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Review Article

Impacts of the COVID-19 Pandemic on Agriculture and Economy of Nepal

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ABSTRACT

The COVID-19 pandemic has resulted in an increasing number of confirmed cases and death cases globally. By November 1, 2020, there have been a total of 46,435,624 cases, of which 1,201,006,960 deaths and 33,526,541 recoveries. In Nepal till November 1, 2020, the total cases reported are 173567 people with a mortality of 960 people, and 134842 recoveries. In this study, we review the current situation of COVID-19 and its management strategies in Nepal. This review also outlines the effects of the coronavirus on agriculture, livestock, agribusiness, food security and economy of Nepal. The production, processing and marketing of agricultural crops and livestock are greatly affected by COVID-19 pandemic. The planting of agricultural crops cannot be operated in time because of this pandemic. Thus, the pandemic has provided a serious impact on food production and food security. The COVID-19 interferes with the supply chain of the markets with impaired production and distribution accompanied by a lack of labor and supply of inputs. Nepal is suffering the most unexpected and extensive closure of economic activity due to the outbreak of the coronavirus. The impact has been seen in many sectors such as tourism, trade, and production linkages and supply. Especially the

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entire service industries; tourism, aviation, and hospitality sector have been hit hardly by the outbreak. Since disease outbreaks are unlikely to vanish quickly, we should adopt the Standard Health Protocol to reduce the impact of COVID-19, maintain social distance, improve health and hygiene, and raise people's awareness. Such proactive actions are needed not only to save lives but also to protect economic prosperity.

1. INTRODUCTION

A new coronavirus known as severe acute respiratory coronavirus 2 (SARS-CoV-2) was first identified in the seafood market in Wuhan City, Hubei Province, China, at the end of 2019 (Zhu et al., 2020). Infectious lung disease caused by this novel coronavirus virus is known as coronavirus disease 2019 or, in short, COVID-19 (Wu et al., 2020). Marked as a dark swan occasion (Rejen, 2020) and compared to the economic scene of World War Two (Reuters, 2020), the COVID-19 (the sickness brought about by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) has destructively affected globally medical services structures with an increasing effect on each part of human life as we probably are aware it. World Health Organization (WHO) decreeing the COVID-19 outbreak as a worldwide

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catastrophe on January 30, 2020 (Sohrabi et al., 2020).

Ideally, COVID-19 is an enclosed RNA virus that is evident in humans and animals. The virus is in the Nidoviral order that belongs to the family, namely Roniviridae, Arteriviridae, and Coronaviridae (Hassan et al., 2020; Singhal, 2020; Modi et al., 2020). The Coronaviridae family is simultaneously divided into two, namely Torovirinae and Coronavirinae. Also, the subfamily Coronavirinae is classified as COVs- alpha, beta, gamma, and Delta (Hassan et al., 2020). These viruses have a virus RNA genome, which ranges between 26 and 32-kilo bases, allowing them to be isolated from several animal species. The cases were recorded since December 8, 2019, and many patients were working or living in Huanan Seafood Wholesale, even if there's no exposure to those market early cases had been seen (Lu et al., 2020). On January 7, the patient's throat swab sample detected a novel coronavirus, initially abbreviated by the WHO as 2019nCoV (Hui et al., 2020). Corona Virus Study Group. Gorbalenya et al. (2020) renamed this disease later as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The disease was referred to as coronavirus disease in 2019 (COVID-19) by the WHO. Since October, COVID-19 cases have spread all over the world especially to Europe, the USA, Australia, Asia, and Africa. To date, the novel coronavirus is still ravaging everyday life in the world, affecting 213 nations, infecting 46,435,624 people, and killing 1,201,006 people, and recovering 33,526,541 until November 1, 2020. Currently, the total active cases of infected patients are 11,708,077 with 11,623,797 (99%) in mild condition and 84,280 (1%) in serious or critical condition. Furthermore, total closed cases are 34,727,547 with 33,526,541 (97%) in recovered / discharged condition and 1,201,006 (3%) in dead condition (Worldometer, 2020).

Nepal is not exempt from COVID-19's pandemic effects. Nepal reported the first case of the deadly coronavirus in the

world on 24 January, recognizing the infected person as a Nepali student who had migrated from China (Chalise, 2020). With the rising rate of contamination, from 24 March till 21 July 2020, the Government of Nepal declared a national lockdown barring domestic and international travel, border restrictions, and the first stage of the restriction of non-essential facilities, which was subsequently eased on 11 June 2020. There were only two reported cases from 610 Reverse Transcription Polymerase Chain Reaction (RT-PCR) experiments and no deaths when the Government of Nepal declared a national lockout (Baruah et al., 2018). On 23 January 2020, an indexed case was identified in Kathmandu concerning a person who had migrated from Wuhan, China (Bastola et al., 2020). On 23 March, two months later, the second case was reported by those traveling from France via Qatar to Nepal (Health Emergency Operation Center et al., 2020). In Nepal, a total of COVID-19 cases with the death of 173567 people and recovery of 134842 were confirmed by 1st November, 2020 (MOHP, 2020).

As the warning alarm rang all over the world because of COVID-19, the government of Nepal employed various policies to restrain infection of COVID-19 in the country. Nepal sealed its boarded with its neighboring countries, India and China, for the entry of people. It also banned international flights for a long period. To control the spread inside the country, the government took the help of policies like lockdown, contact tracing, mandatory use of mask and sanitizers, probationary orders, etc. Yet for weeks, more than a thousand cases have been registered every day. The death rate is 0.6% of total infection and it is rising. Many government policies have been driven to adopt several control measures by the increased potential for disease growth (MOHP, 2020).

The overall economy of Nepal is about \$44.73 billion (US\$32 billion) per year. The nation has been restoring its economy since 2016. It registered a

6% plus economic growth rate during this reconstruction process (Budhathoki, 2020) and reached 7.1% in 2019. The government of Prime Minister K.P. Oli (World Bank, 2020), relying on such a steady growth rate, based on the graduation of Nepal from the 'Least Developed Country' position to the League of Developing Nations by 2022. It had planned to hit an 8.5% growth rate in 2020 (The Himalayan, 2018). However, it didn't turn out as expected due to the pandemic. COVID-19 has severely impacted nearly all industries of Nepal's economy (World Bank, 2019). The Finance Minister, Dr. Yuba Raj Khatiwada, lowered the country's growth estimate to 2.3% due to COVID-19 throughout the federal budget statement on 28 May 2020 (Setopati, 2020). This is well below the growth rate of Nepal in 2018 and 2019 (Financial Express, 2020). An analysis carried out by the Ganesh Man Singh Academy reported that Nepal lost NRs10 billion (\$11.58 million) per day due to COVID-19 and the resulting lockdown (Ministry of Finance, 2019). COVID-19 in the government's revenue collection has influenced the downturn in the economy (Shrestha, 2020b).

The objective of this review paper is to provide the latest information on impacts of the Covid-19 on agriculture and economy of Nepal.

2. Transmission of Corona Virus

Newly established CoVs pose a significant public health threat. The new COVID-19 emergency is the third human CoVs epidemic in the last two decades (Munster et al., 2020). It is no coincidence that predicted possible outbreaks of SARS or MERS-like CoVs in China following pathogenic bat migration (Fan et al., 2019). COVID-19 was emerged in China and spread quickly throughout the world, subsequently to other countries. The role of the Wuhan Market in the dissemination of virus is uncertain. Firstly, the initial COVID-19 cases are related to direct interaction with contaminated animals in the Wuhan, China seafood industry (Singhal et al., 2020). Many of the initial COVID-19 cases were relevant to this

market and indicated the transfer of SARS-CoV-2 from animals to people (Li et al., 2020). However, genomic analysis has shown that the virus has been introduced to the market more quickly from another unknown location, while transmission between people has occurred earlier (Yu et al., 2020). The virus can also spread from person to person, and this is the main form of transmission is considered (Aluga et al., 2020). The contact with the diseased people can lead to the disease, as it spreads mainly by coughing, through the release of respiratory gout. Near contact may also generate transmission within people with COVID-19. In the wake of this worldwide wellbeing emergency, rigid general wellbeing measures have been actualized to shorten the spread of COVID-19 (Adhikari et al., 2020).

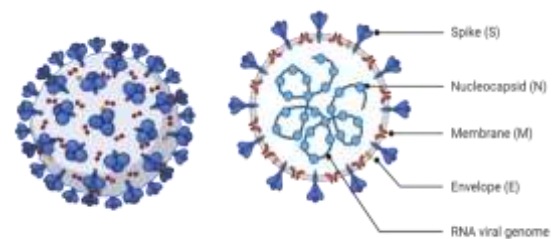


Fig 1: Structure of human coronavirus (Ciotti et al., 2019)

Inescapable flare-ups of irresistible infections, for example, COVID-19, are related to mental pain and indications of psychological sickness (Bao et al., 2020). Therapists over the world ought to know about these appearances, and procedures to oversee them that envelop both the requirements of explicit populaces and the prudent steps important to contain the spread of COVID-19 (Yang et al., 2020). The existence of transmission from person to person has been confirmed by groups of diseased family members and hospital workers (Chan et al., 2020). Person-to-person transmission between close contacts is expected to occur, primarily through air droplets created by the cough or sneezing of an infected person. Fomites can be a major source of transmission, as SARS-CoV survives up to 96 hours on surfaces (Kramer et al., 2006) and for up to 9 days other corona viruses (Kampf et al., 2020).

In pregnancy, a study of nine pregnant women who developed COVID-19 in late pregnancy indicated COVID-19 did not lead to significantly worse symptoms than in non-pregnant women, and there is no evidence of vertical transmission intrauterine infection (Chen, 2020).

3. Status of Coronavirus in Nepal

3.1.Data Sources

The reference data for this research are retrieved from various sources like World Health Organization (WHO), John Hopkins University (JHU), Worldometer and the Ministry of Health and Population (MoPH), Government of Nepal (GoN) in this review, the data of COVID-19 infection is taken from 24th of March considering nationwide lockdown to be the first step taken by the government against COVID-19 outbreak. Then, the government-administered a series of policies as the infection rate got steeper. The rationale of this review is to monitor the direct consequences of those policies upon containing the COVID-19 outbreak. The detail of the policies was retrieved from different websites owned by the Government of Nepal.

3.2.Analyses

COVID-19 was declared as the "public health emergency of international concern" on 30th January 2020. On January 13, a student of 31 years from Nepal from Wuhan University was admitted with mild symptoms who had returned home on January 5 (Bastola et al., 2020). After preliminary tests revealed that he may not have been poisoned, he was discharged on January 17. He was kept in self-quarantine until he tested negative for the coronavirus infection on 29th and 31st January. After three weeks, none of the people who had come in touch with the patient displayed any signs and therefore assumed that the patient had not spread the disease to anyone else in Nepal. There were no reagents for testing in public laboratories in Nepal, and no suspected cases required testing (The Kathmandu Post, 2020a). This was 1st reported case in Nepal (NDTV, 2020). The second case of COVID-19, a young girl of age 19 who came from France on mid-

March, was discovered on 23 March and no new case was identified in February until then. (The Kathmandu Post, 2020b). With a slow starting, on April 30 the total confirmed cases reached 57. More than 9,026, and in total 74 districts were screened for a new coronavirus before this Article was published (June 21), resulting in various physical, socio-economic, and mentally effects on Nepalese (Ministry of Health and Population Nepal, 2020).

For the analysis of the government's action, it is divided into two parts considering the declaration of COVID-19 as the global pandemic by WHO which was done on 11th March 2020.

Table 1: COVID-19 total cases, death, and recovery in Nepal. (All data are measured by the end of the month)

Month (2020)	Total cases	Total death	Total recovered
April	57	0	16
May	1572	8	220
June	13564	29	3194
July	19711	56	14399
August	39460	228	17822
September	77871	498	56428
October	170743	937	131222

3.3. Before WHO Declares Global Pandemic

The government responded against the coronavirus infection by screening passengers at the Tribhuvan International Airports and updating the capacity testing facility of the Country.

On January 23, Sukar Raj, director of the Tropical and Infectious Hospital, reported that hospitals are at high risk and that care for people infected with coronavirus could be carried out at Sukraraj Tropical and Infectious Disease Hospital, Nepal Police Hospital, Patan Hospital and Teaching Hospital (My Republica, 2020a). Consequently, six beds were allocated for the treatment of COVID-19 patients at the Sukraraj Tropical and Infectious disease hospital (Himalayan News, 2020b). On 27th January, National Public Health Laboratory acquired the capacity of conducting confirmatory tests for Coronavirus infection. After that, a similar capacity is disseminated to the other

hospitals as well. Furthermore, the report was instructed to install a thermal scanner at Tribhuvan International Airport for the identification and separation of COVID-19 cases.

The report also instructed the authorities concerned to ensure that personal protective equipment (PPE) is available and to disseminate materials to educate and communicate about the disease.

On 28th January, the ministry for Health and Population, Government of Nepal identified the present capacity of all of the hospitals of the country and instructed the entire main and satellite hospitals to manage Isolation facilities with dedicated beds and space for COVID-19 cases in the future. Rasuwagadi border of Nepal China was closed (Devkota, 2020). Similarly, to minimize the movement across the Nepal India border, they place it on great vigilance. The government identified Nepal Police Hospital, Patan Hospital, and Tribhuvan University Teaching Hospital to treat COVID-19 patients besides Sukraraj Tropical and Infectious disease Hospital (STIDH) on 31st January. In the same way, Northern Tatopani Border is sealed completely for fifteen days to minimize the movement of goods and people to the affected regions of China.

At the end of the first week of February, there had been already 32000 infection cases worldwide with over 3000 cases reported daily. Until then, 24 countries were infected worldwide including Nepal. Meanwhile, the Epidemiology and Disease Control Division (EDCD) of the Department of Health Services (DoHS) Ministry of Health and Population (MoHP), Nepal, institutionalized the COVID-19 cases treatment protocol which was based upon the protocol developed by the UN health agency. The government made it certain that 43 bedded hospitals with suitable testing facilities to be available at Pokhara, Bhairahawa, and Chitawan (My Republica, 2020b). Department of Health Services, MoHP published informative materials on

its website. Quarantine procedure was developed mainly to manage Nepali students repatriated from corona infected region of China. 175 Nepali students were rescued from Hubei, Wuhan, China as per their request (My Republica, 2020c). They were kept in quarantine at Kharipati, Bhaktapur. They were sent to their homes as their COVID-19 test result after 14 days of quarantine was negative (The Kathmandu Post, 2020f). Meanwhile, the government started three hotlines, health desks, and providential health emergency Operations centers to address public concern over COVID-19. To minimize the risk of coronavirus infection, the government requested all private and public organizations to postpone their meetings and programs for some period. On March 22, the government canceled the promotional campaign of Visit Nepal 2020 (The Onlinekhabar, 2020). Besides, arrival visa is canceled for travelers arriving from countries like China, South Korea Italy, Japan and Iran which were highly affected from the COVID-19 effective from 7- 30 March (Xinhua, 2020b). Furthermore, Nepalese nationals traveling from COVID-19 affected countries were instructed with mandatory 14 days home quarantine. Nepalese citizens are advised not to travel in the highly corona affected countries. Aviation authorities also urged the government to strictly adhere to the health regulations. Therefore, the government demanded international travelers to bring COVID-19 free certificate within them (Prasain, 2020).

3.4.After WHO Declares Global Pandemic

After declaration by WHO as the global pandemic, providential rapid Response Teams were activated. The free call center was made available by Nepal Telecom to disseminate information and awareness about the disease on 13 March. Health desks were established at all airports of the country. The government-mandated fourteen days self-quarantine for all the passengers coming through Tribhuvan International Airport (TIA). To unite in the combat against COVID-19, leaders of

SAARC countries hosted a video conference on 15 March (My Republica, 2020d). Different hospitals of Kathmandu and other cities are designated as the COVID-19 treatment hospitals and 2000 beds are arranged for the treatment of those patients. The government suspended all of the school level, university level, and public service commission examinations on March 19 because of the COVID-19 threat (My Republica, 2020e). The Meeting of the House of Representatives is postponed until March 26 with the condition of possible deferral, House of Service (Himalayan News, 2020a). In the same way, the meeting of the national assembly is deferred until further notice (My Republica, 2020f). On March 20, a travel ban was mandated for Europe, Japan, and West Asia, West Africa, and Gulf countries considering rapidly rising cases in those countries. By March 21, Gandaki province set up one hundred eleven beds dedicated to the treatment of COVID-19 infected people (Rising Nepal, 2020a). Considering the ever-increasing threat of COVID-19, the government decided to postpone the issuance of trekking permits to foreign tourists (Xinhua, 2020a). The government was increasing testing of the suspected individuals but at a slow rate. By the end of 23 March, 610 tests were done in National Public Health Laboratory and identified two cases so far COVID-19 (Health Sector Response to Coronavirus Diseases, 2020a). Then, the Government subsequently extended the testing facilities in the different parts of the country. Health checkpoints were being established at different border points. Administrations from Kailali (Rising Nepal, 2020b) and Arghakhanchi district posed lockdown in their respective jurisdiction for an indefinite period (Rising Nepal, 2020b).

On March 24, Government declared a nationwide lockdown coming into the effect from 25th March for eight days. With this, the government posed a ban on all of the activities inside the country except the emergency one. Movie theaters, cultural centers, stadiums, gyms and health clubs, museums, entertainment centers,

swimming pools, dance bars, and clubs are closed until 13th April. It also issued a restriction on the gathering of more than 25 people. With this, the international flight is also halted for fifteen days and the TIA is closed for that period. The protocol for the screening and isolation of the COVID-19 patient at the border point of entries was developed on 24th March. In the meantime, the self-quarantine protocol is developed and contact tracing of infected persons was executed extensively. Hospitals issued a notice not to come to it unless the case is serious.

Expert teams of NMC and WHO prepared the strategies for usage of equipment's equipment in the treatment of COVID-19 infected patients for personal protection. It included the specification of PPEs for aerosol and non-aerosol generating procedures, physicians examining the patients, drivers or escorts, laboratory, and other staffs. It is mandated to make a distance of 3-6 feet while visiting patients. The government also initiated the rescue of foreign tourists (Nepali Times, 2020b). From the different parts of the country, they are brought to Kathmandu and repatriated them through charter flights. They are by the end of March; the COVID-19 testing facility is extended to BP Koirala Institute of Health Sciences and Pokhara (Health Sector Response to Coronavirus Diseases, 2020b). The government also issued quarantine operation and management guidelines (Population Ministry of Health, 2020a) Meeting of High Commission for the Prevention and Control of COVID-19 Infection ordered all local governments to execute contact tracing and manage the possible COVID-19 patients falling in their jurisdiction. To reduce the crowd on the hospitals, non-urgent operations and follow-ups are postponed. Considering the negative effects of fake news, the government ordered all the media to transmit only that news which is verified by either the World Health Organization or the Government of Nepal. Nationwide lockdown and the closing of the international airport are continued for

months with successive cabinet decisions. In April, the first death was recorded because of COVID-19 (Chalise and Dhungana, 2020). So, the government extended the testing more extensively to identification, isolation, and the treatment of COVID-19 infected. By April 6, testing for COVID-19 infection was made available to all of the seven provinces (Health Sector Response to Coronavirus Diseases, 2020a). In total, ten testing facilities were established, four in Bagmati Province, and one each for the other six provinces. A similar facility was established at the Koshi Hospital, Biratnagar on 10th April. The government distributed around five thousand RDT kits to each province (Health Sector Response to Coronavirus Diseases (COVID-19). RDT kits were made available to all of the districts by April 11 (Health Sector Response to Coronavirus Diseases, 2020b).

To increase the morale and motive health personal, the Cabinet meeting passed an order to managing risk bonus for the health personal who are actively involved in airports, border points, quarantine management, labs, and other places as per the decision of local, provincial, and Nepal governments to prevent and control the infection of COVID-19 (Population Ministry of Health, 2020).

Table 2: The capacity of available health resources (15th April, 2020)

S.N.	Descriptions	Total
1	Beds in Hospital	26930
2	Hospitals having Intensive care unit facilities	194
3	ICU beds available	1595
4	Ventilators available	840
5	Hospitals running COVID clinics	111
6	Level -I COVID hospitals	13
7	Level -II COVID hospitals	12
8	Level -III COVID hospitals	3
9	Isolation beds	3076

(Source: MOHP, 2020)

Ministry has initially considered the 10000 active cases and made the dynamic preparedness and response planning based on the availability of ICUs, hospital beds,

ventilators, isolation beds of both public and private sector hospitals (Ministry of Health and Population, 2020b)

In the response plan, it was considered that level -I condition exists until the maximum cases of infection lie below 2000. If the infection cases exceed the up to 5000 cases, it would designate it to be the level-II conditions. If the country had 10000 cases of infection cases, the government would be considered as the level -III condition. If the condition worsens from level -III, the government plans to seek international assistance.

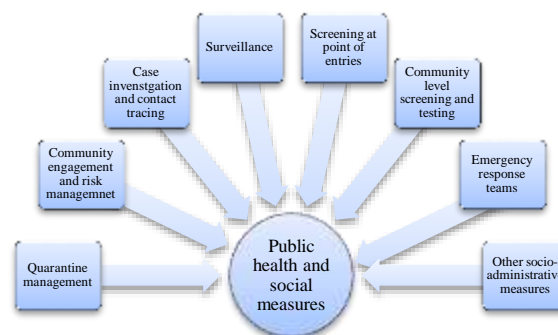


Fig 2: Public health and social measurement

The government decided to lift the four months long lockdown from 22 July to gradually reopen the economy whereas the restriction was still there for long-distance vehicles and the international flight (The Kathmandu Post, 2020g). On 31st July, the government first performed 10000 tests in a day. On August 18, thus, the government granted the discretionary power to the concerned chief district officers for imposing probationary orders or even curfew if needed (The Kathmandu Post, 2020h). After that, different parts of the country were imposed on probation order or even curfew to new hotspots of the countries. For instance, with the consent of district administration offices of Kathmandu, Bhaktapur, and Lalitpur district, Kathmandu valley was subjected to

the probationary order from August 19 to September 9 with several extensions. After that, an odd-even traffic system was implemented by the government to decrease traffic congestion and reduce the crowd in public places.

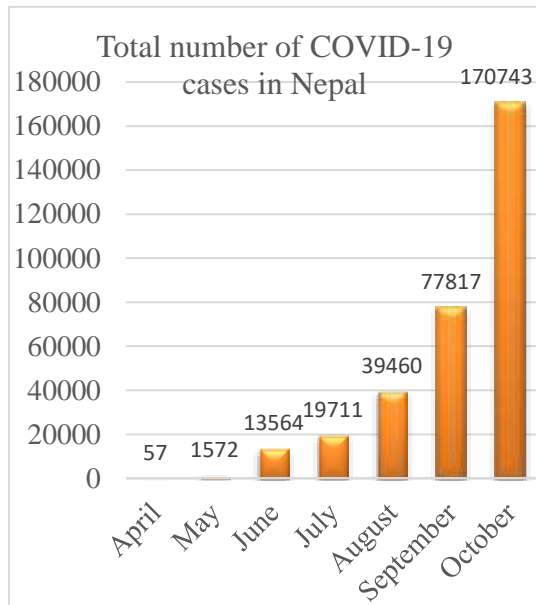


Fig 3: Total number of COVID-19 cases in Nepal in the last 7 months. (Data are measured by the end of the months) (Source: MOHP, 2020).

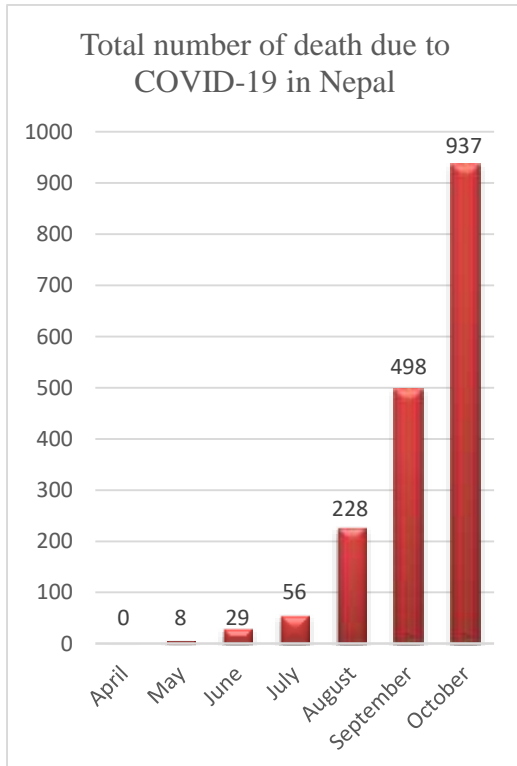


Fig. 4: Total cumulative number of COVID-19 deaths in Nepal in the last 7 months. (Data are measured by the end of the months) (Source: MOHP, 2020)

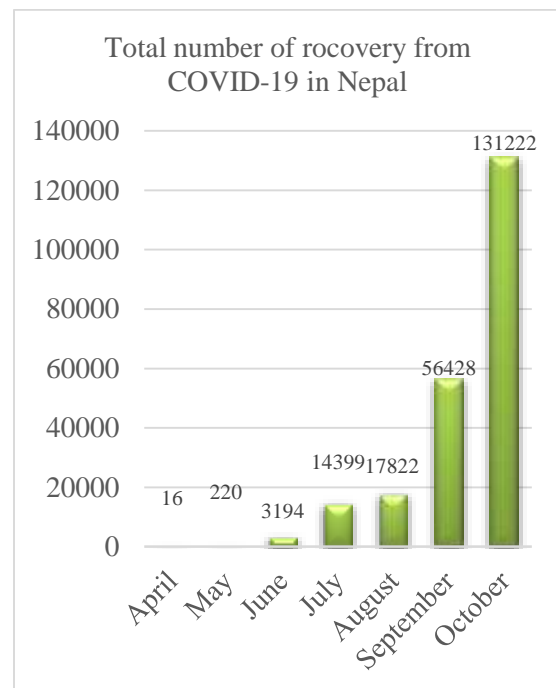


Fig. 5: Total cumulative number of recoveries from COVID-19 in Nepal in the last 7 months. (Data are measured by the end of the months) (Source: MOHP, 2020).

4. Effects of COVID-19 on livestock and food security

The COVID-19 influenced the supply chain of the market with impaired production and distribution accompanied with lack of labor and supply of inputs (Stephens et al., 2020). This vastly affects the livestock, poultry, fishery as well as dairy production. Because of COVID-19, as restaurants, hotels, industries and schools closed, the overall demand for milk, eggs and meat showed a decline in the Nepal. Livestock product supply chain has been disturbed due to COVID-19. There are adverse impacts on animal production, processing, transport, sales and consumption. The effects of COVID-19 on animal production are reduced access to animal feeds, reduced access to inputs and services and reduced access to markets, reduced processing capacity, and constrained national and international transport.

It is not possible to plant spring crops such as corn, sunflower, spring wheat, barley, canola, and open field vegetables in the midst of a pandemic. Therefore, due to the manipulation of the supply chain that the government needs to

fix rapidly, the pandemic has had a significant effect on food security (Stephens et al., 2020). The impact of COVID-19 is not beyond the horticultural harvest, domesticated animals and fish stocks. Of prompt concern is the interruption to food frameworks and the effect on food security (Torero, 2020).

As an agricultural country, lockdown of the movement has gracefully affected each stage of the food chain, together with the development and appropriation of food in Nepal. After a crucial inflexible reduction and the conclusion of the planning of organizations and legitimate business sectors, ranchers are forced to dump milk and vegetables (Poudel et al., 2020).

Delayed effect of COVID-19 could compel rural stalwart nations like China, the USA, and India, to force a prohibition on food sends out. Accordingly, in nations like Nepal, constant food deficiencies bringing about countrywide starvation is inevitable. Indeed, even at present where low flexibly is causing market irregularity, market costs are relied upon to soar when the economy resumes. Additionally, the ascent in each penny of the dollar would correspondingly mean an ascent in the difficulties of imports. In this manner, COVID-19 has shown the world that each country ought to have its food security system at the neighborhood level to be versatile to flare-ups like these, and the shortage that would go with it. The Ministry of Agriculture in Nepal has come out with certain measures to address a portion of these issues (Timilsina and Ghimire, 2020).

The horticultural division is confronting critical obstacles because of concerns COVID-19 pandemic and lockdown as it powers the nations to limit their fringe passages (Subedi and Jha, 2020). The inadequacy of relocating workers, stoppage of transportation, and closure of outskirts have disintegrated the market costs making the makers unfruitful (Ananth, 2020). In Nepal there is a wide range of variation in the topography and climate (Timilsina et al., 2020). By keeping in account climate for horticulture

production, even the smallest delay in sowing or harvesting can affect huge disaster for farmers that finally cause a food emergency (The Kathmandu Post, 2020). Everything stands by, yet vegetables won't trust that the lockdown will end before dying. Along these lines, they should be treated as cutting edge laborers by prohibiting profiteering and unlawful exchanges (Galanakis, 2020). The lockdown has demonstrated horticulture is the spine in each nation and offered a single circumstance to fabricate quality about food course of action, Law-based agro-based structures to help the ranchers around the world (Petetin, 2020). The fundamental agrarian issues are that the ranchers need to confront coordination hard to get data sources, for example, seeds, manures, and bug sprays. China, being the nation with the biggest maker and exporter of the manure on the planet, has influenced the global compost exchange, as a result of its extreme lockdown. Animal ranchers are principally stuck in these issues in which 38.5% of them have recorded in the significant test "Coordination disruption", contrasted with 35.6% of every single rural venture, 19.7% for nonagricultural undertakings (Zhang, 2020). Around 820 million individuals are confronting persistent appetite, and 13 million are confronting intense extreme (CEF et al., 2020).

5. Effects of COVID-19 on agribusiness

This pandemic COVID-19 has prompted an unexpected value climb, dark showcasing, and lack of items in the neighborhood markets. Although the legislature encourages people to pursue isolating and limiting people's get-together, with the appearance of the storm, a large number of ranchers need to gather in Nepal to plant food and cash crops. The present conditions of lockdown can help the legislature to crush this infection. However, on the off chance that the examples of minimal planting, collection, dispersion continue to be upset, many thousands would end their jobs, and the entire country could face big food frailty. The administration needs also implement steps to monitor the pandemic by avoid

disrupting the fluid food chain and taking into account the food security of its population.

Ministry of Agriculture and Livestock Development of Nepal has built up an advanced market and pronounced a 25 percent appropriation on the vehicle of agricultural items, considering the COVID-2019 emergency. Also, an activity of the "agribusiness emergency vehicle" acquired by Province-5 of Nepal for transportation and advertising of farming items can end up being a genuine saver in this pandemic circumstance. Moreover, the Government of Nepal has imagined the readiness and reaction plans to COVID-19 for the Fiscal Year 2020/2021 (Pandey, 2020).

The Government of Nepal has upheld lockdown since the most recent seven day stretch of March 2020 to forestall the spreading of the illness because of the current circumstance of the COVID-19. The pandemic has prompted an uncommon change in the economy of the nation, influencing the way of life of individuals, wellbeing, training, markets, enterprises, and the travel industry area. The agribusiness segment has confronted the most extreme impact with the inaccessibility of horticultural data sources like seed, composts, pesticides; apparatuses, agrarian devices, and absence of satisfactory work the executives. So also, because of aggravation in the transportation framework, reaped food items in some provincial regions will squander because of a lack of appropriate market offices. Nepal primarily relies on imports from far off nations to fulfill the needs of rural items. For example, the import of grains remained at 13,343 tons in the main seven day stretch of lockdown which has almost multiplied to 24,365 tons as of the eighth seven day stretch of the lockdown. For the decrease of import/export imbalance circumstance, Nepal can essentially zero in on the agribusiness segment by moving towards food independence which is characterized as the degree to which a nation can fulfill its own food needs from its homegrown creation without purchasing or importing (MOICS, 2020).

The impacts of lockdown on agribusinesses like agrovets who are significant providers of seed and in a couple of conditions offer compost to ranchers in Nepal. As the lockdown upheld limitations on development, ranchers couldn't buy contributions from agrovets in any event, when the agrovets had some stock accessible in their general vicinity. About 86% of agrovets discussed the trouble to get supplies from their providers because of the blockage of transportation and item inaccessibility, in this manner causing a 50-90% dunk in their agribusinesses (Pradhan, 2020).

In the event of the seventeenth National Paddy Day, Prime Minister K.P. Oli said that it was important to focus on the creative development of horticultural items by keeping up a balance between the dirt and crops and encouraged for most extreme use of terrains without saving them desolate and cultivating for the best yields according to the guideline of use. He additionally expressed that the nation has just given the Right to Food and Food Sovereignty Act, 2018 for the usage of the residents' key right on food as referenced in our constitution. Thinking about the reality, the administration of Nepal has executed arrangements and plans with main concern for feasible food security in the nation by expanding the creation of paddy crop," as indicated by the PM. Moreover, the PM has reaffirmed the administration's pledge to the extension of water system supplies, innovative work of paddy crop, quality seeds in sponsored rate, the arrangement of compost, innovation development, and specialized help to the ranchers. The PM was of the view that the turn of events and development of the farming division was the spine to emerge our public promise to 'Prosperous Nepal, Happy Nepalis' while laying accentuation on.

6. Economic Impact of Corona Virus

In about two months after its origin in China, coronavirus has spread around the world, infecting people and claiming lives at an unprecedented pace, leading to steps that threaten the global economy in an effort to contain it. (Hellewell et al., 2020;

McKibbin and Fernando, 2020; Ramelli and Wagner, 2020; Sohrabi et al., 2020). Due to the cessation of economic activity, the deterioration of employment, and greater pressure on the economic and banking areas, South Asian nations, including Nepal, will see a sharp economic recession. The study mentions that regional growth is expected to fall by between 1.8 and 2.8% in 2020, down from 6.3 percent six months earlier. This worsened outlook will continue in 2021, with growth expected to hover between 3.1 and 4.0 percent, down from the previous prediction of 6.7 percent. Due to the outbreak of the coronavirus, Nepal is beginning to experience the most unforeseen and lengthy shutdown of economic activity. In several industries, such as tourism, trade and production linkages, supply, and health, the effect has already begun to emerge. The tourism, aviation and hospitality sectors were hardly hit by the outbreak in Nepal, especially the entire service industries. According to the report, in fiscal year 2020, Nepal's economic growth is projected to fall between 1.5 and 2.8 percent, with decreasing remittances, trade and tourism, and wider disturbances having a significant effect on the slowing or reduction of services and manufacturing output. In fiscal year of 2021 financial growth will remain low due to the remaining effects of the disease outbreak, and some retrieval is predictable in year of 2022 (The World Bank, 2020). About 90 per cent of economic operations came to a grinding halt during the lockout. Recent forecasts show that the sectors of agriculture, manufacturing and services are expected to rise by 2.6%, 3.2% and 2%, respectively. These figures are slightly lower than the growth witnessed by these sectors last fiscal year. (Sapkota, 2020). Even with new developments and the government's pledge to reducing the complete shortage rate from 18.7 % last year to 16.7 % (Dhakai, 2020). The World Bank assessments that 31.2% of Nepalis are at danger of severe poverty, mostly due to lower remittances from foreign workers, the decline of the tourism industry, job victims in the casual zone and

higher prices of basic goods, all as a result of pandemic (The World Bank, 2020a).

25 percent of the population lives below the poverty line, according to the 2010-2011 Nepal Living Standards Survey. (Central Bureau of Statistics, 2011). Obviously, the correlation between poverty and infectious diseases is obvious (Alsan et al., 2011; Bhutta et al., 2014). COVID-19 is nothing like that, causing worldwide rising unemployment, loan defaults and considerable economic losses. (Kantamneni, 2020). The financial crisis caused by COVID-19 could increase financial inequality, fitness differences and social gaps in Nepal, which can increase in poverty. Businessmen badly effected by Lockdown, especially those who have small shops and have inadequate sources of income, the deprived, marginalized peoples and regular betting are highly exposed. Investigation has shown that the COVID-19 would contribute to an increased mental burden by socio-economic disadvantages such as job uncertainty, housing insecurity and food insecurity for poor or low-income citizens (Goldmann and Galea, 2014).

7. Market Fluctuation

By increasing infections of COVID-19, practically all global economies are being influenced severely. This has come about to a quick deceleration in their focus on monetary development which they have anticipated for the year 2020. Due to COVID-19, the world's annual financial development may recoil and stay at 2.4%, which was supposed to be expanding up to 3.0% during the year 2020. Due to spread of COVID-19 all around the world, the monetary charge will ascend from both sides of interest and gracefully (Sigdel, 2020). The effect of COVID-19 was generally observed in the farming segment. Most confronted genuine troubles in getting their produce to business sectors, both because of transport limitations and irregular conclusion of controlled business sectors or vegetable markets (Rawal and Kumar, 2020). Brokers were hesitant to ship produce due to vulnerabilities in moving merchandise, and even with a breakdown sought after, particularly in

huge metropolitan habitats, costs smashed. The circumstance was especially bleak for those in creature raising, i. e., makers of milk and meat. Numerous helpful dairies cut the costs they paid milk makers. Poultry ranchers confronted a considerable decrease popular, not just because of the conclusion of restaurants and pay misfortunes among purchasers, yet additionally due to introductory gossipy tidbits that COVID-19 is sent through winged creatures (Rawaland Kumar, 2020; Narayanan and Saha, 2020; Mahajan and Tomar, 2020; Seth and Vishwanathan, 2020; Hussain, 2020; Ramakumar, 2020; Singh, 2020). The COVID-19 flare-up has tried the versatility of the horticultural part. A global scale fortune required after from hostels and cafeterias has seen prices of horticultural goods reduced to 20% (Bhosale, 2020).

Delivering the fundamental yearly National Accounts Statistics of Nepal CBS (2020) the administration's focal factual body, said that a 2.27% development means a GDP of about R s3.76 trillion. With this GDP, the per capita salary of Nepalis will reach \$1,085 this monetary year, up from \$1,039 a year ago. Throughout the previous three years, Nepal had accomplished a development pace of more than 6%. Subsequently, CBS inferred that commitment of laborers' settlements as a level of GDP is required to drop to 19 percent this monetary year, contrasted with 25.42% last financial year. Settlement to Nepal is required to drop by an astounding 14% this year, flagging a monetary pain coming from the COVID-19 pandemic. The lockdown has likewise caused lost pay for the numerous individuals that were subject to settlements sent home by relatives working abroad (LWF NEPAL, 2020). This drop-in settlement generally means lost Rs145 billion, in light of the current swapping scale of \$1=Rs120 (World Bank, 2020). The National Accounts Statistics report shows that the commitment of the essential segment, which incorporates agribusiness, fisheries, ranger service, and mining, to the GDP will be 28.20%, with a development pace of 2.54%.

The drop in summer paddy creation and measures received to forestall the spread of Covid-19 has brought about a breakdown in the flexible chain, unfavorably influencing the division's development. Therefore, the agribusiness area, which developed more than 5% last monetary year, eased back to 2.59% this financial year (The Kathmandu Post, 2020e). More than 75% of merchants detailed medium interest levels for nourishments and non-food things, while the adequate volume of wares was accounted for by around 57% of dealers. The 75% of the 118 talked with brokers from 67 locales announced a medium gracefully of wares to business sectors and transportation comparatively was accounted for at a medium level by 59% of merchants. Then, 28% of merchants considered transportation levels high. The Government of Nepal has taken measures to encourage the gracefully of fundamental products to business sectors. The mid-year paddy planting has been almost finished, stretching around 98% of all-out developed land. Be that as it may, the flexibly of synthetic composts is deficient in numerous pieces of the nation because of import limitations brought about by the COVID-19 circumstance, conceivably influencing the general food creation in the nation (World Food Program, 2020).

The pandemic is now producing an exceptional effect on the worldwide and provincial exchange, with world product exchange 2020 expected to fall by as much as 32%. Not at all like some other food or wellbeing emergency in present-day times, the effects of COVID-19 are causing flexibly, and request stuns at a public, local and worldwide level, prompting quick and longer-term chances for food creation and accessibility (My Republica, 2020g). Coronavirus profoundly impacts agribusiness framework availability. The COVID-19 pandemic is affecting global connections a long way past the agri-food area's work power. This incorporates declarations of fare limitations over a few nations that limit worldwide agri-food exchange and market access (Laborde and

IFPRI, 2020). The agri-food segment is profoundly associated globally. Ports that shut down or diminish movement limitlessly decreased cargo limit on business trips for horticultural merchandise, and other expansive worldwide gracefully bind disturbances because of the COVID-19 emergency can restrict basic admittance to rural sources of info and markets. This may contrarily affect rural efficiency for ebb and flow and future seasons. The suddenness and seriousness of these closures leave little extension for recognizing reasonable homegrown substitutes temporarily yet may spike less dependence on worldwide agri-food esteem chains later on (Ivanov, 2020).

8. Positive Aspect of COVID-19

Despite numerous effects, there are some sure effects excessively identified with COVID-19. The positive aspect of lockdowns has been outstanding, as contamination levels have fallen essentially; for example, ozone-depleting substance emanations, nitrogen dioxide (NO₂), dark carbon, and water contamination have diminished definitely (Chakraborty and Maity, 2020; Saadat et al., 2020; Tobías et al., 2020; Wang and Su, 2020; Zambrano-Monserrate et al., 2020). Also, temperature impacts the COVID-19 transmissions, yet have discovered blended (positive, negative, and immaterial) influences on COVID-19 transmissions (Briz-Redón and Serrano-Aroca, 2020; Prata et al., 2020; Shi et al., 2020; Xie and Zhu, 2020). Air pollution is additional vital indicator that influences the COVID-19 transmission and death rate (Abdullah et al., 2020; Carrington, 2020; Muhammad et al., 2020). In this manner, because of less development of anthropogenic exercises, distinctive contamination has been diminished, which is an excellent indication of the progress of the condition situation. While the COVID-19 pandemic has unprecedentedly affected society and the economy, despite what might be expected, it has assisted repair some natural harm (Chakraborty and Maity, 2020). Ozone harming substance discharge, NO₂, water contamination, commotion contamination,

and contamination in seashores have diminished fundamentally because of full or incomplete lockdowns and severe development control request (MCO) by numerous administrations over the world (Chakraborty and Maity, 2020; Saadat et al., 2020; Wang and Su, 2020; Zambrano-Monserrate et al., 2020). These limitations have assisted nations in lessen ecological contamination and recover air quality and personal satisfaction (Chakraborty and Maity, 2020).

9. Government Policy for COVID-19

With the passing of thousands and sensational effects over the worldwide economy, it has constrained governments around the globe to get ready alternate courses of action and bundles alongside the examination about our future (Fernandes, 2020; Hockings, 2020). In a consequence to 'smooth, the loop (Loeb, 2020) Outskirt conclusions, travel restrictions, and isolation have been approved by governments (Alijazeera, 2020; Renjen, 2020) In nations that form the world's largest economies, beginning feelings of dread of a global emergency approaching and a downturn (Buck et al., 2020).

Due to no obvious sickness therapy until now of the COVID-19 and irresistible nature, we need to center on the contamination, anticipation, and control measures. In case of Nepalese, infections are in its 1st stage and early 2nd stage. The legislature is mentioning to whole general society, remain at home to keep the flare-up worsening. Maintaining lockdown request gave by the legislature is an absolute necessity to control proportions of the flare-up. Under the administration of the service of Health and Population, the screening office is giving through the purpose of the passage. The administration has been demonstrating the 24-hour working wellbeing work area office at Tribhuwan International Airport. Observing groups and wellbeing work areas have been set up at significant fringe registration and passageway purposes of the region. The legislature of Nepal under the service of wellbeing and populace (MoHP, 2020) has built up the COVID-19 Quarantine

Operation and Management Guideline-2076, PPE use rule for COVID-19, COVID-19 clinical administration rule. Nepal's legislature deals with the test office of COVID-19 from 7 distinct clinics and treatment agreements as well as the addition of 26 independent emergency clinics.

The Ministry of Federal Affairs and General Administration has given around to all nearby governments to give essential alleviation resources to groups of people and gatherings that are needing uncommon assurance, as the nation reels under the danger of the COVID-19 pandemic (The Himalayan Times, 2020). Neighborhood administrations are venturing up their help dissemination, and the private area is offering critical help to philanthropic causes, and empathetic alleviation like augmentations in the dates utilities and advances should be paid (Nepali Times, 2020). In any case, it was said that help activities were not arranged to spare lives and occupations and that they don't indicate the 'who', 'when', 'how', 'why' and 'under what terms' of the bundles (The Annapurna Express, 2020). The Ministry of Women, Children and Senior Citizens additionally concluded that if older residents and in an unexpected way abled people were kept isolate or disconnection, the nearby level governments concerned would need to make extraordinary game plans and those neighborhood-level governments expected to guarantee that ladies with serious inabilities get least essential materials, including sterile cushions, in isolate or disengagement (The Himalayan Times, 2020). The Top Committee on pandemic in Kathmandu chose 12th March to make each endeavor to forestall the passage of the infection into country (GoN, 2020). On 14th March, all visas were postponed, and all land PoE shut down (GoN/MoHA, 2020). Travelers that had shown up in country were mentioned to remain in isolation and inform to the Sukraraj Tropical and Infectious Disease Hospital in the event of side effects (GoN, 2020). A fast analytic test (RDT) for serology was started in Nepal toward the beginning of April as an

enhancement to RT-PCR (GoN, 2020).

10. Preventive Measures and Challenges to Contain the spread of COVID-19

The COVID-19 pandemic, the biggest global threat faced since the Second World War, has spread to a total of 213 economies and infected over 3 million people. Because of the possibility of transmission of corona virus, Nepal Government undertook numerous precautionary actions. Kathmandu and many other districts are shut down. People are requested to stay at home excluding for reasons of emergency. Health-desks have been established at the international airport and the border checkpoints. Every foreign citizen entering in country must stay on self-isolation for 2 weeks, and all travelling by air have been postponed.

The legislature of country halted completely limited-time missions, for example, 'Visit Nepal 2020'; 'Sagarmatha Sambat 2020', and other global occasions (Mohammad et al., 2020). The world is highly sensitive to avoid the spread of virus by closing borders (The Kathmandu Post, 2020c). Nepal set up wellbeing work areas at the worldwide air terminal and on the checkpoints, starting in mid-January. Land borders with India similarly to China were later completely shut and all travelling by air have been postponed. Each academic evaluation was stopped. Disengage centers, and momentary crisis facilities are being the course of action in the country. Nepal dropped its overall restricted time practices related to Visit Nepal Year 2020. Its economy is needed to be truly affected by the pandemic because of its impact on distant business, the movement business, collecting, improvement, and exchange (The Himalayan Time, 2020). As demonstrated by The Kathmandu Post, prior this disease outbreak hospitals in country had barely any Intensive Care Units (just three in Teku Hospital), which were regularly involved, people normally trusting that the beds will be unfilled. It itemized authorities as saying that it is adjacent to hard to surrender new patients to Intensive Care Units when they need them (The Kathmandu Post, 2020d).

There are different general wellbeing tasks in controlling the dissemination of virus in Nepal. A log jam of monetary action with harmed gracefully chains that sway the general well-being frameworks in Nepal is possible. Many South Asian nations are defenseless against high populace thickness in urban areas, where it is additionally testing to keep up social separating, helpless cleanliness, and lower (wellbeing) education rate. Moreover, in some of disease cases do not produce symptoms, so it is hard to anticipate the seriousness of the flare-up. Nepal is amazingly hard to keep up with social removing, helpless cleanliness, and lower (wellbeing) education rates. Moreover, some COVID-19 cases stay asymptomatic, so it is hard to foresee the seriousness of the flare-up (Shrestha et al., 2020). At last, cooperation between public offices in Nepal with worldwide associations, for example, the CDC and the WHO can assist with containing the spread of COVID-19 through worldwide accepted procedures (WHO, 2020).

11. Conclusions

The pandemic COVID-19 influenced all industries, including agriculture, manufacturing, trade, enterprise, and health. Till November 1, 2020, Nepal has reported 173567 total COVID-19 cases people with a death and 134842 recoveries. The legislature of Nepal is taking activities to diminish the effect of COVID-19 on smallholder ranchers by easing lockdown estimates which helped precede with horticultural exercises. Districts were mentioned to illuminate smallholder ranchers in keeping up social removing while at the same time proceeding with their cultivating exercises. The Ministry of Agriculture and Livestock Development (MoALD) has proposed a crisis bundle of help to smallholder ranchers developing money crops including vegetables and raising little scope animals, which has been submitted for endorsement. MoALD disclosed a horticulture advancement plan comprising of five columns: sponsorship of agrarian

information sources, admittance to low-intrigue advances, expanded specialized administrations, rural protection, and assurance on least investment funds for smallholder ranchers. COVID-19 decreases the supply and accessibility of farm resources such as seeds, fertilizers, pesticides, machinery, which results in a decrease in agricultural productivity. The downturn of COVID-19 is an ongoing big worldwide recession that is smashing into global financial markets. The pandemic also influences the farm-to-consumer supply chain, involving farms, manufacturers, distributors, retailers, and trade. For the world to deal with this pandemic the health sector requires sufficient resources, develop tools to trace contacts, strengthen public health sectors through volunteer mobilization, and better utilize mass media. Effective policies, laws, and regulations should therefore be developed and enforced.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

15. Authors' Contributions

KK: conceptualized the research, involved in necessary data collection, data analyzed, and write up the initial draft of this manuscript.

BM, KG: wrote up the introduction and discussions part of this manuscript
BL, HPP, IT: collected data and helped to write up this manuscript
JS: revised the initial draft of this manuscript

All the authors have approved the final version of the manuscript and agreed on submission for publication.

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