

# Effect of COVID-19 on the Indian Economy and Supply Chain

Shruti Agrawal<sup>1</sup>, Anbesh Jamwal<sup>2</sup>, Sumit Gupta<sup>3</sup>

<sup>1</sup>Department of Social Sciences and Humanities, Malaviya National Institute of Technology, J.L.N. Marg, Jaipur, Rajasthan-302017 (India)

<sup>2</sup>Department of Mechanical Engineering, Malaviya National Institute of Technology, J.L.N. Marg, Jaipur, Rajasthan-302017 (India)

<sup>3</sup>Department of Mechanical Engineering, A.S.E.T., Amity University Uttar Pradesh, Noida 201313, India

## Abstract

At present time world is facing from the coronavirus disease known as Covid-19. The first case of the coronavirus was reported in the December, 2019 in the Wuhan city of China which is known as the major transportation hub of China. After the spread of Covid-19 many countries have shut down their sea ports and airports. They have banned the import and export activities. Also, China is the major distributor of the raw materials which affect the manufacturing activities across the globe due to lockdowns. India is the developing country due to the Covid-19 spread the cases reported in the India government has lockdown the country for 41 days which affected the manufacturing activities and majorly it affects the supply chains and economy of the country. In the present paper we have discussed the effect of Covid-19 on Indian economy and on supply chains in India. There are total of 18 critical barriers are found out which affected the supply chains in the India. It is expected that this study will helpful the researchers to develop the conceptual models to overcome from this issue.

**Keywords:** Covid-19; Indian economy; supply chain; manufacturing industries; barriers

## Introduction

Manufacturing plays an important role in the development of nations by contributing to the GDPs [1]. Manufacturing industries are the major contributor in the global economy [2]. At present time industries across the world are focusing on the high value and high margin products [3]. Now the production of the low margin and high volume products have shifted towards the low economies [4]. The application of the just in time and lean philosophies had contributed towards the cost reductions in the industries. But still due to the Covid-19 issues around 35% of

manufacturers have reported the disturbances in the manufacturing practices. At present there is huge demands of many products in which the face shields and pharmaceutical products are main. The demand of these products has increased in last two months [5]. The manufacturing units in most of the countries have shut down due to Covid-19 spread and most of the countries are facing from the lack of the labour due to the fear of Covid-19 spread. The first case of Covid-19 in India reported in January, 2020 and now Government of India has declared the lockdown in the country to minimize the spread of Covid-19 [6]. Supply chain across the nation is disrupted. The Indian government has already held the high level meetings to set the new manufacturing strategies. Japan and other countries are also looking for the diversify the supply chains and manufacturing systems to new destinations. Indian government is now focusing on the try and establishing India as an alternative to the China for manufacturing for both the local and global market. Most of the countries have shifted their production out of China due to the disruption of the supply chain between major trading partners [7]. Supply chain is also disrupted in India at local level due to some barriers which are discussed in the present study. In the present paper we have discussed the effect of Covid-19 on Indian economy and on supply chains in India. There are total of 18 critical barriers are found out which affected the supply chains in the India. It is expected that this study will helpful the researchers to develop the conceptual models to overcome from this issue.

### **Impact of COVID 19 on Indian Economy**

After the great depression of 1930 in which the global economy has faced the worst recession is now facing the global pandemic of corona virus that has laid the adverse effect on all the economic activates across the world. The sudden decline in economic activities due to the lockdown is unexpected in the history of India. The great economist Keynes has suggested the concept of trade business cycle after the great depression. The four stage of trade cycle is considered to measure the growth rate and real GDP. International Monetary Fund (IMF) has projected the GDP growth as 1.9% and this shows the worst growth performance of India after the liberalisation policy of 1991 in this fiscal year as the corona virus has disturbed the whole economy [8].

Instead after this the IMF in its latest edition of the World Economy Report has placed India being the fastest growing economy in 2020. The global economy is projected to contrast sharply

by -3% percent in 2020 which is much worse than the financial crises in 2008-09. In India, the impact on real or predictive sectors of the economy is worse than that witnessed in 2008 crises. The country will now face multiple challenges in terms of financial crises, health crises, collapse in commodity prices and much more [9]. The banking system has increased the surplus liquidity because of the demand-side shocks that arises due to uncertainties as well as lock down in the market. There is a huge impact on the financial shock that includes stock market crash, liquidity crises as it began to drain out from global market in banking system and various changes in monetary policies. The US dollar credit crunch has started bothering the world economy due to huge collapse of earnings, dollar denominated debts [10]. As the most of the companies that depends upon international trade will suffer severe pressure. The global economic production is on decline and expecting a huge recession in the entire economy. The global pandemic has hit the economy which questioned the target to make Indian economy of USD \$5 Trillion with 7% of GDP by the year 2024. As per the World Bank latest assessment, India is expected to grow 1.5 percent to 2.8 percent as well as according to IMF, it has projected a GDP growth of 1.9 percent in 2020 and to achieve the object of USD \$5 Trillion economy it is expected to grow at 9 percent every year for five years [11]. India's growth trajectory since 2011 shown in figure 1.

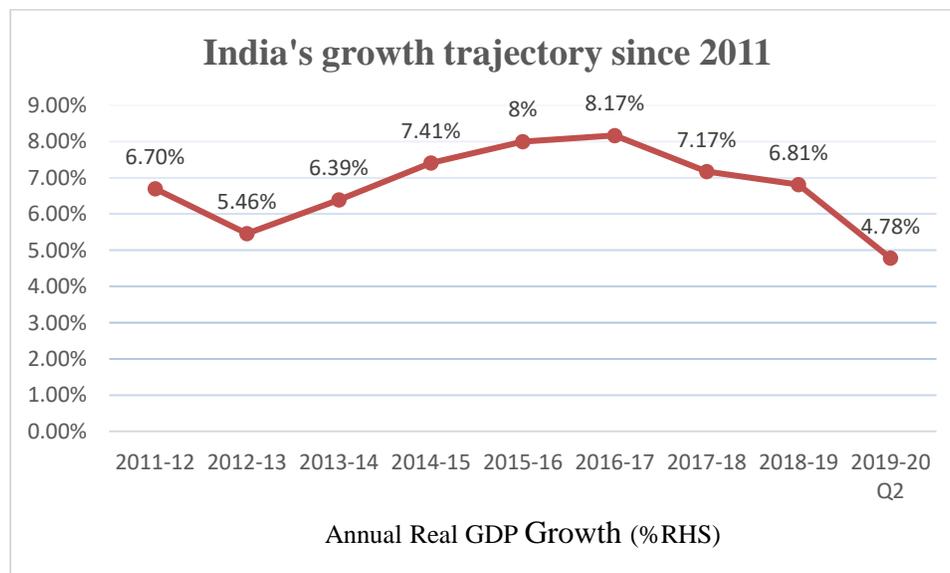


Figure 1: India's growth trajectory since 2011

**Demand side shock:**

The huge uncertainty and fall in market has led to double whammy of business that disturb the entire chain of production and demand cycle. It includes the various facilities and services provided by the Indian government and private sectors such as Tourism, Hospitality and Aviation are the major sectors that are facing maximum loss in the present crises. Tourism that account for 9% of GDP may decline at least next 2-3 quarters [12]. Aviation that contributes around 2.4% of GDP has severely impacted and these sectors include employees around 42.7 million of people. Sectors such as auto, that contributes 10% of GDP and employee around 40 million of people, is declining continuously due to less of demand and due to which the marginal firms and other industries has forced to shut down [13]. Closing of cinema halls, declining in shopping from complex malls has affected the retail sector too and also to the consumption pattern of consumer in terms of essentials and luxury goods. The consumption pattern of consumer has impacted and has shown a downfall due to fall in income and lost jobs especially to the daily wage earners that questioned the Ratchet Effect and Demonstration Effect given by economist J.V. Dusenberry. The constant fear of the pandemic in the public has affected their mental well-being and confidence level that postponed their purchasing decision. The service of travel and transport is on a pause due to lockdown across the country as has direct impact on slowdown in economic activities. It is accounted for a loss of \$4.5 billion every day of the lockdown. The hotel services are catching huge cancellation from business travellers from various conferences, workshops seminar that got cancelled on such a large scale.

**Supply side impact:**

Some targeted industries in the supply side go for the shutdown that are the marginal firms. India being the highest exporter of raw material and import source of goods that are required for their intermediate and final goods are on pause now due to the delay in supply of goods from china. Various sectors such as pharmaceuticals, automobiles, electronics and chemical products etc are facing a shortage of required component [14]. As china accounts for 27% of India's automotive part imports. India imports about 85% of active pharmaceuticals ingredients (API) from china and due to the factor there is a possibility of shortage in availability and thus prices may go on hike. Due to the lockdown and global pandemic the business is hampering with the production

cycle that will further affect the investments [15]. There is about 55% of electronics are imported from china that has slid down to a percentage.

### **Impact on International Trade:**

According to WTO, world trade is expected to fall by between 13% and 32% in 2020 due to COVID 19 pandemic that has disturbed normal economic activity. Share of Indian export in, in total world's export is 3.5% and share of Import in world's import is 3.1% (2019). The trade balance of India has shown a trade deficit of 9.8 USD bn in March 2020. The unexpected decline the trade and production has negative consequences on the business and households. The aspect of international trade the government may look for the countermeasure for the indigenous production and to reduce the dependency ratio on a single country that will somehow boost the production of domestic industries and reduce the trade deficit. China being the highest foreign trade with India and it is major market for many Indian products like sea food, gems and jewellery, petrochemicals etc. Due to the fall in export the fisheries sector has shown a fall of Rs. 1300 crore. For the April-February period, India's current fiscal exports have dropped by 1.5% to 292.91 billion [16]. According to UNCTAD, India's trade impact is about to be 348 million dollars. India stood in among 15 most affected economies due to fall in the production of china that is disturbing the entire trade pattern of world. For India, the estimated trade impact to be most on chemical sector at 129 million dollars, textiles and apparel at 64 million dollars, automotive sector at 34 million dollars, electrical machinery at 12 million dollars, leather products at 13 million dollars, metal and metal products at 13 million dollars and wood products and furniture at 15 million dollars. The UN economist has announced drop by of USD 50 billion drop in manufacturing exports around worldwide. India majorly export 7500 commodities to 190 countries and import around 6000 commodities from 140 countries. India share its trade surplus with USA, UAE, and Bangladesh and have trade deficit with China, Switzerland, Saudi Arab [17]. India's total export growth from April 2019 to March 2020 is shown in figure 2.

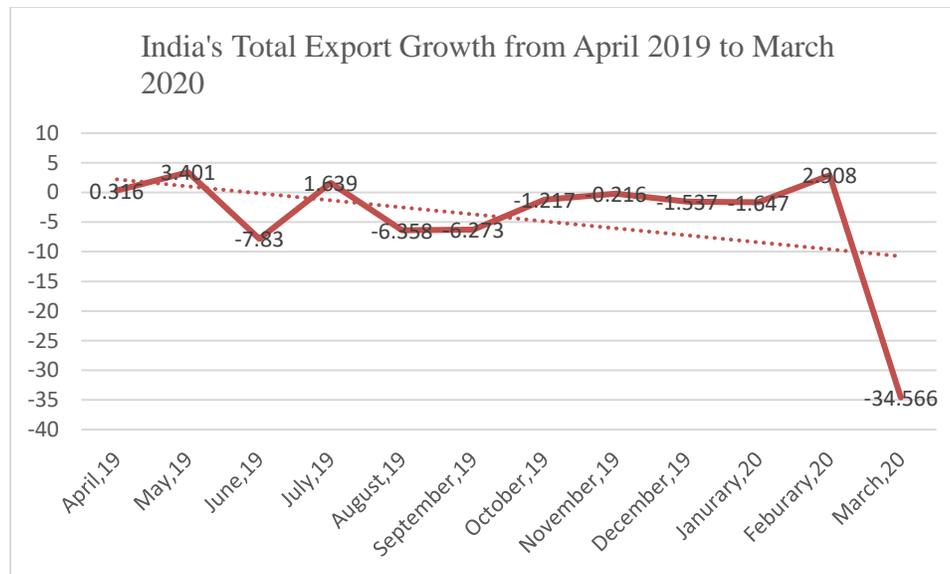


Figure 2: India's total export growth from April 2019 to March 2020

### Impact on Financial Market:

As the global economy is declining in terms of output and production it is expected that the world will suffer from recession. The American Credit Rating Agency Fitch has forecasted Indian rupee, the currency will average 77 per US dollar in 2020 and 80 in 2021 and steep monetary easing. In the short run steep monetary easing will pressure the rupee weaker but over the long term it is expected of overvaluation of Indian rupee. The foreign investors has pulled out \$14 billion dollar in March 2020. The economy is facing huge crashes and wealth erosion, which in turn is impacting consumption levels. On the other side Sensex and Nifty closed sharply baked by weak global cues amid historic due to fall in oil prices. BSE Sensex closed 1,011 points lower at 30,636 and NSE Nifty ended 280 points lower at 8,981 on 21 April 2020. The domestic equity markets was seen on March 12, when following the trend of the global equity markets, both the BSE Sensex and NSE Nifty crashed by more than 8% in a single day. An estimated Rs 10 lakh crore of market cap was reportedly wiped off due to this single day fall. The virus crises has already dropped out equity wealth to 40 percent of the expected size of India's gross domestic product (GDP). The aggregate market capitalism of all BSE listed shares of 52 lakh crore, as it fall from Rs.155.53 lakh crore on December 31, 2019 to Rs. 103.69 lakh crore in March 24,2020. The Reserve Bank of India (RBI) has reduced the repo rate by 75 basis points (bps) and bring it

down to 4.4 percent, the lowest repo rate fallen till now. The rate cut will lead to encourage growth and financial stability.

### **Impact on global manufacturing and supply chain**

n-CoV has affected the manufacturing firms and their supply chain over the world. COVID-19 is affecting our supply chains and manufacturing operations daily. The peak of COVID-19 virus have already affected the supply chain and forced thousands of industries to throttle down or shut down their assembly lines temporarily in the U.S and Europe and now in the developing nations like India [18]. Many of global industries are depends on the China for the materials and parts. The manufacturing units in China have already shut down and will be shut down for next few months. Supply lead time have also affected due to n-CoV it takes around 30 days for shipping from China to U.S or Europe [19]. It means if China has shut down their manufacturing units in January then shipments will arrive in February and there will be spike in the temporary closure of manufacturing units in the mid-March. For example Fiat Chrysler automobiles have already announced for temporary shut down their production in Serbia as the parts imported from China. Similarly, Hyundai has also announced to suspend their assembly lines in the Korea due to the disruptions in the supply chain because of n-CoV. The effect of n-CoV has already visible to world as there is decrease in 40% of departures from the ports of China due to n-CoV outbreak which is showing that there is a major effect on the manufacturing worldwide. There are three impact areas which are majorly affected due to the n-CoV which are:

1. Workforce: To limit the impact of coronavirus government has already instructed their people to stay at home where in developing nations like India, government has already advised their employees to stay at home. Some of the industries are depends on other industries for goods in which supply chain has disrupted due to n-CoV. Now, the industries having very less workforce to meet the customer demands.
2. Products: The n-CoV has transformed the competitive landscape. Suppliers are at risk to lose their market value and share as clients are now seeing the other options when they are not receiving the good products or on time.
3. Costs: There has been increase in the costs of the products due to increase in the shipping charges of products and industries are now also meeting with their financial objectives. There is increase in some of the products due to the n-CoV effect as it disrupt the supply chains. There are multiple challenges for the industries at present such as: at the same time they have to work

for the protection of their workers and also safeguard their operational viability. At present most of industries are working with mobilizing concept so that they can set up the crisis management mechanism for short term. Industries have to face the six main challenges for this:

1. There is need to create transparency on the multi-tier supply chain with the critical list of components. There is need to determine the origin and alternative sources of supply chain to tackle the current situation.
2. There is need for the estimation of current inventory which includes the spare parts and after sale stock which can be used as the bridge to keep the production processes running until the situation comes under control.
3. The demands of some products may increase or decrease in such type of situations. There should be proper demand planning according to industry experience. There is need to develop demand forecast strategies which defines the time horizon for the demand forecast which will help in the risk informed decision for the industries.
4. There is need to optimize the production and distribution capacity in the organization. Optimization process begins by ensuring employee safety which includes the engaging and sourcing with the teams working on the crisis situation to communicate with the employees of the industries regarding infection risk concerns. There should be options for the home or remote location working.
5. There is need to identify and secure the logistic capacity. It helps to estimate the capacity and accelerate whenever possible also results in flexible transportation whenever required.
6. There is need to manage the cash and net work capital by running the stress tests which helps to understand when the supply chain of industry will start to cause the financial impact.

### **Barriers in Supply chain during COVID-19 in India:**

Supply chains are always influenced by some barriers [20]. India is the developing country and Covid-19 has disrupted the supply chain of India. Global supply chains are also disrupted by the Covid-19. Many countries has banned on the import and export of many goods which affected the manufacturing firms across the globe. The barriers for the Indian supply chain caused by the Covid-19 are found out with the academia discussion and supply chain experts. There are total of 18 critical barriers were found out in the study which is discussed below:

S.No	Barrier	Barrier Name
1	B1	Lack of Labour
2	B2	Lack of raw materials for production
3	B3	Unavailability of Imported goods
4	B4	Shortage of livestock feed and their availability
5	B5	Bottleneck in last mile delivery
6	B6	Lack of transportation
7	B7	Slow movement of goods
8	B8	Lack of availability in local transport
9	B9	Ban on overseas transportation
10	B10	Decline in consumption of High value food commodities
11	B11	Lack of awareness in People regarding Covid 19 (affect the chicken and egg demands)
12	B12	Lack of buyers
13	B13	Perception of scarcity among masses
14	B14	Increased shortage for perishables
15	B15	Slow credit flow from banks and non banking financial companies
16	B16	Lack of cash flow
17	B17	Pressure from local laws enforcement
18	B18	E-Pass issues

These barriers have the great influence on the Indian supply chain. Although these issues in the supply chain are very generalized which needs further study and prioritization of these barriers will help the industries to overcome from the supply chain issues due to the Covid-19. These barriers can be studied with the MCDMs techniques such as AHP, ANP, TOPSIS, DEMATEL, MAVT, MAUT, VIKOR, Fuzzy set theory based MCDMs and other model validation can be done by data analytics techniques such as: SEM, ANOVA, and ISM [21-25].

### **Conclusion:**

In the present study the effect of Covid-19 on Indian economy and supply chain is studied. This study also reported about the Covid-19 effect on global manufacturing and supply chain. n-CoV has affected the manufacturing firms and their supply chain over the world. COVID-19 is affecting our supply chains and manufacturing operations daily. The peak of COVID-19 virus have already affected the supply chain and forced thousands of industries to throttle down or shut down their assembly lines temporarily in the U.S and Europe and now in the developing nations

like India. In the study with consultation with experts total of 18 critical barriers were identified which affects the supply chain at local level in India. This study can be extended by assessment of barriers with the multi-criteria decision making approaches. Interrelationship between the barriers can be identified with the interpretive structural modelling.

## References:

1. Johnson, E. (2020). Logistics Technology: Covid-19 forces Freightos into proactive layoffs. JOC. Accessed 31 March 2020, from [https://www.joc.com/technology/freight-procurement-systems/covid-19-forces-freightos-proactive-layoffs\\_20200317.html](https://www.joc.com/technology/freight-procurement-systems/covid-19-forces-freightos-proactive-layoffs_20200317.html)
2. Kemp, S. (2020). China City & Industry Report: A Guide for U.S. Exporters. Beijing: US Commercial Service. Accessed from [https://2016.export.gov/china/build/groups/public/@eg\\_cn/documents/webcontent/eg\\_cn\\_105813.pdf](https://2016.export.gov/china/build/groups/public/@eg_cn/documents/webcontent/eg_cn_105813.pdf)
3. IHS Markit (2020e). IHS Markit/CIPS Flash UK Composite PMI, 24 March 2020. News Release, Chartered Institute of Procurement & Supply (CIPS) and IHS Markit. Accessed 29 March 2020 at: <https://www.markiteconomics.com/Public/Home/PressRelease/0f164ac0128b429ea1c329104afd62c3>
4. Hussain, S. (2020). One third of humanity under virus lockdown. AFP. Accessed 31 March 2020, from <https://www.afp.com/en/news/15/one-third-humanity-under-virus-lockdown-doc-1q57be13>
5. Fazl-e-Haider, S. (2020). Coronavirus brings a halt to China's trillion-dollar Belt and Road Initiative. The New Arab. Accessed 31 March 2020.
6. Jamwal, A., Bhatnagar, S., & Sharma, P. (2020). Coronavirus Disease 2019 (COVID-19): Current Literature and Status in India.
7. DeBord, M. (2020). General Motors and Ford are ramping up ventilator production to fight the coronavirus pandemic. Here's where they are now. Business Insider. Accessed 31 March 2020, from <https://www.businessinsider.com/coronavirus-general-motors-ford-ventilator-production-progress-2020-3>
8. Giuffrida, A. (2020). Italy and China in plan for new Silk Road-style trade network . The Guardian. Accessed 31 March 2020, from <https://www.theguardian.com/world/2019/mar/23/italy-china-new-silk-road-belt-and-road-g7>
9. Fernandes, N. (2020). Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. March 22. Available at SSRN: <https://ssrn.com/abstract=3557504> or <http://dx.doi.org/10.2139/ssrn.3557504>
10. IHS Markit (2020c). IHS Markit Flash Eurozone PMI, 24 March 2020. News Release, IHS Markit. Accessed 29 March 2020 at: <https://www.markiteconomics.com/Public/Home/PressRelease/30078c37216c413bb410af22ae547068>

11. International Labour Organization. (2020). COVID-19 and the world of work: Impact and policy responses. Genève. Accessed from [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms\\_738753.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_738753.pdf)
12. Leigh, G. (2020). The Number Of Daily Flights Is Now Dropping Drastically: The Latest In Aviation. Forbes. Accessed 31 March 2020, from <https://www.forbes.com/sites/gabrielleigh/2020/03/30/the-number-of-daily-flights-is-now-dropping-dramatically-the-latest-in-aviation/#701c2b9943d4>
13. Letzing, J. (2020, March 18). How many policy tools are left to soften the impact of COVID-19?. World Economic Forum. Accessed 27 March 2020 at: <https://www.weforum.org/agenda/2020/03/covid-19-coronavirus-policy-tools-economic-impact/>
14. MarketWatch (2020, March 10). Coronavirus sends food prices soaring in China. MarketWatch. Accessed 22 March 2020 at: <https://www.marketwatch.com/story/coronavirus-sends-food-prices-soaring-in-china-2020-03-10>
15. Moore, M. (2020). APAC: COVID-19 impact on tourist arrivals by country or region 2020 | Statista. Accessed 1 April 2020, from <https://www.statista.com/statistics/1103147/apac-covid-19-impact-on-tourist-arrivals-by-country/>
16. Pallini, T. (2020, March 26). 55 global airlines have completely stopped flying scheduled flights due to travel bans, airspace closures, and low demand for travel — see the full list. Business Insider. Accessed 31 March 2020 at: <https://www.businessinsider.com/coronavirus-global-airlines-stopping-flights-suspending-operations-2020-3#tame-45>
17. Paris, C. (2020). Coronavirus Rattles Shipping Industry as Supply Shock Moves to Demand Decline. Wall Street Journal. Accessed 1 April 2020, from <https://www.wsj.com/articles/coronavirus-rattles-shipping-industry-as-supply-shock-moves-to-demand-decline-11585249552>
18. Pickert, R. (2020, March 26). U.S. Jobless Claims Jump to 3.28 Million, Quadruple Prior Record. Bloomberg. Accessed 28 March 2020 at: <https://www.bloomberg.com/news/articles/2020-03-26/u-s-jobless-claims-surged-to-record-3-28-million-last-week?>
19. Sandhu, M. (2020). Coronavirus: the moment for helicopter money. Financial Times .Accessed 27 March 2020, from <https://www.ft.com/content/abd6bbd0-6a9f-11ea-800d-da70cff6e4d3>
20. Gautam, N., Ojha, M. K., Swain, P., Aggarwal, A., & Jamwal, A. (2019). Informal Investigation of Fourth-Party and Third-Party Logistics Service Providers in Terms of Indian Context: An AHP Approach. In *Advances in Industrial and Production Engineering* (pp. 405-413). Springer, Singapore.
21. Sharm,P., Jamwal, A., Aggarwal, A., Bhardwaj, S., Sood, R. (2018). Major challenges in adoption of RFID for Indian SME's. *Int. Res. J. Eng. Technol*, 5, 2247-2255.
22. Singh, P. L., Sindhwani, R., Dua, N. K., Jamwal, A., Aggarwal, A., Iqbal, A., & Gautam, N. (2019). Evaluation of Common Barriers to the Combined Lean-Green-Agile Manufacturing System by Two-Way Assessment Method. In *Advances in Industrial and Production Engineering* (pp. 653-672). Springer, Singapore.
23. Jamwal, A., Aggarwal, A., Gupta, S., & Sharma, P. (2019). A study on the barriers to lean manufacturing implementation for small-scale industries in Himachal region (India). *International Journal of Intelligent Enterprise*, 6(2-4), 393-407.

24. Aggarwal, A., Gupta, S., & Ojha, M. K. (2019). Evaluation of Key Challenges to Industry 4.0 in Indian Context: A DEMATEL Approach. In *Advances in Industrial and Production Engineering* (pp. 387-396). Springer, Singapore.
25. Gupta, S., Dangayach, G. S., Singh, A. K., Meena, M. L., & Rao, P. N. (2018). Adoption of sustainable supply operation quality practices and their impact on stakeholder's performance and sustainable performance for sustainable competitiveness in Indian manufacturing companies. *International Journal of Intelligent Enterprise*, 5(1-2), 108-124.