Assessing the COVID-19 and its shocks on macro-economic variables in Nepal

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Abstract:

This study assesses the COVID-19 and its shocks on macro-economic variables in Nepalese economy based on the secondary data sets of macroeconomics variable pre- and post-COVID-19 by applying descriptive statistical methods. The growth of COVID-19 is unpredictably spreading all over the world. Its hot spot has been in the South Asia, particularly in Delhi and Nepal. Its correlation between COVID-19 cases and per capita GDP is positive. In South Asia, its growth rate is higher than its recovery indicating inefficiency of health system. Similarly, its shocks are so strong to influence trend, pattern and structure of macro-economic variables. Economic growth declined at 0.1percent in 2020 with falling outputs of agriculture, industry and service sectors. Unemployment rate reaches at 27.8 percent from 11.4 percent. The poor population increased by 7.47 percent. Besides, residential income and household income has fallen along with sharp decline in labor and remittance income. Lastly, its negative implication is found in foreign exchange reserve and balance of payment, trade and revenue. Thus, the COVID-19 and its shocks are undesired fluctuations and impose implications in Nepalese economy. Therefore, Nepal should improve health care system and vaccine availability for reducing the effects of pandemic and the lockdown for stability and recovery of the economy and also for welfare of the poor.

Key Words: *COVID 19, macroeconomic indicators, economic growth, health care system, etc.*

1. INTRODUCTION

COVID-19 became an undesired big exogenous issue to the world from the beginning of the year 2021. Its growth and version dynamics have made unaccountable disastrous shock directly to the health and livelihood of human being but also indirectly to the global economic system (*global production system, global supply system and global trade regime*) and household economy of the world. WHO (2021) reported 299.1 million COVID-19 cases with 5.4 million death and 257.1 million recovered cases, despite rapid vaccination to the world. Debate on COVID-19 about its nature either planned (lab made) or unplanned (nature made) has been going on from its outbreak with 44 COVID-19's positive cases in Wuhan City of China in January 9, 2020 (WHO, 2020 and

Mandal and Pal, 2020) but its first report on 31st December, 2019 from Wuhan, China (Isaifan, 2020; Dutheil et al., 2020; Han et al., 2020). Until and unless, it is a hope that the ongoing and future scientific studies will solve this mystery with its scientific facts, figures, linkages and motives in coming days to the World. Till date, the COVID-19 has badly captured more than 210 countries across the World with the result of 5.2million population positive cases, 0.4 million death and more than 0.2 million recovered (WHO, 2020). Its unexpected side effect is horizontally and vertically all over the World. It badly smashed the public health system of the World challenging its advance technology, services supply and delivered and its standard, along with insufficient beds, testing kits and medicines (Huang et al., 2020, Kambalagere, 2020, Sohrabi et al., 2020 and Zhang et al., 2020). In USA, the overcrowded COVID 19 positive cases could not find bed in the hospitals. A large number of patients were waiting for hospital beds and treatments. Similar constraints were found in Italy, Spain, UK, France, Germany etc. In addition, it has induced humanitarian, cultural and religious crisis. Christian community followed cremating the death body instead of burying. Social distancing was maintained in the funeral ceremony. In Spain, the overflooded death bodies raised demand of coffin and other. In Guatemala, death bodies were left for more than a long week in the street. Similarly, large numbers of dead bodies were buried at the public place in New York. Thus, COVID-19 has been a great threat to the health of the population in the World.

As per the policy response to prevent this COVID-19's outbreak and transmission, lock down and social distancing were employed partially and fully as preventive shield for the safety of the population. As a direct and indirect result of this, COVID-19 has prevented the mobility of 7.8 billion populations and 80 trillion USD worth of world economy in the developed and developing economies. IMF and the World Bank projected that the world economy would have about 3 trillion USD preventive cost causing a 3 percent negative average economic growth, along with its negative outcomes: causing more than 50 percent unemployed population and the growth poverty and vulnerability by 50 percent. Further, OXFAM (2020) predicted its distribution of intensity would be more in developing and least developed countries of Africa and Asia.

A literature of the WHO (2020) has noted COVID-19 as rapid transmittable infectious respiratory diseases having three levels: a) infected, b) recovery and c) non-recovery-death. Its transmittable capacity that is invisible with higher than SARs and HIV/AIDs is either local or imported. Its major cause is mentioned to social integration and contacts between human being. Therefore, WHO (2020) has recommended health protocol to control COVID-19 to three things: mask, social distancing and using sanitizer and now intake of vaccines. The COVID-19 directly affects human health

and livelihood and indirectly national economy. Committee for the Coordination of Statistical Activities (CCSA, 2020) found different cases of COVID-19 across the country with unpredictable nature of the pandemic and policy importance. Clemente-Suárez (2021) has argued COVID-19 as surprises to the world health system with its adverse effect on health, particularly mental health. Similarly, Cheng, Kim, and Koh, (2020) considered it as evidence of global health and economic crisis. Therefore, COVID-19 is a deadly disease changing the world socio-economically and politically.

McKibbin, and Fernando, (2020) examined the impacts of different scenarios on macroeconomic outcomes and financial markets in a global hybrid Dynamic Stochastic General Equilibrium/Commutable General Equilibrium model. The study found significant impact on the global economy in the short run. UN (2020) specified the impact on macro economy as sharp declines in domestic demand, lower tourism and business travel, trade and production linkages, supply disruptions, and health effects, along with the magnitude of the economic impact based on the outbreak length. The study examined the impact of the ongoing COVID-19 outbreak on China and other developing Asian economies based on historical time series data and cross-sectional information through the use of descriptive statistics. Additionally, ADB (2020) and IMF (2020) have similar analysis.

Likewise, CCSA (2020) assessed how COVID-19 is changing the world: a statistical perspective in the world with analytical and descriptive tools. In the quantitative assessment, CCSA (2020) found 40 percent falling global FDI in 2020, 20 percent falling global manufacturing output in April 2020, 150 million full time job loss, pushing additional 71 to 100 million people into extreme poverty and unprecedented decline in the HDI and 43 percent decline in remittance inflow. Thus, the analysis concludes changing the world towards vulnerability and instability in short runs. As a supplement, UN (2020), ADB (2020) and IMF (2020) quantitatively assessed the impact of the ongoing COVID-19 with the prediction of a global impact of $77 billion (0.1%) to $347 billion (0.4%) of global GDP, with a moderate case estimate of $156 billion or 0.2% of global GDP. Two-thirds of the impact falls on the China. In addition, it suggested the impact of the COVID-19 on individual developing Asian economies. ADB(2020) quantified two thirds of the global impact in the moderate scenario the loss to China to a no-outbreak scenario with 103 billion USD (0.8% of Chinese GDP) meanwhile the rest of developing Asia would experience a loss of 22 billion USD (0.24% of its GDP) under the moderate scenario. Differently, IMF (2020) assessed the impact of COVID 19 on the Global Economy, expecting only a 0.1 percentage point (ppt) cut to 3.2%; later, on 4 March, it revised its outlook to a rate lower than the global growth of 2.9% in 2019, before declaring on 23 March that the global economy will face a recession. In its assessment report on the impact of the COVID-19 outbreak published in 2 March, the

OECD predicted a reduction of 0.5 ppt from the original forecast of 2.9% global growth for 2020, to 2.4%, or a near halving to 1.5% in case of a prolonged global outbreak. Additionally, CCSA (2020) has predicted adverse effects of the COVID-19 pandemic on Asian economy.

Cheng, Kim, and Koh, (2020) in the difference-difference method based study of the impact of COVID-19 on subjective wellbeing: evidence from Singapore found a large decline in satisfaction and domain-specific satisfaction, except satisfaction with health. Besides, the study found dropping household income during the COVID-19. Clemente-Suárez, *et al*. (2021) has considered it as health stressor having direct impact on the metal health of the population by provoking the public health for flexibility, innovation and adaptation. The study argues the use of technology and mass media as important tool to mitigate such effects. Therefore, McKibbin, and Fernando, (2020) argued the need for greater investment on public health system in all economies but particularly in less developed economies where health care systems are less developed and population density are higher.

In this context, Nepal's lockdown was exceeded 60 days after adopting the lockdown preventive measures similar to SAARC countries to slow down the vertical and horizontal growth of COVID-19's positive cases and the potential deaths. As the growth of preventive economic cost, IMF (2020) predicted a slowdown equivalent to 3.67 trillion USD economy of SAARC with negative 3 percent. Therefore, Nepalese economy of 38.32 billion USD would have its negative outcomes at macro and micro economic level including economic growth, employment, sectoral output and performance, trade and balance of payment (BOP), fiscal deficit, livelihood, poverty etc. If lock down was extended in future, its undesirable effects would be unexpectedly more. Therefore, the preventive economic cost of COVID-19 and its implication on Nepalese economy at macro and micro level were a relevant issue to find out a way forward to save the economy from COVID-19 induced economic slowdown (recession). Despite its policy execution and discourse, none of the literatures have focused on this issue. Therefore, this issue is relevant to this paper to understand COVID-19 scenario and its shocks on macro-economic variables and implication for future adaptation policy. This paper is organized into five sections including introduction, objectives, data and methodology, result and discussion, and conclusions.

2. OBJECTIVES

The broader objective of this paper is to assess the COVID-19 and its shocks on macroeconomic indicators of Nepal. Its specific objectives are to review COVID-19 in the World and South Asia, Nepal; to assess its shocks on the macroeconomic indicators; to identify its implications on macroeconomic indicators; and to identify its issues

for the further policy implication for preventing and controlling COVID-19 and its undesired shocks in Nepalese context.

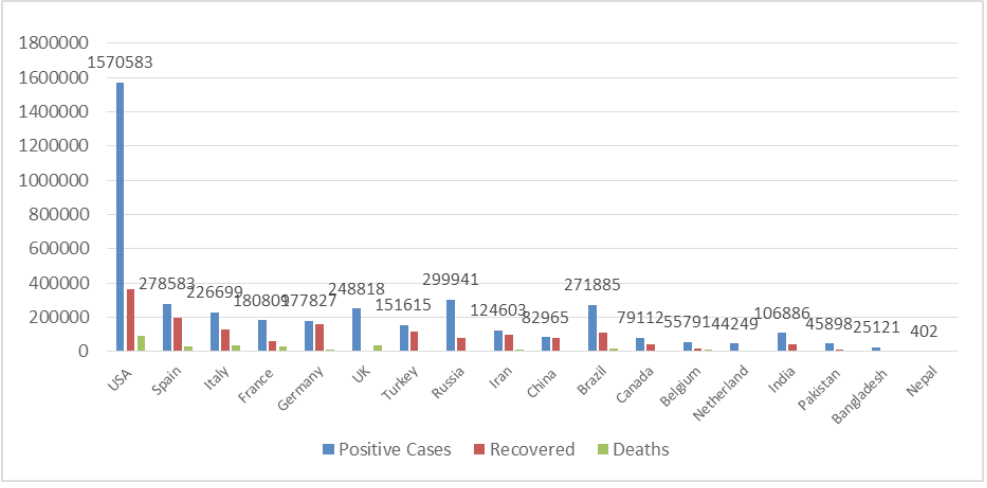
3. DATA AND METHODOLOGY

Under quantitative research design, this study is descriptive cum analytical nature. Data sets of COVID-19 and macro-economic variables are from secondary sources. The data set consists of COVID-19 cases, death and recovery cases across the country from February 2020 to May 2020 collected from the daily report of the WHO. Similarly, GDP per capita of the world was collected from the World Bank (WB) and IMF. Besides, economic growth rate, employment, income distribution, output of sectors, trade, remittance and BOP in the pre- and post- COVID-19 were collected from the Economic Survey, Ministry of Finance, National Planning Commissions, and statistics of Nepal Rastra Bank.

Analytical tool of the study is descriptive statistics to describe two periodical data sets of COVID-19 and macro-economic variables in the pre and post COVID-19 and analyze their dynamics and statistics with economic effects and causes for their indications and implications. In the descriptive statistics, the study analyzes trend, structure and pattern of COVID-19 and macro-economic variables.

In the study, excel sheet was applied to compile all data bases of COVID-19, real GDP per capita, economic growth rate, employment, income distribution, output of sectors, trade, remittance and BOP for exporting in SPSS and further processing in the form of figures and graphs.

Figure 1 COVID-19 Scenario of the World



Source: WHO, 2020

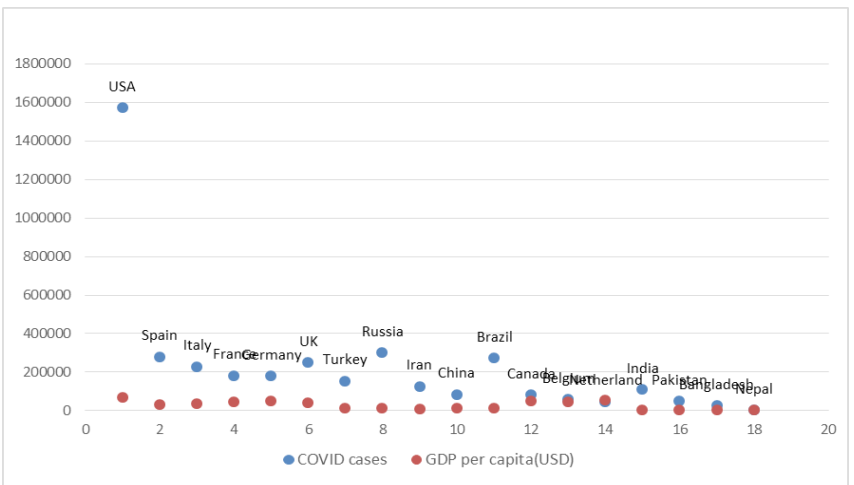
4. RESULTS AND DISCUSSION

4.1. RESULT 1: Review of COVID-19 scenario in the world and south Asia

Coronavirus disease (COVID-19) is an infectious disease (WHO, 2020). As per report of WHO, it can infect massively by attacking mildly the respiratory system of human body. Its nature indicates no need of special treatment but old age people having medical problems like cardiovascular diseases, diabetes, chronic respiratory disease and cancer are more vulnerable. WHO (2020) mentioned that its transmission could be slowed down with awareness, washing hand and sanitization and then isolation. Despite its mildness, no specific vaccines or treatments for COVID-19 was still in clinical trail and killed 0.335 million people by infecting 5.2 million people in 210 countries of the World (Figure 1). Out of 210 countries, USA had ranked at top. In this scenario, COVID-19 did not vary with income per capita categorization and regions of the country, along with age, sex, caste, language, religion, income, position and color.

Its transmission level was from two sources: imported and local (WHO, 2020). All countries had COVID-19 imported from Wuhan City, China at initial level but then its transmission took place to family and then society at mass level. Interestingly, COVID-19 is not reported any more in Wuhan city and the remaining Chinese cities. But its fast growth and concentration can be found in Italy and Spain and then USA, UK, France, Germany and Russia and now slow and gradually, its outbreaks can be found in low per capita income countries (WHO, 2020). Figure 2 shows COVID-19 and per capita income relationship in the world in which y-axis represents to GDP per capita (USD) and x-axis represents to COVID-19 cases.

Figure 2: COVID 19 and GPD per capita in the world

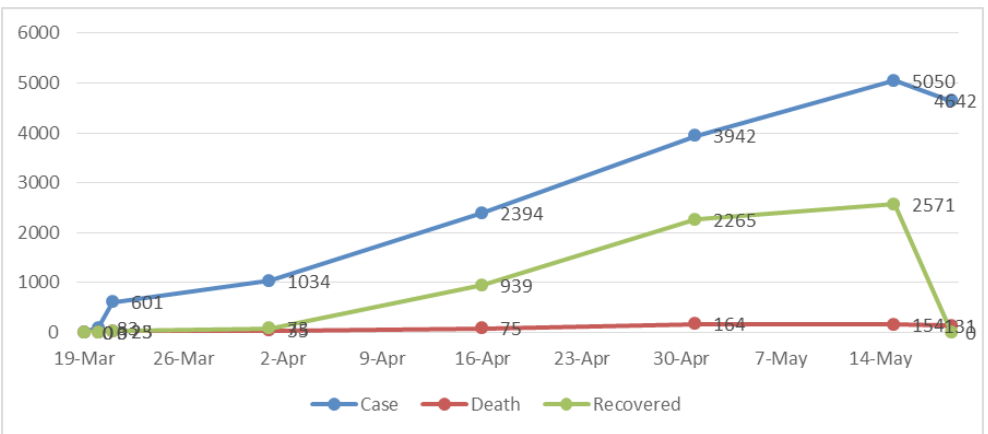


Source: WHO 2020 and World Bank, 2020

As mentioned in the report of WB, figure 2 shows positive correlation between the growth of COVID-19 cases (*Blue dot*) and per capita income (*Red dot*). In the figure 2, USA, Spain, Italy, France, Germany, UK, Russia and Brazil are good evidence for it. Reversely, lower per capita income countries including India, Pakistan, Bangladesh and Nepal have lower intensity COVID-19 cases. Thus, the relationship between COVID-19 and per capita income appears by coincidence to have positive correlation.

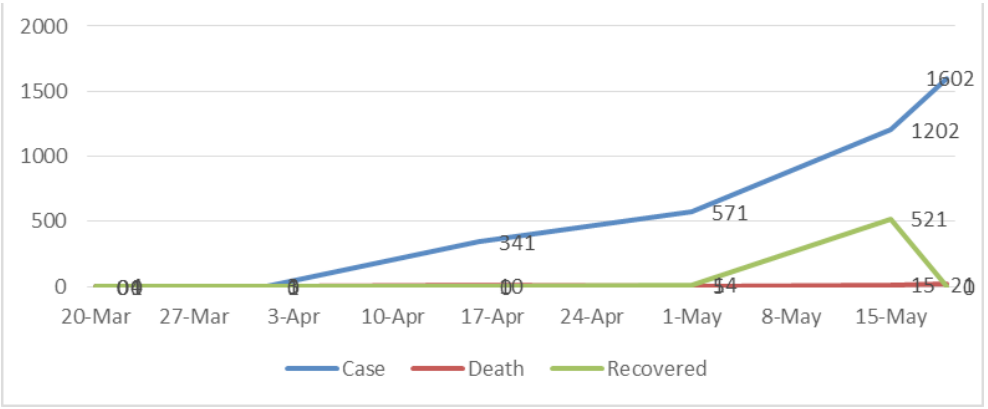
In South Asia, India has become an epi center of COVID-19. It is followed by Bangladesh, Pakistan and Nepal too. Figure 3, 4, 5 & 6 shows 0.11 million population infected, 49026 recovered and 3600 deaths in India; 506924 infected, 15201 recovered and 1067 deaths in Pakistan; 30205 population infected, 6190 recovered and 432 deaths in Bangladesh; and 507 infected, 70 recovered and 3 deaths in Nepal. Such numbers indicate slow gradual growth.

Figure 3: COVID 19 cases in India



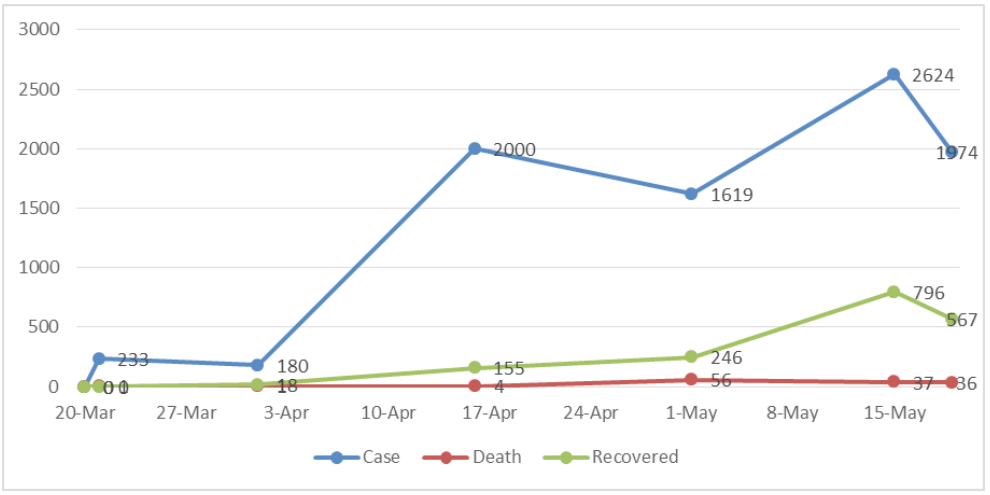
Source: WHO, 2020

Figure 4: COVID-19 in Bangladesh



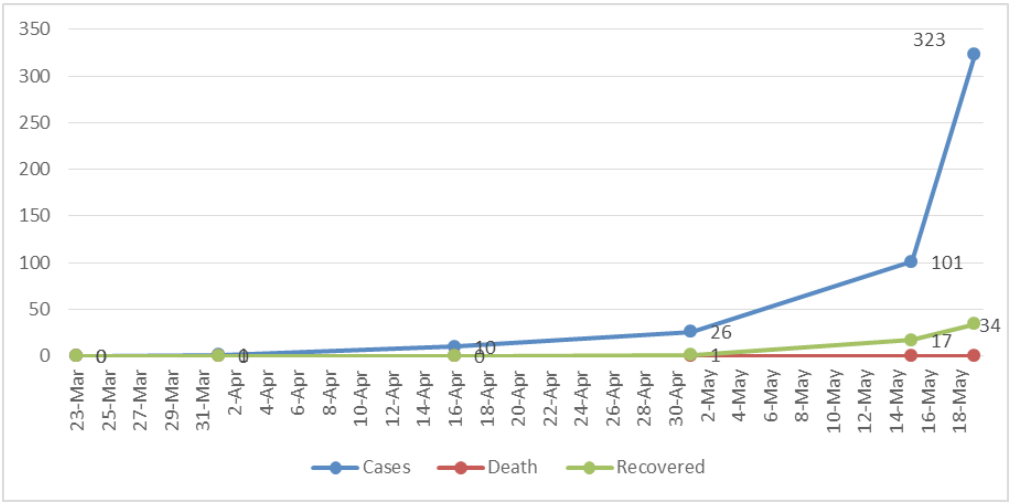
Source: WHO, 2020

Figure 5: COVID-19 in Pakistan



Source: WHO, 2020

Figure 6: COVID-19 in Nepal



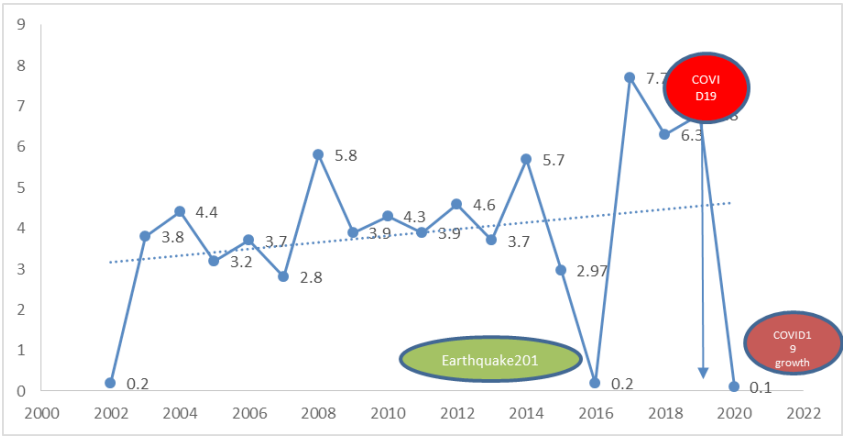
Source: WHO, 2020

However, Figure 3 & 5 shows India and Pakistan have a declining trend but Bangladesh and Nepal have a rising trend (Figure 4 & 6). It indicates higher risk of the growth of COVID threat in South Asia forever in the absence of intervention and resilience. In South Asia, India has become a hotspot spreading rapidly COVID-19 to neighbor countries like Nepal, Bhutan, Bangladesh, Pakistan, etc. To some extent, it reveals fragility and vulnerability of health governance system of all South Asian countries and their preparedness to counter it. Therefore, the collective effort of SAARC countries is necessary to prevent it.

4.2. Result 2: Covid 19 and Economic Growth

Figure 7 presents trend of economic growth with the reference of negative three percent economic growth rate projection of IMF. In 2019, National economy size of Nepal reached at 3832 billion NRs with 6 percent economic growth rate in average in the last three

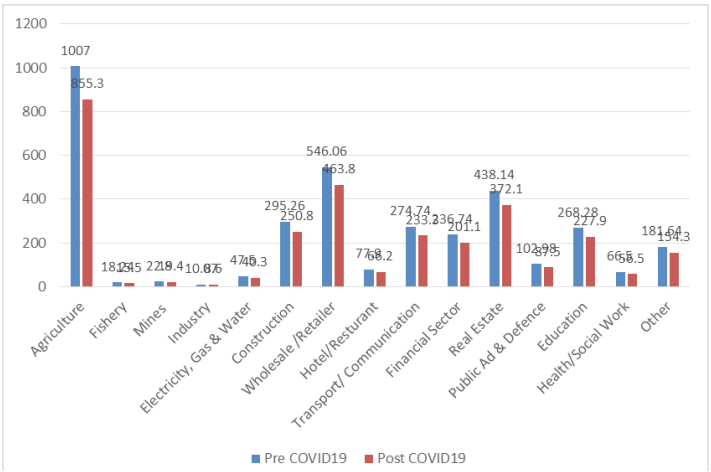
Figure 7: Economic growth of Nepal



Source: MoF 2020

Consecutive years. In 2020, the government of Nepal has expected similar economic growth rate, despite its fluctuation. With lockdown measures, Nepalese economy has lost 10.2 billion NRs per day in economic sectors that comprised of agriculture (27%), Industry (13.5%) and Service sector (59.5%) (Figure 8) . As a result, it has slowed down economic activities with -3 percent economic growth. Therefore, COVID-19 may have a higher shock on economic growth similar to the shock of the earthquake in 2015. As an economic implication, of COVID-19, economic growth would downfall at 0.1 percent (Figure 7).

Figure 8: Sectoral Output during COVID-19 in Nepal



Source: MoF, 2020

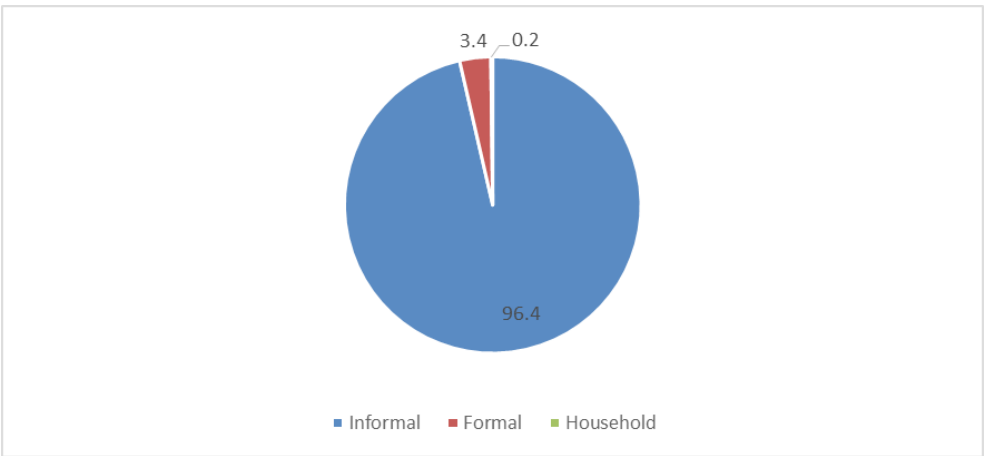
4.3. Result 3: Employment and Poverty Level

Like as output, employment generation is macroeconomic objective and output indicator of economic policy of the government related to industry, agriculture, service and trade. In the last three consecutive years, about 0.5 million employment generation was a key objective of budgetary policy in Nepal. Figure 9 & 10 shows informal employment (96.4 %), formal employment (0.2%) and others (3.4%) in which agriculture sectors contribute more than 65 % employment. Till 2019, approximately 10 million population was economically active out of 30 million total population. Out of economically active population, 76 percent have employment in formal and informal sectors and 4.3 million population is in foreign employment. In 2019, the national unemployment rate was 11.4 percent in which unemployment was 10.9 percent in rural areas and 11.6 percent in urban areas.

Lockdown to prevent COVID-19 has closed down all economic sectors, except health sector. In these all economic sectors, approximately 7.6 million population are unemployed over 60 days long. As a result, the growth of unemployment may be 16.4 percent. Thus, unemployment threat may be 27.8 percent in the post COVID-19(Figure 11). Its further negative consequence will follow.

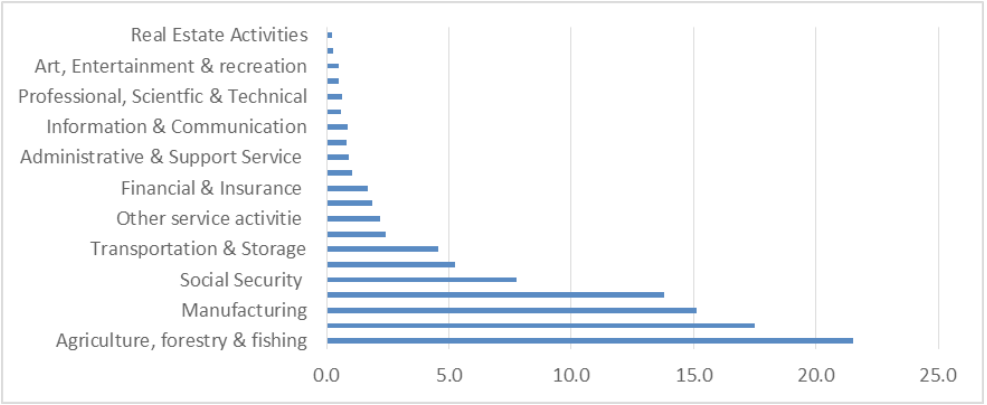
Employment Loss

Figure 9: Employment Structure



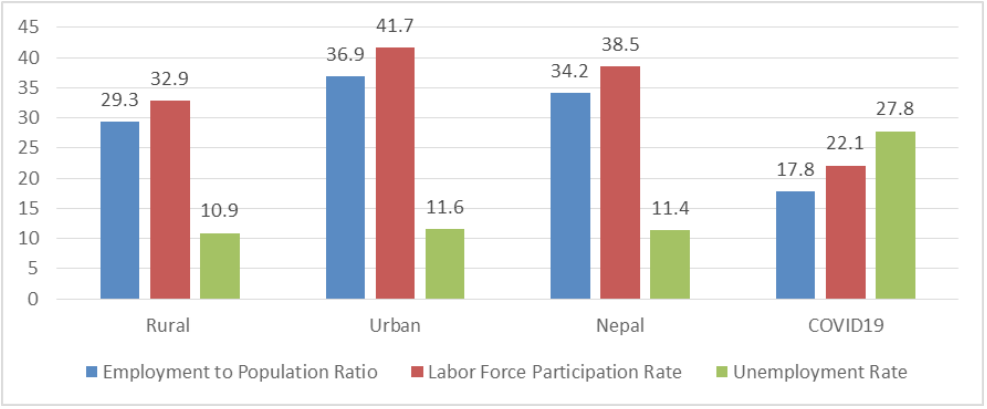
Source: MOF, 2020

Figure 10: Employment Structure by Sectors



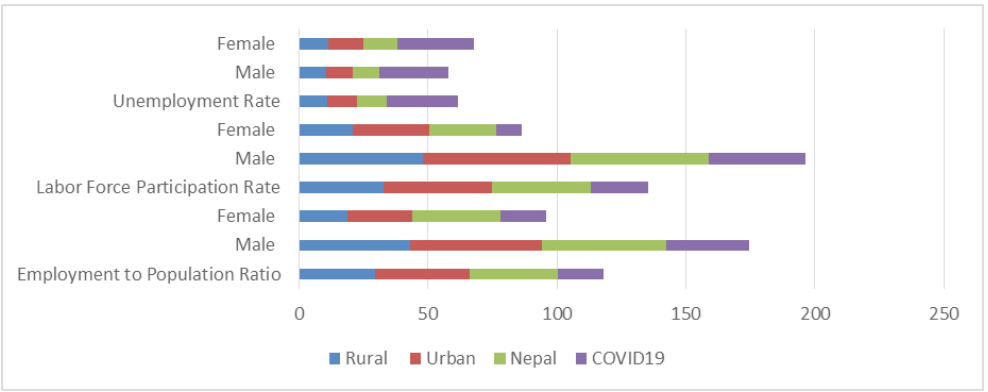
Source: MOF, 2020

Figure 11: Employment and Unemployment Rate



Source: MOF, 2020

Figure 12: Employment, Unemployment and COVID-19

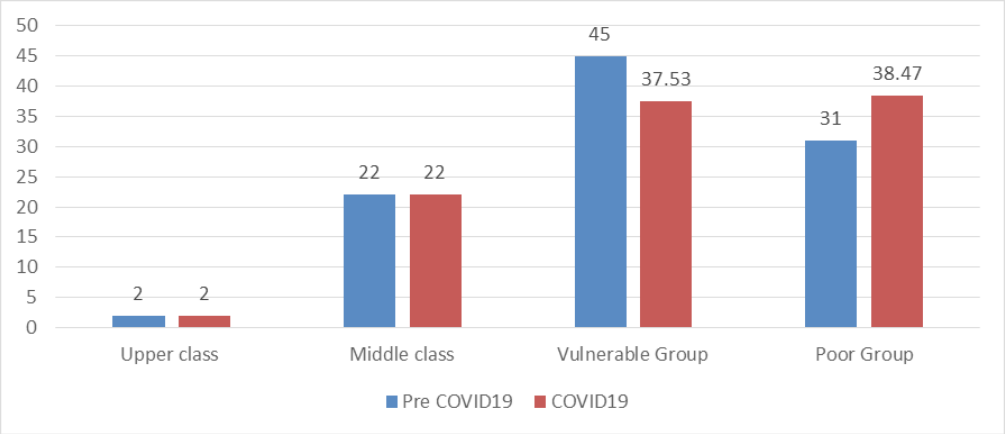


Source: MOF, 2020

Figure 12 shows its negative consequence on both sex: male and female. Its distribution is more on male's employment than female's employment. Despite the less implication of COVID-19 unemployment, it would be sensitive to female because of their small employment level (21 % in rural and 29.3 % in urban areas). It may be a driver to change household budget, income, expenditure, consumption and living standard, along with the growth of gender discrimination and of poverty level.

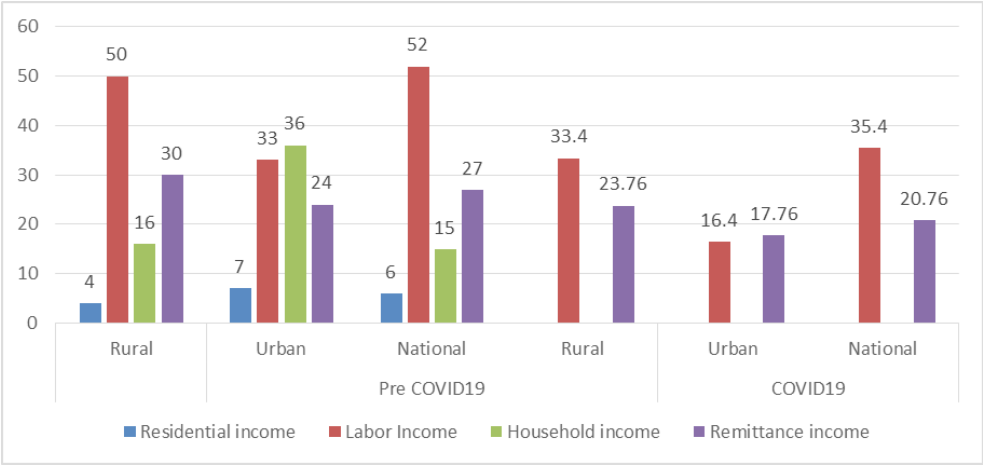
Poverty is a threat to economic growth, development and prosperity of Nepal. Since 2010, Nepal has implemented Poverty Reduction Strategy Paper (PRSP) based on five principles: country-driven, result-oriented, comprehensive, partnership-oriented, and based on a long-term perspective with the following popular strategies: broad based economic growth, social sector development (including human development), Social Inclusion and Targeted Programs, Good Governance, Improving Financial Management and Accountability and Decentralization (NPC, 2007). In 2010, its size was 32 percent. Till date, the poverty level had declining trend at 18.7 percent after the implementation of three consecutive plans. The Fifteenth Plan has a target to reduce poverty at 13.5 percent from 18.7 percent through the implementation of Sustainable Development Goal (SDG). NRB (2015) study has mentioned remittance receipts of 4.3 million household as a major driver of poverty reduction. In addition, Nepal has four income groups: upper class (2%), middle class (22%), vulnerable group (45%) and the poor (31%) having four income sources: residential income (4%), household income (15%), labor income (50%) and remittance income (27%) (Figure 13 & 14).

Figure 13: Income Distribution and Poverty Level



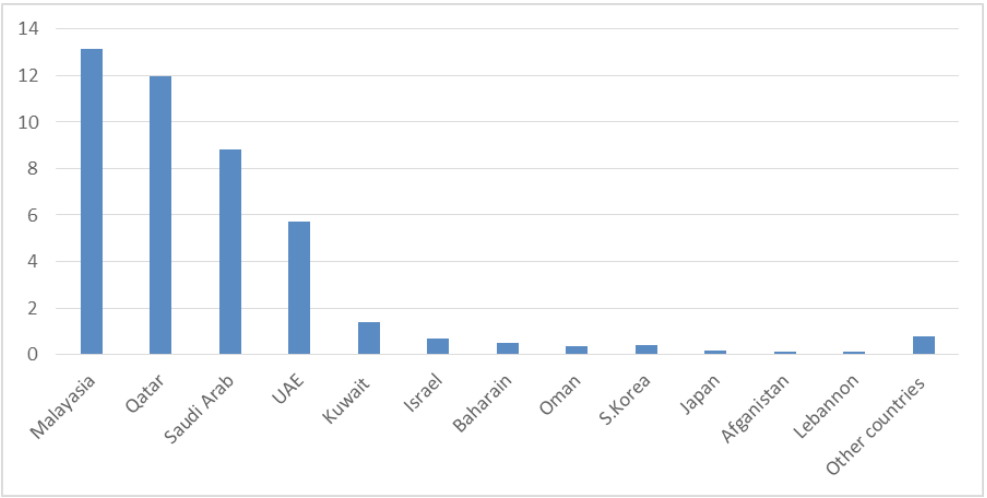
Source: MoF, 2020

Figure 14: Drivers of Poverty Reduction



Source: MoF 2002

Figure 15: Foreign Employment and Remittance

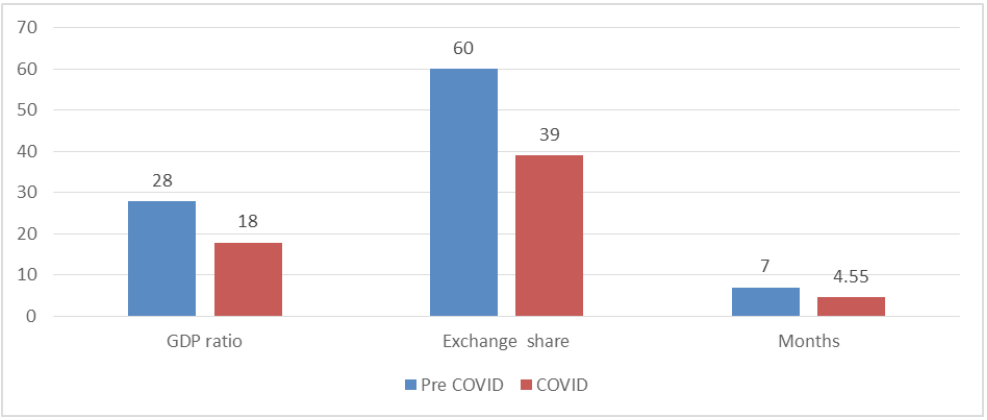


Source: MoF, 2020

Figure 14 shows COVID-19 effects on employment, labor income and remittance income. Based on employment loss (unemployment) (16.4%) and remittance loss (23%), its implication may be negative on poverty reduction and transformation of income group. The loss of labor income and of remittance may not affect on upper and middle class but it may affect more on the vulnerable and poor group. It is expected that the vulnerable group will transform into the poor group. Then, the poor group will spread at 38.47 percent. In addition, out of the drivers of poverty reduction, labor income and remittance income of household may decline at 35.4 percent and 20.76 percent respectively. At household level, COVID-19 may have serious and wider implications by increasing the poverty level and by reducing living standard of household. As a result, poverty level will be 31.8 percent if unemployment rate is 16 % and poverty level is 18.7 percent.

4.4. Result 4: Foreign Employment, Remittance, and Foreign Trade

Figure 16: Remittance and Trade



Source: MOF, 2020

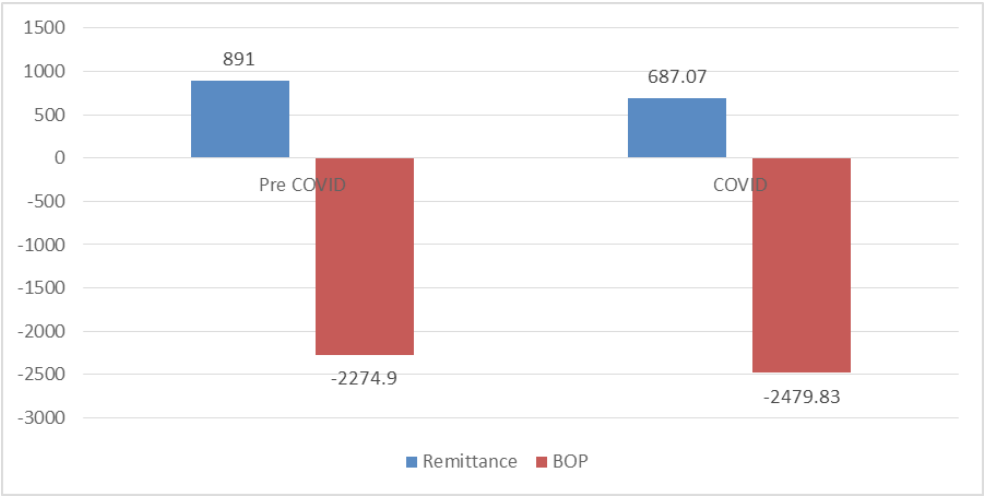
EXCHANGE, TRADE AND BOP

In accordance with CBS (2020), Per annum 0.5 million youth enter in labor market. The supply of job cannot be stated formally because of the dominance of informal labor market. Wider gap between supply and demand in labor market is a prominent feature of Nepalese economy. Big and formal foreign labor market has been a supplementary after the entry of WTO and the effective role of regionalism and liberalization. As a result, Figure 15 shows about 4.35 million population in foreign employment in different countries including Malaysia, Qatar, Saudi Arab, Kuwait, Israel, Bahrain, Oman, Japan, Afghanistan and Lebanon (Bista, 2011, 2016 & 2021). Its return is remittance equivalent to 28% of GDP amounting to 891 billion NRs per annum (Figure 16). It is a major source of foreign currency reserve contributing approximately 60 percent for maintaining import capacity and Balance of Payment.

Figure 16 shows that foreign currency reserve. Foreign currency reserve is cosidered as the strength of national economy. In principle, it should be more than 8 months import payment.

In 2019, its reserve was only for 7 months and its share to foreign exchange was 60 percent. Figure shows decreasing remittance-GDP ratio to 18 percent from 28 percent in Nepal based on the IMF's 23 percent remittance loss estimate. As a result, foreign exchange may be only at 29 percent contributing 4.5 months import payment. Subsequently, COVID-19 destablizes and weakened foreign excahnge reserve in the economy.

Figure 17: Remittance and Balance of Payment

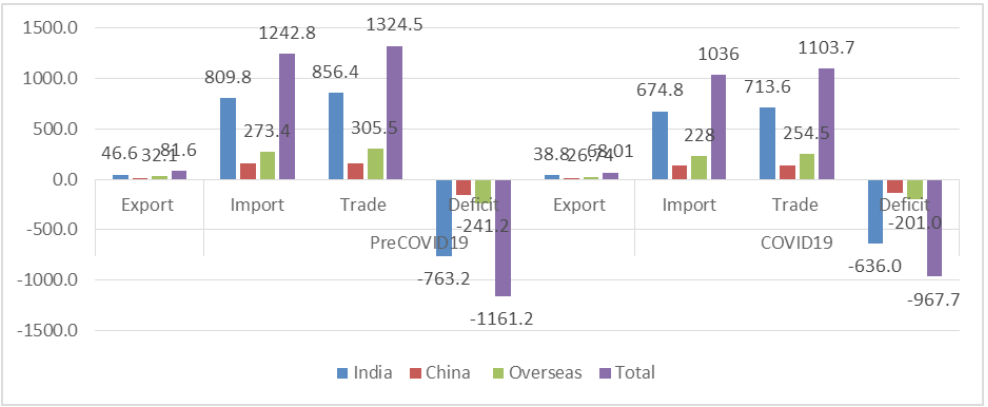


Source: MOF, 2020

Balance of Payment (BOP) is an important macroeconomic indicator. In principle, BOP should be positive for macroeconomic stability and healthy. Therefore, current account should be positive and in surplus. Despite effective and strong macroeconomic policy, the wider trade deficit leads to negative current account balance and then negative BOP. Therefore, the objective of the trade policy is trade surplus oriented for macroeconomic stability, higher economic growth and higher productivity of sectoral economy and labor.

In Nepal, trade has a long history with different thoughts. During 17th and 18th century, it was mercantilist nature with excessive export trade and protectionism to import trade. As fourth component of national economy, trade has opened up Nepalese economy since then. Trade could not expand as target of trade policy to reduce the wider trade deficit and negative BOP. In 1980s, its result was macro-economic crisis to response which the partial trade liberalization was initiated and then fully liberalized in 1990s. As result, trade liberalization has made the growth of trade dependency, trade deficit and negative BOP. Export-Import ratio has reached 1:15 with -1161.2 billion NRs worth trade deficit and -2274.9 million BOP (Figure 18).

Figure 18: Trade and COVID-19



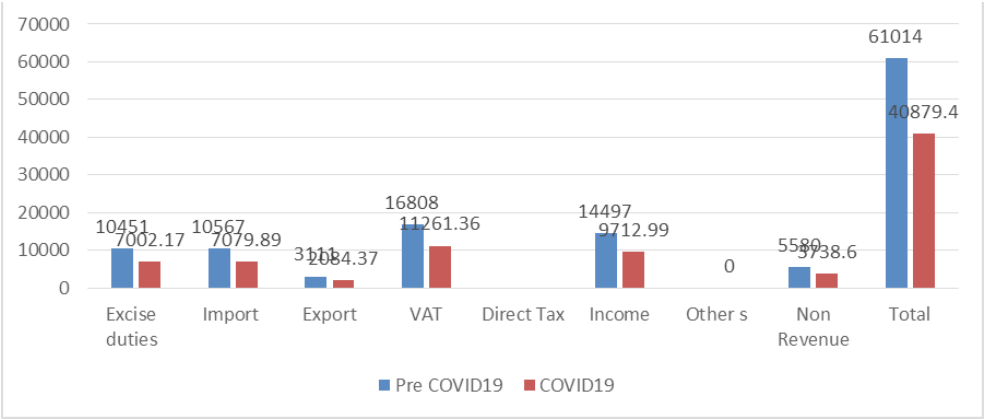
Source: MOF, 2020

Figure 18 shows fully slow down trade (import and export) after lockdown and COVID-19. Trade multiplier is nearly zero over 60 days lockdown. In 2020, import and export trade may decline substantially. As a result, trade deficit may decline and negative BOP may improve. However, declining remittance could not contribute to transfer negative BOP into positive BOP.

4.5. Result 5: Covid-19, Revenue, Budget Deficit and Fiscal Deficit

In SAARC, Revenue-GDP ratio is nearly 25 percent. However, its composition is dominated by revenue tax (91%) (80% indirect tax and 20 % direct tax). About 80 percent tax revenue relates to production, consumption, distribution and import-export trade. Despite higher tax rates and higher Revenue-GDP ratio, it just meet regular expenditure of the budget that is approximatly 1000 billion NRs (MoF, 2019). Its subsquence is the contraction of capital budget and finanacial payment but it extends fiscal deficit more than 5 percent and dependency on external debt and aid for development.

Figure 19: Revenue and COVID-19



Source: MOF, 2020

Over 60 days lockdown, direct and indirect tax collection is slow down with the loss of 200 billion NRs (Figure 19). It is uncertain but that situation may worse in coming days if lock down is extended. Thus, COVID-19 may destroy the capacity to meet the expansionary regular expenditure of the budget. Its negative impact will be wider budget deficit leading to the growth of debt dependency and fiscal deficit. Thus, macro economic stability and economic health would be critical.

5. CONCLUSIONS

This paper analyzes total economic cost of COVID-19 in Nepal and its implication at macro and micro level based on secondary data through descriptive statistics. COVID-19 is an infectious diseases infecting 5.2 million population and killing 0.4 million population in the world, where its intensity was extremely more in G20 countries with higher transmission rate. Similar scenario was found in South Asia where its rate is slow and gradual but it threats India, Bangladesh, Pakistan and Nepal. India was an epi center of COVID-19. In Nepal, its total economic cost was 540 billion NRs and 402 COVID cases having contribution significantly GDP loss of Nepal. So far concerning macroeconomic variables, such economic cost has negative impacts on economic growth rate, sectoral economy, remittance, employment and poverty, foreign currency reserve, balance of payment and fiscal deficit. So, COVID-19's direct and indirect cost to Nepal has increased vulnerability at macro and micro level. Thus, total economic cost may be a big burden and a key driver of macroeconomic instability and poor health of developing country like Nepal having small economy and imperfect and inefficient public health system. It is clear that unpredictable and undesired exogenous variables and events in the world are functional dynamically to counter endogenous variables

and events of national economy of the less developed countries. Its socio-economic and political cost is far beyond the projection to the less developed countries, like Nepal. Therefore, the less developed countries should improve resilient capacity and preparedness of national economy and sector's capacity to minimize socio-economic effects of such unpredictable and undesired exogenous variables and events in the cooperation with the international community to save life of the people and national economy from such economic shocks, losses and cost led economic recession so that humanitarian and economic crisis could be minimized as possible.

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