Title: Strategic assessment of COVID-19 pandemic in Bangladesh: Comparative lockdown scenario analysis, public perception, and management perspectives

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Abstract:

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Global pandemic COVID-19 is in stage 4 of widespread local transmission in Bangladesh- the country which did not have a noteworthy health policy and legislative structures to combat COVID-19 like a pandemic. Early strategic planning and groundwork for evolving and established challenges are crucial to assemble resources and react in an appropriate timely manner. This article, therefore, focuses on the public perception of comparative lockdown scenario analysis and how they may affect the sustainable development and the strategic management regime of COVID-19 pandemic in Bangladesh socioeconomically.

Response from 159 respondents was collected via a purposive sampling survey method through a questionnaire, and 54 statements were collected for scenario analysis. Datasets were analyzed through a set of statistical techniques including Principal Component Analysis (PCA), hierarchical Cluster Analysis (CA), Pearson's correlation matrix (PCM), Linear regression analysis (LRA), and psychometric characteristics were included in the Classical Test Theory (CTT) analysis. There were good associations among the lockdown scenarios and response strategies to be formulated. A strong significant positive relationship was observed between people who will start moving towards regular life and the formal and informal economic activities will be started in lockdown scenario 1(r=0.671, p<0.01). The scenario one describes how the death and infection rate will increase if Govt withdraw the partial lockdown before 40 to 50 days. Scenario 2 outlines people's movement will enable low-level community transmission of COVID-19 with the infection and death rate will increase slowly (r=0.540, p<0.01). Moreover, there will be less supply of necessities of daily use with a price hike (r= 0.680, p<0.01). Scenario 3, full lock down will reduce the community transmission and death from COVID-19 (r=0.545, p<0.01). Moreover, along with the other problems gender discrimination and gender-based violence will increase rapidly (r=0.661,

p<0.01). Form regression analysis, due to full lockdown, the formal and informal business, economy and education sector will be hampered severely (R=0.695), there was a strong association between the loss of livelihood and unemployment rate will increase due to business shutdown (p<0.01) and poor communities both in urban and rural areas will be affected severely (p<0.01).

All these will further aggravate the humanitarian needs of the most vulnerable groups in the country in the coming months to be followed which needs to be dealt with proper response plans. It will undoubtedly affect the targets of global sustainable development goals (SDGs) of 2030 and all other development targets.

Keywords: COVID-19, strategic management, scenario analysis, response plans, lockdown

1. Introduction

According to WHO, worldwide COVID-19 pandemic deaths to infection ratio amounted to approximately 6.9% by April 22, with 175,694 deaths and over 2,54 million confirmed cases. It appears that the national emergency response plan, public health efforts have slowed development and reduced the scale of China's COVID-19 outbreak, preventing hundreds of thousands of cases within 50 days in China, Korea, Taiwan, Vietnam and elsewhere (Tian et al., 2020; Zhang et al., 2020). Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T) (SWOT) analysis method identifies a strategic basis and assesses a relevant and relative approach to prevent and control the COVID-19 pandemic (J. Wang & Wang, 2020). The use of evidenced-based strategic emergency control measures in the epidemic areas and the integration of resources from multiple systems, including business, community, technology, education, and transportation, across China was successful in the containment (Liu et al., 2020).

Yet the public healthcare system and unique legislative structures, as well as a focus of current preparedness and other key capacities, allows and encourage preparedness and response to the pandemic (Oppenheim et al., 2020). Rather than the highly centralized approach, an integration of decentralized approaches is required to slow down the pandemic (Carinci, 2020). Yet the severe infection of COVID-19 pandemic has devastated the healthcare systems across the globe from a shortage of N95 masks, and personal protective equipment (PPEs) for the healthcare workers and putting occupational health risk, allocations of ventilators, ICUs, and hospital beds to a patient who can benefit most from treatment while letting the older persons to death. The peaked disparity between supply and demand for healthcare properties raised a normative query of equitable

resource allocation during the Covid-19 pandemic (Emanuel et al., 2020). Thousands of healthcare workers have already been infected worldwide (Gan et al., 2020) and the administrative and managerial departments are likely to place increased burdens and stresses on the frontline healthcare workers (Willan et al., 2020). Yet the logistical challenges associated with the healthcare supplies and mobilizing the medical forces and rapid construction of new medical facilities intervened crucially to prevent a pandemic, providing frontline healthcare workers' safety and reducing the mortality (Ji et al., 2020).

In response to the COVID-19 pandemic, the Government of Bangladesh (GoB), declared special general leave from 26 March to 5 May 2020 in four different times creating confusion among the most socioeconomically vulnerable groups in the country. However, the lockdown and the social distancing strategy in a densely populated country are not working and Bangladesh is going through level 4 of widespread local transmissions. For instance, in a funeral of a religious leader on 18 April 2020, more than 100000 people gathered violating the lockdown order, and the administration failed to control the gathering (Dhaka Tribune, 2020). Today, after the 48th days of the first COVID-19 patient detection the number of confirmed patients stands at 4,689, with 131 deaths reaching all 64 districts (Figure 1). Until now with the presence of 19 laboratories in the country, the number of tests performed is 39,476, which is still smaller compared to the other countries (Table 1, Figure 2 and Figure 3). Bangladesh did not have a noteworthy health sectoral policy and legislative structures to combat COVID-19 like a pandemic. On 5 March 2020, "National Preparedness and Response Plan for COVID-19, Bangladesh" was released to facilitate planning and identify response levels and risk assessment. There are 1,267 Intensive Care Units (ICUs) in Bangladesh- 520 in government hospitals and 737 in private hospitals reported by the National Committee for Prevention and Control on Covid-19 (IEDCR/DGHS/GOB, 2020a) yet many of them are out of order and there is lack of coordination. Until 24 April 2020, 287 Bangladeshi doctors have been infected in COVID-19 which is about 6.12% of the total infected cases while hundreds are from the emergency services like the caregivers, armed and security forces.

During a pandemic, a humanitarian crisis may arise in a developing country like Bangladesh. In most incidents, it will be the combined effects of a variety of shortages that will very likely to culminate in the worst outcomes (Truog et al., 2020). This can lead to a shortage of basic needs including foods, goods and services such as job loss, economic and financial loss, food insecurity,

famine, social conflicts and deaths. Besides, an impact on the psychosocial and socio-economic and health and wellbeing of the citizens may be affected which we had shown in our previous study (Shammi et al., 2020). Whilst predicting all the subsequent impact of the COVID-19 pandemic is challenging, early strategic planning and groundwork for the evolving and established challenges will be crucial to assemble resources and react in an appropriate timely manner. This article, therefore, focuses on the public perception of comparative lockdown scenario analysis and the strategic management regime of COVID-19 pandemic in Bangladesh socioeconomically. As there is no such prediction on how long the situation prevails, the absence/ lack of management strategy for epidemiological and socio-economical emergency response, it might be a tool to assess the forthcoming situation under a set of specific scenarios. Therefore, the objective of this study is to analyze long-term strategic management of the pandemic in three different lengths of scenarios in a resource-limited setting of the so-called lockdown of the country. The outcome can play a crucial role to formulate emergency response strategy to tackle the COVID-19 pandemic both epidemiologically and socioeconomically in developing countries like Bangladesh

2. Methodology

2.1. Study procedure

Considering the impact of current socio-economic lockdown for flattening the curve of COVID-19 infection in Bangladesh, this study identifies three scenarios based on the country's current situation, expert consultation, literature review and cross-validation. Scenario-based literature review and expert consultation were considered to set and validate 54 statements for getting perceptions from a different group of people. Google Form based online questionnaire was prepared to conduct the survey. An online database of target participants was prepared by reviewing the relevant websites and online social platforms of different expert groups in Bangladesh, considering their current activities, responsibilities and engagement related to COVID19 response, socio-economic sector, country-level planning and policymaking. The prepared questionnaire with an introductory paragraph outlining the purpose of the study was shared through Email, Facebook, LinkedIn, and WhatsApp with selective and relevant people considering the purposive sampling method. The questionnaire survey was conducted from 09 April to 11 April 2020.

2.2. Research sample and population

The target population was general Bangladeshi citizens age 18 years or older. The inclusion of the respondents was different social groups like university faculty and scholars, Government officials, development worker or practitioner, doctors, engineers and technologist, youth leaders and students, businessman and industry officials, banking and finance corporates, researchers and others. The answers to the survey questionnaires are the voluntary basis. Data from 159 participants were collected *via* a purposive sampling survey method. A five-point (1to 5) scenario-based Likert scale was employed to test whether each understands the statement descriptions that ranged from strongly disagree to strongly agreed with the statements. Total 54 statements were used to conduct the scenario-based impact assessment and management of COVID-19 outbreak in Bangladesh

According to the survey findings, the ratio of male to female participants was 3:1, while the composition of age groups was 44% (18–25 years old), 41% (26–35 years old), and 15% (36-55 years old), respectively. However, the average age of the respondents (n=159) was 28.44 years (SD±6.51). More than half of the participants were males (n=113; 71%) and remaining (n=46; 29%) females. Nearby, 40% of the youth leader was mostly students as they are the dynamic group in the society, also involved in COVID-19 response, social works, job seeking, research and reporting activities. Rest of the participants were from various professions of doctors, civil service officials, development practitioners, non-government officials, expert panels, and university scholars.

2.3. Data analysis

The descriptive statistics (e.g., frequencies, percentages, and student T-test) were used to understand the participant's characteristics. Investigation of psychometric characteristics was included in the Classical Test Theory (CTT) analysis. The CTT analysis included internal consistency, test reliability, corrected item-total correlation, average variance extracted (AVE), and validity of the item selection. Applying the Statistical Package for the Social Science (SPSS) v. 25.0, datasets were analyzed via a set of statistical tools such as principal component analysis (PCA), hierarchical cluster analysis (HCA), Pearson's correlation coefficient (PCC), multiple regression analysis (MRA), and CTT analysis. PCA is one of the population data reduction techniques that indicate each potentiality of variables and their significance level in a huge sample size. Before conducting the PCA, Kaiser-Maier -Olkin (KMO) and Bartlett's sphericity tests were applied to confirm the necessity of this analysis. The results of the KMO >0.5 (the KMO value was 0.8 in this research) and the significance of Bartlett's sphericity test at p<0.01 verified our datasets to be fitted for the PCA (Islam et al., 2020). The number of factors chosen was based on the Kaiser's normalization principle, where the only factors with eigenvalues>1.0 were regarded. Cronbach's alpha was employed to test the consistency and reliability of the factor loadings in this study. Cronbach's alpha validation values ranged from 0.925-0.934 (the Cronbach's alpha reliability value was 0.925 indicating that these statements are appropriate in social science study (Table 2) (DeVellis, 1991). The hierarchical cluster analysis (HCA) is a crucial means of identifying relationships among all socio-environmental variables. The HCA assists to classify a population into different groups based on the similar characteristics of a set of the dataset that may show causes, effects, and or the source of any undetected socio-environmental crisis. Furthermore, hierarchical clustering was adopted to determine the possible number of clusters. The one-way ANOVA test was conducted to confirm the significant differences in the variance at p < 0.05.

2.4 Ethics

The study procedure was carried out based on guidelines for the declaration of Helsinki. Informed consent was obtained formally before data were amassed from the participants. All the participants were informed before data collection about the specific objective of this study. Participants were able to complete the survey only once and could terminate the survey at any time they desired.

3. Results and Discussions

3.1. Setting the scenarios

Reductions of COVID-19 pandemic have been linked with the cessation of public transport, educational institutions, the closing of entertainment and business centers, the prohibition of public meetings. Averagely, cities that carried out control measures of lockdown within the first week of the outbreak reported fewer cases compared to the cities which started control later (Tian et al., 2020). Vietnam, the communist country bordering China of 95 million has been an under-reported low-cost success story of the pandemic, which has had just 268 coronavirus cases and no deaths due to strong public health systems, good governance and transparent communication approach and contact tracing. From the first-known international cases on 23 January 2020, Vietnam quarantined anyone who arrived from the high-risk area and closed its porous 1,400-km border with China to all but essential trade and travel. In February, it quarantined more than 10,000 people in the Son Loi village due to infections, it also closed all educational institutions. On March 22,

the Vietnamese government suspended all foreign entries (WEF 2020a). It also decided early on to impose a 14-day quarantine on anyone arriving in Vietnam from a high-risk area. All schools and universities have also been closed since the beginning of February. On April 22, Vietnam eased its lockdown effort. Unfortunately, in the European region such as worst affected Italy, France and United Kingdom and the region in the Americas such as the USA experienced most deaths due to the failure to understand the disease and keep continuing their activities such as travelling and tourism which spiked the death rates, or delayed lockdown efforts. South Korea, Taiwan and Germany, on the other hand, controlled the death rates by increased testing.

The trend of screening the COVID19 in Bangladesh is not quite enough to conclude it, rather due to a very low-test rate (240/1 M population) and limited testing facilities (19 different laboratories based on large cities) mostly focused on urban areas the prediction becomes difficult. Better to go for a scenario-based assessment under different assumptive situation considering the socio-economic and cultural attitude of the country. The later section of the article mainly focused on the different scenario and their possible management way forwards.

In our study we have considered global lockdown practice, country situation analysis, expert suggestions to set 3 scenarios for impact analysis and possible management strategies which are:

Lockdown Scenario 1: Withdraw the existing partial lockdown before 40-50 days (LS1)

Lockdown Scenario 2: Continue the existing lockdown partially to 40-60 days (LS2)

Lockdown Scenario 3: 40 to 60 or more day's full lockdown/ shutdown situation (LS3)

Total of 54 scenario-based statements was set, and perception-based statistical analysis was performed. The descriptive statistics are presented in Supplementary **Table 3**, which exhibits the percentage, mean, and standard deviation (SD), describing the responses of participants to the related scenarios for all 54 statements from each of the 159 respondents and the direction of each statement in the studied survey datasets. The following section 3.2-3.4 discusses the impacts of different lockdown scenarios.

3.2. Impact analysis of lockdown Scenario 1

Considering the withdrawal of existing partial lockdown before 40-50 days, the classical test theory (CTT) outcomes and the corrected inter-item correlation analysis reveals that among 54 statements, eight statements have low corrected item-total correlation values (<0.30). This

includes, people will start moving towards regular life (LS1S1: 0.257); massive movement and a mass gathering of people will be started again (LS1S3: 0.29); community transmission of COVID-19 will increase due to people's movement and mass gathering (LS1S4: 0.298); the number of infected populations will increase (LS1S5: 0.271). From Pearson correlation analysis a strong significant positive relationship was observed between people will start moving towards regular life (LS1S1) and the formal and informal economic activities will be started (LS1S2) (r=0.671, p<0.01) (Table 4). From the linear regression analysis, considering the community transmission of COVID-19 will increase due to people's movement and mass gathering (LS1S4) as the dependent variable, only 2 statements: people will start moving towards regular life (LS1S1, p<0.01), and crime will rise and more people will die (LS1S15, p<.01) exhibited a statistically significant high correlation with the number of infected populations will increase (LS1S5) (Table-5). In addition, more unemployment and loss of livelihood (LS1S13), and more people will die (LS1S15) statistically pose a significant positive impact on an irreversible loss to the economy (p<0.01) of Bangladesh

3.3 Impact analysis of lockdown Scenario 2

From CTT analysis, continue the existing partial lockdown up to 40 to 50 days (LS1M1: 0.276); limited people's movement will enable low-level community transmission of COVID-19 (LS2S1: 0.281); infection and death rate will increase slowly (LS2S3: 0.214); existing with increased facilities for COVID-19 in the health system will be able to provide health services to the infected peoples (LS3S2: 0.202). From Pearson correlation (Table 4), a significant positive relationship was found between the limited people's movement will enable low-level community transmission of COVID-19 (LS2S1) with the infection, and the death rate will increase slowly (LS2S3) (r=0.540, p<0.01). Also, there will be less supply of basic products for daily use (LS2S7) posed a significant relationship with the price of most of the basic products will be higher than usual (LS2S8) (r= 0.680, p<0.01). loss of livelihood and unemployment rate will increase due to business shutdown (LS3S5, p<0.01) and poor communities both in urban and rural areas will be affected severely (LS3S6, p<0.01). Also, considering microfinance support with no or low interest for micro, small and medium enterprises is required to overall the COVID-19 pandemic in Bangladesh (LS3M4, p<0.05). From the linear regression model (Table 5), the association between dependent statements limited people's movement will enable low-level community transmission of COVID-19 (LS2S1, r=0.599, p<0.01) with poor people will suffer food and the nutritional deficiency (LS2S9) and gender-based violence will increase (LS2S10). Based on management scenario 2, massive awareness and enforcement of proper lockdown and quarantine initiatives were strongly associated with limited people movement will enable low-level community transmission of COVID-19 (LS2S1, p<0.05).

3.4 Impact analysis of lockdown Scenario 3

From the CTT analysis, among 54 statements, the corrected inter-item correlation analysis showed that only one statement has low corrected item-total correlation values (<0.30). This adds, existing with increased facilities for COVID-19 in the health system will be able to provide health services to the infected people (LS3S2: 0.255). The highest inter-item correlated value is the loss of livelihood and the unemployment rate will increase due to business shutdown (LS3S5: 0.581) while the lowest value is the number of infections and death will be limited (LS3S3: 0.302). In the case of management of scenario 3, inter-items correlated values are more than 0.478. The high inter-items correlation was observed in the synergy with government, law enforcement agencies, and private sector initiatives (LS3M3:0.555) and long-term planning and implementation of policies regarding COVID-19, psychosocial and socio-economical loss (LS3M6:0.48).

According to the results of the Pearson correlation, there was a statistically significant correlation among scenario 3 where gender discrimination will increase due to COVID-19 outbreak with gender-based violence will increase rapidly (r=0.661, p<0.01). Besides, extremely limited people's movement will reduce the risk of community transmission of COVID-19 with the number of infection and death will be limited (r=0.545, p<0.01). For management purposes, synergy with government, law enforcement agencies, and private sector initiatives with coordinated emergency relief support (r=0.632, p<0.01). Also, considering microfinance support with no or low interest for micro, small and medium enterprises is required to overall the COVID-19 pandemic in Bangladesh (LS3M4, p<0.05).

3.5 Management strategies considering lockdown scenarios

For management strategies of scenario 1, deep analysis of the situation and go for full lockdown up to 60 days with relief support to the poor and most vulnerable are urgently needed for decision making in the county due to the rapid community transmission of COVID-19 (p<0.01). First of all, the government should come up with a comprehensive strategic plan accompanied by nongovernmental and social organizations, and law enforcement to analyze the spread of the virus, identifying the most vulnerable hosts, properly tracked the movement of general people, precise estimation of economic losses from different financial and industrial sectors, educational diminutions and professional and informal employment disruption to picture an integrated scenario of the current situation and future predictions by which the revival of the negative aspects of the country could be managed. There must be two types of the strategic plan on under the category of the emergency response plan (short term) by ensuring basic supplies to all citizens who are in real needs, motivate and/ or force the people to abide by the COVID19 guidelines by the GoB and WHO, prepare a complete but robust list of vulnerable population in terms of COVID-19 spreading, co-morbidities, and economic stress, activate all the local wings of the GoB such as local government representatives at the village level and construct a COVID-19 response task force to monitor and handle the country situation through application of information and communication technologies (ICT). The government should implement those plans with proper timing, transparency, and resources. The government of Bangladesh (GoB) has already been taking a lot of initiatives to tackle COVID-19 pandemic, but there seems lacking proper risk assessment and weak coordination among stakeholders from medical to social welfare. Another plan must be focused on the reconstruction or rebuild (Long term) and must follow the guidelines of the Sendai framework i.e. build back better for the health care sector, industrial sector, education, agriculture, research, environment, and finance. However, deep research complied with proper massive surveillance could help in making decisions whether the lockdown must be further carried on or not and this must have to be based on evidence. Miscommunication and miscalculation may lead to the rise of rumours in social media and trigger the situation to worsen. Communicating the disease risk in the local language is, therefore, necessary to increase awareness about the diseases. Moreover, in the following sections (3.5.1-3.5.3) we have analyzed emergency management issues including short to medium term measures as well as long term management strategies of COVID-19 pandemic lockdown scenarios based on Bangladesh scenarios

3.5.1 Management considerations for Lockdown Scenario 1

"Lockdown" is an unfamiliar word or term to the people of Bangladesh. According to scenario 1, a partial lockdown is a hoax. People recommended to use a more familiar term "curfew" (legal

section:144) to maintain strictly for 50-60 days and there is no alternative to reduce COVID-19 transmission. In total, 78.6% of the participants agreed that community transmission of COVID-19 will increase due to the people's movement and mass gathering, 57.9% agreed to continue the existing partial lockdown up to 40 to 50 days. Whereas, approximately 73% of respondents agreed that deep analysis of the situation is required and go for full lockdown up to 60 days with the relief support to the poor and the most vulnerable. Overall, the participants had a positive view about lockdown scenario 1 to possibly spread out of COVID-19 at the community level. Many people expressed their disappointment towards the extreme corruption of the healthcare sector and that it has collapsed before the COVID-19 pandemic.

Respondents also suggested the government consider biomedical waste management for reducing further environmental transmission and that efficient incinerator to be built for the hospital waste management. However, the responders also suggested the government to maintain the retail and wholesale kitchen market/ bazaar of any area with maintaining the guideline of social distancing. This approach could have positive feedback as already experience in different Upazilas in Bangladesh with the help of local administrative authorities such as Upazila executive officers (UNOs) and police. On 25 April 2020 Bangladesh is approaching first 1 month of partial lockdown and it was observed that almost 60 districts out of 64 have had COVID-19 positive patients. Unfortunately, by this period the test rate increased with an exceptionally slow rate only about 30000 tests were conducted out of about 4 million requests to IEDCR (IEDCR, 2020). Moreover, the selection of COVID-19 test candidates somehow is not in a proper manner. For example, it was reported in mass media that most of the tests conducted in and around the vicinity of Dhaka city and other metropolitan cities. This database seems not to be robust at this point that could be a mess up from the epidemiological point of view. Besides, the few COVID-19 clusters majorly distributed near Dhaka city might regulate the mass people's minds, and ultimately to meet the regular needs, people will be going to the market and they will not maintain social distancing at all in other parts of the country.

Community health workers can support pandemic preparation earlier to the epidemics by increasing access to the healthcare services and the healthcare products within the communities as well as communicating risk and increase awareness in the respected area in cultural language whereas reducing the weights of the formal healthcare systems. Community healthcare workers can contribute to pandemic preparedness by acting as community-level educators and mobilizers,

contributing to surveillance systems, and filling health service gaps (Boyce & Katz, 2019). It is critical to detect cluster surveillance of COVID-19 to better allocate resources and improve decision-making as the outbreaks continue to grow in different districts of Bangladesh to improve resource allocation, faster testing stations, stricter quarantines and city/block lockdowns as well as travel bans (Desjardins et al., 2020). Therefore, the present lockdown scenario 1 might have some risk potentials to create a favourable condition for the community transmission of COVID-19 in Bangladesh. Finally, this study confirms that the withdrawal of the partial lockdown before 40-50 days will not become positive in terms of COVID-19 management in Bangladesh because we do not have enough evidence until the 30th day of the lockdown that the transmission in reducing from the peak or even, we do not know when it will be at the peak. Meanwhile, the recommendation has already been done by the Federation of Bangladesh Chambers of Commerce & Industries on the opening of the industrial sectors with some guidelines (FBCCI, 2020). This might aggravate the COVID-19 transmission among the millions of workers. Moreover, the FBCCI taskforce demanded the COVID-19 incentive financial package in a more gettable way from the GoB. It could be a very crucial decision to be taken considering the COVID-19 contagions and the business development to protect the exports.

3.5.2 Management considerations for Lockdown Scenario 2

Overall, the participants had a positive view about lockdown scenario 2 to stop/slow down the spreading out of COVID-19 pandemic in Bangladesh. By nature, people of Bangladesh are quite unaware specifically they are kind of ignorant to the potential danger of disease COVID-19 pandemic from the very beginning as well as they are not confident somehow with the administrative decision on their livelihoods. So, the government should try to implement a stringent policy of risk communication and media communication during this emergency. Moreover, mass people have lack of confidence in the government policy and the way of implementation to the COVID-19 emergency response. This situation is also well visualized in different mass media, people are in movement for relief, road blockage, corruption by the government representatives, mismanagement in relief distribution, biases to party supporters, and so on. Besides, there is a huge lack of coordination among the different government stakeholders to tackle the emergency both in healthcare and crisis management in the field. For instance, people usually make different excuses to go outside and a regular crowd is common in the raw food marketplace, streets, and small bazaars. In this situation, the GoB declared another 10 days

extension of the general leaves until 5 May 2020. Partial lockdown will not be a solution in Bangladesh, because it seems that only the government, semi-government, autonomous institutes/organizations, and educational institutions are maintaining the rules/guidelines. Under these circumstances, the FBCCI task force and other business groups are continuously pushing the GoB to open the industrial activities to resume the productions. In total, 52.2% of students in this study agreed that existing health facilities will not be able to provide adequate services to the number of COVID-19 patients due to limited community transmission, while 67.9% strongly agreed that there will be a need for emergency food and financial support to the poor communities. About 72.5% strongly agreed that emergency relief to the poor communities both in urban and rural areas should be provided ensuring transparency.

The poor community always lacks food and nutrition due to the injustice and corruption by the local or regional level of political stakeholders in Bangladesh. This situation came into light when the prime minister of Bangladesh assigned bureaucratic administrators to look after the response activities all over the country. The vulnerable groups such as disable and disadvantaged persons, young children and orphans, and aged citizens should be taken under protection for their wellbeing. Right now, doctors, bankers, grocers, police, armed forces are the most vulnerable profession to the COVID-19 infection. Therefore, the lockdown must be permanently for two months. It will be a crisis for a short time, but it will be a savior for the future. However, the GoB already started thinking about the weakening of the lockdown to restart the industrial activities with potential safety measures. However, there is also an absence of proper guidelines or the basis for such a risky decision. They are always focusing on the protection of their people from being infected by the COVID-19 and they also stated that they are well prepared with resources and capacities, then the question is why the GoB is in hurry to partially weakening the lockdown? There might be some strong business/financial issues behind that, and it warrants further study to answer the question. However, the pandemic will not be significantly higher if the country goes on full lockdown. Moreover, partial lockdown is still creating a problem for poor and middle-class people. Extremely coordinated and effective planning and strategies for both the ongoing and afterwards response is required. Moreover, for the next couple of years, it will be extremely hard for the country especially as far as the financial issues are concerned to achieve the current development as well as SDG targets.

Increase surveillance as well as the reallocation of the budget, the distribution of direct cash, private sector engagement could be some of the options to alleviate the crisis. The GoB already declared the delayed beginning of its 8th five years national plan due to the COVID-19 pandemic.

3.5.3 Management considerations for Lockdown Scenario 3

In total, 54.7% of the respondents in this study agreed that due to full lockdown, the formal and informal business, economic and education sector will be hampered severely, 64.8 % agreed that the poor and vulnerable communities both in urban and rural areas will be affected severely. For management purposes, 66% thought that coordinated emergency relief support is required. Overall, the respondents had a positive viewpoint about lockdown scenario 3 due to the COVID-19 outbreak in Bangladesh. If we have no other options, a strategic plan and policy should be taken for the revival of the health sector, economy, and education. It is speculative that a full lockdown might end up with famine and starvation. Microfinancing the poor will bring no good as it will empower the rich organizations. According to the World Bank report (2020) prolonged and broad national lockdowns will bring a negative growth rate of the economy in Bangladesh and other South Asian countries in 2020 due to the COVID-19 pandemic. This negative growth rate will continue in 2021 with growth projected to hover between 3.1 and 4.0%, down from the previous 6.7% estimate.

A more serious issue that will arise due to the progress of the pandemic is the rate of suicide as a long-term effect on the vulnerable population due to economic hardships. Preventing suicide and counselling mental health issues are therefore be considered by the authority (Gunnell et al., 2020). Moreover, the authority should take proper steps to meet the basic emergency services and maintain the basic supply-demand of the daily needs of urban and rural people by transporting the crops and vegetable production from the farms. Due to the lockdown, the farmers should not face any crop loss and they should be also brought under the financial and other stimulus plans so they can continue their productions for the future. If the needed government should give them free seeds, fertilizers, electricity for irrigations and water and other incentives such as no-interest agricultural loans for future food security. The government already declared a financial recovery package with a clear disparity towards the agricultural sector. The financial stimulus package mainly focused on large and export-oriented businesses such as the readymade garment sector (RMG). It seems that this package has arrived a little earlier without any participatory strategic

assessment. A strong collaborative need-based assessment is required to tackle the short-term and long-term needs to properly distribute the stimulus package. In this emergency response, the local government must have to come forward with full strength and capacities to implement the work plan for the GoB.

3.6 Overall relationship assessment of COVID-19 impact on effective management, policy implications, governance and development goals

For overall relationship assessment for effective management of policy implications, governance and developmental effects, PCA (Figure 2), Cluster analysis (Figure 3), and Pearson correlation (Supplementary Table 2) significantly show the relationships.

3.6.1. Interpretation of PCA for short-term and long-term lockdown scenario analysis

PCA showed a significant level of controlling factors in Bangladesh COVID-19 pandemic and how these statements are associated with the various scenarios (Supplementary Table 3). Nine principal components (PCs) were originated based on standard eigenvalues (surpassed 1) that extracted 52.195% of the total variance as outlined in (Supplementary Table 3). However, before PCA applying in the tested data, the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests of Sphericity were conducted to appropriateness for this study. The findings of the KMO value in this research was 0.8 (>0.50), the confidence level of Bartlett's sphericity (BS) test was zero at p<0.01, suggesting the tested data was fit for PCA analysis.

The scree plot was used to identify the number of PCs to be retained to the understanding of the inherent variable structure (Figure 4). The loading scores were classified into three groups of weak (0.50-0.30), moderate (0.75-0.50), and strong (> 0.75) respectively (Liu et al., 2003; Islam et al., 2017). The PC1 (First) explained 11.074% of the variance as it covered a significance level of strong positive loading of the lockdown scenarios and management 2 in Bangladesh (LS1S5: 0.81 and LS1S6: 0.82). Similarly, moderate positively loaded of the lockdown scenarios 1 in Bangladesh (LS1S4: 0.608 LS1S7-S9: 0.741-0.795).

The PC2 (Second) explained 8.305% of the total variance and was loaded with moderate positive loading of lock drown scenarios 3 (LS3S4-9: 636-0.706 and LS3S12: 0.615). The PC3 (Third) elucidated 8.305% of the variance and was strong positively loaded of massive awareness and enforcement of proper lockdown and quarantine initiatives (LS2M3: 0.836) and provide emergency relief to the poor communities both in urban and rural areas ensuring transparency

(LS2M4: 0.789). Furthermore, management scenario 2 and scenario 3 were observed moderate positive loading of PC3 (LS2M2:0.637; LS2M5: 0.597, LS2M6:0.642 and LS3M3: 0.547). The PC4 (Four) accounted for 6.073% of the total variance and was strong positively loaded of poor people who will suffer food and the nutritional deficiency (LS2S9: 0.855) and moderately loaded in scenario 2 (LS2S5-S6: 0.652-0.657 and LS2S11: 0.637). The PC5 (Five) explained 5.072% of the variance and was strong positively loaded of deep analysis of the situation and continue this existing partial lockdown up to 60 days or more (LS1M2: 0.779) and with moderately loaded in the management scenario 1 (LS1M1:0.747 and LS1M3:0.686). PC6 (Six) accounted for 4.646 of the total variances, and were strong positive loading of existing with increased facilities for COVID-19 in the health system will be able to provide health services to the infected peoples and number of infection and death will be limited (LS3S2: 0.812 and LS3S3:0.863) and with moderately loaded of very limited peoples movement will reduce the risk of community transmission of COVID-19 (LS3S1: 0.689). PC7 (seven) explained for 4.419 % of the variance and was strong positively loaded with gender-based violence will increase (LS2S10: 0.796) and gender discrimination will increase (LS3S10: 0.863). PC8 (eight) was responsible for 4.301% of the variance and was strong positively loaded with people will start moving towards regular life and formal (LS1S1: 0.866) and informal economical activities will be started (LS1S2: 0.836) and moderate positively loaded of massive movement and a mass gathering of people will be started again (LS1S3: 0.652)

3.6.2. Interpretation of CA for short-term and long-term lockdown scenario analysis

Cluster analysis (CA) further recognized the total status of scenario variations, and how these scenarios influence the socio-economic and development impacts (Figure 5). All the statements were categorized into five major classes: cluster-1(C1), cluster-2 (C2), cluster-3(C3), cluster-4(C4) and cluster-5(C5). C1 consisted of five sub-clusters of C1-A, B, and C; C1-A composed of an irreversible loss to the economy and More people will die (LS1S12-LS1S15)C1-B comprised of Community transmission of COVID-19 will increase due to people's movement and mass gathering and Panic will rise in the mass communities (LS1S4-S9). C1-C comprised of the possibility of the full lockdown of the whole system again and No basic services will be available (LS1S10 and LS1S11). C2 consisted of three sub-clusters of C2-A, and B. C2-A consists of continue the existing partial lockdown up to 40 to 50 days and deep analysis of the situation and

go for full lockdown up to 60 days with relief support to the poor and most vulnerable (LS1M1-M3) C2-B consists of People will start moving towards regular life and massive movement and a mass gathering of people will be started again (LS1S1-LS1S3). C3 consisted of three sub-clusters of C3-A, B, and C. C3-A contained an existing increase in the health facilities involving private sectors and implement inclusive sustainable quick plan and policies to revive the economy and employment (LS2M2-M6). C3-B consisted of Lack of support and improper management will lead to the psychosocial and socio-economic crisis and Long-term planning and implementation of policies regarding COVID-19, psychosocial and socio-economical loss (LS2S12 and LS3M6) while C3-C composed of Continuous situation analysis of disease outbreak and implement the full lockdown with relief and basic support for human survival and Loan support for business and economic recovery (LS3M1-M5)

Cluster-4 consisted of three sub-clusters of C4-A due to full lockdown, the formal and informal business, economic and education sector will be hampered severely, loss of livelihood and unemployment rate will increase due to business shutdown and poor communities both in urban and rural areas will be affected severely (LS3S4-6), C4-B supply and access to basic daily products in urban areas will be reduced drastically, the extreme need for relief and financial support in the urban and rural communities will increase and people will be involved with conflict and crime to access the basic needs (LS3S7-12) and C4-C there will be less supply of basic products for daily use and price of most of the basic products will be higher than usual (LS2S7-S8). C4-D poor people living in hand to mouth will be severely affected and the formal education system will be Price of most of the basic products will be higher than usual, Gender-based violence will increase and there will be a need for emergency food and financial support to the poor communities (LS2S5-11). C5 consisted of two sub-clusters of C5-A, B, and C. C5-A contained gender-based violence will increase and Gender discrimination and violence will increase LS2S10 and LS3S10. C5-B comprised of limited people's movement will enable low-level community transmission of COVID-19 and Infection and death rate will increase slowly (LS2S1-S3). C5-C contained limited people movement will reduce the risk of community transmission of COVID-19 and the number of infections will be limited LS3S1-S3.

3.6.3. COVID-19 affecting policy implications, governance and development goalsmanagement strategy

The COVID-19 pandemic has the most effects on vulnerable populations, ranging from good health and well-being (SDG 3) to quality education (SDG 4) worldwide. The crises in achieving clean water and sanitation targets (SDG 6), weak economic development and the absence of decent jobs (SDG 8), overall inequality (SDG 10), and above all, no poverty (SDG 1), and food insecurity (SDG 2) will be aggravated in many developing countries. The World Bank reports that about 11 million people will be forced into poverty by the crisis (WEF 2020b). According to UNDP (2020) revenue losses in developing countries are estimated to reach \$220 billion. The losses would consequences of the education, human rights, and, in the most extreme cases, fundamental food security and nutrition, with an estimated 55% of the global population not having access to social protection. Wider socio-economic effects will likely continue for several months to years across the world which will also significantly impact the economy of Bangladesh. Global food security will be hampered as 1/3rd of the world's population is in lockdown (Galanakis, 2020). Both the import of important goods and exports related to the ready-made garment sector and others likely will be affected for income and employment. Financial protection during outbreak matters. At the initial stage of the COVID-19 epidemic, out-of-pocket expenditure posed a substantial financial burden for the poor populations with severe symptoms, even for those under coverage by the social health insurance scheme (Z. Wang & Tang, 2020). People marginally above the poverty level particularly low-income families, daily and informal low wedge earners, ethnic community groups, people with disabilities, returnee migrant workers are already started falling below the poverty line due to loss of income and employment. BRAC an international Bangladeshi NGO survey report confirmed to increase a 60% rise in poverty amidst the COVID-19 pandemic (BRAC 2020). The intake of foods, vegetables, and herbs can boost the immune system against the infection disease while it can stimulate the transmission through the food chain (Galanakis, 2020). Again, the lack of food will rise to malnutrition, hunger, and famine. Approximately 265, million people worldwide will be suffering from acute hunger projected by the UN World Food Programme (WEF 2020c).

Ready-made garment (RMG) sector is goingt to suffer a serious shortfall as until 24 March 2020, orders of RMG products from 738 garment factories worth US\$ 2.4 billion was cancelled. This is the sector where almost 4 million low-income people – of whom over 85% are women – work and another similar number of people indirectly depend on the downstream and upstream services required by the RMG value chain. As the lockdown continues to ensure public health and safety,

many RMG workers already lost their jobs and did not receive their salary of the previous months, some of them have been sacked already. Food Security, social and economic recovery package of the government should focus on immediate response during the lockdown period and outbreak and post-lockdown support mechanisms. In this condition, middle-income families are relying on their savings available. The negative coping mechanism includes skipping meals and nutrition and distressing the whole family. In the prolonged lockdown scenario of 40-60 days, they need government and other support measures to continue their lives under lockdown.

Due to lockdown, the agricultural products in the urban areas are selling at a high price while the farmers are not getting the fair price of the product in agricultural districts. As the months of Aman harvest due in weeks, migrant workers have likely returned to the communities, which will have several bigger social and economic implications. The unharvested rice crops in the haor areas will be prone to natural flash flooding and will be lost due to delays. Moreover, due to the lockdown transport of animal, poultry and fish feed is hampered. Moreover, due to the closure of local restaurants and hotels, the market demand for eggs and chicken has lowered. All this will likely impose further impacts on food production and crop supply chains. To protect the country from famine, the Bangladesh government should consider the stimulus package for the farmers with 2% agricultural loan to continue cropping and agricultural production.

Receiving education has stopped for most of the students in Bangladesh. The government of Bangladesh postponed all academic and public exams until 9 May 2020, considering the growing public concern. Limited delivery of education of the national curriculum is through limited air transmission in the national TV. While urban children can attend virtual classes through the internet, rural and marginalized children are deprived due to limited resources. Students from marginalised backgrounds, with disabilities, will lose out more on their education. Considering this, GOB should prepare special educational package including counselling for marginalized and disadvantaged students.

4. Concluding remarks

Considering the global hard-hit economy, depression, unemployment, job-loss, shortfall of RMG export and incoming remittances, the socio-economic and development impacts, along with the food insecurity as well as rising poverty due to COVID-19 at the community level need to be coordinated in Bangladesh. Along with the pandemic disease, the upcoming seasons of natural

disasters from cyclones, tidal floods, flash floods, and landslides of monsoon seasons should be considered to prepare for the emergencies. All these will further aggravate the humanitarian needs of the most vulnerable groups in the country in the coming months to be followed. As the health sector is the most strained at present, it will affect the targets of sustainable development goals of 2030. In addition, the quality education will be hampered in the country. The government of Bangladesh has already mobilized a noteworthy stimulus package to support the affected industries and community which needs to be coordinated over a longer period of 12-18 months and maybe incorporated in the upcoming 8th 5-year plans. However, this package should also include research and innovation, recovery of education. There is no alternative to strengthen the health care facilities and preparedness for the potential humanitarian crisis. Moreover, humanitarian support should reach the most vulnerable communities which need to be targeted, outlined, and delivered. Finally, economic implications should be subjected to the spatial and geographical locations based on the vulnerabilities. Hotspots identified in the delta plan can be considered here. The long-term strategic plan can be integrated into Bangladesh delta plans 2100, for better strategic management. Whatever will be the lockdown scenario, the basic supports to the mass people must be ensured and that is not so easy without strong strategic planning and multi-sectoral collaboration including supports from the international bodies.

Ethics Statement

The studies involving participants of this questionnaire were reviewed and approved by Jahangirnagar University, Bangladesh. The consent of participants was taken, and they remained anonymous.

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Conflicts of interest

The authors declare no conflicts of interest.

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Figure-2: Daily Confirmed COVID-19 patient count

Figure-3: Percentage of new cases per total test per day





Figure-4: Scree plots of the eigenvalues of PCA

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Country	1st case reported on	Marked Day 45th on	Total Infected on 45th Day	Total Death on 45th day	First 1000 cases on (Date)	First 1000 case was detected on (Day)	Test/M on 24 April 2020	Days past since 1st case identification (on 24 April 2020)	Number of cases reported on (24 April 2020)
Italy	31-Jan-20	15-Mar-20	24747	1809	29-Feb-20	30	26,131	83	189,973
Spain	1-Feb-20	16-Mar-20	9942	342	9-Mar-20	38	19,896	84	219,764
France	24-Jan-20	8-Mar-20	1209	19	8-Mar-20	45	7,103	92	158,183
UK	29-Jan-20	13-Mar-20	798	11	14-Mar-20	46	9,016	86	143,464
USA	21-Jan-20	5-Mar-20	221	12	11-Mar-20	51	14,513	95	889,391
India	30-Jan-20	14-Mar-20	100	2	29-Mar-20	60	393	82	23,502
Bangladesh	8-Mar-20	21-Apr-20	3382	110	14-Apr-20	32	240	48	4,689

Table-1: Forty five (45) days country comparison for COVID-19 (Source: Worldometers)

Table-2: Cronbach's alpha value.

Scenario	Number of items	Reliability	Validity
LS1	18	0.881	0.897
102	10	0.002	0.057
LSZ	18	0.853	0.865
LS3	18	0.873	0.89
Total	54	0.925	0.934

Table-3: Descriptive statistics and item-total correlation

Scenarios	Statements	Denotes	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Corrected Item-Total Correlation
	People will start moving towards regular life	LS1S1	9.4	8.2	6.9	28.3	47.2	3.96	1.314	1.726	-1.156	0.107	0.28
	Formal and informal economical activities will be started	LS1S2	3.1	11.3	10.1	32.7	42.8	4.01	1.128	1.272	-1.031	0.122	0.35
	Massive movement and a mass gathering of people will be started again	LS1S3	5.7	5	4.4	21.4	63.5	4.32	1.138	1.295	-1.805	2.31	0.31
	Community transmission of COVID-19 will increase due to people's movement and mass gathering	LS1S4	1.9	0.6	2.5	16.4	78.6	4.69	0.729	0.531	-3.226	12.089	0.36
	The number of infected populations will increase	LS1S5	0.6	0.6	3.8	19.5	75.5	4.69	0.638	0.407	-2.579	8.58	0.38
Lockdown Scenario 1:	Pressure will increase in the existing health care facilities	LS1S6	1.3	0	1.9	18.9	78	4.72	0.626	0.391	-3.334	14.965	0.44
Withdraw the existing partial lockdown before	Healthcare system will collapse due to limited human and physical resources	LS1S7	1.9	1.3	5	25.2	66.7	4.53	0.81	0.655	-2.288	6.176	0.42
40-50 days (LS1)	The number of deaths will increase	LS1S8	0.6	1.3	6.9	24.5	66.7	4.55	0.735	0.54	-1.884	4.08	0.49
	Panic will rise in the mass communities	LS1S9	0.6	2.5	5.7	27.7	63.5	4.51	0.77	0.593	-1.841	3.775	0.48
	Possibility of the full lockdown of the whole system again	L\$1\$10	5	5	9.4	28.9	51.6	4.17	1.115	1.243	-1.451	1.418	0.45
	No basic services will be available	LS1S11	3.1	9.4	27	31.4	28.9	3.74	1.076	1.158	-0.536	-0.376	0.39
	An irreversible loss to the economy	LS1S12	3.1	2.5	10.1	27.7	56.6	4.32	0.976	0.953	-1.674	2.673	0.44
	More unemployment and loss of livelihood	LS1S13	1.9		6.3	39.6	52.2	4.4	0.772	0.596	-1.839	5.314	0.50
	Social conflict and crime will rise	LS1S14	1.9	1.9	9.4	35.8	50.9	4.32	0.867	0.751	-1.56	2.951	0.54
	More people will die	LS1S15	1.3	2.5	5.7	36.5	54.1	4.4	0.811	0.658	-1.71	3.69	0.61
Management Strategies for	Continue the existing partial lockdown up to 40 to 50 days	LS1M1	2.5	5.7	5.7	28.3	57.9	4.33	0.992	0.983	-1.698	2.436	0.33
Lockdown Scenario-1	Deep analysis of the situation and continue this existing	LS1M2	2.5	5.7	6.9	35.8	49.1	4.23	0.982	0.964	-1.498	1.982	0.44

Scenarios	Statements	Denotes	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Corrected Item-Total Correlation
	partial lockdown up to 60 days or more												
	Deep analysis of the situation and go for full lockdown up to 60 days with relief support to the poor and most vulnerable	LS1M3	1.3	1.9	3.8	20.1	73	4.62	0.761	0.58	-2.535	7.324	0.37
	Limited people's movement will enable low-level community transmission of COVID-19	LS2S1	5	4.4	8.8	40.9	40.9	4.08	1.061	1.126	-1.42	1.703	0.34
	Existing health facilities will not be able to provide adequate services to the number of COVID-19 patients due to limited community transmission	LS2S2	0	1.9	15.1	52.2	30.8	4.12	0.724	0.524	-0.489	0.004	0.32
Lockdown Scenario 2:	Infection and death rate will increase slowly	LS2S3	5	7.5	15.1	51.6	20.8	3.75	1.029	1.06	-1.043	0.817	0.28
	Due to partial lockdown, the formal and informal business will be hampered	LS2S4	1.3	2.5	6.9	46.5	42.8	4.27	0.801	0.642	-1.427	3.065	0.43
Continue the existing lockdown	Poor people living in hand to mouth will be severely affected	LS2S5	0.6	4.4	5	19.5	70.4	4.55	0.832	0.692	-2.054	3.885	0.53
partially to 40-60 days (LS2)	The formal education system will be hampered	LS2S6	3.1	7.5	12.6	33.3	43.4	4.06	1.071	1.148	-1.127	0.615	0.44
	There will be less supply of basic products for daily use	LS2S7	0.6	5.7	7.5	42.8	43.4	4.23	0.864	0.746	-1.233	1.451	0.43
	Price of most of the basic products will be higher than usual	LS2S8	0	3.8	6.9	38.4	50.9	4.36	0.775	0.6	-1.234	1.322	0.38
	Poor people will suffer food and nutritional deficiency	LS2S9	0.6	5	3.8	25.8	64.8	4.49	0.841	0.707	-1.91	3.452	0.38
	Gender-based violence will increase	LS2S10	2.5	8.8	28.9	32.7	27	3.73	1.035	1.072	-0.476	-0.354	0.37
	There will be a need for emergency food and financial support to the poor communities	LS2S11	0	1.3	3.1	27.7	67.9	4.62	0.613	0.376	-1.733	3.374	0.52

Scenarios	Statements	Denotes	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Corrected Item-Total Correlation
	Lack of support and improper management will lead to the psychosocial and socio- economic crisis	LS2S12	0	1.3	5.7	40.9	52.2	4.44	0.662	0.438	-1.038	1.065	0.50
	Limit the partial lockdown situation just considering the most basic services in a tailored way for 40-60 days	LS2M1	1.9	4.4	13.2	47.2	33.3	4.06	0.902	0.813	-1.109	1.468	0.29
	Increase the health facilities involving private sectors	LS2M2	0	1.3	3.8	35.8	59.1	4.53	0.635	0.403	-1.311	1.951	0.39
Management	Massive awareness and enforcement of proper lockdown and quarantine initiatives	LS2M3	0.6	0.6	4.4	34	60.4	4.53	0.673	0.453	-1.742	4.716	0.47
Strategies for Lockdown Scenario-2	Provide emergency relief to the poor communities both in urban and rural areas ensuring transparency	LS2M4	0.6	0	3.8	23.3	72.3	4.67	0.613	0.376	-2.333	7.934	0.47
	Provide compensation support to the informal businesses (micro, small and medium enterprises)	LS2M5	1.3	0	8.8	37.1	52.8	4.4	0.756	0.571	-1.535	3.683	0.51
	Implement inclusive sustainable quick plan and policies to revive the economy and employment	LS2M6	0	0.6	6.3	35.2	57.9	4.5	0.645	0.416	-1.086	0.72	0.51
	Very limited peoples movement will reduce the risk of community transmission of COVID-19	LS3S1	2.5	4.4	4.4	30.8	57.9	4.37	0.945	0.893	-1.855	3.354	0.33
Lockdown Scenario 3: 40 to 60 or more day's full lockdown/	Existing with increased facilities for COVID-19 in the health system will be able to provide health services to the infected peoples	LS3S2	3.8	8.8	16.4	38.4	32.7	3.87	1.083	1.174	-0.895	0.19	0.26
full lockdown/ shutdown situation (LS3)	Number of infection and death will be limited	LS3S3	3.1	6.3	11.9	44	34.6	4.01	1.003	1.006	-1.156	1.12	0.30
	Due to full lockdown, the formal and informal business, economic and education sector will be hampered severely	LS3S4	0	1.9	5.7	37.7	54.7	4.45	0.691	0.477	-1.229	1.533	0.41

Scenarios	Statements	Denotes	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Corrected Item-Total Correlation
	Loss of livelihood and unemployment rate will increase due to business shutdown	LS3S5	0	1.3	4.4	39	55.3	4.48	0.645	0.416	-1.16	1.495	0.58
	Poor communities both in urban and rural areas will be affected severely	LS3S6	0	0.6	4.4	30.2	64.8	4.59	0.608	0.37	-1.382	1.687	0.53
	Supply and access to basic daily products in urban areas will be reduced drastically	LS3S7	0.6	0.6	10.1	34.6	54.1	4.41	0.748	0.56	-1.291	2.058	0.45
	The extreme need for relief and financial support in the urban and rural communities will increase	LS3S8	0	1.3	3.8	36.5	58.5	4.52	0.635	0.403	-1.286	1.892	0.52
	Poor and lower-middle-class communities will suffer food and nutrition deficiency	LS3S9	1.3	1.9	3.8	33.3	59.7	4.48	0.77	0.593	-2.01	5.311	0.36
	Gender discrimination and violence will increase	LS3S10	2.5	7.5	24.5	32.7	32.7	3.86	1.042	1.087	-0.657	-0.172	0.47
	People will be involved with conflict and crime to access the basic needs	L\$3\$11	0.6	1.9	10.7	44.7	42.1	4.26	0.773	0.598	-1.065	1.614	0.53
	The whole socio-economic system will be hampered severely if not managed properly	L\$3\$12	0	0.6	4.4	30.2	64.8	4.59	0.608	0.37	-1.382	1.687	0.56
	Continuous situation analysis of disease outbreak and implement the full lockdown with relief and basic support for human survival	LS3M1	0	0	7.5	34.6	57.9	4.5	0.635	0.403	-0.912	-0.215	0.52
Management	Coordinated emergency relief support	LS3M2	0	0	3.8	30.2	66	4.62	0.559	0.312	-1.159	0.374	0.53
Strategies for Lockdown Scenario-3	Synergy with government, law enforcement agencies and private sector initiatives	LS3M3	0	0	8.8	31.4	59.7	4.51	0.655	0.429	-0.994	-0.141	0.56
	Consider microfinance support with no or low interest for micro, small and medium enterprise	LS3M4	2.5	0.6	5.7	37.7	53.5	4.39	0.834	0.695	-1.968	5.21	0.54
	Loan support for business and economic recovery	LS3M5	1.3	1.3	5.7	37.1	54.7	4.43	0.767	0.588	-1.757	4.436	0.51

Scenarios	Statements	Denotes	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Corrected Item-Total Correlation
	Long-term planning and implementation of policies regarding COVID-19, psychosocial and socio- economical loss	LS3M6	0	2.5	3.8	35.8	57.9	4.49	0.692	0.479	-1.472	2.465	0.48

Table-4: Correlation matrix of people's perception only addressing significant values (>0.5) (detail matrix is provided in the supplementary data Table-S2)

Statements	Correlations
LS1S1	LS1S2 (.671**), LS1S3 (.505**)
LS1S4	LS1S5 (.607**)
LS1S5	LS1S6 (.653**), LS1S7 (.597**), LS1S8 (.657**), LS1S9 (.650**), LS1S15 (.536**)
LS1S6	LS1S7 (.619**), LS1S8 (.680**), LS1S9 (.544**), LS1S15 (.554**)
LS1S7	LS1S8 (.617**), LS1S9 (.545**), LS1S14 (.521**), LS1S15 (.610**)
LS1S8	LS1S9 (.651**), LS1S15 (.628**)
LS1S9	LS1S15 (.556**)
LS1S12	LS1S13 (.726**), LS1S14 (.528**)
LS1S13	LS1S14 (.591**), LS1S15 (.592**)
LS1S14	LS1S15 (.628**)
LS1M1	LS1M2 (.628**)
LS2S1	LS2S3 (.540**)
LS2S5	LS2S9 (.636**), LS2S11 (.519**)
LS2S6	LS2S9 (.612**)
LS2S7	LS2S8 (.680**)
LS2S9	LS2S11 (.595**)
LS2S10	LS3S10 (.661**)
LS2S11	LS2M4 (.506**)
LS2M3	LS2M4 (.690**), LS2M5 (.562**), LS2M6 (.521**)

LS2M4	LS2M6 (.507**)
LS3S1	LS3S3 (.545**)
LS3S2	LS3S3 (.659**)
LS3S4	LS3S5 (.542**), LS3S6 (.639**)
LS3S5	LS3S6 (.605**), LS3S8 (.523**), LS3S11 (.510**)
LS3S7	LS3S8 (.534**)
LS3S8	LS3S12 (.524**)
LS3S9	LS3S12 (.534**)
LS3S10	LS3S11 (.573**)
LS3S11	LS3S12 (.522**)
LS3S12	LS3M1 (.552**), LS3M2 (.512**)
LS3M1	LS3M2 (.592**), LS3M3 (.567**)
LS3M2	LS3M3 (.632**), LS3M6 (.547**)
LS3M3	LS3M4 (.527**), LS3M6 (.548**)
LS3M4	LS3M5 (.510**)

Table-5: Estimated model of multiple regression.

Regression Model-	1: Dependent Va	ariable: LS1S4 (R= 0.712	, R Square= 0.508)				
	Unstandardize	ed Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence In	terval for B
	В	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.127	0.395		0.321	0.749	-0.653	0.906
L\$1\$5	0.528	0.086	0.462	6.124	0	0.357	0.698
LS1S13	0.269	0.069	0.285	3.9	0	0.133	0.405
LS1M3	0.191	0.057	0.2	3.366	0.001	0.079	0.303
LS1S15	-0.253	0.076	-0.281	-3.321	0.001	-0.403	-0.102
LS1S1	0.094	0.034	0.17	2.754	0.007	0.027	0.162
LS1S7	0.169	0.073	0.188	2.331	0.021	0.026	0.312
Regression Model-	2: Dependent Va	ariable: LS2S1 (R= 0.599	, R Square= 0.359)				
(Constant)	1.342	0.574		2.338	0.021	0.208	2.476
LS2S3	0.538	0.069	0.522	7.812	0	0.402	0.674
LS2S10	0.184	0.068	0.179	2.696	0.008	0.049	0.319
LS2S9	-0.212	0.085	-0.168	-2.504	0.013	-0.379	-0.045
LS2M3	0.218	0.106	0.138	2.048	0.042	0.008	0.428
Regression Model-	3: Dependent Va	ariable: LS3S4 (R= 0.695	, R Square= 0.483)				
(Constant)	0.839	0.395		2.124	0.035	0.059	1.618
LS3S6	0.546	0.084	0.481	6.52	0	0.381	0.712
L\$3\$5	0.252	0.081	0.235	3.098	0.002	0.091	0.413
LS3M4	0.171	0.055	0.206	3.115	0.002	0.062	0.279
LS3M2	-0.167	0.084	-0.135	-1.992	0.048	-0.334	-0.001

Table-6: Varimax rotated principle components

	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10	PC11	PC12	PC13	PC14
LS1S1	0.168	0.055	0.085	-0.09	-0.033	0.026	0.058	0.866	0.119	-0.034	0.05	-0.109	-0.001	-0.061
LS1S2	0.135	0.09	0.081	0.136	0.12	-0.053	0.02	0.836	-0.06	0.073	-0.012	0.02	-0.079	0.095
LS1S3	0.283	0.018	0.043	-0.084	0.031	-0.01	0.071	0.652	0.048	0.055	0.014	0.136	0.191	-0.041
LS1S4	0.608	0.038	-0.016	-0.103	0.153	0.139	-0.029	0.167	0.43	0.022	-0.198	-0.105	-0.159	-0.14
LS1S5	0.82	0.05	-0.005	-0.061	0.063	0.06	-0.066	0.125	0.094	-0.067	-0.149	0.062	0.144	-0.049
LS1S6	0.811	0.173	0.059	0.007	-0.018	-0.025	-0.098	0.113	-0.017	-0.079	0.104	0.093	0.077	-0.101
LS1S7	0.789	-0.094	0.004	0.164	0.183	0.13	0.05	-0.032	0.013	-0.019	-0.023	0.011	0.037	0.078
LS1S8	0.795	0.108	0.221	0.017	0.088	-0.076	-0.051	0.127	-0.07	0.119	-0.087	0.125	0.029	-0.007
LS1S9	0.741	0.089	0.031	0.008	0.179	0.032	0.183	0.089	-0.07	0.123	-0.07	0.044	0.01	-0.171
LS1S10	0.336	0.026	0.242	0.153	0.45	0.164	0.153	0.203	-0.058	-0.062	0.024	-0.249	-0.153	-0.38
LS1S11	0.455	0.038	0.192	0.039	0.083	0.208	0.262	-0.018	-0.306	0.218	0.142	-0.293	0.012	-0.131
LS1S12	0.559	0.141	-0.065	0.142	-0.021	0.222	-0.027	0.016	0.162	0.057	0.446	-0.23	-0.238	0.108
LS1S13	0.638	0.111	0.025	-0.008	-0.029	0.172	0.032	0.106	0.286	0.057	0.395	-0.161	-0.25	0.12
LS1S14	0.594	0.104	0.021	0.237	0.04	0.096	0.315	0.074	-0.003	-0.139	0.358	-0.113	0.038	0.289
LS1S15	0.709	0.137	0.084	0.201	0.206	0.046	0.038	0.211	-0.076	0.111	0.118	-0.014	0.042	0.296
LS1M1	0.244	-0.078	0.033	-0.043	0.747	0.074	-0.007	-0.024	0.013	0.056	0.239	0.122	0.068	-0.1
LS1M2	0.192	0.019	0.105	0.158	0.779	0.112	0.028	0.132	0.008	-0.037	0.062	0.109	0.031	0.006
LS1M3	0.13	0.154	0.131	0.009	0.686	0.044	0.151	-0.017	0.184	-0.031	-0.189	0.008	-0.041	0.082
LS2S1	0.105	0.169	0.153	-0.104	0.064	0.216	0.249	0.072	-0.048	-0.012	0.106	0.715	0.026	0.137
LS2S2	0.112	0.147	0.318	-0.122	0.105	0.041	0.066	0.089	0.088	-0.004	0.142	-0.148	0.529	0.032
LS2S3	0.008	-0.044	0.227	0.118	0.16	0.213	-0.016	-0.033	0.096	0.061	0.179	0.725	-0.171	-0.135
LS2S4	0.122	0.205	0.044	0.335	-0.117	0.099	0.189	-0.058	0.139	0.059	0.56	0.112	0.23	-0.09
LS2S5	0.096	0.202	0.187	0.652	0.036	0.047	0.029	0.061	0.118	0.308	0.167	-0.088	0.128	0.235
LS2S6	-0.011	0.343	0.085	0.657	0.123	0.01	0.215	0.026	-0.018	-0.011	0.176	-0.075	-0.065	-0.188
LS2S7	0.038	0.23	0.166	0.298	-0.089	-0.025	0.144	0.035	-0.007	0.743	0.166	0.046	0.041	-0.011
LS2S8	0.047	0.153	0.095	0.193	0.03	0	0.171	0.032	0.057	0.83	-0.024	0	-0.021	0.03
LS2S9	0.086	0.146	0.047	0.855	0.005	-0.028	0.009	-0.021	-0.005	0.223	0.025	0.033	-0.042	-0.04
LS2S10	0.017	0.037	0.062	0.122	0.162	0.014	0.796	-0.01	-0.067	0.23	0.154	0.012	0.035	-0.05
LS2S11	0.135	0.206	0.368	0.637	0.137	-0.004	0.058	-0.116	0.113	0.132	-0.013	0.099	-0.162	0.092

LS2S12	0.121	0.05	0.231	0.312	0.063	-0.145	0.24	0.049	0.413	0.325	0.243	0.145	0.041	-0.068
LS2M1	-0.112	0.086	0.127	0.071	0.157	0.008	0.084	0.061	-0.021	0.119	0.679	0.231	0.065	0.028
LS2M2	0.01	0.127	0.637	-0.041	0.098	0.094	-0.103	0.122	0.094	0.054	0.1	0.139	0.138	-0.018
LS2M3	0.131	0.074	0.836	0.127	0.035	0.049	0.127	-0.029	-0.018	-0.027	-0.036	0.104	0.062	-0.023
LS2M4	0.082	0.18	0.789	0.246	-0.014	0.034	-0.046	0.017	0.009	0.111	-0.055	0.036	-0.112	0.139
LS2M5	0.046	0.113	0.597	0.127	0.119	-0.002	0.362	0.072	0.117	0.075	0.047	0.08	0.1	-0.194
LS2M6	0.028	0.164	0.642	0.072	0.072	-0.085	0.074	0.113	0.14	0.352	0.23	0.07	-0.105	-0.137
LS3S1	0.007	0.126	0.081	0.179	0.272	0.689	-0.065	-0.025	0.02	-0.108	0.036	0.129	0.206	0.086
LS3S2	0.16	0.011	-0.033	-0.096	0.062	0.812	0.06	0.002	0.041	0.115	0.003	0.1	-0.061	0.037
LS3S3	0.12	0.041	0.122	-0.003	0.017	0.863	0.06	-0.026	0.022	-0.077	0.056	0.082	-0.008	-0.122
LS3S4	0.114	0.673	-0.014	0.206	-0.13	0.107	-0.038	0.095	0.122	0.026	0.063	0.166	0.242	-0.306
LS3S5	0.223	0.706	0.151	0.113	0.097	0.081	0.107	0.078	0.133	0.057	0.021	0.009	0.103	-0.15
LS3S6	0.267	0.67	0.21	0.262	-0.125	-0.012	-0.042	0.028	0.043	0.108	0.015	0.127	0.122	-0.139
LS3S7	0.036	0.636	0.069	0.058	-0.057	-0.002	0.183	0.161	-0.003	0.366	0.185	-0.151	0.019	0.174
LS3S8	0.075	0.684	0.23	0.022	0.172	0.145	0.063	0.034	0.094	0.085	0.091	-0.121	-0.039	0.116
LS3S9	-0.041	0.645	0.163	0.268	0.075	-0.078	0.129	-0.07	0.034	-0.05	-0.058	0.183	-0.312	0.151
LS3S10	0.031	0.192	0.094	0.048	0.012	0.1	0.792	0.125	0.283	0.104	-0.006	0.138	0.013	0.055
LS3S11	0.051	0.472	0.08	0.203	0.009	-0.086	0.458	0.23	0.184	0.092	0.093	0.141	0.04	0.378
LS3S12	0.038	0.615	0.337	0.187	0.151	0.03	0.035	-0.065	0.128	0.198	0.09	-0.002	0.048	0.265
LS3M1	0.04	0.342	0.426	0.042	0.46	0.15	0.073	-0.008	0.119	0.045	-0.037	-0.084	0.209	0.268
LS3M2	0.101	0.284	0.493	0.13	0.169	0.083	0.029	-0.047	0.48	-0.023	-0.008	-0.103	0.202	0.141
LS3M3	-0.01	0.274	0.547	0.066	0.298	0.039	0.048	0.172	0.371	0.009	0.036	0.013	0.216	0.107
LS3M4	0.064	0.197	0.189	0.441	0.047	0.219	0.188	0.051	0.383	0.081	0.097	-0.051	0.408	0.112
LS3M5	0.04	0.144	0.42	0.029	-0.012	0.326	0.256	0.098	0.52	-0.007	0.12	-0.068	0.033	0.074
LS3M6	-0.059	0.379	0.274	0.103	0.181	-0.041	0.107	0.031	0.643	0.074	0.065	0.146	0.048	-0.059
Eigenvalues	5.98	4.485	4.485	3.28	2.739	2.509	2.386	2.322	2.145	2.138	1.884	1.787	1.261	1.256
% of Variance	11.074	8.305	8.305	6.073	5.072	4.646	4.419	4.301	3.972	3.96	3.489	3.308	2.335	2.327
Cumulative %	11.074	19.38	27.685	33.758	38.83	43.476	47.895	52.195	56.167	60.127	63.616	66.924	69.259	71.586