Journal of Rural and Community Development

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Citation:
Khan, M. A. (2022). Smallholder farmers' awareness of COVID-19, challenges, and attitude towards government's lockdown strategies in Pakistan. *The Journal of Rural and Community Development*, *17*(1), 49–68.

Publisher:
Rural Development Institute, Brandon University.

Editor:
Dr. Doug Ramsey

ISSN: 1712-8277 © Author
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Smallholder Farmers' Awareness of COVID-19, Challenges, and Attitude towards Government's Lockdown Strategies in Pakistan

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Abstract

Smallholder farmers in Pakistan are at the frontlines of the COVID-19 crisis as their livelihoods have been disrupted due to a countrywide lockdown. This cross-sectional study was conducted over the duration of two months, April and May 2020, with the aim to assess awareness of smallholder farmers regarding COVID-19, their challenges, and attitude towards governments' lockdown strategies in Pakistan. The sample was composed of 384 cotton-wheat smallholder farmers from 1,403 villages of Bahawalnagar, Layyah, and Toba Tek Singh districts of Punjab province. Due to travel restrictions, a telephonic survey was conducted, and data were collected through a semi-structured interview schedule. The instrument contained both open and closed-ended questions and Likert scale items. Results revealed that the vast majority of the smallholder farmers was highly aware of the coronavirus disease, and they had positive attitudes towards the government lockdown strategies. However, some farmers were also facing great challenges in access to farm inputs, unavailability of farm laborers, high prices, and selling their farm produce in the market due to lockdown, which resulted in a drop of their crop incomes and lower food consumption. There remains a dire need to support them in the current crisis and address their challenges.

Keywords: Smallholder farmers, awareness, challenges, attitude, COVID-19

ISSN: 1712-8277

Sensibilisation des petits exploitants agricoles à la COVID-19, aux défis et à l'attitude envers les stratégies de confinement du gouvernement au Pakistan

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Résumé

Les petits exploitants agricoles au Pakistan sont en première ligne de la crise de la COVID-19, car leurs moyens de subsistance ont été perturbés en raison du confinement dans tout le pays. Cette étude transversale a été menée sur une période de deux mois « avril-mai » 2020 dans le but d'évaluer la sensibilisation des petits exploitants agricoles à la COVID-19, à leurs défis et à leur attitude envers les stratégies de confinement gouvernementales au Pakistan. L'échantillon était composé de 384 petits producteurs de coton et de blé de 1 403 villages des districts de Bahawalnagar, de Layyah et de Toba Tek Singh de la province du Pendjab. En raison des restrictions de voyage, une enquête téléphonique a été menée et les données ont été recueillies au moyen d'un calendrier d'entrevues semi-structurées. L'instrument contenait à la fois des questions ouvertes et fermées et des éléments de l'échelle de Likert. Les résultats ont révélé que la grande majorité des petits exploitants agricoles étaient très conscients de la maladie du coronavirus et qu'ils avaient des attitudes positives à l'égard des stratégies de confinement du gouvernement. Cependant, certains agriculteurs étaient aussi confrontés à de grands défis concernant les intrants agricoles, les indisponibilités des ouvriers agricoles, les prix élevés et la vente de leurs produits agricoles sur le marché en raison du confinement, ce qui a entraîné une baisse de leurs revenus agricoles et une baisse de la consommation alimentaire. Il reste un besoin urgent de les soutenir dans la crise actuelle et de relever leurs défis.

Mots-clés : petits exploitants agricoles, sensibilisation, défis, attitude, COVID-19

1.0 Introduction

The Coronavirus Disease 2019 (COVID-19) has affected all developed and developing countries without any discrimination off guard. According to the World Health Organization (WHO) estimates of August 16, 2020, the virus has killed over 761,000 people and affected 21.2 million people in 216 countries since it emerged in Wuhan, China, in December 2019. Due to its rapid spread, the disease has undoubtedly become the greatest health and economic crisis in modern times. In Pakistan, the first two confirmed cases of COVID-19 were reported on February 26, 2020, and continued to climb (Noreen, et. al., 2020). At the time of writing this article in August 2020, there were around 288,047 cases of COVID-19 and 6,162 deaths across the country (Government of Pakistan, 2020). To combat the virus spread, the Pakistani government, like other countries, opted for some

unprecedented strategies, including partial lockdown, travel restrictions, schools and markets closures, and suspension of public transport (The Nation, 2020). On the other hand, the government also introduced several measures to emphasize behavioral interventions, including raising awareness of the disease and encouraging protective behaviors such as social distancing, use of facemasks, and handwashing, etc. (Sheikh, 2020).

The success of the government decisions and protective measures rely largely on rapid changes in population behavior, which are dependent on individuals' ability to perceive risks associated with the virus and adapt their behavior accordingly (Xu & Peng, 2015). Awareness and attitudes are considered one of the most fundamental drivers of human behavior because awareness plays a role in attitude formation (Larsen et al., 2008). Attitude is a state of mind or feeling towards a fact or situation and the way to respond either positively or negatively. People with a positive attitude are usually optimistic and confident, while people with a negative attitude are normally pessimistic and unhappy (Amin, 2017). In a study, Azlan et al. (2020) examined general public knowledge, attitudes, and practices towards COVID-19 in Malaysia and found that majority of the research participants had appropriate knowledge about COVID-19 and had positive attitudes toward the Malaysian government efforts in conquering the disease. However, Onyeaka et al. (2021) concluded that the impact of the global lockdown had far-reaching negative effects in different strata of life. Similarly, the Pakistani government's current strategies of a lockdown have also affected numerous aspects of life in Pakistan. In rural areas, smallholder farmers, businesses, and communities have been particularly affected. Preliminary media reports show that the unavailability of farm inputs due to logistical bans, absence of manpower for food processing, prices instability, fear of the pandemic, and inaccessibility of farm labor have adversely affected farm incomes and supply chains (Anadolu Agency, 2020; Hasan, 2020). According to the Food and Agricultural Organization (FAO) (2020), the livelihoods of millions of smallholder farmers in Pakistan have been affected by a series of natural hazards in the last 14 months and now stand to be devastated by the spread of COVID-19. A question underlying these concerns is if smallholder farmers will comply with lockdowns when their risk of losing livelihood far exceeds the risk of dying from COVID-19.

The interest of this study was gathering empirical data and evidence to address this question because in Pakistan, there are currently 7.4 million smallholder farmers with less than five hectares of land and who are among the poorest and most vulnerable people in the country (Agribusiness Support Fund [ASF], 2021). Unfortunately, media coverage has focused on 'essential workers' getting the world through this time of insecurity, such as health workers, police, supermarket staff, etc. But the unsung heroes (smallholder farmers) who are at the first step of the food value chain, ensuring that we have food on our tables, have been ignored during the COVID-19 crisis. Given the importance of smallholder farmers' psychological and behavioral factors in managing pandemics, it is crucial to formulate policies to protect their livelihoods in the face of the virus. There is a dearth of studies on the awareness and attitude of smallholder farmers towards pandemics like COVID-19. Several studies in Pakistan were conducted among healthcare workers and medical students for measuring the awareness of COVID-19 according to their sociodemographic regions (Ali et al., 2020; Ikhlaq et al., 2020; Hussain et al., 2020; Afzal et al., 2020; Saqlain et al., 2020). Hence, the assessment of smallholder farmers' awareness and attitude through this study is reasonable. This implies that it

is a precondition to applying methods for addressing rural livelihoods and food security issues in the country.

2.0 Literature Review

The relationship between human disease, agricultural production, livelihoods, and food security in rural agrarian societies is often complex, with direct and indirect manifestations. In 2003, China experienced huge public health crises caused by the disease Acute Respiratory Syndromes (SARS), which infected more than 8,000 people, killed 774, and threatened a worldwide pandemic (Cooper, 2020). The outbreak had caused huge negative impacts on food and nutrition security and the economy. It delayed China's winter wheat harvest by two weeks, triggering a food market panic in Guangdong and Zhejiang provinces, though production and prices were largely unaffected in the rest of China (Chen et. al., 2020). Further, in 2014, the Ebola Virus Disease (EVD) was reported in six countries across West Africa, including Guinea, Sierra Leone, Liberia, Nigeria, Senegal, and Mali. The caseloads in Guinea, Sierra Leone, and Liberia were the greatest, with over 11,000 confirmed deaths and nearly 29,000 suspected, probable, and confirmed cases (de la Fuente et. al., 2019). Governments in these three countries declared a state of emergency and imposed intra- and international restrictions to human movement to curtail the spread of EVD within their borders. These restrictions resulted in border closures, bans on large gatherings such as within markets and schools, and curfews and quarantines of the most heavily affected areas. The disease spread through villages, towns, and cities, and some distinct characteristics of EVD made the disease a concern for agriculture and food security, particularly in rural areas. The movement of farmers, laborers, and goods was all significantly impacted. For many farming communities, the epidemic started during the planting season and continued to grow during crop maintenance and harvesting periods for staple crops, including rice, maize, and cassava (Famine Early Warning System Network [FEWS NET], 2017). In a study, Gunjal and Jean (2016) found that in Guinea, Liberia, and Sierra Leone, farm operations, inputs, and then harvesting were affected in two ways. The main impact was seen through the reduction in farm labor due to restrictions/ban on people movement. Secondly, through the labor associated non-labor inputs—reduced use of material inputs such as applied quantities of fertilizer, irrigation, chemicals, etc. Depending on their use and the relative impact, these changes affect crop output.

Similarly, various scholars, including Saqr and Wassan (2020) and Phillipson et al. (2020) argue that the impact of the recent outbreak of COVID-19 on health, society, and the economy is far-reaching, significant, and devastating. Since it is causing the lockdown of countries, it is profoundly disrupting fundamental activities we all depend on, including agriculture and food systems—and endangering all those who depend on it as their livelihood (International Fund for Agricultural Development [IFAD], 2020). Pakistan is an agricultural country where more than 60 percent of the population lives in rural areas. The agricultural sector not only furnishes food and raw material but also employment opportunities to a very large proportion of the population as well. In fact, it is the main occupation of the working population in the country in which about 38.5 percent of the population is engaged (Ministry of Finance, 2018–2019). Though the agricultural sector is already facing a number of problems, yet the current lockdown has choked off almost all economic activities in the country. The challenges farmers face today have been both unexpected and devastating, in the form of the coronavirus that is spreading rapidly in the country (Ali et. al. 2020). The literature on COVID-19 is only evolving, and there is, thus,

limited knowledge about the possible impact on the food security and livelihoods of vulnerable categories of society such as smallholder farmers.

Therefore, this study was designed with the aim to assess the smallholder farmers' awareness regarding COVID-19, their challenges, and attitude towards the government's lockdown strategies in Pakistan. The focus of this study was cotton-wheat smallholder farmers because the lockdown started during the harvesting time of wheat and sowing season of cotton (Asian Development Bank [ADB], 2020). The cotton-wheat cropping system is prominent in Pakistan and is considered a "grain plus cash" cropping system. Cotton is sold as an industrial product and increases farmers' income, while wheat improves food security (Mubeen et. al., 2020). These crops contribute greatly to improve the economic conditions of a large number of people engaged in farming, processing trade, and the textile industry. According to FAO (2004), about 7.1 million hectares of the agricultural area is under the cotton-wheat farming system in Pakistan. It is well understood that in this system, delayed wheat harvest causes a delay in cotton planting and leaves cotton crops exposed to hot weather during critical flowering and grain formation periods as well as severe insect and pest attacks and hence affect yields. The results of this study are expected to initiate the discussion and information exchange among local communities, field experts, policymakers, and researchers to improve the level of agricultural development services and disaster risk reduction services, particularly for smallholder farmers residing in remote areas.

3.0 Methodology

3.1 Research Site

The main province for agricultural production in Pakistan is the Punjab province. According to Bureau of Statistics, Planning & Development Board, Punjab Development Statistics [PDS] (2019), it covers over 60% of the total cropped area of Pakistan, contributing a major share to the country's agricultural economy by providing about 83% of cotton and 80% of wheat to the national food production. In order to identify and approach smallholder cotton-wheat farmers, a company working in the field of agriculture, the Rural Business Development Center (RBDC) Pakistan, was contacted and requested to facilitate in providing the lists of registered farmers along with their contact information. The company is currently working with more than 165,000 cotton-wheat smallholder farmers in six districts of Punjab. Therefore, in this research, three districts i.e., Bahawalnagar, Layyah, and Toba Tek Singh, were selected as research sites.

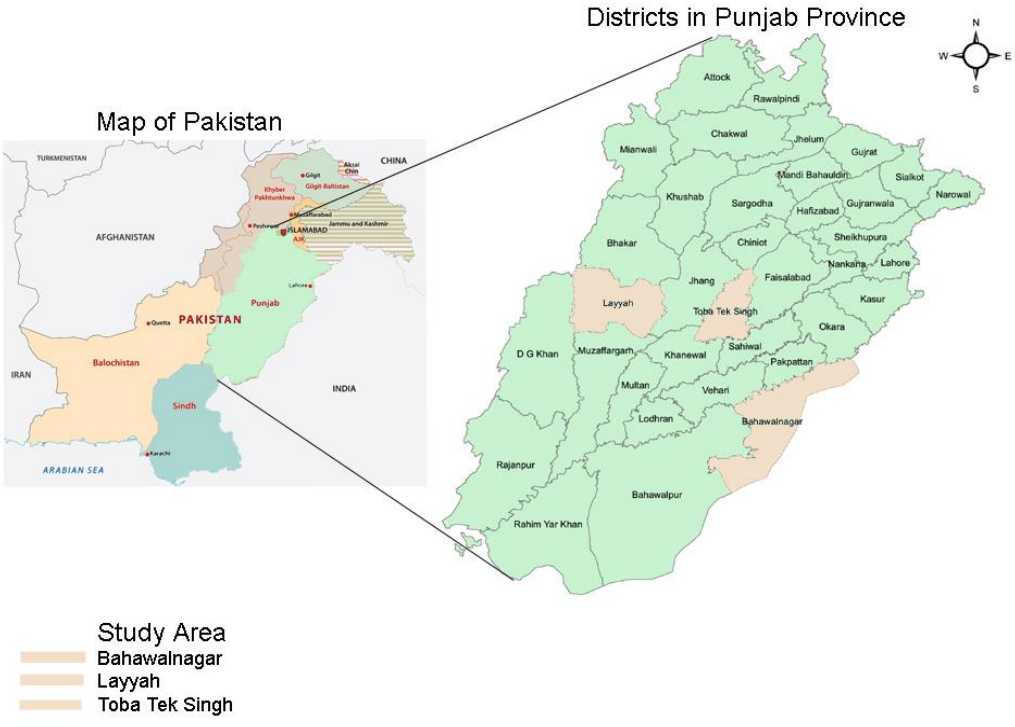
According to the Pakistan Bureau of Statistics (2020), the Bahawalnagar district is spread over an area of about 8878 km^2 with a population of about 2,981,919 people. The district has a very hot and dry climate in summer, in which the maximum temperature touches 52^{o}C. The climate in the winter is very cold and dry. The district can be divided into three parts according to the soil condition, i.e., the riverain area, the canal irrigated plain, and the desert area. The riverain area of the district lies close to the Sutlej River, which flows in the north-west. The land in this area is irrigated by non-perennial canals. During the summer monsoons, the area is generally inundated by river water. The canal irrigated area is the plain area that has been brought under cultivation by the canals. According to Bureau of Statistics, Planning & Development Board, the total cultivated area of Bahawalnagar is about 620,000 hectares and makes up 4.9% of the cultivated area of Punjab (Punjab

Development Statistics [PDS], 2019). The desert area of the district is called the Cholistan, and the surface of this desert consists of a succession of sand dunes.

Similarly, the Layyah district is located in the southern part of the Punjab province, covering an area of 6291 km^2. According to the 2017 census, the population of the district is about 1,824,230. The district has a semi-rectangular block of sandy land and an extremely hot climate. The maximum temperature in the summer can reach 53ºC, while the temperature in the winter is low due to the area's nearness to the Koh-Suleman range of mountains. The river Indus passes from north to south on the western side of the district. The total cultivated area of Layyah is about 491,000 hectares and makes up 3.9% of the cultivated area of Punjab (PDS, 2019). It is comparatively better in agricultural activities than other districts of the province, but it also has large areas of sand dunes and uncultivated land.

The Toba Tek Singh district is situated in central Punjab and occupies an area of about 3,259 km^2. According to the 2017 census, the population of the district is about 2,190,015. The summers in the district are sweltering, and the winters are very cold and clear. The district is made up of large areas of lowlands that frequently flood during the rainy season. Floods originate from the Ravi River that runs along the southern and southeastern borders. The majority of people living in this district work in agriculture, and the region produces several kinds of agricultural and dairy products. The total cultivated area of Toba Tek Singh is about 269,000 hectares and makes up 2.1% of the cultivated area of Punjab (PDS, 2019). Figure 1 shows the map of Punjab Province and the selected districts for the study.

Figure 1. Map showing districts of Punjab Province.



Source: Author, 2020.

3.2 Sample Determination

In order to select survey respondents, lists of about 143,480 registered cotton-wheat farmers from 1403 villages were obtained from the RBDC's zonal offices. From these lists, a sample size of 384 cotton-wheat farmers was drawn by using the following formula:

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

Where:

N = population size (143480),

e = Margin of error (0.05),

p = standard of deviation (0.5), and

z = z-score (1.96) based on 95% confidence level.

3.3 Survey and Data Collection

In this cross-sectional study, a semi-structured interview schedule was administered to collect the primary data. Ethical approval was granted by the University of Peshawar's Research Ethical Committee prior to the commencement of the survey. The interview schedule contained four sections with a total of 32 questions, including both open and closed-ended questions and Likert scale items, which are often used to measure respondents' attitudes by asking the extent to which they agree or disagree with a particular question or statement. The interview schedule was first sent to four randomly selected expert professors at the University of Agriculture Peshawar, Pakistan, to get their feedback regarding its contents, simplicity, and significance. Secondly, a pilot study was carried out involving 40 smallholder farmers from different villages. Finally, Cronbach's alpha of 0.74 was obtained to demonstrate the reliability of scale items. However, due to the countrywide lockdown, it was not possible for the researcher to reach the study respondents and conduct face-to-face interviews. Therefore, a telephonic survey was carried out during the months from April to May 2020. By using a simple random technique, sample respondents were selected from the lists obtained from RBDC's zonal offices and contacted to participate in the survey interview. In response, about 26 respondents refused to be interviewed. Therefore, to complete the sample of 384 respondents, 26 other farmers were taken from the lists and interviewed accordingly. Table 1 shows district-wise distribution of sample size.

Table 1. *District-wise Number of Villages, Registered Cotton-Wheat Smallholder Farmers, and Sample Size Distribution*

No.	District	No. of Villages	No. of Registered Farmers	Sample Size
1.	Bahawalnagar	700	60,937	165
2.	Layyah	340	47,500	128
3.	Toba Tek Singh	363	35,043	91
	Total	**1,403**	**143,480**	**384**

Source: RBDC, 2020.

3.4 Data Analysis

The collected data were analyzed through Microsoft Excel (MS-Excel 2016) and Statistical Package for Social Sciences (SPSS-25) programs for compilation and calculation of descriptive statistics as frequency, percentage and mean scores. However, to measure the respondents' attitude towards the government's lockdown strategy, a 5-point scale was used stating satisfaction levels, ranging from very dissatisfied to very satisfied. Very dissatisfied and dissatisfied were scored 1 and 2, satisfied and very satisfied were scored 4 and 5, and neutral or no response was scored 3. A mean of less than 3 score was classified as a negative attitude (dissatisfaction), while a mean of greater than 3 score was classified as positive attitude (satisfaction). Therefore, the lower the satisfaction scores were, the higher the probability of negative attitudes and the reverse applied for a high score. Secondary data sources in the form of reports, government statistics, published academic papers, news reports, and other written material were applied to form part of the analysis.

4.0 Results and Discussion

4.1 Preliminary Information of the Farmers

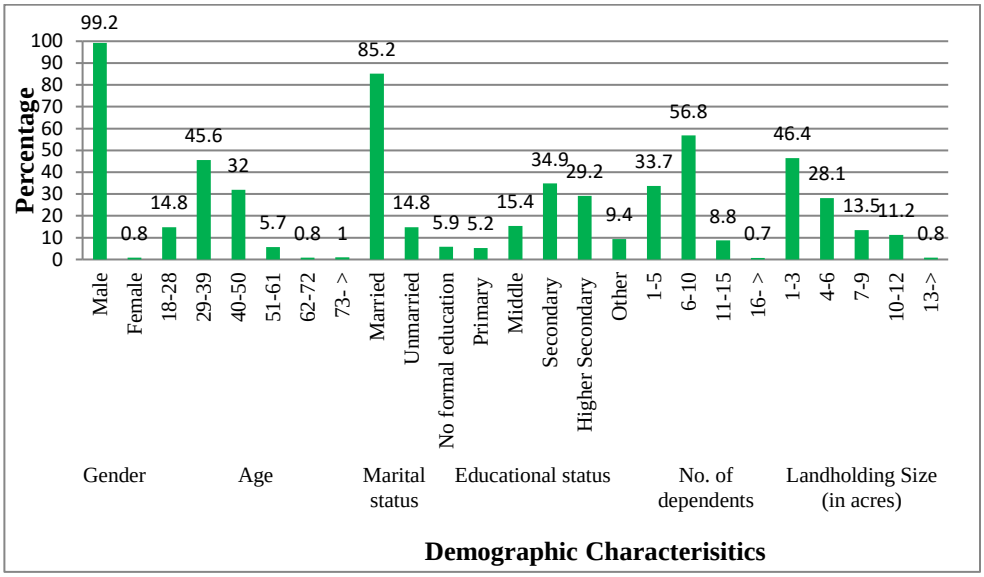
Results regarding demographic characteristics of the cotton-wheat smallholder farmers are presented in Figure 2.

The data shows that the male-headed households (99.2%) dominated the study area, and the remaining (0.8%) households were headed by females. This indicates that in Pakistani culture and socioeconomic conditions, households are generally headed by males, particularly in rural areas. It is believed that a male is expected to work outside the home as a breadwinner and a female has to take care of the home as a wife and mother. In agricultural work, within rural areas, both males and females work in the fields and are expected to contribute equally to household work to fulfill their basic needs due to low earnings and high expenditures. These findings are similar to Jabeen et al.'s (2020).

There is a general assumption that the awareness and attitude of individuals are associated with age and education factors. Therefore, these factors are the most important characteristics that might affect the person's attitudes and the way of looking and understanding any particular phenomena. By comparing the three

districts in terms of the age of the sampled farmers, the first (45.6%) and second (32.0%) majority of farmers were between the ages of 29–39 and 40–50 years. Likewise, the literacy status of the farmers in Figure 2 revealed that the majority (94.1%) of the farmers were literate. However, the variable 'Educational level' of the literate farmers was investigated, and the data pertaining to education indicated that the majority of the farmers (34.9%) had a secondary level of education, followed by 29.2% that had a higher secondary level, 15.4% had middle level, and only 5.2% had a primary level of education. Yet, about 9.4% of the farmers mentioned bachelor's and master's levels of education. The implication of this is that the majority of the farmers in the study area were young and educated. Therefore, it can be concluded that education provides knowledge of the world around us that leads to understanding certain situations we come across in our lives, and a lack of education may result in a lack of knowledge and understanding of situations that how we can best deal with them. These results are comparable in context to the studies of Aldosari et al. (2019) and Khan et al. (2012).

Figure 2. Demographic characteristics of the smallholder farmers.



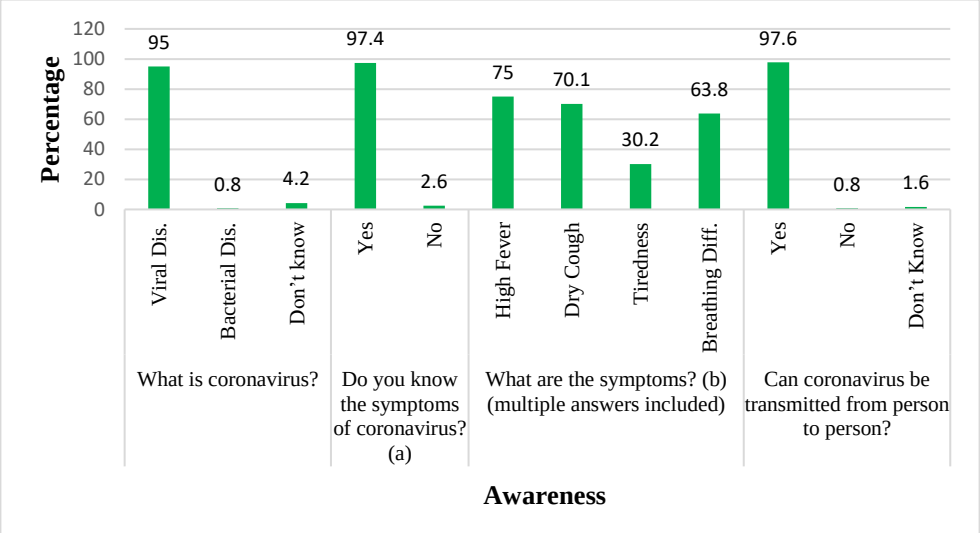
Similarly, marriage and family are also important social institutions of a society. The perceptions and attitudes of a person can also differ by the marital status because marriage might make the person more responsible in terms of supporting his/her family members. Figure 2 describes that a large majority (85.2%) of the farmers were married. As joint and extended family systems were prevalent in the study area, by the same way, dependent members in a household provided information about the quantitative and qualitative potential of household heads for work and income generation. Therefore, in this study, dependent household members were referred to household size and divided into four groups. The data in Figure 2 illustrates that about 56.8% of farmers belonged to a medium size family with 6–10 dependent members, followed by 33.7% of farmers that had small family size with up to five dependent members, 8.8% of farmers belonged to a large family size with equal and more than 11 dependent members, and 0.7% of farmers belonged to a very large family size with over 16 dependent members in the household. These findings were in line with the findings of Kanwal et al. (2016).

Likewise, the land is a symbol of farmers' dignity and survival. It is an important natural asset and sign of wealth, and those who possess land have better livelihood opportunities. According to Pakistan Land Reform Regulations 1972, small farmers are those who hold up to 12.5 acres in Punjab (Agricultural Census Organization, 2010). The findings in Figure 2 show that in the study area, about 46.4% of the farmers had an average farm size of about 1–3 acres for cotton-wheat crop cultivation, followed by 28.1% farmers had 4–6 acres, 13.5% farmers had 7–9 acres, 11.2% had 10–12 acres, and 0.8% had around 13 acres of land for their crops, which indicated that all of the farmers owned smaller farms.

4.2 Farmers' Awareness and Prevention of COVID-19

Results regarding farmers' awareness about the COVID-19 disease, its symptoms, spread, control, and prevention are presented in Figures 3a and 3b.

Figure 3a. Smallholder farmers' awareness regarding COVID-19.

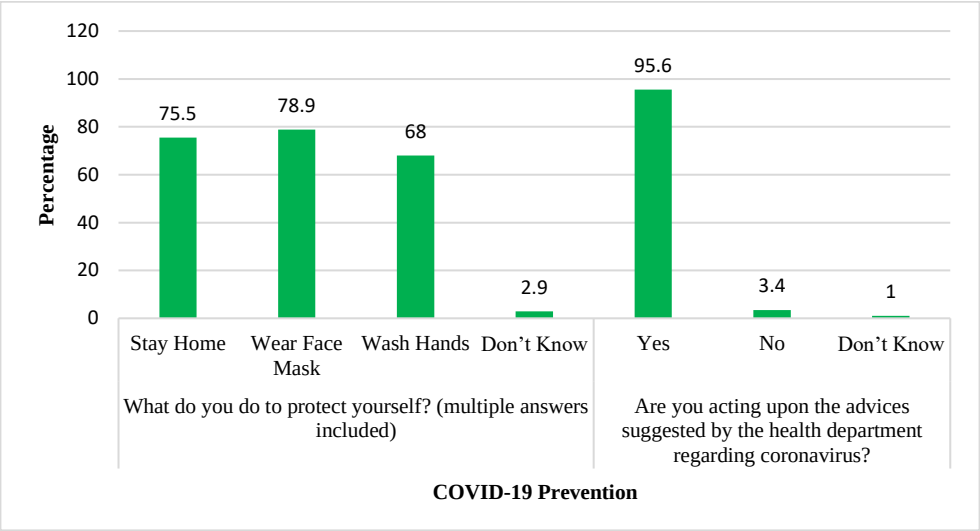


The data in Figure 3a indicates that the overwhelming majority of the farmers (95%) were aware that COVID-19 is a viral disease, while 4.2% of farmers said that they didn't know whether it was a viral disease or bacterial disease. However, only 0.8% of farmers said that it was a bacterial disease.

To assess the knowledge of the farmers about common symptoms of COVID-19, the majority (97.4%) of farmers knew about the symptoms of the disease, whereas only 2.6% farmers were not sure about such symptoms. Those who had knowledge of COVID-19 symptoms had given both single and multiple answers. About 75.0% farmers answered that high fever is the main symptom of COVID-19, followed by 70.1% answered dry cough, 30.2% answered tiredness, and about 63.8% answered breathing difficulties.

The results regarding the transmission of coronavirus disease show that the majority (97.7%) of the farmers believed that the coronavirus could be transmitted from person to person. In comparison, about 0.8% of farmers did not believe in the virus transmission from person to person. Interestingly, about 1.6% of farmers had no idea about the transmission of the disease.

Figure 3b. Smallholder farmers' prevention from COVID-19.



In response to the question regarding the prevention of COVID-19, the data in Figure 3b indicates that the overwhelming majority of the farmers was of the view that direct contact with infected persons and public gathering could cause COVID-19 infection. About 75.5% of the farmers believed that staying home is the best way to prevent coronavirus, followed by 78.9% agreeing to wear face masks, 68.0% considered hand washing. Unfortunately, some (2.9%) very old farmers had no knowledge of how to prevent the disease.

With regard to the question about acting upon the advice suggested by the health department regarding the coronavirus, it is evident from Figure 3 that a large majority (95.6%) of the farmers were acting upon the advice suggested by the health department, whereas, 3.4% of farmers mentioned that they didn't follow the instruction from the health department due to mistrust. However, some (1.0%) of the old farmers had no knowledge about any instruction from the health department. Taken together, these findings illustrate that most of the young and educated farmers showed high levels of awareness about COVID-19.

4.3 Challenges faced by the Farmers due to Lockdown

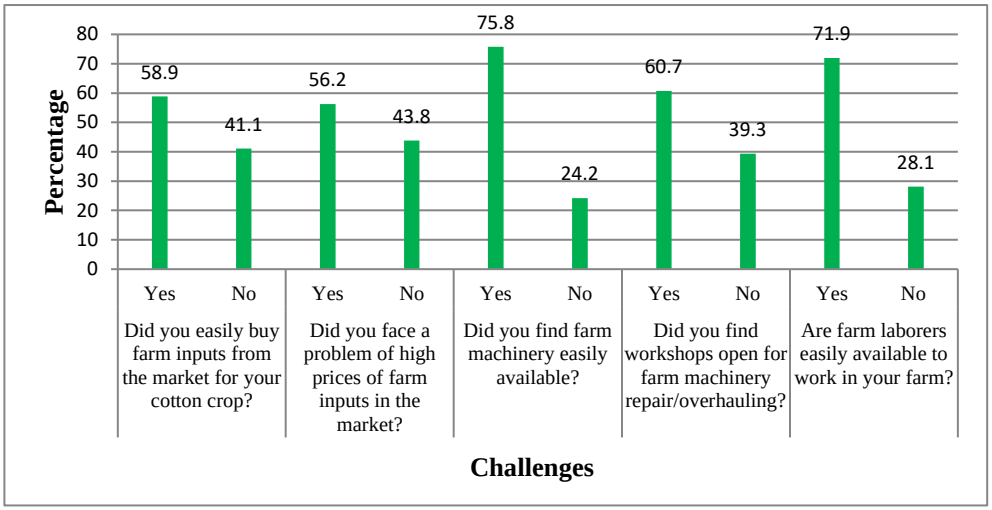
Lockdowns based on travel restrictions, public gathering prohibitions, markets closures, and suspension of transport impose different kinds of risks that may affect farmers' livelihood activities. Results regarding challenges faced by the cotton-wheat farmers in Bahawalnagar, Layyah, and Toba Tek Singh districts due to lockdown and the impacts of lockdown on their livelihoods are presented below:

4.3.1. Cotton Crop Sowing. With respect to cotton crop sowing, challenges faced by the farmers due to lockdown are presented in Figure 4.

Figure 4 expounds that 41.1% of farmers had faced difficulties buying farm inputs from the market due to restrictions on traveling and limited availability of inputs. In comparison, 58.9% of farmers reported that they had not faced any difficulty to buy farm inputs from the market during the lockdown situation. Similarly, 43.8% of farmers found that the prices of farm inputs were high in the market due to lockdown, whereas 56.3% of farmers mentioned that they had not faced any problem

of high prices of farm inputs in the market. In the same way, 24.2% of farmers described that the farm machinery was hardly or not available in their areas due to lockdown, while 75.8% of farmers stated that the farm machinery was easily available to them. About 39.3% of farmers stated that they had not found workshops open for farm machinery repair and overhauling due to restrictions of lockdown while 60.7% of farmers agreed that the workshops for farm machinery repair and overhauling were opened in their areas. With respect to farm laborers' availability, 28.1% of farmers reported that due to lockdown, farm laborers were not easily available to work on their farms, whereas 71.9% of farmers stated that farm laborers were available to work on their farms.

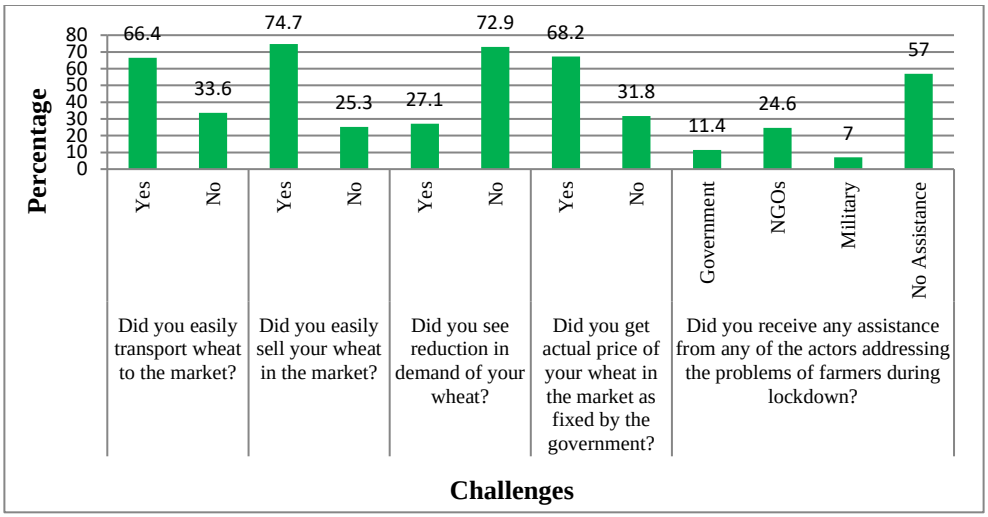
Figure 4. Challenges faced by the smallholder farmers in cotton crop sowing.



4.3.2. Wheat Crop Harvesting. Challenges faced by the farmers regarding wheat crop harvesting are given in Figure 5.

Figure 5. Challenges faced by the smallholder farmers in wheat crop harvesting.

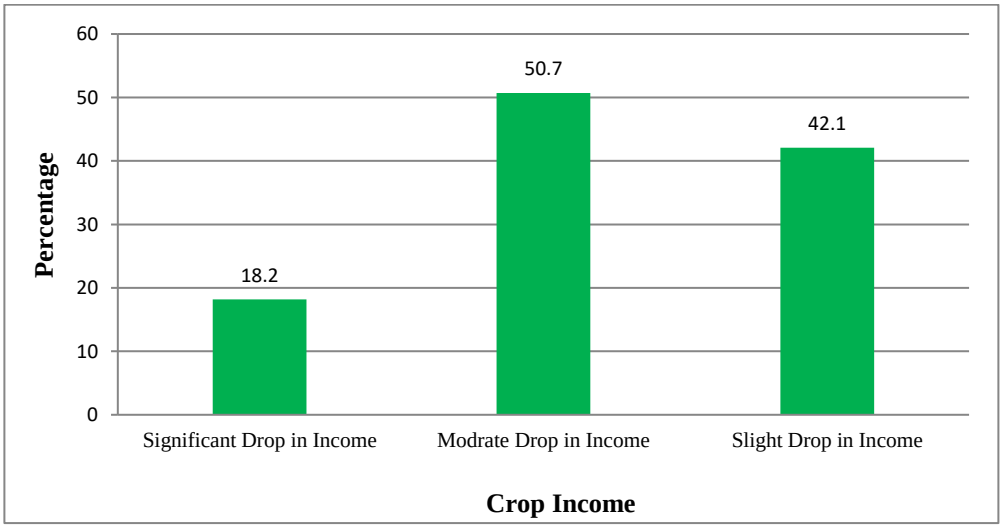
Figure 5 displays that 33.6% of farmers had faced difficulties transporting their wheat to the market due to the ban on transport during the lockdown, while 66.4% of farmers mentioned that they were able to easily transport their wheat to the market. Similarly, 25.3% described that they sold their wheat hardly due to limited buyers in the market, whereas 74.7% of farmers sold all of their wheat in the market without any problems. About, 27.1% of farmers reported that they saw a reduction in the demand for their wheat in the market, while 72.9% of farmers stated that they had the same demand for their wheat in the market as before the lockdown situation. In response to the question "Did you receive the actual outturn in such situation?" about 31.8% of farmers explored that they sold their wheat to the middlemen at low prices due to the challenges mentioned above, while 68.2% of farmers stated that that got actual outturn. The farmers were also asked about any assistance they received from the government and other organizations. The majority (57%) of the farmers reported that they did not receive any assistance in the difficult time of COVID-19. However, about 24.6% of farmers mentioned that they received assistance in the form of cash and household food items from national NGOs, followed by 11.4% from the government, and 7% from the military relief services.



4.3.3. Drop in Crop Income. As stated above, 31.8% of farmers didn't get an actual outturn of their wheat crop due to disruptions in agricultural value chains, The farmers were also exposed to disruptions in non-farm income activities of their household members such as wage laborers and income from small businesses. These farmers were asked to rate their experiences in the drop of their crop income in the context of the COVID-19 pandemic. Their responses are illustrated in Figure 6.

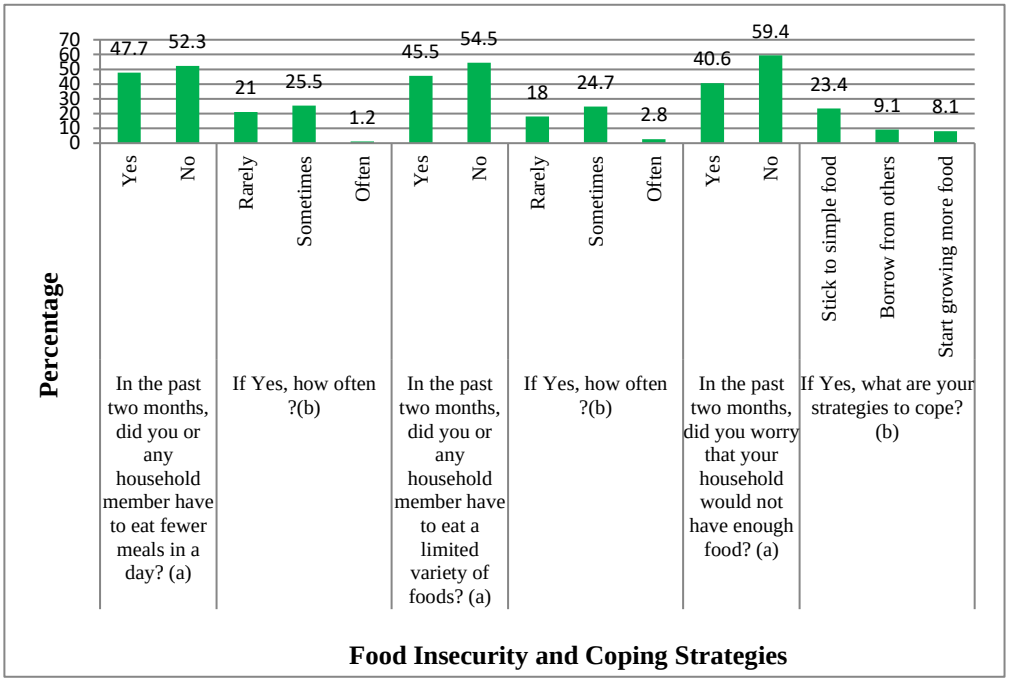
Figure 6. Smallholder farmers' drop in crop income.

Figure 6 highlights that the majority of farmers (50.7%) had a moderated drop in their wheat crop income, followed by 42.1% that rated a slight drop, and 18.2% that had a significant drop. This means the farmers in some study areas were exposed to income losses due to lockdown. However, to cope with significant losses in income, some farmers described that they would consider growing other crops (such as mung beans) and more vegetables as a coping strategy for their livelihood and food security in the uncertain COVID-19 situation. Hence, it would be right to say that when livelihoods are negatively affected by a shock/crisis, households may adopt various mechanisms (strategies) to cope with the situation.



4.3.4. Food Insecurity. To discuss the impact of the lockdown on farmers' food security, it is important to know their routine activities in ensuring food security for their households in normal circumstances prior to the COVID-19 situation. The majority (68.5%) of the farmers reported that they grow their own food (i.e., wheat and vegetables) as well as buy from the market to fulfill the need of their household members. About 16.4% of farmers reported that they grow their own food for their household consumption, and they do not buy from the market. However, 15.1% of farmers indicated that they do not grow enough food due to a lack of resources, and they usually buy food from the market to fulfill the food requirements of their household members. Results regarding the impact of the lockdown on farmers' food security are presented in Figure 7.

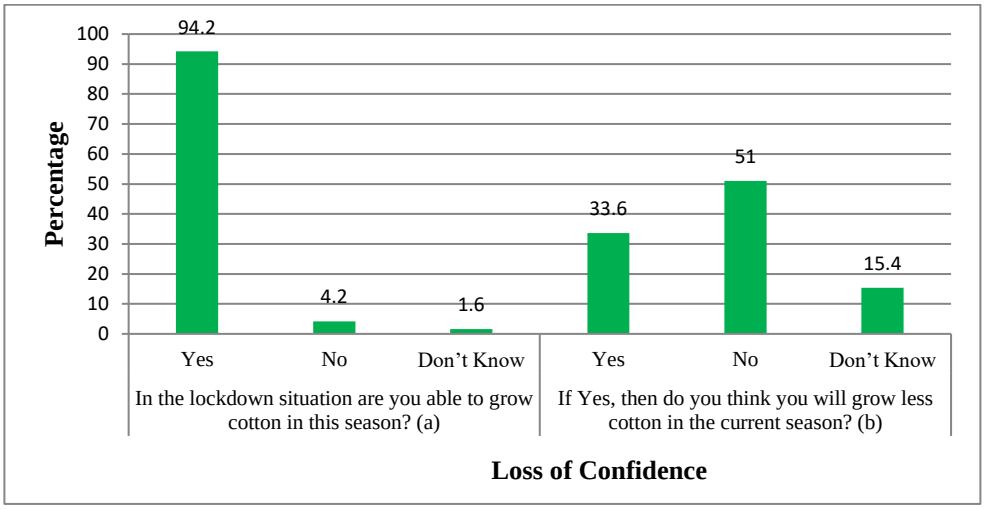
Figure 7. Smallholder farmers' food insecurity and coping strategies.



The above results have variations because the lockdown restrictions were different in different parts of the study districts. Furthermore, the study was conducted only one month after the lockdown (April – May), and at that time, the effects of the lockdown were not very prominent. However, the study found that the farm income and food security of somewhat half of the farmers were directly or indirectly affected by the lockdown due to coronavirus.

4.3.5. Loss of Confidence. It is usual that under uncertain circumstances, the risk of losing livelihoods for poor farmers is high, which leads to a lower level of confidence. Figure 8 explores the farmers' loss of confidence due to the critical lockdown situation.

Figure 8. Smallholder farmers' loss of confidence.



In answer to the question "Are you able to grow cotton in the current season due to lockdown situation" Figure 8 shows that 94.2% of farmers reported "Yes" while 4.2% reported "No", and about 1.6% reported "Don't Know" whether they are able to grow cotton in the current season or not because of the COVID-19. These results clearly show that the farmers lost their confidence as their livelihoods were being disrupted. Those who reported yes to the statement were further asked "Do you think you will grow less cotton in the current season?" Just over a third of the respondents (33.6%) were sure that they will grow cotton as usual, while 51% farmers were not confident that they will grow less cotton in the current season due to the lockdown situation, whereas 15.4% farmers were not sure about the question. The unequal results may refer to area-specific restrictions and lockdown strategies of the government.

4.4 Farmers' Attitudes towards Lockdown Strategies by the Government

The following results regarding farmers' attitudes towards the government's lockdown strategies to control the spread of COVID-19 are presented in Figure 9.

Figure 9. Smallholder farmers' attitude towards government's lockdown strategies.

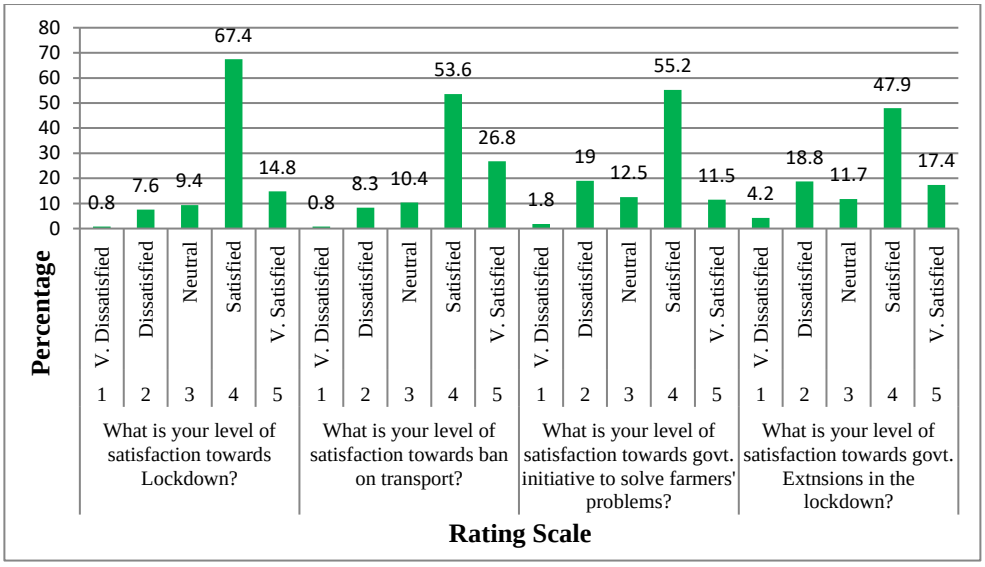
Farmers were asked to rate their satisfaction level towards each of the statements on a 5-point scale. It is evident from the data that the majority of the farmers (67.4%) were satisfied, and 14.8% were very satisfied with the government's lockdown strategy because they believed that a lockdown is the only solution to stop the spread of coronavirus. Similarly, 7.6% of farmers were dissatisfied, and 0.8% were very dissatisfied because they thought that the lockdown would lead to a further economic crisis in the country. However, about 9.8% of the farmers were not able to give any view about the government strategy to control the virus.

For the second question on attitude, the data in Figure 9 shows that the majority (53.6%) of the farmers were satisfied, and 26.8% were very satisfied with the government ban on transport because they were of the view that the coronavirus would be controlled by banning the inter- and intra-transport services. Similarly, 8.3% of farmers were dissatisfied, and some 0.8% were very dissatisfied because

they thought that a ban on transportation would adversely affect the livelihoods in the country, while about 10.4% of farmers had no opinion on the transportation ban.

The third question on attitude asked whether the government has taken initiatives to address the problems of farmers during the lockdown. The data in Figure 9 indicates that 55.2% of the farmers were satisfied, and 11.5% were very satisfied with the government's initiatives for farmers. However, about 19.0% of farmers were dissatisfied and a smaller number of farmers (1.8%) were very dissatisfied with the government's initiatives as they were of the view that government initiatives are just political statements but not real steps towards solving problems of the farmers and rural communities. Even so, 12.5% of farmers were unsure whether the government's initiatives are in favor of small farmers or not.

In the same way, for the fourth question on attitude, the data in Figure 9 shows that a majority (53.6%) of the farmers were satisfied, and 26.8% were very satisfied with the government extensions during lockdown as they trust that extensions would reduce the spread of the virus until there is a vaccine available. Similarly, about 19.0% farmers were dissatisfied and some (1.8%) were very dissatisfied with the government extensions during lockdown because they believed that further extensions will further squeeze the economic conditions of the people. Some (11.7%) farmers had neutral answers for government extensions during lockdown.



Most of the farmers reported that this is a challenging time for them as their livelihoods have been affected due to the lockdown, but the fear of COVID-19 has changed their attitudes as they were more worried about their family members' health.

Hence, the survey identified a positive attitude (mean greater than 3) among cotton-wheat farmers towards government strategies in order to curtail the spread of the virus in the country. The farmers believed that the Pakistani government is handling the health and economic crisis very efficiently. They were confident that the government would be able to win the battle against COVID-19.

5.0 Conclusion and Recommendations

It can be concluded that a large majority of the smallholder farmers showed high levels of awareness about COVID-19 and had highly positive attitudes towards government lockdown strategies to curtail the spread of the virus in the country. The findings of this study are distinct as it was conducted only a month after the lockdown in three different districts where restrictions and lockdown situations were different. In some of the study areas, the coronavirus outbreak had caused a diverse range of adverse effects on smallholder farmers' livelihoods because the lockdown started during the sowing season of cotton and harvesting periods for wheat. The farmers in these areas found it difficult to buy farm inputs and to deal with problems of high prices, the unavailability of farm machinery, limited availability of farm laborers, and marketing problems during the lockdown. As a result, these farmers lost their confidence to grow cotton in the current season, and even those who were sure to grow cotton had a fear of low production in the current and next crop seasons due to the disruption in livelihood activities. With the drop in crop income, the lockdown also negatively impacted the food security of the farmers; however, some of them started exchanging food with their relatives and neighbors and also growing more vegetables to fulfill the household food consumption as a coping strategy. Although these farmers had concerns over the government's ignorance, they were oppressed to comply with the lockdown as they were of the view that the risk of losing their livelihood is far better than the risk of dying from COVID-19. They understood that the hard situation of COVID-19 is temporary and will be end soon.

Addressing the COVID-19 crisis and securing the livelihoods of the smallholder farmers, the following recommendations are made:

- There is a strong need for both a short-term and long-term economic recovery packages for this humanitarian crisis, including cash and food grants for immediate support during the lockdown period and later on for economic recovery.
- Although disruptions in the food supply chain are minimal so far, keep the supply chain gears moving with flexible arrangements for transportation of agricultural commodities from the production areas to urban markets where the demand is high.
- The impact of COVID-19 has hampered the ability of smallholder farmers to engage in next years' production if no support is provided to them. Therefore, social protection programs should be launched for them against hazards and interruption.
- The government should play a leading role in controlling the prices of agricultural inputs.

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