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RESEARCH ARTICLE Agricultural Science Digest

The Effect of COVID-19 on Small Farmers' Economic Conditions

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ABSTRACT

Background: The COVID-19 pandemic left hundreds of small farmers in economic problems. The objective was to measure the effect of COVID-19 economic impact on farmers in Jordan.

Methods: Quantitative descriptive study was used. The questionnaire was used as a tool to collect the data about the effect COVID-19 pandemic on the economic conditions of small farmers. A random sample of 630 farmers were selected to fill this questionnaire.

Result: The first effect of the pandemic was on the prices which decreased due to the decrease in the quality. The second impact was on the imports and exports which affected the inputs and the product prices. The effect of supply chain increased the inputs prices. The final impact was on the cash flow and the low prices of products.

Key words: COVID-19 pandemic, Economic conditions, Small farmers.

INTRODUCTION

The agricultural sector is one of the sectors affected by COVID-19 severely (Troskie, 2020). The impact of COVID-19 started from the production stage (Gregorio and Ancog, 2020) and passed to the marketing activities (GoB (Government of Bangladesh, 2020) and the supply chains (Dev, 2020). Different researchers have investigated the effect of restrictions applied to the agricultural sector on food security (Bahadur Poudel *et al*., 2020; Gregorio and Ancog, 2020; Singh, 2020; Varshney *et al*., 2020). The reduction of agricultural production due to the lockdown increased the agricultural product prices, but this increase did not leave a positive impact on farmers' economic conditions due to high product losses (Pan *et al*., 2020). Through these events, the farmers were high affected, while the middlemen and the retail shops got the high benefits (Nicola *et al*., 2020; WFO, 2020).

The agricultural sector in Jordan was affected widely by the pandemic of COVID-19. The impact was observed on all farmers. Small farmers' ability to tolerate the risks initiated was less and, thus, they were affected badly. This paper has investigated the different effects caused by the COVID-19 pandemic on the economic conditions of farmers in Jordan.

Literature review

Food security and availability were the first concern (Okolie and Ogundeji, 2022; ReliefWeb, 2020). Food security concern was on both the national and international levels. On the national level, some countries draw policies for the agricultural sector to ensure the continuity of agricultural production and market satisfaction (Varshney *et al*., 2020). The concern at the local level is to improve the local economy in rural areas to improve the life quality of rural areas (Hamadani *et al*., 2020; Phillipson *et al*., 2020; Singh, 2020).

Most farmers faced distress due to the lack of capabilities to proceed with farming work, especially farming work is a very sensitive and time-affecting process (Kapse, 2020; Raghavendra *et al*., 2022; Upendra *et al*., 2021). The tolerability and management of farmers for the crisis was dependent on their education and capabilities to manage their business through COVID-19 pandemic (Speranza *et al*., 2014). Also, the distance the area, the low possibility to provide enough labor for the farm and the low ability to reach these cities for marketing purposes (Ayanlade and Radeny, 2020).

One major aspect was related to the lack of cash flow due to the interruption of processes witnessed in the agricultural sector (International Trade Centre, 2020) which affected the farmers' ability to hire labor. In small farming, the cash flow is considered very crucial to managing the daily processes on farms. Gregorio and Ancog (2020) reported that the major cause of agricultural production is the decline of labor in the agricultural farms resulting from the restricted movement within the pandemic.

Troskie, (2020) discussed the effect of imports and exports of agricultural products on the agricultural sector. The lack of exports has increased agricultural input prices, placing an additional burden on farmers, especially small farmers. WFO, (2020) reported that the closure of the border affected the availability of seeds, fertilizers and many other inputs. Tamru *et al*. (2020) reported the extreme effect of COVID-19 on the input of vegetables and fruit production.

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Pu and Zhong (2020) and Dev (2020) explained the effect of COVID-19 on labor availability in China which affected negatively the production availability. The vegetable farmers experienced the same manpower problem in Ethiopia. The vegetable farmers experienced losses resulting from the ability to harvest the crops at the proper time (Tamru *et al*., 2020).

The supply chain ensures the continuity of agricultural production and the outputs to ensure the flow of products and distribution (Bahadur Poudel *et al*., 2020; Nzeyimana *et al*., 2022). World Farmers Organization (2020) reported that the pandemic outbreaks affected the food supply chain regarding all items. OECD (2020) has reported that the pandemic affected the farmers through the cease of the supply chain for inputs and the supply of agricultural products for the consumers within the countries.

In view of above, the objective of the study was to investigate the effect of COVID-19 on the socio-economic conditions of farmers.

MATERIALS AND METHODS

Settings

Cross-sectional study was applied to the farmers of Jordan Valley in Jordan. The time for data collection started in March 2020 to Dec. 2021.

Population and sample

The population of this study was the small farmers of the Jordan Valley. Random sample of small farmers included 1000 farmers was selected, while the recovered responses were 630 forming 63.0% of the sample.

Study variables

The study variables were determined based on the literature review. The socio-economic characteristics of farmers were collected (education, source of income, income level and experience). The independent variables included (Fig 1):

1. The effect of exports and imports on farmers through the COVID-19 pandemic (Troskie, 2020).
2. The production prices' stability (Dev, 2020). These variables were included to measure their effect on farmers' financial position.
3. The effect of the supply chain on farmers (Dev, 2020).

Data collection

A questionnaire was distributed to pilot sample farmers to measure its validity. The questionnaire was distributed to the original sample after making the required modifications. Field enumerators collected the data through personal interview.

Statistical analysis

The collected data were entered into the SPSS software (Ver 26) for data analysis. The trend of small farmers for the effect of COVID-19 pandemic were figured out using means and standard deviations, while structural equation modeling (SEM) was to measure the extent of effects on financial position of small farmers.

Validity and reliability analysis

The validity of the questionnaire was executed through its application on a pilot survey. The reliability analysis was measured by using Cronbach's alpha. Table 1 shows the results of reliability analysis results. The alpha value for all the parameters was more than 0.6 which is the threshold limit for such kind of research reflecting the possibility of using the questionnaire to reach the results of this research (Hair *et al*., 2007).

RESULTS AND DISCUSSION

Demographic characteristics of farmers

The results showed that farmers had a B.Sc. degree (45.0%) followed by Tawjeihi (35.0%) and the least was recorded for higher education and less than Tawjeihi education. The

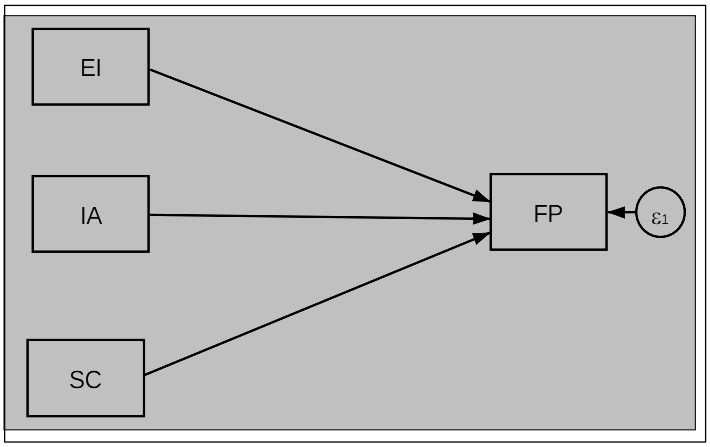

Fig 1: Study model based on literature review (EI: Exports and Imports; IA: Input agricultural prices; SC: Supply chain; FP: Financial position).

majority of the sample showed that agriculture forms the only source of income for farmers (75.6%), while the rest of the sample has another source of income (Fig 2).

The income level of the farmers in usual conditions ranged from 500-1000 Jordanian Dinar (JD) per month. While the rest of the sample was distributed in categories more than or less than the average income. The highest frequent farmers' experience ranged from 5-to 10 years which reflects that the farmers have sufficient experience to manage their business, but the complete lockdown and the issued penalties will force them to commit to emergency laws (Fig 2).

The effect of exports and imports of agriculture products

The farmers' agreed that the lockdown left a wide effect on the imports and exports related to agricultural activities (3.38±0.81). The input activities related to fertilization or harvesting prices increased through the lockdown periods due to the crease in the importation of the inputs and the lack of materials in the market (3.49±1.17). The advantage of the lockdown and the cessation of the importation of the agricultural product increased the prices of local agricultural products (3.48±1.34). The loss of non-harvested crops increased the risks for the farmers due to lockdown restrictions (3.45±1.21). Despite the increase in prices of products, still, these prices were not stable due to the lack of exports and transportation (3.30±1.25). The least effect was for the quantities of production on the prices (3.22±1.20) (Table 2).

Table 1: Estimates of reliability analysis by using Cronbach's Alpha.

Variable	Alpha value
Exports and imports	0.81
Agricultural input prices	0.92
Production quantities stability	0.93
Production quality stability	0.95
Supply chain	0.89
Financial losses	0.82
Total	0.94

Trends for agricultural input activities

The prices of these activities were affected widely by the complete lockdown (3.51±0.78). The highest effect was on the increase of labor wages (3.61±1.17), followed by the effect of the low packaging facilities which decreased the prices of products (3.57±1.15). The variations of prices among different whole sales markets increased (3.56±1.17). Also, the transportation prices increased due to the complete lockdown (3.52±1.07). The least effect was on the possibility to complete the production process through the pandemic to the increase in inputs prices (3.33±1.07) (Table 3).

The effect of supply chain on agriculture production

The pandemic affected the supply chain due to the complete lockdown and the impossibility to move from one area to another (3.33±0.95). The highest effect was on the possibility

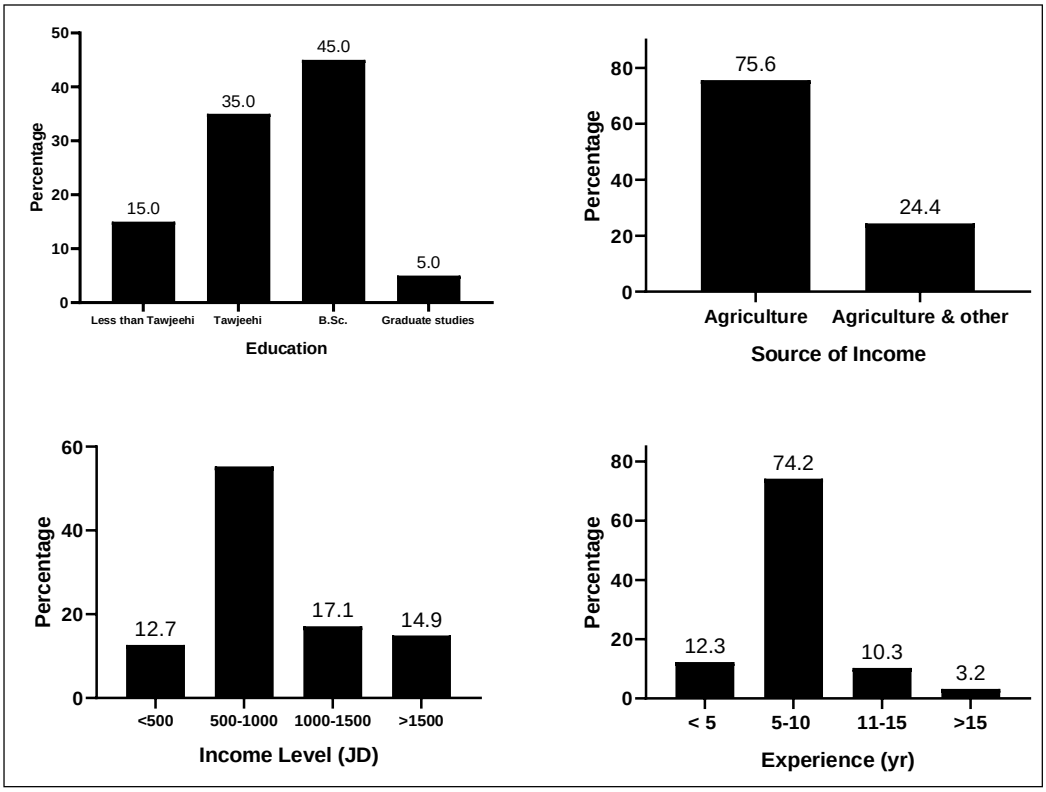

Fig 2: Demographic characteristics of farmers (n=630).

of saving the needed fertilizers and pesticides (3.46±1.09). The second high effect was the lack of transportation to move the products from one area to another (3.38±1.15). The lack of a supply chain increased the farmers' risk and production disturbances throughout the production process (3.27±1.14). The least effect was on the lack of harvesting labor which increase the loss of production (3.33±0.95) (Table 4).

Trends of the effect of the pandemic on farmers' financial position

The results showed that the farmers' financial conditions were highly affected by the pandemic lockdown (3.45±0.98). The highest effect was on the low ability to pay the labor rented for harvesting services (3.69±1.08). The low cash flow of farmers was the second constraint within the pandemic lockdown (3.40±1.18). The farmer loss through the pandemic resulted from the non-harvesting increased the farmers' losses through the pandemic (3.29±1.19) (Table 5).

Fig 3 explains the effects of exports and imports of agriculture products, the supply chain and input of agricultural activity prices on farmers' financial conditions of farmers. The results showed that the highest effect resulted from the lack of a supply chain to ensure the continuity of the production process (r=0.54) followed by the effect of exports and imports (r=0.21), while the least effect resulted from input activities access (r=0.063).

The arrangement processes started in the agricultural sector through the issue of movement permissions for the farmers to manage their farms. The issue of movement permissions was given to vehicles that can be used for agricultural transportation to the major markets in central governorates. At this time, the movement of individuals without permission faces high fines and jail. So, the

Table 2: Trends for the effect of ceasing of exports and imports of agriculture products on farmers through the pandemic.

Item	Mean	St. Dev.
The agricultural inputs prices increased	3.49	1.17
The low agricultural imports improved the prices of local products	3.48	1.24
The losses of non-harvested crops through the lockdown increased the prices due to paused exports	3.45	1.21
The prices of products were not stable due to a lack of exports	3.30	1.25
The fluctuation of products quantities affected the prices widely due to ceased exports	3.22	1.20
Average	3.38	0.81

Table 3: The effect of the pandemic on input prices.

Item	Mean	St. Dev.
Labor prices increased	3.61	1.17
The low packaging facilities decreased the prices of products	3.57	1.15
The lockdown created high variation in prices among the wholesale markets	3.56	1.17
The lack of free movement increased the transportation prices	3.52	1.07
The high variation of input prices increased the ability of farmers to complete the production process	3.33	1.07
Average	3.51	0.78

Table 4: The effect of the pandemic on supply chain.

Item	Mean	St. Dev.
The lockdown affected the availability of fertilizers and pesticides	3.46	1.09
Transportation restrictions	3.38	1.15
Affected supply chain increased the farmer risk	3.32	1.13
The lack of governmental support increased the risk to save the production inputs	3.27	1.14
The lack of harvesting labor increased the loss of products	3.25	1.18
Average	3.33	0.95

Table 5: The effect of farmer's financial position for the risk bearing.

Item	Mean	St. Dev.
The farmers were not able to pay for labor for harvesting services	3.69	1.08
Farmers suffered from cashflow during the pandemic	3.40	1.18
The crops damage was high which increased the financial losses of farmers	3.29	1.19
Total	3.45	0.98

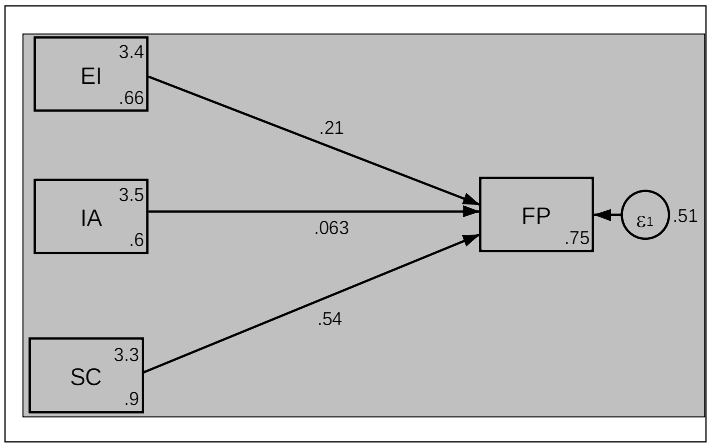

Fig 3: The effect of imports and exports, agricultural inputs and supply chain on the financial conditions of farmers through the COVID-19 pandemic.

movement was restricted and the supply chain was redistricted too. Troskie (2020) discussed the instability of agricultural production through the pandemic which affected the ability to continue the production processes. World Farmers' Organization (2020) discussed the effect of the pandemic on the supply chain in the agricultural sector and its negative effect on the production process.

This period was characterized by the low labor force that can be used for harvesting. At the beginning of the crisis, most of the small farmers and due to the lack of storage facilities lost part of their crops without marketing. At the same time, they couldn't provide the needed inputs to continue the production process. This stage was characterized by the lack of governance arrangements to protect farmers from losses and provide them with their needs to continue the production process.

Even though the importation process cessation, the impossibility to get the needed requirements to continue the production process decreased due to the closure of the stores that provide the agricultural needs, Moreover, most farmers lack the financial liquidity to provide their needs in cash to continue the production process. These obstacles increased the farmers' overburdened financially. When the government had shorten the lockdown, the farmers got more space to work and manage their farms.

The procedures applied during the pandemic approve that the government lacks any organized plans to manage the agricultural sector at the time of the pandemic. The government concern was high in some aspects while it ignores others that are considered very important for the farmers during the pandemic. Also, the government did not consider the financial conditions of the small farmers and the assessment of the effect of different procedures on this important category in the plant production process. Gregorio (2020) discussed the effect of the pandemic on the continuity of the production process in Southeast Asia. The author showed the extent of agricultural production decrease and the shortage of food availability. Similar conditions were suffered in Jordan at the first stage of the crisis.

CONCLUSION AND RECOMMENDATION

The results of this study approved showed severe financial effects of the pandemic and complete lockdowns on small farmers (mentioned whether other categories of farmers were there in the methodology). The results revealed that the major effect was due to the lack of liquid fund which made the small farmers unable to pay the different activities to continue the production process. The cessation of the supply chain for the inputs and the impossibility to provide the needed labor force to continue the production process were the major obstacles faced by the farmers which also lad to loss of crops and income. Also, the cease of movement at the beginning of the crisis increases the losses of small farmers resulting in the loss of crops. The farmers' financial position was highly affected due to the lack of liquidity and low cash flow. The study recommended the adoption of emergency strategies accompanied by financial strategies that target the farmers primarily which, in turn, helped agricultural sector to strengthen in such emergency conditions.

Future research

The study recommended studying the financial elements that affect the small farmers' production in emergency conditions to be the major components of the treatment strategy in such conditions.

Conflict of interest: None.

REFERENCES

Ayanlade, A. and Radeny, M. (2020). COVID-19 and food security in Sub-Saharan Africa: implications of lockdown during agricultural planting seasons. Npj Science of Food. 4(1): https://doi.org/10.1038/s41538-020-00073-0

Bahadur Poudel, P., Ram Poudel, M., Gautam, A., Phuyal, S., Krishna Tiwari, C., Bashyal, N. and Bashyal, S. (2020). COVID-19 and its global impact on food and agriculture. J. Biol Today's World. 9(5): 221. https://doi.org/10.35248/2322-3308.20.09.221.

Dev, S.M. (2020). Addressing COVID-19 impacts on agriculture, food security and livelihoods in India. COVID-19 and Global Food Security. 1-5. https://www.ifpri.org/blog/addressing-covid-19-impacts-agriculture-food-security-and-livelihoods-india.

GoB (Government of Bangladesh). (2020). COVID-19/ : Bangladesh Multi-Sectoral Anticipatory Impact and Needs Analysis Needs Assessment Working Group Date/: Needs Assessment Working Group. Needs Assessment Working Group BANGLADESH, April. https://reliefweb.int/sites/reliefweb.int/files/resources/covid_nawg_anticipatory_ impacts_and_needs_analysis.pdf.

Gregorio, G. and Ancog, R. (2020). Assessing the impact of the COVID-19 pandemic on agricultural production in southeast asia: toward transformative change in agricultural food systems. Asian Journal of Agriculture and Development. 17(1): 3-51. https://doi.org/10.37801/ajad2020.17.1.1.

Hair, J., Celsi, M., Money, A. and Samouel, P. (2007). The essentials of Business Numeracy. John Wiley and Sons.

Hamadani, J.D., Hasan, M.I., Baldi, A.J., Hossain, S.J., Shiraji, S., Bhuiyan, M.S.A., Mehrin, S.F., Fisher, J., Tofail, F., Tipu, S.M.M.U., Grantham-McGregor, S., Biggs, B.A., Braat, S. and Pasricha, S.R. (2020). Immediate impact of stay-at-home orders to control COVID-19 transmission on socioeconomic conditions, food insecurity, mental health and intimate partner violence in Bangladeshi women and their families: An interrupted time series. The Lancet Global Health. 8(11): e1380-e1389. https://doi.org/10.1016/S2214-109X(20)30366-1.

International Trade Centre. (2020). SME Competitiveness Outlook COVID-19: The Great Lockdown and its Impact on Small Business.

Kapse, P. (2020). Farmers Distress During the COVID-19 Lock Down: Psychosocial Response. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3627250.

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A. and Al-jabir, A. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. January.

Nzeyimana, J. B., Butore, J., Ndayishimiye, L. and Butoyi, M. (2022). Impact of Covid-19 on livestock production chain and its consequences on food security: A Review. Agricultural Science Digest. 42(2): 196-202. https://doi.org/10.18805/ag.DF-395.

OECD. (2020). COVID-19 and the Food and Agriculture Sector: Issues and Policy Responses. Oecd, April, 12. https://read.oecd-ilibrary.org/view/?ref=130_130816-9uut45lj4qandtitle=Covid-19-and-the-food-and-agriculturesector-Issues-and-policy-responses.

Okolie, C.C. and Ogundeji, A.A. (2022). Effect of COVID-19 on agricultural production and food security: A scientometric analysis. Humanities and Social Sciences Communications. 9(1): https://doi.org/10.1057/s41599-022-01080-0.

Pan, D., Yang, J., Zhou, G. and Kong, F. (2020). The influence of COVID-19 on agricultural economy and emergency mitigation measures in China: A text mining analysis. PLoS ONE. 15(10): https://doi.org/10.1371/journal.pone.0241167.

Phillipson, J., Gorton, M., Turner, R., Shucksmith, M., Aitken-McDermott, K., Areal, F., Cowie, P., Hubbard, C., Maioli, S., McAreavey, R., Souza-Monteiro, D., Newbery, R., Panzone, L., Rowe, F. and Shortall, S. (2020). The COVID-19 pandemic and its implications for rural economies. Sustainability (Switzerland). 12(10): 1-9. https://doi.org/10.3390/SU12103973.

Pu, M. and Zhong, Y. (2020). Rising concerns over agricultural production as COVID-19 spreads: Lessons from China. Global Food Security. 26. https://doi.org/10.1016/j.gfs.2020.100409.

Raghavendra, R.H., Kumar, R.A. and Shakunthala, H. (2022). Suicide of Farmer and Farm Workers Amid COVID-19 in India: A Review. Bhartiya Krishi Anusandhan Patrika, of. https://doi.org/10.18805/bkap434.

ReliefWeb. (2020). Policy Brief_ The Impact of COVID-19 on Food Security and Nutrition, June 2020 - World _ ReliefWeb. June. https://reliefweb.int/report/world/policy-brief-impact-covid-19-food-security-and-nutrition-june-2020.

Singh, B.P. (2020). Impact of COVID-19 on Rural Economy in India. SSRN Electronic Journal. 100530. https://doi.org/10.2139/ssrn.3609973.

Speranza, C., Wiesmann, U. and Rist, S. (2014). An indicator framework for assessing livelihood resilience in the context of social-ecological dynamics. Glob. Environ. Chang.

Tamru, S., Hirvonen, K. and Minten, B. (2020). Impacts of the COVID-19 crisis on vegetable value chains in Ethiopia. IFPRI Book Chapters, in: COVID-19 and Global Food Security. 81-83. https://www.researchgate.net/publication/343267777.

Troskie, D. (2020). Impact of Covid-19 on Agriculture and Food in the Western Cape Working Document (Version 2). April. Upendra, R.S., Ahmed, M.R., Kumar, T.N., Prithviraj, S.R. and Khan, A.S. (2021). Indian Agricultural Sector Present and Post Pandemic Condition. Indian Journal of Agricultural Research, of. https://doi.org/10.18805/ijare.a-5709.

Varshney, D., Roy, D. and Meenakshi, J.V. (2020). Impact of COVID-19 on agricultural markets: assessing the roles of commodity characteristics, disease caseload and market reforms. Indian Economic Review. 0123456789. https://doi.org/10.1007/s41775-020-00095-1.

WFO. (2020). Covid-19 Pandemic Outbreak: Overview of the Impact on the Agricultural Sector. WFO COVID-19 Agri-Information Hub. May, 1-9. www.wfo-oma.org/covid-19-agri-information-hub.

World Farmers' Organization. (2020). Farmers never give up. https://www.wfo-oma.org/.