on farmers' information access.

Source: AgriLink

3 WP2 case studies overview and methodological approach

3.1 WP2 case studies selection

The case study delimitation in AgriLink was built through two dimensions. One of the dimensions was the spatial delimitation of the R-FAS boundaries at the focus region level, and the second the farmers selection in relation to the innovation type. Table 1 presents the selected innovation according to the respective innovation type and the sustainability challenge addressed by innovation.

Table 1: Selected innovations and sustainability challenges

Type of innovation	Innovation cluster	Selection focus	Sustainability challenge addressed
Technological	Autonomous vehicles, robots, drones, intelligent sensors/Precision Farming	IT (Information technologies)	Climate change, Eco-efficiency, Pests & diseases
			Growth and jobs – Digitalization
			Food security – Biodiversity, Food provision
Process (farming practices)	Biological Pest Control	Integrated ecological farming	Climate change, Eco-efficiency, Pests & diseases
	Soil Improving cropping systems		Food security – Biodiversity, Food provision
Marketing and financing	Retro-innovation	Diversification	Growth and jobs – Business diversification, Social cohesion
	Introducing new crops		
	Direct marketing		Eco-efficiency
	Developing new activities		
Social and organisational	Natural resources common management	Collaborative organisations	Growth and jobs – Social cohesion, Digitalization
	Labour Innovative arrangements		Food security – Biodiversity
			Eco-efficiency, Pests & diseases

Source: AgriLink

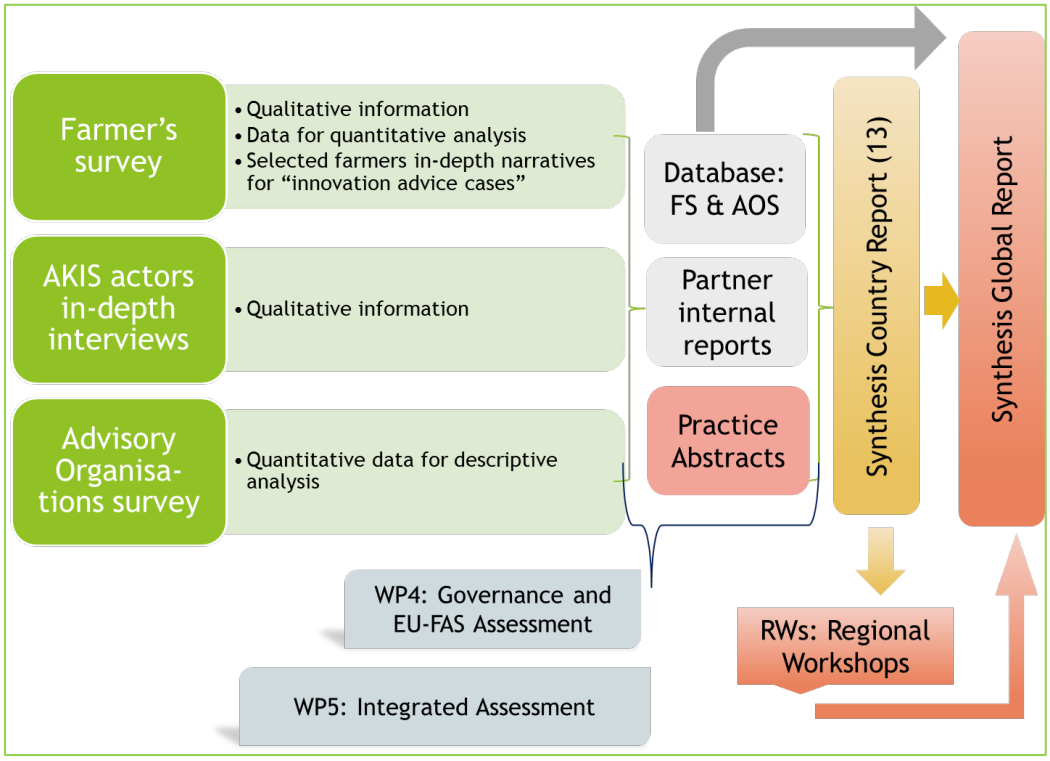
The farmers' selection in each case study built on targeting groups of farmers amongst whom the innovation is already widespread, so that it would be possible to characterise the micro-AKIS supporting innovation up-take of adopters, as well as the micro-AKIS of non-adopters.

3.2 WP2 methodological framework

The methodological framework implemented in WP2 consists of a mixed-method strategy (for a detailed description see WP2 research protocol in D2.1), combining case study approach with quantitative survey-type data collection. It is implemented in three steps. Firstly, the case study selection, already described. Second step consisted of delineating and implementing two major surveys: a) of farmers to collect the data for describing the micro-AKIS and the role the advisory service providers play on it; and, b) of advisory service providers to enable describing R-FAS in relation with the innovation addressed by each case study.

Figure 2 depicts an overview of the WP2 data collection strategy, highlighting the intermediate outputs and the outcomes to be generated from the data analysis, including the inputs to subsequent WPs.

Figure 2: Overview of WP2 data collection and reporting



Source: AgriLink

Farmers' survey was conducted through a question-guide comprising both open-ended and closed questions intended to gather quantitative data on *whom* and *how* type of questions (who are the advisory service providers and how these are provided), along with qualitative data on the *why* and *how* type of questions allowing for in-depth understanding of farmers' micro-AKIS. Quantitative data from farmers' survey (FS) were entered in a database, while qualitative information and narrative descriptions were recorded and analysed in order to provide the descriptive and analytical insights. This deliverable, the synthesis country report, presents the outputs of both, the data analysis and description and the qualitative insights for each case study.

Farmers' survey was implemented through face-to-face interviews, conducted by members of research teams or duly trained students, following a question-guide including open, mixed and closed questions to collect data on the trigger events, the farmer's innovation evaluation, knowledge and information sources, flows and social networks, farmer profile and demographics, business model and farm structure. FS comprised a set of matrixes to gather data to describe farmer micro-AKIS for the three main stages of the TCM (awareness, active assessment and implementation of the innovation), and on the micro-AKIS used by the respondent for farm management in general, and as optional the household micro-AKIS for the family farms when family members show to be influential actors for information and knowledge flows assembled by farm decision-maker(s). Detailed information on the farmer survey and respective question-guide is available at the Deliverable D2.1.

The advisory organisation survey (AOS) question-guide builds mainly on closed questions and addressed formal providers of advice (see Box 2), excluding informal providers. Formal advisory service suppliers comprise organisations providing advisory services as a secondary activity and /or providing them for free

(e.g. associated with the supply of inputs or software). In-depth information on the R-FAS is gathered through complementary in-depth semi-structured interviews delivered to a small number of regional AKIS actors.

Box 2: Definitions on advisory services for R-FAS survey

Advisory services
- A service activity that enable farmers to develop farm-level solutions, enhance skills and coproduce knowledge with advisors.

Advisory suppliers
- Any organisation that delivers advisory services to farmers.

Advisory organisations
- Traditional suppliers specialised in the supply of advisory services to farmers. This corresponds to former 'extension suppliers'.

Source: AgriLink

The question-guide for advisory organisations comprised mostly closed questions and addressed data collection to: a) describe the organisation, including its ownership status, action level, advisory services supplied, funding resources and in-house R&D facilities; b) characterise its human resources, their distribution according to front-office and back-office activities, qualifications, certification and training, and on the methods they use for supplying advisory services; c) describe the type of advisory services' clients and the main topics of these services; d) identify the national and regional public support to advisory organisations, including funding and other type of support to back-office activities (training, R&D and networking activities); e) assess organisations' benefit from current EU level policy instruments, such as EU-FAS, EIP-AGRI, and rural development programmes; f) describe the organisation of advisory services supplied in relation to the innovation at stake in the case study, and the back-office activities undertaken by the organisation to support the supply of these services; and g) collect the organisations' vision regarding the major challenges to be faced in the next years by the advisory service suppliers, in the focus region, regarding the innovation development.

The in-depth interviews with AKIS key actors collected their knowledge on the innovation path in the region, on major innovation triggers, and on their evaluation of the farmers' knowledge and information needs and demand along the various stages of the innovation TCM and to what extent R-FAS is responding to these demands. The target number of interviews with key actors was established as five, whereas they can be fewer depending on the number of relevant actors is each case study.

The data analysis and qualitative insights obtained in each case study are also part of this deliverable, the synthesis country report. Detailed information on the advisory organisations' survey and respective question-guide is available in the Deliverable D2.1.

In addition, this deliverable comprises the description and the insights gathered from detailed narratives of farmer's decision-making processes regarding the uptake of the innovation, built on the TCM and addressing the advisory service supplier's role. Three narratives per case study were included in the data collection conducted by the WP2 to generate information for the integrated assessment to be carry on by the WP5.

3.3 WP2 sampling strategy

The target population for sampling purposes was a group of farmers with similar technical-economic orientation amongst whom the innovation is already widespread, enabling to identify adopters and non-adopters of the innovation. Hence the target population to be sampled was defined by two criteria: a) innovation adopters and (informed) non-adopters; with b) a similar technical-economic orientation, whilst addressing farm structural heterogeneity among the targeted group of farmers, which might lead to the inclusion of farmers with different farm styles and/or business models. In addition, specific categories of non-adopters, such as droppers, or of adopters, such as partial adopters, were accounted for sampling purposes when found to be relevant in the targeted population.

A sample of 40 to 50 farmers was required by each case study. A snowball-type sampling procedure was adopted relying on the support of key-informants ('gatekeepers') familiar with the targeted group of farmers, which might include farmer associations, researchers, and other AKIS actors and experts. To avoid selection bias, different information sources needed to be used and cross-checked (See Deliverable D2.1 for a detailed description of farmers sampling strategy).

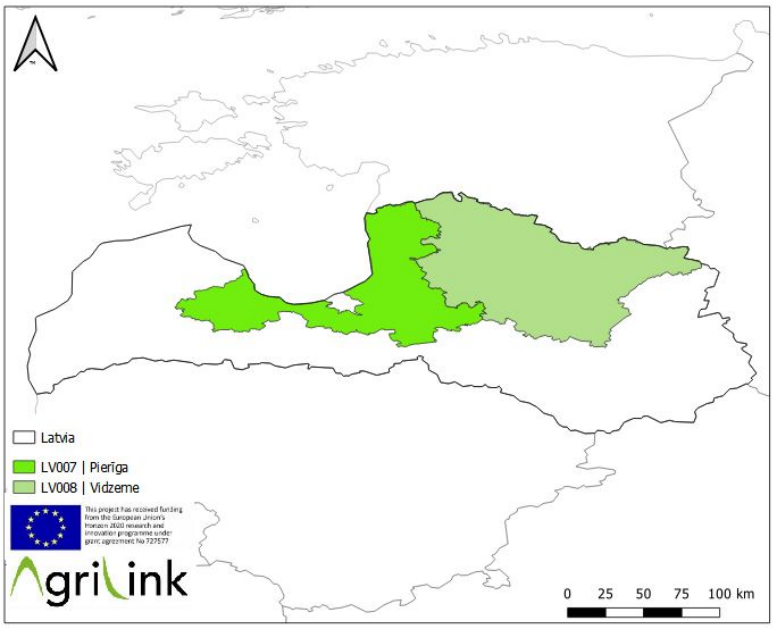
The advisory organisations were sampled through a snowball process relying on diverse sources to ensure that the complete spectrum of advisory organisations supplying (or that could supply) advisory or related services is included in the sample. A minimum of 20 organisations was established for the cases were sampling was needed to cover the diversity of advisory service providers. In other cases, with few formal suppliers on the ground the strategy was to interview the maximum number of existing organisations.

4 Country case-studies, farmers groups and advisory suppliers

4.1 The case studies and focus regions

This report looks at two innovations - direct marketing in the Pierīga region (LV007) and biological pest control in the Vidzeme region (LV008) (see Figure 3).

Figure 3: Focus regions in Latvia



4.1.1 Case study 1 – Biological pest control

Latvian agriculture has witnessed a notable expansion of integrated and organic farming over the last two decades. In 1995, the Association of Latvian Organic Agriculture was founded, presently uniting 16 regional offices with 1500 registered members, and the number of organic farms in Latvia is growing. These developments, largely induced by growing consumer demand for organic (clean, environmentally friendly) food, and growing EU and state support for organic farming, have spurred farmers' interest in, and use of, biological pest control methods on their farms. Consumer demand and public support can, in principle, be considered additional contextual trigger factors, which, in practice, have to converge with some more personal factors – health concerns, environmental convictions or others in order to trigger adoption.

The reason for selecting Vidzeme as our focus region for biological pest control is related to the prominence of organic farming in this region. According to the data of the Central Statistical Bureau of Latvia[3], Vidzeme is a predominantly agrarian region of Latvia with a high number of organic

[3] Number of agricultural holdings and areas of agricultural crops in organic farming by statistical region (ha): https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__zeme__laukstrukt_13/LSSA13_1109.px/; Number of agricultural holdings and land area by statistical region: https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__visp__laukstrukt_13/LSSA13_101.px/, accessed on 31/03/2019.

holdings (1044 in 2016). Furthermore, organic farming has also recently become more prominent in Vidzeme, judging by the steady growth of the number of organic farms in the region (an increase of 18.9% between 2013 and 2016). In addition, while the total number of organic holdings is higher in another statistical region (Latgale), Vidzeme has the highest share of organic farms (7.47%, national average – 5.25%).

This report looks at different biological plant protection methods, without focusing on one particular technique. Some notable examples include the targeted use/introduction of natural predators of pests (e.g. ladybirds and parasitic wasps to control greenflies), proving special shelters for useful animals (insect houses), etc. The underlying knowledge is based on a mix of both traditional/local knowledge passed on from earlier generations of farmers and new research-based knowledge provided by contemporary science, which is imparted by various advisors.

There are several research organisations and companies, along with several public regulatory and advisory bodies, working on biological plant protection methods and products in Latvia providing the basis for the generation, application and dissemination of knowledge and innovations in this domain. Nevertheless, there is a growing need for relevant expertise among researchers and advisors that could assist existing and newly emerging organic farms in adapting their farming practices based on the principles of biological pest control. These advisors could motivate a larger pool of potential adopters among conventional farmers as well. Furthermore, interviews with experts suggest that there is a pronounced need for independent expertise on these matters, as input providers often encourage a more intensive use of their commercial products.

The experts and organisations we interviewed could not specify issues that were specific to Vidzeme. A crucial advantage for farmers living in the Pierīga region would seem to be the proximity to Riga and the main office of the Latvian Rural Advisory and Training Centre (LRATC) which is the biggest advisory organisation in Latvia on matters pertaining to agriculture and rural development. However, farmers in Vidzeme have access to regional offices and many organisations provide advice over the phone. Furthermore, our interviews indicate that peer-to-peer learning plays an important role in relation to both of the chosen innovations suggesting that local solutions can be found if necessary.

4.1.2 Case study 2 – Direct marketing

Direct sales are a major marketing channel for small farmers and small food processors in Latvia. Access to conventional market channels is challenging for small holders because of specific requirements regarding the quality, amount, supplies, etc., and these unfavourable market conditions and specific requirements can act as triggering factors. Many farmers and producers search for alternatives and develop individual market strategies, while some operate in the "grey" market. In the group of small farms who sell more than a half of their produce these market channels account for up to 80-90% of total farm sales.

Direct marketing is also of relevance for certified organic producers because of underdeveloped full-cycle organic food chains (lack of infrastructure, processing lines). Better market access for these groups of farmers and producers is relevant in order to face such sustainability challenges as local food provisioning and security by contributing to a more stable food supply at the local level and reducing dependence on imported or external to the region food. Direct marketing can also contribute to maintaining biodiversity (in the case of organic production, but also small-scale farming as it tends to use less intensive production technologies). It can also improve social cohesion within local

communities and between urban and rural areas - by stimulating recognition of the contribution of small farmers and producers to food security and rural development.

Direct sales involve a broad spectrum of innovations: market innovations – new market channels and forms of food distribution; social innovations – new relations between producers and consumers; organisational innovations – new formal and informal collaborations between various actors; technical innovations – new production technologies and products, use of e-commerce, logistics and other services. The actors involved in this innovation primarily include small farmers, small processors, artisanal producers, consumer groups, local governments, environmental groups and food movements.

In the case study we consider various forms of direct marketing. While farmers' stands at open town markets are traditional in Latvia, local farmers' markets are a more recent phenomenon (or can be considered as a retro-innovation if we take into account farmers' markets in the period prior to the 1940s). Direct purchasing groups are also quite a recent phenomenon, especially in bigger urban centres due to growing public interest in healthy diets and locally sourced food. Many of these new initiatives learn by doing and often operate based on trial and error; some may profit from examples found abroad. All the involved parties (farmers, consumer groups, local municipalities, also controlling bodies of food production and distribution) have considerable advice needs regarding how to establish and successfully manage these new market initiatives. However, such advice is not specifically provided by any of the existing AKIS organisations. Lack of knowledge and poor governance lead to many unresolved issues (lack of clarity with permits, taxes and certificates, high costs for farmers, lack of control, management constrains, etc.), and specialist advice would allow tackling these issues.

The Pierīga region was chosen as it is a predominantly urban region located near the capital city of Latvia (Riga), which gives farmers access to an area with a higher density of customers with higher purchasing power. It has good infrastructure and, consequently, access to both the capital and many regional market towns (e.g. Tukums). This has enabled many farmers to start practising direct selling.

The experts and organisations we interviewed could not specify issues that were specific to Pierīga. A crucial advantage for farmers living in the Pierīga region would seem to be the proximity to Riga and the main office of LRATC. Farmers also have access to regional offices and many organisations provide advice over the phone. Furthermore, our interviews indicate that peer-to-peer learning plays an important role in relation to both of the chosen innovations suggesting that local solutions can be found if necessary.

Our interest also stems from the fact that direct marketing has been left on its own in terms of institutionally based and formally organised advice provision. There is little in the way of formal advice or it is insufficiently specific to be of practical use to people engaged in direct marketing. There is also a lack of formalised management, control and certification procedures and tools. Existing control and monitoring procedures from the Food and Veterinary Service and municipal police are patronising and restrictive. There is an obvious lack of an empowering and coordinating management procedures and instruments. There is also a lack of self-organisation among farmers. This may explain the lack of collective certification and mutual control and supervision mechanisms among farmers, which are present in other countries.

4.2 Group of farmers target and sampling strategy

Even though the interviews we carried out present a variety of insights, our sample is not random and, therefore, has limitations. Our findings cannot claim to be representative of the complexities attendant to implementing biological plant protection methods and direct marketing techniques. Nonetheless, cross-comparison between interviews suggests that we have managed to identify several issues that are of common relevance to many farmers. Consequently, while not exhaustive, our findings are indicative of common issues, experiences and obstacles that affect farmers who are engaged with the innovation in question.

4.2.1 Biological pest control

In the case of biological pest control, the decision was made to focus on farmers who employ various biological techniques and methods of protecting plants from pests. We used the term "pest" broadly to refer to a range of various diseases, animals, weeds and insects that have an unwanted and destructive impact on crops and plants more generally. Similarly, we did not focus on a specific area within agriculture (e.g. horticulture). The reason in both cases was that there would not be a sufficiently big sample population of adopters in the target region if we had focused on a specific method, technique or specific area. This was corroborated in our conversation with specialists on plant protection methods at the Latvian Plant Protection Research Centre. However, a potential weakness was that our approach to biological plant protection methods may have been too general, and this made it difficult for some of the respondents to be specific when answering our questions.

We generally approached farmers who practised organic farming, though our sample also includes conventional and integrated farmers. Our reason was that organic farmers were the most likely to use biological plant protection methods. We did, however, also interview farmers who used integrated pest management techniques and had either dropped or never actively considered employing biological techniques to deal with pests. Our sample also includes people who are in the process of transitioning to organic farming. Our approach yielded interesting results as several organic farmers claimed that they do not use biological plant protection methods (see Section 5.1).

We combined various sampling strategies, and our sample has limitations. Some contacts were provided by local advisors, while others were suggested by the respondents themselves. Care was taken to avoid interviewing a single group of friends or colleagues who obtain advice from one another or the same sources. This is evidenced by the geographical spread of our interviewees – clusters in different parts of Vidzeme. Nonetheless, the sample is not random, which limits the extent to which findings can and should be generalised. A further issue with our sample relates to the difference between the boundaries of Vidzeme as understood traditionally (Vidzeme as a historical region of Latvia) and from the point of view of statistical analysis (Vidzeme as a statistical region). A small number of the farmers we interviewed lived and worked just outside Vidzeme as a NUTS 3 unit, though we do not consider that this will have a significant impact on the overall conclusions that can be drawn about the use of biological plant protection methods in Vidzeme.

4.2.2 Direct marketing

No specific group of farmers was targeted in the case of direct marketing, other than the fact of using one or several methods of direct selling. We wanted to capture a variety of insights and

experiences, so we decided against focusing on one particular method of direct marketing. The proximity to the capital city, good infrastructure (both physical and IT) and the comparatively high purchasing power of regional residents has stimulated the growth of direct marketing across the region. Again, care was taken to avoid interviewing a single group of friends or colleagues from the same part of Pierīga who obtain advice from one another or the same sources. Consequently, we approached farmers in different parts of Pierīga to capture different experiences.

In the case of direct marketing, we also combined several strategies, though snowball sampling was more prominent. Aside from using our own knowledge of individual farmers practicing direct sales through various channels, we approached farmers who sell their produce at several markets or other trade spots in the Rīga and Pierīga regions and hail from the Pierīga region. We obtained contact information from the people responsible for the markets. Additional contacts where suggested by the farmers we interviewed. This was especially crucial for obtaining the contacts of non-adopters and droppers.

Our sample has certain limitations. We found it challenging to locate a high number of droppers and adopters, which limits our insight into the decision-making of these groups, as we have to rely on the experiences of a small number of farmers. In addition, engagement with direct purchasing groups was poorly represented in the sample, even though they are becoming increasingly popular in Latvia.

4.2.3 Sample

The total number of farmer interviews conducted for the case studies amounted to 70 with 40 on biological pest control and 30 on direct marketing. The samples of farmers surveyed for both case studies included representatives of all three groups of farmers vis-à-vis the adoption or non-adoption of the respective innovation (see **Table 2**).

Table 2: Farmers surveyed per case study

Innovation case study	Adopters	Non-adopters	Droppers	Total
Biological Pest Control	22	15	3	40
Direct marketing	21	6	3	30

Source: AgriLink – Latvia

4.3 AKIS experts and advisory organisations

4.3.1 Biological pest control

A total of five interviews were conducted with advisory organisations and five with AKIS experts involved in the field of biological pest control. In sum, we interviewed representatives of six organisations, and four were interviewed both as AKIS experts and advisory organisations. All six were mentioned in the interviews with farmers. We had hoped to interview one of the leading figures from the Association of Latvian Organic Agriculture – an organisation that featured prominently in the interviews. However, several attempts to arrange a mutually convenient time and venue failed.

In selecting experts and organisation to interview, we had to take a broad view of what constituted an advisory organisation. The AKIS in Latvia is quite fragmented (see above). There are a limited number of FAS/AKIS agents that correspond to the definition of an advisory organisation in the sense that it employs permanent staff to provide advice to farmers, and this is not specific to biological pest control. The only organisation that unproblematically fits into this category is LRATC. Other agents that were mentioned as advice providers in the interviews and were, consequently, interviewed by us, more closely resemble advisory suppliers who do not have a specific advisory function, nor do they employ staff that is advisor, even though they provide advice in practice.

The advisors we approached were chosen based on several considerations. These involved prior knowledge gained in other projects, advice from experts on agricultural advice provision and being mentioned by our respondents as one of the agents/organisations that had assisted them in relation to biological pest control. In addition to representatives from LRATC, we also interviewed experts from the Institute of Horticulture, the State Plant Protection Service, and the Latvian Plant Protection Research Centre. In all four cases we interviewed these organisations as AKIS experts and advisory organisations. We also interviewed the director of *Vides kvalitāte* ("Environmental Quality" - an institution in charge of certifying organic farms) and a representative of the company *Bioefekts* (a prominent supplier of biological pest control products). We could only interview the director of *Vides kvalitāte* as an AKIS expert as it is technically illegal for the inspectors employed by this organisation to provide advice. Nonetheless, *Vides kvalitāte* was mentioned on several occasions as an advice provider and their function requires them to have a sound understanding of biological pest control, which was the basis for our decision to interview them. *Bioefekts* was mentioned on several occasions in our interviews with farmers and experts from the Latvian Plant Protection Service. What is more, farmers indicated that representatives from this company assisted them in the assessment and implementation stages.

4.3.2 Direct marketing

A total of four interviews were conducted with advisory organisations and four with AKIS experts. We had also hoped to interview a representative of the Food and Veterinary Service, but the interview was declined.

Much like in the other case study (biological pest control), we had to take a broad view of what constituted an advisory organisation. Specifically, we note that there were few specific AKIS agents that correspond to the definition of an advisory organisation in the sense that it employs permanent staff to provide advice to farmers. While LRATC was mentioned in the interviews as an advice supplier and it does facilitate learning, it does not claim any specific expertise in direct marketing – this was also corroborated by one of the experts we interviewed. Other agents that were mentioned in the interviews and were, consequently, interviewed by us, more closely resemble advisory suppliers who do not have a specific advisory function, nor do they employ staff who are advisors, even though they provide advice in practice.

The advisors we approached were chosen based on several considerations. These involved prior knowledge gained in other projects, advice from experts on agricultural advice provision and being mentioned by our respondents as one of the agents/organisations that had assisted them in relation to direct marketing. In addition to representatives from LRATC (whom we interviewed both as experts and

advisory organisations), we also interviewed representatives of two specialised markets (Straupe, Kalnciems) and the Latvian Rural Forum (an NGO specialising in rural development).

4.4 Farmers selected for in-depth narrative interviews

The farmers we chose for the in-depth narrative interviews were selected to illustrate phenomena that were specific to the Latvian advisory landscape.

4.4.1 Biological pest control

We chose on adopter and one non-adopter. Both were chosen to illustrate the complexities attendant to understanding the way farmers in Latvia approach biological pest control. The adopter we chose at first did not even consider herself an adopter. This was due to the fact that, in her opinion, the methods she used did not make her an adopter, as many people in the area use them, without advertising this as biological pest control. Likewise, the non-adopter we chose illustrates the complex distinctions between pest control, farm management and monitoring that characterise the perception of biological pest control in Latvia. The farm in question has been an organic farm since its inception, though pest control was mainly done by taking care of the ecosystem, rather than deploying particular pest control methods.

4.4.2 Direct marketing

We chose one adopter and one dropper. The adopter was chosen as a typical example of a farmer who has turned to direct marketing recently and relies on the advice of peers and online sources, contrary to many older farmers who exclusively rely on the advice of their neighbours and other farmers engaged in direct marketing. The dropper, in turn, was chosen to illustrate two phenomena we identified in the interviews. Firstly, farmers who started to practice direct marketing in the 1980s and 1990s could seldom identify how they became aware of this practice, and it was simply an extension of attempts to sell their produce. Secondly, the high labour investments force farms to re-evaluate their approach to distributing their products, sometimes leading to re-conventionalisation.

5 Results

5.1 Case study 1: The role of farm advice in biological pest control

5.1.1 Findings related to the Farmers' survey

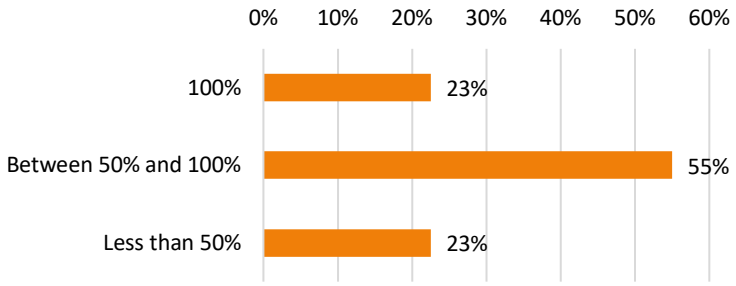
5.1.1.1 Farmers' profile and farm structure

The farms in our sample varied greatly in terms of their size and land tenure arrangement. The smallest farm in our sample was only 7.3 hectares, while the biggest was 1200 hectares. These extremes account for the high mean size of the farm (122.5 hectares), even though almost two thirds of the farms in our sample were smaller than 100 hectares. Almost all the farms owned some or all of their land, though among those who rented, the rented area was, on average, 51.8 hectares.

Almost all farms had family members working on the farm full-time. In the vast majority of cases, the labour force was constituted by family members, and only 30% had full-time hired employees. In most cases these were one or two workers, though a few farms employed a considerably higher number of employees (i.e. one farm had 22 full-time employees, and another had 10, while two additional farms indicated that they had 10 temporary or seasonal workers).

The farms were generally commercially oriented. Out of the 40 farms we interviewed, only 22.5% sold less than 50% of what was produced on the farm (see Figure 4). The majority (55%) sold between 50% and 100%, while the remaining 22.5% sold everything that was produced on the farm.

Figure 4: BIOP, percentage of total output sold (n=40)



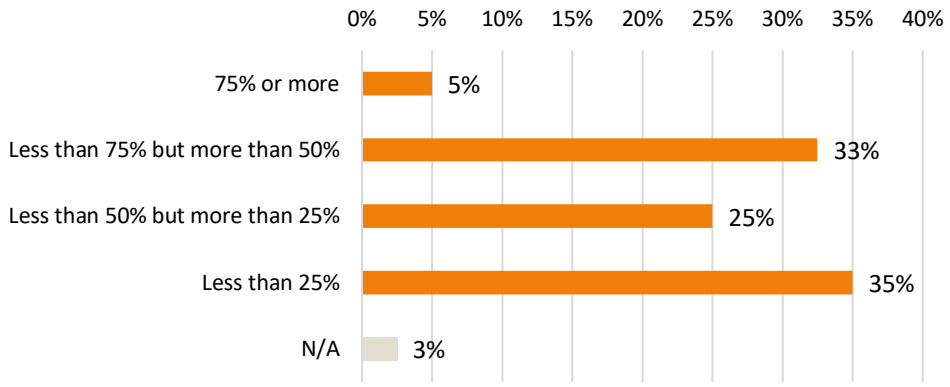
A considerable share sold their products directly to consumers. Selling products directly to consumers is a common practice in Latvia, and only 22.5% of our respondents said that they did not sell anything directly. 12.5% of respondents said that direct sales accounted for less 35% of what was produced on the farm, while the remaining 65% said that direct sales account for more than 35% of the farm's total output.

60% of all respondents were engaged in some other gainful activity. For 27.5% of all respondents these activities accounted for less than 25% of their total income, while 12.5% noted that the majority of

their income (75% or more) came from other gainful activities. The three most popular activities were the provision of health, social and educational services, forestry and agro-tourism.

All respondents benefited from agricultural subsidies, though only a minority were heavily reliant upon them (see Figure 5). 35% of respondents indicated that subsidies only account for 25% or less of their farm's total income, and an additional 25% said that subsidies amounted to 50% or less of their income. Crucially, only two respondents said that subsidies account for most of their income (75% or more). The overall picture is, therefore, consistent with the commercial orientation of the farms.

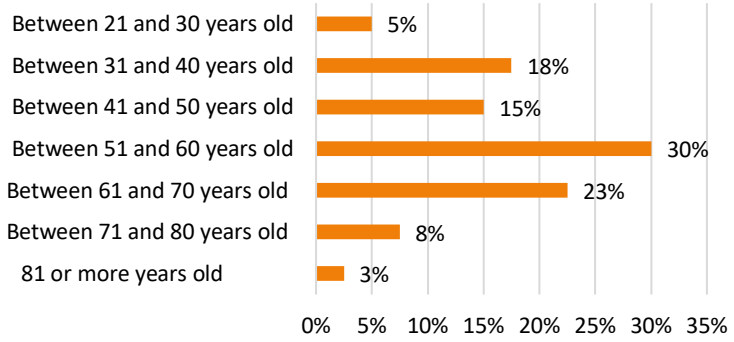
Figure 5: BIOP, subsidies as percentage of income (n=40)



Just over half of all respondents had received financial support to implement innovations. In almost all cases this was EU funding, sometimes administered by local authorities (e.g. Rural Support Service). The nature of this support varied. In some cases, it was support for small or young farmers, while others were more specialised (e.g. sustainable technologies, a pilot project, support for hiring workers with special needs).

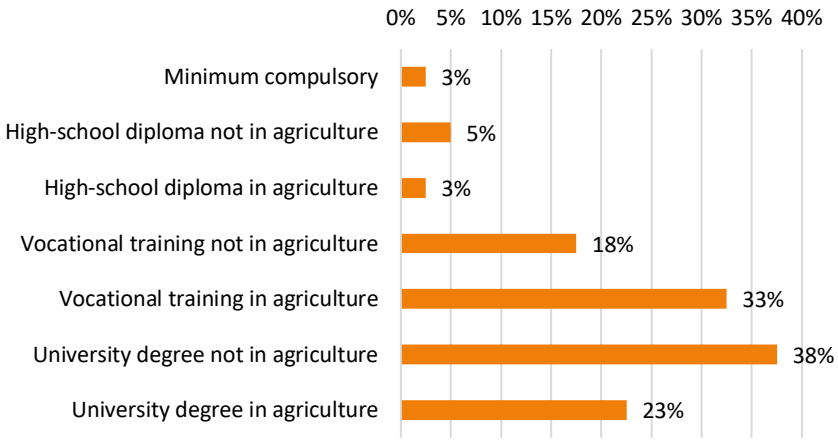
While all age groups were represented, more than 60% of all respondents were at least 51 years of age. Both the youngest and the eldest age groups were poorly represented, though the sample as a whole was skewed towards older farmers, with 35% being over 61 years of age, while only 22.5% were younger than 40 (see Figure 6).

Figure 6: BIOP, age of respondents (n=40)



More than half of all respondents had received agricultural training. The sample as a whole was skewed in favour of well-educated farmers, with 60% of all respondents holding a degree from a university (see Figure 7). Furthermore, almost the same number of respondents had received agricultural training, though only 22.5% held a higher degree in agriculture, with the others having received either vocational training or a specialised high school diploma.

Figure 7: BIOP, highest level of completed education (n=40)[4]



The majority of the sample had considerable farming experience. Only three of the farmers we interviewed had been farming for less than five years. More than 30%, on the other hand, had been farming for more than 30 years, with the remainder being evenly split between the 5-14 and 15-29 groups, meaning that over 60% of respondents had been engaged in farming for more than 15 years.

5.1.1.2 Farmers' attitude towards innovation and change

The responses indicate that LRATC was by far the most popular organisation providing assistance on general matters pertaining to the management of the farm. More than half of our respondents indicated that they had received assistance from the LRATC. Other prominent agents were

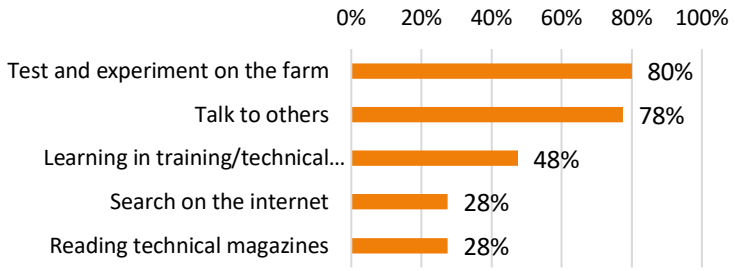
[4] Some respondents indicated that they held two qualifications of the same level.

the Rural Support Service and other farmers (sometimes even an informal group of farmers). Somewhat surprisingly, only 10% (four respondents) indicated that the Association of Organic Farming had provided assistance or advice. On the whole, however, a wide range of agents was mentioned, suggesting individual knowledge-acquisition strategies.

The responses as regards the nature of the advice should be treated with caution. Many of the farmers we interviewed could not say with certainty what type of support they received from the agents/organisations that had assisted them. Many simply said that the organisation in question had advised them on all the listed topics. The only option that stood out, and was often chosen individually, was "technical matters".

Managerial, technical and legal knowledge are paramount in successfully managing a farm, though the character of the manager also plays a role. Unsurprisingly, our respondents indicated rather predictable skills as important to organise and plan work on the farm. By far the most popular were technical knowledge (e.g. agricultural, legal), organisational skills (incl. management and bookkeeping) and marketing (i.e. the ability to sell and distribute what was produced on the farm). However, personal character traits, such as innovative thinking, love of work and enthusiasm were also mentioned. This indicates that, according to our respondents, a successful manager is one who possesses the appropriate knowledge and character traits. The farmers we interviewed also expressed a definite preference for testing things out on their farm (80%) and consulting with other farmers (78%) (see Figure 8). Almost half also indicated that they prefer learning at technical workshops (48%), while online sources and technical magazines were chosen by just over a quarter of our respondents.

Figure 8: BIOP, preferred methods of acquiring skills/knowledge - management (n=40)



More than 60% of all respondents had attended a training event related to agriculture in the last 12 months. Out of the people who said that they had attended a course or training, less than half had only attended one. Courses on organic farming and plant protection were the most popular, though more specialised courses (e.g. growing hemp, beekeeping) had also been attended. Those who had attended two or more events indicated a greater variety of subjects. In addition to the topics already mentioned, these included growing vegetables, beef cattle and other poultry and livestock, crop insurance, food safety requirements, and biodynamic agriculture.

The responses indicate that there are various knowledge needs that are not being met by the current AKIS. Approximately one half of the farmers we interviewed claimed that they require additional assistance on farming matters. The issues mentioned in the interviews included marketing and sales, and technical knowledge to implement practical solutions (e.g. drinking stations for animals) or work with particular animals (e.g. calves, fish) and produce various products. Somewhat surprisingly, many farmers indicated a need for greater insight into legislation and agricultural policy to plan and organise their activities accordingly.

5.1.1.3 Farmers' innovation paths and trigger cycle change model

Our sample consists of 22 adopters, 15 non-adopters and 3 droppers. We note that several non-adopters could just as easily be classified as droppers, as they indicated that the assessment stage had lasted for several years.

The variety of biological pest control methods we encountered in our interviews was considerable (see Box 3). The adopters and droppers we interviewed almost invariably mentioned that they use several methods in conjunction. Most involve a specific use of plant products or strategic use of insects that were natural enemies of specific pests, while others simply rely on the willingness of the farmer to tend to her plants and trees. Crucially, the majority of the methods employed by the adopters in our sample did not require financial investment, but they were labour & knowledge-intensive. Some, however, involved the acquisition of commercial products (with trichodermin being the most prominent).

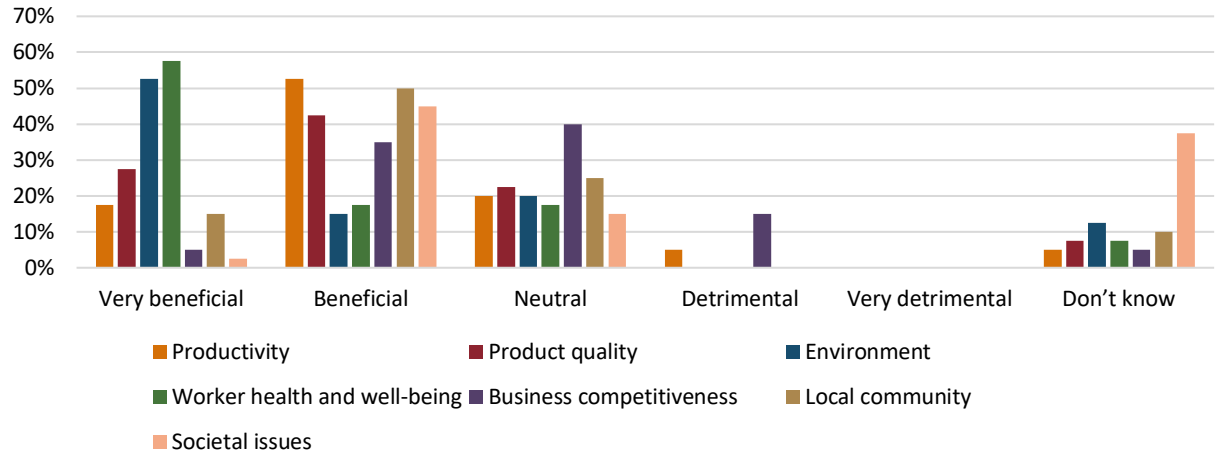
Box 3: Some varieties of biological pest control mentioned in the interviews

Ducks find and eat snails; chickens eat insects; clay in the ground; nettle decoction; ashes; folk methods – hemp to attract ladybirds; crop rotation; salt water; tomato leaf decoction; Colorado potato beetle decoction; onion peel decoction; Bordeaux mixture; various flowers and plants; garlic skins; vermicompost; compost; growing hemp among potatoes; ash decoction; tobacco; enriching soil with nitrogen; feeding tits; marigolds; garlic water; nets made from hay; useful insects; potato leaf decoction; traps; sticky traps; celandine decoction; birds nesting in trees; removing branches with pests; planting compatible plants next to one another; carnivorous ticks in the greenhouse; following the phases of the moon; weeding.

Perceptions of the use of biological pest control methods in the region were varied, though this perhaps reflects the somewhat unclear perception of what "counts" as biological pest control. Specifically, our interviewees expressed conflicting assessments regarding the extent to which biological pest control methods were widespread in Vidzeme and Latvia more generally. In addition, it must be noted that many could only be confident about the practices of farmers in their vicinity, rather than Vidzeme as a whole. Some argued that many farmers use biological pest control methods, while others did not agree with this assessment, arguing that it is comparatively rare to come across a farmer who uses biological methods. One observation that was broadly constant across the different groups was that biological pest control methods are the domain of smaller farms, rather than big commercial farms. This, however, has to be qualified by adding that some actually felt that biological pest control methods might be too expensive for (small) farmers in Latvia, implying that they equate biological plant protection methods with commercial products. Similarly, it appears that not all crop varieties are equally amenable to biological pest control methods, as farmers who grew cereals noted that such methods were challenging to implement in their case.

The interviewed farmers were not uniform in their assessment of impact of biological pest control on various dimensions (see Figure 9).

Figure 9: Perception of biological pest control (n=40)



Perception as to the impact on productivity was positive overall. From the comments it appears that, with a few exceptions, our farmers do not necessarily see a clear link between the use of biological plant protection methods and increased productivity. The weather, proper planning and soil management were often mentioned as being more important. However, when asked to rate the impact of biological pest control methods on productivity many indicated that it is either beneficial or very beneficial.

As regards product quality, the assessment is positive, though the impact is not believed to be significant. Those who felt that they could provide a specific comment indicated that biological pest control does not necessarily have a clear impact on the quality of products. Some even suggested that the products are perceived as being worse due to their not conforming to the aesthetic expectations of the general public regarding food. However, when asked to rate the impact on a scale, the majority again chose beneficial or very beneficial.

Biological pest control methods are believed to have a positive effect on the environment and people. An overwhelming majority indicated that these are environmentally friendly methods with a positive impact on the health and well-being of those working on the farm, and, to a slightly lesser extent, the local community.

Perception as to the impact on competitiveness was considerably more measured. Many respondents indicated that the impact is either neutral or detrimental. If we consider the potential reasons for this assessment, the situation becomes a bit more complicated. Several respondents acknowledged that organic products are in demand and public perception of organic farming is positive overall. However, the purchasing power of Latvian consumers is often insufficient to afford organic products. From the business side, EU support for organic farming was often mentioned as being crucial for the continued use of biological pest control methods. Finally, even though traditional biological pest control methods were

considered "cheap", they were also believed to be labour-intensive and required extensive agricultural knowledge to be implemented successfully and responsibly.

Our respondents were hesitant to assess the impact of biological pest control methods on broader societal issues. When asked to rate the impact on a scale, many people noted that biological pest control methods have a positive impact, though this must be qualified by noting that many people could not say what, if any, impact biological pest control methods have. Furthermore, respondents who indicated that biological pest control methods have a positive impact were generally positively disposed towards these methods.

The awareness stage

As regards the context of the awareness stage, many of the farmers in our sample had become aware of biological pest control methods when they were children or when they had attended educational courses, though the channels were incredibly varied overall. In the case of the former group, older relatives or neighbouring farmers had been the agents who had introduced biological plant protection methods to the farmers. In the case of the latter group, various courses and seminars were mentioned. Some farmers referred to general courses on organic farming, while others indicated that these were courses organised by specific institutions (e.g. LRATC, Latvia University of Life Sciences and Technology and the Rural Support Service). Nonetheless, many of our respondents mentioned different ways of finding out about biological pest control – trips abroad, cooperatives, farmers from Germany (in the 1990s), organic farming association, farmers' organisations and input providers.

The awareness stage indicates a good balance between formal and informal learning. The responses indicate that different agents and organisations had introduced farmers to biological pest control. This is also reflected in the nature of the interactions as they included both formal (e.g. courses, structured interactions) and informal (e.g. casual meetings, conversations, exchanges) channels of learning about biological pest control.

Biological pest control was often a practice that respondents had first encountered in their childhood or youth, so it was not perceived as an innovation. In the case of farmers whose parents or grandparents had farming experience, knowledge of, and appreciation for, biological pest control had been passed on informally and experientially. These were often practices that had been in use for several generations, though their effectiveness is debatable, as was indicated by the experts at the Latvian Plant Protection Research Centre. A significant observation in the case of older farmers was that their awareness of biological plant protection methods came from informal interest groups or semi-formal institutional arrangements, rather than a specific advisory institution.

The assessment stage

The relationship between awareness and assessment is difficult to assess definitively. In many cases there was a significant temporal gap between becoming aware of biological pest control methods and the decision to assess them on the farm. The trigger event in many cases was the decision to practise organic farming and use methods that were perceived as being more traditional or natural. Consequently, the link between awareness and active assessment is highly dependent on the context in which a farmer became aware of biological pest control methods. For those who had become aware of these methods during their childhood, the assessment stage was simply an extension (albeit with some modifications) of

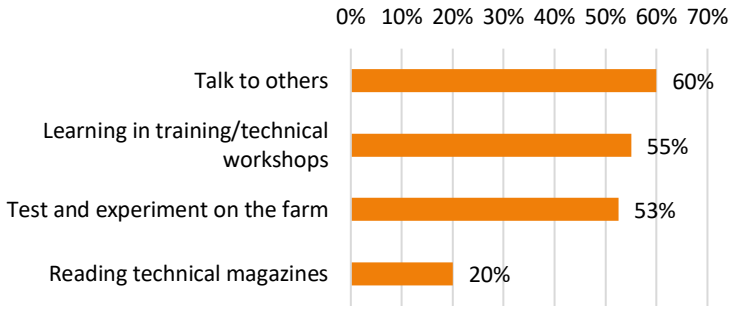
practices that were widespread around them. For those who said that they first encountered these methods during a study course, the link between awareness and assessment was more definite and more closely approximates a trigger-response model, though this has to be qualified by stressing that many farmers simply saw this as a requirement for qualifying as an organic farm.

The most popular motivation that lead to an active assessment of biological pest control was starting or transitioning to organic farming. Biological pest control was, therefore, simply seen as a requirement in order to practise organic farming. However, there were also those who started to use biological pest control methods out of curiosity or due to the influence of other farmers who were members in the same farmers' organisations (e.g. Association of Latvian Organic Agriculture). The triggers, therefore, were quite varied and ranged from practical considerations to more philosophical convictions about the use of biological methods. Even among several non-adopters (who still maintained that they were organic farmers) there was a sense that "natural" methods were best suited to maintaining the equilibrium in the ecosystem.

Various different forms of knowledge and skillsets were invoked in the context of assessing biological pest control. These included familiarity with technical questions (forms of knowledge related to planning, agriculture in general, and organic farming in particular). Practical experience working on and managing a farm, and experience working with plants and pest control methods, was also mentioned often. Love of nature, a familiarity with "ancestral methods" and an interest in organic farming were also considered important, underlining the complex mix of practical skills, habitual knowledge and philosophical considerations in the assessment stage.

Practical experience was highly valued in the assessment stage. Despite the fact that our respondents listed several organisations and agents that provided them with the information necessary to assess biological pest control methods, they indicated a pronounced preference for acquiring knowledge informally and independently (see Figure 10). Testing and trying things out on one's farm was a popular way of acquiring the necessary knowledge/skills, as was talking to, and learning from, other farmers and partners.

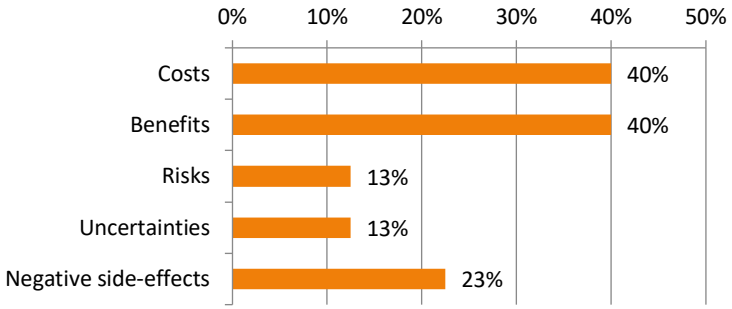
Figure 10: BIOP, preferred methods of acquiring skills/knowledge – assessment (n=40)



Training received at workshops or trade schools was often crucial for assessing biological pest control methods. The preference indicated for training rivalled testing and trying things out on one's farm, and the results indicate that it was one of the top three ways of acquiring knowledge in the assessment stage. This corroborates the claim that courses on organic farming were an important source of raising awareness about biological pest control methods.

Few respondents could specify what kind of information was useful when assessing biological pest control. Most respondents could not identify a particular piece of information that was relevant when assessing biological plant protection on their farm. Some emphasised practical skills and economic data, but by far the most frequently mentioned one was conversations with other farmers and experts, which corresponds to the answer given to the previous question.

Figure 11: BIOP, aspects considered in the assessment stage (n=40)



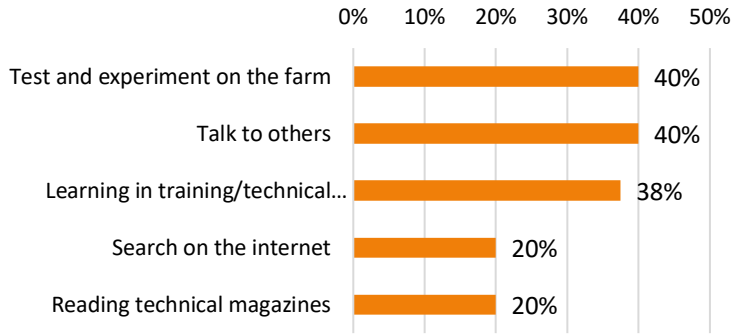
The responses indicate that in the assessment stage farmers placed an emphasis on the calculation of costs and benefits. Among those who actively considered and assessed the potential of biological pest control methods on their farm, the financial expenses and the necessary labour inputs were considered, as were the environmental, health and financial benefits (see Figure 11). However, it must be noted that 23% of all respondents also considered the negative side-effects of implementing this innovation.

The implementation stage

The implementation stage shows a greater emphasis on technical knowledge and practical experience. General agricultural knowledge and knowledge specific to organic farming were deemed crucial for a successful implementation of biological pest control methods. Thus, knowledge regarding soil, seeds and an understanding of the legislation that applies to organic farmers was mentioned. More general skills gained through practical experience were also listed, as was the willingness to learn and find the necessary information.

Both the assessment and implementation stages indicate similar preferences vis-a-vis the methods through which knowledge and skills are obtained. Much like in the assessment stage, the practical approach (testing things out on one's farm) and exchanges with one's peers (talking to others) were deemed the most useful ways of acquiring knowledge about biological pest control (see Figure 12). This was followed by technical training received at workshops.

Figure 12: BIOP, preferred methods of acquiring skills/knowledge – implementation (n=40)



The implementation stage shows a greater reliance on technical literature and the Internet. In addition to the three most prominent forms of acquiring knowledge, it appears that farmers opt to broaden their horizons and attempt to find practical solutions to their problems by using both online and print sources, which was less prominent in the assessment stage.

The responses indicate that there were certain knowledge needs that were not met by the national FAS/AKIS. Several farmers reported the lack of specific technical knowledge about, for example, the choice of fertiliser, and less resource-intensive biological pest control methods that could be used on organic farms.

Few respondents could specify what kind of information was useful when implementing biological pest control methods on their farms. Much like in the assessment stage, few respondents could specify a particular piece of information that was relevant when implementing biological plant protection on their farm. Some emphasised practical skills and economic data, but conversations with other farmers and experts was the most popular answer.

Non-adopters and droppers cited several reasons for not implementing biological pest control methods on their farms. There was no single dominant reason for not implementing these

methods, and several non-adopters could not provide a specific reason. Some mentioned the costs (financial, time and labour) associated with these methods, while others indicated that they were unsure as to their efficacy. One respondent referenced a kind of path-dependency whereby agricultural policy in the past had determined his choices. Finally, there were those who claimed that such methods were unnecessary as nature could take care of itself with the proper application of knowledge. Droppers cited age, the costs associated with organic farming, and one respondent indicated that he simply stopped practising organic farming.

5.1.1.4 Farmers' innovation micro-AKIS

In the awareness stage, family members, formal advisors (both working individually and for LRATC) and neighbouring farmers were mentioned most often. As mentioned above, the farmers we interviewed mentioned several agents and organisations that had made them aware of biological pest control. One-to-one meetings were prominent in the case of farmers who relied on their neighbours and relatives, while a mix of different formats (e.g. courses, printed materials) was evident if an advisor had been engaged.

In the assessment stage, advisors (either working individually or for LRATC) were the most prominent agents. While various different agents and organisations played a role in the farmer's decision-making process, traditional advisory organisations were mentioned in 45% of the interviews. The second (neighbours or peers) and third (farmers' circles and clubs) most popular mentions suggest that informal learning is also an important part of the assessment stage. References to the assistance received from relatives further underline this.

The implementation stage shows a pronounced preference for formal advisory organisations, though less than half of all respondents had received assistance from an advisor. Our interviewees mentioned various different agents and organisations that had been engaged during the implementation stage, ranging from advisors to input suppliers. The most prominent organisation was LRATC, which was mentioned by 28% (11) of our respondents, and the organic farming course run by LRATC was specifically mentioned by two interviewees. A few independent advisors were also mentioned. Somewhat surprisingly, the Association of Organic Farming was only mentioned by two interviewees, though several references to other farmers indicate that other members of the organisation are being consulted on a regular basis. As regards general management issues, the respondents did not indicate fundamentally different preferences vis-a-vis the acquisition of knowledge, relying on a similar range of actors and organisations.

One of the issues we encountered in the interviews was that farmers did not, at first, identify the institution but a specific advisor at the institution or one of its regional branches. This often complicated the distinction between advisors and scientists working individually and representing a particular institution, as some respondents identified key individuals that helped them in particular. In most cases the advisors were other farmers or advisors (who also work for LRATC). However, scientists affiliated with local universities (e.g. Latvia University of Life Sciences and Technologies, Institute of Horticulture), were also prominent. While this is not necessarily always significant, it indicates that the professional reputation of specific advisors is as important as their institutional affiliation, as it is on the basis of their reputation that they are engaged. This should not detract from the fact that many of the

advisors identified by name were simply regional representatives of LRATC and, most likely, chosen due to their proximity and availability.

Another prominent source of advice is various interest groups or societies. Our interviews indicate the significance of learning through various formal and informal networks that bring together people with common practical or commercial interests. The Association of Latvian Organic Agriculture was featured prominently as a forum of advice and practical suggestions. However, other organisations (e.g. The Community of Environmental Health) were also mentioned in the interviews, and it was indicated that members assist one another on various technical issues (including pest control). Several farmers indicated that they have formed their own informal network of farmers with mutual interests.

In addition to advisors and informal interest groups or societies, an increasingly prominent source of information was the Internet. Many respondents noted that they searched for information that was relevant in the assessment and implementation stages online. The use of online sources includes both general browsing to find information about topics of interest and consulting official sources (e.g. the homepage/database of the Rural Support Service) to clarify uncertainties regarding regulations.

Family members and neighbouring farmers continue to play a role in the assessment and implementation of biological pest control, and they form a crucial part of the regional advisory system. As was noted above, many farmers engaged the services of regional advisors to address issues both related and unrelated to biological pest control. However, many of the other organisations that were mentioned do not have a regional presence. This means that informal advice provided by relatives and peers often plays a significant role in the assessment and implementation stages. Furthermore, as was noted above, family members and neighbouring farmers had played a hugely significant role in the awareness stages.

5.1.1.5 General comments and reflections

One of the possible limitations that we encountered was that not all respondents had the same understanding of biological plant protection methods. Specifically, there were those who indicated that they do not use any biological methods or techniques because they assumed that these involved products purchased from input providers that sold biological plant protection products. This led them to believe that the routine techniques they used on their farm did not qualify as biological plant protection methods. Others had a broader understanding of biological plant protection methods and also included an intentional use of insects, attraction of birds to reduce the impact of particular pests and other soil management techniques.

There is a possibility that farmers fail to recognise some of their practices as forms of biological pest control. In one of our first interviews we noted that an interviewee who indicated that she is an organic farmer also claimed that she did not use any biological pest control methods. However, upon further questioning it became clear that her understanding of biological pest control was based on the assumption that it is a systematic application of certain techniques. However, the methods she used (e.g. poultry as a form of pest control) also fully qualified as biological pest control methods.

Several of our respondents who claimed that they were organic farmers indicated that they do not use biological pest control methods. One of the more surprising findings, corroborated by our interviews with the experts, was that many farmers do not use specific pest control methods. Indeed, this was flagged as an issue by the experts we interviewed who contended that many farmers believe that "nature should be allowed to take its course". Furthermore, it was indicated that many of these farmers either primarily rely on EU funding (due to their farm satisfying the requirements to qualify as an organic farm) or complain about low yields.

Labour and knowledge-intensive forms of biological pest control were the most prominent among farmers who identified themselves as adopters. Some interviewees mentioned that they use trichodermin and some proprietary commercial products as biological pest control. However, all adopters had implemented some technologically less-intensive methods that relied on the farmer's agricultural knowledge and willingness to tend to one's plants and fields.

This diversity of opinion regarding what counted as biological pest control was reflected in different assessments of biological plant protection methods. While it was generally noted that biological methods had a beneficial or very beneficial impact on the quality of products, the environment and the well-being of workers, enthusiasm for their impact on competitiveness was muted. However, this includes two somewhat contradictory sentiments that were expressed by our respondents. One the one hand, it was indicated that biological methods lead to lower yields and are more expensive. On the other hand, some respondents indicated that they chose biological methods because they were cheaper. This can, potentially, be the result of a different understanding of what constitutes a biological method. For some, it was a creative (and often traditional) use of natural resources to combat pests, while others saw biological methods as the use of commercial products that were suitable for use on organic farms.

5.1.2 Findings from the AKIS experts' interviews and advisory organisations' survey

5.1.2.1 Advisory landscape in the focus region

Farmers in the Vidzeme region have access to several institutions that provide advice about farming in general, and biological pest control in particular, and key players are easily reachable. Many of the farmers we interviewed relied on the services of LRATC – a privately-owned, but publicly funded organisation[5], which has several regional offices in Vidzeme or close to Vidzeme. However, farmers also consult the Association of Latvian Organic Agriculture, *Vides kvalitāte* (a certification agency), the State Plant Protection Service, the Latvian Plant Protection Research Centre, cooperatives (e.g. VAKS), several input providers, and universities and research centres (e.g. Institute of Horticulture), which are all located in the nearby regions of Pierīga and Zemgale.

5.1.2.2 Key players of advice for the innovation area in the focus region

Various different agents consult and advise farmers as regards biological plant protection methods. The range of actors identified by our respondents includes traditional advisory organisations, universities, informal groups or thematic associations, neighbours, relatives, public institutions, NGOs,

[5] It is formally a private limited liability company that receives public funding to provide advice to farmers on matters pertaining to agriculture and rural development.

cooperatives and input providers. Note, however, that the majority of the agents are advice providers without a specific advisory function.

The majority of the farmers we interviewed indicated that they had approached LRATC, which is the biggest advisory service in Latvia with several regional branches. In most cases advice was provided during face-to-face meetings or conversations on the phone, though several respondents noted that they had attended courses on organic farming or the management of organic farms, which was often an important part of the awareness and assessment stages. LRATC was often engaged regarding general farm management issues.

Advisors, however, have not had a significant impact on stimulating the uptake of this innovation. Experts indicated that it is unlikely that advisory organisations or advice providers in general have greatly contributed to the uptake of biological pest control methods. They have certainly played a role in helping farmers assess and implement these methods (as confirmed by our interviews), but their role in spreading awareness about biological pest control methods is debatable.

Input providers were often mentioned as sources of advice about biological pest control. Previous research has noted that, in Latvia, farmers and cooperatives often rely on the advice of input providers, international business conglomerates and their distributors in Latvia. To a certain extent this was also true in the case of biological pest control. Several of our interviewees indicated that commercial companies such as *Bioefekts* and *Agrimatco* provided advice about the use of their products on the farm. The experts we interviewed confirmed that input providers play a significant role.

There is a lack of specialised, neutral experts in biological pest control, even though many organisations provide advice. Experts noted that neutral advice on the merits and shortcomings of biological pest control methods is required. "Paid" advisors have squeezed out the independent advisors. Not all farmers have the necessary knowledge to competently and critically assess the (biological) method in question, so they just assume that using more products will be enough. The advisors representing input suppliers encourage this as it increases sales.

In the case of biological pest control, a potential advisory challenge is the unwillingness of farmers to acknowledge that biological plant protection methods appropriate for successful organic farming require a systematic approach. Experts from the Latvian Plant Protection Research Centre and the State Plant Protection Service indicated that many farmers believe that "natural" methods should be non-invasive and demand little in terms of input and effort from the farmer. This may partially account for the unexpected finding that many organic farmers do not purposefully use biological pest control methods. However, the experts also noted that such an approach to pest control and soil management leads to unpredictable yields and a poor appreciation of the fragility of the situation on the farm in question.

Not all farmers are willing to learn and introduce new practices on their farms. Experts from the Latvian Plant Protection Research Centre indicated that, in their experience, farmers are willing to follow instructions at training events, but not many are willing to learn from these instructions so as to be able to introduce specific plant protection techniques and monitoring methods on their own farms.

The generous subsidies for organic farming may have an adverse effect on attempt to use biological pest control methods to increase crop yields. The experts we interviewed commented that, in their experience, many farmers use the transition to organic farming as an excuse to stop tending to their fields, as reasonable profits require considerable effort on behalf of the farmers, while only limited profitability is required to qualify for subsidies.

Nonetheless, the high costs of biological pest control methods are a crucial obstacle, limiting their uptake. This was a widely shared opinion both among farmers and experts. The costs involved (mainly labour, though some methods can be expensive) often determine the choice of whether or not to use biological pest control methods, and currently biological pest control methods are not commercially significant. One expert suggested that advisors have to emphasise that biological methods can be cheaper. Another argued that, positive examples of big farms using biological pest control methods could also help.

Clear and transparent official requirements could actually be a more effective means of stimulating the uptake of this innovation. Experts noted that the majority of farmers might not be willing to adopt biological pest control methods. Often the problem is that people are either insufficiently committed to (it was noted that "truly committed" organic farmers generally follow stricter guidelines), or knowledgeable about, organic agriculture. Limiting the range of chemicals that are available for use may steer farmers towards biological pest control methods. This, however, is also a potential weakness of the current situation regarding biological pest control methods – it is often not clear to farmers which methods are permitted on organic farms. This uncertainty regarding official requirements hampers the uptake of biological pest control, as even the experts we interviewed were sometimes unsure what was prohibited.

Biological pest control methods may be more appropriate for small farms. Both farmers and experts referenced the fact that people with small allotments have used biological pest control methods for a long time, and regularly seek advice from the State Plant Protection Centre. Big commercial farms, on the other hand, may find it challenging and inordinately expensive to use such methods on their farms.

While there are some examples of this, a more widespread use of demonstration events and use of success stories could persuade farmers to use biological pest protection methods on their farms. In the interview with the Latvian Plant Protection Research Centre, experts indicated that they have organised several demonstration events to teach and underline the potential usefulness of monitoring and pest control methods that do not involve the use of chemicals. Interest in these events has been considerable. Furthermore, some of the farmers we interviewed indicated that they were uncertain as to the effectiveness of these methods, suggesting that events demonstrating their impact could stimulate further uptake.

Experts indicate that there are both commercial and non-commercial considerations involved in the choice to (re)turn to organic farming. The experts acknowledge that many farmers continue to use or introduce biological pest control methods due to the belief that these (i) are better for the environment and (ii) provide vegetables or dairy products that are better for people's health, as they are perceived to be more natural. Nonetheless, there are also those farmers who are either partially or fully persuaded to transition to organic farming out of commercial considerations (e.g. subsidies, higher price). This is also corroborated by many interviews with organic farmers.

Opinion about biological methods is generally positive, but this topic is not popular enough to provoke serious discussions. Experts generally had a positive opinion of biological pest control methods, even though some reservations were expressed regarding the way some organisations talk about these methods. Specifically, the concern was that biological pest control methods were given an esoteric/"nature knows best" spin that has actually convinced some farmers that less effort has to be expended to maintain the soil and crops. Furthermore, not enough research regarding the impact on the quality of products has been carried out, even though a responsible use of biological methods was believed to be better for the environment. No significant public disputes regarding biological pest control could be named, though it was emphasised that this may be due to the comparatively minor commercial role that biological pets control methods play. If input suppliers specialising in chemical pesticides etc. perceive them as a threat, things may change. However, experience suggests that they could just as easily start offering their own specialised products that could be classified as biological pest control.

While there are no concrete obstacles to the application of biological pest control methods, there is little support from the Ministry of Agriculture. None of the experts indicated that public institutions are against biological pest control methods, and the availability of generous subsidies would seem to indicate public support for this innovation. Nonetheless, it can just as easily be seen as an implementation of EU policy without any particular interest in the innovation itself.

5.1.2.3 Transformation of advisory landscape

Gradually more and more farmers introduce biological pest control methods on their farms. It was indicated that it might be challenging to find droppers, as not many farmers had actually seriously started using these methods and dropping them afterwards. However, as more and more chemical plant protection methods are being prohibited, farmers have started considering biological pest control methods. This is reflected in growing demand for advice from farmers.

Biological pest control is becoming a more prominent topic for AKIS/FAS organisations. In our interviews with experts and AKIS organisations it was indicated that the significance of biological pest control is steadily growing as a result of more interest and the greater restrictions placed upon the use of pesticides. Conventional methods, however, still retain their prominence.

The number of advisory staff members focusing on biological pest control is generally low. For example, it was indicated that in LRATC approximately 15 members of staff (out of 315) are involved in the provision of advice on biological pest control. The number of people was higher in the case of the State Plant Protection Service (83), though this was largely because they provide advice on all forms of pest control. Consequently, even though the significance of biological pest control is growing, it is still a relatively niche topic for advisors.

The importance of direct and indirect consultation varies between organisations. For example, our conversation with representatives of LRATC suggests that face-to-face meetings either on or off the farm are the most important. However, the State Plant Protection Service and the Latvian Plant Protection Research Centre indicated that conversations over the phone are more popular. This, however, can be explained by the fact that neither of the two organisations is an advisory organisation in the formal sense, even though they provide assistance to farmers.

EU policy is widely credited for popularising organic farming, though it is unclear whether it has yet had significant impact on the prevalence of biological pest control. As noted above,

many farmers made the switch to organic farming when Latvia joined the EU, as it provided generous subsidies to encourage this way of growing food. This was echoed in the interviews with experts and AKIS organisations that referred to the commercial motivation of farmers, as distinct from the environmental concerns expressed by others. However, the impact of EU regulations on the adoption of biological pest control specifically is presently unclear, though the restrictions placed on the use of chemical pesticides may yet encourage farmers to make the switch to biological pest control methods.

The growing significance of input suppliers as providers of advice raises the possibility that neutral expertise may be in short supply. It was suggested by one of the experts we interviewed that "the field is open" in the sense that there are few specialists who can advise farmers about biological pest control. Specifically, there may be a need for impartial experts and advisors, especially in view of the influx of various commercial products and the ever-changing regulations regarding the use of various pest control methods.

5.2 Case study 2: The role of farm advice in direct marketing

5.2.1 Findings related to the Farmers' survey

5.2.1.1 Farmers' profile and farm structure

The farms in our sample on direct marketing were generally small. The smallest farm we approached had a total area of 0.06 hectares, and 19 farms (approximately 63% of the sample) were below 50 hectares, while the biggest farm had a total area of 200 hectares. In the majority of cases the land on which the farms were located was owned by the farmers and the family, though 11 farms also rented land. Of those that rented, the average rented area of land was 25.8 hectares.

70% of the farmers we interviewed sold more than 50% of what was produced on the farm. Even though only one of our respondents claimed that all 100% were sold, an additional 20 farmers said that they sold between 50% and 100% of what was produced on the farm (see Figure 13). Five farmers indicated that they sold less than 50%, and four noted that there were no sales, or they were residual.

Figure 13: DMAR, percentage of total output sold (n=30)

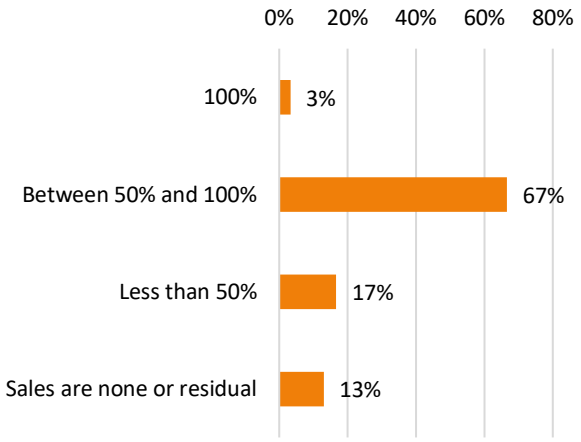
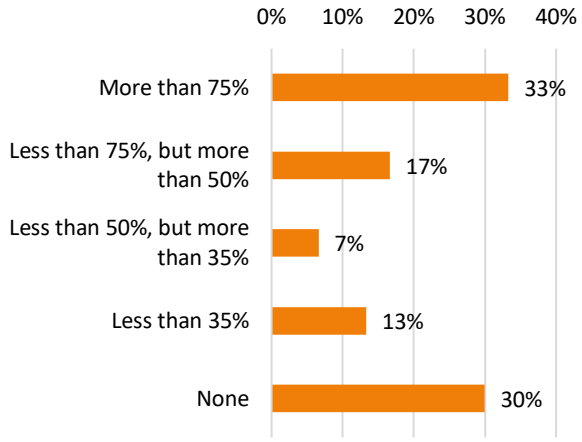


Figure 14: DMAR, percentage of total output sold directly to consumers (n=30)



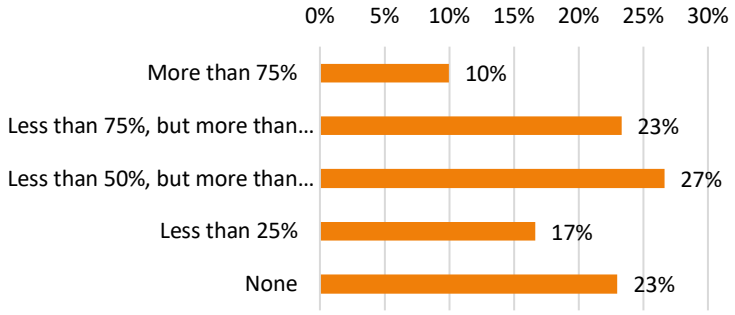
50% of the farmers we interviewed sold more than half of what they produced directly to consumers. Due to the fact that these farmers were selected for interviews regarding direct marketing, the high volume of direct sales is not surprising. One third of respondents indicated that they actually sold 75% or more of what was produced on the farm directly to consumers (see Figure 14). However, approximately 30% noted that there were no direct sales, or they were residual, which corresponds to the number of non-adopters and droppers.

Just over a third of our respondents were engaged in other gainful activity. In almost all cases (10 out of 12) these activities only accounted for 25% or less of the total income on the farm. The most prominent of these activities was the processing of agricultural products, agro-tourism and forestry.

Local public infrastructure is sufficiently conducive to direct marketing. Most farms have high-quality Internet connections and are located on, or close to, the main roads, which provide easy access for potential clients if sales take place on the farm.

The majority of our respondents heavily rely upon agricultural subsidies. Approximately 77% of our respondents currently receive agricultural subsidies (see Figure 15). Crucially, one third of the farmers we interviewed indicated that more than 50% of their income comes from agricultural subsidies, while a further 27% indicated that between one quarter and half of their farm's income comes from subsidies.

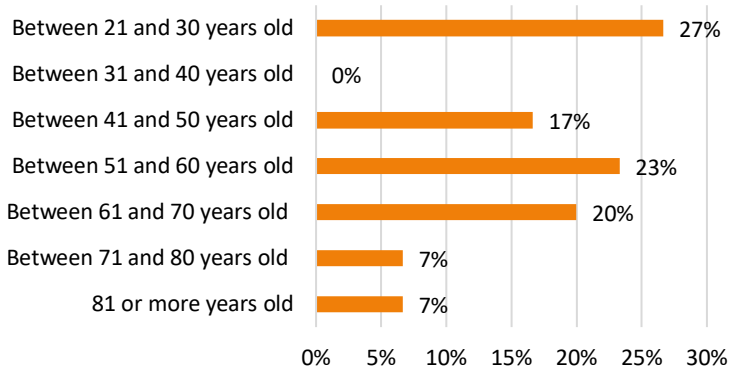
Figure 15: DMAR, subsidies as percentage of total income (n=30)



Only 30% of our respondents received some kind of support for innovation. This can partly be explained by the fact that many farms were comparatively small, and the most prominent type of support was received as part of the funding scheme administered by the Rural Support Service to support small farmers.

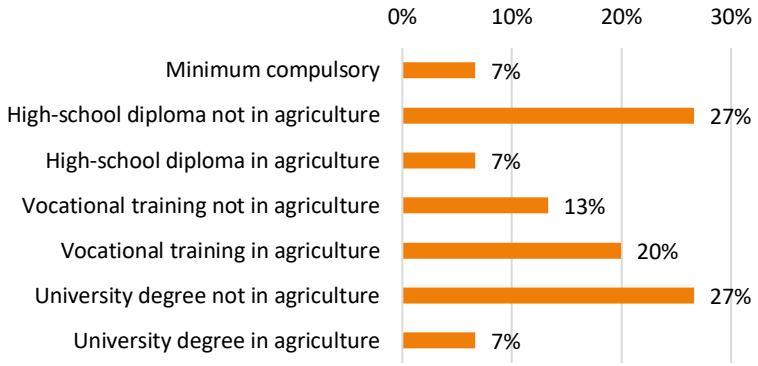
The demographic composition of respondents indicated a gap between the "old" practitioners and the "new" practitioners, which was also noted by the experts we interviewed. We noted a peculiar characteristic of our sample in that, while most age groups were represented, there were no respondents in the 31-40 age group (see Figure 16). This lends further credibility to the claim that direct marketing in Latvia is both an old and a recently reinvigorated from of selling one's products, showing signs of retro-innovation – especially as practised by younger farmers.

Figure 16: DMAR, age of respondents (n=30)



Only one third of our respondents have received agricultural training. Overall, there was an even split in the sample between those who held a high-school, vocational or university diploma (see Figure 17). However, vocational training predominated among those who had received an agricultural education.

Figure 17: DMAR, highest level of completed education[6] (n=30)



More than half of our respondents had been farming for over 15 years. The farmers in our sample were experienced, with only 10% indicating that they had been farming for up to five years. 20% said that they had been farming for 30 years or more, while 15-29 years was the best-represented group.

Overall, there was a clear bias toward employing family members, rather than hired workers, corroborating that these were small to medium-sized family-owned farms with modest labour input requirements. Only in four cases did the farm employ hired workers on a permanent basis, though seven indicated that they had part-time or seasonal hired workers. Family members were employed full-time in 19 cases, though more farms employed family members part-time (22).

Almost all the farmers we interviewed lived in the agricultural holding at least some part of the year. Two thirds of our respondents lived in the agricultural holding full-time, while the remaining third used it as a second home.

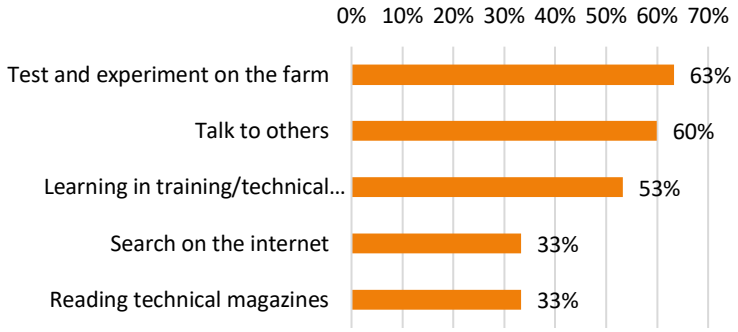
5.2.1.2 Farmers' attitude towards innovation and change

The knowledge and skills necessary to successfully manage a farm proved to be quite varied, with few clear standouts. Some farmers mentioned knowledge about the specific animals that the farmer works with (e.g. cattle, bees, poultry), while others referred to a need for more general agricultural knowledge and the knowledge to work the land. There were mentions of practice-based knowledge and experience, some of which had been passed down informally. Many indicated that they need managerial and planning skills (e.g. bookkeeping). Some references were also made to specific character traits (e.g. perseverance, patience, self-discipline).

The knowledge/skill acquisition practices for management purposes do not differ significantly from those mentioned in relation to the innovation. Testing things out on one's farm and talking to others were prominent ways of acquiring the skills necessary to practise farming and successfully manage the farm (see Figure 18). However, more than half of the farmers we interviewed also indicated that they had attended courses and workshops, indicating that there are knowledge and skill needs that require technical training.

[6] Some respondents indicated that they held two qualifications of the same level.

Figure 18: DMAR, preferred methods of acquiring skills/knowledge – management (n=30)



Over half of our respondents had attended a training event related to agriculture and farming in the last 12 months. More than 40% of our respondents had attended at least one training event, and 17% had attended two or more. Thematically, these courses ranged from general courses on organic farming, horticulture and sheep farming, to courses on cooperation and growing specific tomato varieties.

The general advisory landscape proved to be considerably different from the one indicated in relation to direct marketing, with a greater emphasis on the role of organisations. While some farmers had mentioned LRATC and the Rural Support Service in relation to direct marketing, these organisations were considerably more prominent in relation to general management issues. It should be noted, however, that relatives and other farmers were still an important source of advice, even though fewer farmers mentioned them.

The responses indicate that, in general, there are no specific, currently unmet knowledge and service needs, though several farmers indicated some problems. There was interest in the experience of others and assistance regarding marketing and some technical questions (i.e. agricultural knowledge). Legal questions (e.g. taxes, bookkeeping) were mentioned by some, as was the local unavailability of veterinary services.

5.2.1.3 Farmers' innovation paths and trigger cycle change model

Selling products directly to consumers via various channels is a common practice in Latvia. According to interviews with LRATC experts and several farmers, direct marketing (in some form) is practised by approximately 50% of small farms in Pierīga and Latvia more generally. This seems like a plausible estimate, as direct marketing is a widespread practice in Latvia. While there are indications that farmers innovate and reinterpret existing practices in light of the technological solutions offered by information and communication technologies, and increased mobility afforded by improved infrastructure, the basic principle of selling products without mediation is commonplace and seldom regarded as an innovative way of distributing food and agricultural products. Furthermore, some respondents even expressed confusion as to the possibility of classifying this practice as a discrete phenomenon.

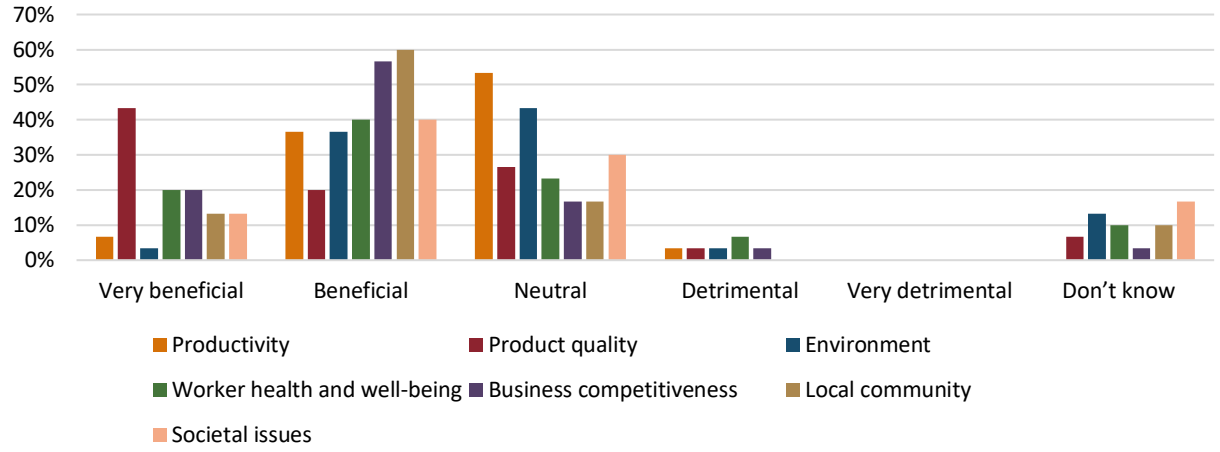
Various forms of direct marketing are practised in Latvia, though not all are adequately represented in our sample. By far the most common method in Latvia is the distribution of goods (and

also giving products away for free or through barter exchange) through social networks of various scales. These networks may include relatives, friends, acquaintances, neighbours, colleagues and their respective social circles. The distribution of food through such social networks is seldom understood as direct marketing, however, but is an important channel for distributing one's products without the involvement of commercial intermediaries. Both the interviews, and observations made in other projects, clearly indicate that family members often play a role in distributing products produced or grown on a rural property. In our sample, the most important channels were local and farmers' markets, farm sales, farm shops, permanent clients, sales in market towns, delivery to residential areas and places of work, and online sales. Somewhat surprisingly, direct purchasing groups were mentioned only in three cases, which points to a potential limitation of our sample, as this is an increasingly important distribution channel in Latvia.

As in the case of biological pest control, our respondents provide conflicting accounts of how widespread direct marketing is in Pierīga. While many or the farmers we interviewed claimed that direct marketing is popular (particularly in view of the number of stands at various markets), there were also those who said that not many farmers in the immediate vicinity practise direct marketing, often citing depopulation as a cause. However, this discrepancy may simply reflect the diversity of the Pierīga region in terms of the popularity of direct marketing.

The interviewed farmers were not fully uniform in their assessment of impact of direct marketing on various dimensions (see Figure 19).

Figure 19: Perception of direct marketing (n=30)



Generally speaking, the impact of direct marketing on productivity was believed to be neutral or slightly beneficial. While some noted that they had started growing and producing more as a result of direct marketing, others indicated that direct marketing has had little to no effect on how much they produced. In some case, however, direct marketing and feedback from clients had made the farms shift their focus. It should also be noted that not all products are amenable to direct marketing. Vegetables, honey, dairy products and poultry were well represented in our sample. Non-adopters noted that direct marketing is simply not a viable method for distributing beef, cereals and large quantities of milk. This also partly explains why direct marketing tends to be more prominent among smaller farms.

The impact on product quality was generally believed to be beneficial. Unlike in the case of productivity, many farmers indicated that direct marketing had and should have a positive impact on quality. Primarily, this was due to the fact that direct communication with a relatively small group of clients makes reputation and good word-of-mouth crucial for customer retention. Selling poor quality products would simply not be a sustainable business strategy, so care must be taken to ensure that the quality of the product is competitive and in line with what the customer is looking for. Conversely, there were also those farmers who indicated that growing demand meant that less time could be devoted to properly tending to their crops, so the quality inevitably suffered.

While its impact on the environment was generally believed to be neutral, direct marketing has a positive effect on the people working on the farm and the local community. Our respondents did not believe that direct marketing had a direct impact on the environment. The positive impact had more to do with the way farming was done (i.e. positive impact in the case of organic farming). The only specific negative impact had to do with the amount of petrol used when transporting goods, though even in this case it was unclear, as it depended on where the supermarket chains sourced their products. In terms of positive impact, an example would be the re-use of packaging, which is not as prevalent in the case of purchasing products from supermarkets. Direct marketing was believed to have a positive effect on the farms engaged in it and the communities in which these farms were located. Direct marketing was perceived to encourage interaction and communication, and give people access to good quality food.

Direct marketing can enhance the competitiveness of the business, but the mechanisms can vary. Our respondents were generally of the opinion that direct marketing is good for competitiveness. It makes products easier to access, provides them at a cheaper price, and it was indicated that customers generally trust the quality of products purchased directly from farmers. Competitiveness also had to do with where the farm was located. Some of our respondents believed that they were the only farm in the immediate vicinity that practised direct marketing. This gave them a competitive advantage over their neighbours.

In contrast to biological pest control, direct marketing was believed to have a positive impact in the context of broader societal issues. While few respondents could provide specific comments as to why this was, those who did stressed the importance of locally sourced food for food security and the quality of food in relation to public health. Employment was also mentioned, as direct marketing allows people in rural areas to make a living.

The awareness stage

From the perspective of farmers, direct marketing was often perceived as a traditional and "old" form of commercial activity that everyone seems to have knowledge about. Most of the farmers we interviewed had become aware of direct marketing from their relatives. The responses indicate that many farmers' parents, grandparents or other close relatives were engaged in direct sales to a greater or lesser extent. Thus, relatives were often key sources of information about direct marketing in the awareness stage. Consequently, the activity is considered by many of our respondents to be something inherited from their family. For many, the knowledge and skills necessary for direct marketing are part of their experience and family history. In other words, direct marketing is part of their everyday routine. Farmers perceive this knowledge about direct marketing as experience-based knowledge. Even those

farmers who did not become aware of direct marketing via their relatives did so from friends or neighbours. This lends further credibility to the impression that direct marketing is a common practice.

There was a diversity of channels through which direct marketing had been discovered. Those who had practised it since the late 1980s and early 1990s could not identify a particular person or organisation that had told them about direct marketing. What was clear, however, was that advisors and advisory organisations in the narrow sense had played a peripheral role in this process. Some found out about this practice from their neighbours, relatives or colleagues. Others could not identify a specific source, as it was simply knowledge that was known to everyone - also experienced by many as consumers, especially in case of the more traditional forms of direct sales (e.g. market stands, on-farm sales). Some respondents were clearly puzzled by the question as they thought that direct marketing was something that everyone was aware of. Those who had started to practise direct marketing more recently found it easier to identify a particular person or organisation that had informed them about direct marketing, including more novel forms of individual sales.

Unsurprisingly, direct marketing was often not seen as an innovation by the farmers we interviewed. There were farmers who had sold their products directly to customers for several decades, and they began to do so largely because this was a convenient way to sell their produce and other goods during the transition period to a capitalist economy (in the 1990s). Furthermore, this was seen as an extension of what many people around them (incl. their relatives) were doing, rather than an innovative practice. Many interviewed farmers had already taken part in direct marketing from an early age, travelled to the market with their parents, helped with sales etc. This also explains the significant role of parents and family members in the acquisition and exchange of knowledge. This was not always the case, however, and people who had started to practise direct marketing in the last decade indicated that theirs was a conscious choice, though the triggers varied. Some farmers responded to demand, while others simply said that they had to do something to earn a living.

The assessment stage

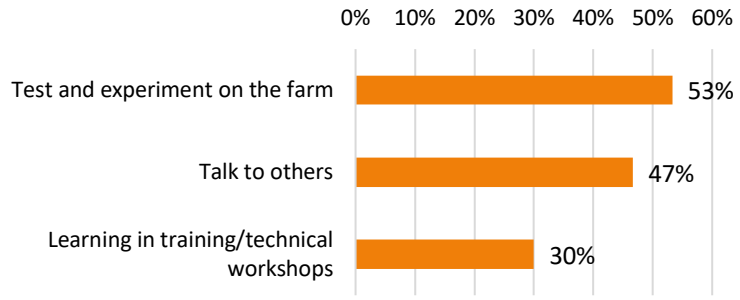
The transition from awareness to assessment was not always clear, and seldom explained with reference to a specific trigger. The decision to start direct sales was seldom explained with reference to a conscious and considered decision-making process. It was simply a way for farmers to sell products and make some money from the surplus they produced on the farm, often even without a clear long-term plan. Alternatively, our interviewees noted demand for their products or specific life events (e.g. retirement, job loss, having to work from home due to the birth of a child, returning from abroad) as the trigger to start practising and assessing direct marketing on their farm.

Sales and communication skills, economic skills and planning were the most prominent skills necessary to assess the innovation. Our respondents placed an emphasis on practical skills required to successfully sell one's products, rather than economic data. As regards information and data needs, information about markets, technical information (from the Food and Veterinary Service [permits] and State Revenue Service [taxes]) and the experiences of other farmers were most useful when assessing the innovation.

Interviewees cited several prominent ways of learning about direct marketing (see Figure 20). The main sources of information and learning mentioned in the interviews were personal observations

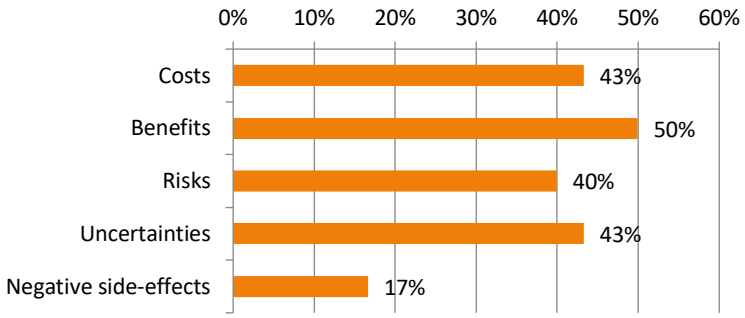
made at markets, exchanges with other farmers, feedback from clients and professional literature. Attendance of courses was also mentioned, but these events were seldom specifically about direct marketing, though they did involve bookkeeping and rural tourism, which have a connection with direct marketing.

Figure 20: DMAR, preferred methods of acquiring skills/knowledge – assessment (n=30)



A wide range of issues was considered when assessing the merits of direct marketing (see Figure 21). Respondents showed a clear appreciation of the fact that direct marketing can lead to higher incomes and give them the opportunity to sell their own goods. However, the expenses involved in transporting (e.g. fuel) and distributing (e.g. taxes, market fees) goods were also considerable, as were the time and labour investments. Risks mostly concerned the inability to sell products (or, alternatively, meet consumer demand), attract clients, while uncertainties were mainly bureaucratic and legal in nature (e.g. taxes and permits).

Figure 21: DMAR, aspects considered in the assessment stage (n=30)



The implementation stage

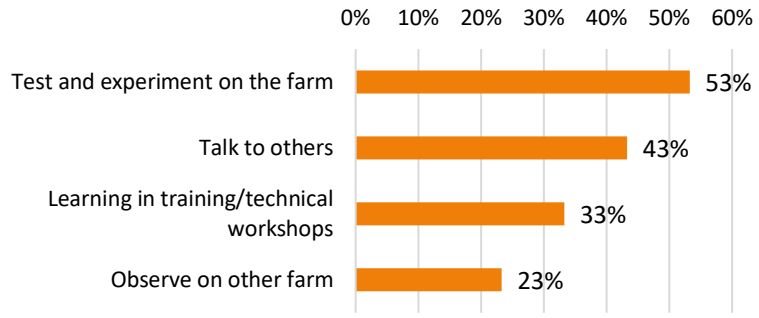
While the distinction between awareness and assessment was generally clear to the respondents, assessment and implementation were harder to distinguish. Many of our respondents were familiar with direct marketing prior to the decision to start practising it. However, some interviewees expressed visible confusion (and even sarcasm) as to the distinction between assessment and implementation. This was also evident in their responses as to the knowledge, information and advice

needs at these stages, as they could not confidently say whether there were any differences and whether different agents or organisations had assisted them. This may also depend on the type of method employed by the farmer and the extent to which existing practices required modification and investment to start practising direct marketing.

The skills necessary to successfully implement direct marketing proved to be more varied than the skills necessary to assess it. Much like in the assessment stage, sales and communication skills, economic skills, the ability to respond to consumer demand and planning were considered important. However, practical skills to do with marketing, packaging, driving and having the necessary documentation, as well as language proficiency (Latvian, Russian, English) were also mentioned by the respondents. Unsurprisingly, agricultural knowledge, legal questions and marketing tricks were among the knowledge needs that were not met during the implementation stage. As regards information and data needs, information about markets, technical information from the Food and Veterinary Service and the State Revenue Service and the experiences of other farmers were most useful when implementing the innovation.

Practical knowledge/skill-acquisition methods were preferred, and training events were no more prominent than in the assessment stage. Testing direct marketing out on one's farm and talking to others and making observations on other people's farms were prominent ways of acquiring the skills necessary to practise direct marketing (see Figure 22). However, one third of the farmers we interviewed also indicated that they had attended courses and workshops. This is consistent with the broader knowledge and information needs mentioned above, which are more likely to be transferred via training events.

Figure 22: DMAR, preferred methods of acquiring skills/knowledge – implementation (n=30)



The farmers we interviewed generally indicated that they had very few knowledge needs that were not met or could not be met with some effort on their part (e.g. looking for information online). Nonetheless, some of our respondents noted that they had experienced a lack of knowledge and skills when they started practising direct marketing – technical/agricultural knowledge, legal questions (e.g. taxes, requirements) and marketing skills.

Non-adopters and droppers cited various reasons for not practising direct marketing. Non-adopters referred to their product not being well-suited for direct marketing. Examples were also provided by adopters. These included meat (beef in particular) and cereals. In some cases, however, the reason was

simply the reluctance to sell small quantities to individual consumers – preference was given to intermediaries and processors (e.g. in the case of milk). While we interviewed a small number of non-adopters, the reasons they provided for choosing not to engage in direct marketing were echoed in the comments of experts on direct marketing in Latvia. Specifically, experts noted the need for new skills (e.g. communication skills) that were distinct from the skills necessary from those involved in growing and cultivating produce. Droppers, on the other hand, cited health and the increased workload as reasons for dropping direct marketing.

While this phenomenon was not well represented in our sample, interviews with experts indicated a recent trend of abandoning direct marketing. For example, one farmer explained that the reason is the decline of the number of buyers in local markets as a result of depopulation, and the high labour and time investments needed for the farmer to market the produce himself. As a result of the abandonment of the innovation, the farm in question had moved from horticulture to sheep farming and grain cultivation. A related comment was made in an interview with an expert from the Latvian Rural Forum who suggested that farmers who are engaged in direct marketing must accept that they have to be a kind of "circus artist". In addition, an expert from LRATC also pointed to the difficulties attendant to implementing the requirements of the Food and Veterinary Service. These present a practical challenge and, moreover, are insufficiently clear to farmers.

5.2.1.4 Farmers' innovation micro-AKIS

The general advisory landscape was considerably different from the one indicated in relation to direct marketing. Some farmers had mentioned organisations such as LRATC and the Rural Support Service in relation to direct marketing. However, the role of these organisations was considerably more prominent in relation to general management issues. Nonetheless, relatives and other farmers were still an important source of advice, even though fewer farmers mentioned them.

There are few structured forms and formal agents that provide farmers with advice on direct marketing at all stages of engaging with the innovation. All forms of direct marketing require professional advice, and the education of farmers, consumers and traders would greatly contribute to the stability of direct marketing, but such assistance is only sporadically available. The available advice provision and procurement mechanisms are not structured and are not sufficiently tailored to different forms of direct marketing, relying on the ingenuity and initiative of individual farms.

The awareness stage did not feature any prominent FAS/AKIS organisations. Some of our respondents found about direct marketing from their neighbours, relatives or colleagues. There were others who could not identify a specific source, as it was simply knowledge that was known to everyone. However, those who had started to practise direct marketing more recently found it easier to identify a particular person or organisation that had informed them about direct marketing.

In the assessment stage, relatives were prominent advisors, while advisory organisations were seldom engaged in this capacity. Many interviewees could not identify a specific agent or organisation that had assisted them in assessing the merits of direct marketing. Among those who could, the overwhelming majority indicated that they had relied on their social networks – friends, neighbours

and relatives had helped them to assess the innovation on their farm. Advisors (even in the broad sense) were seldom mentioned.

The advice of fellow practitioners and farmers, and relatives was crucial during the implementation stage. Compared to the assessment stage, the advice of other farmers engaged in direct selling was more prominent, which is consistent with the observation that, in the case of direct marketing, farmers learn by doing. However, the input and assistance of family members cannot be disregarded even during the implementation stage.

In general, the most prominent exchange of knowledge and practical tips is with reliable and well-known peers and relatives. Almost every farmer has several colleagues that have earned his/her trust, and with whom informal exchanges take place. In contrast, informal exchanges with farmers outside of the trusted circle are more cautious. For example, in the case of a cluster of farmers we interviewed in Pierīga, farmers exchange information about the range of customers, sales outlets and production demand, while the information provided to "outsiders" is limited. Other cases have also been reported when other farmers have deliberately provided misleading information.

Situational and episodic knowledge transfer predominates in the case of direct marketing. Interviews indicate that informal exchange of knowledge among farmers is unsystematic. It takes place in the usual places of rural communication – market, shop, post office, village centre. Informal learning is not intentional. Farmers involved in direct marketing are not organised in cooperatives or producer groups where targeted knowledge sharing or learning would take place. The exception is the Jaunpils home-producers' association, which involves several farmers and their supporters. An additional channel for acquiring knowledge is establishing close personal ties with a trusted, more experienced colleague or relative.

5.2.1.5 General comments and reflections

Even though much of the required knowledge is passed down and exchanged informally, direct marketing requires bringing this practice into line with today's market conditions and societal demands. Social learning and informal peer-to-peer learning is widespread, though it has the undesirable side effect of narrowing down the range of channels and forms for selling one's products. It may be the case that no one in the particular social circle has experience with novel forms and channels. Access to knowledge possessed by other groups is, therefore, very important and could be facilitated by institutional learning. The continuation and adaptation of old practices to new market and societal conditions require innovative solutions. Unsurprisingly, we note that several of our interviewees were aware that "old" knowledge exchanged among peers requires the influx of new insights. Therefore, it is crucial to acknowledge that farmers involved in direct marketing are aware of other sources of information that allow new practices to enter into the mix.

Most of the farmers involved in direct marketing practice several forms of direct marketing. We note that our respondents were opportunistic as regards the methods they employ to distribute their goods. As the circumstances change, a particular channel may become more prominent. For example, a farmer admitted that by limiting sales on the farmers' market due to a lack of buyers, she has strengthened

and even expanded the range of regular customers shopping directly on the farm; another farmer had expanded sales through an online channel.

Even if direct marketing is an inherited, traditional activity and the farmers themselves do not regard it as a distinct innovation, there are signs of innovation and modification. Direct marketing appears to be a highly mutable and somewhat unpredictable practice. This often means that farmers have to experiment with different sales techniques and distribution channels whose continued relevance is routinely re-evaluated as a result of communication with regular clients and the available technological and infrastructural means. A prominent approach is building social circles with regular customers. This can eventually become an important source of information and feedback for the farmers about their products. There have been several cases where farmers have started growing new types of vegetables because of consumer demand.

After our having explained what we meant by direct marketing, several of our respondents confirmed that they were adopters, even though they previously had indicated that they were non-adopters. There were farmers whose responses indicated that they often did not regard what they were doing as a specific kind of activity. This was evidenced by discrepancies in their accounts as to when direct marketing was first considered and or implemented. Several respondents seemed to make a distinction between routine distribution of goods to neighbours and people in the general vicinity and practising direct marketing.

There are indications in the interviews that suggest that direct marketing is permeated by illegal practices, though their impact is manifold. For example, presenting imported products as if they were the farmer's own is a routine violation of official regulations, but the controlling agencies seem to be unable to eradicate this practice. In turn, the farmers themselves often do not have the resources, the understanding or the desire to change the situation (e.g. by protesting, approaching the people in charge of the market, developing their own collective certification, etc.). Farmers' experience shows that market management is not interested in solving this problem. In this instance, the consumer is a kind of victim who is unable to easily differentiate between domestic produce and imported vegetables. Unfair competition, coincidentally, is another factor contributing to the abandonment of the innovation, as is poor market management by the owners, municipalities and controlling agencies.

Some of the interviewed farmers who had abandoned the innovation continued to work in agriculture, both in the production of niche products and common products for the industrial market, though one farmer had abandoned her attempt to obtain an organic certificate. There are other informal economic activities that permeate direct marketing, which, in fact, ensure the continued involvement of some farmers. Several farmers engage in semi-legal and illegal practices, such as selling animal products and household products (milk, cottage cheese, fresh meat, etc.) without certificates and permits. This happens in an "under the counter" fashion and the range of clients is limited. Buyers are people who trust the quality of household products and consider the official food safety and hygiene requirements to be excessive.

We suggest that direct marketing in Latvia can be considered a form of retro-innovation. By this we mean that it is a reinterpretation of a traditional practice in a contemporary context. This involves

a series of innovations in different domains (social, technological, organisational) to successfully combine routine commercial practices with new possibilities and changing tastes and norms.

5.2.2 Findings form the AKIS experts' interviews and advisory suppliers' survey

5.2.2.1 Advisory landscape in the focus region

Farmers in the Pierīga region are well situated to have access to various advisory organisations and providers of advice in general. An important regional player is LRATC – a privately-owned, but publicly funded organisation. The presence of several markets (e.g. Central market in Riga, Tukums market) provides additional support, while state institutions (e.g. Food and Veterinary Service, State Revenue Service) are easily accessible both in person (in Riga) and via ICTs. However, the crucial component, confirmed in our interviews, is the high number of farmers engaged in direct marketing, who serve as an invaluable source of advice.

5.2.2.2 Key players of advice for the innovation area in the focus region

Informal advice is more prominent than formal consultation in the case of direct marketing, with limited involvement of organisations. Both in our interviews with farmers and experts it was evident that the flow of knowledge regarding direct marketing is quite diffuse. Neighbours, relatives, fellow practitioners and the organisers of specific markets are key providers of knowledge and advice at all stages of the innovation cycle. The nature of the advice varies, but often relates to the distribution and marketing of goods. Formal advisory organisations assist in matters pertaining to taxes and bookkeeping. A potential consequence of widespread familiarity with direct marketing and its perceived commonality may be a perception (though not shared by all) that seeking advice and learning outside of the family and informal exchanges with other farmers is not necessary.

Some forms of direct marketing are comparatively worse off in terms of the availability of advice. For example, online sales and direct purchasing groups have no formalised and structured advice procurement procedures. It is also difficult to get advice from other farmers about these new forms and channels of distribution, so producers are learning by experimenting and from the experience (both positive and negative) of their colleagues, using information about e-commerce in other sectors or relying upon the input of their children.

The knowledge chain as regards direct marketing is fragmented. Our research indicates that advice provision regarding direct marketing and local markets is hampered by issues coming both from the supply side (e.g. lack of advisors specialising in direct marketing) and the demand side (e.g. limited interest in approaching advisors for suggestions and assistance). Overall, neither supply, nor demand, is clearly articulated.

Informal learning among farmers is more active than cooperation in marketing, but there is understandable caution in this respect. In the field of direct sales, there is conspicuously little co-operation between farmers on issues related to marketing. This reluctance to cooperate could be explained by the fact that marketing information is relatively sensitive, and farmers are not inclined to share marketing tips, fearing competition. One respondent actually told us that he had received intentionally misleading information from other farmers, though this was not widespread. On the other

hand, there is evidence of co-operation and assistance regarding more general matters pertaining to direct marketing (e.g. information about markets).

The effectiveness of the direct marketing business model may be due to the social embeddedness of several farms. Direct marketing is economically advantageous for small farms specialising in, for example, growing vegetables, herbs, salads and garlic. Its economic benefits are also manifested in small part-time farms, which produce small-scale niche products and also deal with small-scale processing and handle all sales without intermediaries, thus generating higher income. This is often done through established sales channels via social ties (relatives and customers in the workplace through relatives). Reliance on social networks also saves the time needed for marketing, as significantly more time would be needed to sell products in the market.

Re-conventionalisation is a phenomenon that has emerged recently. This refers to ceasing or limiting direct marketing activities, which were previously seen as a lucrative alternative to the dominant market channels. Especially in the 1990s, many farmers chose individual sales strategies, including direct marketing. More recently, as a result of falling demand and improvements in farmers' economic analysis and management skills, many farmers have begun to re-evaluate the costs and benefits of direct marketing, and the suitability of this business model. The main benefits of direct marketing have historically been better income for output, but these were offset by significant investments of time and labour.

Various forms of trading and distribution channels are developing at different rates. For example, traditional urban markets are stagnating and gradually declining in importance, though it must be noted that some farmers' markets continue to flourish (e.g. Straupe). Direct purchasing groups have gradually become more prominent, and distribution via online tools is also increasing in importance. Many of these dynamics are not captured by official statistical data. The growth and decline of various distribution channels are due to different drivers. The decline of local markets is largely determined by the depopulation of rural areas and lack of professional management and long-term planning for the future of these markets. Internet marketing, on the other hand, is facilitated by the improved skills of farmers (both young and old) in the use of mobile applications (often facilitated by younger relatives), easy access to courier services and the growing interest of consumers in niche products. Direct purchasing groups are consumer-driven innovations facilitated by motivated and educated urban consumers and entrepreneurs.

In the case of direct marketing, there are no specialised institutionally based knowledge brokers or intermediaries that could, or aim to, facilitate the spread of direct marketing. This was corroborated in our interviews with farmers. However, an examination of other sources (e.g. expert interviews, studies, websites of AKIS organisations, press publications) suggests the presence of such agents or organisations. It should be borne in mind that providing advice specifically regarding direct marketing is not their main function. For example, in some farmers' markets (Kalnciema market, Straupe market) the organisers partially perform the advisory function. A prominent non-governmental organisation (Latvian Rural Forum) also provides advice on direct marketing, but this is part of a general attempt to stimulate rural development, rather than a specific focus on short food chains. Consequently, the available advice is often fragmented, conveyed in a non-systematic manner, and not always perceived by farmers and market representatives as useful for implementing the innovation.

In addition to providing farmers the agricultural knowledge and skills necessary to produce high-quality products, advisors need to be able to impart entrepreneurial and marketing skills. Many of our interviewees noted the need for skills associated with planning a business and marketing. While some argued that this couldn't be taught in courses, it was evident that a limited ability to market one's goods was a serious challenge for many farmers. This was confirmed in the interviews with experts who noted that direct marketing requires a unique combination of skills that few farmers possess. Specifically, farmers may be quite proficient at growing vegetables or fruit, but they may lack the skills to present it and attract customers. This point was often made by market representatives who noted that they often have to encourage farmers to think about their product more thoroughly.

Exchange of knowledge and experience could be facilitated by advisors. It was suggested that advisors could organise training events on direct marketing, with the involvement of experienced farmers as consultants and mentors, on a more regular basis. In addition, meetings could be organised with consumers and direct purchasing groups to discuss demand and supply issues, consumer preferences, dietary requirements, etc. Specific seminars with farmers, LRATC advisors, municipalities and other organisations could be useful to discuss rules, regulations and the organisation of trade.

The experts' perception of direct marketing was positive overall. The assessment was seldom made in relation to environmental concerns, however. In most case, direct marketing was considered positive in relation to rural development (e.g. markets as markers of regional identity) and the quality of life in rural areas, as it was a good way to make a living. Direct marketing (especially in the context of town or farmers' markets) also created opportunities for socialisation.

The positive perception, however, rendered a critical appreciation of direct marketing difficult. The representative of the Rural Forum indicated that discussions of direct marketing generally emphasise the good sides of it, but the costs associated with direct marketing (e.g. emotional and labour) are inadequately appreciated. These underappreciated costs, in fact, may account for some farmers dropping this form of selling goods.

There are incompatibilities between direct marketing, the corresponding AKIS and governance mechanisms. From a general perspective, direct marketing has been left on its own in terms of institutionally based and formally organised advice provision. There is little in the way of formal advice or it is insufficiently specific to be of practical use to people engaged in direct marketing. There is also a lack of formalised management, control and certification procedures and tools. Existing control and monitoring procedures from the Food and Veterinary Service and municipal police are patronising and restrictive. There is an obvious lack of an empowering and coordinating management procedure and instruments. There is also a lack of self-organisation among farmers. This may explain the lack of collective certification and mutual control and supervision mechanisms among farmers, which are present in other countries.

5.2.2.3 Transformation of advisory landscape

As mentioned above, there are currently few formal advisory organisations that provide specific advice on direct marketing. For example, the organisations we approached did not have specific staff members involved in the provision of advice about direct marketing, though several of their

employees do, in fact, provide advice about these matters. However, in most cases these concern specific elements of direct marketing, so the advice is partial and requires that the farmer in question seek additional advice elsewhere. LRATC is an excellent instance of this. We interviewed a representative of their regional branch who indicated that employees provide advice regarding bookkeeping and navigating the plethora or official requirements. They also provide advice regarding technical solutions for home producers. However, sales techniques and practical skills are imparted by way of peer-to-peer learning.

Advice is often provided by organisations whose primary purpose is not the provision of advice. As mentioned above, many of the organisations that actually assist farmers in relation to direct marketing are not actually advisory organisations. The organisers of markets provide advice regarding marketing and presentation, while, for example, the Latvian Rural Forum and rural partnerships are primarily interested in rural development, rather than direct marketing as such.

Consequently, the case of direct marketing to a certain extent lays bare the lack of formal advice provision, though it illustrates the significance of peer-to-peer and informal learning practices. The limited advisory resources available to farmers willing to engage in direct marketing indicate that there is room for further development. However, the long tradition and resilience of direct marketing suggests that an innovative practice can survive with limited institutional support. With some caveats, peer-to-peer and informal learning in general have managed to compensate for this seeming deficiency of the regional FAS. This is contingent upon a high number of practitioners willing to share their knowledge and skills with others, and there are areas (e.g. cooperation) that require further attention.

6 Discussion: Answering research questions

6.1 Role of advisory suppliers in the farmers' TCM and innovation paths

What roles do advisory services play in the cycles of farmers' decision-making?

Suppliers of advice play various roles in the farmers' TCM and innovation paths, and this depends on the type of innovation chosen. Our interviews clearly indicate that organisations and agents in the Latvian FAS and AKIS more generally provide different kinds of assistance. Their role is, to a large extent, determined by the size and focus of the farm. However, the case of biological pest control shows that innovations that involve significant amounts of technical and agricultural knowledge require assistance throughout the innovation cycle. A diverse range of actors were involved, though LRATC and scientific institutions played a crucial role in the assessment and implementation stages by providing farmers with the necessary information to work with biological pest control methods. In the case of direct marketing, however, formal advisory organisations and advice providers were more prominent in relation to general farming and management issues, while peer-to-peer and other informal learning practices were more important in the context of the innovation. This is not to say that folk knowledge and informal exchanges were not important in the case of biological pest control – they certainly were. Nonetheless, the responses we received indicate that the knowledge required to use biological pest control proved to be more technical in nature, requiring the involvement of formal advisory organisations. It is unclear, however, to what extent the advisors made the farmers reconsider their previous choices.

Organisations with an advisory function were prominent in the assessment stage in the case of biological pest control, but considerably less so in the case of direct marketing. A common theme in both cases we looked at was that knowledge and skills were often passed down informally, without the involvement of advisory organisations or other institutional suppliers of advice. This was especially prominent in the case of direct marketing where most respondents had learned about this practice from relatives or peers. In the case of biological pest control, institutions such as LRATC and the Rural Support Service were crucial in raising awareness or at least reiterating the relevance of these methods in the context of organic farming. However, in neither case was there a clear emphasis on sustainability. This could perhaps be explained by the fact that there are no public disputes over the fact that both direct marketing and biological pest control have a positive impact on sustainability (understood broadly), though some experts did express concerns regarding the uncritical acceptance of the supposed positive impacts.

The nature of the interaction in the assessment stage depended on the nature of the agent or organisation involved, and the innovation being assessed. The organisations we interviewed indicated that they employ different methods when interacting with farmers. LRATC showed a preference for in-person forms of interaction (e.g. one-to-one, seminars, courses), while state institutions not formally involved in the provision of advice provided consultations over the phone. In the case of direct marketing, the provision of advice was almost accidental – a by-product of other activities. This can partly be explained by the simple fact that no institution provides advice regarding direct marketing as such, though LRATC provides advice on bookkeeping, permits, etc. This has direct implications for the assistance that can be provided in the assessment stage. Biological pest control seems to illustrate a more structured approach,

where informal and formal learning co-exist, and assessment is based on a combination of formally approved and folk knowledge. Direct marketing, however, illustrates a more fragmented and anarchic advisory landscape where assessment is done in practice and by learning from other practitioners, rather than following institutionally sanctioned forms of advice.

The implementation stage showed marked differences between the two innovations in the involvement of advisors. General agricultural knowledge and knowledge specific to organic farming were deemed crucial for a successful implementation of biological pest control methods. Furthermore, the implementation stage showed a pronounced preference for formal advisory organisations, though less than half of all respondents had received assistance from an agricultural advisor. In the case of direct marketing, some interviewees expressed visible confusion as to the distinction between assessment and implementation. Among those who could make the distinction, the advice of fellow practitioners, farmers, and relatives was crucial during the implementation stage, with little involvement of formal advisory organisations or institutions in general. Overall, a learning-by-doing approach was favoured, though the technical and agricultural knowledge requirements of biological pest control meant that advisors were engaged on a more regular basis.

6.2 Farmers' diversity and role of advisory services in innovation uptake processes

What is the relationship between different types of farmers and advisory service providers in the decision-making process?

Contextual factors, practical considerations and philosophical outlooks determine the involvement of formal advisors in the decision-making process. In both cases we looked at, it was apparent that some objective characteristics of the farm and/or farmer determined the nature and frequency of their interactions with advisory organisations and institutions or agents that provide advice on the innovation in question. For example, some products, such as cereals and beef, were believed to be poorly suited to direct marketing. In the case of biological pest control, the size of the farm was believed by many to limit the extent to which biological methods were practical. In many cases, there were seemingly objective obstacles to implementing the innovation and consulting a specialist. This was echoed in the interviews with experts who opined that small to medium-sized farms were more likely to consider the studied innovations. However, the interviews suggest that, in addition to these seemingly objective characteristics of the farm, other factors seem to play an equally important role. For example, the prevalence of the innovation in the surrounding area, the farmer's opinion on the quality of organically grown vegetables, and the farmer's agricultural knowledge and experience play a significant role in determining his or her inclination to assess and implement the innovation, and seek assistance from formal advisory organisations.

Farmers implementing knowledge-intensive innovations showed a greater reliance on formal advisory organisations. Both innovations require the farmer to acquire new forms of knowledge and skills, and both innovations relied on pre-existing social relations. However, the complexities of biological pest control demand greater familiarity with agricultural and biological (agronomic) knowledge, and, consequently, a greater involvement of advisors with the relevant scientific and technical expertise. This alone does not account for the greater reliance of formal advisory organisations, as availability of advice was more problematic in direct marketing, which allows for the possibility that help would have been

sought were it widely available. This is corroborated by the fact that the practitioners of direct marketing regularly seek advice from other, non-institutional sources such as their peers and relatives.

Regional context played a prominent role, but not in terms of access to advisory resources. Latvia is a comparatively small country, and many of the regional FAS and AKIS actors are also prominent in the national AKIS. For example, LRATC has several regional offices. The same is true of other state institutions that provide advice to farmers located in all parts of Latvia. Nonetheless, the interviews suggest that the regional fate of innovations also depends on the particular advisors in the region (e.g. some advisors were praised, while others were deemed lazy), and the presence of markets and distributions channels (e.g. proximity to Riga in the case of direct marketing). Thus, while access to advisory resources is not a limiting factor, local specificities play a role in the uptake of the innovation.

The use of online tools did not feature prominently in our sample, though their influence appears to be growing. Younger farmers were more inclined to use a variety of digital resources, though many farmers (including older ones) cited the online resources provided by the Rural Advisory Service and meteorological forecast systems. The Internet was often mentioned as a prominent way of gathering useful information. In the case of direct marketing, this appeared to be more prominent.

The commercial motivation of input providers (in the case of biological pest control) caused concerns among AKIS experts and organisations regarding the impartiality of the expertise provided. While the practical value of the products that were sold was not explicitly questioned or doubted, it was suggested that input providers have a definite interest in encouraging the use of the products they sold. This, however, was at the expense of a more holistic assessment of the pest control needs of the farm in question.

6.3 Transformation of advisory service suppliers and farmers' innovation uptake processes

How does the transformation of advisory service providers' landscape influence farmers' decision-making and uptake of innovation?

The transformation of the advisory landscape appears to be important in the case of direct marketing, but the uptake of biological pest control is more related to subsidies and changes in legislation. The innovations we have looked at manifest different responses to the transformation of the advisory landscape. Direct marketing has benefited from the popularity of various local and farmers' markets. The organisers are key providers of advice and often assist the farmers in the implementation stage, while indirectly encouraging others to assess direct marketing. In the case of biological pest control, it was suggested that advisors have had a limited impact on the uptake of the innovation. The generous subsidies, demand for organic products and the restrictions placed upon the use of chemicals have encouraged organic and integrated approaches to farming, though the activities of input providers (e.g. *Bioefekts*, *Agrimatco*) should also be acknowledged.

Many people rely on both regional and national sources, though regional specificities persist. Our interviews suggest that farmers rely on a great variety of sources for information, knowledge and practical skills regarding these innovations. While prominent national players (e.g. LRATC) play a significant role, most farmers have individual channels for acquiring the advice and input they need. This can be

cooperation with a knowledgeable peer, engaging a specialist, attending workshops and supplementing existing knowledge by studying online sources. The growing importance of markets (for direct marketing) and input providers (for biological pest control), and online sources more generally has also introduced changes in the R-FAS. Consequently, there are many different channels for receiving advice, which are reflected in different regional and sub-regional configurations, though the extent to which they contribute to the proliferation of triggers is unclear.

The importance of peer-to-peer, practical learning and courses (organised by LRATC and the Rural Support Service) indicates that farmers' and advisors' access to shared knowledge is reasonable, though negative aspects are seldom publicly discussed. Our interviews with experts suggest that public discourse about direct marketing and biological pest control tends to be positive. There are some uncertainties regarding biological pest control (e.g. are the products actually healthier?), but there are obvious limits in the extent to which negative side-effects can be appreciated and considered collectively. Specifically, in the context of biological pest control it was suggested that there is an uncritical acceptance of positive claims, whilst ignoring the dangers associated with excessive use of plant decoctions and insects that are natural enemies of particular pests. In the case of direct marketing, the labour and time investments necessary to sustain this practice often go unnoticed, as does the fact that farmers may find it challenging to become good marketers of their products.

7 Case study narratives

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8 Conclusions: Insights & Highlights

8.1 Insights

There are many factors that contribute to a successful uptake of innovations, and the availability of advice from formal advisory organisations is only one part of the process. There were several respondents who indicated that they had needed a piece of advice or information during the implementation stage, but the R-FAS and AKIS more generally had failed to satisfy this demand. Indeed, direct marketing in Latvia sorely lacks appropriate advisory support. However, our interviews suggest that familiarity with successful examples of implementation, appropriate material and infrastructural conditions for implementation, a corresponding philosophical outlook and familiarity with the innovation as such are also important factors.

Failure to see the value of a particular innovation and the practical constraints limiting its applicability hamper the uptake of direct marketing and biological pest control. The decision not to adopt an innovation was sometimes related to the costs involved. However, the belief that there is no specific value attached to the innovation in question was equally important. Furthermore, the specificities of the two innovations we looked at made them more applicable to small and medium-sized farms that did not specialise in growing cereals or beef.

Both innovations would benefit from readily available impartial expertise. Biological pest control and direct marketing face different advisory "gaps". However, there is a need for specialised advice in both areas as their continued existence is partially dependent on the availability of public support measures (biological pest control) and the willingness of practitioners to exchange experiences (direct marketing). Furthermore, in the case of biological pest control in particular there is a need for independent advice to counterbalance the growing influence of input providers. Furthermore, while the experts and AKIS organisations we interviewed listed a similar range of advisors to the ones mentioned by farmers, they were more likely to indicate a lack of independent advisors, suggesting considerable room for growth.

Both case studies illustrate the importance of informal learning. Biological pest control and direct marketing are both practices that are not regarded as innovative by the farmers themselves. However, they continually evolve, combining old tricks with new knowledge and insights that are often learned in informal exchanges between peers and relatives, without the explicit involvement of formal advisory organisations.

8.2 Highlights

The national FAS and AKIS remain fragmented as planning and coordination mechanisms are currently weak. While LRATC is a major organisation and plays a crucial role, advice provision in agriculture in Latvia is highly diverse and decentralised. An increasing number of public, private and third sector organisations are involved in providing advice to farmers, and there is little evidence of widespread coordination among them. This was corroborated in the responses we received, which indicate a partial and fragmented view of the available advisory services.

There is a certain opportunism of advisors in terms of establishing relationships with farmers, and many of them provide advice individually, rather than through the institutions they work for. On several occasions our interviewees referred to a particular advisor or scientist providing advice

during the assessment and implementation stages. It was not always apparent whether the advisor had been engaged through an institution (e.g. university or LRATC) or as an individual. Supplementary comments indicated that an advisor or scientist had been approached because of his/her reputation or prior acquaintance with the farmer in question. Regional advisors also often fall into the category of neighbour/peer, as was exemplified by one advisor in the case of biological pest control.

The main advisory organisation was approached often regarding general farming issues. There were differences in the extent to which LRATC was involved in relation to the innovations we looked at. However, the interviews indicate that LRATC was by far the most popular organisation advising farmers on general matters pertaining to the management of the farm.

Managerial, technical and legal knowledge are paramount in successfully managing a farm, though the character of the manager also plays a role. The skills and forms of knowledge required to manage a farm proved to be predictable. However, many farmers noted the importance of the farmer's personal traits, implying the perception that farming is a very particular vocation.

Several respondents had difficulty separating awareness, assessment and implementation. The reasons for this were manifold. For example, many of our respondents transitioned to biological pest control when they became organic farmers. This means that, while the distinction between awareness-assessment-implementation may be applicable to particular methods, it does not hold for the entire range of biological pest control methods. The adopters of direct marketing often found it difficult to distinguish between assessment and implementation. In other cases, farmers simply could not distinguish between the advice received at the different stages. This may indicate that for them the uptake of an innovation was a single, continuous process that can only be separated into discrete stages analytically and somewhat artificially.

Farmers show limited awareness as to how widespread the innovation is in the region. We were repeatedly struck by the different assessments of whether biological pest control and direct marketing were popular methods in the region. This underlines the internal diversity of the regions we chose, though there may also be issues related to identifying an adopter, as even many of the adopters we interviewed failed to identify themselves as such.

Somewhat surprisingly, a considerable share of farmers sold their products directly to consumers. While this was to be expected in the case of direct marketing (adopters in particular), we were struck by how frequently the farmers we interviewed about biological pest control indicated that they sold their products directly to consumers. This underlines the claim that direct marketing is a common (though still evolving) practice in Latvia.

Both biological pest control and direct marketing show signs of retro-innovation. We have repeatedly stressed that for many of the farmers we interviewed these were not innovations. However, it is important to note that these practices involve a mix of knowledge and skills that requires a constant influx of new insights and techniques that allow them to adapt to changing circumstances and make use of recent developments (e.g. pheromone traps, online sales). In short, they involve the combination of "old" and "new" knowledge.

Success stories underline the importance of drawing on different sources of advice. The case studies illustrate different advisory landscapes, but both highlight the importance of peer-to-peer and informal learning that supplements, and occasionally compensates for the lack of, assistance from formal advisory organisations. In the case of biological pest control, there appears to be a co-existence of sorts between formal instruction (e.g. courses) and informal learning. In the case of direct marketing, there appears to be a kind of division of labour where advisory organisations are engaged regarding technical requirements and permits, whereas the skills necessary for distribution and sales are acquired through practice, customer feedback, and consultation with peers.

References

Central Statistical Bureau of Latvia (2019a) *Number of agricultural holdings and areas of agricultural crops in organic farming by statistical region* (ha): https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__zeme__laukstrukt_13/LSSA13_1109.px/ ,accessed on 31/03/2019.

Central Statistical Bureau of Latvia (2019b) *Number of agricultural holdings and land area by statistical region*: https://data1.csb.gov.lv/pxweb/en/lauks/lauks__skait_apsek__visp__laukstrukt_13/LSSA13_101.px/ ,accessed on 31/03/2019.

Šūmane, S., Grīviņš, M., Tisenkopfs, T. (2014). *AKIS and advisory services in Latvia*. Report for the AKIS inventory (WP3) of the PRO AKIS project. PRO-AKIS project report.

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