

**THE IMPACT OF COVID-19 ON THE FARMING SYSTEMS AND  
LIVELIHOODS OF SMALL-SCALE FARMERS: A CASE STUDY OF  
SELECTED VILLAGES IN PATTOKI TEHSIL, DISTRICT KASUR,  
PUNJAB**

By

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## **ABSTRACT**

The purpose of this study is to explore the impact of COVID-19 on the rural livelihood of small-scale farmers. It identifies the factors which have affected them the most and their strategies for adjusting to the shocks of COVID-19. The study takes a mixed-method approach and covers the economic and social impacts, a shift in farm activities and the role of government institutions. Data has been collected in three villages of Pattoki tehsil, District Kasur in the Punjab province, Pakistan, where small farms that is below 12.5 acres are abundant. The findings identify the strategies used by small farmers to deal with the impact of COVID-19. At the end of the study, policies have been suggested to mitigate the impacts of any further pandemics or other shocks to small-scale farmers.

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# 1. Introduction

Nearly 25 percent of the global population is involved in the agricultural sector, where farmers deal with several challenges throughout the year including climatic disasters like heavy rainfall and droughts. Nonetheless, the arrival of COVID-19 has emerged as the most severe threat that farmers have had to face, aggravating concerns regarding food security. Farmers were faced with uncertainty as they were hesitant to plan their crops and decide the suitable quantity which won't go to waste. This uncertainty came from their need to stock their crops for longer periods because of the lockdowns. Consequently, farmers had to face losses as their farm incomes were being compromised (Timilsina, et al., 2020).

Where the global pandemic seemed unprecedented, humankind has been challenged with even worse outbreaks such as the Spanish Flu, Asian Flu, and HIV/AIDS. The very first case of COVID-19 was diagnosed in Wuhan, China, after which it was officially declared a global pandemic by the World Health Organization on March 11, 2020 (Cucinotta & Vanelli, 2020). Therefore, COVID-19 not only highlight the existing faults in our agricultural systems worldwide, but also added to the complexity of the lives of small farmers (Guido, Z., Knudson, C., & Rhiney, K., 2020).

Organization for Economic Co-operation and Development (OECD) predicted a decline in the annual global GDP growth from 2.9 per cent to 2.4 per cent in 2020. Along with this, a warning was also issued that the GDP may further decrease to 1.5 per cent if the virus remained uncontrolled (OECD Assessment, 2020).

Apart from the many outcomes of COVID-19, the World Food Programme also stressed the concurrent food security issue. Closure of borders, curfews, and trade restrictions resulted in various challenges for farmers in procuring labour, purchasing farm inputs, and selling produce. These lockdowns disrupted food supply chains and agricultural trade, thus affecting food security. The rural population, mainly small-scale farmers found themselves particularly vulnerable due to lack of access to clean water, farm credit, transportation, and social services support, further damaging their socio-economic well-being (Yazdanpanah et al., 2021).

In a report by the Food and Agriculture Organization (FAO), it was found that approximately 60 per cent of the global population is dependent on agriculture as a means of income and survival. The International Labour Organization (ILO) investigated that 25.68 per cent of the total labour force in 2019 was involved in the agricultural sector (Poudel, P. B. et al., 2020). Considering these important statistics, it has become imperative that the impacts of COVID-19 on small farmers are studied, who were particularly exposed to the pandemic. More research in this context will assist governments all over the world in devising effective policies to mitigate the negative impacts on the agricultural sector.

## **1.1 COVID-19 in Pakistan**

The COVID-19 pandemic posed many unprecedented challenges to various sectors, particularly agriculture across the world, and Pakistan was no exception. Farmers who had relatively fewer farm holdings, and are an essential part of the food chain, faced substantial challenges and disruptions to their livelihood and farming systems.

According to a report by Economic Adviser Wing (2020), before the pandemic broke out, Pakistan's GDP growth for 2019–2020 was estimated to be at 3.2 per cent with the agricultural sector alone contributing 2.9 per cent. After the pandemic many sectors of Pakistan's economy were affected, resulting in the provisional growth of GDP for 2019–2020 to be projected at –0.4 per cent. (Pakistan Bureau of Statistics 2020).

The agricultural sector is essential to the economy of Pakistan as it contributes over 19 per cent of GDP (PBS 2020) and employs approximately 39 per cent of the labour force of Pakistan (PBS 2018). It is the main source of survival for the rural population, which constitutes around 63 per cent of the total country's population (PBS 2017) and is responsible for the largest share of Pakistan's exports. (Government of Punjab 2018)

As Punjab contributes 57 per cent of the national agricultural production, it has been selected as the area of focus for this study. Approximately 80 per cent of Pakistan's wheat and cotton production is based in Punjab, around 2/3<sup>rd</sup> of sugarcane, and half of maize. Its horticultural output in the total national production stands at 67 per cent. (Government of Punjab 2018)

The first case of COVID in Pakistan was reported on 26<sup>th</sup> February 2020 in Sindh. By 18<sup>th</sup> March, all four provinces had reported cases. The provincial governments of Sindh and Balochistan announced a province-based lockdown on 24<sup>th</sup> March. The Federal government also followed suit, by implementing a nationwide lockdown on 1<sup>st</sup> April which went on till 9<sup>th</sup> May. (Yamano, T., 2020).



Later in April 2020, based on the figures at the time, GOP projected economic losses to the provincial GDP due to the pandemic at between \$3 billion and \$5 billion. (Government of Punjab 2020) Due to the extended lockdown of another few months, the government estimated losses of around \$20 billion in an even worst-case scenario.

The nationwide lockdown at the time put a pause on almost every nonagricultural economic activity, with a potential impact on the food supply chain. Pakistan majorly depends on the interprovincial movement of food to stabilize the supply and demand across seasons and to gain the advantage of the different agroecological zones (FAO 2020). Wheat remains to be the main crop that is associated with food security via interprovincial trade. According to the International Rescue Committee in April 2020: district government officials were concerned about food supply—a substantial percentage of respondents at the community level reported a shortage of food at the household level, along with shortages at the market level (IRC 2020).

The lockdown was imposed just when the wheat harvesting season had arrived and the sowing of Kharif crops. Even though the government relieved machinery service providers, farm inputs, the market, and other agriculture sectors from COVID-related restrictions, issues like high rental charges, shortage of labour, and limited access to the market were reported nonetheless (FAO 2020).

Farmers in Pakistan primarily sell their produce to wholesalers (Siddiq and Basher 2019), but according to some report's lockdown restricted some of the farmers from selling their produce to the market (Latif and Niazi 2020).

Food crops in Pakistan are predominantly categorized into two groups: cereals (wheat, rice, maize, etc.) and fresh produce (vegetables and fruit). Where production of cereals has been mechanized mostly, vegetables and fruit mainly rely on labour and their production is mainly expected to be disrupted by a shortage of labour. As fruits and vegetables cannot be preserved for long, issues in their transfer to markets on time can result in huge losses for the farmers. For similar reasons above, livestock, which contributes around 60.6 per cent share in agriculture and 11.7 per cent to the overall economy, was also exposed to restrictions caused by the lockdown (PBS 2020).

The outbreak of COVID-19 and the subsequent measures implemented to control its spread, such as lockdowns, travel restrictions, and social distancing protocols, have disrupted the entire agricultural supply chain. Small-scale farmers, who heavily rely on local markets and direct interactions with consumers, have faced obstacles in accessing inputs, labour, markets, and essential services.

## **1.2 Small-scale farmers in Pakistan**

Pakistan's agricultural sector comprises 7.4 million small-scale farmers with less than 12.5 acres of land and is the most underprivileged and vulnerable people in the country (Agribusiness Support Fund [ASF], 2021). Media has mainly focused on the 'important labour force' to get the world through this tough time, such as our health staff, policemen, departmental store staff, etc. But the real heroes are small-scale farmers who are the main feature of the food supply chain, and who ensure that we don't have to face food shortages, have been ignored during this pandemic.

Small-scale farms, also identified as family farms, have been defined differently in different research studies. The most common determinant is the size of their farm: much of the literature defines small-scale farms as those that have equal to or less than 12.5 acres of irrigated land or less than 25 acres of unirrigated land. (Pakistan Agricultural Census, 2000). Some define small-scale farms as the ones that are dependent on their household members for the majority of the labour or ones that produce at a subsistence level, where they aim to produce mainly for the household's consumption. (Hazell et al., 2007).

Currently, around 90 per cent of farmers (7.4 million) fall under the category of small-scale farmers in Pakistan as they own land less than 12.5 acres (5 hectares). Small-scale farmers are the main pillar of the agriculture sector, they contribute to maintaining food security at the national level and generating profit through exports. But the profits they receive from the agricultural market economy are marginal that can be improved by restructuring them under a more formal structure via farmer organizations. Currently, small-scale farmers in Pakistan do not have access to finances, good quality farm inputs, social services, equal access to the market like large-scale farmers and significant representation at policy forums. (Agribusiness Support Fund [ASF], 2021)

Small-scale farmers have to face several struggles to manage their household expenses due to gaps present in the current agriculture economy. Low production of crops further diminishes their capability to receive a loan from financial institutions that demand collateral to issue loans. The total amount of advances provided by banks during the fiscal year of 2020 was PKR 8,200 billion which shows that agricultural

financing comprises 14.81 per cent of the total loan portfolio of banks. From a borrower's point of view, agricultural loans were distributed to 3.1 million people (farm and non-farm sector, SBP FY 2020 agriculture credit disbursement).

At present, commercial banks are not lending to small-scale farmers (having less than 5 acres of land) as its requirements and procedures, criteria for collateral and security, and loan assessment system is not set up to serve this section at reasonable rates. Moreover, the conventional banking system doesn't allow banks from providing financial services to the rural population living in far-off areas. Due to no affiliation between farmers and commercial banks, credit needs of the agricultural sector are being carried out by informal means (middlemen) who provide payment-in-kind to small-scale farmers at unreasonable rates and framers are also obligated to sell their produce to them at low prices. (Agribusiness Support Fund [ASF], 2021)

Like other developing countries, the dominance of small-scale farmers in Pakistan paired with the absence of formal credit providers affects their production decision(s), disrupts the chain between rural and urban markets, and widens the gaps in productivity and income, thereby triggering food security. (Ahmed et. al, 2016)

### **1.3 Challenges of small-scale farmers**

Small-scale farmers possess the potential to increase their income by shifting from grain-based production to high-value production. Although high-value agriculture is mostly labour-intensive and therefore more appropriate for small-scale farmers, they still counter many disruptions. Since high-value agricultural commodities are liable to rot soon and their markets are fragmented, their price levels are mostly volatile, thus

making them a high market risk. Furthermore, small-scale farmers have a low marketable surplus, and their cultivated lands are located in far-off areas where infrastructure is underdeveloped. Consequently, they face extreme transaction costs and risks in producing and marketing their crops. They also lack access to farm credit, food security and a quality standard of life in general. (Thapa, G., & Gaiha, R., 2011)

One of the primary challenges smallholder farmers have faced is the disruption of input supply chains. Restrictions on the movement of goods and labour have led to shortages of vital inputs like seeds, fertilizers, and pesticides, impacting their ability to sow crops and maintain productivity. Furthermore, limited access to credit and financial support has compounded these challenges, hindering farmers' capacity to invest in inputs and technology. (Thapa, G., & Gaiha, R., 2011)

The closing of restaurants, hotels, and other places where people eat had a big impact on small-scale farmers. Fewer people wanted to buy fresh food, so farmers had a hard time selling what they grew. This made prices go up and down a lot, and it was tough for farmers to make enough money. They ended up with extra food that they couldn't sell, which caused waste and made it harder for both farmers and people who needed food to have enough to eat.

Furthermore, restrictions on transportation and movement made it difficult for farmers to reach markets and sell their produce. Many small-scale farmers had to find new ways to sell their food, like using websites or working with local communities. However, these new approaches posed difficulties because some farmers lacked knowledge and experience in using technology.

The agricultural sector holds immense significance not only for the rural economy but also for the overall economic stability and food security of Pakistan. Presently, an overwhelming 65-70 per cent of the country's population depends on agriculture as their primary source of sustenance. However, this crucial sector remains highly vulnerable to both natural calamities and the ongoing pandemic. Over the years, Pakistan has witnessed a steady decline in the agricultural growth rate, primarily attributed to the persisting challenges of water scarcity, rapid population growth, and escalating urbanization. Nevertheless, it is noteworthy that the agricultural growth achieved in the previous year closely approached the ambitious target of 2.8 per cent set by the government for the fiscal year, showcasing resilience and determined efforts in the face of adversity (Ministry of Finance, 2020).

The small and marginal farmers who do not own land are most exposed to the crisis. Disruptions caused in agriculture supply chains due to transportation problems are a threat to the livelihood of small-scale farmers. (Bhat, Gull, & Jeelani, 2020) And the only way to minimize the impact is by providing some sort of safety net to these vulnerable people as their main source of income depends on agriculture.

Small farmers have some distinct characteristics that make them different from larger-scale farmers. Firstly, they focus on growing crops for food to feed their families rather than selling them in markets. They have a wider variety of crops in their fields, such as vegetables, fruits, and grains, ensuring a diverse and nutritious diet for their households. Compared to larger farmers, small farmers tend to be more cautious in their farming practices. They avoid taking big risks that could have negative impacts on their livelihoods. They rely on traditional methods and

knowledge passed down through generations to minimize losses and maintain a steady food supply. One significant challenge faced by small farmers is the limited availability of financial resources. They often struggle with a shortage of money and capital, which makes it difficult for them to invest in modern farming tools and technologies. Due to financial constraints, they rely heavily on their family members for labour, working together to manage the farm. While this reduces labour costs, it also means they have to work harder to maintain their crops. Despite the challenges they face, small farmers play a crucial role in ensuring food security and providing sustenance to their communities. Their prosperity is very necessary for the well-being of our society. A small farmer always thinks that the only way to survive and prosper is to find ways to get more out of what he already has and to learn to live better while using less land and less capital. (Ikerd, 1997). Their diverse crop production, risk aversion, and utilization of family labour contribute to the resilience and sustainability of local food systems. Recognizing the importance of supporting small farmers and addressing their specific needs can help create an enabling environment for their growth and prosperity. Access to affordable credit, training in modern agricultural practices, and market linkages can empower small farmers to enhance their productivity, increase their income, and improve their overall livelihoods (Khan, 1990).

Out of the total 47.58-million-acre farm area of Pakistan, the 30.5-million-acre area is occupied by farms less than 12.5 acres in size. Small farmers (< 12.5 acres) constitute 93.12 per cent of the total farms and account for 61.4 per cent of the total farm area

(Govt. of Pakistan, 2002). Likewise in Punjab, small farmers comprise 85 per cent of the total farms and 47 per cent of the total farm area (Govt. of Pakistan, 2001).

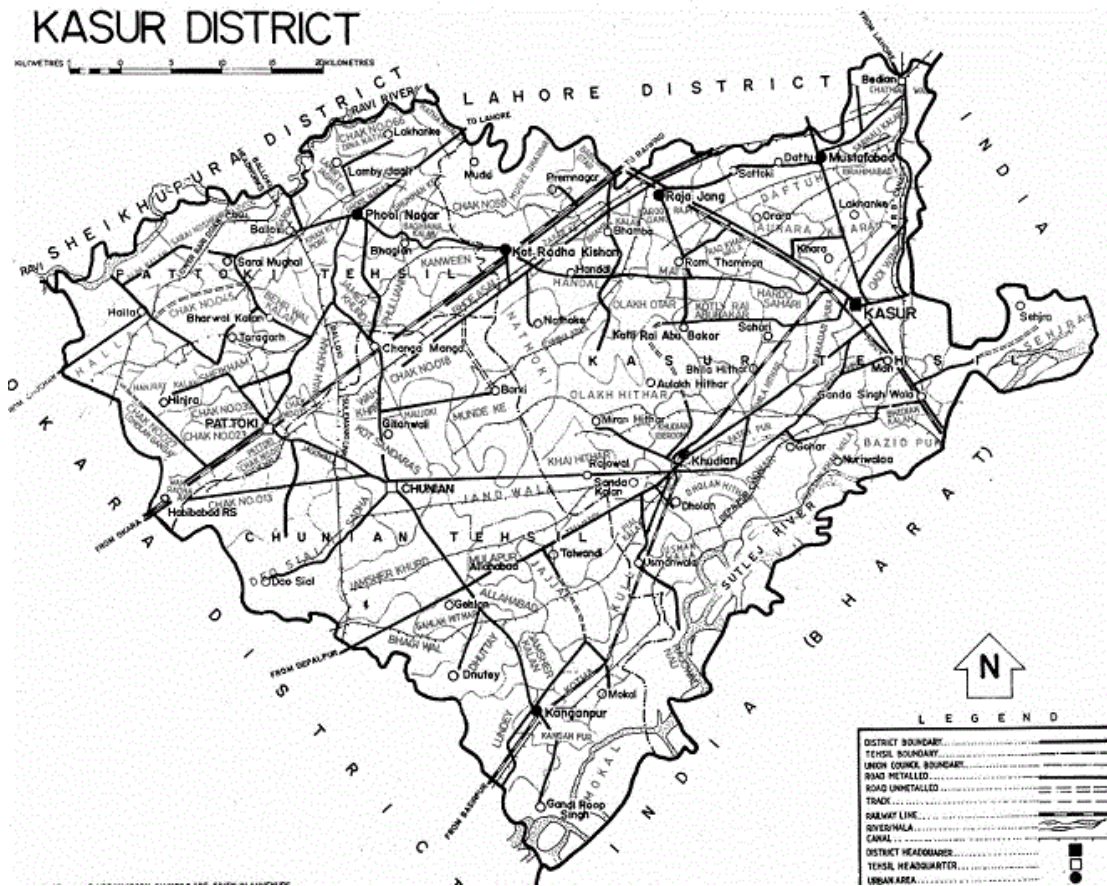
Since small-scale farms and farmers occupy a significant position not only in terms of number but also in farm size, a stable and broad-based economic development of Pakistan thus requires improvement in the operational performance and income of the smallholder farmers. Therefore, the present research was carried out to identify how COVID-19 has affected the livelihoods and farming systems of small farmers.



## **2. Background: District Kasur**

In our focus area, District Kasur, three Tehsils, namely Kasur, Chunian, and Pattoki, are situated. Geographically located between the Ravi and Sutlej rivers, it is commonly known as Majha. Kasur shares its borders with India to the east, District Okara to the south, District Sheikhupura to the northwest, and District Lahore to the north (Government of Punjab, 2016). According to historical accounts, Kasur city was established by Kishwar, Kassu, or Kishi, son of Ram Chandra, while his brother Laho founded Lahoopur or Lahore. Thus, Lahore and Kasur are considered twin cities. It is believed that the name Kasur signifies the "city of palaces" due to the numerous forts and architectural landmarks that still grace the old city of Kasur. The Pathans, who claim ancestry from the Mughal emperor Babar's army, state that they were granted jagirs (land) in Kasur.

Below is a detailed map of Kasur. It highlights the three main tehsils.



Kasur has recently been known for water pollution as it is one of the seven major centres for tanneries. Due to tanning activities of about 350 units, around 9,000 cubic meters of highly contaminated water and 150 tons of solid waste are discharged into local water channels and drains daily. This is not only causing environmental degradation, but it is also leading to a severe threat towards the health of people living there by exposing them directly to such conditions and the consumption of polluted water. People there are also indirectly affected by crops grown on chemically polluted water, and milk and meat output from animals. Almost 50 per cent of Kasur's groundwater is unfit for irrigation.

The total farm area of Kasur is 393,000 hectares out of which cultivable land is 295,000 hectares. Kasur is located in a simmered belt having subtropical land of vegetation, therefore not favourable for horticulture except some areas in the southwest near Pattoki, another tehsil, known for its large number of nurseries. But these farmers do not find any market within Kasur and mostly sell to markets in Lahore.

Kasur's main crops are sugarcane, wheat, rice, cotton, and maize. Although millet, sorghum, moong, mash, masoor, oilseeds such as rapeseed/mustard and sunflower are also grown in lesser quantities. Wheat is sown on over 1.94 million hectares of land, whereas fodder is the second-largest crop in terms of area (over 1.23m hectares) and rice crop covers about 0.902m hectares.

In terms of fruits, citrus, guava, and mangoes are grown majorly, while peaches, java plum (jamun), grewia (falsa), lychee, banana, plum, pomegranate, pears and apricot orchards are also grown in the district. The total area under fruit farms is more than 8,299 hectares. Potatoes, onions, carrots, cauliflowers, brinjals, bottle-gourds, turnips, garlic, ladyfingers, and peas are the main vegetables grown there on more than 20,360 hectares of land. Out of the vegetables, potatoes claim the largest area which is 13,162 hectares, whereas fruits, citrus and guava take the majority of land. Most of these fruits and vegetables are supplied to the main cities of the province to gain more profit.

Unfortunately, volatile prices, absence of cold storage, lack of transportation, quality seeds and credit institutions are constraining the profit of the farming community and causing hindrances in improving their earnings. These challenges coupled with poor

soil quality are decreasing the yields as compared to the Okara district. Contract farming has also been initiated by corporate firms to sow white varieties of potatoes to prepare chips and other products.

Kasur has over 1.1m buffaloes and 0.39m cattle apart from 0.47m sheep/goat in the district. The majority of the milk production is for Lahore's market and other nearby cities. Similarly, goats and cows are also mainly for Lahore's meat market, where some meat exporters are also gaining profit from leftover livestock.

The industry of growing nurseries in Pakistan is mainly located around the big cities. The most important floricultural crops to trade for cut flowers in Pakistan are roses, gladiolus, tuberose, marigolds, carnation, lilies, gerberas and statice, etc. Places such as Pattoki near Lahore, Sahiwal in Sargodha district and Hyderabad have taken importance because of the growing sizable area under these crops. Pattoki is the main area for floriculture in Pakistan. Pattoki market is developing as a prominent home for cut flower floriculture technology (Alam and Manzoor, 2005). It is the main market for buying and selling fresh-cut flowers in Pakistan. Around 1 million pieces of cut flowers are transported daily from Pattoki to different markets in Pakistan which include Karachi, Peshawar, Lahore, and Islamabad.

While talking about the mechanization of agriculture, it is important to note that there are 17,809 units of tractors in Kasur, which is more than any other district in Lahore and in the adjacent division of Sahiwal. According to a report by the Punjab Bureau of Statistics, the number of other farms in Kasur is 24,572.

Some areas of District Kasur are low-lying or riverine areas. It is mostly flooded during the monsoon season. The water levels in this area are higher than the rest of the area comparatively. The soil here is sandy. The upland area consists of flat plains from northwest to southwest. Most of the cultivated area here is canal irrigated, however, to meet water shortage, there are 31,886 electric and diesel-run tube wells. These pump out mostly contaminated subsoil water which damages soil quality and yield as well as threatens the health of consumers, whether human or animal.

In our area of study particularly in Pattoki tehsil, 69 per cent of landholdings are with small-scale farmers i.e., less than 12.5 acres of land. (Pakistan economic survey, 2020-2021) Hence, it makes it an important focus of our study.

## **2.1 Research Objectives**

- Overall to explore the impact of COVID-19 on the rural livelihoods of small-scale farmers.
- In particular to examine the impacts of COVID-19 on the well-being, socio-economic outcomes, and access to institutions of small farmers.
- To identify the coping strategies adopted by small-scale farmers in response to the impacts of COVID-19, including measures taken to adapt their farming practices and livelihood activities.
- Based on the findings, suggest recommendations and practical insights for policymakers and stakeholders to develop targeted interventions that can help mitigate the adverse impacts of shocks like COVID-19 on small farmers.

## **2.2 Research questions**

1. How did COVID-19 affect the rural livelihood of small-scale farmers?
2. How did COVID-19 affect their well-being, socio-economic outcomes, and access to institutions?
3. To what extent did the farmers manage to mitigate the impacts of COVID-19?
4. What policies should be devised to withstand the impacts of COVID-19?

## **2.3 Research Gap**

Considerable research has been conducted on the effects of the COVID-19 pandemic on agriculture in numerous countries with significant agricultural sectors. However, it is imperative to recognize and address the specific impact of the pandemic on the livelihoods of small-scale farmers in Punjab particularly in remote areas of Pattoki Tehsil where small scale farmers are in abundance and faced major issues during COVID that went unreported. While larger agricultural enterprises may have the resources and adaptability to navigate such crises, small farmers often face unique challenges that necessitate focused attention and support. Expanding research in this area is crucial to better understand how small farmers have been affected and to develop targeted interventions to safeguard their livelihoods.

This study aims to conduct a thorough investigation into the agronomic challenges encountered by small farmers in Pattoki. It highlights the necessity for further research on the livelihoods of small farmers in Pakistan, considering the substantial impact of the COVID-19 pandemic on our country. As such, there is a need to delve

deeper into understanding the specific issues faced by small farmers to develop targeted interventions and support mechanisms for future pandemics.

### **3. Literature review**

COVID-19 has affected farming communities around the world with potential impacts on agricultural production and the farming community. More than 65 per cent of households in Sub-Saharan Africa are smallholder farmers. Ayanlade & Radeny (2020) studied the impact of COVID-19 on food security, focusing on how it affects the agricultural production of small-scale farmers. They found how COVID-19 the production of rice and yield went down and affected the farmers as their planting season is in March till mid-April which is when COVID-19 struck them in 2020. The small farmers in Sub-Saharan Africa are likely to face a sharp decline in rice and maize production due to climate change, recent locust invasion, coupled with the travelling restrictions caused by COVID-19. As a large majority of this country depends on agriculture, there's a high probability that the region might face its first recession in 25 years. There is also evidence that rural households in Sub-Saharan Africa might directly be impacted by the decline in economic growth caused by COVID-19 (Amewu, Asante, Pauw & Thurlow, 2020).

The study by Akter et al. (2021) in Bangladesh explored the impact of COVID-19 on women small-scale farmers. Women farmers faced heightened vulnerabilities during the pandemic, including limited access to markets and reduced market opportunities. Additionally, increased unpaid household work due to the pandemic further strained their time and resources. Women also experienced a decrease in decision-making power within their farming households, further exacerbating gender inequalities in agricultural activities and livelihoods.



Yazdanpanah (2021) studied the impact of COVID on the livelihood of small farmers in Southern Iran. They studied how people there were impacted by the pandemic in terms of their ability to get enough food and survive. They identified that farmers were not receiving the adequate amount of nutrition they required. Before COVID-19, almost 32 per cent of Iranian households didn't have adequate food, but this figure increased during Covid-19. This was due to the strategies developed to fight the pandemic that had a big impact on farmers, who were already struggling. During the lockdowns, many rural families couldn't get adequate food due to their sources of income and ways to make a living being constrained.

Different areas of the agricultural sector have been hit hard by the pandemic such as crop production, livestock, and fishery. Zhang, X. (2020) highlighted the impact of COVID-19 in China on how it affected livestock farmers as they had limited access to animal feed and labour shortage. The ban on travelling also restricted them from getting breeding stock for their poultry. Furthermore, fish farmers in China are also unable to sell their harvest in the market as they are facing issues in aquaculture production due to a lack of access to seed and feed.

During these unprecedented times of COVID-19 -19, the main issue that the farmers are facing is getting ahold of inputs such as seeds, fertilizers, and insecticides. China is the largest producer and exporter of fertilizer and has singlehandedly affected the trade of fertilizer internationally. Apart from farmers involved in agriculture, livestock farmers are also heavily affected by COVID-19 -19. "Livestock farmers are mainly stuck in these problems in which 38.5 per cent of them are listed in the major challenge 'logistics disruption', compared to 35.6 per cent of all agricultural

enterprises, 19.7 per cent for nonagricultural enterprises and 18.9 per cent for the service sector”. (Timilsina, et al., 2020)

FAO (2020) predicted that small farmers and fishermen in different parts of the world will be the ones most affected by COVID-19. They will be unable to sell their products which would result in a considerable decrease in their income and purchasing power. Food insecurity will also be high due to COVID-19 and will affect the poorest and the most vulnerable class. (Zhang, 2020)

In the western parts of Pune, India, where grapes are grown in large quantities, small-scale farmers were affected by the COVID-19 pandemic. They faced a shortage of workers because travel restrictions made it difficult for labourers to come and help with the harvest. To overcome this, farmers had to find students and others to help them pick the crops, which added extra challenges and costs. Another problem was that the farmers didn't have proper storage facilities for their produce. They had to sell their crops quickly, but the market conditions were not good. There was a lot of supply, but not enough demand, so the prices were very low. As a result, the farmers had to sell their crops for much less than they expected, causing them to suffer big financial losses. These difficulties had a negative impact on the livelihoods of the small-scale farmers. They struggled with labour shortages and low prices, which made it hard for them to make enough money to support themselves and their families. Policymakers and others need to understand the specific needs of these farmers during times of crisis like the COVID-19 pandemic. They should provide support in finding alternative labour sources and improving storage options, so that

farmers can better cope with future challenges and have a more stable and sustainable farming business (Poonia, et al., 2020).

At this point, it is important to note how agricultural farmers are not the only ones affected by COVID-19. Millions of poultry farmers, mainly from Orissa, Maharashtra, Andhra Pradesh, and Karnataka are forced to waste their products due to travel restrictions. There are mainly three vulnerable groups that will be most affected during this pandemic. And one of them includes small farmers who will be restricted from working in their fields, getting inputs like seeds and fertilizers for their crop production. (Poonia, et al., 2020). A study by Kansiime et al. (2020) conducted in Uganda highlighted the challenges faced by small-scale farmers during the pandemic. Farmers experienced difficulties in accessing markets due to transportation restrictions, resulting in decreased sales and income loss. Additionally, disruptions in input supply chains and labour shortages led to reduced crop productivity and increased post-harvest losses.

Evidence from Pakistan shows the potential impact of COVID-19 on small farmers. In March 2020, the wheat crop was ready to be harvested but due to the travel ban and social distancing, no farmers could harvest the crop. Farmers also had to face problems while delivering wheat to the warehouses due to restrictions. If these limitations are sustained then every link of the food supply chain, mainly inputs (seeds, fertilizers, pesticides) and delivery will be disturbed - resulting in a blow towards the livelihood of small farmers. Khan et al., (2020)

COVID-19 has certainly doubled the impact on small farmers in Pakistan. Before the pandemic started, the farmers were just recovering from the impact of locust attacks

which caused severe damage to the crops, eventually putting economic stress on the farmers. For a developing country like Pakistan in which the poor class is already struggling with societal and economic issues, the pandemic can further cause increases in unemployment and income deficits. (Rasheed, Rizwan, Javed, Sharif & Zaidi, 2021). A study by Frelat et al. (2021) conducted in sub-Saharan Africa examined the multi-dimensional impacts of the pandemic on small-scale farmers. The research revealed that farmers faced challenges in accessing agricultural inputs, markets, and financial services. This led to decreased productivity, increased food insecurity, and the loss of livelihoods for farming households.

As per a study conducted by Adil, Badar, & Sher (2004), the gross income of small-scale farmers was noticeably increased by family members, part-time workers, and full-time labourers that they hired. Costs related to seeds, fertilizers, and irrigation also created a constructive effect on their income. The livestock that they had on the farm also slightly benefited from income, but not dramatically. Expenses for plant protection had a substantial positive effect on the farmers' overall earnings. However, those farmers who owned a larger farm size had a negative impact on their income.

According to recent research on small-scale farmers by Benedek et al., (2021), it has been observed that diversification plays a crucial role in their success. These farmers, who typically have similar income levels and smaller operations, can greatly benefit from diversifying their marketing channels and product categories. The study found that diversification strategies yield positive outcomes, although the impact may vary depending on the specific context. In terms of marketing channels, the research suggests that an intermediate level of diversification proves to be effective. This

means that small-scale farmers who engage in a moderate number of different ways to sell their products are more likely to achieve success. On the other hand, when it comes to product diversification, the study indicates that both lower and higher levels of diversification can lead to positive results. Therefore, small farmers need to carefully consider the range of products they offer to maximize their potential benefits. It is important to note that small-scale farmers face multiple challenges as they juggle various roles and responsibilities. With limited time and resources at their disposal, they must make strategic decisions about where to invest their efforts. The research highlights that diversifying marketing channels and product categories increases the likelihood of finding sustained demand and adapting to changing market conditions. This study contributes significantly to the existing literature, particularly in the area of diversification related to products. The research employs a mixed-method approach, which is uncommon in studies focused on small-scale farmers and short food supply chains. Although further research is necessary to validate these findings in different socio-economic contexts, the selected sample and approach are anticipated to yield robust and generalizable outcomes. Ultimately, this research emphasizes the importance of diversification for small-scale farmers and offers valuable insights that can inform future strategies and policies to support their sustainable development and overall well-being.

As mentioned earlier, climate change will have a big impact on Pakistan, and these changes are unavoidable. These changes will make it even harder to meet the growing needs of people who rely on agriculture. One major problem is that crop production in Pakistan is lower than the global average because there isn't enough water. Water

scarcity is a big issue for farming in Pakistan. Climate change is making it even worse by changing rainfall patterns, increasing temperatures, and melting glaciers. With less water available for irrigation, farmers struggle to grow crops effectively. This leads to lower yields and less food being produced. The decline in crop production has serious consequences for food security. It becomes difficult to provide enough food for everyone as the population grows. Pakistan needs to find sustainable solutions to deal with water scarcity and improve farming despite climate change. Some things can be done to help. Using water-saving techniques like efficient irrigation and collecting rainwater can make better use of the limited water available. Investing in research and development for drought-resistant crops and sustainable farming methods can also improve agricultural productivity in areas with little water. Dealing with water scarcity and its impact on farming requires cooperation from the government, experts, and local communities. By recognizing the problem and taking action, Pakistan can build a stronger farming sector that can adapt to climate change and provide enough food for its people (Bhatti, Suttinon, Nasu, 2009)

## 4. Conceptual Framework

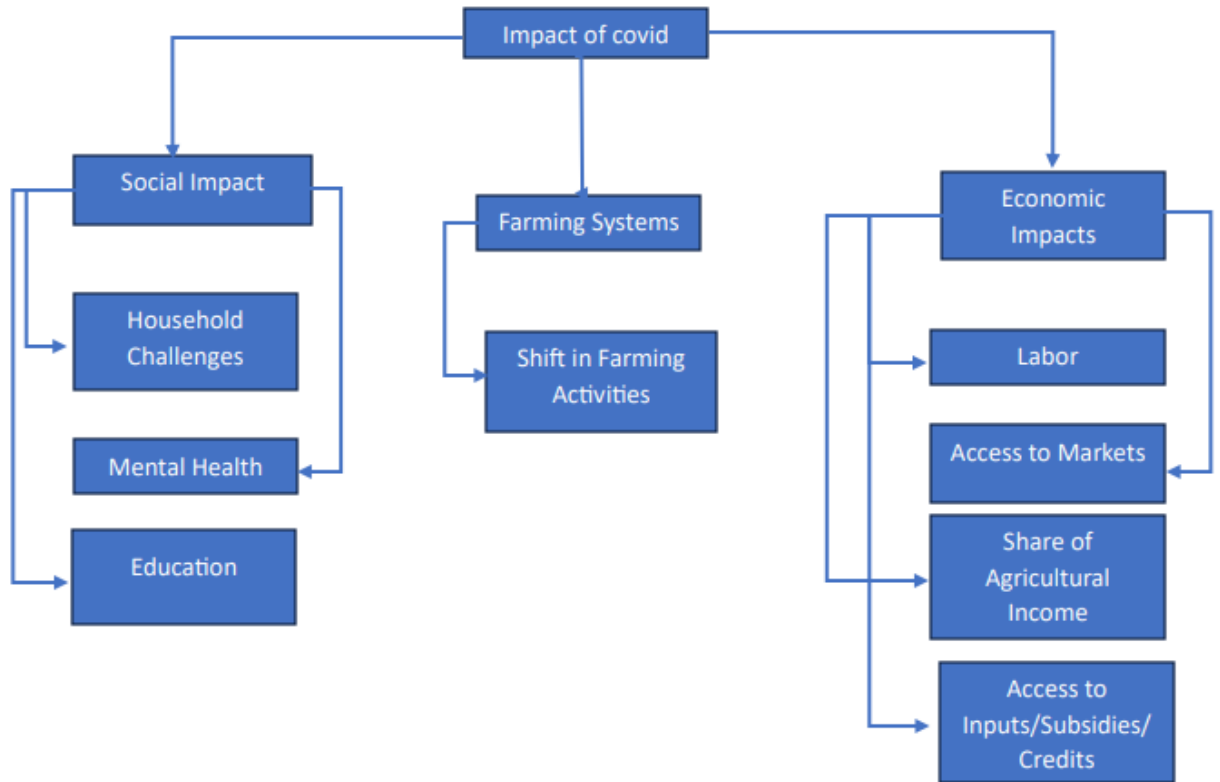
This study will focus on the farmers in selected villages of Pattoki tehsil, District Kasur, Punjab and analyze how COVID-19 has impacted their farming systems and livelihood. The lockdown imposed due to COVID-19 has naturally restricted farmers' access to a number of facilities and necessities. For this reason, The Theory of Access will be used as it distinguishes between a person's right to access resources and their ability to take advantage of these. (Mutea, Rist & Jacobi, 2020). McKay and Colque (2016) observe that "having the ability to benefit from resources involves access mechanisms that go beyond legal rules or titles and that lacking such mechanisms results in exclusion." For instance, a farmer might have land to work on but does not have access to labour and capital.

The Theory of Access offers a comprehensive framework for studying the role of access in understanding household food security and social services (which looks at the livelihood perspective), and access to inputs, machinery, markets, and labour (which looks at the farming system perspective).

As rightly pointed out by Mutea, Rist & Jacobi (2020), sustainable livelihoods are only achieved when the person is capable to *gain, maintain, control, and enhance* resources on which their livelihood depends. The study will focus on how restricted or no access to things necessary for a sustainable livelihood and farming system affects the small farmers in Pattoki, Punjab.

Below is the conceptual framework that shows the variables we'll be studying.

**Figure 1: Conceptual Framework**





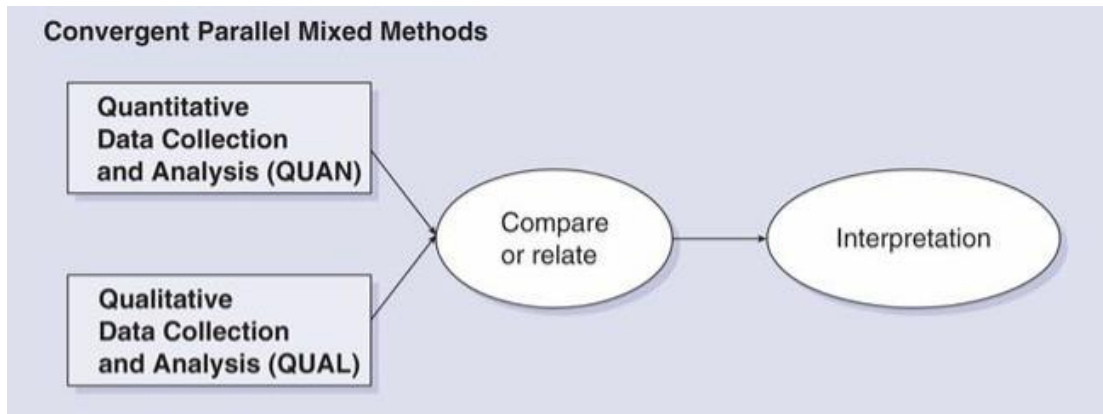
The conceptual framework above defines our main variables. We will be looking at social and economic impacts of COVID-19 and its impact on farming systems. The impact on farming systems will be looked at by observing the shift in farming activities of the farmers. We will be measuring the social impact by looking at their mental health, household challenges, and their children's education. Whereas economic impacts will be measured by access to inputs, subsidies, credits, share of agricultural income in household, labour, and access to markets.

## 5. Methodology

### 5.1 Research Design

In order to achieve the objectives of this research and answer the research questions mentioned above a mixed-method approach has been adopted. We follow a pattern based on a convergent parallel design by combining case study method and quantitative analysis. Please see the figure below. (Creswell, J., 2018)

**Figure 2: Convergent Parallel Mixed Method**



An in-depth study was conducted in 3 villages near Pattoki (Hanjrai Kalan, Sheikhum, and Hanjrai Khurd) helped us find how the lockdowns implemented because of COVID-19 has impacted the livelihood of small-scale farmers socially and economically and their farming systems.

Our respondents were small-scale farmers from these three villages in the Pattoki district. Small farmers are defined as the ones who own landholding of 12.5 acres or less. (Pakistan Agricultural Census, 2000)

A mixed-method approach has been adopted based on a questionnaire with open and close-ended questions from 24 farmers (8 from each village) regarding their livelihood during the COVID-19 lockdown. The questionnaire was translated into Punjabi for the farmers. In addition, one-to-one in-depth interviews were also conducted with six (5) farmers out of 24 (2 from each village), 2 *Numberdaars/Agricultural Officer*. The latter were questioned on their perspective regarding the impact of COVID-19, how they helped the farmers during this time, etc.

By employing a mixed-method study method firstly, the in-depth interviews with the respondents were transcribed and then themes were developed. A quantitative analysis is done based on the data collected from these farmers.

## **5.2 Sample size**

Convenience sampling was used in this research as our target audience – farmers – were interviewed and questioned based on their availability and willingness to take part.

24 farmers were taken from the above-mentioned villages in order to find out what issues they faced due to COVID-19 lockdown. 8 farmers from each village were interviewed and questioned based on the formulated questionnaire.

## **5.3 Selection of variables**

In order to measure the impact of farming systems, we looked at the shift in farming activities. We aim to observe how farmers opted for different farming activities during COVID and what reasons led to those changes. This also reflects the adaption

and mitigation technique of farmers where they opted for a farming activity that benefitted them more during COVID.

Social impacts are being measured by exploring the farmers' household challenges, the effect on their mental wellbeing, and their children's education. These variables best define the social impacts at a household level.

Economic impacts are being measured by variables that affect the livelihood of farmers. Farmers' lack of access to agricultural inputs, subsidies, credits, markets closely define the economic impacts of COVID. The change in their share of agricultural income, and the availability of labour also show us the economic impacts.

#### **5.4 Data collection**

The questions in the questionnaire are both close-ended and open-ended to achieve our objective of a detailed analysis. They've been formed in a way to address the following:

1. Socio-demographic data
2. Semi-structured interviews with the farmers

Section 2 would entail the impact of COVID-19 on the following:

- a. Cropping system
- b. Livestock system
- c. Horticulture system
- d. Mitigation and adaptation of COVID-19 impact
- e. Livelihoods and social well-being

- f. Social Services, Finances, and Household Challenges

## **5.5 Limitations**

The study is limited to the farmers who were:

1. Willing to participate in the study and will provide written informed consent.
2. Limited to Pattoki district.

## **6. Findings and Analysis**

This chapter delves into the demographics of small farmers, the particular challenges faced by small-scale farmers, and the strategies used by them to mitigate the impact of COVID-19. For the purpose of analysis we have divided farmers into three categories based on the size of their landholding as follows:

(1) 1-5 acres

(2) 5.1-8.5 acres

(3) 8.6-12.5 acres

### **6.1 Descriptive Trends**

The age distribution of small-scale farmers ranged from 25 to 75 years, with an average age of 49. This diverse age range suggests a mix of experienced farmers and younger individuals entering the sector. The average household size was 8 individuals, with a range of 3 to 20, reflecting the presence of extended families participating in farming. Almost 3/4<sup>th</sup> of the total farmers have attained less than primary education.

On average, 5 working members were involved in farming activities within each household. This points to a collaborative effort in farming, possibly involving multiple generations. The land size varied from 1 acre to 12 acres, with an average of 8.5 acres. Before COVID, the primary activity of all the 24 farmers was cropping (cereals) and their secondary activity was predominantly livestock (18 out of 24). The

rest of the 6 farmers were involved in horticulture. Therefore, all the farmers were involved in multiple farming activities.

We account for the dimensions of Market Dynamics, Economic impacts, Social Impacts, and last but not least the Role of Government and Farmer Organizations. These themes will cover our findings and how COVID-19 impacted the farming systems and the livelihood of small-scale farmers.

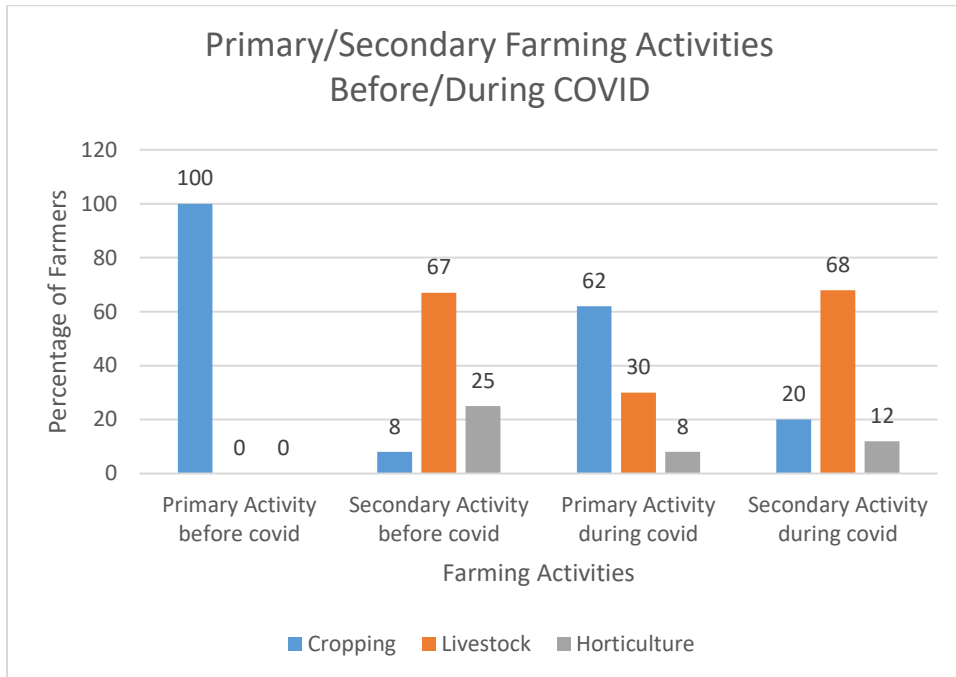
We proceeded to first check whether the interviewees agreed that COVID-19 had a direct impact on their livelihood or not. The rationale behind asking the basic question is because commonly during an informal conversation with the interviewees; they did not acknowledge COVID-19 as a pandemic but considered it a myth. However, on further probing, 87 per cent agreed that it did have an impact on their livelihood, whereas the rest of the farmers (13 per cent) did not feel much of a negative impact.

## **6.2 Farming Systems**

### **6.2.1 Shift in Farming Activities: Transition from Cropping to Livestock and Horticulture during COVID-19**

This section examines an important trend observed among small-scale farmers, wherein there has been a considerable shift in primary farming activities from cropping to livestock rearing and horticulture. This transition reflects the adaptability and resilience of these farmers in the face of unprecedented challenges.

**Figure 3 - Primary/Secondary Farming Activities Before/During COVID**



### **6.2.1.1 Pre-COVID-19 Cropping Dominance**

Respondents were asked about the shift in their farming activities due to COVID-19 - 19. In figure 3 we can see that pre-COVID, all of the 24 farmers had cropping (cereal) as their primary activity whereas their secondary activity was predominantly livestock (62 per cent), with a few in horticulture as well (25 per cent). The region's climatic conditions, land availability, and market demands had historically favoured crop cultivation.



However, after COVID-19 struck, things changed. We saw a stark difference in how farmers changed their farming activities to mitigate the negative impacts (Table 1). We saw how cropping (cereal) had reduced as their primary activity (62 per cent) and livestock had emerged (30 per cent), with some farmers (8 per cent) in horticulture as well. This rise in livestock was merely a re-allocation technique used by farmers to switch to something that possibly required less input and with more chances of selling to the market during the lockdown.

#### **6.2.1.2 Transition Triggers/re-allocation of resources**

The outbreak of COVID-19 and the disruptions to supply and demand chains prompted farmers to reconsider their traditional approaches. As lockdowns and restrictions hindered transportation and limited access to markets, many farmers faced difficulties in selling their produce. This scenario led to a strategic pivot, as farmers sought alternative avenues to sustain their livelihood.

So we can see that to compensate for the limitations in crop production, farmers diversified their income streams by integrating livestock into their farming systems. As the literature suggests, most farmers increase their focus on animal husbandry, including poultry, dairy farming, or small-scale livestock rearing as it offers a more reliable and stable income source, requiring fewer inputs while utilizing locally available resources such as forage, crop residues, and organic waste. (Iqbal & Jehangir) In the absence of certain inputs such as specific seeds or fertilizers, some farmers also explore alternative crops that required fewer or different types of inputs. They diversify their crop portfolio by growing different varieties or adopting new crops that were better suited to the available resources and inputs. This diversification

strategy helped reduce their dependency on specific inputs, minimized risk, and enabled them to explore new market opportunities. (Sampath, & Bahinipati, 2020)

### **6.2.1.3 Shift towards Livestock Rearing**

Livestock rearing emerged as a viable option for diversification. Farmers recognized the potential benefits of livestock, including a relatively shorter production cycle, reduced dependence on external markets, and the opportunity to cater to local demand for meat, milk, and other animal products. Livestock also presented a more manageable and flexible approach, allowing farmers to adapt quickly to changing circumstances. This has been supported by research in this area (Sampath, & Bahinipati, 2020)

### **6.2.1.4 Embracing Horticulture**

Similarly, the adoption of horticulture gained attraction as farmers explored cultivating fruits and vegetables. Horticulture offered advantages such as faster growth cycles, smaller land requirements, and the potential for year-round production. This allowed farmers to cater to local markets more effectively, reducing the impact of supply chain disruptions.

### **6.2.1.5 Resilience and Future Prospects**

The transition from cropping to livestock rearing and horticulture illustrates the resilience and innovation of small-scale farmers in adapting to adversity. This shift not only helped farmers navigate the challenges posed by the pandemic but also gave

the possibility to potentially open doors to more sustainable and profitable farming practices. It potentially diversified income streams and reduced reliance on a single market, possibly improving the overall resilience of the farming systems.

### **6.2.2 Impact of shift in farming activities on socio-economic status of farmers**

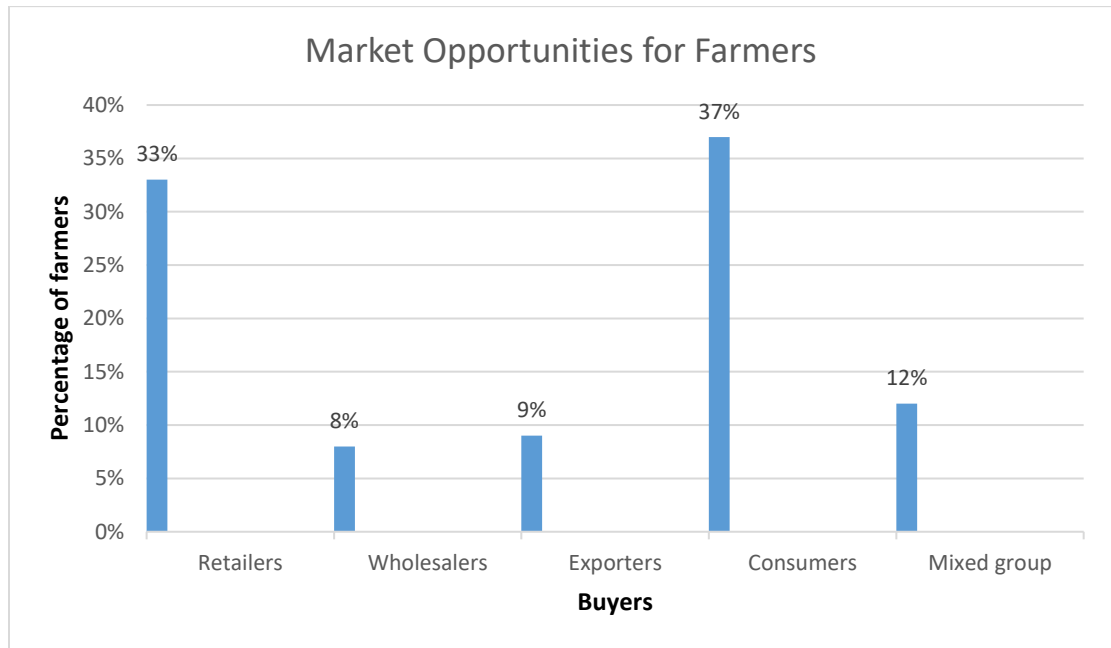
Before COVID, all of 24 farmers had cropping as their primary activity. But after COVID, only 15 of those stuck with cropping being their primary activity whereas the rest of them chose livestock and horticulture. This was primarily due to lack of inputs required for cropping which caused the transition for some farmers. For them livestock was a better source of income during COVID due to a number of reasons.

After looking at the 9 farmers, who changed their primary activity after COVID, we saw that 80 per cent of them agreed that they did not have access to seeds and fertilizers. They also agreed that COVID reduced their ability to rent machinery. Two out of those 9 farmers, who opted for livestock as their primary activity after COVID disagreed when asked about their lack of access to water, labour, and feed for livestock, and their ability to sell livestock production. These farmers were better off with livestock as their primary activity during COVID as they could easily access water, labour and feed for their livestock. They also had no trouble in selling their produce in the market as they could easily sell it to other farmers in the village who were also struggling to get basic commodities like milk. Rest of them opted for horticulture as their primary activity, 60% of those opted so because they found it more convenient to procure vegetables seeds and could easily grow in their land.

We saw how these 9 farmers opted for better opportunities in order to best mitigate the impacts of COVID.

### 6.2.3 Marketing Opportunities for Farmers in Pattoki

Figure 4 – Market Opportunities for Farmers



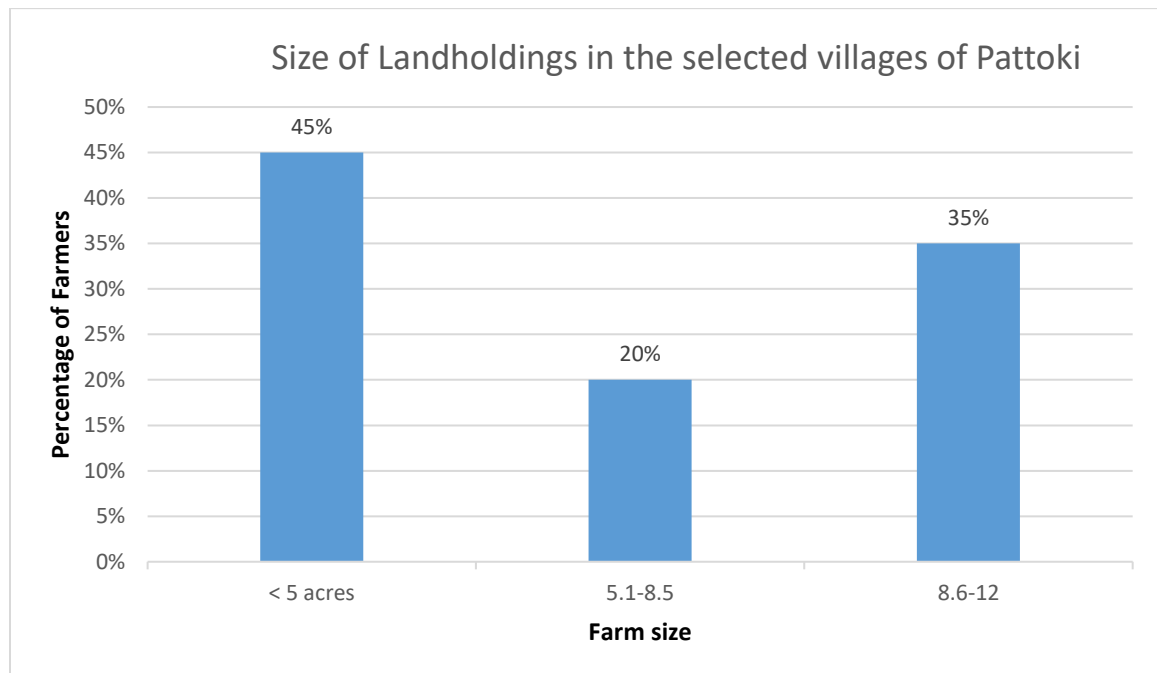
In terms of selling their products, 37 per cent of farmers sold their products directly to consumers. Additionally, 33 per cent of farmers were selling to retailers. Whereas few farmers exclusively sold to wholesalers (8 per cent) and exporters (9 per cent). The remaining farmers (12 per cent) adopted a mixed buyer approach, which may involve a combination of selling to retailers, wholesalers, exporters, and directly to consumers.

### 6.3 Economic Impacts

All 24 farmers strongly agreed that COVID-19 has resulted in their loss of income. Among them, 80 per cent have attributed this loss of income due to lower levels of farm production. And 70 per cent identified the rising prices of farm inputs as the main reason for lower levels of farm income.

### 6.3.1 Size of Landholdings in the selected villages of Pattoki

**Figure 5 – Size of Landholdings in the Selected Villages of Pattoki**



The figure above categorizes the farmers based on their landholdings. They have been categorized into three with 1-5 acres of land, 5.1-8.5 acres of land, and 8.6-12.5 acres of land. Our first category (1-5 acres) is taken as such to focus on landholdings less than 5 acres as they're the ones that occupy most land in Punjab i.e., 64 per cent (Phambra, et al., 2020). As our average land size across 24 farmers is 8.5 acres, our second category covers farmers who have land size up till average which is from 5.1-8.5 acres. And the third category shows the farmers who have land sizes above 8.5 acres and up to 12.5 acres.

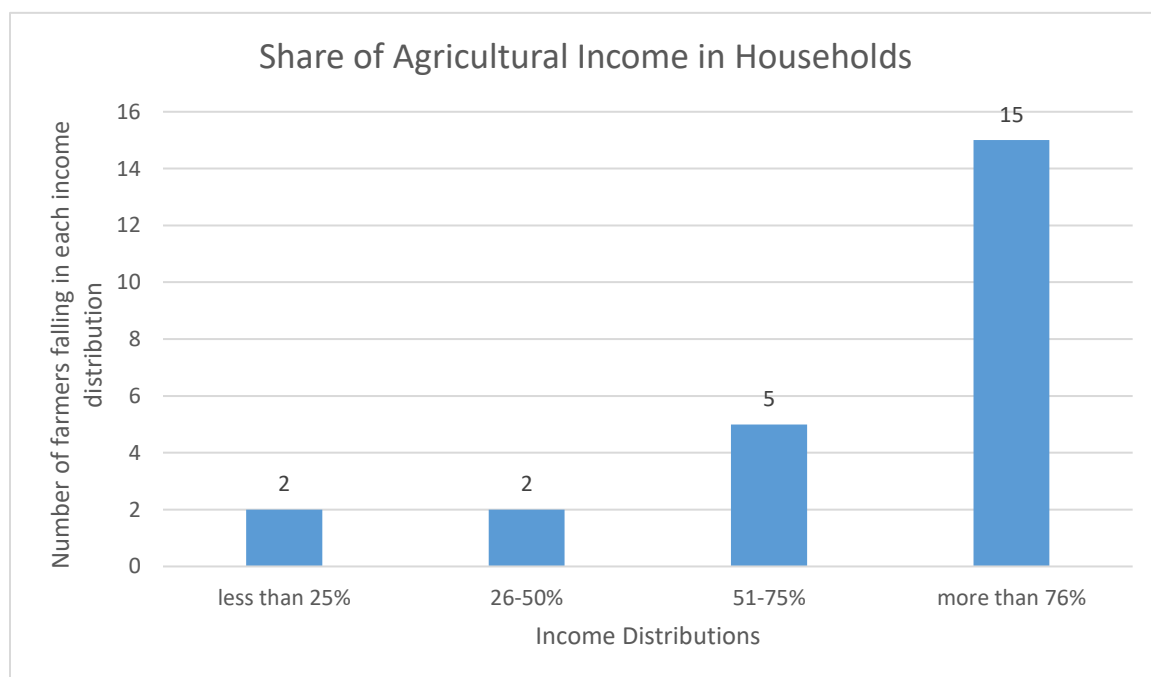
The first category farmers who have a farm size of less than 5 acres and are more prone to the negative impacts of COVID-19 were the highlight of this survey (45 per cent). These farmers were also the ones who had more working members in the

household and did not require much labour from outside. 80 per cent of farmers with this landholding size shifted from having cereals as their primary activity to livestock during COVID-19 as they could not afford high input prices. This category was also the one whose mental health was impacted the most. Most of the farm holders were young with ages ranging from 25-37, which goes on to show how they did not receive any generational wealth in terms of land and started from scratch and growing crops at a subsistence level. On the contrary, the third category farmers who had land between 8.6-12.5 acres, their ages ranged from 45-71 mostly showing their years of hard work in agriculture and land procured through lineage.

Our third category farmers (8.6 – 12.5 acres) that constitute 26 per cent of our total respondents were the ones that were comparatively less affected by COVID-19. These are the ones who were the most resilient and had resources to mitigate the impacts of COVID-19. The 37 per cent that sold directly to consumers (table 2) also fell in this very category. As these farmers were comparatively more resourceful were able to sell to consumers directly, they did not really feel the impact of lockdowns in the cities. Their produce still got sold and they were able to earn enough for their household. 23 per cent of these farmers agreed that their crop production that goes for household usage wasn't affected. When interviewed one of the farmers with a farm size of 9.5 acres, *“We never had to bear the brunt of COVID-19 by the blessing of Allah Almighty. The only difficulty we had was in selling to exporters due to lockdown but otherwise, our ration never stopped, and I was able to provide for my own family and extended”*.

Farmer with 12 acres, aged 40: *“COVID-19 has marginalized the lives of many farmers in my village, but I was able to withstand the negative impacts because of my strong link and connections with retailers and wholesalers. I further reallocated some resources to livestock which helped in maintaining our food consumption levels.*

### 6.3.2 Farmer’s share of agriculture income in the household



**Figure 6 – Share of Agricultural Income in Households**

Farmers were questioned on their share of agricultural income that goes into household consumption. It is important to note that the more income goes into the household, the more the probability of farmers producing at a subsistence level and hence more prone to the impacts of COVID-19.

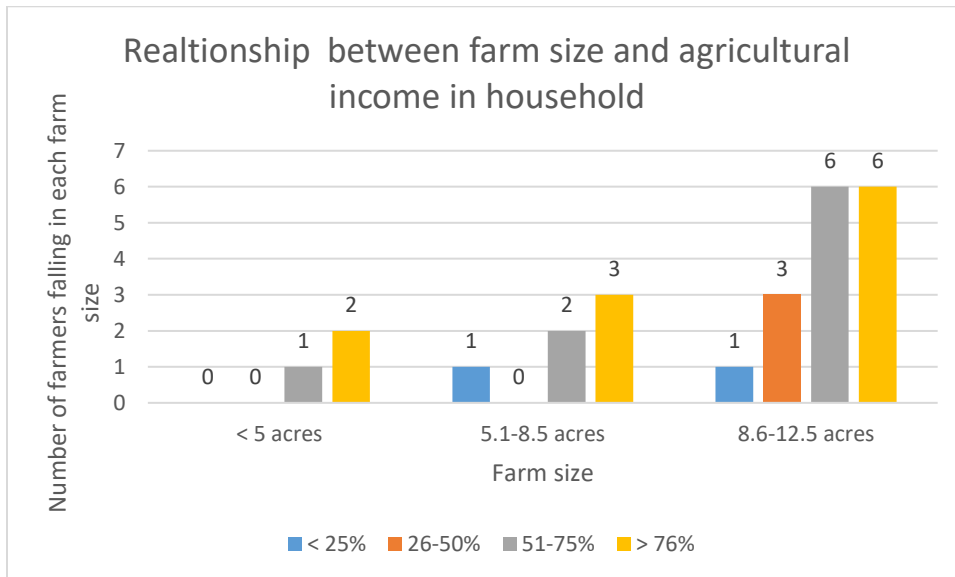
62.5 per cent of the farmers contributed more than 80 per cent of their farm income to their total household income. *“COVID-19 affected all of us severely, our income levels went down due to lower levels of production. As markets closed down, we could not produce enough and only had to produce at subsistence level.”* (A farmer aged 50, having 2 acres of land).

The data reveals the percentage of farmers falling into different income brackets. Out of 24, 2 farmers reported contributing up to 25 per cent of the total household income. And 2 reported contributing between 26 per cent and 50 per cent of the total household income. They play a significant role in supporting the household's financial stability, albeit to a lesser extent than those in higher income brackets. A comparatively larger proportion of farmers, i.e., 5 reported contributing between 51 per cent and 75 per cent of the total household income. This suggests that these farmers are key contributors to the financial well-being of their households. Their income plays a substantial role in meeting the household's financial needs and ensuring a certain level of stability. The majority, encompassing around 15 farmers, reported contributing 76 per cent to 100 per cent of the total household income. This group of farmers holds significant responsibility as the primary income providers for their households. Their income plays a crucial role in meeting not only the basic needs of the household but also in supporting other expenses, such as education, healthcare, and investments.

### **6.3.3 Correlation between farm size and share of agriculture income in the household**



**Figure 7 – Relationship between Farm Size and Agricultural Income in Household**

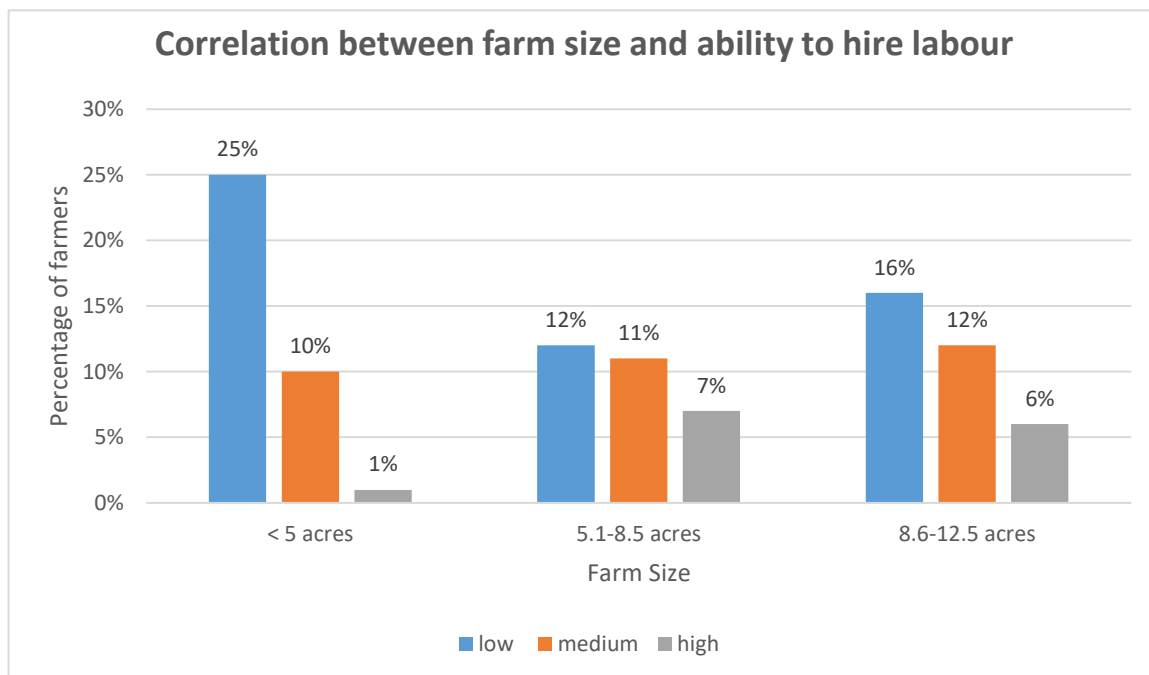


We can see from the figure above that farmers with landholdings above our average farm size i.e., 8.5 acres have the most share of income in household. 12 of those farmers fall in this category. This is mainly due to having enough land than the rest of the farmers to contribute to household consumption. Whereas farmers with land sizes ranging from 5.1 to 8.5 acres also share a considerable amount of their agricultural income in households. Farmers who have land sizes of less than 5 acres can hardly contribute to their household consumption due to lack of resources and land. In monetary terms, we can see that these farmers were contributing less to the household. However, based on the findings above we can assume that they were contributing in real terms (agricultural produce for households). As it is evident from the literature on small farmers, they produce at subsistence level and hence their contribution in monetary terms is less.

### **6.3.4 Correlation of farm size and ability to hire labour during COVID-19**

Small farms are described as those for which most of the labour depends on the household members (Hazell et al., 2007). Small-scale farmers are defined by an FAO Study (Dixon et al. 2003) as ones who have limited resources as compared to others in the sector. This similar characteristic was reflected in our study as well where we saw that farmers with less than 5 acres of land had less dependence on outside labour and therefore had no challenges when it came to hiring labour.

**Figure 8 – Correlation between Farm Size and Ability to Hire Labour**

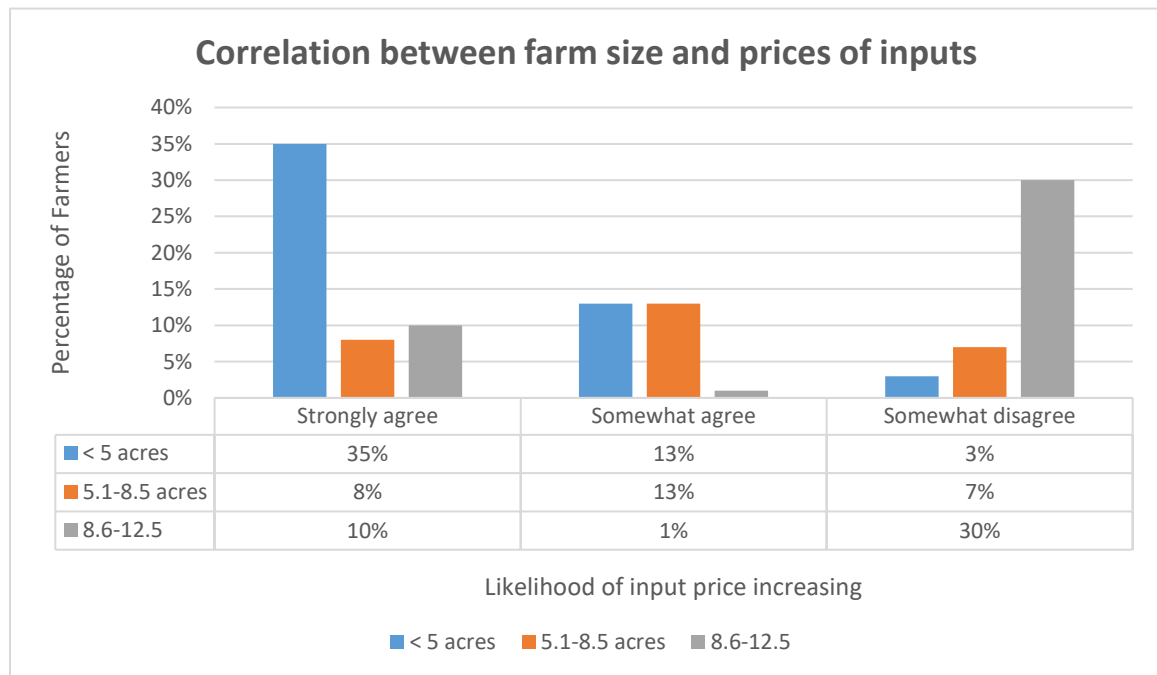


In the figure above we can see that most farmers with land size less than 5 acres reported having no difficulty in procuring labour (25 per cent) as they depended on their household members mostly (refer to 5.2.3.1). Only a few farmers in this category had difficulty in procuring labour (1 per cent) which was due to having fewer working members in the family (2-3 members).

Farmers with land size up till 8.5 reported having almost none to moderate level of difficulty in getting labour (11 per cent). As it has been suggested by literature that farmers in this category mostly make use of inefficient combinations of labour and capital (Kiani, 2008) so they do not depend solely on labour.

Lastly, the majority of farmers who had land size 8.6 acre plus also reported having no difficulty (16 per cent). This could also be due to enough working members in the household for this farm size (with an average of 7) and due to ample availability of labour.

### 6.3.5 Correlation between farm size and prices of inputs during COVID-19



**Figure 9 – Correlation between Farm Size and Prices of Inputs**

While looking at which of the farmers felt more that the input prices have increased for them during COVID-19, we analyzed them across three categories of farm sizes.

From the table above we can see that 35 per cent of farmers who strongly agreed that inputs prices had land size less than 5 acres. This should come as no surprise since these farmers are barely making ends meet with their small land size and felt the surge in input prices. On the contrary, as one would expect, the majority of the farmers who strongly disagreed (30 per cent) had a land size of more than 8.6 acres. Whereas farmers who only somewhat agreed to be impacted by the input price increase had a land size of below average i.e. 8.5 acres.

*“When prices were increased for fertilizers and seeds due to the lockdown and disrupted supply chains, I was unable to produce the same level at which I used to produce before COVID-19 and this led to the loss of income”. (A farmer aged 60, having 5 acres of land)*

### **6.3.6 Employment and Financial Independence during COVID-19**

The interplay of various variables within the context of small-scale farming systems revealed insightful connections that shape the farmers' responses to challenges, such as the COVID-19 pandemic. One such correlation can be drawn between the presence of working members within a household, financial independence, and the overall resilience displayed during the pandemic.

Small-scale farming is often a collaborative effort, involving multiple members of a household in various farming activities. The presence of working hands within the household not only aids in cultivating the land but also provides essential financial support. Having a larger number of working members allows farmers to manage tasks

that would otherwise require hiring laborer. This financial advantage can translate into reduced production costs and increased profitability.

#### **6.3.6.1 Reduced Dependency on Hiring Labour**

The financial support derived from the working members within the household can lead to a decreased reliance on hiring labourers from outside. This reduced dependency on external labour helps in controlling costs, leading to improved financial sustainability. It also enables farmers to maintain greater control over their production processes, ensuring the implementation of familiar and effective practices. A farmer we interviewed told, *“My brother worked as a waiter in Lahore but when COVID-19 was implemented and restaurants closed down, he had to come back and although he was jobless at the time, we got an extra hand to work on the field.”*

As the COVID-19 pandemic disrupted labour markets and supply chains, farmers who were already supported by their household's working hands were better positioned to navigate the challenges. Their ability to manage farm activities without the need for external labourers allowed them to continue farming operations even in the face of labour shortages and logistical difficulties.

The correlation between working hands, financial independence, and COVID-19 resilience underscores the adaptability and flexibility of these small-scale farmers. By relying on their household members, they exhibited the capacity to adjust their strategies to unforeseen circumstances, which became even more crucial during the pandemic.

### **6.3.6.2 Impact of COVID-19 on the Availability of Labour**

We got some interesting findings while interviewing labourers on their struggles during COVID-19. The common perception in the public overall was that there was a shortage of labour because people were restricted to their homes. Therefore, the expectation of a shortage of labour was a possible assumption. However, we found that farmers did not have a shortage of labour and people were readily available to work. This was mainly possible due to the implementation of a ‘smart lockdown’ by the government. This policy helped in keeping the economy afloat and exempted the agricultural business from lockdown restrictions. (Dawn, 2020)

Even so that the supply of labour was more than the demand; eventually giving the bargaining power to the landowners and the labour had to work at a considerably lower rate than usual. This influx of supply could be directly correlated with the low income of labourers. These labourers were hardly making ends meet and were willing to do the grunt work for a lower pay scale. While interviewing one of the farmers, they had quite interesting remarks when posed with the question of labour shortage. One of the landowners stated, *“Labour was coming to us at our doorstep than us trying to look for them. This authority and power felt amazing and provided us with the upper hand to reduce our labour costs. They were affected by COVID-19 but so were we but in different ways.”*

## **6.4 Social Impacts on the Well-being of Farmers**

As during COVID-19 farmers faced significant challenges in sustaining their agricultural operations and generating income, the closure of markets, limited access to agricultural inputs, and labour shortages further impeded their ability to produce and sell crops, leading to an impact on their well-being.

*“I supply milk and butter to the retailer but due to the lockdown, the supply chain has been disrupted and which has resulted in a loss of income. And it had a severe consequence on our livelihood in terms of loss of income. And this eventually led to an increase in tension and anxiety in the household.”* (A farmer aged 62)

However, it wasn't the case for everyone. The loss of income did not affect all because in some instances the high level of social networks and collateral at the village level has benefitted farmers in mitigating the negative impacts on their wellbeing. *When COVID-19 struck us, we all stuck together in these tough times, our bonds helped us get through this. Our social networks helped us during these times and somehow the impact did not feel as much as had the support of each other.* (A farmer aged 42)

After interviewing these farmers we saw how everyone was impacted differently during COVID-19 times. While some were impacted greatly and their income went down, most farmers also benefitted from the strong bonds of their community.

### **6.4.1 Impact of COVID-19 on the education of farmer's children**

During COVID-19, schools were repeatedly closed to control the number of cases that were emerging through official notifications of The National Command and

Operation Center. Kashif Mirza, the head of the Pakistan Private Schools Federation, expressed his concern about the situation. According to him, only educational institutions were targeted for lockdown purposes while everything else remained open. In his opinion, this choice was made to hide the government's failure in making sure that new SNC books were accessible in the market. (Dawn News, 2021)

Most farmers faced various challenges during the pandemic, including increased agricultural responsibilities and financial constraints. These challenges were increased by closing schools. According to a farmer's wife, *"We live in a joint family system, and due to the loss of income coupled with the school closures and children always staying at home, resulted in petty fights and arguments amongst the children and their parents. All of this added to our mental tensions."*

As per our findings substantial majority of farmers, approximately 70 per cent, acknowledged the impact of the COVID-19 pandemic on their children's education. This finding highlights the far-reaching consequences of the pandemic on the educational landscape within farming communities.

#### **6.4.2 Household challenges due to COVID**

58 per cent of farms in Pakistan are of less than 5 acres of land but only 16 per cent of that farm area is favourable for agriculture. On the contrary, farms of more than 10 hectares occupy 37 per cent of the total farm area. (Thapa, G., & Gaiha, R., 2011)

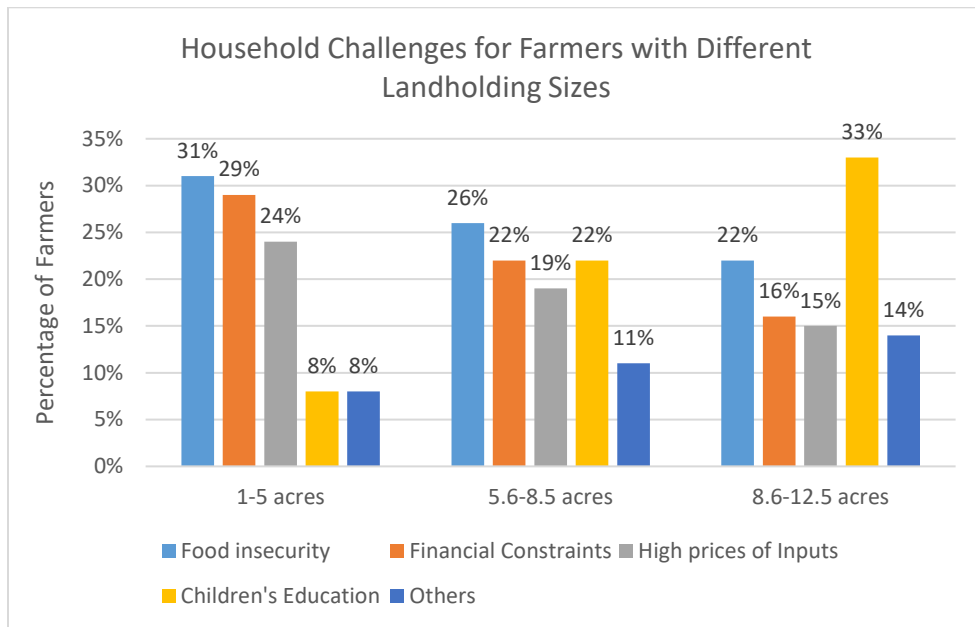
According to the report of FAO (2015) and IFAD (2011) farm producers (farm size < 5 acres) constitute more than 2/3rd of the total poor and food insecure people around the globe. As these are the farmers who have limited resources and rely on household



members for most of the labour, (Thapa, G., & Gaiha, R., 2011) it is imperative we studied their household challenges.

The below table depicts the relationship between pandemic-induced household challenges for the farmers with varied landholdings.

**Figure 10 – Household Challenges for Farmers with Different Landholding Sizes due to COVID**



After questioning the farmers with different landholding sizes we saw how they were affected differently due to lack and access to resources (depending on their financial situation). The highest percentage of the farmers (24 per cent) reported that they faced challenges due to high prices of inputs. 29 per cent of them faced financial constraints which is an outcome of lack of access to agricultural inputs. 31 per cent of farmers reported to be food insecure as their production of crops went down and were unable to produce enough for household consumption and selling. Another significant challenge faced by these farmers was their children’s education (8 per cent). Some

couldn't send their children to school due to the lockdown, whereas some couldn't due to financial constraints.

A farmer stated, "*Our nearby school was open during lockdown for the most part, but I could not afford to send my children as I was barely making enough for food consumption, at this point, I could educate them or let them starve*". Some farmers (8 per cent) reported some other significant challenges such as a lack of alternate mode of earning (due to less land holding), fewer buyers (due to lockdown imposition), and higher prices of electricity/diesel. Although the percentage of these issues is minor, they still stood out to be significant on a household level.

After gathering information from farmers within the landholding range of 5.6 to 8.5 acres, it became clear that their challenges were caused by different factors. A significant percentage of these farmers (26%) reported struggling with food insecurity, which was a result of reduced crop yields that left them unable to meet household consumption and sales demands. An additional 22% of farmers faced financial constraints, restricting their access to required agricultural inputs. The high cost of inputs was noted as a challenge by 19% of farmers, putting pressure on their overall productivity. Furthermore, the education of their children was a concern for 22% of these farmers, stemming from difficulties in sending their children to school due to the lockdown or financial limitations. Other challenges were mentioned by 11% of the farmers who thought that there were multiple factors that had an impact on their household due to Covid-19 that have been mentioned previously.

Moving on to farmers owning land between 8.6 and 12.5 acres, it was apparent that their experiences were shaped by a mix of factors caused by their landholding size. Moreover, 22% of farmers stated that they faced food insecurity, showing a decline in crop production that impacted their ability to provide for both their households and the market. Financial constraints were encountered by 16% of respondents. The increased cost of inputs also was identified as a difficulty for 15% of these farmers, due to their operational costs. Surprisingly, 33% of respondents expressed concerns regarding their children's education, reflecting the impact of lockdowns on their ability to provide educational opportunities as out of the three groups, this group faced less difficulties overall; therefore, the biggest concern that they had was the education of their children which was being affected. An additional 14% of farmers outlined other challenges, indicating the complexity of their situations.

#### **6.4.3 Impact of COVID-19 on Mental Health of Farmers**

The COVID-19 pandemic had an impact on the mental health of farmers' households (79 per cent) predominantly because of loss in income. The combination of multiple frustrations and household challenges stemming from the pandemic significantly affected them. They also faced financial uncertainties due to disruptions in the agricultural supply chain, market closures, and fluctuating prices caused by the pandemic. Uncertainty regarding the continuity of farming operations, availability of resources, and market demand created a sense of insecurity about the future. To some extent, fear of contracting the virus, concerns about the health and safety of their families, and the potential impact on their livelihoods added to the emotional burden experienced by farmers. They often felt powerless in the face of external factors such

as market dynamics, government regulations, and unpredictable circumstances. This loss of control over their farming operations and the inability to make decisions that could positively impact their livelihoods heightened stress levels and negatively affected their mental well-being.

One of the farmers stated, *“Loss of income because of the inability to supply goods to the market due to COVID-19 has affected the psychological well-being of my family. We have to curtail our consumption expenditures which leads to frequent arguments among the spouses. This also created frequent arguments with my wife and children. The extension of the lockdown added extra fear into our psyche”*.

One of the farmers’ wives stated, *“We live in a joint family system, and due to the loss of income coupled with the school closures and children staying at home at all times, resulted in petty fights and arguments amongst the children and their parents. All of this added to our mental tensions.”*

On the contrary, another farmer painted a different picture.

*Because of COVID-19, we got to spend more time with each other. The presence of grandparents helped in inculcating good social values in our children. And secondly, in the neighbourhood, we all used to sit together in the evening for longer hours catching up which increased the bonds among the community members. These challenges highlight the need for targeted interventions and support mechanisms to bolster the resilience of farmers, safeguard their livelihoods, and promote their overall well-being during and beyond the COVID-19 crisis.*

## **6.5 Institutional Challenges**

### **6.5.1 Access to farm credit/subsidies**

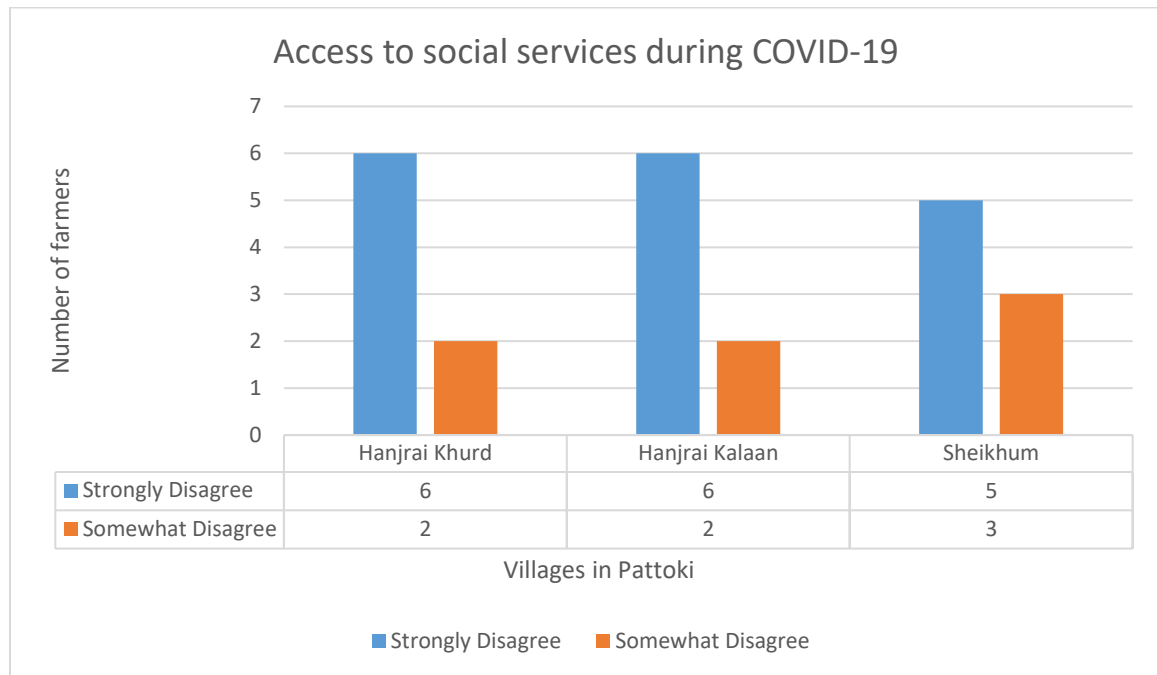
In a developing country like Pakistan, farmers rarely have savings, therefore, the main source of lending credits for Pakistani farmers are formal and informal lenders such as specialized banks like Zarai Taraqiati Bank (ZTBL), commercial banks, cooperatives, or commercial agents. (Zulfiqar. et al, 2021)

Not only small scale and medium-scale farmers obtain credit for their survival, but it is also useful for large-scale farmers to increase their source of income from farms (Das et al. 2009). Credit-constrained farmers are more likely to apply lower levels of inputs in production compared to those who are not.

By interviewing farmers across the villages above we found out how most of them did not receive access to farm credit/subsidies during COVID-19. 90 per cent of farmers in Hanjrai Khurd, 85 per cent in Hanjrai Kalaan, and 95 per cent in Sheikhum reported receiving no credit or subsidies from the government.

### **6.5.2 Access to Social Services during COVID-19**

**Figure 11 – Access to Social Services during Covid-19**



By selecting 8 farmers from each village (24 total), we saw how most farmers (17) across three villages were denied access to social services during COVID-19. Social services are being defined here as better education, healthcare, and sanitation services.

### **6.5.3 Role of Farmer Organizations during COVID-19**

Farmer organizations provide a platform where the stakeholders get together to discuss and solve their socioeconomic issues. Through these organizations, individuals combine their financial and social resources, thereby giving the resources that are needed to achieve their investment, manufacturing, and consumption needs. (Jabbar, A., et al, 2023)

While questioning farmers we came to know how farmer organizations did not exist at all in Hanjrai Kalaan and Hanjrai Khurd or the farmers were not aware of their

existence. Whereas in Sheikhum they did exist, but all 8 farmers (out of 24) reported that they did not provide any kind of support during COVID-19. The farmers would voice their concerns, but they weren't listened to. According to one farmer from Sheikhum with a land size of 4 acres, *"When COVID-19 arrived, I was having trouble selling my vegetables to the market, due to which I had to throw away most of my produce that I could not sell. I kept some for-household consumption but had to waste most and went into loss. I put forward my case in front of the farmer organization during our evening sit-down and they paid no heed to my issues. I raised it time and time again but did not receive any assistance which resulted in my family suffering for 2-3 months."*

We interviewed the *Numberdaar* in that area and inquired about how people were impacted by COVID-19 and how they coped with it. He responded *"In my opinion the most significant impact of COVID-19 was their lower levels of income and how they couldn't provide for their family as much, but I found most of the farmers resilient. I saw how they somehow managed to cope with this loss of income by reducing their consumption level and keeping it to a need-basis level, so their children do not suffer"*

## **7. Conclusion**

To avoid further marginalization of rural households in Pattoki, a fundamental transformation of the farming systems appears inevitable. The questions posed by this research have been revolving around the impact of COVID-19 on the livelihood of farmers and their adaptability to alternative strategies in the hard times. The data compiled shows that livelihood of farmers in terms of education, mental health, and household challenges were indeed deeply affected. There was a shift in farming activities due to a lack of access to resources and an increase in input prices, whereby before COVID all of them were involved in cultivating cereals as their primary farm activity. 9 out of 24 farmers shifted to livestock and horticulture as their primary farm activity. One of the most interesting findings was the ample availability of labour – even with the ongoing challenges, farmers were willing to work at the lowest rate just to keep their households running and no shortage of labour was seen. 79% per cent of farmers reported that their mental health was affected due to the restriction in markets and loss in income, etc., whereas the rest of them painted an entirely different picture due to access to multiple resources and strong links with buyers.

By dividing landholding sizes into three categories (1-5 acres, 5.1-8.5, and 8.6-12.5 acres) we saw how the ones with land size under 5 acres were most affected due to lack of resources. Whereas, the ones with land size above our average i.e. 8.5 were comparatively less affected by COVID due to access to multiple resources. Farmers with land size under 5 acres also contributed the least to their household in monetary terms as compared to the other farmers who contributed a lot more. Most farmers also



faced loss in production due to increase in agricultural input prices. This increase in price was felt more by the farmers with land size less than 5 acres.

One finding that remained common throughout and that was the unavailability of the social services that the government had promised these farmers. Similarly, these small-scale farmers were either unaware of the existence of the farmer organizations or did not find them helpful at all in crises, which indeed is an alarming situation. Lack of access to farm credit also added more complexity to the existing financial problems of smallholder farmers.

Circumstances like these are a true testament to the policy implications. Policy existence is one thing, but its implication is a completely different story. This leads us to the dire need for better policymaking to counter such unprecedented occurrences and to ensure that people keep their faith in the system.

In conclusion, the farmers from villages, Hanjrai Kalaan, Hanjrai Khurd and Sheikhum in Pattoki were deeply affected by COVID-19. Although their belief in the pandemic itself was shaking, they all felt that there had been a disruption in their daily activities. While many farmers adapted and changed their farming activities to diversify their income streams; some farmers remain delusional about the impact of COVID-19 and didn't accept the existence of the pandemic or its devastating effects. However, in a nutshell, the reality was faced and accepted by as many as it affected their mental health due to the financial crisis.

## **8. Policy Implications**

Pakistan has no alternative to building an export-based manufacturing and services sector; move people out of agriculture; and consolidate operational land holdings into larger more efficient units that could use better technology, more machinery and hence increase labour productivity and incomes. However, building up an export-oriented manufacturing and services sector will take effort, time and investment. In the short term, developing agriculture, particularly smallholder agriculture, would allow the country to meet several high priority targets such as reducing poverty, food insecurity and malnutrition; and providing employment, particularly to young people. If properly managed, agriculture also has the potential to enhance exports, reduce imports and improve the balance-of-payments situation - a chronically weak aspect of Pakistan's economy.

We saw that in these villages near Pattoki, the majority of farmers are located at a distance from the cities and credit-providing institution; farmers are unable to avail of the credit facilities. Therefore, specialized banks such as Zarai Taraqati Bank Limited and other commercial banks need to improve the credit facilities policies to overcome these issues for better agriculture developments in Pakistan.

The government must provide a favorable environment to help farmers grow — for example by setting up market boards, sponsoring fairs, exhibitions, and other events where synergies and partnerships can be built; by helping get access to government funding, for example through creating special production zones similar to what is being done for manufacturing. The government also needs to

work with banks and insurance companies to provide risk management mechanisms.

It is also important for the government to step up and support small farmers, especially during challenging times by providing financial assistance such as loans, ensure farmers have access to necessary resources and markets, and offering guidance on health and safety measures. Providing subsidized agricultural inputs is essential at such times. They must show that they value and care about the farmers who work hard to ensure our food security. They should devise policies for rural livelihood strategies keeping in view the status of livelihood assets possessed by the households.

Farmer's organizations are also essential and should be formed to provide the much-needed support, guidance, and advocacy for the farmers, who were left to face the pandemic's impact on their own. In the end, the government should introduce short-term and long-term economic recovery packages for any upcoming crisis, including cash and food grants for immediate support during the lockdown period and later on for economic recovery.

## Appendix A

### Questionnaire for the Farmers

#### SECTION 1: Socio-demographics

Age of Farmer	_____
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
Current size of farmer's household	_____
Educational Level of the farmer	<input type="checkbox"/> Less than elementary level (Illiterate) <input type="checkbox"/> Elementary to less than high school <input type="checkbox"/> High School <input type="checkbox"/> Two years college <input type="checkbox"/> University or above
Apart from the land that you own, do you work on any other rented land?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Size of your land? And how much of it is rented?	_____
How many working members are there in your family?	_____
Do you have a strong relationship with a farmer organization?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If no, why not?	_____ _____
What is the share of the income from agricultural production in your household income?	<input type="checkbox"/> Up to 25 % <input type="checkbox"/> 26 – 50 % <input type="checkbox"/> 51 – 75 % <input type="checkbox"/> 76 – 100 %

<p>Who do you sell your products to?</p>	<p> <input type="checkbox"/> Directly to consumers  <input type="checkbox"/> Retailers  <input type="checkbox"/> Wholesalers  <input type="checkbox"/> Exporters  <input type="checkbox"/> Processors  <input type="checkbox"/> Governmental corporation for storage and marketing of agricultural products  <input type="checkbox"/> Other (specify):            _____            _____         </p>									
<p>Please enlist both, primary and secondary, farming activities that you undertook before and during Covid-19?</p>	<table border="1"> <thead> <tr> <th data-bbox="802 852 987 919"></th> <th data-bbox="987 852 1170 919">Primary (%)</th> <th data-bbox="1170 852 1354 919">Secondary (%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="802 919 987 1014"><b>Before Covid</b></td> <td data-bbox="987 919 1170 1014"></td> <td data-bbox="1170 919 1354 1014"></td> </tr> <tr> <td data-bbox="802 1014 987 1119"><b>During Covid</b></td> <td data-bbox="987 1014 1170 1119"></td> <td data-bbox="1170 1014 1354 1119"></td> </tr> </tbody> </table>		Primary (%)	Secondary (%)	<b>Before Covid</b>			<b>During Covid</b>		
	Primary (%)	Secondary (%)								
<b>Before Covid</b>										
<b>During Covid</b>										

**SECTION 2: Cropping system**

<p>Which primary crops do you produce?</p>	<p> <input type="checkbox"/> Rice  <input type="checkbox"/> Wheat  <input type="checkbox"/> Sugar cane  <input type="checkbox"/> Cotton  <input type="checkbox"/> Maze  <input type="checkbox"/> Pulses  <input type="checkbox"/> Other: _____         </p>
--	---

<p>COVID-19 reduced your access to labor in the last season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>
<p>COVID-19 reduced your access to seeds in the last season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>
<p>COVID-19 reduced your access to fertilizers in the last season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>
<p>COVID-19 reduced your ability to plant crops in the last season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>
<p>COVID-19 reduced your ability to rent machinery for the last planting season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>
<p>COVID-19 reduced your crop yields in the last harvest season. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree  <input type="checkbox"/> Somewhat Disagree  <input type="checkbox"/> Neither agree/Disagree  <input type="checkbox"/> Somewhat agree  <input type="checkbox"/> Strongly agree</p>

### SECTION 3: Livestock system

Which primary livestock do you raise?	<input type="checkbox"/> Cattle <input type="checkbox"/> Goat/sheep <input type="checkbox"/> Poultry <input type="checkbox"/> Camels <input type="checkbox"/> Others: _____
COVID-19 reduced your access to water for your livestock in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your access to labor for your livestock in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your access to feed for your livestock in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your ability to feed my livestock in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your ability to sell your livestock's production in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

#### SECTION 4: Horticulture system

What are the vegetables grown in your farm?	<input type="checkbox"/> Potato <input type="checkbox"/> Onion <input type="checkbox"/> Chilies <input type="checkbox"/> Tomato <input type="checkbox"/> Tunip <input type="checkbox"/> Okra carrot <input type="checkbox"/> Cauliflower peas <input type="checkbox"/> Tinda groud <input type="checkbox"/> Others: _____
COVID-19 reduced your access to seeds in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your access to fertilizers in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your access to water in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your ability to plant vegetables and fruits in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree



<p>COVID-19 reduced your ability to hire labor for the last planting season. Do you agree?</p>	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
<p>COVID-19 reduced your yields in the last harvest season. Do you agree?</p>	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

**SECTION 5: Floriculture system**

<p>What are some of the flowers grown in your farm?</p>	<input type="checkbox"/> Jasmine <input type="checkbox"/> Roses <input type="checkbox"/> Tulips <input type="checkbox"/> Chrysanthemums <input type="checkbox"/> Poppies <input type="checkbox"/> Orchids <input type="checkbox"/> Others _____
<p>COVID-19 reduced your access to seeds in the last season. Do you agree?</p>	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
<p>COVID-19 reduced your access to fertilizers in the last season. Do you agree?</p>	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

COVID-19 reduced your access to water in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your ability to plant flowers in the last season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your ability to hire labor for the last planting season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
COVID-19 reduced your yields in the last harvest season. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

## SECTION 6: Adaptation and mitigation of COVID-19 impact

Has COVID-19 impacted you directly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
What is the likelihood that you will change traditional agricultural practices due to COVID-19?	<input type="checkbox"/> Very Low <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High
Did you diversify your farm activities during COVID-19?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how? _____ _____
What is the likelihood that you will change your crop calendar due to COVID-19?	<input type="checkbox"/> Very Low <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High
What is the likelihood that you will be able to hire labor for planting and harvesting this upcoming agricultural cycle due to COVID-19?	<input type="checkbox"/> Very Low <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High
What is the likelihood that you will manage your livestock differently due to COVID-19?	<input type="checkbox"/> Very Low <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High

## SECTION 7: Livelihoods and social well-being

Getting enough food on a regular basis for your household during COVID became more difficult. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
During COVID the market where you purchase food for your household closed down or was significantly disrupted. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
During COVID you witnessed a significant increase in the price of foods you purchase for your household. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
During COVID the market where you sold the produce/livestock from your farm either was closed or significantly disrupted. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
You received adequate access to off-labor throughout the previous agricultural cycle. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
The restrictions caused by COVID-19 affected your children's education. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree

	<input type="checkbox"/> Strongly agree
The negative impacts of COVID-19 affected your mental health. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

**SECTION 8: Access to social services and finances**

During COVID times you had access to other social services to help your household. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree
During COVID times you had access to farm credit, subsidies, or other financial supports. Do you agree?	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree

**SECTION 9: Challenges at Household level**

<p>What are the greatest challenges that COVID-19 has posed for your household?</p>	<p><input type="checkbox"/> Food security <input type="checkbox"/> Access to food <input type="checkbox"/> Potential famine <input type="checkbox"/> Lack of job <input type="checkbox"/> Others (specify) _____ _____</p>
<p>COVID-19 has affected the amount of crop production that goes in your household consumption. Do you agree?</p>	<p><input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Somewhat Disagree <input type="checkbox"/> Neither agree/Disagree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Strongly agree</p>

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