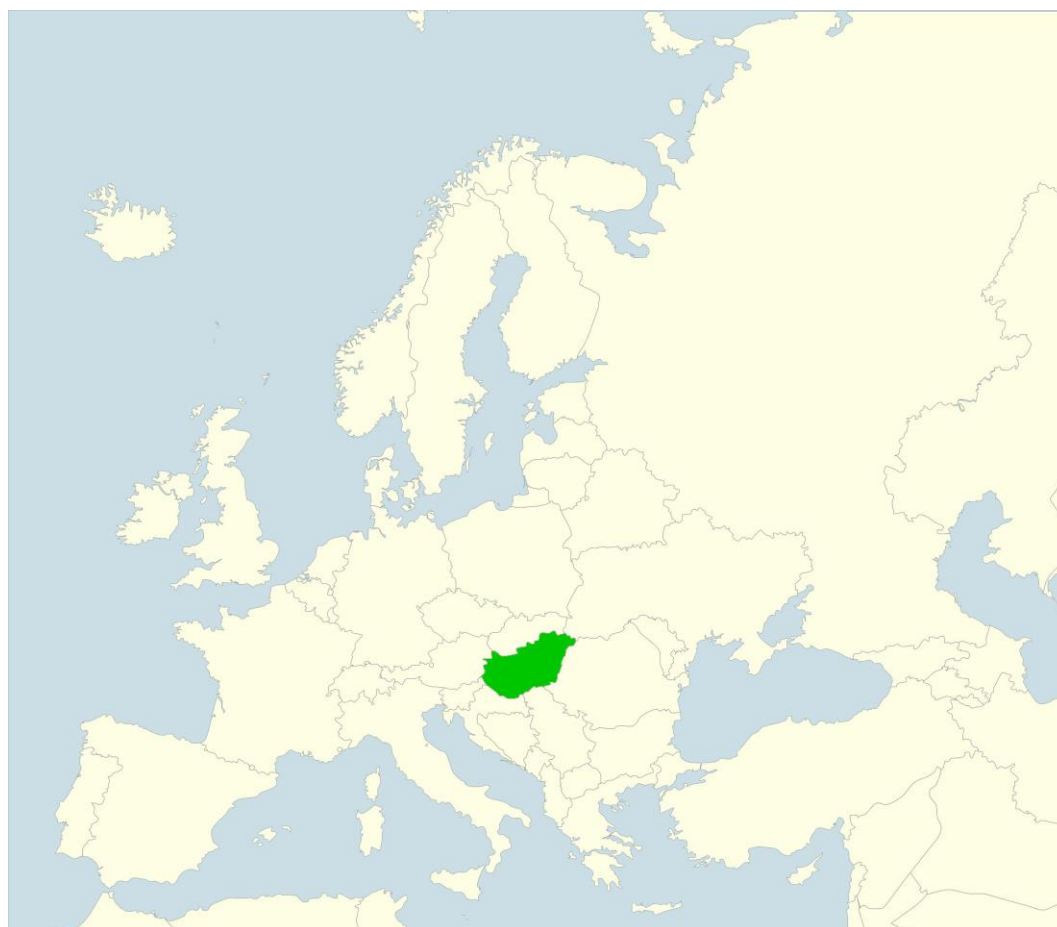
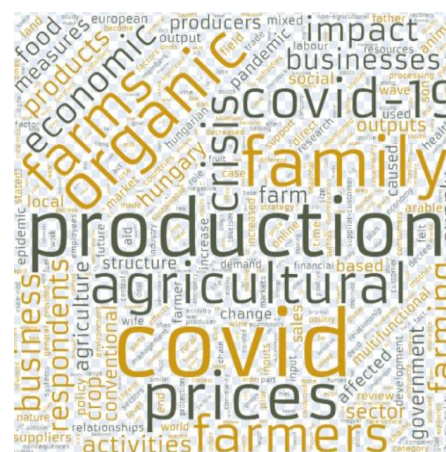


COVID CRISIS EXPERIENCES OF HUNGARIAN SMALL FAMILY FARMS ENGAGED IN MULTIFUNCTIONAL AGRICULTURE

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Abstract: The paper presents the experiences and survival strategies of small family businesses engaged in multifunctional agricultural activities in Hungary during the COVID crisis. The following topics were examined: human resources, supplier-customer relations, production and sales, distribution channels, inputs and outputs prices, strategies and business models, and subsidies in agricultural sectors combined with financial assistance. The study was conducted using a qualitative research methodology, with the help of structured in-depth interviews made with 22 small family businesses. The results show that multifunctional family businesses performed well. The health consequences and the measures taken by the government caused disruption but did not completely hinder the operation of businesses.

Keywords: COVID-19, Multifunctional agriculture, Family farms, Short supply chain, Small family businesses

Összefoglaló: A kutatás a magyarországi multifunkcionális mezőgazdasági tevékenységet folytató családi kisvállalkozások tapasztalatait és túlélési stratégiáit mutatja be a COVID-válság idején, a következő témakörök mentén: emberi erőforrások, vevő-beszállító kapcsolatok, termelés és az értékesítés, input és output árak a termelésben, stratégiák és üzleti modellek, valamint támogatások a mezőgazdasági ágazatokban, pénzügyi segítségnyújtás. Vizsgálatunkat kvalitatív kutatási módszertannal, strukturált mélyinterjúk segítségével végeztük 22 családi vállalkozás tulajdonosával és/vagy vezetőjével. Az eredmények azt mutatják, hogy a többfunkciós családi vállalkozások jól teljesítettek. Az egészségügyi következmények és a kormányzat által hozott intézkedések zavart okoztak, de nem akadályozták teljesen a vállalkozások működését.

Kulcsszavak: COVID-19, Multifunkcionális mezőgazdaság, Családi gazdaságok, Rövid értékesítési lánc, Online kereskedelem, Kis családi vállalkozások

Highlights

- Flexibility of small family businesses engaged in multifunctional agriculture during COVID
- Solutions for mitigating the epidemic effects
- Emergency situation as an opportunity for farmers
- Government's role in the COVID crisis management

1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared a pandemic caused by the rapidly spreading coronavirus disease (WHO, 2020). The global expansion of COVID-19 virus did not only affect healthcare. Governments restricted the activities of companies operating in various industries, made social distancing mandatory, and suspended non-essential businesses, which simultaneously caused problems on both the demand and supply sides (del Rio-Chanona et al., 2020).

White (2021) points out that in times of crisis, be it a pandemic or climate change, a transformed food system that includes small farms is entailed for the resilience of the community. Other authors considered the diversification of products, markets, and sources of income (so-called multi-layered diversification) as one of the major resilience factors for small producers in times of crisis (Marsden et al, 2023). The COVID-19 crisis positively affected the local food product demand (Benedek et al., 2021a) which is also confirmed by Ricker & Kardas-Nelson (2020), Hiller (2020), and White (2021). According to the mentioned authors, a shift towards direct market sales could be experienced e.g., in the USA. They also agreed that due to

the uncertainty of the usual distribution channels, financially sound consumers began to look for local foods considered safe and reliable (Ricker & Kardas-Nelson, 2020; Hiller, 2020; White, 2021). This tendency may be connected to the communication strategies as they could help farmers in “confidently growing produce for local demand, locating processors, negotiating prices, organising safe and personal delivery, and creating online shops” (Marsden et al., 2023). Moreover, during the pandemic, when the meetings in person were limited, communication technologies provided the opportunity for online purchases and sales (Benedek et al., 2021b). Zanetti et al. stated that apart from several negative effects of the pandemic, it also brought new opportunities: some economic, social, and environmental trends soon became visible, such as raising awareness for agrifood products and the importance of rethinking the environment improvement and the contribution to „sustainable development, based on fair, green and healthy agri-food systems” (Zanetti et al., 2022). Based on the study conducted in 13 countries in the first few months of the COVID-19 crisis (Nemes et al. 2021), it is found that the increasing interest in alternative and local food systems can be explained by their contribution to food safety, food quality, health, social solidarity, and food justice. Certain authors, when studying the changes in consumer behaviour during the time of COVID-19, showed that many consumers tried to switch to a healthier lifestyle including a diet high in fruits and vegetables (Naja & Hamadeh, 2020; Vittuari et al., 2021).

The pandemic has significantly rewritten the economic mechanisms of the world and thus of Hungary. The agricultural economy, the rural areas, and rural development have been severely affected by short-term measures, and quarantines, followed by a significant downturn. The pandemic required measures that could not be implemented promptly and effectively as part of traditional legislation and public administration. Therefore, the measures were taken in accordance with the state of danger, using the act on the state of danger and numerous decrees.

Hungary's agricultural potential is unquestionable, despite its declining share in the overall economy. However, the epidemic also limited the use of this potential, affecting the multifunctional activities of agriculture whose role in the countryside is unquestionable from several points of view, as summarised by the European Model of Agriculture (EMA): ‘MA is the sustainable way to integrate the interrelated objectives of farmers and society in three functions: i) production – to provide consumers with secure and stable supplies of healthy quality food and non-food products and to develop its competitive position on the world market based on sustainable production methods; ii) territorial – to safeguard and enhance the countryside and to provide environmental services valued by the public at large; to underpin the infrastructure, the economy and employment in a vast number of villages throughout the European Union and to prevent depopulation and desertification in more remote and difficult areas; iii) social – to contribute to reinforcing the economic and social cohesion between groups and regions – reducing disparities between the richer and poorer regions of the EU.’

The Hungarian Central Statistical Office (HCSO, 2022a) conducted a full-scale agricultural census in Hungary in 2020, which included a survey of ‘other, non-agricultural activities’ of farmers, emphasising that the non-agricultural activities contribute to the stabilisation of farmers' incomes in less favourable years and the ‘retaining of the rural population’ role of agriculture. The non-agricultural activity includes meat processing, milk processing, winemaking, wine bottling, forestry, wood processing, agricultural contract work, fruit- and vegetable processing, and other non-agricultural activities such as hospitality, tourism, leisure activities, provision of health, social or educational services, renewable energy production, handcraft basketry, folk arts, fishing, fish farming, trade in agricultural products, and transport. Previous studies have investigated the role of diversification of farm income as a survival strategy in agriculture (Vik et al., 2011; Castellano-Álvarez et al., 2019) and how a greater integration with the local context makes these farms less vulnerable (Ciolac et al., 2019) in other countries as well.

The number of multifunctional farms can be calculated by the economic size, as the practice of multifunctional farming is typical of small farmers in many countries (Liang et al., 2012). In Hungary, family farms running family businesses are also included in this category, their number reached 18,000 in 2014. In 2020, the smallest Hungarian farms (under 1 ha), representing 24.3% of all holdings, used 3% of the agricultural land, which is a 3-fold increase compared to 1% in 2016 (HCSO, 2022a). Based on

the statistics, the role of small family businesses performing multifunctional activities in agriculture and their impact on the countryside is indisputable.

The present research greatly contributes to the knowledge of the challenges and breaking points experienced by small family farms engaged in multifunctional activities in the event of a crisis, which itself fills a gap as this topic is less researched so far. Accordingly, the main goal of the research was to identify possibilities of post-COVID recovery and adaptation processes of small family businesses in Hungary from the perspective of their multifunctional agricultural activities. This required mapping the historical and operational elements of their multifunctional agricultural activities; examination of the factors that affected the small family businesses during the COVID crisis; and the perception of government measures in Hungary that intended to mitigate the consequences of the epidemic. The results of the research contribute to the exploration of possibilities inherent in crisis situations that can be supported by measures taken in the future in the event of a similar situation.

2. Literature review

2.1 Hungarian family farms in the context of multifunctional agriculture (MA)

Based on the Food and Agriculture Organization (FAO) of the United Nations 'multifunctional activities provide non-food goods and services, shape the environment, affect social and cultural systems and contribute to economic growth, thus contributing to the achievement of sustainable development'. The FAO statement was already described in the Agenda 21 of the Rio Earth Summit (United Nations Conference on Environment and Development, 1992) in chapter 14 dedicated to Promoting Sustainable Agriculture and Rural Development. In 1997, the European Council declared that agriculture in Europe had to be multifunctional, sustainable, and competitive. As a result, a new financial framework for MA within the second pillar of the Common Agricultural Policy (CAP) appeared in 1999. CAP introduced rural development and described the integrative role of MA in protecting the natural environment, the cultural landscape while providing socio-economic development (Granvik et al., 2012).

The latter aspect has also become important, as agriculture is deemed more valuable in regions in critical economic situations, as it often offers the only source of living (Renting et al., 2009). MA considerably re-evaluates the so far production-oriented role, the significance of agricultural activities, and the multifunctional characteristics of agriculture (MTVSZ, 2011; NHRDP, 2015). Even before the intensification of agriculture, Hungary – like many other countries – was characterised by MA with its social, ecological, and economic benefits, but due to the growing demand for products and services issued by multifunctional farms, MA receives special attention these days (Song et al., 2020).

Organic farming is not accidentally classified as MA. Organic farms are generally characterised by a greater degree of multifunctionality, as they use a wide variety of landscape functions and are more focused on self-sustaining operation. Typical activities include growing fewer common crops, maintaining landscape vegetation, and conserving natural landscape features (Tybirk et al., 2004).

At the political level, among the principles of rural development policy in Hungary, the integrated, multifunctional characteristic of agriculture and local resource-based development appeared, emphasising the importance of diversified activities and alternative forms of farming. Rural development has become increasingly strong over time and has appeared in the support system (Differentiated Appropriations for Rural Development from 2000 to 2002; the SAPARD Program from 2000 to 2006; the Operational Program for Agriculture and Rural Development from 2004 to 2006). From 2007, a call for proposals was launched within the framework of the New Hungary Rural Development Program (NHRDP) to encourage activity diversification. There was a shift in emphasis in support programs – in terms of areas of diversification and objectives (NHRDP, 2015; Czimbalmos and Kovács, 2017).

Despite the supportive political environment, there are currently no detailed statistics in Hungary on which farms are engaged in multifunctional farming, and what percentage of their activity is related to the production of non-basic food and raw materials. The ratio of Hungarian farms carrying out non-agricultural activities was around 11.2% in 2003, then dropped to 5.08% by 2007. (In the EU-27, the ratio

was 6.2% in 2003 and 9.94% in 2007.) This can also be related to the fact that based on Eurostat data in 2010, the number of farms in Hungary declined by 35% between 2000 and 2007 (Fehér et al., 2010). At this time, among the non-market-driven activities and functions, substantial community and national support and payments could be obtained for nature protection and agricultural environment protection. Regarding the average farm size in Hungary, it reached 22 ha in 2020.

The proportion of small farms with a standard production value of less than EUR 4,000 decreased significantly, from 70% to 53%, while that of medium-sized farms (mainly those in the EUR 15,000–99,999 size category) increased from 9% to 17%. The concentration of production is also indicated by the fact that 53% of the farms fall into the smallest size category, however, 45% of the standard production value appears in the farms of the largest size category, representing a share of about 1% (HCSO, 2022b).

In addition to the political intention, diversification of farm activities greatly depends on the willingness of the farmer. The summary study released by Czimbalmos and Kovács (2017) made in micro-regions classifies the farm activities and functions in order to reveal the extent of willingness and motivation of Hungarian farmers to diversify. Accordingly, the following groups were identified: Clearly market-driven (on-farm sales of agricultural products, on-farm processing of agricultural products, local and community services, on-farm production of non-agricultural products, non-agricultural services); Not market-driven (landscape management, nature protection, agricultural environment protection); Transition between the previous two (organic farming, energy production). These studies concluded that farmers considered 'Strengthening the economy of their own micro-region' to be the most important in terms of future plans for non-commodity outputs, followed by 'On-farm sales of agricultural products'.

Family farms are excellent hosts of MA, as it is often said that family farms are the backbone of Hungarian agriculture since the national economy benefits greatly from family farming both as a contributor to GDP and as a contributor to the creation and maintenance of public goods (FFKP, 2014). Nonetheless, there is no single definition for family farms in Hungary as they differ greatly in size and in their management. Accordingly, family farmers can be individual farmers, part-time farmers, individual entrepreneurs, limited liability companies, and also farmers' co-operatives. The National Land Act (Act No. CXXII/2013.) classifies family farming based on the following combination of criteria related to ownership:

- agricultural production should be on less than 300 hectares of agricultural land (owned, rented, or used), and regarding employment next to the farmer, at least 1 family member full-time employee is required (governmental regulation 326/2001 (XII.30.) and
- at least 2 owners; employment: 1 owner and 1 employee from the same family (Mandl, 2008).

Among other favourable measures (special taxation rules, simplified administration, etc.), the government supports the diversification of family farms, the promotion of local sales, agro-tourism, and the transition to organic farming in order to boost low incomes. It supports their participation in specific programs that also serve to keep the rural population in place (e.g., Social Land program, SLP; START Public Employment Scheme). E.g., SLP by applying the bottom-up approach instead of the top-down method, thus locally designed and conducted activities, contributes to the achievement of the main goal, the improvement of life quality of the most disadvantaged communities. Regardless of obstacles to its development, the SLP has supported these highly vulnerable groups through increasing self-sufficiency in the context of household farming (Csoba & Sipos, 2019).

In the Hungarian agricultural sector, as in most CEEs countries, small and very small farms have a significant number, but cover a minor part of the agricultural area. In 2010, as stated in the Farm Structure Survey, 87% of farms were less than five hectares. Although this rate passed 91% when considering all holdings under 10 ha, they accounted for only 10% of the Utilised Agricultural Area. At the same time, they provided a large family-based labour force – 72% of the people working in agriculture (Maurel, 2015). In 2016, 87% of all holdings were under 10 ha, with an 86% family workforce share (European Commission, 2021).

In Hungary, the smallest farms (under 2 ha) mostly engage in horticulture, cultivating fruit and vineyards, keeping pigs and poultry, thus in sectors not with a high level of CAP support. Maurel (2015) concluded that as CAP Pillar 1 measures have a limited effect on small farms, so CAP Pillar 2 – in spite of several

measures with the potential to support these farms – also does not significantly favour them. Since the new CAP still strives for a fairer distribution of income support among farmers, it focuses more on small and medium-sized family farms. The recently adopted Hungarian Strategic Plan also includes several interventions in this field, such as e.g., the Complementary Redistributive Income Support Mechanism (EC, 2023). This new element within the direct payments system is aimed at transferring funds from large to small or medium-sized farms in order to improve sustainability by using 14% of the national ceiling, thus exceeding the minimum 10% defined by the EU (NAK, 2023).

2.2 Impact of COVID-19 on the business field with special regard to Hungary

The impact of COVID-19 has led to an economic meltdown and financial constraints (Kitukutha, 2021; Ye, 2020), due to the loss of revenue and jobs arising from total lock-downs based on World Health Organisation (WHO) guidelines to contain and stop further spread of COVID-19 (Ma, 2020). There are many international scientific publications related to the global impact of COVID-19 (Caggiano et al., 2020; Dogan and Christina 2020; Elleby et al., 2020; Onyeaka et al., 2021; Açıkgoz et al., 2020). Some of them deal with special economic aspects (Škare et al., 2021), some of the studies focus primarily on SMEs (Belitski et al., 2022; Liang et al., 2022; Corredera-Catalán et al., 2021), while others examine workforce management and occupation (Dias et al., 2020; Adamowicz, 2022).

According to an analysis of policy measures undertaken by 54 OECD and emerging economies (including Hungary) between January 1 and April 28, 2020, these regulations forced most sectors to limit or halt their activities, with the exception of health, agriculture, and food, and a few other sectors deemed essential for the basic needs of the population (Gruère and Brooks, 2021). The coronavirus epidemic has significantly worsened economic expectations and macroeconomic forecasts for the coming years in every part of the world (Szappanos, 2020; Rungcharoenkitkul, 2021).

In April, the GKI (2021) economic index fell significantly, with the business confidence index falling by about 25 percentage points and the consumer index by almost 40 percentage points. Within the business sector, expectations of services have deteriorated the most, while those of the industry have deteriorated the least. The positive propensity to employ in the past couple of years has fallen into the negative range, mostly in industry, with most firms thinking of redundancies rather than recruitment and expansion. In April, 58 percent of businesses felt the impact of the epidemic on their business was significantly negative, with a total of 94 percent experiencing some degree of adverse impact (Tóth et al., 2021). A similar unfavourable impact was felt by businesses in other parts of the world (Fairlie, 2020; Engidaw, 2022). The deteriorating economic expectations have a direct impact on financial markets. According to Czech et al. (2020) the positive and significant correlation between the number of reported COVID-19 cases and the exchange rates has been confirmed, implying that the ongoing pandemic has resulted in the depreciation of the Visegrad currencies. So, the pandemic has had a negative impact on the financial markets of Hungary and Visegrad countries. Aharon and Siev (2021) explored the impact of government intervention to contain the spread of COVID-19 in emerging countries (including Hungary) on the performance of their leading stock indices and found that government restrictions are associated with negative market returns. The authors found a positive market response to direct income support and a negative response to debt or contract relief. Emerging capital markets respond in a positive manner to testing policies or contact tracing that can help fight COVID-19 (Aharon and Siev, 2021).

The crisis has affected different sectors of the economy to varying degrees over time. In Hungary, similarly to other countries around the world, initially the priority sectors (e.g., trade, hospitality, tourism) were affected (Gursoy & Chi, 2020; Qiu et al., 2020; Mohammed Said Al-Mughairi et al., 2022), then an economic downturn affecting all sectors followed (Hajdú and Rácz, 2020; Tóth et al., 2021). The first signs of the economic downturn were observed in the supply chain, due to the loss of Chinese suppliers, which put Hungarian manufacturing firms in a difficult situation. The negative effects were particularly visible in the manufacturing of vehicles and components and the manufacturing of electronic equipment, while the share of the import of medical devices increased. Subsequently, the closure of borders with neighbouring countries had negative repercussions on the labour market and tourism as well (Hajdú and Rácz, 2020). By April 2020, international tourism had practically ceased to exist (passenger traffic at

Budapest Airport dropping to 2%) accompanied by a significant reduction in domestic traffic. The decline in tourism traffic affected each segment of tourism and hospitality, hitting particularly hard tourist destinations (HCSO, 2020a; Kovács, 2020). Many of the regulations directly impacted Short Food Supply Chains. Restaurants, bars, and cafés closed everywhere and only take-away and delivery services were allowed, but many establishments decided to close completely until restrictions were lifted (Benedek et al., 2021a). In April 2020, the value of retail sales showed an average decrease of 10% compared to the previous year, with variable rates across the country (HCSO, 2020b). Markets adopted a wide range of strategies. With the growth in social isolation, the demand for online food purchases and home delivery services increased significantly across all countries (Benedek et al., 2021b). Machová et al. (2021) found that a large number of people consider local products safer than those that are imported. Their finding predicts the localism trend. In the case of agricultural firms, producers with higher mobility, a well-established customer base and an online presence displayed the greatest resilience to the crisis (Benedek et al., 2021b). Kovács et al. (2020) found that while the epicenter of the pandemic was the capital city and its surrounding area, the socio-economic impacts of containment measures implemented by the Hungarian government were felt across the whole country (Kovács et al., 2020).

However, the effects of government measures varied geographically, not least due to differences in Internet access. The restrictions led people to switch to remote working or learning schemes. This, in turn, resulted in the revaluation of digital achievements and contributed to the importance of broadband internet access in various spheres (e.g., shopping, managing finances, entertainment) (Kerényi and Müller, 2019). Other authors also revealed that the spread of coronaviruses has fuelled the growth of e-commerce as a platform to conduct businesses between retailers and consumers or business-to-business (Karácsony, 2020; Kitukutha et al., 2021). Relating to the abovementioned, it caused a serious problem that in the domestic context, despite the availability of digital platforms, they cannot be accessed everywhere and by everyone. In several cases, people are facing such problems as the lack of internet access or the necessary equipment or competence to use it (Kovács, 2020).

The type of governmental measures was also different over time. The government used general containment measures during the first wave and more targeted and sector-specific measures in the second wave, allowing for more economic activity. Together with stronger international demand, this benefited manufacturing and many service sectors, leaving hospitality as the most affected sector (OECD, 2021). Oravský et al. (2020) examined the macroeconomic indicators of selected European countries (including Hungary) after the end of the 2008 global economic crisis and assessed the risks arising from the current situation caused by COVID-19. The analysis showed that, despite consolidation measures, countries have failed to return to pre-economic levels, which has a negative impact on their readiness to face the impending economic crisis. A particularly significant risk is the high level of indebtedness (also in the case of Hungary), which makes it difficult to borrow money to eliminate the consequences of this crisis (Oravský et al., 2020).

2.3 Perception of government measures in Hungary to mitigate the consequences of COVID crisis

The epidemic caused by the COVID-19 virus has significantly rewritten the economic mechanisms of the world and thus of Hungary, resulting in prompt action from the government in the form of measures and decrees. The constitutional basis was established by § 53 of the Fundamental law of Hungary, declaring a state of emergency in the event of elemental disasters or industrial accidents that endanger the safety of life and property and may result in emergency measures. On 1 April 2020, Parliament adopted Act XII., the first measure to control the spread of the coronavirus, and thus suspended previous traditional legislative procedures. At the end of 2020, the Act LVII of 2020 was repealed, and Act I of 2021, and the related government decree No. 27/2021 entered into force.

In order to clarify the special rules and economic support measures during the pandemic, the parliament passed 7 laws, 45 government decrees aimed at protecting or restarting the economy, and 13 agricultural ministerial decrees adjusting their agricultural aspects. The economic downturn first hit the supply chain of enterprises dependent on Chinese products and then with the closure of the borders, the labour market and tourism also faced the problems caused by the epidemic (Hajdú and Rácz, 2020). Regarding

entrepreneurs in the agricultural sector, producers with higher adaptability, and a well-established customer base have been less burdened by the crisis, and the organisations with online platforms performed exceptionally well compared to others (Benedek et al., 2020a). Following the first wave, the government developed plans to relaunch the economy in addition to the necessary health and economic protection measures that had an impact on society as a whole and on the economy in general, therefore having a direct impact on agriculture.

Government decrees related to Act I of 2021 (about the state of danger) differ in measures, i.e., administrative discounts, tax relief, wage and labour market facilitation, and targeted, temporary, crisis grants and applications.

Several specifically agriculture-related supporting decrees were also adopted. The Government Decree No. 122/2020 on the different application of certain agricultural regulation provisions (a part of the Economic Protection Action Plan) and its amendment Government Decree No. 180/2020 suspended the submission of applications for the liquidation of undivided common ownership of land. Moreover, the Economy Protection Action Plan contained further specific facilitations for the agricultural sector until 31 December 2020, such as the postponement of deadlines, the electronic submission of applications, the payment of public proceedings fees, and, in the case of wine communities, the payment of wine community contributions. The modification of Act XCV of 2009 on the prohibition of unfair commercial practices against suppliers of agricultural and food products, stated what are the types of potentially unfair market practices in the interval of the COVID crisis. During the COVID epidemic, every pricing controversy between the trade parties has been investigated in the event of a complaint by a supplier.

Government Decree No. 688/2020 imposed a moratorium on the registration for the family farmer status. Government Decree No. 62/2021 provided the possibility to apply for non-refundable financial support (up to 125000 €) from the central budget for small shops in order to increase the population retention capacity of small settlements and to improve the accessibility of basic services. The poultry sector was also eligible for transitional aid of 3750 € per employee under Government Decree No. 44/2020.

Under Ministerial Decree No. 38/2020 on agriculture, HORECA and wine-producing organisations involved in wine tourism could claim an amount of 1500 € per hectare up to 30 hectares. This measure was re-promulgated in 2021 by Government Decree No. 35/2021 with the aid amount of 1125 €.

Under Decree No. 31/2020 AM (Agriculture Ministry), a transitional aid of 200 € per pregnant mare was granted to horse breeders implementing a breeding programme.

The amount of transitional aid that could be granted to poultry and pig farmers under Decree No. 29/2020 AM was calculated based on the difference between the aid provided in Decree No. 11/2019 AM and Decree No. 39/2018 AM and the aid provided in Decree No. 20/2020 AM. Under Decree No. 28/2020 AM, beekeepers were entitled to transitional aid of 2.5 € per hive for the number of hives determined for 2020 under Decree No. 29/2019 AM.

The horticultural holdings were also financed, up to 1250 € per employee, in accordance with Decree No. 26/2020 AM. On the basis of Decree No. 25/2020 AM, temporary aid (up to 312.5 €) could be granted from the National Food Crisis Management Programme dedicated to food processing enterprises.

In addition, on the basis of Decree No. 14/2020 AM, prompt access to a small amount of support was made possible under the Economic Protection Action Plan, in the Agricultural Széchenyi Card Scheme.

Finally, Decree No. 30/2021 AM provided for a maximum subsidy of 0.375 € per litre for the quantity of wine delivered by the wine producer, with the aid for crisis distillation of wine products in 2021.

3. Methodology

Exploratory qualitative research has been conducted during the period 21st March 2022 to 30th May 2022. Originally, data was to be collected through online communication channels (MS Teams, Skype, Zoom, etc.), however, respondents preferred a different method of communication (by phone, face-to-face, or online). During February 2022, the structuring, clearness, and understanding of the in-depth semi-

structured interview using the technique of open and structured questions (open questionnaire) were tested on a selected respondent (R10). During the preliminary (pilot) qualitative research, the respondent evaluated the questions as clear and understandable, so there was no need to change the open questions and the original structure of the qualitative research questionnaire. The questionnaires contained open-ended questions along six dimensions: Human resources; Supplier-customer relationships; Prices of inputs and outputs of the production; Subsidies in agricultural sectors and financial support of business during the COVID crisis; Nature of production and sales; Strategies and business models of agricultural family businesses.

At the time of data collection, barriers to personal communication due to the pandemic crisis had already been eliminated, and therefore the originally planned online communication was not implemented. Semi-structured in-depth interviews were finally conducted in person, by telephone, or by e-mail. We applied a paper-based questionnaire and then recorded the answers in MS Word and Excel. One interviewer asked 5–6 interviewees. After the interviews, the author team discussed the gained experiences, with special regard to identities and specialties, then analysed the results together with the method called “Affinity Diagram”. Affinity diagramming is a technique used to externalise, make sense of, and organise large amounts of unstructured, far-ranging, and seemingly dissimilar qualitative data (Lucero, 2015).

The respondents are unidentifiable in accordance with the GDPR’s rules. The identity of each respondent is well known, nevertheless, the respondents were willing to participate under the promise of their anonymity. Therefore each respondent is marked R1, R2....R22. Details about respondent characterization can be seen in Table 1. (See Appendix I.) Respondents were to come from three main groups – conventional agriculture (12), organic farming (8), and mixed production (2), these latter farms pursuing both types of farming.

All respondents met the set criteria (multifunctional family farms). The respondents come from all over Hungary. There were respondents from all regions of the country except Northern Hungary (Fig. 1). The respondents were selected using the purposive sampling technique. A total of 25 respondents were contacted who met the set criteria and, in the end, 22 respondents were willing to participate in the qualitative research. Respondents come from different areas of agriculture (e.g., viticulture, crop or animal production, fruit and vegetable sector), but all respondents met the presumption of multifunctionality.

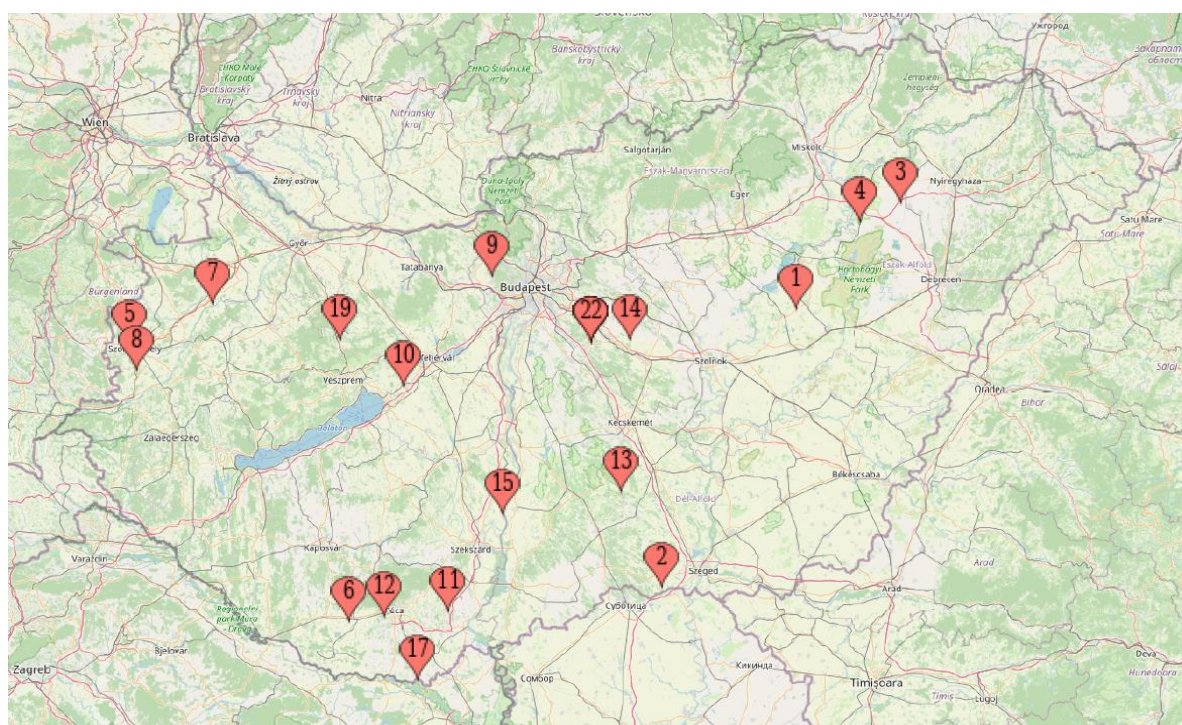


Fig 1. Location of the surveyed Hungarian farms. Source: own editing
Note: 5 farmers belong to point 22 (Monor)

In Hungary, the family farm is the special form of farming preferred by the national agricultural policy. There is a separate law in Hungary on the family farm of primary producers and the family agricultural company. The family farm is not a form of corporate law, but rather a taxation category. They are owned and run by a family.

The target group was the small family businesses from the multifunctional agriculture sector within Hungary (up to 50 employees and annual turnover 10 million EUR according to the definition of Regulation of the European Commission No. 70/2001).

The selection criteria for the interviewees were the following:

- 50% deal with conventional agricultural production.
- 50% occupied with organic production with organic certification.
- The respondents were decision makers, i.e., owners, managers, and responsible persons in management.

4. Results

The findings are divided according to the 6 groups of factors that may affect the original business model during the COVID crisis (Human resources, Supplier-customer relationships, Prices of inputs and outputs of the production, Subsidies in agricultural sectors, and financial support of business during the COVID crisis, Nature of production and sales, Strategies and business models of agricultural family businesses).

The qualitative research focused on the comparison of respondents' business before, during, and after the COVID crisis.

The main purpose of this research was to find out the main factors that may have affected the original business model during the COVID crisis and if the possible changes (positive or negative) during the COVID crisis are permanent or only temporary. We also explored the difference in the sales channels and challenges of organic and non-organic production during the COVID crisis. Selected factors that influenced the businesses are presented in table 1. (Appendix I.)

A detailed analysis of respondents' answers is summarised below and divided according to the identified six groups of factors (4.1 – 4.6).

4.1 Human Resources (HR)

The aim of this category of questions was to clarify whether small family businesses were forced to change the organisational structure and original staff due to the COVID crisis.

Almost all of the respondents stated that COVID-crisis did not affect the workforce (i.e., there were no staff downsize or fluctuation), as the small family farms both organic and conventional, follow the typical traditional structure for family businesses. That means that family labour dominates, they rely on family members (in the mental work such as planning the seasonal and ad-hoc treatments, organisation of sales, administrative tasks, and also in the physical work such as pruning, harvesting, detasseling, grazing, etc.), and employ only few seasonal workers, if any. However, some sector-specific differences emerged: one sheep farmer (R19) had the direct effect of COVID, the employee number decreased because the revenue of the producer decreased. At the same time, one mixed conventional farm (R15) hired even 1 more full-time worker during COVID. In the wine & vine sector – although the large producers, as well as the local producers, are less affected by the impact of COVID – the high human resources costs and the general shortage of labour accelerated the process of changing the harvesting method. The harvester machines displaced the seasonal employees (but that cannot be considered as a direct consequence of COVID).

Most interviewees employing seasonal workers noted that in 2020 and 2021, there were difficulties in finding a reliable workforce. Respondents did not always attribute this to COVID. Wages are constantly increasing (even during COVID), but there is still a labour shortage. The payment of wages and social security contributions makes it very difficult for family businesses to be profitable. The organic peach

producer (R2), employing Transylvanian (Transylvania is part of Romania) seasonal workers in pruning and harvesting, experienced their absence due to COVID-caused illnesses, but it was not drastic. The interviewed organic animal keeper (R4) mentioned that among his reliable colleagues (apart from family members), some of them could not work due to COVID-related illness (e.g., his butcher).

Another interesting fact is that several farmers mentioned (R1, R2) that the active family member, the wife, could not work in the family business entirely (only 50–60%) due to homeschooling since children had to be taught at home. One of the animal keeper farmers (R1), whose wife had been preparing the cheeses for the market, gave up this activity due to its home teaching activity.

One organic farmer (R13) mentioned that the working time was halved (4 hours), while the wage remained the same, which means that the wages rose during the COVID. In the case of one mixed farm (R15), the working hours of employees increased during replacement due to COVID-illness in order to reduce the extra work per person.

Two interviewees (R11 and R14) who both have other jobs, noted that the home office left more time for the farm, and in their opinion, the COVID crisis had a positive effect from this point of view.

Rather, a change can be outlined, that two entrepreneurs (R5, R8) tried to stand on more feet and further strengthen their activities outside the farm. Two organic farmers (R7, R8), both producing horticultural products and relying on family labour, also mentioned that during the pandemic, their children paid more attention to their full-time job and provided less help. A farmer (R5) mentioned that their father, who is over 65 years old and has managed the farm so far, took on less work under the restrictions and handed over the management tasks to his sons. This period seemed "favourable" for the generation change similar to the case of a couple dealing with organic farming (R6). They produced goat milk products and had been looking for young people willing to live in the countryside to whom they could hand over the farm in the form of leasing. This was achieved during the COVID closures because a young married couple living in the capital lost their jobs and a relative mentioned to them the possibility of becoming organic farmers. The couple met the organic goat milk producers, got to know each other, learned the methods slowly, and finally moved to the countryside.

Based on the interviews, it can be stated that in Hungary, the COVID crisis had no significant effect on the HR among the examined farms, as the respondents did not have to give up their businesses during the lockdowns. They also confirmed that the COVID crisis has no effect on the future staffing in their farms. Besides, the COVID crisis had no impact on the original structure of the family business during and after the COVID crisis.

4.2 Supplier-customer relationships

This factor category examined whether the relationship of the interviewees with their suppliers and customers changed as a result of the COVID crisis.

In general, with some exceptions, the supplier structure did not change during the COVID crisis. Regarding supplier relations e.g., the organic apple producer (R3) reported that the supply of machine parts was interrupted. The suppliers worked with longer deadlines (e.g., the Italian fruit sprayer arrived in 4 months, as the factories in Italy stopped working) at higher prices. But in this case, the Russian-Ukrainian war also played a role. One conventional crop producer (R11) also stated that COVID had an observable effect on deliveries from abroad – either it disappeared completely because the factory closed or the delivery time multiplied (e.g., it took about 3 months to deliver a mower knife). One mixed organic farm (R13) owner noted that some of their suppliers even warned them that prices would increase and they could buy larger quantities at the old (former) price.

It should be stressed that small farms purchase only a few external inputs from suppliers. Some interviewees brought up the rise in diesel prices as a problem now, but it was not caused by the COVID crisis.

Furthermore, concerning the supplier relationship, the respondents drew attention to awareness. One of the arable land farmers (R1) looking to the future, and learning from the experience of the COVID crisis,

he wants to strive for greater independence, achieving this by the application of regenerative agriculture. His future goal is to buy fewer lubricants, fuel, and spare parts and to spend less time on conventional crop production field practices. For this reason, he wants to produce his own seeds in the future, decreasing vulnerability. There was a general increase in demand for agricultural crops so there was no problem with sales using conventional sale channels. However, the farmer now prefers to sell to the end users directly, increasing his profits for the higher quality products, leaving out the dealers.

Most of the respondents claimed that the COVID crisis did not change the original supplier-customer relationship and also the customer base and relationship with the customers remained the same during the COVID crisis.

At the same time, several farmers mentioned a change in the way of communication with suppliers – fewer face-to-face meetings, more phone calls, and online meetings. It is part of the change in the way of negotiating and communicating with suppliers that electronic invoicing has become essential with COVID (R14). According to the organic farmer running the meat CSA (R4), it was unfortunate that the family farm had to hold the annual recruitment event online (typical for the operation of CSAs) because he could speak much more convincingly and authentically in person than online.

During the COVID crisis, the customer relations and customer structure of the interviewed organic farmers (R2, R3, R4) did not change. In some cases, farmers noticed a negative effect on the customer base e.g., an organic farmer running the meat CSA (R4) had fewer members during the COVID crisis (by 10–20 members, compared to 120 members now), due to the financial shock of the members.

Those organic farmers (R7, R8) who have run their enterprises for a longer time, could provide information about their experiences during the first wave (the newcomers, like the young couple that took over management of the farm during the second wave, had no observations on it). A decline in demand could be detected during the first wave. The “retired age time zone” or people's fear did not favour sales. During the second wave, the organic producers reported an increase in demand, which they believe can be explained by the rise of health awareness and the fact that people also went to the market because of social relations, since there was no other place to go.



Fig 2. Farmer applying mixed crop in his field for the purpose of own fodder production. Source: own picture with the permission of the farmer R1

During the first wave, one of the family farmers with a livestock profile (R5) felt the negative effects of the epidemic most in turkey farming, since the main market for this product is the catering industry. According to him, "in the first period, we produced for the freezer." The respondent from one of the mixed farms reported a similar tendency: due to restaurant closures during the COVID, the demand decreased (R15) or no revenue was generated at all (R14). In the latter case, cheesemaking was finished and meat production became the main activity of the farm since the meat demand was continuous. The same livestock farmer (R14) noticed that in the meat sector, the relationship with local buyers strengthened (thus the original relationship changed). In the case of both farms also dealing with cheese making (R14, R15), the COVID crisis changed the original supplier-customer relationship as some suppliers changed.

They are looking now for suppliers who deal more smoothly and keep their time commitments strictly (R15).

In the wine & vine sector, the local producers (R16, R18, R21, R22) had fewer problems, because their trading process works in SSC (short supply chain) and the consumers are well-established partners, whose loyalty is high for the producers. A larger winery (R17) had relevant problems because the duty-free trading at the airports collapsed, the HORECA partners temporarily closed, and the conventional contacts in part shifted to virtual space.

In Hungary, the wool market almost ceased to exist and the sheep farmer (R19) was not able to trade with wool. In addition, the internal demand for mutton radically decreased.



Fig 3. Field grazing in order to increase the use of own resources. Source: picture taken by farmer R1

4.3 Prices of inputs and outputs of the production

Generally, an increase in the input and output prices was detected to a lesser extent in 2020 and to a greater extent in 2021. The input prices increased first which was followed by the output prices. It is an important fact that the increase in the output prices rarely reached the increase in the input prices. Some of the farmers consider the change in prices a direct impact of the COVID crisis, while the majority see it as a complex problem. They assumed that COVID is an element of the economic crisis, but not the single one. The other anomalies of the supply chains are the Ukrainian war, and the impact of climate change that appeared simultaneously. Several farmers (R11, R14, R16, R18, R19, R20, R21) consider these factors the roots of the deepening agricultural crisis. The small farmers in Hungary have no price policy. They were following the volatility of prices, or they had a long-term contract for the takeover prices. Most of them commented they were too small for direct interventions for price shaping.

For the farmers (R5, R9, R10, R11, R15, R16-R22) who practise conventional farming based on external inputs, the COVID crisis meant a drastic increase in input prices (fertiliser, machine parts, fuel, lubricants). In the arable crop production, the takeover prices followed the increase of the input prices. The situation

in livestock production for export was similar. Livestock farmers trading on the internal market had no real chance to adjust output prices to input prices, so the increase in the prices of the outputs was bigger than the increase in input prices.

The fruit, wine, and vine producers had to face almost identical problems, the pesticides and the fertilisers' prices exponentially increased, but the price of the produced goods could not follow them, since there is a main factor – the seasonal impact – that determines the pricing. That is also true for the organic producers (R16, R2), however, they rely on another structure of inputs compared to conventional farmers.

The increase in human resources cost appeared also as a key problem for farmers having employees (R5, R10, R13, R17, R20), and most of the farmers also mentioned their difficulties with transportation that also caused direct price increases (R2, R5, R10, R13, R16, R17).

It was difficult for the respondents to make sharp differences between the roots of price increases, as it was due to the COVID crisis and/or the ongoing economic and political crisis. At the moment, most respondents are afraid of the future because of unexpected future economic and political circumstances. During the year 2022, all respondents were forced to increase their output prices due to a dramatic increase in input prices and they are expecting more price increases till the end of this year (2023).

4.4 Subsidies in agricultural sectors and financial support of business during the COVID crisis

This category of factors dealt with the efficiency and the form of subsidies combined with other financial help during the COVID crisis.

All respondents confirmed that drawing financial support to eliminate the consequences of the COVID crisis has no impact on drawing other subsidies in the agricultural sector. At the moment, none of them draw any financial support to eliminate the consequences of the COVID crisis.

In Hungary, there are a lot of subsidies (one-time animal-based support, HORECA sector aid, aid for crisis distillation for the wine products, employee wage subsidy, etc.) against the impacts of the COVID crisis but only a smaller proportion of respondents used these opportunities (R1, R5, R13, R10, R17).

Farms engaged in animal husbandry (R5, R10, R13, R14) received one-time animal-based support to mitigate the effects of COVID, but at the same time, just a few farmers (R1, R17) used any other support in connection with COVID. According to the livestock farms, "only fire-fighting happened", so there is a lack of a long-term concept. Livestock farming is, according to them, very undercapitalised. In summary, there were livestock farms that used the one-off payment but not all, however, the opportunity was open for all of the stakeholders. The HORECA sector subsidies were used only by one farm (R17). None of the surveyed farms applied for the aid dedicated to crisis distillation of wine products.

The low uptake of subsidies by family farmers is presumably due to the fact that subsidies are optimised for enterprises with larger farm sizes and a significant production volume. For small farms, forms of aid independent of COVID were more easily available.

4.5 Nature of production and sales

The nature of production and sales during and after the COVID crisis was also explored. Based on the interviews, the current nature of production and sales were not affected by the COVID crisis and there were no significant changes in the production structure. However, the crisis made the conventional farmers (who were more exposed to the uncertainty due to the crisis caused by their conventional sales channel) realised that they have to change their production structure in the future. The farmer (R1) who has been using conventional sales channels until now will start selling his meat and milk products through CSA (Community Supported Agriculture). He feels confirmed that he must adopt short distribution channels in the future, leaving out the traders. The COVID crisis affected his crop production activity more drastically (compared to his animal-keeping activity) as he experienced more vulnerability caused by the increased input material prices. The poultry keeper (R10) mentioned that they would rather focus on

crop cultivation in the future, within which the goal could be to strengthen digitalization. In the case of organic farmers, there was almost no change in their production and sales. In the market, COVID did not cause problems for them. Therefore, they did not switch to online sales (R2, R3, R4, R6, R7, R8). In the case of the organic peach producer (R2), among his buyers, there were 5% preferred online sales during the COVID crisis so the peaches were sent by a delivery company directly from the market. Since the organic market is 150 km away from the producer due to economic reasons (e.g., fuel prices, labour costs), he does not plan home delivery or switch to online sales in the future either. The farmer who does mixed farming, having both organic and conventional production (e.g., the organic apple producer – R3), also wants to convert his arable fields to organic and start direct sales. He believes in more sustainable agriculture and finding a market niche, which provides an opportunity for smaller family farms. In the case of those organic farmers that deal with meat, cannot sell online anyway (e.g., R4 and R13). Only small changes they applied during COVID in their sales manner. E.g., the weekly portion was distributed in bags instead of boxes at the collection points (in the case of R4). After the end of the COVID crisis, everything switched back to the way it was before.

A problem arose in the case of those farmers who enriched their activity with catering, hospitality, and agro- and wine tourism (R17, R21, R13) as these sectors temporarily stalled. After the COVID crisis, they managed to 'restore' their activity, however, the village table services and festival catering was slower to restart. In the summer of 2022, the level of trade is likely to be the same as in 2019. Concerning the structure of production of these farmers (R17, R21, R13) at the peak of the COVID crisis, they made temporary changes, but these were only operative interventions. One farmer (R14) reported a drastic change in their production structure as during COVID crisis, cheese production ceased completely due to lack of demand, and its restart is not expected. Accordingly, only meat production remained, as the price and demand were stable. The representative of the mixed farm (R15), which also deals with cheese making, stated that the demand for artisanal products (made by processing raw milk) was most affected by the COVID crisis – it decreased the most. The processing stopped slowly but completely after the first wave of COVID. Then, after complying with health regulations (i.e., getting used to a new way of life caused by COVID regulation), the orders (demand) started to increase again. In the medium term, the farmer expects a further decrease in the demand for artisanal products due to a significant increase in staple foods' prices.

In general, farmers mentioned other problems (droughts and the lack of rainfall) than COVID that may influence their production structure.

4.6 Strategies and business models of agricultural family businesses

This last category of questions aimed to find out if family businesses were forced to change their original business models and strategy during the COVID crisis. Based on the answers of the respondents, it can be stated that none of them were forced to change their business models or strategies during or after the COVID crisis, however, strategy creation is not necessarily characteristic of small family businesses in general. The COVID crisis affected or rather influenced the future strategic plans of small family businesses in different ways. However, most of the respondents believe that no changes are needed to address the consequences of the COVID crisis.

The farmer, who practises conventional farming in his field (R1), followed the business model typical of conventional agriculture, but in the future, he wants to transform his entire system. 'Crisis is an opportunity' – this is how he expressed himself. In accordance with regenerative agriculture, he wants to use direct seeding, which of course also requires investment (e.g., direct seeding machine). In his opinion, everyone should rethink their agricultural practices. The other conventional producer (R11) was of the same opinion, as a price-value-oriented strategy should always be based on local inputs and resources. For another livestock farmer (R14), the COVID crisis was clearly an opportunity for making changes (e.g., in the way of production or minor digitalization: electronic registration of animal passports, online result records), thus he considers it beneficial for now.

Interestingly, there are also opposing opinions. An organic farmer (R13) thinks that COVID could not be defined as a crisis, but definitely, it was not an opportunity as agrotourism as an important diversified income narrowed significantly. According to the representative of the mixed farm which also deals with cheese making (R15), COVID could be considered more of a crisis. Other organic farmers think about diversification and more of their own input materials usage as a strategy. The organic peach producer (R2) is planning a new strategy in terms of nutrient supply. He buys organic manure now, but he does not plan to keep animals just to have his own manure. The organic apple producer (R3) is also looking for innovative but close-to-nature solutions. He bought a compost tea maker that can be used as foliar fertiliser, and he wanted to replace artificial fertiliser in his arable field as well.

Among the plans of the organic farmer operating meat CSA (R4) is planning to organise rapid markets, to increase his product range (stewed meats, ready-made products, healthy – without nitrite products). In his opinion, small-scale farming is more stable (like theirs), and human-scale solutions are always more sustainable in the long term. In the livestock farm (R14), they currently follow a demand-oriented strategy adjusted to the market price and then try to contract for a certain, regularly delivered quantity.

A farm engaged in poultry production (R5) would strengthen the crop production profile. According to him, "diversification would also be important at such a level that, for example, the farms should be provided with the opportunity to engage in green energy production, for which e.g., the roof of the stables also provides an opportunity". A farmer who mainly deals with precision consulting (R9) mentioned that he thinks a rise is expected in this area, as the COVID crisis and its spill-over effect have favoured the use of precision elements.



Fig 4. Utilisation of solar energy on the conventional family farm R10. Source: picture taken by farmer R10

The conventional arable crop producer (R11) emphasised that the two crises must be separated – the COVID crisis has no appreciable impact, and the agrarian crisis is caused by the war. According to him, the ideal solution to the crisis in agriculture and the COVID-19 crisis is the support of environmentally friendly, sustainable production methods and the replacement of monoculture and polluting technologies.

In general, respondents describe areas in which strategies should be created in the future – none of them are directly related to the COVID crisis: provision of workforce and seasonal workers, better utilisation of financial funds and subsidies, application of short supply chains, and sustainable soil cultivation that might change the soil water capacity during drought.

5. Conclusion and discussion

It can be concluded that the surveyed enterprises and producers adapted well to the restrictions related to the coronavirus epidemic, moreover, two farmers considered it as an opportunity (R1, R11). In the wine and organic sectors, most businesses even experienced an increase in demand, especially those who successfully switched to online sales (R1, R6, R16, R18) as also stated by Zanetti et al. (2022). Rather, the negative impact of the COVID crisis was felt by those family businesses that also dealt with hospitality and accommodation. This is also consistent with Mastronardi et al (2020) findings. The interesting and rather a spill-over effect of COVID is the desire for greater self-sufficiency, the transition to organic farming, and diversification. Perrin and Martin (2021) findings also confirmed the relevance of agroecological models in achieving resilience in farming and food systems against shocks such as the Covid-19 pandemic. In addition, Durant et al. (2023) found that farmers who increased their use of online sales during the first year of the pandemic and had more on-farm crop and livestock diversity were more resilient to the shocks of the pandemic.

Based on the research results, it can be stated that the COVID crisis had no significant effect in Hungary regarding Human Resources in small family businesses running multifunctional farms. This is consistent with the findings of the authors, who described that due to long-term family ownership, family members are emotionally attached to their company, which can affect their performance in times of crisis, but at the same time, they strive to build and maintain long-term relationships, including with their employees (Arrondo-Garcia et al., 2016; Berrone et al., 2012).

In general, with some exceptions, the supplier structure did not change during the COVID crisis. Most of the respondents claimed that the COVID crisis did not affect their original supplier-customer relationship. Furthermore, their customer base and their relationship with the customers remained the same during the crisis. On the other hand, some farms (R3, R5, R10) reported the following difficulties: "the supply of spare parts from Italy and China was interrupted. It was difficult to find a freighter". On the other hand, organic farmers experienced an increase in the number of customers during and after the second epidemic wave which farmers attribute to the increased health awareness. This experience was also confirmed in the papers of other authors (Naja & Hamadeh, 2020; Vittuari et al., 2021). In the wine & vine sector, the local producers had fewer problems, because they reached their consumers through a short supply chain and their consumers are well-established partners with loyalty to the producers. In contrast, bigger wineries faced severe challenges, because the duty-free trade collapsed at the airports, the HORECA partners temporarily closed, and the conventional contacts in part shifted to the virtual space.

The main "victims" of the COVID crisis were those operating in the export-oriented agricultural sector, along with tourist service and catering providers. Examples of this are dairy lamb production and the beef cattle sector in Hungary. Almadani et al. (2022) found that factors affecting global beef and sheep meat production and prices in the past decade kept producer prices at record levels in 2020, which continued to offset the negative effects of the epidemic in most countries and regions. In some countries, particularly South America, the impact of the pandemic exacerbated existing problems facing beef and sheep producers, principally arising from political instability, low economic growth and consumer purchasing power, high inflation, and rapid currency depreciation.

The prices of basic inputs increased without exception in all examined sectors. In the case of organic farmers, the biggest problem was the increase in labour costs. In chicken production, the avian flu influenced the prices more due to the limited supply. At the same time, it was noticeable that the difference between the prices of organic and conventional products decreased, which is partly due to the fact that the input materials of conventional farms became much more expensive.

Most farmers (R11, R14, R16, R18, R19, R20, R21) blamed the drought, rising energy prices, the Russian-Ukrainian war, and their direct and indirect effects on the increased input prices. Only a few interviewees mentioned (R5, R10), and rather characterised the first period of the crisis, that prices increased due to the disruption of supply chains, which is directly attributable to the impact of COVID. However, short

supply chains are very popular with family farms, especially among organic farmers. Therefore, they felt less about the problems of global supply chains.

In relation to the subsidies, it can be stated as a whole that the livestock farms all used the offered one-time subsidy, but its sum was judged by all to be little. In many cases, producers were either unable to find out about the availability of subsidies or were unable to use them. Only the greater wine producers could call for funding directly, as they could apply for the HORECA sector subsidies. In some cases (R1), farmers took advantage of the reduction of public charges on agricultural employees or applied for state support programs and/or credit constructions. In the case of investment subsidies, it was a problem that the deductible could not be financed with a discounted loan, which in one case (R5) also prevented their implementation.

Overall, it can be stated that the nature of production has not changed, but many interviewers are thinking about the greater role of online sales in the future and the shortening of the supply chain. Non-productive agricultural activities, especially hospitality, and agritourism, temporarily stalled but then recovered after the crisis. In these sectors, village table service and festival catering started again more slowly. In the summer of 2022, the level of trade is likely to be similar to that of 2019.

Furthermore, no producer wants to change their business strategy followed before the COVID crisis. Only one producer mentioned (R1) that he would like to pursue regenerative farming in the future, which would entail a strategic change. Several producers (R3, R5, R11) are planning minor changes in the future, which can be said to be more aimed at self-sufficiency, trying to reduce dependence on external resources.

Differences between the examined farms can be observed mostly between the organic and non-organic categories. Conventional farms were more exposed to changes in input prices and the proper functioning of global supply chains. It is therefore not surprising that several farmers mentioned that they are thinking about switching to organic farming in the future, which is often coupled with a short food supply chain. This finding confirms other authors' statements (Barman et al., 2021) according to which the epidemic is one of the causes of huge changes in the food supply chain including consumers' preferred purchasing channels. At the same time, it is important to mention that even within conventional production, the extent to which the COVID crisis has affected depends on the sector.

From the practical perspective, the research reinforces the theory that multifunctional small family farms respond flexibly to challenges and show better buffering capacity and resilience in times of crisis. At the same time, the limitation of the research is that the number of examined farms is not representative, which recommends the continuation of the research. The difficulties caused by the Ukrainian war and the crisis management strategies induced by climate change – that are mentioned by the respondents – require further study.

Nonetheless, based on the results, it is recommended to strengthen the multifunctional farm model representing diverse agricultural activities and income at the farm level as it also contributes to the retention of the rural workforce at the regional level even during crises. Therefore, at the national and EU level, the support of the multifunctional farm model, which places the creation of added value as a central function, becomes even more pressing in light of unexpected crisis situations.

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Appendix I.

Tab 1. Overview of interviewed respondents (with selected factor influencing business). Source: own research

Respondent	R1	R2	R3	R4	R5	R6	R7
Town in Hungary	Tiszaszentimre	Zákányszék	Tiszavasvári	Polgár	Lukácsháza	Gyűrűfű, Ibafa	Mihályi
No. of employees	8	5	18	7	4	0	0
No. of involved family	4	4	3	5	3	2	4
Family members relationship to farmer	wife, father, mother	wife, father, mother	wife, sister	wife, brother, father, mother	brothers, father	wife, husband	mother, father, son, daughter -in-law
Profile of the farm	grassland, arable crops, cattle	peach, carrot	apple, arable crops, grassland	animal husbandry	poultry	goat	apple, pear, plum, elder
Type of the farm (organic/non-organic)	certified organic grassland, conventional field crop production	certified organic fruit production, conventional field crop production	certified organic fruit production, conventional field crop production and grassland management	certified organic grassland and field crop production	conventional animal husbandry	organic animal husbandry	organic fruit production
Size of the farm (ha)	500 ha	11,5 ha	225 ha	60 ha	10 ha	10 ha	20 ha
Animal number (if any)	200 cattle	none	none	70 cattle, 40 swine, 400 chicken	35000 turkey, 60000 poultry	100 goat	none
Specificity of the farm	holistique management, cheese making	direct selling in the organic market	direct selling in box scheme	direct selling, operating meat CSA	turkey for catering	cheese and milk products on organic market	only fruit, and processed products on organic market
Selected factor that influenced business	<i>Nature of production and sales:</i> COVID-crisis affected mainly the nature of his crop production and sales drastically due to the increased input material prices. <i>Strategy and business models:</i> He strives for greater independence and in the future plans to switch to regenerative agriculture.	<i>Prices of inputs and outputs of the production:</i> Recently the rise in the diesel price is the only problem (but it was caused by the war and not by COVID). Despite the great demand for peaches, he did not raise the prices, even though it is an organic product.	<i>Supplier-customer relationships:</i> Supply of machine parts from Italy was interrupted and delayed due to COVID crisis. <i>Strategy and business models:</i> He plans to convert his arable land to organic.	<i>Supplier-customer relationships:</i> They had fewer members of their meat CSA (customers) during the COVID crisis due to the financial shock of the members. <i>Strategy and business models:</i> They want to diversify their activities (with training, agrotourism) in the future.	<i>Subsidies in agricultural sector:</i> They used a one-time subsidy for livestock. Loan interest rates rose, which prevented investments. <i>Strategy and business models:</i> They want to diversify their activities in the future.	<i>Prices of inputs and outputs of the production:</i> A price increase of only a few percent was implemented during the COVID crisis.	<i>Supplier-customer relationships:</i> There was a drop in the demand during the first wave, because of the restrictions.

Respondent	R8	R9	R10	R11	R12	R13	R14
Town in Hungary	Szombathely	Piliscsaba	Sárkeszi	Feked	Orfű	Bugacpuszta	Tápióbicske
No. of employees	0	0	6	0	2	2	0
No. of involved family	3	2	4	2	7	2	3
Family members' relationship to the farmer	mother, father, son	wife, husband	mother, father, sisters	father, son	father, son, their wives, and 3 children (not involved in farming yet)	husband, wife	father, mother, son
Profile of the farm	vegetables	advisory activity	arable crops, poultry	arable crops, engineering activity	arable crops, animal husbandry, organic production	mixed profile (crop + animal production)	animal production (beef-cattle)
Type of the farm (organic/non-organic)	organic vegetable production	conventional field crop production	conventional mixed farming	conventional field crop production	mostly conventional, partially organic	organic	conventional
Size of the farm (ha)	13 ha	12,5 ha	1000 ha	arable land (90 ha) and pasture (30 ha)	200 ha crop production (70%), animal husbandry (28%), organic production (2%)	209 ha grassland and arable land	60 ha
Animal number (if any)	none	none	77000 chicken	none	20 beef-cattle	50 Hungarian grey cattle + 25 calves and sheep Racka	15 + calves
Specificity of the farm	vegetables, seedling on organic market	cereals, advisory on precision farming	cereal, chicken to wholesale dealers and processing industry	engineering activity; the time spent at home under COVID has led to a positive change in attitudes towards the farm and farming	touristic activity (water tour organisation)	ecotourism, agrotourism, farm tourism	some lease work in the summer; farming, close to organic, direct selling

Respondent	R8	R9	R10	R11	R12	R13	R14
Selected factor that influenced business	<i>Prices of inputs and outputs of the production:</i> During the COVID crisis, they did not implement a price increase as they were afraid of losing customers.	<i>Prices of inputs and outputs of the production:</i> The input prices in plant production increased with a higher rate than the output prices.	<i>Subsidies in agricultural sector:</i> They used a one-time subsidy for livestock. Loan interest rates' rise made the investments more expensive. They can take into account the increased cost of materials for construction investments, but not for machinery investments. <i>Supplier-customer relationship:</i> <i>The broiler chicken buyer has changed, but not as a result of COVID. They have no contracts at the moment.</i>	<i>Prices of inputs and outputs of the production:</i> Independently of COVID, the drought, the Russia-Ukraine war affect primarily the prices. The price of products based on foreign production chains and resources has risen. COVID had a noticeable effect on deliveries from abroad – either it disappeared completely because factories closed or the delivery time increased significantly. <i>Supplier-customer relationship:</i> They plan to introduce new sectors that they want to turn to organic farming, along with the current ones	<i>Supplier-customer relationships:</i> No change in the structure of suppliers, but change in communication with suppliers – less face-to-face meetings, more phone calls and online meetings <i>Prices of inputs and outputs of the production:</i> Output prices are most affected by the drought and the rise in energy prices and not by COVID.	<i>Prices of inputs and outputs of the production:</i> Prices went up (machine parts, seeds), in some cases a lot. Many small machine parts were not available (from China, Italy), now the situation is much worse due to COVID. Output prices were not affected by the COVID crisis They use no-till farming to reduce costs.	<i>Supplier-customer relationships:</i> Change in the customer base and structure due to the closing of restaurants (cheese customers); change in the original supplier-customer relationship; the relationship with local buyers has strengthened. <i>Nature of production and sales:</i> The COVID crisis has changed the sales. They had time for minor digitalization. <i>Strategy and business models:</i> The contractual strategy has been replaced by market-oriented strategy.

Respondent	R15	R16	R17	R18	R19	R20	R21	R22
Town in Hungary	Dunaszentbenedek	Monor	Kisharsány	Monor	Bakonyszentkirály	Monor	Monor	Monor
No. of employees	2	0	35	0	1	2+2 seasonal	none	none
No. of involved family	5	6	2	1	3	1	none	none
Family members relationship to farmer	father, mother, son, 2 daughters	wife, children, parents	mother, daughter	alone	wife, son	alone	alone	alone
Profile of the farm	mixed (dairy farming, crop production)	winevine, apple	winevine	winevine, crop	meadow/pasture	crop	winevine	winevine
Type of the farm (organic/non-organic)	conventional	conventional	mixed (11 ha organic)	conventional	conventional	conventional	conventional	conventional
Size of the farm (ha)	130 ha	10 ha	100 ha	1,8 ha vine, 4 ha crop	52,4 ha	67 ha	6 ha	4 ha
Animal number (if any)	130	none	none	none	lamb / sheep 100	none	none	none
Specificity of the farm	artisanal cheese making, direct selling	direct selling, e-commerce	trade with traditional supermarkets, duty free shop (airport), e-commerce	direct selling	export to trader (Italy)	selling to trader	selling to winery, & direct selling to small private cellars	selling to winery

Selected factor that influenced business	<i>Supplier-customer relationships:</i> Change in supplier structure (new suppliers of fertilisers and fuel). The way of communicating has changed. <i>Prices of inputs and outputs of the production:</i> Difficulties in procuring some products has led to significant price increase. Purchase dumping due to poor communication and alarmism) occurred, and the resulting deficit), induced higher demand and a rise in input prices.	<i>Prices of inputs and outputs of the production:</i> The input prices increased and it has to be calculated into the output prices because of the narrow margin.	<i>Supplier-customer relationships:</i> There was a little change among suppliers, but it didn't have a significant impact on the trade. The dutyfree shop temporarily closed and that had a relevant impact on the revenues. <i>Prices of inputs and outputs of the production:</i> They had to cut the costs, especially of the expenditure on materials.	<i>Prices of inputs and outputs of the production:</i> The Input prices strongly increased (pesticides, and fertiliser), the increase of output prices slowly followed the input prices, but did not catch up.	<i>Prices of inputs and outputs of the production:</i> The Input prices increased, and the output prices followed that slowly.	<i>Prices of inputs and outputs of the production:</i> The Input prices highly increased, the output prices partly follow them.	<i>Supplier-customer relationships:</i> The vine selling to wineries decreased little but the wine and vine direct selling to small private cellars and consumers well compensated it, in fact total income increased.	<i>Prices of inputs and outputs of the production:</i> The Input prices increased, the output price more or less but followed it.
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