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The Impact of COVID-19 Lockdown on West Romanian Crop Production in 2020

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Abstract: The COVID-19 pandemic and the resulting public health crisis had an enormous impact on the global economy and its sectors. Most components were adversely affected, especially the tertiary industry (the part of a country's economy that provides services), with different types and sizes of businesses suffering to varying degrees. Reports on the impact on agriculture are not lacking, and the crisis was perceived and responded to differently from the supply chain to the household level. The research question proposed in this paper concerns the impact of the early restrictions induced by COVID-19, namely the lockdown period from March to June 2020, on Romanian agriculture and more precisely Western Romanian crop production. Two counties in the West were selected: the county Timis for its highly favourable agricultural production and the county Caras Severin for its integrative agricultural production centred on mixed farms, where crop production is integrated with animal production towards a higher added value. Using secondary data from the National Agency for Payments and Interventions in Agriculture allowed the disaggregation of data at the level of each municipality for 2019 and 2020. The choice of this dataset was related to the level of precision, as the beneficiaries of direct payments in the respective areas are verified each year for both areas and crops. The paired two-tailed t-test was used to test the data for each LAU 2 municipality in each of the selected counties; as the crops sown in 2019 could not be affected by the COVID lockdown period in spring 2020 (March to June), the most important spring crops in terms of area in 2020 were selected and tested against the 2019 datasets. The results show that there is not enough evidence to conclude a significant statistical difference between the two years, and therefore, we cannot reject the null hypothesis and conclude that the pandemic lockdown did not affect the spring crops during their most restrictive period in spring 2020; thus, the overall influence of the COVID-19 lockdown on crop production in Western Romania was insignificant, observed only at the level of primary production. Spring crop production could have been severely affected by the restrictions imposed by the health crisis on access to certain inputs, freedom of movement for field work, and other activities closely linked to agricultural production, leading to early disruptions along the food chain.

Keywords: pandemic restrictions; COVID-19 lockdown impact; agriculture; crop production

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1. Introduction

The COVID-19 pandemic and health crisis affected the global economy in different ways and to different degrees, depending on the continent or country, the type of activity, the scale of operations, and the sector.

1.1. Research Question

The research question in this paper is about the impact of the COVID-19 lockdown on crop production in Western Romanian agriculture: did crop production change under the pressure of health crisis restrictions and health threats in the spring of 2020? The answer needs to be statistically proven and supported with contextual and sectoral information. The novelty of the research method used is the use of data sets from the administrative records of area-coupled subsidies in order to obtain a high degree of precision in the quantification of the area covered by a given crop. The use of this type of data for the area makes it possible to work with the most accurate information, which is verified by the administrative services before payments are made. The subsidies are not relevant to the research, but the area is relevant to these subsequent payments. These highly accurate data sets are of great value when the Single Area Payment Scheme is used as the backbone for the link between the area and the subsidies.

1.2. Literature Review

At the level of the general economy, the health crisis has had an overall negative impact when all the sectoral effects are taken into account at the macroeconomic level. At different levels, from regional to local, and from the sector level to small-scale business, the impacts were in certain situations more temperate or even presented temporary positive outcomes. A start-up was defined as "a rapidly growing firm due to its innovation in terms of products/services and processes through the aid of IT/ICT enabled services" [1] or as "a newly established company that is in the early stages of development and is focused on bringing an innovative product, service, or business model to the market" [2] recorded a split result with positive outcomes for IT, e-commerce, healthcare-related, and digital education. At the same time, hospitality and tourism were negatively impacted [3], as revealed in Hungary and the Visegrad Countries in Central Europe. Despite immediate policy measures to support start-ups during the pandemic, the crisis was a natural selection among the newly created companies.

At the level of household income, cross-country evidence suggests that the poorest among the households benefited most from compensatory policy measures, while the disposable income of the best-placed households suffered less from containment measures [4–6]. Evidence from Malaysia indicated that households with low incomes were unaffected by pandemic restrictions or even benefited [7]. The same reference indicated that female-headed households suffered as much as male-headed households during the pandemic, as demonstrated in Malaysia.

Entrepreneurship and self-employment in South America showed great resilience, with the ability to virtualise their business, suggesting that the economic stability of employees and their communities is as important as the business itself [8]. Evidence from the top 10 affected countries showed that financial asset markets suffered, while real asset markets remained more stable, with trade and travel affecting the oil market [9]. Zdolsek and Taskar Beloglavec noted that "awareness of sustainability issues has improved, leading to improved sustainability reporting", as COVID-19 "had no effect on the dynamics of change in the ecosystem of non-financial reporting announcements" [10]. In Iran, Iraq, and Jordan, the sustainable business models of SMEs "shifted slightly from technological to social, customer and organisational changes", motivating SMEs to rethink their core competencies and redefine their sustainability, while the pressure of pandemic restrictions improved and increased the change and innovation components of SMEs [11,12].

The impact of the pandemic on industry and logistics was not symmetrical, with SMEs being more affected by the increase in transport costs and availability [13]. Logistics disruptions had a severe impact on rural households in China, and economic losses were exacerbated by the perishable nature of inputs and outputs and their higher prices [14]. The pandemic also had an impact on the energy production sector, with a drop in demand during the period of restrictions and a steady increase once restrictions were lifted [15].

In world trade, it is estimated that the oil market may have kept the world cereal market relatively stable despite the obvious disruption to the supply chain, but export restrictions in 2020 led to rapid and sustained price increases that were passed along the food supply chain [16,17]. In Poland and Romania, imports were more affected than total exports, which actually increased during the pandemic restrictions, in contrast to developing countries, where exports or, in the case of trade in services, imports were most affected [18].

The most affected sector, tourism, experienced an unprecedented loss of income and jobs as a result of mobility restrictions and travel bans in Northeast Asia, Australia, Spain, Greece, India, Romania, and Taiwan [19–23]. The US travel industry, which was most affected by COVID-19, estimated a decline in travel spending of USD 519 billion. This translates into a total economic loss of USD 1.2 trillion in economic output, more than nine times the impact of 9/11 on travel industry revenues. The cumulative impact on GDP in 2020 of USD 651 billion is equivalent to 45 per cent of the economic value of the travel industry in the previous year [24].

Siche [25] identified three categories of potentially vulnerable people in terms of food security during the COVID-19 pandemic: people who experience chronic hunger and whose mobility cannot be interrupted, small farmers if they are prevented from working their land and accessing markets, and low-income families dependent on social programmes if these are disrupted.

Studies of food supply chains during pandemic restrictions in Kenya and Rwanda have suggested that short supply chains, particularly those distributing fresh fruit and vegetables, are beneficial for nutrition and health and contribute to reducing pollution and improving air quality by reducing the need for processing [26]. In Poland, studies on consumer behaviour change as an effect of COVID-19 have shown that women are more cautious about the risks of shopping in supermarkets; age and education are also important factors in choice, with more educated and younger people (under 46 years) choosing to shop in smaller stores [27]. A strong correlation between food availability and food stress, food insecurity, and food prices was observed in the UAE as a result of the pandemic, with consumers becoming more anxious due to shifts in food production and delivery [28]. Fresh e-commerce platforms proved to be a resilient urban force in coping with mobility restrictions during the second Shanghai lockdown in 2022 when over 25 million people were forced to stay indoors for the second time [29].

1.3. Agriculture and Rural Areas

Most EU farms supplying the hospitality sector or direct sales were more affected than others, while all benefited from the availability of local labour, capital, and a high proportion of home food consumption from their own production; the initial stockpiling behaviour of consumers was to some extent beneficial to supermarkets and farms with unsold stocks; however, the side effect of the restrictions led to an increase in local produce and provided a basis for the growth of short food chains, although this was not a lasting effect [30]. In assessing the agricultural labour crisis, Bochtis estimated that 31% of the workforce and 27% of the annual budget were not affected by COVID-19, while 50% of the workforce and 54% of salaries were at medium to high risk [31]. The UK beef and sheep supply chains were less affected by the pandemic health crisis, while pig and chicken farmers suffered from animal welfare problems caused by the delayed arrival of processors; livestock markets were not seriously disrupted, retailers coped well with the pressure, and the food service sector lost thousands of jobs, highlighting the resilience of the beef and sheep sector and the lack of it in pig and chicken production [32]. The agricultural sector in Punjab, India, did not face disruptions in food production; medium to large farms were more affected by the availability of inputs, machinery, services, and labour, and as a result, the cost of food production increased at the farm level, affecting their productivity [33]. A systematic literature review and meta-analysis of the impact of COVID-19 on agriculture and food security in Africa by Balgah et al. [34] identified the main impacts

of the pandemic as a decline in agricultural exports, the closure of local (and international) markets, price volatility, an increase in post-harvest losses and expenditure on imported food, and wage cuts and job losses in agricultural enterprises. The COVID-19 restrictions affected the mobility of seasonal workers in agriculture, leading to labour shortages in several European countries and increasing the vulnerability of agricultural producers, as in the case of France, Germany, Italy, Spain, and Poland [35]. Logistical difficulties affected the agricultural production, prices, and market availability of agricultural products, while the lack of labour mobility had a double impact on farmers and workers, including seasonal workers, as observed in Peru by Zuniga et al. [36]. According to Singh et al. [37], an estimated 10 million migrant workers had to return to their hometowns due to the pandemic lockdown, making labour availability the main issue in India, as also noted by Bhojiya and Abubakar [38]. In Arkansas, the agriculture and forestry sector as a whole suffered less during the first year of the pandemic with minor losses, but at the county and local level, the impact was more pronounced due to the distribution of industries, as reported by English et al. [39]. Harvest delays and increased food losses, especially for perishables, due to mobility restrictions in the European Union were also reported by Stanisic et al. [40]. The study concluded that "the COVID-19 pandemic did not change the importance of agriculture for the economic performance of individual countries" and "did not have a negative impact on the contribution of agriculture to GDP" [40]. Evidence from Malaysia through observations by Say Peng et al. [41] suggested that labour shortages due to mobility restrictions led to a decline in agri-food production. Umar [42] concluded that farmers below the poverty line in developing countries are unlikely to recover from their financial collapse following the pandemic shock.

The COVID-19 pandemic, climate change, and conflict do not just distort food supply, food prices, and consumption; their effects are not static but sequential, dynamic, and long-term, as researchers on global food security warn [43]. The number of negative impacts on the primary sector in Italy, particularly during the first quarter of the health crisis, and the effects on agricultural production and food processing were considered unprecedented and extended to the food and wine export and tourism sectors [44]. Agricultural systems in Tanzania and South Africa faced income losses and reduced demand, supply chain disruptions and changes in consumer demand, and disruptions in national and international trade; both small and large farms suffered losses as a result of the health crisis conditions [45]. Fish farmers in Brahmanbaria lost nearly 48% of their income in 2020, and over 70% of fishermen were unable to provide three meals per day; however, the open-water fish catch was positively impacted by COVID-19 with better and more diversified catches in 2021 [46]. China's rural areas, especially those with high ecological resilience, are coping well with pandemic restrictions, and rural areas with exceptional environments have solid resilience [47]. The positive contribution of agriculture during the pandemic was highlighted and indicated as highly important for daily life, food supply, land and landscape, and job creation by Et-Touile et al. in the case of the Moroccan economy [48]. Among other opportunities generated by the pandemic, Dickson and Yao [49] identified a possible boost in local products and service production as a result of import reduction together with import replacement. Jiang et al. [50] highlighted the positive outcomes of the economic changes induced by the pandemic, such as the upgrade of consumer services, the acceleration of Internet-based industries, the development of virtual businesses, and e-administration, despite the real income level decreasing and production prices and consumer goods increasing. Adopting IoT and advanced technology-intensive systems in agri-food production is one of the opportunities created by the pandemic [41].

Agriculture experienced both positive and negative effects, especially at the beginning of the pandemic. Agricultural stocks were depleted as a result of consumer panic and compulsive buying, short food chains boomed with the help of social media and e-commerce, and people generally returned to local food. In general, fresh produce and less processed or semi-processed foods sold relatively well during the pandemic, so the impact of the lockdown period tended to be positive. The initial positive impact on short food chains and

direct sales of local agricultural products was maintained beyond the pandemic, with web platforms, mobile applications, and social media groups continuing to grow and diversify their offerings of all types of local products. E-commerce in food products, despite slowing down compared with the COVID-19 closure period, has stabilised at a higher volume of transactions compared with pre-pandemic levels.

2. Materials and Methods

2.1. Area of Study

The choice of two counties in western Romania at the NUTS 3 level was due to the realities of the agricultural year 2020, when a severe drought affected most of the agricultural land in the southern, south-eastern, and eastern regions of the country. Eliminating the bias of external factors, such as the aforementioned drought affecting the agricultural area, and in particular the arable land, allowed for a more accurate observation of the pandemic pressure on agricultural production. The selection focused on regions not affected by the drought in 2020 that were of high relevance for agricultural production. The first agricultural county of Romania, Timis County, was the first option, and its selection due to its relevance for agricultural production is obvious in all unbiased conditions. The second option, outside the drought area, was Caras Severin county, which is less favourable for large field crops, with more hill and mountain agriculture. The choice of the second county not only looks for different conditions but also observes changes in the lower scale of agriculture, mostly family farms based in relatively harsh environmental conditions of high hills and mountains, with a more pronounced type of mixed production and involving a greater extent of animal production complementary to crop production as a further integration with higher added value. The two western counties are recognised at the regional and national levels for the importance of their agricultural production and are geographically located in the northernmost area influenced by the sub-Mediterranean climate, making them less affected by the drought in 2020 (Figure 1).

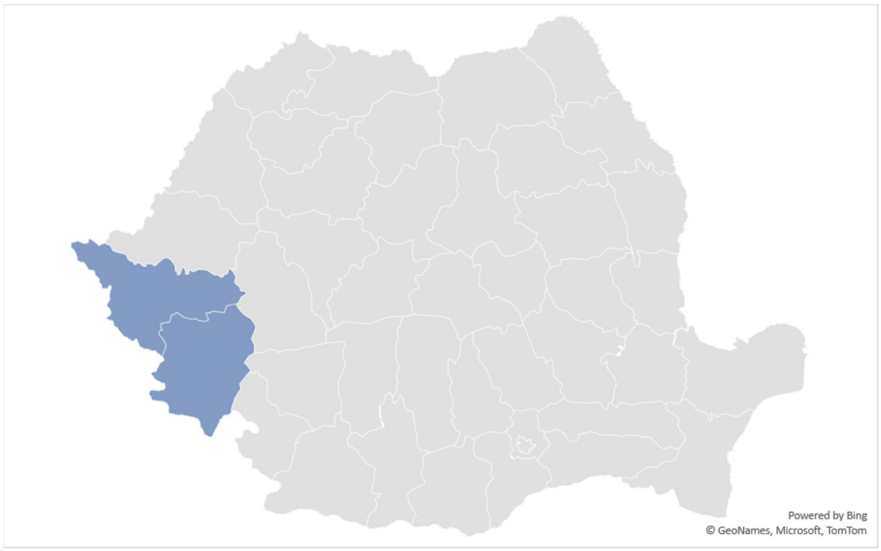

Figure 1. The two selected counties (NUTS 3 level).

2.2. Data

The national general statistical data, as secondary data, did not have sufficient granularity to observe the changes at the level of the municipality or LAU 2, so another data set was required. The most accurate dataset identified was that produced by the National Agency for Payments and Intervention in Agriculture (PIAA) and concerned the payment of subsidies. The full list of direct payments and transitional national aids implemented by the PIAA is presented in Table 1 below [51].

Table 1. Payment schemes implemented by the National Payments and Intervention Agency for Agriculture in Romania.

Direct Payments
SAPS—Single Area Payment Scheme
Redistributive payment scheme
Payment scheme for agricultural practices beneficial for the climate and the environment (Greening payment)
Payment scheme for young farmers
Coupled support—Soya
Coupled support—Alfalfa
Coupled support—Peas beans for industrialisation
Coupled Support—Beans for Industrialisation
Coupled Support—Hemp for Oil and Fibre
Coupled support—Rice
Coupled support—Seed potato
Coupled support—Hops
Coupled support—Sugar beetroot
Coupled support—Tomatoes for industrialisation
Coupled Support—Cucumbers for Industrialisation
Coupled support—Crops from greenhouses (tomatoes, cucumbers, peppers, and cabbage)
Coupled support—Crops from solariums (tomatoes, cucumbers, cabbage, eggplants, and peppers)
Coupled support—Plums for industrialisation
Coupled Support—Apples for Industrialisation
Coupled support—Cherries/cherries for industrialisation
Coupled support—Apricot/buttermilk for industrialisation
Coupled support—Early, semi-early and summer potatoes
Coupled support—Sheep
Coupled support—Goats
Coupled Support—Bovine Meat
Coupled support—Dairy cows
Coupled support—Milk buffaloes
Coupled support—Silkworms
Transitional National Aid
ANT 1—Transitional National Aid for arable crops
ANT 2—Transitional National Aid for flax for fibre
ANT 3—Transitional National Aid for hemp for fibre
ANT 4—Transitional National Aid for tobacco
ANT 5—Transitional National Aid for hops
ANT 6—Transitional National Aid for sugar beet
ANT 7—Transitional National Aid—Decoupled production scheme, bovine species—Meat sector
ANT 8—Transitional National Aid—Decoupled production scheme, bovine species—Milk sector
ANT 9 Transitional National Aid—Sheep/goat species

The permanent and area-related type of subsidy used for the purpose of the analysis was the Single Area Payment Scheme (SAPS), as it is paid annually on the basis of claims submitted by farmers for their cultivated parcels of more than 0.3 ha, provided that their total farm area is equal to or greater than 1 ha and verified by the Agency. Verification means that the area declared may differ from the area determined, the latter being the area on which the subsidy is paid. Other types of subsidies available in relation to area were not used as cross-references because of their nature and the often-distorted information available at the level of all the municipalities concerned.

The source data represented the total area of the different crops benefiting from the selected direct payments. In a second step, all data for the different crops were aggregated at the level of the respective municipalities in hectares, for a total of 76 beneficiary municipalities in Caras Severin County and 100 beneficiary municipalities in Timis County. The data were then aggregated at the level of each beneficiary municipality in the two counties in hectares for the main spring crops only, i.e., all types of maize, sunflower, and rapeseed. The two sets of data, all crops, and selected spring crops only for each of the two years

2019 and 2020 and for each county were used to determine the differences using the paired two-tailed t-test to analyse the statistical significance of the respective changes.

2.3. Method

The impact of COVID-19 on agriculture was analysed using surveys and interviews, data analysis, economic modelling, remote sensing and satellite imagery, and case studies. The current analysis used an indirect combination of two of the above methods: data analysis and satellite imagery. Surveys and interviews rely on primary data collected by enumerators, but this type of data is not available for Romania. Such a dataset would have provided a better and deeper insight into the changes at the farm level during the pandemic. Economic modelling is extremely valuable when forecasting and analysing longer time periods than the lockdown period from March to June 2020. In the absence of the dataset currently analysed, modelling would have been the next choice. The case studies should be considered to take the current research to a new level, eventually to the entire pandemic period, and to include other variables at the level of disruption or production. The use of secondary data, verified by satellite imagery by the Integrated Administration and Control System of the Agency, the precise data analysis for the current purpose of the research—to identify changes in crop production in western Romania during the COVID-19 lockdown.

The chosen method to compare the records from the two years 2019 and 2020 in each of the regions was a t-test—specifically the paired two-tailed test. As the focus of the analysis was on the lockdown period from March to June 2020, the datasets from the two years (2019 and 2020) allowed for an accurate comparison (Appendix A).

Further research on the impact of the entire pandemic period can be developed by adding the 2021 datasets or even extending to 2022 and beyond for the analysis of global disruptions beyond the health crisis alone. The use of tests makes it possible to observe statistically significant differences and reject or not reject the null hypothesis. The tests were carried out at the level of each of the two counties for each of the iterations comparing the total area covered by SAPS subsidies and then comparing only the selected dominant and most important spring crops, namely maize (all types), sunflower, and rapeseed, in 2019 and 2020. The SAS OnDemand for Academics (online) and Microsoft Excel were used to process the data and output the results of the analysis.

3. Results and Discussion

The first iteration took into account all the cultivated areas in both counties, practically all the crops, and the areas defined as cultivated with the respective crops in 2019, that is, before any pandemic crisis when all the choices of change were free and related to any possible subject other than COVID-19 pressure. Carrying out the t-test for the two counties analysed yielded the following p-values: $p = 0.00828315$ in the case of Caras Severin County and $p = 0.02404952$ in the case of Timis County. Since both p-values were lower than 0.05, the null hypothesis was rejected, and the difference between the two years 2019 and 2020 was statistically significant in both counties analysed. This led to the observation that there were significant differences if the analysis only considered the data set for the two years compared without distinguishing between crops sown before and after the pandemic period.

Therefore, in the next iteration, only a selected number of the most important spring crops (in terms of cultivated area) in the two counties was presented, taking into account that these crops were sown exactly during the COVID-19 lockdown restrictions, including the general mobility restrictions for the entire population, with notable exceptions. The paired two-tailed t-test performed for the two counties for the 2019 and 2020 data, respectively, gave the following calculated p-values: $p = 0.50284119$ for Caras Severin County and $p = 0.84923827$ for Timis County. Since both calculated p-values were higher than 0.05, there was not enough evidence to conclude a significant statistical difference between the two years, and therefore, we could not reject the null hypothesis. The differences observed in 2020 compared with 2019 in the two counties for selected main spring crops are presented

below in Figure 2. It is also worth noting the difference in scale between the two graphical representations for the two counties, with the scale of the representation for Timis County having twice the amplitude, in order to capture the variations at the commune level. This means that in Caras Severin County, the scale and amplitude of the changes were reduced due to the smaller agricultural areas for the respective municipalities, taking into account the geography of the county and the predominance of higher altitudes.

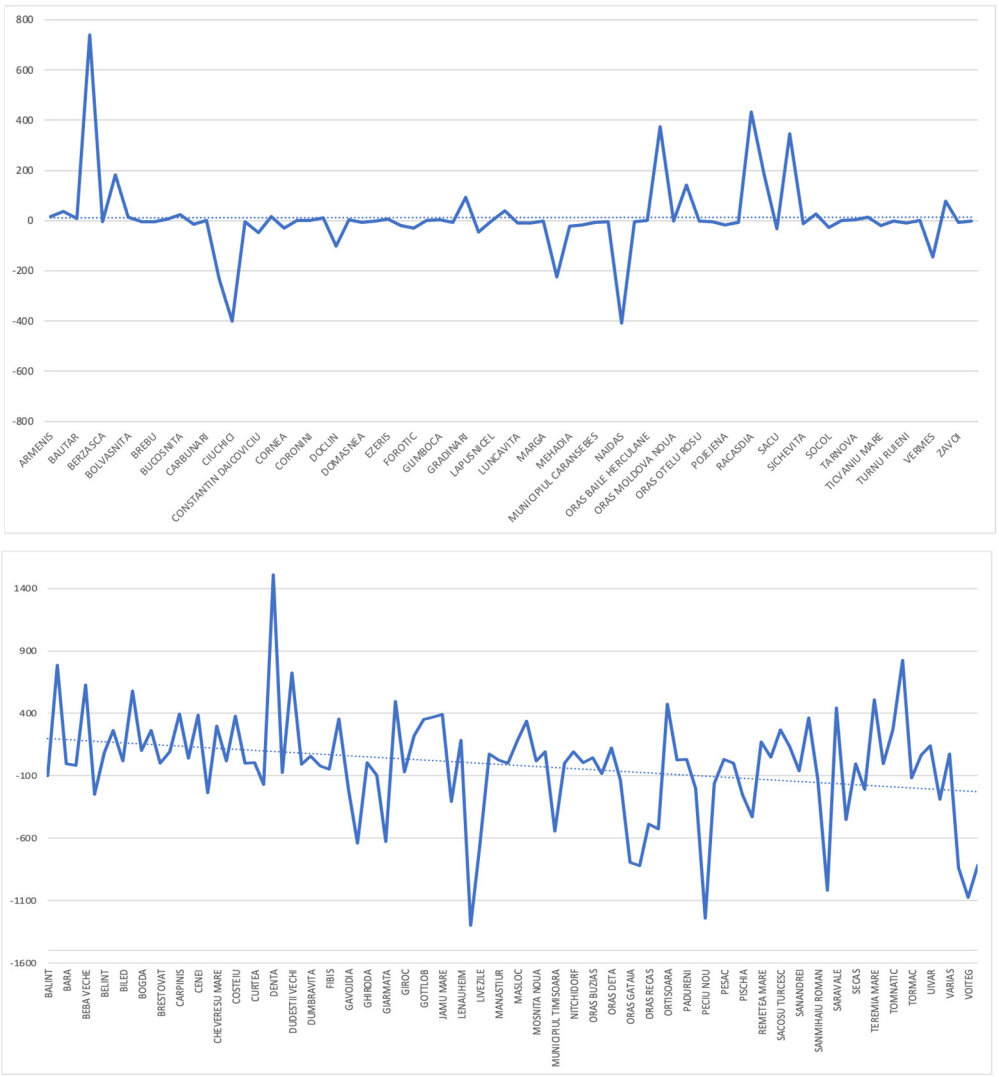

Figure 2. Difference in cultivated/subsidised area in 2020 compared to 2019 for selected major spring crops (Caras Severin County—**upper part**; Timis County—**lower part**).

In other words, although the differences between the two agricultural years were statistically significant when considering all crops and the total agricultural area (subsidised), the case of spring crops rules out the possibility that these differences were due to the special measures taken during the first wave of the COVID-19 pandemic. This situation was most likely made possible by the special restrictive measures taken during the early stages of the pandemic in spring 2020, when mobility was extremely limited for citizens and most professional categories but farmers were exempted for their agricultural activities, including transport to and from their plots and other specific or related activities. It appears that this freedom consistently contributed to a normal flow of agricultural activity, and decisions to temporarily stop farming were rare or related to other reasons. The differences observed could be related to reasons concerning the availability of specific inputs, the general logistical accessibility, or the crop rotation schedule. It should be added that structural

issues, such as dual farm structures, with a relatively small number of large and very large farms coexisting with an extremely large number of small and very small farms and farm households, coupled or not with a high proportion of elderly farm managers, may have contributed to a number of changes independent of the pandemic pressure.

The empirical evidence suggests that the COVID-19 public policy measures aimed at supporting agriculture were effective, with no apparent impact on agricultural production or farmers' decision to continue crop cultivation. Analysing the sown or planted area during spring 2020 revealed significant changes, indicating both effective government decisions regarding agricultural production and adjusted restrictions as well as ease of farming for all categories of farms, irrespective of their economic or physical size.

Research references regarding the impact of COVID-19 on agricultural production have a dual focus: observing the agriculture sector at a general level and conducting in-depth analyses concentrated on issues related to labour, logistics, markets, or agri-food integration. All references considered the pandemic period and the specific restrictions that extended beyond the first pandemic year. The initial reference category considered the economic impact on the agricultural sector, both upstream and downstream. The direct impact of the pandemic triggered significant changes, affecting the production or market distribution of agricultural products. The comprehensive studies reveal findings concerning labour availability deficiencies, specifically the immediate economic consequences resulting from the inaccessibility of migrant or seasonal workers, particularly in developing economies. Agricultural households in the aforementioned economies experienced more significant impacts than comparable households in developed economies. Comparing the findings of this study with the existing references reveals a lack of correspondence due to the incomparability of the analysed time period and production-related elements.

The research findings presented are solely focused on the initial and most stringent phase of the COVID-19 health crisis, namely the lockdown phase. The novelty of the current analysis lies in its investigation of crop production changes, which are closely tied to this specific time period. The cultivated area serves as a direct indicator of the restrictive environment. In the absence of significant changes, as evidenced by the results, the findings suggest a neutral effect of the specially adjusted public policy measures during the lockdown. Although the absence of any direct or indirect negative impact on the planned and cultivated area can be viewed positively, there are no quantifiable elements to support this other than the farmers' perceptions.

4. Conclusions

The COVID-19 pandemic and resulting public health crisis had an enormous impact on the global economy at all scales and in all sectors, with disruptions affecting most types of economic activity [2–12], including related sectors such as logistics, transport, and energy [13–16,24]. While tourism and related activities, including food services, were most affected [20–24], agriculture was affected to varying degrees, depending on the scale, type, and nature of production and geographical location [25–50]. Under these circumstances and specific conditions, the research question aimed to answer the extent to which Romanian agriculture, in particular crop production in the western part of the country, suffered from the mobility restrictions and other prohibitions imposed as part of the public protection measures in the early stages of the pandemic during the quarantine period. The comparison of the cultivated area covered by direct payments as the most coherent and precise way for the identified agricultural parcels in 2019 and 2020, in two different counties of Western Romania, Timis being very favourable for agriculture and Caras Severin being less favourable, at the level of the whole agricultural year and for the whole set of agricultural activities using the land as a production support (including trees and shrubs, pastures and meadows), led to statistically significant differences rejecting the null hypothesis when using the paired two-tailed t-test. However, at a higher level of precision, comparing only the area of the selected (main) spring crops, the comparison results indicated that the null hypothesis could not be rejected and that there was insufficient evidence to conclude a

significant difference. This observation implies that the crops sown during the highest level of restrictions were not negatively affected by the specific mobility bans. The general conclusion is that the impact of COVID-19 and its subsequent restrictions on crop production in Romania, particularly in the western part of the country, was not significantly negative.

The results of this research can further contribute to the analysis of the impact of COVID-19 on the economy by adding refined observations on the changes in the primary sector during the pandemic crisis. Further extension of the analysis period and geographical coverage is possible for extended comparisons at the regional level, both at the national and European levels. The addition of subsequent data series for 2021 may lead to an extended and more comprehensive impact of the pandemic beyond the lockdown focus of the current analysis. In addition, extending the analysis period with data from 2022 and 2023 can extend the analysis of the pandemic to a whole new level, including the impact of disruptions on agriculture, such as the energy crisis in Europe and the war in Ukraine.

One of the obvious limitations of the present study may be the finest level of granularity at the farm level; although (confidential) data were available, pre-tests showed similar results, so the final decision was to maintain open access to data and work at municipality level (LAU 2). Another limitation may be the lack of any qualitative assessment of the farmers' perspectives during the pandemic period; parallel qualitative studies at the family farm level in the two selected counties indicated a rather positive perspective, as additional subsidies and specific support measures were perceived positively by farmers in the absence of real restrictions, but these assessments may be biased by the farmers' personal positions or perspectives during the pandemic period. Livestock production in the two counties, another obvious limitation, was not included in the analysis, as the changes captured by the secondary data would not reflect the direct impact of any kind of restrictive measures or disruptions during the health crisis-related lockdown, nor of previous unrelated decisions or natural changes in herds or flocks. Another methodological limitation is represented by the number of datasets and time series used for analysis. Although series comparison requires three time series to highlight significant differences, the present analysis was based on only two time series, considering that it focused on only one event (the second series) and its absence (the first series), and the results indicated that the null hypothesis could not be rejected. The differences observed could have required a third time series to eliminate the possible annual differences, but in this case, it was considered less necessary since the differences were not significant. The dataset for 2020 presented no significant changes in the sense of not rejecting the null hypothesis, which confirms a low impact of the lockdown period over the spring crop cultivated area.

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Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available upon request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Datasets for the two selected counties in 2019 and 2020: (a) Caras Severin County; (b) Timis County.

(a) **Caras Severin County**

Place	Area 2019	Area 2020	Place	Area 2019	Area 2020
ARMENIS	2855.51	2708.52	ARMENIS	49.13	65.35
BANIA	2316.54	2339.52	BANIA	157.12	193.36
BAUTAR	1526.92	1646.92	BAUTAR	28.3	36.09
BERLISTE	4917.11	4951.39	BERLISTE	961.24	1701.49
BERZASCA	990.94	1013.49	BERZASCA	78.73	73.61
BERZOVIA	7617.23	7996.44	BERZOVIA	1757.06	1940.14
BOLVASNITA	2224.67	2250.2	BOLVASNITA	52.93	65.77
BOZOVICI	2187.98	2237.19	BOZOVICI	172.4	169.08
BREBU	1532.19	1571.21	BREBU	135.51	131.36
BREBU NOU	582.38	621.25	BUCHIN	91.17	96.56
BUCHIN	2303.86	2396.93	BUCOSNITA	163.31	186.89
BUCOSNITA	2415.37	2434.82	CARASOVA	100.47	86.53
CARASOVA	1603.45	1546.66	CARBUNARI	1.65	1.64
CARBUNARI	250.72	252.94	CICLOVA ROMANA	544.56	309.37
CICLOVA ROMANA	3827.39	3893.65	CIUCHICI	837.64	437.67
CIUCHICI	3044.22	3165.6	CIUDANOVITA	27.84	24.52
CIUDANOVITA	656.17	614.14	CONSTANTIN DAICOVI-CIU	459.31	411.9
CONSTANTIN DAICOVI-CIU	1585.22	1661.16	COPACELE	123.14	140.3
COPACELE	1450.01	1621.41	CORNEA	120.76	89.83
CORNEA	2236.5	2190.31	CORNEREVA	75.3	76.35
CORNEREVA	6754.36	6821.82	CORONINI	20.31	20.11
CORONINI	417.11	430.41	DALBOSET	173.52	184.09
DALBOSET	1714.03	1765.96	DOCLIN	271.27	171.06
DOCLIN	3099.46	3119.35	DOGNECEA	2.08	5.06
DOGNECEA	232.18	260.42	DOMASNEA	52.81	47.18
DOMASNEA	1606.26	1575.52	EFTIMIE MURGU	73.81	71.75
EFTIMIE MURGU	1562.37	1580.32	EZERIS	85.09	91.27
EZERIS	1532.26	1539.62	FARLIUG	384	365.02
FARLIUG	5014.04	5008.73	FOROTIC	234.66	203.59
FOROTIC	4761.9	4753.23	GARNIC	3.91	3.59
GARNIC	853.75	896.29	GLIMBOCA	29.89	32.64
GLIMBOCA	498.67	507.76	GORUIA	57.27	50.09
GORUIA	1093.3	1122.76	GRADINARI	250.1	341.95
GRADINARI	2355.91	2457.65	IABLANITA	109.19	63.71
IABLANITA	2638.32	2532.87	LAPUSNICEL	21.55	18.95
LAPUSNICEL	1652.56	1650.92	LAPUSNICU MARE	116.94	156.16
LAPUSNICU MARE	1365.79	1377.2	LUNCAVITA	86.77	77.56
LUNCAVITA	1971.09	1985.71	LUPAC	77.52	67.69
LUPAC	917.42	910.36	MARGA	11.24	9.52
MARGA	576.82	526.22	MAURENI	2415.77	2192.38
MAURENI	7536.17	7509.05	MEHADIA	79.85	57.37
MEHADIA	2619.52	2576.18	MEHADICA	63.31	46.23
MEHADICA	1470.54	1428.34	M. CARANSEBES	76.18	70.5

Place	Area 2019	Area 2020	Place	Area 2019	Area 2020
M. CARANSEBES	1345.6	1372.66	M. RESITA	16.42	13.27
M. RESITA	1423.24	1454.66	NAIDAS	713.53	304.79
NAIDAS	2055.09	2107.61	OBREJA	91.04	87.4
OBREJA	2127.28	2256.07	O. BAILE HERCU-LANE	1.3	1.3
O. ANINA	365.1	367.85	O. BOCSA	92.63	466.61
O. BAILE HERCU-LANE	43.89	43.1	O. MOLDOVA NOUA	14.46	11.93
O. BOCSA	1364.12	1432.41	O. ORAVITA	340.57	481.69
O. MOLDOVA NOUA	730.08	728.77	O. OTELU ROSU	47.73	45.9
O. ORAVITA	4294.46	4366.46	PALTINIS	165.62	160.39
O. OTELU ROSU	734.97	715.14	POJEJENA	195.14	177.64
PALTINIS	2516.86	2496.68	PRIGOR	214.04	206.66
POJEJENA	1101.22	1089.36	RACASDIA	771.3	1204.86
PRIGOR	3892.73	3897.95	RAMNA	366.84	551.58
RACASDIA	4274.65	4325.2	SACU	294.09	261.35
RAMNA	3235.55	3310.03	SASCA MONTANA	35.68	381.73
RUSCA MONTANA	185.49	112.33	SICHEVITA	230.83	219.36
SACU	1903.36	2002.32	SLATINA-TIMIS	82.19	109.2
SASCA MONTANA	2013.85	2119.65	SOCOL	764.71	736.87
SICHEVITA	2560.28	2518.48	SOPOTU NOU	68.06	69.14
SLATINA-TIMIS	2763.26	2854.88	TARNOVA	11.34	14.48
SOCOL	1802.6	1973.43	TEREGOVA	120.75	135.13
SOPOTU NOU	1448.34	1468.85	TICVANIU MARE	305.61	286.85
TARNOVA	758.15	799.27	TOPLET	7.64	6.42
TEREGOVA	8033.79	8239.43	TURNU RUIENI	76.8	68.43
TICVANIU MARE	4803.94	5051.49	VARADIA	953.25	953.99
TOPLET	352.58	364.33	VERMES	1054.72	909.34
TURNU RUIENI	1964.31	2012.44	VRANI	800.96	877.62
VALIUG	359.65	362.29	ZAVOI	137.68	131.44
VARADIA	5307.72	5144.55	ZORLENTU MARE	244.22	242.07
VERMES	4398.91	4015.49	Total	18,853.76	19,702.72
VRANI	2854.8	2954.34			
ZAVOI	9487.43	9577.99			
ZORLENTU MARE	1914.94	2000.67			
Total	180,786.45	182,986.62			

(b) **Timis County**

Place	Area 2019	Area 2020	Place	Area 2019	Area 2020
BALINT	2610.2	2662.2	BALINT	747.91	647.59
BANLOC	8910.83	8942.68	BANLOC	1327.22	2111.5
BARA	3430.24	3660.99	BARA	31.73	27.58
BARNA	1750.81	1629.82	BARNA	237.32	220.76
BEBA VECHE	8494.95	8496.69	BEBA VECHE	1556.4	2183.29
BECICHERECU MIC	3746.79	3706.4	BECICHERECU MIC	1393.84	1142.56
BELINT	4098.93	4309.9	BELINT	1916.94	2002.77
BETHAUSEN	3491.37	3660.54	BETHAUSEN	785.1	1048.64
BILED	4679.22	4496	BILED	2255.8	2274.71
BIRDA	5276.46	5296.47	BIRDA	1195.54	1775.67
BOGDA	1415	1574.96	BOGDA	119.01	221.6
BOLDUR	5343.27	5414.71	BOLDUR	1488.21	1751.03
BRESTOVAT	4662.56	4596.26	BRESTOVAT	206.24	204.87
BUCOVAT	2199.62	2232.6	BUCOVAT	866.21	957.44
CARPINIS	3809.68	3794.23	CARPINIS	1942.09	2335.92
CENAD	6691.18	6712.15	CENAD	1863.85	1905.26
CENEI	5756.07	5769.77	CENEI	2533.78	2921.82
CHECEA	5021.45	5058.73	CHECEA	3123.79	2886.34
CHEVERESU MARE	4663.12	4805.81	CHEVERESU MARE	1093.37	1391.4
COMLOSU MARE	7998	8020.04	COMLOSU MARE	4061.69	4078.58
COSTEIU	3688.79	3881.49	COSTEIU	1267.1	1646.11
CRICIOVA	989.16	1028.62	CRICIOVA	374.55	374.79
CURTEA	789.99	851.65	CURTEA	118.02	122.74
DAROVA	5979.37	6030.43	DAROVA	766.33	596.18
DENTA	6954.59	7003.27	DENTA	1355.78	2865.89
DUDESTII NOI	4160.63	4127.65	DUDESTII NOI	1441.66	1365.7
DUDESTII VECHI	12,186.01	12,246.01	DUDESTII VECHI	4484.62	5209.7
DUMBRAVA	3052.16	3066.72	DUMBRAVA	417.29	410.99
DUMBRAVITA	349.66	344.57	DUMBRAVITA	119.12	176.48
FARDEA	1026.51	1038.02	FARDEA	171.76	151.07
FIBIS	4222.86	4234.56	FIBIS	684.72	636.55
FOENI	5087.91	5106.07	FOENI	1216.6	1573.09
GAVOJDIA	3538.08	3646.16	GAVOJDIA	998.6	789.66
GHILAD	8843.54	8796.53	GHILAD	1927.97	1287.66
GHIRODA	1001.79	996.84	GHIRODA	352.97	356.24
GHIZELA	3935.66	3960.14	GHIZELA	463.66	368.29
GIARMATA	4761.13	4910.21	GIARMATA	1844.13	1215.94
GIERA	7275.03	7356.67	GIERA	1739.02	2237.49
GIROC	1476.58	1548.47	GIROC	335.68	265.38
GIULVAZ	7932.65	8005.15	GIULVAZ	1787.18	2008.07
GOTTLOB	3792.49	3788.06	GOTTLOB	1579.24	1932.88
IECEA MARE	2992.19	2993.23	IECEA MARE	1578.45	1949.15
JAMU MARE	12,251.77	12,213.88	JAMU MARE	1859.18	2249.98
JEBEL	5197.7	5225.74	JEBEL	1117.16	812.32
LENAUHEIM	9845.69	9794.06	LENAUHEIM	4837.69	5021.56
LIEBLING	6758.79	6842.82	LIEBLING	2629.84	1329.62

Place	Area 2019	Area 2020	Place	Area 2019	Area 2020
LIVEZILE	4465.22	4493.47	LIVEZILE	1377.61	708.92
LOVRIN	3451.34	3485.12	LOVRIN	1188.38	1262.41
MANASTIUR	1690.91	1750	MANASTIUR	191.89	216.68
MARGINA	1748.87	1771.04	MARGINA	298.88	300.19
MASLOC	5318.16	5442.27	MASLOC	1150.88	1333.91
MORAVITA	7099.38	7167.01	MORAVITA	1655.24	1995.11
MOSNITA NOUA	2196.14	2266.98	MOSNITA NOUA	585.98	604.34
M. LUGOJ	1790.34	1847.2	M. LUGOJ	638.99	733.39
M. TIMISOARA	3579.67	3630.19	M. TIMISOARA	1263.91	719.33
NADRAG	181.68	182.19	NADRAG	44.34	44.98
NITCHIDORF	3695.79	3715.05	NITCHIDORF	246.44	339.28
OHABA LUNGA	2218.26	2295.75	OHABA LUNGA	149.44	154.73
O. BUZIAS	5903.79	5837.92	O. BUZIAS	1136.25	1179.12
O. CIACOVA	10,459.17	10,428.5	O. CIACOVA	3003.63	2921.37
O. DETA	2233.85	2240.79	O. DETA	391.58	516.17
O. FAGET	4689.4	4631.35	O. FAGET	774.36	640.43
O. GATAIA	13,995	12,929.77	O. GATAIA	4024.57	3230.54
O. JIMBOLIA	9019.52	9034.67	O. JIMBOLIA	5234.49	4414.89
O. RECAS	14,352.71	14,628.43	O. RECAS	4011.44	3522.93
O. SANNI-COLAU MARE	11,151.08	11,315.23	O. SANNI-COLAU MARE	4432.7	3906.68
ORTISOARA	122,14.4	122,79.2	ORTISOARA	2695.47	3168.17
OTELEC	6364.82	6414.67	OTELEC	1607.92	1633.21
PADURENI	2882.72	2908.41	PADURENI	637.77	671.13
PARTA	4823.21	4849.28	PARTA	1890.53	1690.28
PECIU NOU	10,640.69	10,651.85	PECIU NOU	4283.7	3041.15
PERIAM	4708.93	4702.42	PERIAM	1784.89	1621.89
PESAC	2807.87	2832.32	PESAC	1618.64	1650.57
PIETROASA	1201.99	1126.87	PIETROASA	66.33	67.01
PISCHIA	7083.42	7207.12	PISCHIA	1731.36	1476.51
RACOVITA	7410.64	7576.24	RACOVITA	2954.64	2524.7
REMETEA MARE	4252.98	4372.3	REMETEA MARE	1077.3	1250.7
SACALAZ	8972.04	8901.57	SACALAZ	3920.32	3969.31
SACOSU TURCESC	8740.75	8882.72	SACOSU TURCESC	2158.58	2425.35
SAG	2243.74	2246.46	SAG	674.56	811.43
SANANDREI	6168.92	6201.91	SANANDREI	691.99	633.28
SANDRA	4418.47	4377.89	SANDRA	2225.91	2588.66
SANMIHAIU ROMAN	5130.46	5135.08	SANMIHAIU ROMAN	2042.47	1916.75
SANPETRU MARE	8186.32	8261.52	SANPETRU MARE	2931.76	1913.06
SARAVALE	8600.87	8672.01	SARAVALE	2263.29	2708.18
SATCHINEZ	7929.32	7925.07	SATCHINEZ	3385.76	2936.46
SECAS	2790.79	2809.49	SECAS	26.24	21.42
STIUCA	4551.45	4665.06	STIUCA	854.3	644.93
TEREMIA MARE	7256.48	7265.32	TEREMIA MARE	3388.33	3896.88
TOMESTI	537.71	549.75	TOMESTI	47.37	43.04
TOMNATIC	3376.55	3440.67	TOMNATIC	1345.6	1620.17
TOPOLOVATU MARE	7186.25	7211.32	TOPOLOVATU MARE	1949.65	2776.71

Place	Area 2019	Area 2020	Place	Area 2019	Area 2020
TORMAC	10,512.81	10,617.9	TORMAC	1294	1177.22
TRAIAN VUIA	3454.84	3567.06	TRAIAN VUIA	699.13	765.56
UIVAR	9429.82	9402.44	UIVAR	2922.87	3062.32
VALCANI	5570.96	5589.53	VALCANI	1768.54	1481.59
VARIAS	10,089.79	10,077.03	VARIAS	4503.11	4576.3
VICTOR			VICTOR		
VLAD DELA-MARINA	6384.74	6627.62	VLAD DELA-MARINA	1717.63	882.2
VOITEG	5854.66	5904.07	VOITEG	1609.9	534.61
Total	533,160.17	536,223.07	Total	158,785.22	157,969.01

References

1. Ehsan, Z.-A. Defining a Startup—A Critical Analysis. *SSRN Electron. J.* **2021**. [CrossRef]
2. OECD. *Proposed Guidelines for Collecting and Interpreting Technological Innovation Data: Oslo Manual*; Organisation for Economic Co-Operation and Development: Paris, France, 1997.
3. Kézai, P.K.; Kurucz, A. Crisis Resilience of Startup Companies (The Case of Hungary among the Visegrad Countries with a Focus on the Pandemic). *Sustainability* **2023**, *15*, 7108. [CrossRef]
4. Kalinowski, S. Od paniki do negacji: Zmiana postaw wobec COVID-19. *Wieś i Rolnictwo* **2020**, *3*, 45–65. [CrossRef] [PubMed]
5. Kalinowski, S.; Łuczak, A. Social (in)Security—The Ambivalence of Villagers' Perceptions during COVID-19. *Probl. Polityki Społecznej* **2022**, *54*, 48–67. [CrossRef]
6. Kalar, B.; Primc, K.; Kump, N. Differences in COVID-19 Policies and Income Distribution: A Cross-Country Comparison. *Sustainability* **2023**, *15*, 4916. [CrossRef]
7. Zakaria, R.H.; Sabri, M.F.; Satar, N.M.; Magli, A.S. The Immediate Impacts of COVID-19 on Low-Income Households: Evidence from Malaysia. *Sustainability* **2023**, *15*, 8396. [CrossRef]
8. Fernández-Bedoya, V.H.; Meneses-La-Riva, M.E.; Suyo-Vega, J.A.; Gago-Chávez, J. de J.S. Entrepreneurship Research in Times of COVID-19: Experiences from South America. *Sustainability* **2023**, *15*, 6028. [CrossRef]
9. Kumar, V.; Alshazly, H.; Idris, S.A.; Bourouis, S. Evaluating the Impact of COVID-19 on Society, Environment, Economy, and Education. *Sustainability* **2021**, *13*, 13642. [CrossRef]
10. Zdolšek, D.; Beloglavec, S.T. Sustainability Reporting Ecosystem: A Once-in-a-Lifetime Overhaul during the COVID-19 Pandemic. *Sustainability* **2023**, *15*, 7349. [CrossRef]
11. Homayoun, S.; Velashani, M.A.B.; Abbas Alkhafaji, B.K.; Jabbar Mezher, S. The Effect of COVID-19 on the Performance of SMEs in Emerging Markets in Iran, Iraq and Jordan. *Sustainability* **2023**, *15*, 7847. [CrossRef]
12. Gregurec, I.; Tomičić Furjan, M.; Tomičić-Pupek, K. The Impact of COVID-19 on Sustainable Business Models in SMEs. *Sustainability* **2021**, *13*, 1098. [CrossRef]
13. Hilmola, O.-P.; Lähdeaho, O.; Henttu, V.; Hilletofth, P. COVID-19 Pandemic: Early Implications for North European Manufacturing and Logistics. *Sustainability* **2020**, *12*, 8315. [CrossRef]
14. Li, N.; Chen, M.; Huang, D. How Do Logistics Disruptions Affect Rural Households? Evidence from COVID-19 in China. *Sustainability* **2023**, *15*, 465. [CrossRef]
15. Keokhoungning, T.; Wongsinlatam, W.; Remsungnen, T.; Namvong, A.; Khunkitti, S.; Inthakesone, B.; Siritaratiwat, A.; Premrudeepreechacharn, S.; Surawanitkun, C. Challenge of Supplying Power with Renewable Energy Due to the Impact of COVID-19 on Power Demands in the Lao PDR: Analysis Using Metaheuristic Optimization. *Sustainability* **2023**, *15*, 6814. [CrossRef]
16. Kassem, M.A.; Radzi, A.R.; Pradeep, A.; Algahtany, M.; Rahman, R.A. Impacts and Response Strategies of the COVID-19 Pandemic on the Construction Industry Using Structural Equation Modeling. *Sustainability* **2023**, *15*, 2672. [CrossRef]
17. Gutierrez, L.; Pierre, G.; Sabbagh, M. Agricultural Grain Markets in the COVID-19 Crisis, Insights from a GVAR Model. *Sustainability* **2022**, *14*, 9855. [CrossRef]
18. Kalinowski, S.; Wyduba, W. *Moja sytuacja w okresie koronawirusa. Raport końcowy z badań (My Situation during Coronavirus Period)*; IRWiR PAN: Warszawa, Poland, 2020. [CrossRef]
19. Tudorache, A.T.; Nicolescu, L. Insights about the Effects of COVID-19 on International Trade during the Main Pandemic Years in Romania and Poland. *Sustainability* **2023**, *15*, 8726. [CrossRef]
20. de Fátima Brilhante, M.; Rocha, M.L. COVID-19 Impact on the Tourism Accommodation and Restaurant Sectors of São Miguel (Azores). *Sustainability* **2023**, *15*, 343. [CrossRef]
21. Rodríguez-Antón, J.M.; Alonso-Almeida, M.D.M. COVID-19 Impacts and Recovery Strategies: The Case of the Hospitality Industry in Spain. *Sustainability* **2020**, *12*, 8599. [CrossRef]
22. Korinth, B. Impact of the COVID-19 Pandemic on International Tourism Income in Tourism Receiving Countries. *Sustainability* **2022**, *14*, 12550. [CrossRef]

23. Czuczor, K.; Kozma, G.; Dorogi, Z.; Li, T.; Radics, Z. The Comprehensive Analysis of the Network of Superstructure Based on Territorial Characteristics of Accommodation and Food and Beverage Service Providers Considering the Financial Crisis and COVID-19: The Case of Bihor County, Romania. *Sustainability* **2023**, *15*, 6759. [CrossRef]
24. Oxford Economics. *The Impact of COVID-19 on the United States Travel Economy, 2020 Analysis*; Oxford Economics: Oxford, UK, 2020.
25. Siche, R. What Is the Impact of COVID-19 Disease on Agriculture? *Sci. Agropecu.* **2020**, *11*, 3–6. [CrossRef]
26. Tonnang, H.E.Z.; Sokame, B.M.; Wamalwa, M.; Niassy, S.; Muriithi, B.W. System Dynamics Modeling for Assessing the Impact of COVID-19 on Food Supply Chains: A Case Study of Kenya and Rwanda. *Sustainability* **2023**, *15*, 4717. [CrossRef]
27. Kusz, B.; Witek, L.; Kusz, D.; Chudy-Laskowska, K.; Ostyńska, P.; Walenia, A. The Effect of COVID-19 on Food Consumers' Channel Purchasing Behaviors: An Empirical Study from Poland. *Sustainability* **2023**, *15*, 4661. [CrossRef]
28. Abu Nahleh, Y.; Al Ali, B.; Al Ali, H.; Alzarooni, S.; Almulla, S.; Alteneiji, F. The Impact of COVID-19 on Supply Chain in UAE Food Sector. *Sustainability* **2023**, *15*, 8859. [CrossRef]
29. Wang, J.; Fu, M.-J. Study on the Distribution of Fresh Food Support System—An Example of Shanghai during the Epidemic Closure of 2022. *Sustainability* **2023**, *15*, 7107. [CrossRef]
30. Phillipson, J.; Gorton, M.; Turner, R.; Shucksmith, M.; Aitken-McDermott, K.; Areal, F.; Cowie, P.; Hubbard, C.; Maioli, S.; McAreavey, R.; et al. The COVID-19 Pandemic and Its Implications for Rural Economies. *Sustainability* **2020**, *12*, 3973. [CrossRef]
31. Bochtis, D.; Benos, L.; Lampridi, M.; Marinoudi, V.; Pearson, S.; Sørensen, C.G. Agricultural Workforce Crisis in Light of the COVID-19 Pandemic. *Sustainability* **2020**, *12*, 8212. [CrossRef]
32. Payne-Gifford, S.; Whatford, L.; Tak, M.; Van Winden, S.; Barling, D. Conceptualising Disruptions in British Beef and Sheep Supply Chains during the COVID-19 Crisis. *Sustainability* **2022**, *14*, 1201. [CrossRef]
33. Vatta, K.; Bhogal, S.; Green, A.S.; Sharma, H.; Petrie, C.A.; Dixit, S. COVID-19 Pandemic-Induced Disruptions and Implications for National Food Security and Farm Incomes: Farm-Level Evidence from Indian Punjab. *Sustainability* **2022**, *14*, 4452. [CrossRef]
34. Balgah, R.; Benjamin, E.; Kimengsi, J.; Buchenrieder, G. COVID-19 Impact on Agriculture and Food Security in Africa. A Systematic Review and Meta-Analysis. *World Dev. Perspect.* **2023**, *31*, 100523. [CrossRef]
35. ILO International Labour Organisation, ILO Sectoral Brief, COVID-19 and the Impact on Agriculture and Food Security. 2020. Available online: https://www.ilo.org/wcmsp5/groups/public/{-}{-}ed_dialogue/{-}{-}sector/documents/briefingnote/wcms_742023.pdf (accessed on 8 July 2023).
36. Zúñiga, B.; Calderón, K.; Ale, T. Impacts of COVID-19 on Agriculture and Food Security. *Cent. Agrícola* **2021**, *48*, 72–82.
37. Singh, G.; Kumar, M. *Impact of COVID-19 Pandemic on Agriculture and Management Strategies*; Springer: Berlin/Heidelberg, Germany, 2021; Volume 2, pp. 1–6.
38. Bhojiya, A.; Abubakar, Y. Global impact of COVID-19 on agriculture. *J. Indian Res.* **2021**, *9*, 82–87.
39. English, L.; Pelkki, M.; Montgomery, R.; Tian, N.; Popp, J. Evaluating Economic Impacts of COVID-19 for Arkansas' Agriculture and Forestry Sectors in 2020. 2022. Available online: https://ageconsearch.umn.edu/record/330155 (accessed on 8 July 2023).
40. Stanisic, T.; Lazarević, S.; Pantic, N.; Lekovic, M. COVID-19 Pandemic and Economic Results of Agriculture in the European Union. *Ekon. Poljopr.* **2022**, *69*, 1151–1163. [CrossRef]
41. Say Peng, T.; Chuen, N.; Lyndon, N.; Aman, Z.; Kannan, P.; Hashim, K.; Teo, H.M.; Syazlie, M.; Ibrahim, C. A Review on Post-COVID-19 Impacts and Opportunities of Agri-Food Supply Chain in Malaysia. *PeerJ* **2023**, *11*, e15228. [CrossRef]
42. Umar, N. A Global Analysis of COVID-19 Impact on Agriculture. *Jundishapur Journal of Microbiology* **2022**, *15*, 1126–1138.
43. Paudel, D.; Neupane, R.C.; Sigdel, S.; Poudel, P.; Khanal, A.R. COVID-19 Pandemic, Climate Change, and Conflicts on Agriculture: A Trio of Challenges to Global Food Security. *Sustainability* **2023**, *15*, 8280. [CrossRef]
44. Barcaccia, G.; D'Agostino, V.; Zotti, A.; Cozzi, B. Impact of the SARS-CoV-2 on the Italian Agri-Food Sector: An Analysis of the Quarter of Pandemic Lockdown and Clues for a Socio-Economic and Territorial Restart. *Sustainability* **2020**, *12*, 5651. [CrossRef]
45. Tripathi, H.G.; Smith, H.E.; Sait, S.M.; Sallu, S.M.; Whitfield, S.; Jankielsohn, A.; Kunin, W.E.; Mazibuko, N.; Nyhodo, B. Impacts of COVID-19 on Diverse Farm Systems in Tanzania and South Africa. *Sustainability* **2021**, *13*, 9863. [CrossRef]
46. Shamsuddin, M.; Hossain, M.B.; Rahman, M.; Tazim, M.F.; Ali, M.R.; Kawla, M.S.; Begum, T.; Albeshr, M.F.; Arai, T. Impact of COVID-19 Pandemic on Fisheries Sector and Actions Taken to Cope with the Situation: A Case Study from a Top Fish-Producing Country. *Sustainability* **2023**, *15*, 3605. [CrossRef]
47. Yu, J.; Zhang, J.; Zhou, M.; Cai, W. Impact of COVID-19 on the Comprehensive Resilience of Rural Areas—A Case Study of Jilin Province of China. *Sustainability* **2023**, *15*, 3152. [CrossRef]
48. Et-Touile, H.; Arib, F. Impacts of COVID-19 Pandemic on Agriculture, Food Prices, and Food Security in Morocco. *Int. J. Financ.Account. Econ. Manag. Audit. (IJFAEMA)* **2021**, *3*, 973–988. [CrossRef]
49. Dickson, R.S.; Yao, D. The Impact and Opportunities of COVID-19 in Ghana. *Open J. Soc. Sci.* **2020**, *8*, 71–86. [CrossRef]

50. Jiang, Z.; Wang, X.; Wang, H.; Lu, G.; Wang, G.; Zhang, X.; Gong, X. The Impact and Opportunities of COVID-19 in China. *J. Serv. Sci. Manag.* **2020**, *13*, 558–566. [CrossRef]
51. Prezentare Scheme de Plată/Măsuri de Sprijin Şi Ajutoare Derulate de APIA. Available online: https://apia.org.ro/despre-apia/scheme-de-plata-masuri-de-sprijin-derulate-de-apia/ (accessed on 6 June 2023).