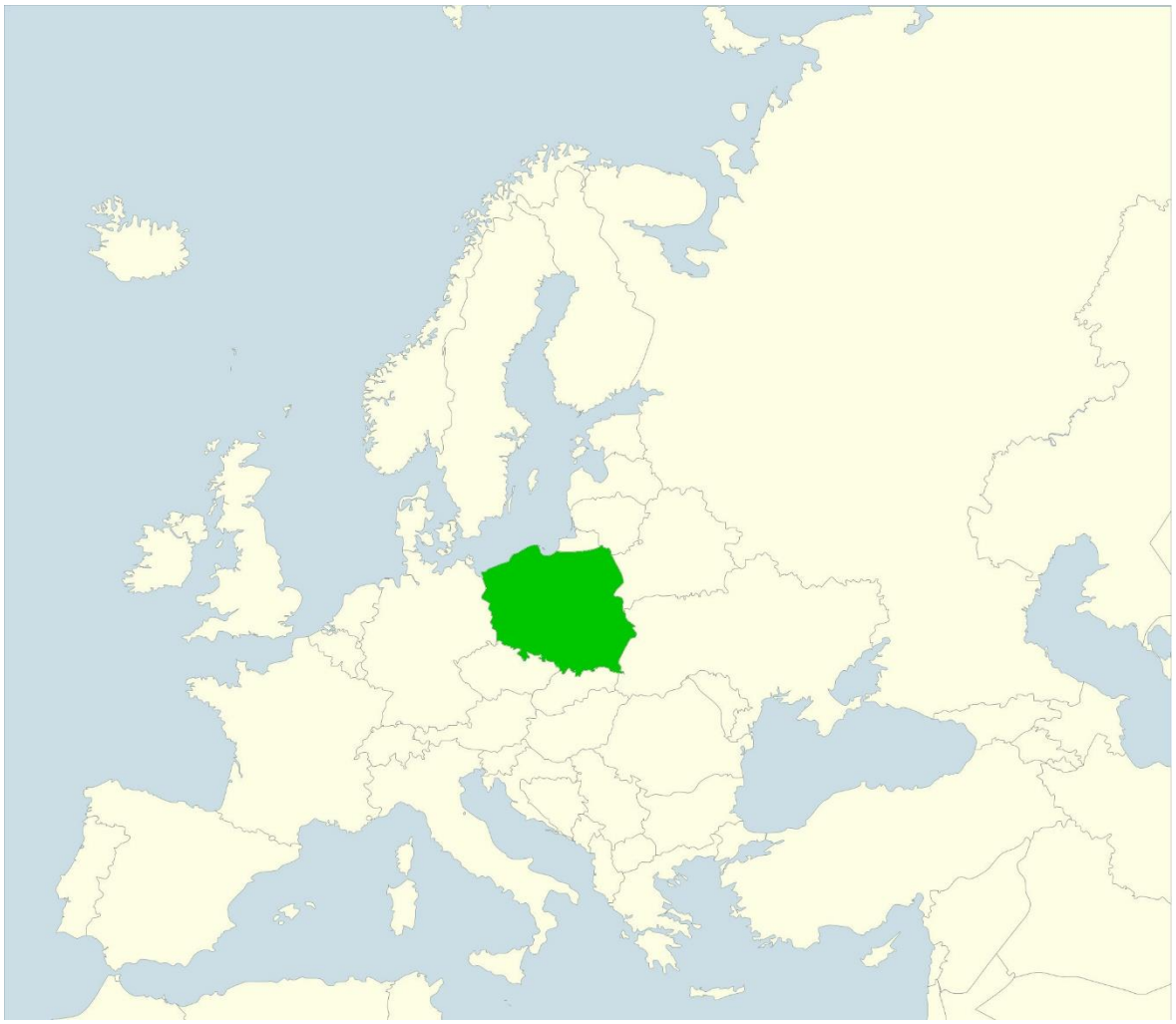
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LOOKING FORWARD TO WHEN IT IS OVER: REACTIONS AND SHORT-TERM COPING MICRO-STRATEGIES OF POLISH FRUIT AND VEGETABLE FARMERS DURING THE COVID-19 PANDEMIC

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Abstract: The present paper focuses on farmers' strategies for coping with the shock caused by the outbreak of the pandemic of COVID-19. Using the concept of farm resilience, which underlines the role of capacity and abilities as well as different actions undertaken in difficult situations, this study proposes an analytical framework of farmers' coping short-term micro-strategies in relation to external crises, on the example of the COVID-19 pandemic. Taking into account academic literature, qualitative data gathered from fruit and vegetable producers in different regions in Poland and the information from sector experts, the paper outlines the varied consequences of the pandemic for farms, and also farmers' diverse reactions to them. The findings from this study suggests that the analysed farms' relative resilience to the crisis was achieved thanks to their available economic and social resources and the actions they undertook. The above-mentioned resources and activities were considered in the study primarily using the relational (process-based) approach, focusing on the ways of their creation, maintenance and adaptation. At the same time, the empirical material under analysis has shown that the adaptive measures adopted were short-term and did not respond to the farms' permanent problems, which the COVID-19 pandemic has exacerbated significantly. It is assumed that presented results and proposed framework of farmers' micro-strategies, which were taken during the pandemic, might be useful for future studies focusing on various external shocks as well as for research to be conducted in other CEE countries due to many common contextual factors that has shaped food practices and institutional arrangements.

Keywords: resilience, coping micro-strategies, fruit and vegetable farms, effects of COVID-19 pandemic

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Streszczenie: W niniejszym artykule skupiono się na strategiach radzenia sobie rolników z szokiem wywołanym wybuchem pandemii COVID-19. Wykorzystując koncepcję odporności gospodarstwa (farm resilience), która podkreśla rolę potencjału i zdolności gospodarstw oraz różnych działań podejmowanych w trudnych sytuacjach, w artykule przedstawiono propozycję schematu analitycznego krótkoterminowych mikrostrategii radzenia sobie rolników w odniesieniu do kryzysów zewnętrznych na przykładzie pandemii COVID-19. Uwzględniając literaturę przedmiotu, dane jakościowe zebrane od producentów owoców i warzyw w różnych regionach Polski oraz informacje zgromadzone od ekspertów branżowych, w artykule przedstawiono zróżnicowane skutki pandemii dla gospodarstw rolnych, a także reakcje rolników na konsekwencje nowej i niespodziewanej sytuacji. Zebrany w opracowaniu materiał empiryczny wskazuje na względną odporność badanych gospodarstw na kryzys, osiągniętą dzięki dostępnym zasobom ekonomicznymi społecznym, a także podjętym działaniom. Wspomniane zasoby i aktywności rozpatrywano w badaniu przede wszystkim wykorzystując podejście relacyjne (proces-based), skupiając się na sposobach ich tworzenia, utrzymania i adaptacji. Jednocześnie analizowany materiał wykazał, że przyjęte działania adaptacyjne były krótkotrwałe i nie odpowiadały na stałe problemy gospodarstw, które pandemia COVID-19 znacznie pogłębiła. Założono, że przedstawione wyniki i zaproponowane ramy analityczne mikrostrategii rolników, podjęte podczas pandemii, mogą być przydatne w przyszłych badaniach skupiających się na różnych szokach zewnętrznych, a także w studiach prowadzonych w innych krajach Europy Środkowo-Wschodniej ze względu na wiele wspólnych kontekstów, czynników, które ukształtowały tamtejsze praktyki żywieniowe i rozwiązania instytucjonalne.

Highlights

- A resilience concept was used to analyse fruit and vegetable producers' response to external shock.

- The consequences of the COVID-19 pandemic for farms were varied.
- Farmers responded to them by trying out several strategies.
- The farmers' resilience to the crisis stemmed from their economic and social resources.
- Micro-strategies in relation to external crises were proposed.

1. Introduction

The outbreak of the COVID-19 pandemic has been an unprecedented shock. It has contributed to health problems of many people worldwide as well as undermining the basic forms of social functioning, causing a multiple-aspect and multilevel health, social and economic crisis (ILO, FAO, IPAD and WHO 2020, Ikechukwu and Tochukwu 2020, WHO 2021). This crisis has also affected farmers, including fruit and vegetable producers, who are responsible for delivering staple food that is important for maintaining food security, consumers' basic needs, and providing farming households with a livelihood (Herrero et al. 2017; Childs et al. 2019). As a result of the growing incidence of COVID-19, fear of becoming infected, diminishing trust, and the public restrictions on socio-economic life introduced by the authorities, the scale and methods of fruit and vegetable production and trade have been limited (Hailu 2020; Mahajan and Tomar 2021). This situation also undermined food security levels in some of its dimensions like uncertainty, availability and stability of access to fresh products (Devereux, et al., 2016, OECD 2020c). The pandemic has not only caused new problems in the fruit and vegetable segment, but has also exacerbated dysfunctions and difficulties that have been noticeable for a long time, in the form of market destabilisation, producers' unfavourable income situation, tough working conditions and low wages for employees, and also a low level of resilience to the external shocks such as, for example, extreme weather incidents caused by climate change, epidemics, trade embargos or military conflicts (OECD 2020; Anderson 2020; Ridely, Devadoss 2021). However, despite all the negative effects of the pandemic on the food system, some positive impacts were noted as well (e.g., improved food management practices or a food waste limitation by some households (Principato et al. 2022).

The scope and variety of socio-economic effects of the pandemic have dynamised the discussion on the possibility of transforming the food system and the farm sector towards ensuring an appropriate standard of living for the farming population and delivering the necessary volume of healthy, safe foodstuffs while maintaining a neutral impact on the climate and having a positive impact on the natural environment (Clapp, Moseley 2020; Blay-Palmer et al. 2020; Fairbairn, Guthman 2020; Curt 2020). One of the conditions of success in effecting this kind of change lies in identifying how food producers running small and medium-sized farms, which are often in the form of family businesses, have responded and functioned during the period of the unpredictable external shock brought about by the outbreak of the pandemic (Benedek, et al 2021).

The aim of the paper is to identify and discuss fruit and vegetable farmers' reactions and coping short-term micro-strategies towards the crisis caused by the first (from March to July 2020) and second (from August to December 2020) wave of the COVID-19 pandemic[3]. Coping short-term micro-strategies of farmers were analysed, while taking into consideration literature of the subject, general and local contexts, which consisted of stable and changing market, social and health conditions. The study also indicated the factors, actions and characteristics of wider socio-economic and institutional settings that serve to strengthen and those that hinder farmers' capabilities of coping with difficult situations caused by sudden changes in the environment. Coping/adapting is understood not just maintaining existing agricultural operations (e.g., a farm's continuation), but also as functioning in the new socio-economic circumstances with the prospects for further growth. This is an important issue at a time of possible intensification of climate, health, political and economic crises, because what is at stake is not just the ability to return to the *status quo ante*, but also gathering resources, experience and skills serving to

[3] In connection with the "first wave" of the pandemic, a state of epidemic danger was introduced in Poland as of 12 March 2020 and changed into a state of epidemic a few days later. The start of the COVID-19 "second wave" was dated from August 2020, since harsher restrictions on socio-economic life started to be reintroduced in the country.

produce adequate responses to negative events approaching from outside in future, and also accelerating any previously planned restructuring and measures supporting further development. Especially in Central and Eastern Europe (CEE), where there is low public trust in state institutions and low social trust, building resilience may be difficult, because an important role in shaping resilience has social capital (Ghodsee, Orenstein 2021; Wilson 2010,).

2. Theoretical background

2.1 Farm resilience and the COVID-19 pandemic

One of the economic areas to which the category of resilience is applied is the agri-food sector and its various actors (manufacturers of means of production, agricultural producers, logistics, trade businesses, consumers) (MacKinnon, Derickson 2012). Its analysis from the point of view of agricultural producers is particularly interesting and useful, showing not only the effectiveness and appropriateness of the social response to fundamental crises, but also the situations, values and actions of different social groups, while also accounting for a number of local factors. According to the literature, farm resilience involves three elements: (1) robustness – the capacity to resist and endure shocks and stresses; (2) adaptability – the capacity to actively respond to shock and stresses without changing farming system structures and feedback mechanisms; (3) transformability – the capacity to reorganise the structure and feedback mechanisms in response to shock and stress. This approach to resilience underlines that change can be composed of slight modifications, and not necessarily only deep transformations (Anderies et al, 2013; Meuwissen et al, 2019).

Farm resilience can be considered through an analysis of its components. Namely, it comprises the broadly understood potential of the farm and the people connected with it (capacities/abilities). This includes all kinds of resources, capital and assets, such as natural capital (land), physical capital (buildings, machinery, equipment), financial capital and social capital, which can all be successfully diagnosed using quantitative research tools (Groot, et al 2016; Hess 2020, et al; Paganini, et al. 2020; Borychowski et al 2020). Other authors point to the impact of food producers' socio-psychological characteristics, what could be considered as elements of human capital (stress management skills, risk inclination, knowledge, level of specialist and business skills), that might be important for handling events like the COVID-19 pandemic and its many different negative effects (Meuwissen, Feindt et al. 2019). The farm resilience component of greatest importance has yet to be identified, nor has an optimal configuration of elements yet been found (Béné 2020). A deeper insight into the problem and factors of farms' resilience to various types of shock is provided not only by a structural approach concentrating on the state of resources and potentials but by a relational (process-based) one invoking financial, emotional and social bonds as well as how they are formed, maintained, broken and adapted (Béné 2020, Slijper 2020). This way of thinking focuses on farmers' agency and their active participation in the process of change (ongoing learning), expressed in their attitude towards means and methods of production, activities undertaken on the market, or taking advantage of business opportunities (Darnhofer, et al. 2016).

The potential both of farms and their users' actions can prevent stressors and external shocks from having a long-term and unfavourable impact on the development or continuation of existing agricultural operations (Barrett, Constas 2014). It is emphasised that in this context it is important to distinguish resilience *per se*, as a process, mediating element or effect leading to a long-term state of affairs, from resilience capacity as a chance to sustain agricultural operations or develop them once the crisis is over (Béné 2020). Choosing an appropriate strategy, i.e., one that limits the risk of an unfavourable effect in the medium or long term increases the chances of a positive outcome following the crisis. In this context, the role of actual resilience in restoring, maintaining and improving a farm's operations or sustaining the wellbeing of its users is decisive (Béné 2020).

Analysing resilience, we have to take into account the socio-political context that the process takes place (Dagdeviren et al. 2021). Residents of Poland and other EEC are characterized by low public trust in state institutions and low social trust. Farms producing for the market are highly dependent on various types of institutions and thus on the quality of governance (Ghodsee, Orenstein 2021). According to research in

CEE countries, its rate is low, and the COVID-19 period has only worsened the existing situation (Charon et al. 2021). Rural community resilience is analysed as a balance between the economic, environmental and social needs of rural communities (Wilson 2010). The above-mentioned factors as well as the deteriorating quality of soils and waters make the conditions for building sustainable resilience farms difficult in Poland and in the entire region (Atlas Rolny 2021).

The COVID-19 pandemic encourages in-depth, qualitative studies on the actual resilience of farming systems at the local level, including that of fruit and vegetable producers. The present paper focuses on farmers specialising in fruit farming and horticulture in Poland. It is assumed that short-term micro-strategies adopted by this group in the face of the pandemic reflect actions that might be similar to those introduced by producers from other CEE countries due to many common contextual factors that have shaped food practices and institutional arrangements. The noticeable presence of food self-provisioning, the symbiosis of agricultural enterprises and household smallholdings, the existence of formal and informal economic relations and traditional identity increasingly exposed to global economic interests and new technologies, are *inter alia* among those similarities (Jehlička et al. 2021). Also in the dimension of social, environmental and economic capital in CEE countries, we can see similar challenges. When extrapolating the results of our research to the entire region, it should be remembered that this is not a homogeneous area, having various forms of collectivization behind it, which has an impact on today's agrarian structure. Poland stood as a country with very limited collectivisation of agriculture during the socialist era and the persistence of family farming (Ziętara and Mirkowska 2019).

2.2 Background: Vegetable and fruit farming in Poland before and at the time of the COVID-19 pandemic

Several historical factors like limited collectivisation of agriculture during the socialist era, the persistence of family farming, the economic transformations from a planned economy to a market economy in the early 1990s, joining the EU in 2004, as well as an intensive market competition afterward, have contributed to the current structure of farms in Poland, which is characterised by a sharp polarisation (Visser et al.2021, Zegar 2019;). The division into a large number of small farms and a small group of big farms was shaped by the past, long-term and spatial differentiation of a pace of economic development, as well as the regional differences in the institutional, political, geographical and natural conditions of farming activities (Ziętara and Mirkowska 2019). In the case of farms producing fruit and vegetables, current public statistics indicate that their overall number in Poland can be estimated at about 64,000 entities. Most of them are small or medium-sized family units. The main role in this group is played by the 8–15% of large agricultural holdings that in terms of volume, fruit and vegetable production in Poland account for 10% of the total EU output (third place after Spain and Italy) (National Strategy 2017). Together with fruit and vegetable processing, horticulture and fruit farming thus occupy an important place in the country's agri-food economy (Szczepaniak et al. 2020). The level of development of the fruit and vegetable sector has been considered as high so far due, among other things, to favourable conditions for growing fruit and vegetables, an established tradition (especially in central and eastern Poland), the availability of a relatively cheap labour force (largely from outside the EU). As for the quality of the institutional environment and resilience to crises, however, the lack of knowledge, experiences, as well as systemic solutions aimed at mitigating the external shocks were indicated as one of a weakness (National Strategy… 2017).

In the first and second waves of the COVID-19 pandemic, Polish farms producing fruit and vegetables were not covered by public support (especially by direct, financial government aid) in comparison to other agricultural operations (e.g., animal production) and to non-farming business entities, as the situation was not seen to necessitate it. However, fruit and vegetable farmers struggled with serious perturbations caused by the COVID-19 restrictions and the shutdown of the economy.

3. Methodology and empirical material

Despite its usefulness and convenience, resilience is a category that is hard to study and measure, especially when it comes to its operationalisation and quantification (Slijper et al. 2020). This means that

it is usually difficult to present using a single indicator. In the present paper, farm resilience has therefore mainly been analysed by a qualitative approach. Reactions to the crisis and the resultant actions towards it (the COVID-19 pandemic and its consequences) have been evaluated on the basis of free-form comments, declarations by the farmer respondents and, to a lesser extent, the researchers' observations. Since the fundamental question in our analyses concerned resilience understood as the capacity to endure, actively respond and reorganise the structure and feedback mechanism in response to the external shock, the analysis refers to the relational (process-based) approach proposed by Béné, Slijper and Meuwissen et al. It includes characteristics of the farm itself, its managers, their actions, attitudes, characteristics and ways of running agricultural operations and relations with the market. This setting tries also to account for the broader environment, i.e., the institutional, historic-social and natural context (Meuwissen et al. 2019).

The term "coping micro-strategies", taken from research on corporate management, is also used in the paper (Salvato 2003; Logan, Fisher-Wright 2009). These can be described as a set of mutually related routines, micro-activities and resources that can be analysed in the functioning of business entities (Salvato 2003). Micro-strategies are applied to planned outcomes, resources possessed and actions undertaken within a given business operation (Logan 2009). They reflect the main direction of actions, which for any business activity are focused on the growth, stability or limiting of production or the scale of operations (Odening, Bockelmann, 2012).

The reactions and coping micro-strategies of fruit and vegetable producers in relation to the consequences of the pandemic, including a model of short-term adaptation to external crises, have been explained on the basis of an analysis of in-depth interviews with eleven Polish farmers specialising in the type of agricultural production considered here as well as two experts (one with a journalist from the trade press and another with a representative of one of the biggest associations of vegetable and fruit producers). In the case of three interviewees, an on-site observation at farms and the local marketplace was carried out. The in-depth interviews with operators of fruit and vegetable farms were conducted between 20 October and 11 November 2020, on the basis of a script prepared in advance. Eight interviews were carried out online via one of the software platforms for teleconferencing and three of them were face-to-face. The interviews were recorded and transcribed. Gathered qualitative data were coded and analysed using the methodology and assumptions of thematic analysis (TA) (Kiger, Vapiro 2020). In order to understand experiences, thoughts and behaviours the questions asked during interviews focused on the respondents' subjective evaluation of how the pandemic affected their personal situation, the operation of their farm, their household's financial situation, aid received from public institutions or nongovernmental organisations, and their expectations as to the actions of public institutions.

The choice of agricultural producers and experts for the study was deliberate (convenience sampling), guided by the aim of studying a group that was varied in terms of characteristics important for the research problem and in order to reflect the different perspectives on it, including a gender. The selection was made on the basis of the authors' own expert knowledge and the suggestions of various stakeholders (experts, specialists, agricultural advisers). The characteristics of respondents and their farms that were taken into consideration included: various farmer socio-economic characteristics (age and sex), a farm's location in provinces with different types of agriculture and the specialisation and scale of agricultural production[4] (see table 1). The farms in the study differed in terms of the organisational form of their agricultural activity, their place in the food supply chain, and their management systems. Further on in the paper, statements quoted and information obtained in the study have been attributed

[4] As for the sample selection, the convenience sampling technique was employed in the study. A given spatial distribution of analysed cases of farmers was used for two reasons. Firstly, it reflected an importance of fruit and vegetable production in Polish regions. According to Statistics Poland data in 2020 in Mazowieckie province (four out of eleven interviews were conducted there) tree fruit production in orchards was the biggest in the country and amounted to 1806.6 thous. tons (46.3% of total). In turn, in 2020, the field vegetable production amounted to 481.0 thousand tons (12% of total, the fourth place in Poland) (Statistics Poland 2021). Secondly, an implemented respondents' selection was partly based on geographical proximity of analysed farms to the article's authors place of living and stemmed from the COVID-19 restrictions (the research was carried out during the second and severe wave of the pandemic).

to specific respondents by the symbol [C] and an individual identification number (The interviewed experts the following symbols C12 and C13 were attributed further in the paper).

One of the reasons for choosing fruit and horticultural farms for research was the high dependence of this type of agricultural production on external factors such as weather, climate, changes in the economic situation on the markets or the political conditions in international trade. Therefore, when deciding to conduct research in this group, it was assumed that the strong effects of the COVID-19 pandemic and its economic, institutional and social consequences would occur.

Tab 1. Characterisation of the fruit and vegetable farmers covered by the study. Source: own work based on the case studies

Item	location (region, province)	Type of farm	Farm size [ha]	Farmer' characteristics	number of family members working on the farm	seasonal workers from Ukraine employed	selected agri-food products	other products and services	selling food directly to consumers
C1	Mazowieckie	family farm	no data	female, middle-aged	6	yes	potatoes, strawberries, processed foods (sauces, fermented and unfermented pickles tomatoes,)	X	Yes
C2	Mazowieckie	family farm	20	female, 43 years old	2	yes	apples, strawberries, raspberries, fruit preserves	agritourism	Yes
C3	Mazowieckie	family farm	25	male, 55 years old	2	yes	cucumbers, cabbage, processed products (fermented pickles), onion seeds	seed production	No
C4	Mazowieckie	family farm	200	male, 35 years old	2	yes	beef, poultry, potatoes, maize, cereal crops	production of alcoholic products, hotel and transport services	No
C5	Podlaskie	family farm	100	female, 56 years old	2	no	poultry meat, eggs, cereal crops, strawberries, cabbage, potatoes, onions	X	Yes
C6	Warmińsko-Mazurskie	cooperative	50	male, middle-aged	n/a	no	potatoes, celeriac, leeks, carrots, cabbage, kale, fruit, cereal crops, herbs	X	Yes
C7	Wielkopolskie	family farm	50	female, 38 years old	2	yes	tomatoes, cereal crops	X	No
C8	Zachodniopomorskie	family farm	26	female, 51 years old	1	yes	raspberries, strawberries, chokeberries, fruit preserves (jam, syrup, juice), herbs, flowers	X	Yes
C9	Lubelskie	family farm	7	male, middle-aged	2	no	beetroots, broccoli, courgettes, strawberries	horse breeding, horseback riding lessons	No
C10	Warmińsko-Mazurskie	family farm	25	male, middle-aged	3	no	apples, plums	x	No
C11	Lubelskie	family farm	100	female, 58 years old	3	yes	onions, carrots, leeks, courgettes, peppers, pumpkins, cabbage, beans, parsley root, potatoes	agritourism	no

4. Results

4.1 Health, psychological and economic effects of the COVID-19 pandemic

The continuation and exacerbation of the COVID-19 pandemic and the associated socio-economic restrictions caused a variety of reactions among the food producers in the study. The main theme in the respondents' narratives was uncertainty as to how the epidemiological and economic situation, which determined their functioning as farmers, would develop in the future:

What the next season will be like, I haven't got a clue. I'm hoping it will all be over and we'll be able to get to grips with everything, get things back to normal. (C7)

Some of the respondents' limited capacity to predict the development of the economic situation, and thus to take appropriate action on their farms, was the result of their sense of having a negligible influence on their environment. The respondents indicated that the reality in which they would come to function depended on many global, national and local factors. The actions they undertook as farm managers were an attempt to adapt to the crisis. It was not clear, however, if their reactions would turn out to be right, as suggested by this respondent statement from autumn 2020, during the pandemic's "second wave":

There will be even bigger problems. We can see what's happening even now. They'll shut everything down. A lockdown is inevitable… I'm a little short on optimism. Not because I'm a complainer, but because I can see what's going on around me. (C8)

The great intensity of infections at the time of the interviews meant that the respondents were worried about their own and their employees' health. They were aware that infection with the virus and having people on their farms placed under quarantine would have serious economic consequences for their operations, including the possibility of irreparable and substantial financial losses. For example, such a situation affected one of the fruit growers running a large-scale agricultural operation (C10):

There are no benefits involved. It's all about pure survival. There's great fear. … We were also worried that if something happened that would place us under quarantine… all the fruit would be left on the ground. … And it would be a very real concern if any of our employees or we ourselves fell ill or were found to have COVID-19... (C10).

In the case of some producers, financial losses and a state of market uncertainty caused by COVID-19 were worsened by unfavourable weather, i.e., a drought in the first half of the year (in winter and spring) and excessive rainfall in autumn. New circumstances increased the uncertainty connected with farming business activity, its day-to-day management (purchase of means of production, work organisation, sales) and planning. As the respondents' statements show, the pandemic's adverse impact on farming varied at different stages of its development. Some fears were well-founded (e.g., high variability in food demand), while others were not (trouble with obtaining means of agricultural production):

At the start of the pandemic, there was panic. We were fearful about everything. Who would buy our apples and for how much? Where would we get plant protection products and workers? We wondered if we should buy everything in one go for the whole season. But it turned out there was no problem. (C2)

The deterioration of some respondents' financial situation was mainly due to restrictions on the movement of people between Poland and Ukraine, introduced in the first half of 2020 as the pandemic spread. Many farms in Poland specialising in fruit and vegetable production rely on relatively cheaper workers from Ukraine. An increase in the need for labour is the result of a seasonal accumulation of work that progresses variously in different types of fruit and vegetable production from early spring until autumn. The outbreak of the COVID-19 pandemic and the resultant restrictions on cross-border movement caused uncertainty among foreign workers and a significant outflow of the labour force from farms. A return to their native country was mainly observed among seasonal economic migrants who had come to work on farms in Poland for the first time or had started doing so recently.

This year [2020], there was a great shortage [of labour]. … In spring, the girls from Ukraine left – the ones whose visas had expired. But it wasn't just them. They were scared the border would be closed. We thought about sowing just half the land because we would be on our own… (C1)

A lack or shortage of workers prevented some of the farms from carrying out planned and necessary jobs affecting plant growth and thus also the volume and quality of the future harvest. Losses connected with the failure to carry out appropriate tasks in the field on time due to the lack of workers led to a raspberry yield about 40% lower than the previous year's, according to the estimate of one of the farmers in the study, while another (C11) suffered an irreversible loss of several hectares' worth of vegetable crops.

They [Ukrainians] could [return] in June. Work on our farm starts in April. That's when the plants start off. So do the weeds. It was impossible to undo. Interventions not performed in time have their consequences. Whatever we were able to handle ourselves, we did. With the acreage we have right now, it's impossible to cope with 26 ha of raspberries without a workforce. … The consequence later is that the yield is significantly smaller. (C8)

The pandemic and the restrictions that the public authorities imposed on agri-food markets caused a drop in the demand for raw materials and products offered by farms. This reduced demand also affected some of the farms in the study. Some respondents reported a smaller number of orders for their products especially immediately after the coronavirus appeared in Poland (spring and summer 2020). But the changes caused by the pandemic and affecting the demand for food seem to be relatively lasting and hard to reverse. A farmer from Mazowieckie province who sells her products directly to consumers in Warsaw reported a decrease in the number of customers compared to the period before the economy was locked down.

Lots of people moved out of Warsaw. My very good customers…They've escaped from Warsaw and are working remotely. And you can feel it. … Frankly, it's 20% of my customers. (C1)

According to respondent C1, the pandemic mainly caused the departure of wealthy customers who appreciated healthy food and had spent a lot of money on it. However, the loss of this group of consumers was partially compensated for by the arrival of new buyers. These were middle- or low-income customers who had previously mainly bought their food from retail and discount chains. In a situation potentially hazardous to their health, they started paying greater attention to their diet and the quality of the food they ate. An increased interest in fruit and vegetables as well as their processed products, usually associated with healthy food that increases immunity to various kinds of infection, was observed in the case of a producer of pickled goods (cucumbers, cabbage) (C3), farmers selling fruit and vegetables directly to customers in bigger cities (C1, C2, C5), and experts on the domestic fruit and vegetable market (C12 and C13).

A drop in the volume of orders when the pandemic crisis began in Poland was also noticeable on farms geared towards selling to international entities (C3, C7). The closing of the borders in spring 2020 restricted their buyers' access to the Polish market, and also caused a temporary interruption in the distribution of agri-food products to international markets. At the same time, lower demand for fruit, vegetables and potatoes was reported by one of the farmers who sold his products on the domestic market to businesses whose operations were being closed down or restricted in order to stop the spread of the virus (hotels, restaurants, schools, etc.) (C4). The CEO of an agricultural production cooperative reported a worsened financial situation (reduced sales volume and receipts) at the businesses under his management as a result of the cancellation of large events at which their products had been sold and promoted before the pandemic broke out (trade fairs, exhibitions, meetings) (C6).

After a period of uncertainty and the most painful economic restrictions, the fluctuating demand for the products of some of the respondents stabilised. The interviews indicated that the fruit and vegetable segment in Poland had long been dependent on strong seasonal sales fluctuations and changeable weather conditions, irrespective of the COVID-19 pandemic (e.g., C10).

4.2 The farmers' reactions and short-term micro-strategies for coping with the consequences of the COVID-19 pandemic

One of the consequences of the COVID-19 pandemic on the financial and economic situation of the respondents was its impact on their planned investments. Uncertainty, price fluctuations on markets as well as losses incurred led some of the respondents to assume a wait-and-see attitude, i.e., to avoid

unnecessary risk and withdraw from previously planned projects (C1, C3). For example, a farmer specialising in tomato growing decided to abandon a large project to build a greenhouse to cultivate 7 ha of tomatoes (C7). The manager of an organic farm (C11) and her husband abandoned plans to change the sales method for some of their products. Before the pandemic, they had planned to launch their own outlet selling vegetables and vegetable products directly to consumers in Lublin (the regional capital).

The sudden shortage of seasonal workers was met with various coping strategies from the food producers in the study. In some cases, the respondents resigned themselves to the situation and did not carry out various jobs, interventions or harvests. Another type of action in the crisis involved trying to find workers from the local population (C1, C4, C8), unemployed people registered at labour offices (C8), and friends and family (C1, C5, C8). One of the farmers tried to obtain assistance from the labour office (C7). Relatively, the most effective measure turned out to be the support of family members in seasonal jobs; their help enabled farms to continue functioning in the toughest periods (C1, C5). Support was also offered by agricultural producer friends or people from other sectors who employed Ukrainians and sent these employees to help the respondents (C2, C7). No special problems with labour were felt by those respondents who hired people they knew (often the same ones over a long time) to work on their farms, especially local residents (C9, C10).

Problems stemming from difficulties in hiring foreign workers were approached with a variety of solutions. One of the respondents introduced safe work organisation (distancing between workers) and provided employees with appropriate means to protect them from SARS-CoV-2 infection (masks, gloves, disinfectant) (C10). Another farmer, who grows greenhouse tomatoes (C7), took advantage of the option to lengthen the work hours of healthy employees and persons not in quarantine, which was allowed by the regulations in force at the time. Another solution involved switching to shift work and adapting the accommodation of seasonal foreign workers to meet the sanitary norms (C13).

Under conditions defined by an unstable epidemiological and economic situation, the respondents usually declared that they continued to run their farms according to their previous ways and means, while practising greater caution than previously. It was all about everyone connected with the farm respecting the relevant rules at work and in daily life (e.g., social distancing, frequent disinfection, wearing masks, isolating the sick). In this respondent's case, such measures enabled infections and other problems to be avoided in the workplace.

Things are fine. We're taking all possible precautions. It's bringing results. And if we continue behaving, proceeding like this, teaching people, our crew, then things will be fine. But accidents happen. And sometimes, despite every precaution being taken, someone will sneeze and everything will fall apart. For now, it's absolute caution, and caution once again. (C10)

In the face of all kinds of negative effects of the COVID-19 pandemic on food production, the respondents' strategy was to limit the costs of their operations. This was due to the necessity to economise in "hard times" as well as the desire to compensate for current financial losses and those anticipated in the next season. For example, a farmer (C1), who sells her products in a big city, reduced spending by reducing her rented sales space. Another farmer (C3) decided to reduce spending on heating and electricity by installing solar panels to provide power to the produce storehouse.

The COVID-19 pandemic also affected how some of the farms in the study acquired their means of production. Out of fear of infection, some respondents decided to change the channel through which they bought materials necessary for farming. They stopped buying these at physical shops and started using online channels instead (C1). In view of possible turbulence in the market for means of agricultural production, one of the producers in the study was considering changing the frequency of fertiliser purchases for her farm from multiple deliveries to a single delivery for the whole year (C7).

On the other hand, as predicted by the fruit and vegetable market expert (C13) as well as other respondents (C3, C5, C6, C10), the COVID-19 pandemic may contribute not only to an increase in domestic demand for food but also to a change in society's dietary habits and food intake towards a diet based on healthy, locally grown products. This trend, noticeable especially in larger cities and rural areas within their sphere of influence, stands a chance of continuing in the future. One person (C3), experiencing

growing demand for his goods, intends to shift towards organic food production in future. This will require him to improve work organisation on his farm as well as the production process.

At the same time, the pandemic's negative effects in the form of diminished global demand and the deterioration of society's income situation as well as tendencies long present on agricultural markets, i.e., farmers' worsening position in the food supply chain in favour of middlemen, processing facilities, retailers and suppliers of means of production, means that the respondents see a need for change in their operations or for intensified activity. Alongside a drive to become distinctive by offering the market healthy, organic and locally produced food, this involved working to shorten the distance in relationships with customers (strengthening one's own sales outlet, developing outlets for food product collection, building a good reputation in social media) (C1, C5, C6, C8, C11). As one of the farmers in the study said:

It's a good thing we have the shop. Those who don't [have one] have long given up farming. Today, you have to have a huge field of the same thing for it to be profitable. And then the corporations squeeze the farmer anyway. Only shops like this make sense. Your own shop is best, but people are afraid of challenges, risk. (C5)

Another farmer underlined her favourable situation compared to other farmers who produce raw materials, do not have their own food "brand" and do not sell their products directly to consumers:

I think I'm in a fortunate situation right now because I decided on such production from start to finish. I sell an end product. But those who sell semi-finished products, meaning they sell carrots for pennies, or sell potatoes? (C8)

At the same time, the examples of some of the respondents point to effectiveness and favourable prospects for projects that involve initiating and developing their own processing facilities and the sale of their own agricultural products. Such an approach worked well during the pandemic, when the farms in the study could respond to growing and direct customer demand, as well as before the coronavirus, when the profitability of production was satisfactory thanks to the option not to share profit margins with middlemen and other buyers. At the same time, it is worth noting that optimism regarding the future (shown by some respondents) was based on the assumed low probability of another complete shutdown of the economy. According to one respondent (C10), there is hope in the fact that producers and consumers were adjusting to the pandemic and assimilating the norms of safe behaviour:

The situation is normalising enough that people are getting used to living in a pandemic. … We have to eat, and at least that's one thing people will go out to buy. (C10).

However, the tough year 2020, also led to the choice of strategies aimed at reducing the scale of production. Emerging problems caused one of the farmers in the study to change her production operation and switch to a less labour-intensive segment than vegetables, namely cereal crops (C11). Another respondent plans to give up organic vegetable farming and horse ranch (C9).

Undertaking micro-strategies, which in the long run are forms of resilience, is undoubtedly influenced by the context in which these actions are undertaken. As it was shown previously, the level of good governance is decreasing in Poland. Farmers pointed out that public institutions did not provide them enough support, and if it wasn't on time and in the right place (C2, C5, C7, C8, C10). A serious problem for the respondents were, especially at the beginning of the pandemic, rapidly changing regulations, lack of good communication between institutions implementing these regulations and agricultural producers. It was difficult to determine who was really responsible for information regarding dynamically changing regulations. Farmers felt lost.

We lacked reliable information from the beginning, there was a lot of misinformation. We were lost in information chaos. I don't even know whose role it would be to help us – agricultural advisory unit? Sanitary inspection? I do not know. But we didn't know how to behave especially at the beginning. [C2].

Lack of information or unclear messages from the authorities did not facilitate the employment of employees, especially those from abroad. This gave rise to anger and frustration. For example, the regulations regarding quarantine conditions and sources of financing for conducting tests for visiting

employees have changed. Information chaos caused delays in starting work on the farm, which as a result of the accumulation and delay of field work, was negatively reflected in the harvest [C2].

Feeling lost often accompanies farmers, regardless of the pandemic. The examined member of the cooperative (C6) claimed that there was a lack of systemic support in building a model of ecological sales. This problem, in the current situation, has become even more acute. A limited number of organic processing plants, together with undeveloped direct selling procedures, hinder the development of farmers, as well as the sourcing of local organic products by consumers.

Organic farmers, who are extremely burdened with bureaucracy, pointed out that the bureaucracy had not decreased. The possibility of digital reporting has not been introduced. For a long time, for organic farmers, bureaucracy, the so-called "paperwork", is a time-consuming and limiting activity that discourages farmers from staying in the organic production system. This opportunity was also not used to change this situation and, at the same time, to reduce the need for direct contacts.

Huge bureaucracy, you have to keep all the documents in paper, nothing digitally. Nothing has changed now, no new digital solutions. For example, a digital platform was not created to improve this and limit contacts at the same time. [C6]

5. Discussion

The crisis caused by the COVID-19 pandemic exacerbated the structural difficulties of the fruit and vegetable sector, especially in case of family farms (Clapp, Moseley 2020; Kraciński 2020). The short-term and negative impacts of this crisis resulted from a response of many governments to impose lockdown, which implied the inability to perform typical economic activity by food system's various actors, including farmers (e.g., planting crops timely, using inputs, harvesting and post-harvesting or selling food) (FAO 2020c). The main sudden issue was a shortage of workers, which in some cases translate into a lack of stability and availability of certain products (Béné 2020, OECD 2020c). The weakness of state institutions as well as the declining quality of governance was visible in the rapidly changing regulations, the lack of good communication and coordination between stakeholders, as well as the enormity of bureaucracy (OECD 2020b). On the other hand, according to FAO's global survey in some countries, a number of policies and measures have been implemented at different levels to ensure the food supply and protect vulnerable social groups (FAO 2020b).

Above-mentioned negative effects of the COVID-19 pandemic affected all of the interviewed farmers. Farmers producing for export, selling products at special events (trade fairs, exhibitions, meetings) as well as to the hotel and catering sector saw a significant decrease in the demand for their goods (C4, C6, C7). For many fruit and vegetable producers, the economic crisis also caused their financial liquidity to suffer as a result of payment delays for deliveries to buyers (e.g., C11). The new circumstances in which fruit and vegetable growers had to operate because of the pandemic also necessitated costly adjustments in work organisation and led to frequent inspections by the police and sanitary authorities. Agricultural income was seen to drop significantly as a result (C4, C6, C7, C10, expert's opinion – C12).

Some of the respondents' physical and mental health deteriorated (C7, C8). As regards their career situation, they found it difficult to navigate the new circumstances and make appropriate day-to-day production decisions, as well as finding it hard to seek solutions focusing on the longer term. Especially early on in the pandemic, some respondents declared helplessness and a feeling of having little influence on their environment (C5, C7, C8, C9).

The study confirmed the findings of other research on farm resilience, that the declared reactions and short-term micro-strategies of action depended on a number of different factors and predispositions, and also on structural and external circumstances (Meuwissen et al. 2019). It includes the specific segment of agricultural production, the level of reliance on hired labour, the types of sales channels used, relations with buyers (clients) and, finally, local weather conditions and market situations (Groot et al. 2016; Paganini et al. 2020; Borychowski et al. 2020, FAO 2020c). One significant determinant of mentioned reactions among farmers interviewed was the level and scope of various resources, in the form of physical

and financial and natural capital, as well as certain socio-economic characteristics (high level of certain skills and links with the city dwellers). The importance of structural factors that made facing the pandemic easier was documented especially in the case of farmers C4, C5, C6, C7 and C11 (table 1). Factors that helped farms maintain relative economic stability and survive the hardest period of the pandemic (production losses) also included using existing financial resources (savings in case of C4), production assets (C4), and a location close to ready markets (C1, C4, C5). In the face of the pandemic, respondents' financial, physical and natural capital (land and location) enabled them to react and apply short-term strategies to maintain previous management methods, give up planned agricultural investments (put them off until better times as in the case C1, C3, C7 and C11), slow down market expansion and wait out the most difficult period (C6).

A significant element enabling farmers to react and introduce short-term strategies, determining the level of their resilience, was social capital. Thanks to a high level of this asset, which ensured help from family members (C1, C8), friends, local residents and other farmers (C4, C5, C7), it was possible to continue the production process and receive support at times when work in the field piled up. For some respondents, social capital, in the form of trust, lasting relationships with seasonal workers and creating good work conditions, enabled farming operations to continue without interruption (especially in the cases C1, C4, C7, C10). With regard to social capital, it is also worth mentioning the deeper relationship with customers created on the basis of quality food products and the respondents' work on upholding contacts (C1, C2, C7). This bond enabled them to continue sales at a satisfactory level. At the same time, however, the low level of bridging social capital was evident in the fact that farmers did not establish new forms of cooperation with each other, which is particularly important in measures aimed at shortening food chains.

As it was indicated in the literature on the subject, in the case of farmers interviewed high management abilities have played a substantial role in building farm resilience: existing specialist knowledge, information on how to proceed in a crisis, management skills and experience (e.g., C1, C7, C10). These assets made a number of *ad hoc* micro-strategies possible: launching a new method of delivering products to customers (food boxes in case of C1 and C6), cost optimisation (reduced spending in case of C1), changes in work organisation on the farm (C7, C10), or changes in how means of production are purchased (C7). The above-mentioned resources and activities were considered in the study primarily using the relational (process-based) approach, focusing on the ways of their creation, maintenance and adaptation. In some cases, existing know-how and experience enabled respondents to choose a strategy that involved giving up farming and seeking an alternative source of income (horse breeding and recreational services in case of C9), changing the future production structure by making it more diversified (e.g., produce more organic cereal crops like in case of C11), or finding new product-marketing options (e.g., farmer C3 planning to switch to organic production and improve packing of his products). The importance of the above-mentioned income diversification strategy for farmers in dealing with the COVID-19 crisis was reported also in the Italian case (Mastronardi et al. 2022).

Some respondents declared that if the COVID-19 pandemic continued and harsh restrictions on movement and cross-border travel were introduced, difficulties with pursuing agricultural production would increase again. First and foremost, they would be related to obtaining workers for seasonal jobs, chiefly foreigners, who determine production continuity on farms in most of the cases analysed. Moreover, the respondents assume a continuation of market trends that are unfavourable for them, i.e., the slump caused by the pandemic, which would contribute to the worsening of consumers' financial situation and consequently translate into reduced interest in the respondents' quality products and organic food (C8, C11).

As underlined at the beginning, the essence of resilience lies in a farm's survival and adjustment to a new situation (Meuwissen et al. 2019, Béné 2020). In this sense, compared to many other research conducted so far, using qualitative, in-depth and relational approach, our study analyses the way farmers coped in this specific crisis and their capacity to adjust to the new, sudden and difficult shock (Borychowski et al. 2020; Paganini et al. 2020). The coping micro-strategies adopted by the respondents enabled them to adapt to new and uncertain circumstances, at least in the short term. Despite the appearance of

a previously unknown stressor, most of the respondents maintained their farms in relatively good condition. In some cases, the unfavorable consequences of the pandemic gave rise to changes in farming (in terms of adaptability), which might result in their further development as well as an increased level of sustainability, as suggested in some approaches to resilience (a long-term resilience) (Meuwissen et al. 2019; Serflippi, Ramnath 2018). Nevertheless, the pandemic inclined a small group of respondents to reduce their scale of farming and adopt a strategy of withdrawal from the market (e.g., C9, C8).

Resilience as a category is hard to study and measure, requiring description with the help of multiple indicators (Meuwissen et al. 2019, Béné 2020; Slijper et al. 2020). The paper presents the situation of farms in the face of an external crisis from the point of view of the farmers, and the data and information used to study the coping micro-strategies constitute the subjective information obtained from respondents. Such an approach has enabled presented findings to empirically capture "actual resilience" which, in theory, determines whether farms will maintain or improve their functioning (Slijper et al. 2020).

The reviewed literature on resilience and the situation of farmers during the COVID-19 pandemic, as well as the analysis of the reactions and micro-strategies of interviewed farmers enabled us to summarise the material gathered and propose an analytical framework for farmers resilience (Figure 1). This framework can be applied in the future studies to the contexts of other external shocks (e.g, war) and to analyse reactions and strategies of various groups of food producers. Figure 1, which the authors have developed on the basis of qualitative data and the theoretical approach expounded by Meuwissen et al., Slijper and Béné, provides a summary of the relationship between the effects of the external shock on a macro and micro scale, the individual reactions it triggered, the micro-strategies adopted and, finally, the initial effects of using existing resources and taking specific action. The key thing is that the diagram also indicates the relationships between the type of resources and actions and their effects (Meuwissen et al. 2019, Béné 2020).

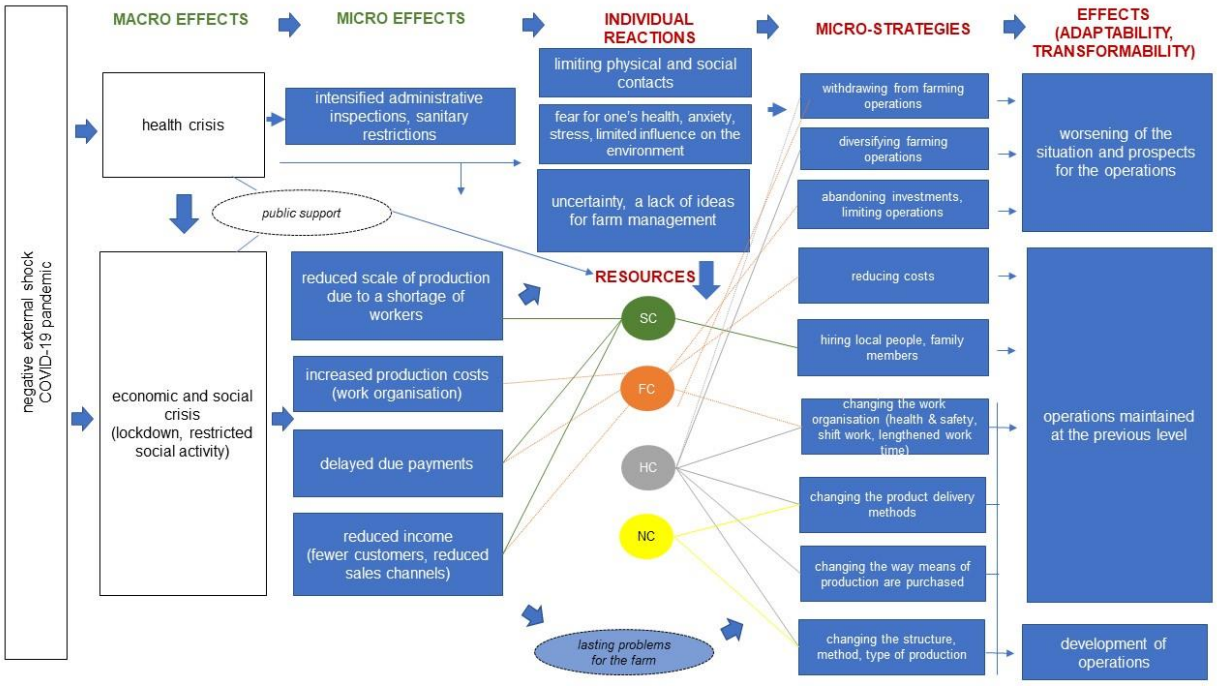


Fig 1. Negative effects of external shock (the COVID-19 pandemic) versus reactions and coping short-term micro-strategies of farmers: an analytical framework. Source: own work based on the case studies

HC – human capital; SC – social capital; FC – physical and financial capital; NC – natural capital.

We see at least two kinds of limitations to the research methodology adopted in our study. They are related to the aggregation and analysis of the data gathered as well as the one-off time of data collection (during the second wave of the COVID-19 pandemic). The research approach adopted here has enabled us to analyse farm resilience on the individual level based on a small sample of respondents, but not to

extrapolate the results to the wider population of fruit and vegetable farmers in Poland. We have chosen to try to overcome this limitation by selecting respondents having various socio-economic characteristics and performing differentiated reactions and adaptations to the negative consequences of the pandemic, and by setting the analysed cases in a wider socio-economic and institutional context. Therefore, future studies may analyse the impact of external shocks, like e.g., pandemics or the world's agricultural market disruptions as an effect of war, on food producers and their responses and strategies (i.e. resilience) using a quantitative and qualitative approaches and larger samples of respondents or available relevant public statistics. Another shortcoming of the presented study outlined here is that it was not possible to analyse resilience in the longer term, which is important for its consideration as a process and for evaluating the effects/effectiveness of the coping short-term micro-strategies chosen by the respondents. As was reported, the current pandemic could stimulate innovative community and business responses and adaptation across rural areas (Phillipson et al. 2020). Exploring this phenomenon requires further research. In our study, we judged the effectiveness of the farmers' actions *ex-post*, so to speak, largely relying on the respondents' declarations and our own subjective observations (three of analysed cases) (Darnhofer et al.: 2016; Darnhofer, 2020; Xu, Z., et al. 2021). Nevertheless, it is assumed that presented results and proposed framework of farmers' micro-strategies, which were taken during the pandemic, might be useful for future studies focusing on various external shocks as well as for research to be conducted in other CEE countries due to many common contextual factors that have shaped food practices and institutional arrangements.

It is thus worth repeating this study in the same group of respondents in successive years and checking whether introduced micro-strategies built long-term resilience. It also needs to be remembered that the situation in the economic, institutional and social environment of these farms has changed substantially since the time of our study, which may also have affected the resilience being considered here. The authors' observations additionally suggest that the legal and institutional chaos noticeable during the pandemic, the lack of adequate public support for the producers in the study at a time of crisis, together with previously mounting structural problems in the fruit and vegetable sector in Poland (a shortage of workers, a weak position in the supply chain), could make above-mentioned long-term resilience uncertain.

6. Conclusions

The present paper's contribution to research consists in applying the concept of farm resilience to external shocks, in this case the multifaceted consequences connected with the spread of COVID-19. In particular, the analysis was aimed at capturing regularities and differences in reactions to the crisis, and at developing an analytical framework of coping short-term micro-strategies used by fruit and vegetable producers.

The coronavirus situation has significantly increased the uncertainty felt by the fruit and vegetable producers in the study, not only in terms of their personal circumstances and fears for their own health and that of their families and hired workers but also regarding their agricultural operations. In spite of many difficulties, the respondents managed to adjust to the changes caused by the COVID-19 pandemic, at least in the short term. The coping micro-strategies they adopted enabled them to maintain their farms as a source of livelihood and as suppliers of foodstuffs, despite turbulence in the market. In most cases, the individualised actions undertaken by the farmers allowed farming to continue, and in some cases even enabled the farmers to look to the future with optimism. Evidence of this includes the fact that the farmers increasingly sought possibilities for the direct sale of products from their farms.

The great majority of the farms covered by the study displayed comparative resilience to sudden stressors, at least in the relatively short term, as they were robust, showed a potential for adaptability, and some even showed the possibilities for transformability. It needs underlining that apart from a few exceptions, the farmers reacted in an individualised way to the tough external situation. They did not initiate cooperation with other farmers or with organisations, at the same time being an object of limited interest to the government authorities. This situation implies the danger that the actions they undertook may not bring long-term resilience, understood as an effective adaptation to the new reality. With a relatively low level of bridging and bonding social capital in CEE countries (Ortiz-Ospina, Roser 2016), which limits

the willingness to cooperate, as well as low level of quality of governance, it is very likely that similar problem of ineffective in the long run coping micro-strategies will be observed in other countries of the region. In longer perspective, it will also challenge food security at the national level (European Quality of Government 2017).

Current agricultural policy in Poland as well as the EU CAP (Farm to Fork Strategy) aim to serve the development of food direct sales, among other things. Many farmers' initiatives thus went in this direction and are desirable from the point of view of developing a sustainable food system. At the same time, it is clear that the farmers undertook actions aimed at reaching consumers directly while having very limited support from the system. That is why it would be worthwhile to perform an analysis of the variability, diversity and effectiveness of the farmers' micro-strategies in this regard in the longer term, conducting a repeat study to this aim. The analysis outlined in the study has enabled the authors to draw up some preliminary recommendations for public institutions involved in the functioning of the food system, including the government, ministries, public bodies, local governments, and agricultural consultancy centres. Namely, there is a need to develop relatively more optimal institutional conditions for the operations of agricultural producers during a socio-economic crisis like the COVID-19 pandemic. This system should cover public support in finding workers for food sector businesses (including bureaucratic simplification), a proper and up-to-date information policy, clear and favourable regulations related to requirements for agri-food production, improvement of the quality and scope of the public agricultural advisory system in supporting farmers in and the formation of direct sales sites of agricultural products.

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