For Covid-19: A Policy Search From Indian Price Indices

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Abstract

Covid-19, its first and second waves are such disease which can affect every human being including healthy ones and the entire sub-continent of Indian economy is presently under the ravage of its second wave. Since it has the capacity to make everyone sick, revival framework for Indian economy and the World as a whole, should rely on such policy instruments which touch mass population in one and other way. From Economics viewpoint, such policies need to revolve around likewise fiscal, monetary and their possible mixes which can influence day to day activities of every people like earning, spending, inhalation, adopting precautionary measures and corona treatment costs. These can be compensatory income provision, relief in tax and premium payment, monetary stimulus package, underwriting treatment cost off and wavering associated medical spending, special job training and assistance in beginning new start-ups of persuading online distribution system. Considering its widespread nature, associated lockdown and curfew of different sorts in consumption and production dense spaces are most likely to halt and make disruption in such activities at a very large scale. Consequently related indices such as Wholesale Price Index (WPI) and Consumer Price Index (CPI) can incorporate its adverse impact both at aggregate and disaggregate levels. This paper makes an attempt to grasp and analyse these movements in WPI and CPI for deriving underlying incidences and thereby, searches for probable and possible revival policies for Indian Economy to turn around.

Key Words: Pandemic, Wholesale Price Index, Consumer Price Index, Economic Policy, Aggregate Demand and Aggregate Supply
I. INTRODUCTION

In India, Covid-19 took shape of pandemic from March, 2020 and similarly, second wave started racing again from March, 2021 whereas surprisingly in China, USA and second wave in UK peaked up December onwards. It can be looked upon like that below geographical equatorial ellipsoid, this pandemic is beginning severity from upcoming summer season while above that countries are facing this virus near starting of winter season. Relatively warm country like India felt its burn during summer seasons and above mentioned countries experienced the same in following shivering cold seasons. It is well known that global warming is leading to extreme climatic changes turning summer seasons hotter and winter seasons colder. Two waves of Covid-19 point towards onslaught of spread, severity and increased mutation capacity of coronavirus family in tandem with extreme climatic changes resulting from global warming and carbon dioxide led tearing of atmospheric ozone layer. Lone, et al (2020) articulate that Corona virus is a Zoonotic virus which growth gets fostered by global warming led glacier melting, greenhouse gas emission, deforestation, farm modernisation and it can be due to the lowest per capita CO2 emission, African continent is the least affected and within this continent, South Africa registers higher number of confirmed cases. Considering widespread poverty and greater economic impact, countries of this continent are relaxing restrictions and following coordinated efforts between Government and public as pursued earlier for facing Ebola, HIV and Polio outbreaks. While Chakraborty, et al (2020) make it clear that even though Covid-19 is leading to global emergency like situation after World War II, it seems to be indulging into contrasting consequences. On one hand, its follow up measures like lockdowns are clearing environment through reduced emission of CHGs, fossil fuel and industrial waste and on other hand, its mutation capacity is increasing its lethal power. Given this, care for environment should be accorded the topmost priority at present situation and future times. In calendar year, one new programme needs to be added in the name of International Sanitisation Day alongwith yearly celebration of World Environment Day and Plantation programme. This implies environment demands now direct care to counter reckless pollution, which onus often fell on unconscious and deliberate actions of living animals to some extent, alongwith earlier initiative which usually indirectly secured environment through plantation, reduced emission agenda and waste recycling. Government, National and International institutions are to constitute Pandemic Committees worldwide to monitor adoption of environmental sterilisation drives and ensure strict vigilance on observance of that calendar day to sanitise and clean surrounding environment every year. Its reflection and inclusion in framing annual economic budget making are becoming mandatory like AIDS, Hepatitis, Polio, Tuberculosis, Worming and drives of plantation, International Women Day.

Compared to other adverse natural phenomenon, lasting of this disease is longer, spread is not limited to few areas and this attacks human life and branches through human beings only, severity is more intense due to its greater mutability, leaving other aspects of human beings, entire biosphere and infrastructure untouched.
In the book ‘Economics in the Time of COVID-19’ by Baldwin, et al (2020), propagation of COVID-19 is found to be global in nature including the G7 plus China compared to past supply shocks of 2011. First-round shocks are amplified through Keynesian multiplier magnifying further from unemployment. Pandemic led supply-chain contagion is reflected in sharp decline of Caixin/Markit Manufacturing Purchasing Managers’ Index for East Asia, US and Germany. As less lethal COVID-19 is more transmissible than SARS, there is concept of remote place working although certain tangible goods production can be hampered. However, output contraction is lower relative to twenty years back SARS pandemic due to availability of digital and cloud-based technology.

However, in absence of corona vaccination, its precautionary measures like lockdown casted its worst impact on infrastructure of production activities vacating factories, reverse migrating workers and shutting down productions altogether. Its widespread made its adverse affect of very large scale (sub-continental scale), relative to other ailments which impact remains limited to some niche and regional pockets, thereby its little impact cannot influence vast supply chain and demand generation to wider extent, resulting in insignificant fluctuation of price indices. From this perspective, an effort is made in this paper to search revival framework for Indian Economy through a study of aggregate and disaggregate movement in its Wholesale Price Index (WPI) and Consumer Price Index (CPI).

Perspective for Revival Framework

Searching way outs for revival of Indian economy after being raged by Covid-19 first wave and present second wave can be based upon many perspectives – firstly, knowhow of Spanish Flu pandemic handling hundred years back; secondly, with changes in economic development over hundred years, modifications need to be incorporated with addition and deletion of revival processes; thirdly, policies followed by countries in similar development scale and economic size for further upgradation and lastly, undertaking scientific and epidemiological research activities of its possible mutation capacity to generate more waves and turn deadlier alongwith genomic sequencing and further improvement in vaccine strength as well as effecting environmental sanitisation drive at all levels.

According to Afolabi, et al (2021), present pandemic surpasses earlier epidemics in scale and associated healthcare burden except to that of 1918-1920 Spanish Flu. Under prevalence of economic backwardness making lockdown persistence unviable, reigning misconceptions, urban slums with informal settlement, poor emergency preparedness, weak and less surveillant health systems as well as low testing and poor contact tracing, lessons learnt from the Ebola epidemics becomes significant to tackle Covid-19 distress in sub-Saharan Africa and this necessitates community effort and coordination to national initiatives alongwith international support. In an illuminating policy analysis, Loayza, (2020) brought a differentiation in policy framework depending upon nature of economy. Low and middle income developing countries usually remain fraught with problems of limited disaster preparedness, large informal sector, poor governance, resources scarcity and burden of relatively young population. From cost-benefit analysis of various countermeasures, author comes to
conclusion that prevailing socio-economic condition and resource paucity are not favourable for such countries to adopt stricter measures rather to proceed with moderately expansionary fiscal and monetary policies.

In Economics, we decompose real life phenomenon in terms of demand and supply lenses. At macro level, given volume of aggregate demand if aggregate supply gets disrupted by abrupt supply shock, then we visualise rise in average price level. Even if aggregate demand falls, faster decline in aggregate supply can again result in higher price level. This can be reality both at aggregate and disaggregate levels. From German firm-level survey data, Balleer, et al (2020) reveals that Covid-19 had more disruptive impact on aggregate demand than on aggregate supply resulting in lower price level and policy focus should be upon aggregate demand stabilisation relatively. Given volatility in aggregate price movement and inability to cross lower bound of monetary policies, sector specific fiscal policies instead are to be relied upon. Ceylan, et al (2020) in paper titled ‘Historical evidence for economic effects of COVID-19’, finds manifold increase in online shopping of essential consumables during pandemic but market for durable sales was stumbled due to fall in demand, led to closure of many units and huge unemployment. For tackling such adverse affects, authors suggest that expansionary economic policies and various relief measures need to be implemented in such a way that these initiatives do not result in high inflation and greater degree of economic hardship further. When entire economy comes under supply adversities, average price level rises faster while sectors specific breaks in supply chains result in slower increase of average price level, however, certain sub-sectors can undergo intolerable price rise. Present Pandemic led vicious microbial environment, ways out of lockdown and curfew imposition and creation of containment zone all can be clubbed as factors deterring impetus for stimulating aggregate demand and supply. Considering it global spread, first and second wave attacks, its worst impact Maharashtra, Madhya Pradesh, West Bengal and Delhi within India; from Economics viewpoint, adverse consequences of Covid-19 can be studied under both aggregate and disaggregate framework.

During first wave, vaccine was not available and in its absence, there was little alternative except to practise nationwide lockdown, wearing masks and maintaining social distancing. Fear of being contiguously affected by contact of human being functioned as natural disincentives for sub-sectors requiring close human interaction and transportation for distant workplaces to sustain work plea amidst pandemic. People serving agriculture, forestry, fishing, mining and quarrying mostly live surrounding land areas and interact with land, forest and water resources for larger duration on daily hour basis whereas sub-sectors of industries and services are mostly concentration of human beings and transportation density. Further emphasis on continuance of essential supply with work from home through digital and online mode wherever and whenever possible during Covid-19, provided necessary fillip to producers for maintaining perseverance to essential goods, service and medicine productions. Presently, instances are not rare which showcase that even farmers are implementing artificial intelligence to ensure better resource utilisation, output volume, its marketability, weather forecast and insect led demurrage predictability. In a paper entitled ‘Redesigning Supply Chains using Blockchain-Enabled Circular Economy and COVID-19 Experiences’, Nandi, et al (2021) provides rationales behind evolution of Block chain technology (BCT) as a
solution to problem of supply chain disruption caused by Covid-19 since in BCT, electronic mapping of input-output status remains digitally stored blockwise in network chain of circular World economy and during adversities, it can provide requisite information regarding scarce and abundant product spaces, their real time status, required inventory management, storage and distribution in no time with help of big data, internet of things (IOT) and artificial intelligence.

**Revival Framework and Price Indices**

Movement in average price level can be captured from Wholesale Price Index Number (WPI) and Consumer Price Index Number (CPI). WPI basically records average price which producers get after completion of factory and mandi operations while CPI keeps track of average price level at which consumers purchase commodities at retail market. Rising trends in both WPI and CPI show better prices for produces and requires more purchasing power for consumers while falling trends in both indicators point towards lower profitability prospect for producers and surplus earnings for consumers. A rising WPI and a declining CPI are favourable for both producers and consumers whereas a falling WPI and increasing CPI are not likely to welcome by anyone involved in exchange activities. Impact of Covid-19 is largely on supply side due to social distancing, lockdown and containment zone creation in different parts of India and there is also demand disruption owing to unemployment, migration, income halt, salary cut, sickness, lack of work and work avenues, which were offset to some extent by various guarantee schemes like that of income, job and medical benefit allowances.

This leads to disproportionate growth in both aggregate demand and aggregate supply compared to the pre-Covid period level and resulting unbalance without any doubt will cast some impact upon commodity prices which average movement gets expressed from WPI and CPI fluctuations. If this pandemic hits all sectors at similar degree, then overall WPI and CPI statistics are expected to estimate positive correlation to its constituent commodity and labour types. On other hand, in case of sectoral variation in respect of its burnt felt, WPI and CPIs are likely to calculate negative association to some of its categories. Ghiani, et al (2020) noted that lockdown and travel restriction led closure of various businesses, industries, commercial productions, public offices, schools, family organisations, tourism and the overall tertiary sector, brought substantial fall in electricity loadings, its consumption volume and wholesale energy price level relative to renewable energy sector of Italy. Cariappa, et al (2020) finds that even though India’s supply network, one of the largest in the World, is being ravaged by Corona pandemic, its agricultural sector was not affected to that extent and price rise did not cross normal range due to internal resilience and consistent inducements given towards this sector. Whereas Saikia, et al (2020) justifies that shortcomings of Indian supply chains got exposed under Covid-19 but its affect did not fell on agricultural sector as industrial and service sectors could not build resilience like the former where cultivation and harvesting were allowed, security schemes and availability of concessional credit at lower interest rate continued amidst lockdown alongwith that of rainfall. Based on daily data of all major agricultural markets of Jammu and Kashmir, Ali, et al (2020) explains that wholesale price in general and terminal markets was unaffected by pandemic but became lower in satellite market during lockdown, possibly due to export restriction, closure of restaurant and overall,
hospitality sector. However, wholesale price of perishable fruits and vegetables increased from rise in household panic buy and purchase to ensure health immunity although its hydrated category experienced a decline.

Next, International comparison can reveal position of Indian economy in respect of suffering adverse affect of corona relative to rest of the World as well as identify countries which are at similar scale in respect of average price level and such movement and therefore, can emulate and interchange policy prescription in this regard to reverse ravage of ongoing pandemic. If an economy is found to be with lower WPI in this respect, it can very well indicate greater supply generation as well as lower impetus received by mass producers than other countries in the identified group. When comparison is made to an another country falling outside the group, depending upon nature of that economy, it can signify that relatively lower production takes place and greater encouragement exists for enterprisers to flourish in both underdeveloped and developed economies. These international studies can also depict trends followed by average price level over years, an upward trend will indicate incentives bestowed for production process to rise from lower level while a downward trend will imply existence of already a supply glut and uniform trend, a rare possibility, will stand for persistent encouragement that is imparted to production process.

Empirical Findings

Empirical analysis is based upon Reserve Bank of India (RBI) Statistical Handbook of Indian Economy, Economic Survey 2020-21 derived from Indian Budget website and Price Level Indices (PLI) of OECD site. First two sites show data of Indian Economy from 1950-51 to 2021 on Annual Growth Rates of Real Gross Value Added at Constant Prices, WPI and CPI at aggregate and disaggregate levels while PLI dataset is equipped with price indices of forty three different countries of the World including India from 1997-2020.

From this PLI dataset, annual compound growth rate (CAGR) was estimated for each country firstly for the entire period of 1997-2020, then last five years of 2014-2019 before onslaught of Corona pandemic and then, classification is made in terms of positive and negative CAGR as well as in respect of fluctuating PLI from 2019-2020 to 2021 and this is presented Table I:

Table I provide us the following insights

(i) Countries which experienced fall in price level all throughout the period, last five years as well as during first wave of pandemic years include only RUS and this indicates Covid-19 could not disrupt supply chain of this country at large scale of production.

(ii) Countries which experienced fall in price level all throughout the period, last five years but rise during first wave of pandemic years are AUT, BEL, DNK, FIN, FRA, DEU, GRC, ITA, SWE, GBR, EA18 and EU27 where production side is devastated by Corona.
(iii) Countries which experienced rise in price level all throughout the period, last five years as well as during first wave of pandemic years are CZE, SVK, USA and ISR. This can imply aggregate demand of these countries had always been exceeding its aggregate supply aspect, produces got boosted and even if pandemic affected its production capacity adversely, it was not able to lower aggregate demand to that extent.

(iv) Countries which experienced rise in price level all throughout the period, last five years but fall during first wave of pandemic years consist of ISL, KOR, CHN, IDN, IND and ZAF. This implies aggregate supply was relatively little ravaged by Covid-19 than that of aggregate demand even though aggregate demand of these countries had always been higher than its aggregate supply.

(v) Analysing by absolute level of these price indices further over years, it can be found that IND is at the second lowest level after IDN and in its close vicinity lying BRA, CHN, COL, POL, RUS, SVK, TUR and ZAF at around PLI value of 50 as shown by a horizontal line in Figure I. Considering PLI level, its CAGR and sub-continental size of economy, Indian revival policies in this respect can closely follow BRA, CHN, RUS and ZAF alongwith that of COL, POL, SVK and TUR.

Some policies exercised by these countries include (a) amendment in laws and constitutions of expenditure ceiling and terms of credit (b) repo operations of national bonds (c) assistance from Unemployment Insurance Fund (d) social grant and solidarity fund for vulnerable families and (e) loan guarantee by Government, particularly for SMEs and affected industries (f) tax deferral and holiday for SMEs, skill development and NGOs providing social services (g) custom duty exemption for essential commodities, medicines and equipments (h) increase in frequency and size of repo operation and refinancing facility (i) waiving of social security contributions (j) fee and tariff cuts for usage of roads, ports, and electricity by SMEs (k) expanded re-lending and re-discounting facilities for manufacturers of medical supplies and daily necessities, MSMEs and agricultural sector (l) supporting uncollateralized SME loans from local banks (m) raising lending growth to MSMEs by large banks (n) lifting cap on online loans and bank fees for online retailers (o) increasing compensation for frontline medical personnel and safety inspectors (p) sick leave benefits and leave pay to individuals under quarantine (q) unemployment benefit for job losers and additional lumpsum benefit for their children (r) deferral and reduction in social contributions for SMEs in affected sectors (s) full and partial tax refund for registered self-employed including sole proprietors (t) lowering age eligibility to register as self-employed (u) budget grants for SMEs in affected industries to cover salaries of employee for certain period under condition of preserved employment (v) budget grants to firms hiring people who lost jobs (w) subsidies to airlines, airports and automakers (x) granting loan waiving for restructuring (y) refinancing facility to support SME lending and lowering its interest rate (z) lowering risk coefficients for loans to medical suppliers, pharmaceutical companies and high-tech exports (International Monetary Fund).

From Economic Survey 2020-21, it is found that in Indian economy Annual Growth Rates of Real Gross Value Added (RGVA) at Constant Prices turned negative (-7.2 %) for the pandemic year 2020-21 and except RGVA of agriculture, forestry & fishing, mining and quarrying (AFFMQ) at the rate of 0.9 %, addition of all other
sectors declined by absolute values - Manufacturing, construction, electricity, gas and water supply (MCEGW, -9.3 %), Trade, hotels, transport & communication (THTC, -21.4 %), Financing, insurance, real estate and business services (FIRB, -0.8 %) and Community social & personal services (CSP, -3.7 %). After seventy years of independence, this is the first time that Covid-19 brought downfall in almost all the sectors simultaneously but one. Separately, contribution from CSP was never negative since Independence and this had been realised four times for MCEGW and only once for FFIRB and THTC in the year 1974-75 and 1979-80 respectively.

From graphical presentation of WPI for aggregate and disaggregate sectors in Figure II, it can be noticed usual upward trend was maintained for WPI of all commodities, Food Articles (FA), Minerals (MN) and Manufactured Products (MF) but that of Fuel & power (FP) caught downward trend. Only WPI of FP is estimated to be negatively correlated to that of general WPI. Implication can be that both aggregate demand and aggregate supply of FP are disrupted by pandemic but it is the aggregate demand which is under more burn. For other sectors except AFFMQ, aggregate supply was pulled down more than aggregate demand by corona. Although RGVA of AFFMQ is positive, this is lower compared to the pre-pandemic years. However, monthly trend of 2020 WPI shows fluctuation and there are downwards tendencies only for MN and FA from the month of September and October respectively. Policy stimulus like subsidies, infrastructure utilisation cost wavering, easing credit terms, direct income transfer, package schemes and special assistance to make technology driven start-ups trendy for maintaining social distancing led human security from Covid-19, needs to push both aggregate demand and aggregate supply upward but selective emphasis can be placed relatively more on aggregate demand generation for FP while it can be on aggregate supply for MN, MF and in general. According to Deshmukh et al (2020), considering strenuous performance of Indian manufacturing sector similar to social distancing, shut down, labour migration and reduced demand led global slowdown under Covid-19, viable policy alternatives are turning out to be low cost and people oriented automation of traditional units and implementation of Industry 4.0 with existing pool of english speaking scientists, researchers and engineers suited to artificial intelligence, increasing digitisation and high-tech industries.

If these WPIs are analysed commoditywise, it is found that out of ten such produce which weight is more than one in wholesale basket, only for wheat, cotton yarn and mineral oil WPIs deviate from normal trend during 2020-21. Ramakumar (2020)'s analysis of Indian agriculture during pandemic shows that supply adversities and fall in demand provided lower price for farmers and price fall was substantial particularly for wheat, perishables like vegetables, fruit, eggs and poultry chicken. Monthly WPI statistics of 2020-21 depicts initiation of disruption from the month of June-July. Affect comparison can be seen from the diagram (d) that even though General WPI, that of Agricultural and Manufactured products increased consistently, ratio of Manufactured WPI to that of Agriculture started falling and this was from the month of June, 2020 particularly. Revival policies can accordingly be oriented particularly for cultivation of wheat, cotton yarn, mineral oil and overall, manufactured products.
Lastly, movement of CPI captured in Figure III reveals that although general CPI, CPI of Food and Non-Food articles fell in retail shops for industrial workers during 2020 starting the month of August, other CPIs of rural, urban, combined, agricultural labourers and rural labourers rose continuously, at a faster rate from September, making their purchasing power lower and cost of living higher. Direct income supporting schemes should be continued through instant online transfer for pandemic period to maintain minimum calorie intake and sustainable consumption at every level of society alongwith provision of job guarantee, psychological counselling for corona trauma, adoption of precautionary measures such as wearing masks, social distancing, washing hands and sanitisation as well as mandatory running of various employment schemes and technology start-ups for those wish for new enterprising initiative to improve surrounding space, people and environment, independent of caste, creed, sex, disability and all other such considerations. At regional level Bhattacharya et al (2021) recommend implementation of special efforts for Uttar Pradesh, Madhya Pradesh, Bihar, Assam and Jharkhand with the highest health vulnerability indices, economic vulnerability indices and overall vulnerability indices which did not decline. In order to contain adverse impact of the pandemic and prevent further fall in growth rate of per capita state output level, SMEs and migrant workers should receive special assistance during the pandemic. They advise both cash and kind transfer, public distribution system operation through fair price shops and provision of work guarantee to needy households, particularly in MGNREGA states. Further, they ask to involve unemployed labour pool and migrant labour force seeking rehabilitation in India wide vaccination programme as assisting medical personnel.

II. CONCLUSION

Revival framework for Indian Economy to fetch normalcy after rage of Covid-19 basically requires awaring millions of people about precautionary measures like wearing mask, maintaining social distancing, undergoing vaccination, regular hand wash, sanitisation and trauma counselling. Ultimately it boils down to implementation aspect for rejuvenation of consumption and production activities and this can be at its best if relied upon at block level authority with formation of a brand new Coronal Cell which will include medical personnel, authorised workers directly connected to Labour and Treasury office. An online portal alongwith whatsapp number and grievance option needs to be open up for Corona hit people to register and lodge problems to resolve. Afterwards, Coronal Cell personnel are required to take immediate actions upon production of problem certificate from authority deputed by Block Level Development Office (BLO). Alongwith assurance and granting of compensatory income policy and medical assistance, these personnel should be powered enough to assist in job training and beginning start up of the job liked by people wishing to alter occupational pattern.
III. REFERENCES

1. Afolabi, M.O., Folayan, M.O. & Munung, N.S. et al. (2021). Lessons from the Ebola epidemics and their applications for COVID-19 pandemic response in sub-Saharan Africa, Developing World Bioeth, 21, 25–30. https://doi.org/10.1111/dewb.12275
2. Ali, J. & Khan, W. (2020). Impact of COVID-19 pandemic on agricultural wholesale prices in India: A comparative analysis across the phases of the lockdown, J Public Affairs, 20:e2402. https://doi.org/10.1002/
pa.2402
3. Baldwin, R. & di Mauro, B.W. (2020). Economics in the Time of COVID-19, Centre for Economic Policy Research, London, UK, EC1V 0DX. ISBN: 978-1-912179-28-2
4. Balleer, A., Link, S., Menkhoff, M. & Zorn, P. (2020). Demand or Supply? Price Adjustment during the Covid-19 Pandemic. CESifo Working Paper, No. 8394, Center for Economic Studies and Ifo Institute (CESifo), Munich. http://hdl.handle.net/10419/223466
5. Bhattacharya, M. & Banerjee, P. (2021). COVID-19: Indices of economic and health vulnerability for the Indian states, Social Sciences & Humanities Open, 4, 100157.
6. Cariappa, A.G.A., Acharya, K.K., Adhav, C.A., Sendhil, R. & Ramasundaram, P. (2020). Pandemic Led Food Price Anomalies and Supply Chain Disruption: Evidence from COVID-19 Incidence in India Available at SSRN: https://ssrn.com/abstract=3680634 or http://dx.doi.org/10.2139/ssrn.3680634
7. Chakraborty, I. & Maity, P. (2020). COVID-19 outbreak: Migration, effects on society, global environment and prevention. Science of the Total Environment, 728. https://doi.org/10.1016/j.scitotenv.2020.138882
8. Deshmukh, S. G. & Haleem, A. (2020). Framework for Manufacturing in Post-Covid-19 World Order: An Indian Perspective. International Journal of Global Business and Competitiveness, Global Institute of Flexible Systems Management. https://doi.org/10.1007/s42943-020-00009-1
9. Ghiani, E., Galici, M., Mureddu, M. and Pilo, F. (2020). Impact on Electricity Consumption and Market Pricing of Energy and Ancillary Services during Pandemic of COVID-19 in Italy. Energies, 13, 3357. doi:10.3390/en13133357. www.mdpi.com/journal/energies.
10. GOI (2021). ‘Economic Survey 2020-21’. Statistical Appendix. May 6. Retrieved from www.indiabudget.gov.in.
11. Loayza, N.V. (2020). Costs and Trade-Offs in the Fight against the COVID-19 Pandemic: A Developing Country Perspective. Research & Policy Brief No.35. World Bank Group - Malaysia Hub.
12. Nandi, S., Sarkis, J., Hervani, A & Helms, M. (2021). Redesigning Supply Chains using Blockchain-Enabled Circular Economy and COVID-19 Experiences. Sustainable Production and Consumption, 27, 10–22.
18. OECD (2021). ‘Price Level Indices’. May 6. Retrieved from www.oecd.org.
19. Ramakumar, R. (2020). Agriculture and the Covid-19 Pandemic: An Analysis with Special Reference to India.
20. Review of Agrarian Studies. 10 (1), 72-110.
21. Saikia, C., Nath, P. and Deka, H. (2020). Assessing the Vulnerability and Resiliency of Indian Agriculture: A COVID-19 Perspective. International Journal of Management, 11(10), 1198-1209. http://www.iaeme.com/IJM/issues.asp?JType=IJM&VType=11&IType=10.
22. Shabir, A. & Aijaz, A. (2020). COVID-19 pandemic – an African perspective, Emerging Microbes & Infections, 9 (1), 1300-1308. DOI: 10.1080/22221751.2020.1775132
23. Yu, Z., Razzaq, A.; Rehman, A., Shah, A., Jameel, K. & Mor6, R. (2021). Disruption in global supply chain and socio-economic shocks: a lesson from COVID-19 for sustainable production and consumption. Operations Management Research. https://doi.org/10.1007/s12063-021-00179-y