Journal of Contemporary Issues in Business and Government Vol. 28, No. 01, 2022
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2022.28.01.026

Logistic Management in Pandemic: An Empirical Study of Iron and Steel Sector in India

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Abstract
Since 2019, Covid -19 pandemic has changed our style of living, our businesses. Most of the countries in the world are facing problems to main their economy during this pandemics period. When government of India was announced first phase of lock down, every business operation were paused and no one have an idea to run it during this situations. After relaxation of lock down businesses started with new and innovative matter. This paper focused on supply chain business and their management during the pandemic period by taken into condensation of their association with iron and steel sector in India. For this paper, empirical study of performance selected iron and steel companies have been done on the basis of their logistic management. Data of SAIL, TATA STEEL, JSW are taken into account for analysis purpose. The result of the study is expected to help for the companies for future development.

Keywords: Pandemic, Supply chain, iron and steel, Logistic Management

Introduction

Novel Corona virus was out break from Wuhan city located in China 2019 (WHO, 2020), with a few months it was spread all over the world and still we have not able to find out full cure for the disease. In past , world have faced several pandemic like Spanish Influenza in 1918 which killed approx 50 million people (Weintraub, 2006), similar incident was happened in H1N1 virus (Illahi & Mir, 2021). During this period of time logistic and supply chain management plays an important role to save mankind. During the initial period, world's have faced pandemic situation in the month of March 2020, "supply chain (SC) management (SCM)". It was a issue which is needed to solve with a demand which is non forecasted for certain products. During this period there was a limits for travel and production have been imposed (Twinn et al., 2020) . Business operations are attempting to adjust to the new environment, and there will almost certainly be changes that will last long after the pandemic has passed. SCs in relation to the epidemic have been widely addressed in the headlines, and

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scientific investigation into the crisis' ramifications has already begun. (Lopes de Sousa Jabbour et al., 2020).

Different industries have countered to the buoyancy face up to in a wide range of methods the healthcare industry emerges as a leader in resilience. They used the most comprehensive set of indicators, with 60% of healthcare respondents claiming to have regionalized their supply chains and 33% claiming to have shifted production closer to end markets. Only 22% of automotive, aerospace, and defence companies, on the other hand, have regionalized manufacturing, despite the fact that more than three-quarters of them prioritised. In their responses to the 2020 survey, they took this approach. Chemicals and commodities companies had the least overall supply-chain footprint modifications over the past year. Some of the discrepancies between sectors can be explained by the structural characteristics of the industries concerned: chemicals and metals, for example, are asset-intensive industries with vast, expensive manufacturing facilities. New capacity investments can take years to complete. Others said they had difficulty finding suppliers who could support their localization or near-shoring goals. (statista.com, 2020). The Covid -19 crisis caused jagged reduction in trade and industry activities athwart mainly sectors and economics (Meyer et al., 2021).

Overview of Sector

Steel Iron and steel is a diverse business that is intrinsically linked to the global economy as a whole and plays a vital role in bolstering the economy of any country. Many industries, including infrastructure, automotive, engineering, and other manufacturing sectors, use steel as an input raw material. The goods of the steel industry is also important for society's long-term growth. (Taneja et al., 2020).

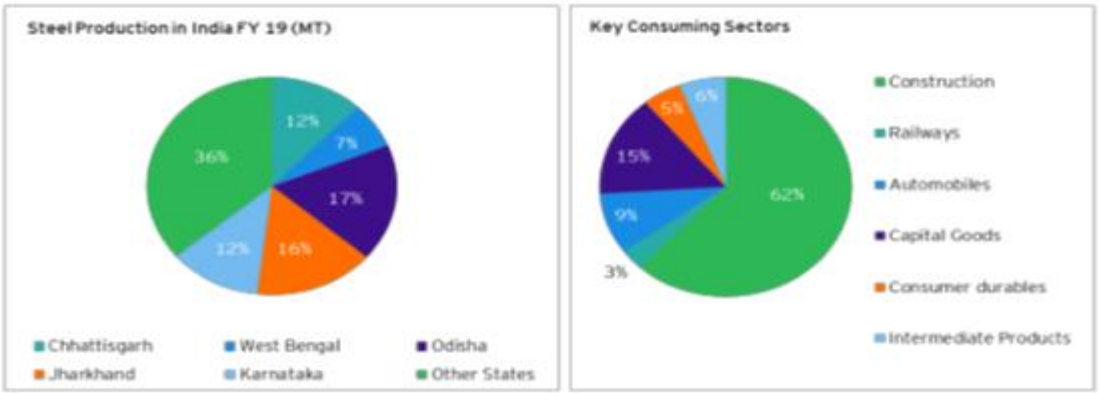

Fig1: Source: "Managing the impact of COVID-19 on India's supply chains"

Global overview

"The size of global steel 39 industry is about US$ 2.9 trillion (INR 217.5 trillion) and accounted for 3.8% of global GDP in 2017 . The industry provides 96 million jobs worldwide. China is the world's largest steel producer followed by India, Japan, the US, Russia, South Korea and Germany, among others. Some of the leading players in the global steel industry include Arcelor Mittal, China Baowu Group, Nippon Steel Corp. , Global production, export s and POSCO and HBS Group" (Taneja et al., 2020).

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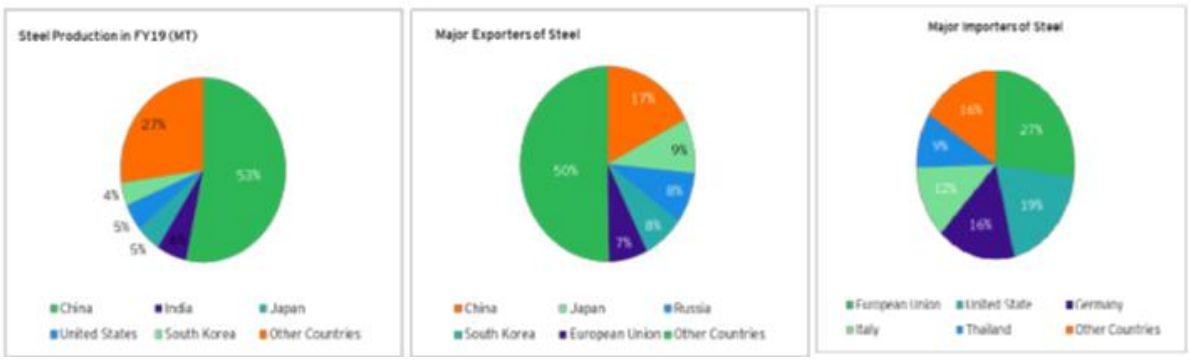

Fig 2: Source: *Managing the impact of COVID-19 on India's supply chains*

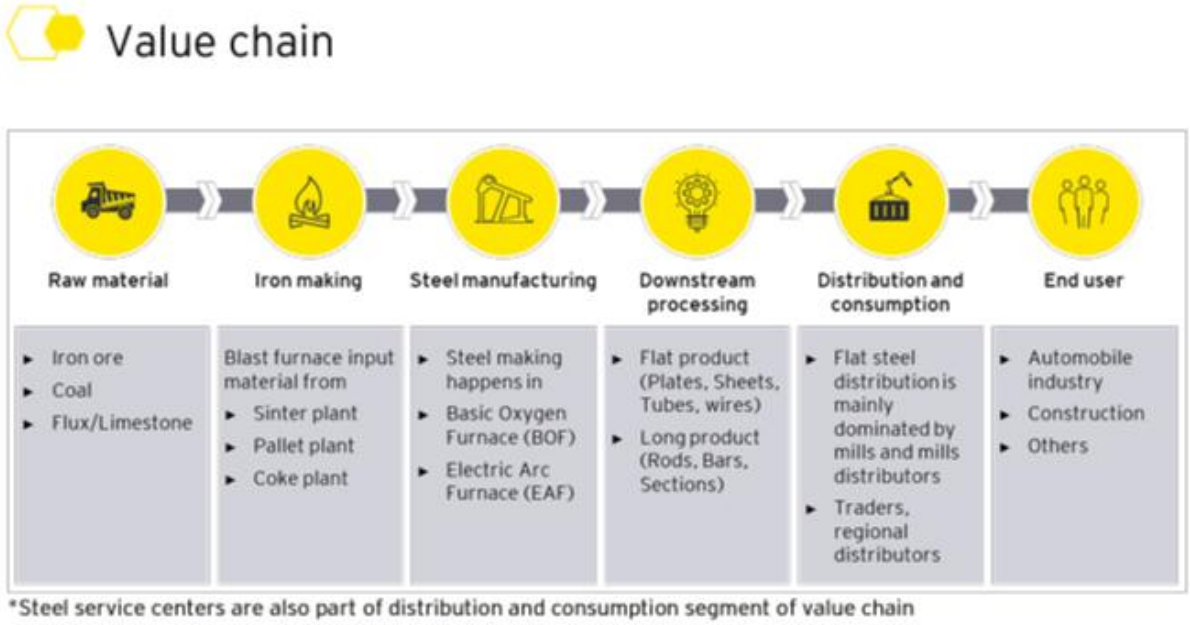

Fig 3: Source: *Managing the impact of COVID-19 on India's supply chains*

Impact of Covid 19

Steel producers, on the whole, have shown flexibility and have continued to maintain output levels as a result of previously signed promises all over the world. While steel manufacturing and supporting operations such as mining are covered by the Essential Commodities Act, functions such as "service centres" were not considered essential services, despite their importance in supply chain disruptions. (Taneja et al., 2020).

The following are possible manifestations of the overall impact:

In the next 3–4 quarters, most countries are anticipated to endure slow or negative economic growth, as well as accompanying disruptions. In all countries, this results in:

1. Labor supply issues, primarily owing to social separation, which has an influence on productivity.
2. Production disruption due to poor capital productivity.
3. Efforts by the government to boost demand by increasing spending.
4. Worldwide supply networks are not as efficient as they should be, posing a global trade obstacle.
5. Furthermore, a worldwide protectionism eruption would emerge, erecting new impediments to international trade.

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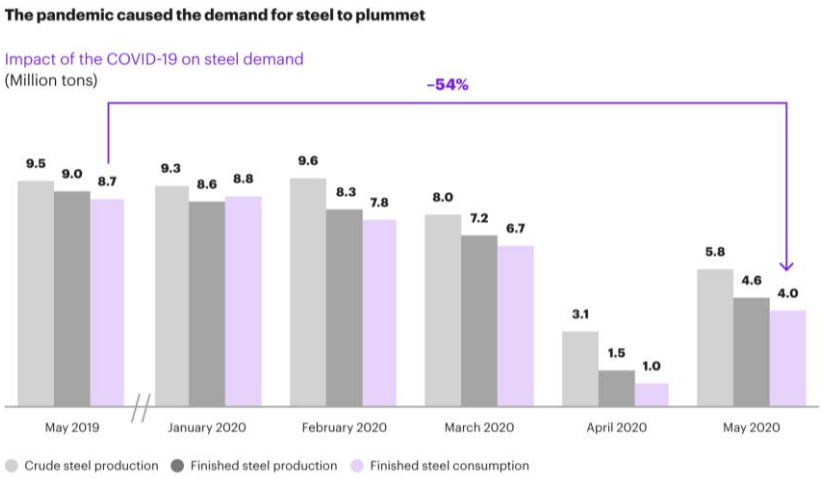

Fig 4: Source: Kearney Analysis

Methodology used In Research

This research is based on the data available from secondary sources. The study is empirical in nature and four companies, two private and one government sectors has taken into consideration for this research. The basic objectives of research are as follows.

1. To understand impact of Covid pandemic on steel and iron industry.
2. To analysis the policies adopted by selected companies for logistic management.

Companies Description and Analysis.

1) Tata Steel

The Tata Iron and Steel Company (TISCO) was formed on August 26, 1907, by Jamsetji Nusserwanji Tata and Sir Dorabji Tata. As a subsidiary of Jamsetji's Tata Group, TISCO began producing pig iron in 1911 and steel in 1912. (*Indian Steel Industry History, First Steel Plant in India*, n.d.). On February 16, 1912, the first steel ingot was produced. The corporation experienced considerable expansion throughout the First World War (1914–1918) (*History of Tata Steel*, n.d.).

The Tata Iron & Steel Company formed The Tinplate Company of India Ltd (TCIL) in 1920 as a joint venture with then-Burmah Shell to produce Tinplate. TCIL is now Tata Tinplate, with a market share of 70% in India.

It was the largest steel factory in the British Empire by 1939. In 1951, the corporation embarked on a massive modernization and expansion initiative. The scheme was then increased to a 2 million metric tonnes per annum (MTPA) project in 1958 (*History of Tata Steel*, n.d.) By 1970, the company employed 40,000 people in Jamshedpur, with another 20,000 working in the nearby coal mines. (*History of Tata Steel*, n.d.).

Strategic Decision Making

Domestic demand of the steel was down due to lockdown in 2020, during first quarter. After the clearing process of unlock down, iron and steel sector recovered more effectively than other sector, due to high global demand of the product (*114 Year*, n.d.).

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Logistic risks

Physical and environmental constraints, trade restrictions owing to geopolitical issues, and disruption at suppliers all affect the supply chain network. The growing rail, road, port, and handling infrastructure, as well as reliance on outsourced partners, may cause operations to be disrupted. (*114 Year*, n.d.).

How to resolve it?

Tata Steel has a dedicated team dedicated to logistics management. To address supply chain interruptions, they are constantly attempting to diversify their procurement and extend our vendor base from various geographies. Tata Steel has forged alliances with ports, shipping businesses, and logistics service providers such as Indian Railways and trucking companies. Measures such as optimising the logistics network, increasing operational capacity at loading/unloading locations, and upgrading existing facilities are being implemented. Tata Steel has invested in private mitigation techniques scrapes such as Special Freight Train Operator (SFTO) and General Purpose Wagon Investment Scheme (GPWIS) to increase the stability of its supply chain network. We took a number of steps to address supply chain issues caused by the pandemic. Licences were obtained in order to maintain operations and minimise logistical impact. The use of the alignment of mill production plans with export schedules helped to accommodate greater export volumes by monitoring the introduction of crew and ships to high-risk nations to assess probable quarantine requirements. As we continuously monitor important elements in their supply chain, they remain watchful of the shifting pandemic situation. They are deleveraging by generating domestic cash and monetising non-core assets. They have purposefully changed our finance sources in order to tap into diverse pools while researching financing options. They are constantly seeking to extend the maturity of our debt in order to provide more flexibility to the business plan for the year. In India, capital allocation for margin expansionary growth initiatives has resumed within the parameters of the desired financial framework. The gradual opening of the economy has aided a faster-than-expected recovery in the steel and related industries, as well as a healthier cash flow situation for us. The smooth transfer of raw materials and completed items was assured by close cooperation with railways, trucking companies, and ports. Active management of shipping vessels and ports, portfolio extension of ports utilised, and alignment of mill production plans with export schedules helped to accommodate increasing export volumes as domestic sales declined. As we closely monitor important pieces in our supply chain, they keep watchful of the shifting pandemic situation. (*114 Year*, n.d.)

2) Jindal Steel Works (JSW)

JSW Steel is the portfolio's most profitable firm, with a market capitalization of US$ 13 billion. JSW Group, as one of India's biggest business houses, operates in a variety of industries, including energy, infrastructure, cement, paints, sports, and venture capital. JSW Steel, dubbed "Great Places To Work" in 2021, has emerged as a company with a strong cultural base and a strong chance of becoming one of the Top 100 organisations. It has developed from a single production unit to become India's leading integrated steel corporation, with a capacity of 28 MTPA in India and the United States, over the last thirty years (including capacities under joint control). Its expansion strategy for the next phase includes a target of 37.5 MTPA steel capacity by FY25. With a capacity of 12 MTPA, the

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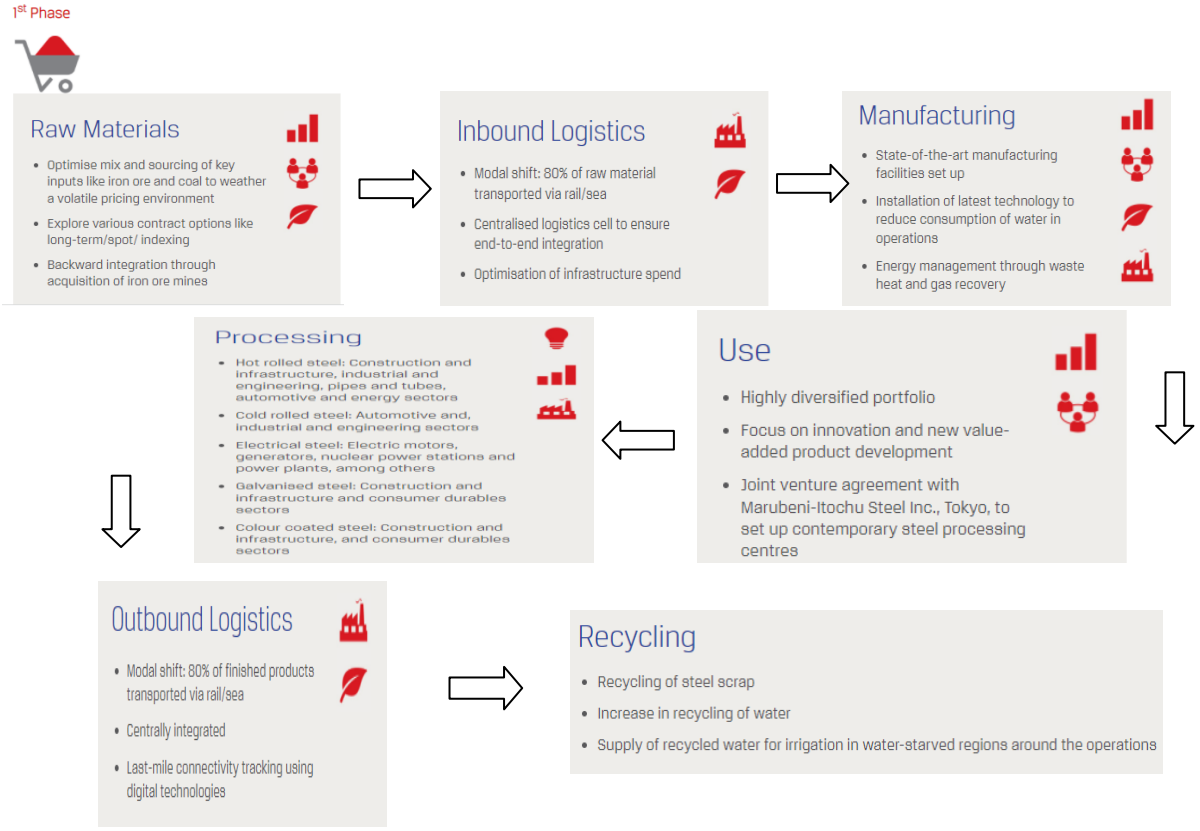
Company's production facility in Vijayanagar, Karnataka, is India's largest single site steel-producing facility. (Leading Steel Manufacturing Company in India - JSW, n.d.).

Logistic Management

Today's businesses rely heavily on logistics management. With the rise of green consumerism, Supply Chain Sustainability (SCS) has become a business requirement that affects all stakeholders as well as the firm itself. SCS mostly refers to climate-smart supply chain planning, which aims to integrate the environmental, social, and economic impacts of a company's value chain. JSW is committed to responsible growth and partnering with our suppliers on our path to a better future, because we can accomplish so much more together than we can alone. They designed a Supplier Code of Conduct to match our businesses' interests with those of all our business companions in the procurement chain, including suppliers, vendors, contractors, subcontractors, consultants, and business partners, with the same ingenuity. (*Supply Chain Sustainability Article*, n.d.).

Value Chain:



3) Steel Authority of India

It is a largest steel producer Central Public Sector Enterprises in India. It is one of the 'Maharatna' company among the other 'Maharatna' companies in India. Annual production is around 17.43 MT. SAIL gives highest quality of steel and continues production and quality and became important global steel manufacturing company.

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All plants controlling by SAIL in India produced wide range of products with high quality level. Products of SAIL are using in different project owing by government and private companies for infrastructure development.

"A long term strategic plan has been worked out to maneuver the company towards a target of 50 MT of hot metal production by 2031, thereby meeting the strategic objectives of maintaining leadership position in Indian steel sector and a position amongst the top steel companies globally and makes its steel available at customers' doorsteps through one of the most extensive warehouse, distributor and dealer networks" (SAIL, 2019).

Logistic Management & Challenges

Among the few sector, Steel industry is one of them which is growing with pace even in economics disruption. SAIL is a top producer of steel in our country and one the top manufacturers of steel among the global players with capacity of 23 MT. But the main issues and challenges faced by the company is raw material and logistic. Company is depends on rail and road transportation. It is very difficult to move 48-50MT material, SAIL used 65 rakes daily for the same(*Logistics Cost Is 14-15% Now, SAIL Is Trying to Reduce It _ Policy Circle*, n.d.).

Major problem facing by SAIL is, that they do have any plant which is near to port, according to them, company needs small ports which able to handle huge tones of raw material and finished goods. Logistic cost is around 15% of over cost costing (*Logistics Cost Is 14-15% Now, SAIL Is Trying to Reduce It _ Policy Circle*, n.d.), company looking forward to reduce it by using costal movement for this they tried from Haldia to Chennai. Due to lack of Logistic infrastructure transformation of goods from ports to plants delayed.

Focus on 2030; SAIL have a positive approach towards Indian Railways. This is an opportunity for the Indian railways to develop proper freight corridor.

Strategies during Period of Lockdown:

During the initial stage of pandemic, total locked down was final step taken by the government for control. Steel sector also feels the heat during this period of time. As per SAIL coal and steel were allows to run as they are core sector but production of plants were 50% (SAIL Plants Show How Workers, Wages Are Being Sacrificed During Economic Recovery[a] n.d.). Lockdown deadly impact of supply chain, therefore during the first phase of unlock, company was decided to conserve cash. Due to lack of demand and fallen of cash collection, committee has decided sales off its scrapes and borrowed fund to maintain cash crunch (SAIL Plants Show How Workers, Wages Are Being Sacrificed During Economic Recovery[b], n.d.). Company has decided to supply the material according to market needs to maintain load on logistic. During the lockdown, core sector industries churning out essential products such as coal and steel were allowed to run, but production in the two factories halved. They showed uptick through phases of unlock to reach 90% or more in August.

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Conclusions

Iron & Steel is a building block of any country. For the country like India, which one of the fastest growing developing country in the world, steel sector is as a back bone for the infrastructure development. Requirement of steel is in everywhere as India is progressing and we have the sources of raw material for the steel manufacturing, In India, Chhattisgarh state is having maximum steel manufacturing plants due availability of iron ore and other important raw materials around 36%. In construction is maximum user of steel and iron approximate 62% followed by Capital goods sector 15%. In the global market, China is producing world's 53% of steel and also largest export of steel around 17%. Among the importer countries European unions are the major imports of steel. Basically, it a value chain process started from mixing of iron ore and other material, convert them to steel and then finally to the end users like Automobile Sector, Consumer Goods, Defense etc.

During the first lockdown period, there was shortage of demand, supply of labour was affected and major issues were to maintain the logistic and supply chain. In May 2019, finished steel production was 9 Million Tonnes and in May 2020 it was 4.6 MT, similarly, finished consumption of steel was 8.7 MT and during lockdown period it was 4.6 M.

In this paper, we have studied about the big giants of steel sector in India, SAIL, TATA Steel and JSW Steel. It is studied that companies are focused on their logistic management.

Tata Steel has associations with ports and road transport operator and railways. They also invested in various schemes like GDWIS, SFTO involved in logistic management. To manage the supply chain effectively company has obtained licenses to minimized the problems occurs during the pandemic period. JSW steel has worked on decision making related to manage the sustainable logistic management. Company has focused on firm relation with suppliers and clients by using distinguished approach towards logistic management.

Steel Authority of India Limited, agrees that logistic is a big issue for them. Around 15% of total expenditure is related to logistic management. During the lockdown down period, company suffer huge loss and after the unlock period they need money to main the working capital. SAIL, is totally depends on Indian railways, now they are planning to associate with some port to maintain their supply chain management. They firmly believes, in future due to new initiatives in by Indian Railways which will help them in future.

In this study, it is clear that Steel Industry strategically face the problems of lockdown and unlock period during the period of pandemic to manage logistic.

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