

Sustainable innovation in agriculture: Building a strategic management system to ensure competitiveness and business sustainability

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Abstract: To understand and promote the importance of business sustainability in agriculture as an important societal issue, one must use the circumstances to force modern-minded management to abandon the classical model of only complying with statutory obligations and to structure the knowledge to coordinate interdisciplinary approaches to ensuring sustainable innovation. The paper analyses the role of business sustainability in promoting sustainable innovation in agriculture. The study used a factor analysis applied to a sample of 183 companies ($n_1 = 183$) and qualitative research through focus groups ($n_2 = 5$). The main objective was to identify the factors influencing the innovated areas in relation to sustainability. The results of the factor analysis showed a six-factor solution: process approach, corporate social responsibility, quality management system, supply chain operation processes, demand for production, and employee performance.

Keywords: corporate social responsibility; factor analysis; knowledge transfer; performance; process approach; productivity; quality

Not only the development of the world's population but also constant changes in the climate, ecosystems and the business environment, as well as their harmful effects on society (Chalupa et al. 2021; Lee and Trimi 2021) emphasise the need to address responsible and sustainable innovation across a broad context (Saha et al. 2017; Cillo et al. 2019; Horbach et al. 2022), using a knowledge approach (Hadj 2020). This applies to all sectors, including agriculture, forestry and food. It is the voluntary integration of social and environmen-

tal aspects into all business operations and interactions with the stakeholders (Reficco et al. 2018). Agricultural enterprises have a moral obligation to work towards improving social well-being, which involves a new approach, attitude, and creating conditions to fulfil three pillars (Klarin 2018), namely social, economic, and environmental ones, which are balanced to the complete satisfaction of all parties involved, according to Sarkar and Searcy (2016). However, the improvement in all the conditions is based on setting an appropriate and

efficient knowledge transfer, thanks to which a sustainable competitive advantage can be achieved.

Porter's hypothesis assumes that environmental constraints create a competitive advantage by stimulating innovation (Hadj 2020), and so sustainable entrepreneurship and innovation based on new knowledge in the strictest sense are often associated with environmental connotations. Innovation, mentioned above in the context of eco-oriented innovators, is related to new technologies, knowledge, and savings from efficient production (Cancino et al. 2018), promoting the transfer of best practices and low-carbon technologies, seeking and sharing information on new low-carbon technologies, and developing technical skills to master these new technologies quickly and efficiently. However, in the broadest sense, responsible and sustainable innovation can be placed in the context of meeting the economic, social, and environmental objectives (Cillo et al. 2019), which are important in all business sectors, including agriculture, forestry and food.

It is about strengthening technological development, innovation, and knowledge transfer, including the related processing and investment in the development of modern intensive technologies enabling sustainable production. It can be stated that responsible and sustainable innovation is based on several principles, including (Cancino et al. 2018) market knowledge, the constant search for new opportunities, strengthening performance, the implementation of modern human resource management trends, setting effective knowledge transfer among the current employees as well as the future employees (knowledge management and knowledge continuity management), the art of overcoming obstacles, risk management, orientation to customers and other stakeholders, and effective cost management, which is in line with the research of Cancino et al. (2018) or Saha et al. (2017).

The research shows significant gaps, thus it is necessary to move from the narrow concept of sustainable innovation in relation to an environmental context. In connection with the terminological ambiguity, it is necessary to identify clusters describing sustainable innovation.

Especially nowadays, being affected by war in Europe, high inflation and the ever-growing COVID-19 pandemic, sustainable innovation is essential for the survival and success of organisations (Lee and Trimi 2021). Organisations are under great shock; however, new practices may help in a future competitive context. Agricultural entities use modern technologies, but much less is invested in production automation,

robotisation and digitisation. Food consumption will increase in the future mainly due to the increasing population. Great hopes are, therefore, placed in the principles of smart agriculture. The ambition of this research is to identify the factors affecting the innovated areas with regard to sustainability.

Theoretical part. Businesses that are not only focused on short-term profit but also take the principles of long-term sustainability into account, can be called sustainable businesses, which are based on the principles of sustainable development (Nosratabadi et al. 2019; Lukáč et al. 2021). For businesses, sustainability is becoming a fundamental principle (Wichaisri and Sopadang 2018). Innovation and technological opportunities, as well as changing consumer preferences and sustainability concerns, have become the main drivers of the economy. According to Zilberman et al. (2013), technological progress requires constant public investment in research and innovation, as well as in the creation of a regulatory framework and financial incentives that would lead to the commercialisation of new products. Research and innovation, the predominant engine of European Union (EU) priorities, are dedicated to capital-intensive systems and higher levels of global value chains. The importance of innovation and knowledge in ensuring sustainability will grow; it is clear that sustainability is a driver of innovation (Kneipp et al. 2019) together with an adequate knowledge transfer setting (Hadj 2020). The circular economy, corporate social responsibility (Klarin 2018), shared economics, technological innovation, and lean manufacturing (Wichaisri and Sopadang 2018) are just several trends that can be considered as drivers of sustainability-related business model innovation.

The research shows significant gaps in the knowledge and definition shortcomings (Reficco et al. 2018) in the context of the factors influencing the orientation towards sustainable innovation. At the same time, it is necessary to move from the narrow concept of sustainable innovation to an environmental context, involving a wide range of stakeholders' interests. Table 1 presents the defined framework for sustainable innovation. To achieve the framework of definition variants, a qualitative approach was taken to systematically review the literature using data from the Web of Science (WoS) and Scopus.

Based on Table 1, five basic clusters describing sustainable innovation can be defined. In the first cluster, the authors oppose narrowly defined eco-innovations. The second cluster is widely understood as the three-pillar context for sustainable business and the mechanism of economic, social, and environmen-

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Table 1. Sustainable innovation in the context of different areas of definition variants

Order	Definition of sustainable innovation	Comments
1.	Sustainable innovation is a strategic and systematic approach to economic, social, and environmental aspects (Kneipp et al. 2019). It requires a change in philosophy and organisational structure (Adams et al. 2016).	The authors oppose isolated actions such as eco-innovation. On the contrary, social and environmental benefits are also desirable in addition to the economic impact.
2.	Sustainable innovation reconciles economic, environmental, and social goals (Adams et al. 2016; Cillo et al. 2019; Kneipp et al. 2019). It requires going beyond economic connotations and actively managing social and environmental issues, material cycles, and waste reuse (Lubberink et al. 2017; Reficco et al. 2018).	Several authors emphasise the connection with the three-pillar concept of business sustainability . They point out the need not to limit themselves to the company's economic goals. At the same time, the authors emphasise the mechanisms of economic, social, and environmental cooperation.
3.	Sustainable innovation improves environmental, economic, and social sustainability performance (Hall et al. 2018). Sustainable innovation practices have a significant positive correlation with business performance (Kneipp et al. 2019).	Sustainable innovation is associated with increased business performance through effective knowledge sharing. The process approach helps manage relationships and dependencies to improve business performance.
4.	Sustainable innovation contributes to the sustainable competitive advantage of organisations (Kneipp et al. 2019).	Sustainable innovation contributes to the organisation's sustainable competitive advantage . The primary indicator of sustainable competitiveness is business quality, which requires economic, socio-cultural, and environmental dimensions to be applied.
5.	Sustainable innovation implies a sustainable lifestyle and is a driving force for sustainable development (Hernandez-Vivanco et al. 2018). The authors refer to a holistic and long-term process of sustainable development.	Sustainable innovation as a driving force for sustainable development – the concept of development, the idea of needs, and the idea of future generations including the setting of knowledge continuity management (Klarin 2018).

Source: Own elaboration

tal cooperation. The third cluster highlights performance through knowledge sharing with stakeholders, which is followed by cluster 4 under sustainable competitiveness. Sustainable innovation as a driving force for sustainable development is part of the 5th defined cluster. Responsible and sustainable innovation aims to respond to overarching societal challenges (Lubberink et al. 2017), so it can be said that sustainable innovation conceptually overlaps with responsible innovation, which Adams et al. (2016) explicitly consider being a path to sustainability. Lubberink et al. (2017) also stated that sustainable innovation can serve as a source for understanding responsible innovation. Table 1 shows that sustainable innovation is linked to the triple bottom line with respect to meeting economic, social, and environmental objectives to increase the organisation's performance while ensuring its sustainable competitiveness.

The bibliographic analysis of the data from the Scopus database (2 479 results) when searching for 'sustainable innovation' or 'responsible innovation' on Oct 1, 2022

using the VOSViewer 1.6.16 program provided the results shown in Figure 1.

The keywords associated with sustainable innovation or responsible innovation in agriculture are, in particular, sustainable development linked to the concept of the triple bottom line, corporate social responsibility, stakeholder engagement, social capital, human resource management, climate change and knowledge. The bibliographic analysis also indicated significant environmental connotations, especially environmental management, and life cycle management. The ethical level associated with the philosophical aspects and responsibility towards the community cannot be neglected either.

Based on the literature search, the orientation of sustainable innovation in agriculture can be summarised in the areas of labour productivity, the quality of the work or products, technologies aimed at reducing negative environmental impacts (Hernandez-Vivanco et al. 2018), material innovation, working practices (Hernandez-Vivanco et al. 2018), social innovation

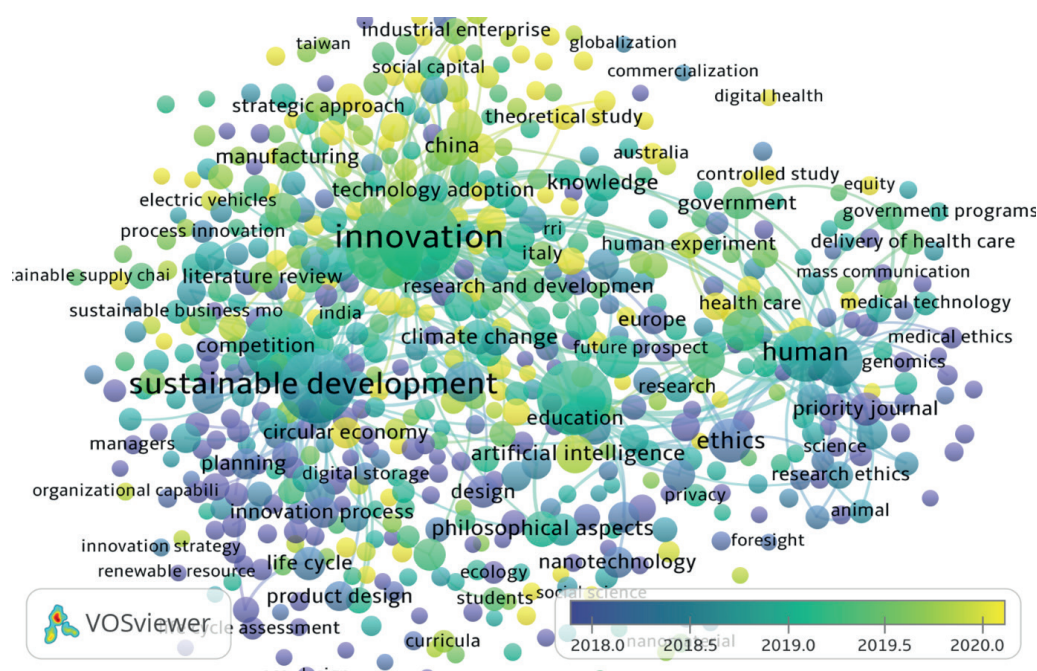


Figure 1. Bibliographical analysis – the overlay visualization of key words

Source: Own elaboration in VOSViewer 1.6.16

(Lubberink et al. 2017), marketing innovation, organisational innovation in the context of the organisational structure, relationships or climate changes (Adams et al. 2016; Kneipp et al. 2019), material or service supply innovations, innovation in the way products or services are sold (Kneipp et al. 2019), the length of the production process (Hernandez-Vivanco et al. 2018), production costs (Cillo et al. 2019) and knowledge transfer (Saha et al. 2017).

Sustainable business innovation in agriculture is crucial for strengthening competitiveness and job creation in research and development (Hall et al. 2018). A collaborative innovation process that integrates profitable production while addressing the economic, environmental, and social pillars of sustainability is identified by Jordan et al. (2016) as 'sustainable commercialisation'. Tajeddini (2016) showed that if an organisation is more focused on innovation in education with an emphasis on practical knowledge transfer, it leads to an overall improvement in the organisation's performance. The paper analyses the role of sustainable entrepreneurship in promoting responsible and sustainable innovation in agriculture. Although most studies focus on sustainable innovation research in the tertiary or secondary sector, the primary sector, i.e. agriculture, forestry and food industry, is also important for further research in this area. Therefore, the main objective was to identify the

factors influencing the innovated areas with regard to sustainability.

MATERIAL AND METHODS

The areas of sustainable and responsible innovation in agriculture are analysed through quantitative and qualitative research using the online questionnaire technique of data collection. Previous publications and other documents related to responsible and sustainable innovation and sustainable management systems were reviewed as part of the study preparation. The questionnaire survey was conducted via Google Forms and completed by the middle or senior management of the organisations, and, in the case of smaller organisations, by the owner ($n_1 = 183$). The sample was based on the Albertina database of organisations (which contains important data from more than 2 700 000 organisations registered in the Czech Republic). In total, 850 organisations were contacted (based on a random selection, 70% from the tertiary sector, 20% from the secondary sector, and 10% from the primary sector according to the recommendations of the Czech Statistical Office) and the response rate was 21.5%. There was one respondent per organisation. In checking this criterion, IP addresses were checked and those that showed non-compliance were completely excluded from the research. The questionnaire was created

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by the authors and a preliminary survey ($n_3 = 10$ respondents) was carried out before sending it to see if the questions were understandable. Based on the feedback from the preliminary research, the questions were reformulated (mostly, it was an explanation of concepts, removal of duplications, shortening of individual questions, etc.). At the same time, we found out whether the questionnaire is too difficult and whether the respondents did not spend a lot of time completing it (within 20 min). We do not include the results of the preliminary research in the results of the questionnaire survey, they only served to adjust the questions in the questionnaire.

The questionnaires were designed to comply with the ethical rules and the requirement of anonymity. The basic identification questions include the following variables: the sector of an organisation (primary, secondary, and tertiary), the size of the organisation by the number of employees, majority ownership (Czech or foreign organisations), the type of organisation (private, public, and non-profit) and the annual turnover, see Table 2.

The minimum sample size was determined according to Krejcie and Morgan's formula. The minimum number of respondents ($n = 164$) was objectively determined while maintaining the sample's representativeness. The χ^2 test was performed for selected nominal variables depending on the size of the organisation according to the number of employees. To find the hidden factors, the multidimensional statistical method of factor analysis was applied, which is used to reduce the number of variables (to characterise p variables by a smaller number of common factors) and to reveal the structure of the relationships between the variables. The null hypothesis of independence of the nominal variables (company size according to the number of employees) and

the other nominal variables (work productivity, quality of work, product quality, environmental technologies, material innovation, work instruction, social innovation, marketing innovation, organisational innovation, method of delivery, sales method, length of the production process, production costs) were tested at a 0.05 significance level. These nominal quantities were identified from the bibliographic analysis and literature search based on the authors cited in Table 1. The factor analysis determines the network of relationships between the variables in IBM SPSS Statistics 24 (Statistical Package for Social Sciences version 24) by estimating the factors using the principal component method and orthogonal rotation using the varimax method, which maximises the sum of all the factors' variances. The prerequisites for using exploratory multivariate factor analysis are cardinal variables, low cross-correlations, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy greater than 0.7, and non-zero correlations. The factor analysis model describes the observations by the following Equations (1):

$$\begin{aligned} X_1 &= a_{11}F_1 + a_{12}F_2 + \dots a_{1m}F_m + U_1 + \mu_1, \\ X_2 &= a_{21}F_1 + a_{22}F_2 + \dots a_{2m}F_m + U_2 + \mu_2, \\ X_p &= a_{p1}F_1 + a_{p2}F_2 + \dots a_{pm}F_m + U_p + \mu_p, \end{aligned} \quad (1)$$

where: $X_1, \dots, X_p$ – the observed variables; $F_1, \dots, F_m$ – the common latent factors; $a_{11}, \dots, a_{pm}$ – the factor loads; $U_1, \dots, U_p$ – the specific factors representing random deviations; $\mu_1, \dots, \mu_p$ – constants.

The KMO [Equation (2)] is between 0 and 1 (values closer to 1 are more appropriate), and the minimum

Table 2. Organizations participating in the research – primary data

Characteristics	Categories		
The sector of organization	Primary 4.4%	Secondary 41.5%	Tertiary 54.1%
The size of organization	≤ 50 26.2%	51–249 28.4%	≥ 250 45.4%
Majority ownership	Domestic 45.4%	Foreign 54.6%	–
The type of organization	Private 85.8%	Public 11.5%	Non-profit 2.7%
Annual turnover	EUR ≤ 10 mil. 38.3%	EUR 11–50 mil. 37.7%	EUR ≥ 50 mil. 24.0%

Source: Own elaboration

recommended value is 0.7. The principal component method is applied to extract the factors. All the necessary prerequisites for performing the factor analysis were met.

$$KMO = \frac{\sum_{i \neq j} r_{ij}^2}{\sum_{i \neq j} r_{ij}^2 + \sum_{i \neq j} u_{ij}^2} \quad (2)$$

where: KMO – Kaiser-Meyer-Olkin measure; r_{ij} – correlation matrix; u_{ij} – partial covariance matrix.

The suitable varimax extraction method was selected as follows (3):

$$V = \frac{1}{p} \sum_{j=1}^m \left[\sum_{i=1}^p \left(\frac{l'_{ij}}{h'_i} \right)^4 - \frac{1}{p} \left\{ \sum_{i=1}^p \left(\frac{l'_{ij}}{h'_i} \right)^2 \right\}^2 \right] \quad (3)$$

where: V – varimax value; p – specific variance; l'_{ij} – estimated factor loads; h'_i – communality for the i^{th} variable.

The qualitative research ($n_2 = 5$ plus the moderators) was based on focus groups, which is a suitable method of supplementing quantitative research in social sciences. The focus group participants were randomly selected from the approached companies in the Czech Republic. When requesting to fill in the questionnaire, agricultural enterprises were also asked to provide time for a focus group. After repeated calls, a focus group of five managers from agricultural enterprises took part. The qualitative research is based on individual interviews with owners and managers of Czech agricultural enterprises. Questions were asked regarding the sources of innovation and factors having a dominant influence on the sustainable development of the organisation. Afterwards, the results of the quantitative questionnaire survey were presented to the managers of the companies, and they added their insights and comments to the individual results. The individual results were commented on, and the moderators of the discussion asked about specifics in the agricultural sector, especially with regard to any perceived barriers, current trends, and the use of technological platforms.

This study contributes to the theory and practice of sustainable and responsible innovation, the framework of the determinants was also practically verified by the quantitative ($n_1 = 183$) and qualitative research ($n_2 = 5$). The survey took place from June 2020 to December 2020 and the interviews were conducted in September 2022.

RESULTS AND DISCUSSION

The majority of the surveyed organisations deal with business sustainability (41%), but the focus groups showed that the main reason is due to pressure from the external environment. 23% of the addressed companies pursue purely economic objectives in compliance with the law. The majority of the surveyed companies have business sustainability, or more precisely sustainable innovation incorporated into their company strategy at least in brief.

The paper aspires, among other things, to identify the factors influencing the innovated areas. To reduce the data from the questionnaire survey, exploratory factor analysis was applied in order to replace the relationships in the set of interrelated variables with a small number of characteristics, see Table 3. The variables in this study were collected from relevant literature sources.

As shown in Table 3, the first component (factor) accounts for almost 18% of the variance in the items, the second component accounts for nearly 12%, the third one accounts for 10%, the fourth one for 9%, and the fifth one for about 9%. The cumulative variance percentage represents the current and all previous factors (66%). The six factors identified in Table 3 are related to the most critical areas of innovation pursued by the surveyed companies. Table 4 names the individual factors based on the strength of the correlations. The higher the correlation, the more saturated the factor is with that variable.

The first factor identified by the research is the 'Process approach', which explains about 17.6% of the overall behaviour of the sample. Variables that define the factor are material innovation (0.777), delivery method (0.533), and product quality (0.373). The results show that the organisation's functioning is currently strongly influenced by the material supplies, the quality and ef-

Table 3. Principal component analysis: factors in the context of innovation areas

Factor	Total variance	Total % of the variance	Cumulative % of the variance
1	2.291	17.625	17.625
2	1.559	11.992	29.616
3	1.271	9.774	39.391
4	1.222	9.402	48.793
5	1.139	8.763	57.556
6	1.123	8.636	66.192

Source: Own elaboration

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Table 4. Factor loads in the six-factor solution after the Varimax rotation – factors in the context of innovation areas

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
	Process approach	CSR	Quality management system	Supply chain operation processes	Demand for production	Performance of employees
Work productivity	0.109	0.163	0.010	0.041	0.141	0.825
Quality of work	–0.012	–0.055	0.793	–0.044	0.037	0.396
Product quality	0.373	–0.050	0.063	–0.091	0.636	0.145
Environmental technologies	0.276	0.638	–0.017	–0.312	0.367	–0.219
Material innovation	0.777	0.004	–0.175	–0.027	–0.048	0.109
Work instruction	0.104	0.038	–0.168	0.717	–0.025	0.247
Social innovation	0.007	0.774	0.023	0.146	0.077	0.053
Marketing innovation	–0.245	0.078	–0.065	0.233	0.761	0.059
Organizational innovation	–0.045	0.680	–0.029	0.183	–0.198	0.260
Method of delivery	0.533	0.128	0.159	0.439	–0.113	–0.021
Sales method	0.083	0.182	0.132	0.704	0.265	–0.247
Length of the production process	0.656	0.023	0.256	0.161	0.158	–0.004
Production costs	0.100	0.038	0.817	0.008	–0.043	–0.278
Total % of variance	17.625	11.992	9.774	9.402	8.763	8.636

Bold – significant measures; CSR – Corporate social responsibility

Source: Own elaboration

efficiency of the production, the sustainability, and the distribution. This factor is even more significant during crises when there are problems with a lack of material, financial, or human resources. According to the focus group respondents, such management is based on a process approach to management, which helps improve the existing processes in the organisation. That is, key activities are described in detail, the powers and responsibilities of employees are determined, and the risk of non-conforming products, environmental accidents, or the number of accidents at work is reduced. Determining the processes depends mainly on the products/services that the organisation offers, while the organisational structure is often influenced by the size of the organisation and the possible existence of branches. The philosophy of re-engineering in agriculture is based on the priority orientation of the control elements on the processes (not on the workers, machines, and products). Significant positive changes in the processes are desirable, in the direction of quality improvement (the respondents in the focus group defined, in particular, a reduction in the defects, malfunctions, deficiencies, and a substantial increase in the quality parameters leading to exceeding customer expectations), a reduction in the production times, primarily by the elimination of lost time, downtime, but also by shortening production preparation time, own

production, cost reduction, productivity increase, capacity utilisation, etc.

The research also identified the important factor of 'Corporate social responsibility' (CSR), where the environmental, social, and organisational areas of innovation form the primary focus of agricultural enterprises. Without organisations focusing on CSR, financial performance, as well as sustainability, cannot be achieved in today's highly competitive market, which is in line with the research of Sarkar and Searcy (2016). The environmental pillar of CSR clearly affects both the social and economic levels. Efforts to protect the environment have led to today's sustainable development, which, however, also emphasises the social as well as the economic levels. Nevertheless, within the focus groups, the companies agreed that during the COVID-19 pandemic, they withdrew their tactical and strategic CSR activities due to the severe lack of resources and the increased uncertainty resulting from the macroeconomic situation. Currently, the high inflation and the lack of qualified personnel are further exacerbating the situation. However, it turns out that if companies incorporate CSR into their strategic management and it is part of the corporate DNA, such activities result in significant cost savings, where customers and other stakeholders appreciate the activities, and, thus, such companies have a higher

probability of becoming competitive. The focus group respondents agreed that CSR creates favourable conditions for sustainable growth and knowledge transfer. The focus groups also showed that, unlike large companies, by the number of employees, which are motivated by external influences, the internal aspect and personal motivation of the owner play a dominant role in the case of small companies. According to the respondents, the knowledge that must be maintained and available to the extent needed is used to improve the processes and management of the organisation. According to the focus group, businesses in agriculture are currently implementing model processes and procedures corresponding to the given chain / sector / location according to the Organisation for Economic Co-operation and Development-Food and Agriculture Organization (OECD-FAO) Guidance.

The third factor monitors the 'Quality management system' (QMS) in organisations and its actual impact on organisational performance. There is constant pressure on agricultural enterprises to improve the quality of their products and services, and pressure to retain customers and attract new ones, as customers demand safe, high-quality products that were manufactured with a minimal negative impact on the environment. The respondents also agreed that customer needs change over time and that the requirements are the result of several factors, such as biological (gender, age, etc.), social (education, employment, etc.), demographic (location, climate, etc.) or societal (advertising, public opinion, etc.) inputs. According to the focus group, one of the most critical aspects of the QMS is a strong focus on the requirements and needs of customers and other stakeholders. Agricultural supply chains in the Czech Republic have exceptional dispositions for responsible functioning. Among the many examples, the respondents mentioned the awarding of agricultural and food companies for quality, social responsibility and sustainable development in programmes announced by the Quality Council of the Czech Republic.

Logistics and its efficient setting are essential variables in the identified factor of 'Supply chain operation processes'. The focus group respondents were in agreement that identifying and shaping the structure of logistics processes is of dominant importance for the planning, control, and management of elements in the logistics chain, as they are systematically linked to the company's strategy, its involvement in the supply chain, and competitiveness. Therefore, these organisations emphasise the speed, timeliness, and accuracy of logistics processes that customers appreciate, and

make profits by retaining and winning new customers. The focus group participants stressed that the higher quality and operational efficiency of logistics centres will be linked to robots in the near future, which is also a solution to the situation in the labour market where there are not enough available workers. It is necessary to continuously work on sophisticated solutions that provide a wide range of functionalities and help to autonomously self-regulate logistics facilities, the equipment used by logistics staff, and monitoring and management information systems.

The factor called 'Demand for production' consists of two variables, namely the product quality (0.636) and marketing innovation in the context of new sales and distribution channels (0.761). The organisations in question primarily focus on developing marketing innovation and increasing sales of their products and services through new marketing tools. Marketing, in collaboration with management, creates and manages marketing strategies and plans, of which innovation is an integral part. This area focuses on the better communication of customers' and other stakeholders' needs, on opening new markets or introducing new products or services to increase its sales. The innovation system interacts with the economic sphere by connecting innovation with marketing. According to the respondents, marketing innovation positively affects the growth of the turnover, improves the organisation's good name and the overall perception of the organisation by customers and suppliers, or more precisely by all the stakeholders. The focus groups admitted that marketing communication is probably the biggest weakness and at the same time a challenge to create broad marketing research that would help identify opportunities and problems related to sales, and provide information about the needs, preferences and behaviour of the customer. The use of organic products in the Czech market has its peculiarities. These are branded goods produced under specific conditions (Act on Organic Agriculture), checked during the production process (inspection), and their origin can be documented (certification). The goods usually have a higher price, are marked with the organic product trademark or the producer's logo and are accompanied by a certificate of origin. There are a number of reasons that do not allow the general adoption of models from abroad. In developed countries, especially in Western Europe, the general level of ecological awareness is significantly higher than in the Czech Republic, it is necessary to focus more on the marketing of small producers in a bio-based economy.

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The last factor, the sixth one, is represented by organisations that prioritise 'Employee performance', primarily through the quality of the work and productivity. Continuous improvement is an inherent prerequisite for maintaining and increasing performance. The focus group of respondents mentioned the following methods to ensure continuous improvement: continuous innovation, a cycle of the continuous improvement process, lean production, histograms and control charts, and output conformity verification. The process approach described as the first factor helps to manage interrelationships and dependencies in order to increase the organisational performance. Modern performance evaluation considers wider social contexts, especially social responsibility, with a particular emphasis on environmental protection and the application of social diversity (also known as sustainable performance).

In the quantitative questionnaire survey, the respondents agreed that they most often innovate variables, such as labour productivity (20%), work quality (19%), product quality (16%), and last but not least, work processes (12%) to streamline the time and financial performance, see Table 5.

Given the calculated P -values, the null hypothesis of independence of the nominal variables cannot be rejected. Innovative activities in internal production and service processes, i.e. internal process innovation, are considered to be the most important innovation in business processes. Significant changes in the cooperation, organisation, or management of the company, and

in external relationships, so-called organisational innovation, were indicated by only 4% of the respondents. Significant changes in the marketing and sales of their products or services, so-called marketing innovation, were carried out by 3% of organisations.

Discussion. For every company, regardless of its sector, innovation is a crucial area for the company's further development and competitiveness in the present globalised market and agriculture, forestry and the food industry are no exception. Active innovation support is an integral part of a company's business strategy and overall management approach (Baumgartner and Rauter 2017). Looking ahead to 2050, Sarkar et al. (2018) identified several significant challenges that will require transformative and innovative processes linked to the environment, the health of individuals, sustainable production and consumer demands driven by the projected growth of the world's population. A timely and appropriate strategy contributes to the success of the innovation and its positive impact on sustainability.

The findings of the study build on and expand the results of previous research, e.g. Cillo et al. (2019); Saha et al. (2017) or Sarkar and Searcy (2016) and expand the results for agriculture. The research revealed six significant factors influencing the innovation areas that have a dominant influence on streamlining the time and financial management that are prioritised in organisations seeking to build a strategic management system to ensure business sustainability.

Table 5. Crosstabulation: the most innovated areas (relative frequencies), χ^2 test

Variables (innovated areas)	250 employees and more (%)	51–249 employees (%)	up to 50 employees (%)	Total (%)	P -value
Length of the production process	3	2	2	7	0.648
Quality of work	6	5	8	19	0.571
Product quality	7	5	4	16	0.845
Marketing innovation	1	2	1	3	0.326
Material innovation	1	0	2	3	0.648
Organizational innovation	1	1	2	4	0.981
Work instructions	5	3	3	11	0.057
Work productivity	13	4	3	20	0.845
Social innovation	1	1	0	2	0.604
Environmental technologies	2	2	0	4	0.065
Production costs	4	1	0	4	0.781
Method of material delivery, or more precisely services	0	1	2	2	0.198
Method of selling products, or more precisely services	3	0	1	3	0.528
Total	45	28	26	100	–

Source: Own elaboration

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As far as we know, none of the previous studies examined the factors in question in such a comprehensive manner, only in isolation, for example, in the context of selected industries (Dhraief et al. 2018), the type of innovation (Chatchawan et al. 2017), or they focused on start-ups (Del Bosco et al. 2021), etc. The findings of Koc and Ceylan (2007) emphasise four similar predictors, namely technology strategy, idea quality, idea generation and technology acquisition and exploitation. The context of innovation through 'CSR' practices (as a mediating effect) is also emphasised by Zhu et al. (2019). With regard to 'supply chain operations processes', Choi et al. (2017) propose the deployment of innovative optimisation models and new methods in the areas of supply chain operational processes, strategic supply chain planning, logistics management, demand forecasting, revenue management, and system investment decisions.

Regarding the results in the area of 'Performance of employees', Chatchawan et al. (2017) investigated the factors influencing the innovative work behaviour of employees – the team climate inventory, learning orientation, organisational supportiveness, and transformational leadership play a direct role in the development of innovative work behaviour. However, the results of Koc and Ceylan (2007) suggest that firms focus on the technology strategy, idea quality, idea generation, and technology acquisition and use rather than on teamwork and learning organisations. To the above, the findings of Dhraief et al. (2018) add the important role of institutional factors, namely being a member of an association, benefiting from extension services, and being a source of technological knowledge.

Emphasis must be placed on the effective transfer of knowledge and its preservation, i.e. promoting best practices. This continuously leads to the development of internal resources in the company, which are also the innovation potential of every company and bring companies a competitive advantage in the longer term. Innovation is positively associated with organisational performance and helps to achieve sustainability not only in agricultural enterprises but in other areas as well. Du Plessis (2007) adds that the complexity of innovation has increased with the growing amount of knowledge available to organisations. Innovative companies from all the surveyed sectors focus on the exchange of knowledge and their combination.

The transition to an innovative company entails the automation of many work processes, which implies new risks and pressure on organisations to regularly retrain and educate their employees. It is the continuous

retraining, education and development of employees, working with their knowledge that leads to the sustainable development of companies.

CONCLUSION

The continuous improvement of the processes and performance of the entire organisation are never-ending priorities. Responsible, or more precisely, sustainable entrepreneurship is essential for both large and small businesses, which can improve their economic, environmental, and social characteristics in the short and long term through innovative products and services, new capabilities, and stakeholder involvement. The surveyed companies are encouraged to innovate by seeking new knowledge or ways to use their existing tacit and explicit knowledge.

Every organisation must monitor its processes and reduce costs to succeed in a competitive environment. The focus group of respondents are fully aware that achieving business sustainability is impossible without innovation. At the same time, the respondents emphasise that only effectively linked organisational processes create added value for the company. In their view, the priority is to react flexibly to changes (even in the context of sudden changes caused by the current pandemic, for example) and to adapt their products to customer requirements, improve their processes and look for innovations to achieve this. People are the bearers of knowledge, the sharing of which can positively impact both the innovativeness of the organisation and its perceived capability, with which the respondents agree, adding that innovativeness further acts as a mediator and supports the impact of the extent of knowledge sharing on the perceived organisational performance. Given the results of the conducted research, one can agree with the findings of Wang and Wang (2012) that the sharing of tacit knowledge contributes to the higher quality of innovation, and the sharing of explicit knowledge tends to accelerate the innovation process.

The research contributed by identifying six factors (process approach, corporate social responsibility, quality management system, efficiency of logistics processes, demand for production, and performance of employees). Based on them, a strategic management system is being built in the surveyed organisations to ensure business sustainability.

The generalisability of our study findings to translate to small and medium enterprises (SMEs) is questionable at this stage. In order to address this issue,

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similar research should be conducted in small and medium-sized enterprises. Based on such research, a comparison can then be made between large, and small and medium-sized enterprises. Future research can be based on the above-mentioned conclusions and expand these results with an international comparison and the identification of factors that are specific to various multinational corporations. This paper also provides a sound basis for measuring the effectiveness of the individual factors in the form of case studies of particular organisations. The conclusions based on this study can further expand the research areas at the theoretical and practical levels.

The presented research contains a number of limitations but may represent interesting avenues for future research. A limitation of the research can be considered that the results come from the data and answers provided by the representatives of the companies in the questionnaire survey and during the interviews. The respondents may have tended to create a better image of their business and appear more rational. Nevertheless, the questions were asked in a non-leading manner and compliance with the rules of social science research.

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