Economic Impact of Select Decisions of the Supreme Court and National Green Tribunal of India

Synthesis Report

CUTS International

D-217, Bhaskar Marg, Bani Park, Jaipur 302 016, India
Tel: +91.141.228 2821, Fax: +91.141.228 2485
Email: cuts@cuts.org, Website: www.cuts-international.org

The study was carried out with the financial support of NITI Aayog, Government of India, and conducted by Consumer Unity & Trust Society, Jaipur

Economic Impact of Select Decisions of the Supreme Court and National Green Tribunal of India

Synthesis Report

CUTS International

D-217, Bhaskar Marg, Bani Park, Jaipur 302 016, India
Tel: +91.141.228 2821, Fax: +91.141.228 2485
Email: cuts@cuts.org, Website: www.cuts-international.org

The study was carried out with the financial support of NITI Aayog, Government of India, and conducted by Consumer Unity & Trust Society, Jaipur

Disclaimer

Consumer Unity & Trust Society, Jaipur, has received the financial assistance under the Research Scheme of NITI Aayog to prepare the report. While due care has been exercised to prepare the report using the data from various sources, NITI Aayog does not confirm the authenticity of data and accuracy of the methodology to prepare the report. NITI Aayog shall not be held responsible for finding or opinions expressed in the document. This responsibility completely rests with Consumer Unity &Trust Society, Jaipur.

This study is purely an academic exercise and is nowhere intended to interfere with the decision-making process of the judiciary. It is merely an attempt to assess the economic impact of select decisions of the SC and the NGT.

Research and Advisory Team

Sr. No.	Name	Designation
1.	Pradeep S Mehta	Secretary General
2.	Amol Kulkarni	Director (Research)
3.	Shagufta Gupta	Senior Fellow
4.	Kapil Gupta	Assistant Policy Analyst
5.	Sakhi Shah	Former Assistant Policy Analyst
6.	Pragya Singh	Former Research Associate
7.	Krithika Subramanian	Former Policy Analyst

Contents

1 Background

1.1 The judiciary in India, led by the Supreme Court of India (SC), operates at the intersection of public interest, political pressures, and social expectations. The apex court continuously negotiates such undercurrents and attempts to demonstrate an ideal conduct for all levels of the judiciary to follow, including itself. This includes managing and balancing the varied expectations and interests of the society and economy and increasingly dealing with complex issues interlinking economics, environment, competition, trade, technology and allied fields.[1]

1.2 This does not mean precedence of a particular subject area over others, but balancing and considering the interests of stakeholders towards equity, inclusivity, welfare, and sustainable development. This can happen by taking into account interests of hitherto ignored and vulnerable groups.

1.3 While law and economics has been often used by policy makers in antitrust matters, tax and finance, scholars have been increasingly pointing out the need for the judges to be guided by economic principles when deciding cases.[2] Many noted advocates of law and economics in the United States such as Richard Posner, Frank Easterbrook and Guido Calabresi have ascended to the bench and used economic analysis to help decide the issues before them.

1.4 On the increasing importance and entangling of law and economy, Judge Richard Posner pointedly said that, "the most interesting aspect of the law and economics movement has been its aspiration to place the study of law on a scientific basis, with coherent theory, precise hypotheses deduced from the theory, and empirical tests of the hypotheses. Law is a social institution of enormous antiquity and importance, and I can see no reason why it should not be amenable to scientific study. Economics is the most advanced of the social sciences, and the legal system contains many parallels to and overlaps with the systems that economists have studied successfully."[3]

1 https://thewire.in/economy/india-judiciary-economically-responsible-environment

2 Richard Posner, Utilitarianism, Economics, and Legal Theory, 8 J. Legal Studies 103 (1979).

3 Judge Richard A. Posner in Michael Faure & Roger Van Den Bergh, Eds., 'Essays in Law and Economics', 1989

2 Significance of Economic Impact Analysis in Judicial Decisions in India

2.1 In India, the importance and need for economic impact analysis in judicial decisions have been increasingly recognised over the past few years. Justices A.K. Sikri and A.M. Sapre in Shivshakti Sugars Ltd. v. Shree Renuka Sugar Ltd., (2017) 7 SCC 729 (Shivshakti Case), on 9th May 2017, observed that economic evidence is crucial in environmental matters. Although the Shivshakti Case made strong observation to initiate the discourse on economic analysis of law while adjudicating a sensitive economic matter, however, the consideration of such commentary by the judiciary in its decision making still requires attention and adoption. In the Shivshakti case, the bench highlighted that the court must avoid that particular outcome which has a potential to create an adverse effect on employment, growth of infrastructure, economy or the revenue of the state and keep the economic impact and effect of a decision in conscious understanding.

2.2 In the Shivshakti Case, the court also called for an economic analysis of law approach while citing Judge Richard Posner's book 'Frontiers of Legal Theory' but limiting the discussion to the economic impact of judicial decisions. The judges noted that the law and economics interface are most relevant today as India is on the path of economic growth and development, which is a result of decades of effort. Most importantly, since the country has been a developing economy for several decades, the judiciary must perform its functions alongside the executive, to ensure it becomes a fully developed economy.

2.3 Overall, the SC in Shivshakti Case highlighted that the scope of economic analysis of law has expanded beyond its original focus on explicit economic dimensions such as in tax, competition, or finance to non-market or quasi non-market fields of law. Amongst other things, these may include tort law, family law, criminal law, free speech, procedure, legislation, public international law, the law of intellectual property, the rules governing the trial and appellate process, environmental law, the administrative process, the regulation of health and safety, the laws forbidding discrimination in employment, and social norms.

2.4 The need for economic impact analysis in judicial decision-making was highlighted in a televised roundtable discussion on the 'Economic Impact of Court Judgments'[4] between Justices A. K. Sikri, and M. M. Kumar, and eminent lawyers Abhishek Manu Singhvi and Pinki Anand. It was pointed out that the courts in India lack expertise to undertake economic analysis and understanding stakeholders that may get impacted including the multiplier effect on the economic structure due to their decision making. Towards this, the panel recommended primary reliance on scientific evidence to balance law and economics and application of the power of substantive justice under Article 142 of the Constitution of India.

[4] https://youtu.be/jCpFaO24KgI

2.5 Similarly, Justice B. N. Srikrishna, former SC judge, during the National Virtual Conference on 'Economic Dimensions in Judicial Decisions', highlighted the importance of economic analysis of decision making remarked that SC could institutionalise an economic research wing within the apex court to analyse effects of decisions on ground level citizens.[5] Moreover, he further noted that judges do not have requisite resources, ability, or competence to conduct an impact assessment for the issue in question, which could be fulfilled by experts.

2.6 To facilitate reliance on evidence-based decision making, ex-ante economic analysis strengthens the understanding of multitude of issues including the multiplier effect of court's decisions on society, market and economy. As in the new economy, economic matters are increasingly complex and frequently placed for adjudication; the ex-ante evidence-based exercises would highlight and balance society, economic development and environment towards an equitable, inclusive, and balanced decision-making.

[5] https://youtu.be/O9Hn3ovYKik

3 Objective

3.1 In the above background and context, this study attempts to understand the first-order direct economic impact of the select judicial decisions of the SC and National Green Tribunal (NGT) on the economy and stakeholders. These cases are:

3.1.1 The Goa Foundation vs. M/s Sesa Sterlite Ltd. & Ors. (Goa Mining Case)
3.1.2 Hanuman Laxman Aroskar vs. Union of India (Mopa Airport Case)
3.1.3 The Tamil Nadu Pollution Control Board vs. Sterlite Industries (I) Ltd (Sterlite Copper Plant Case)
3.1.4 National Green Tribunal Bar Association vs. Ministry of Environment & Forests and Ors. (Sand Mining Case)
3.1.5 Vardhman Kaushik vs. Union of India & Ors. (NCR Construction Ban Case)

3.2 The study also aims to inform an evidence-based approach towards institutionalising comprehensive and balanced thinking in judicial decision-making. Furthermore, the study intends to inform the human-centricity of economic development and environment sustainability and evaluate the best possible remedy with equal consideration to equity, environment and economy.

3.3 This study is purely an academic exercise and is nowhere intended to interfere with the decision-making process of the judiciary. It is merely an attempt to assess the economic impact of select decisions of the SC and the NGT.

4 Methodology and Approach

The study adopted a mixed research method with an evidence-based and bottom-up approach using primary and secondary data. In furtherance of that, an extensive review of existing literature related to the respective cases was conducted, followed by field visits and in-depth interviews with key stakeholders who might have been impacted. Specific focus was accorded to understand the impact of decisions on revenues of industry, state/ government, employment, and salaries of workers. The understanding of impact on different stakeholders was utilised to ascertain the impact on the economy.

4.1 Secondary Research

4.1.1 The secondary research entailed a thorough and extensive review of existing literature including various industry and government reports, academic papers, news articles, and secondary data from relevant stakeholders. For each of the cases, stakeholder mapping was conducted using extensive review of literature, including reports in news articles.

4.1.2 To ensure a comprehensive stakeholder outreach, keeping in mind the constraints caused due to the Covid-19 pandemic and other location-specific challenges, purposive sampling was chosen to determine the sample. A list of initial stakeholders was identified through secondary research and email and telephonic interactions, followed by snowballing techniques to identify more stakeholders.

4.2 Primary Research

4.2.1 The primary research involved interacting with relevant stakeholders of the respective case studies such as the directly impacted groups, which are often hitherto ignored during the proceedings, using key informant interviews (KII) and focus group discussions (FGD). In-person interactions with stakeholders were conducted in Goa (Goa Mining and Mopa Airport Cases); Thoothukudi, Tamil Nadu (Sterlite Copper Plant Case); Delhi-NCR (NCR Construction Ban Case); and Gautam Buddh Nagar, Uttar Pradesh (Sand Mining Case), telephonic calls, as well as solicited written responses were sought from select stakeholders.

4.2.2 A multi-pronged outreach approach was adopted while contacting the stakeholders including appropriate follow-ups and reminders. To effectively leverage the interviews and seek relevant data and information across data points, semi-structured questionnaires were designed for all categories of stakeholders based on extensive literature review. A semi-structured interview approach was adopted to seek relevant information towards the various identified data points from each category of stakeholder.

4.3 Ethical Considerations

4.3.1 To prioritise ethical considerations involved in social research and interacting with human respondents including affected and vulnerable groups, at all stages of the study, ethical practices have been followed, including:

- Informed Consent: The research team ensured informed consent of all participating respondents with the aim to eliminate information asymmetry.

- Privacy: Unless otherwise agreed, throughout the study, due importance and care has been given to maintaining the confidentiality of information and anonymity of respondents given the sensitive nature of the data and the cases being studied.

4.4 Limitations

4.4.1 Due to Covid-19 pandemic and ensuring health safety protocols, the team could only meet a limited number of stakeholders during the field visit in all the case study locations. This also resulted in delay in the completion of the study.

4.4.2 The data estimations done in the case studies are based on primary data collected from a representative sample of stakeholders and hence, the data estimations on impact are limited to the accuracy of responses by such stakeholders. However, an attempt has been made to validate the responses with other publicly available data including government and industry reports, among others, as and where possible.

4.4.3 The objective of the study limited the scope to analysing the economic impact of the respective cases, without quantifying and accounting for the monetary value of consequential environmental impacts. The sensitive nature of the cases also impacted the extent of participation by the stakeholders.

4.4.4 Furthermore, given the objective of the study, certain categories of stakeholders with different and diverse perspectives were not willing to engage, such as environmentalists, activists, and village administrators, among others, impacting data responses from primary sources.

4.4.5 In the Synthesis Report, capital expenditure multiplier has been used to estimate induced economic impact of the cases. 2.45 is the capital expenditure multiplier for India. It assumes that if government utilises Re 1.00 for capital expenditure, consequent gains to the economy in subsequent years could be to the tune of Rs. 2.45. Using this multiplier, assuming that relevant governments in the covered matters would have utilised the lost revenue (if available) for capital expenditure purposes, and consequent gains would have been consistent with the capital expenditure multiplier for India, the report estimates induced economic impact. Consequently, the capital expenditure multiplier is used as a measure to approximate impact on the economy and the consequent result/observations must be observed in a restricted and limited manner, to the extent possible and may not convey accurate representation.

4.4.6 To estimate the consolidated impact of different matters on the economy, impacts estimated on different stakeholders groups during different time periods may have been aggregated. This is only for the purpose of calculations and may not necessarily result in accurate representation.

5 Case Summaries

5.1 The Goa Foundation vs. M/s Sesa Sterlite Ltd. & Ors. (Goa Mining Case)

Background: Iron ore has been a mineral of economic significance for Goa since the 1950s. However, around late-2000s, concerns of environmental violations and illegal mining in Goa surfaced. Consequently, the Government of Goa (GoG) suspended all mining operations on 10th September 2012 after the Justice MB Shah Commission tabled its report in Parliament on illegal mining in Goa.

On 21st April 2014[6], the SC, on a petition by Goa Foundation, a civil society group, ruled that all the mining leases expired on 20th November 2007 and thus, all the mining operations since then were illegal. Although, the mining activities were restarted in 2016, after the GoG granted second renewals to 88 mining leases, following an order by the Bombay High Court (BHC)[7]. These renewals were also set aside by the SC on 7th February 2018[8], and termed as illegal, thus suspending the mining operations for the second time with effect from 16th March 2018, as of date. In the bargain, the mining suspension resulted in economic and job losses to the mining companies, dependents, service providers and the state exchequer.

In this case, we met with representatives of Goa Foundation who were not hostile to the mining operations and even meeting us. They had even suggested an alternate strategy to minimise environmental harm, but that was not adopted by the government.

About the Study: To objectively understand the economic impact of the mining suspension, if any, on the Goan economy and relevant stakeholders of the iron-ore mining sector using primary and secondary research methodologies. The Assessment Period of the impact was March 2018 – January 2021. The study also makes an effort to identify the best possible remedy which would have also been benign to the environment.

Growth and Significance of Iron Ore in Goa: In 1947, about 5,464 tonnes of iron ore was exported, whereas in 2011-12, Goa had an annual iron ore production of 32.61 million tonnes (MT). Almost 99% of the Goan iron ore was exported to China and other eastern countries, as the Goan iron ore is low-grade having low iron (Fe) content and Goa's geographical location gives it an advantage to export at one-fifth of the cost to transport within India. In 2010-11, iron ore mining contributed almost about 20% to the state's Gross State Domestic Product, which declined to 1.64% in 2017-18, a drastic fall.

Impact on State Exchequer: The state public debt increased at a Compound Annual Growth Rate (CAGR) of 10.06% from 2007 through 2021, while the market loans taken by the state

6 In Goa Foundation vs Union of India & Ors., (2014) 6 SCC 590

7 In Lithoferro vs State of Goa, 2015 (3) ABR 32

8 In The Goa Foundation vs Sesa Sterlite Ltd. & Ors., (2018) 4 SCC 2183

increased at a CAGR of 19.93%, consequently due to mining suspension. The total revenue[9] earned by the state government between the financial years 2015-18 was Rs. 1128.38 crore, which declined by 79.51% to Rs. 231.23 crore in the Assessment Period, a difference of Rs. 897.15 crore. As a consequence of the mining ban in Goa, the central and state revenues cumulatively suffered an estimated deficit of Rs. 668.39 crore in taxes paid by the mining companies, whereas the state revenues exclusively suffered an estimated deficit of Rs. 1821.32 crore.

Impact on Mining Companies and Service Providers: The revenues of the mining companies are estimated to have been impacted by Rs. 6976.71 crore between 2018-19 and 2020-21. Whereas, amongst the service providers, the truck owners, barge owners and mining machinery owners may have an estimated revenue impact of Rs. 609.28 crore, Rs. 193.50 crore, and Rs. 40.45 crore, respectively, in the assessment period.

Parameter	**Estimated Impact during Assessment Period (in Rs. Crore)**
Estimated Revenue Impact on Mining Companies	-6976.71
Estimated Revenue Impact on Service Providers	-843.23
Total	**-7819.94**

Impact on Livelihood and Employment: About 10,108 workers employed with the service providers (barge owners, truck owners and machines owners) and about 4,750 mineworkers (employed with the mining companies) are estimated to have lost employment due to the mining suspension.

Parameter	**Estimated Impact**
Estimated Salary Loss to Workers of Service Providers (in Rs. Crore)	**-385.56**
Estimated Loss of Jobs for Workers of Service Providers and Mining Companies (in Numbers)	**-14,858**

Impact on Mormugao Port: The Mormugao Port earned about Rs. 228.82 crore from Cargo Handling and Rs. 100.54 crore from Port Charges in 2010-11, which declined to Rs. 60.07 crore and Rs. 86.89 crore, respectively, in 2013-14. Also, about 1161 service providers[10] workers at Mormugao Port in 2017-18, reduced by 34% to about 763 workers in 2018-19. These 398 workers who are estimated to have lost their jobs due to mining suspension, are also estimated to have immediate adverse impact on their livelihood by about Rs. 7.51 crore loss in welfare.

[9] Royalty (excluding e-auction ore), District Mineral Fund, Goa Iron Ore Permanent Fund, and State GST

[10] Steamer Agents, Repair Workshops, Shipchandlers, Surveyors, Launch Owners, and Stevedores

Conclusion: With respect to the matter in its current form, both the iron ore mining suspensions in Goa were completely avoidable. The GoG failed to act judiciously in mitigating the environmental violations that were being reported in mid to late 2000s as well as granting of second renewals on time (before 2007). Even after the SC termed mining illegal from 2007 to 2011, but considering the significance of mining for Goa and livelihood, the court directed the state to issue **fresh** mining leases, as a matter of state policy.

The court also set a cap of 20MT on the annual production of iron ore. The second renewals of 88 mining leases by GoG, on BHC's order allowing renewals despite SC directing for fresh leases, was in haste and to avoid an ordinance by the GoI that would make the grant of leases through bidding or competitive auction mandatory. This led the SC to set aside the second renewals. Although an appeal against BHC order would have delayed restarting the mining to an extent, however, it would have ensured judicial backing by the SC and certainty for the mining operations.

While quashing 88 mining leases, the SC could have directed GoG to restart mining operations within a stipulated time under the court's supervision and facilitated by a committee of subject experts including economists, environmentalists, etc. Such an approach could have been informed by an ex-ante impact analysis of the mining suspension, initiated and supervised by the SC itself. The analysis could have also explored the best possible environmental protection meaures to keep the damage to the minimum. It could have mitigated or lessened the adverse impact on many key stakeholders, especially the livelihood of many mining dependents, ensured economic progress while preserving environmental and intergenerational equity. A balanced and informed approach to development, society and environment would ensure sustainable development, wherein public institutions such as the SC increasingly play a crucial role.

After all appeals made to the SC to restart mining in Goa were dismissed, the GoG recently consitituted Goa Mineral Development Corporation, which received Governor of Goa's assent in September 2021.[11] As part of restarting mining, GoG is reported to auction eight mines in December 2021 as **fresh leases** in accordance with the SC judgment.[12]

5.2 Hanuman Laxman Aroskar vs. Union of India (Mopa Airport Case)

Background: In 2015, Government of Goa (GoG) received Environmental Clearance (EC) from the Union Ministry of Environment towards the development of a second international airport in Mopa, Goa, as the existing Dabolim airport in Goa was saturated. In 2017, the EC was first challenged before the NGT by Hanuman Laxman Aroskar and Federation of Rainbow Warriors, which was upheld by the Tribunal in 2018. The petitioners then appealed to the SC against the NGT order. On 29 March 2019, SC suspended the EC, thereby the construction of Mopa airport, and ordered the Expert Appraisal Committee (EAC) to revisit the environmental concerns that were highlighted by the apex court.

[11] https://www.heraldgoa.in/Goa/Goa-Governor-gives-assent-to-Goa-Mineral-Development-Corporation/180063

[12] https://timesofindia.indiatimes.com/city/goa/8-mining-leases-tentatively-set-for-auction/articleshow/88017986.cms

The key ground to the EC challenge was failure of GoG to disclose crucial facts in statutory Form-1. On this, Amitabh Kant, CEO of NITI Aayog remarked that SC is treating environment and economic development as binaries and stopping critically important projects such as Mopa airport can irreparably harm investor confidence and foreign investment. In April 2019, EAC revisited the recommendations and laid out additional environmental safeguards and conditions, which was accepted by SC on 16 January 2020 withdrawing the suspension from EC.

About the Study: To objectively understand the economic impact of the stoppage of Mopa airport construction in Goa, if any, on its project cost and timeline including first-order impact on key stakeholders.

Impact on Project Cost and Time Overrun: Due to discrete judicial restraints on the construction of Mopa airport, remobilisation of resources, and Covid-19 pandemic delays, cost of the first phase of the airport increased from Rs. 1,900 crore to Rs. 2615 crore, which is a 38% cost overrun. About 1,500 workers who were engaged at the project site could have suffered immediate jobs loss due to the suspension of construction work. Due to such delays, GMR Goa International Airport Limited (GGIAL), project concessionaire, also received an extension of 634 days, postponing the commissioning of the first phase from September 2020 to August 2022, which is a time overrun of 21 months. The airport is scheduled to be operationalised on 15th August 2022.

Impact on Financial Dimensions: Under the concession agreement with GoG, GGIAL is required to maintain 70:30 debt to equity ratio towards financing the airport construction. For this, GGIAL secured a financial closure of Rs. 1330 crore of debt funding from Axis Bank, while the remaining Rs. 570 crore equity support was received from GMR Airport Limited (GAL), the holding company of GGIAL.

Due to cost overrun, the financial closure is estimated to go up to Rs. 1830.5 crore, further expanding bank's exposure to the project. Similarly, GGIAL may need to increase equity support from GAL by about Rs. 215 crore. As per inputs received, the Engineering, Procurement and Construction contract value for Megawide Construction Corporation, the construction contractor for the project, may increase from Rs. 1377 crore to Rs. 1815 crore, which is a 32% increase in value due to price escalation of the relevant materials owing to the delay.

Conclusion: The delay in the construction of the Mopa airport and suspension of EC was avoidable had the GoG made all relevant and necessary disclosures in Form-1 as provided in Environmental Impact Assessment (EIA) Notification, 2006. Thus, it is imperative to fix accountability of agencies/officials involved in the EIA process. An accountable, transparent and effective governance structure would reduce such avoidable litigations.

During the EC appraisal process and judicial challenge, the EAC and NGT failed to discover the concealment of facts by GoG. The shortcomings/loopholes in the appraisal process had a

cascading effect on the outcome, including wastage of time, resources and capital. Thus, EIA Notification 2006 must be implemented in letter and spirit and loopholes should be plugged. Similarly, it is important to review the role of EAC to ensure their ability to critically appraise environmental facets of the projects, while NGT must engage a critical review of merits. Projects such as the Mopa airport involve numerous stakeholders and high capital with a potential of adverse economic impact. Thus, it is essential to record and address stakeholders' concerns, if any, on the project in a time bound manner. Most importantly, SC must institutionalise a screening mechanism to prioritise listing of cases with economic significance to ensure expedited adjudication and pre-empt avoidable delays and economic losses, as in the Mopa airport case.

5.3 The Tamil Nadu Pollution Control Board vs. Sterlite Industries (I) Ltd (Sterlite Copper Plant Case)

The debate of balancing human rights and economic rights is not a new one. Rather, one of the oldest facets of this dichotomy is how to harmonise environment and development and livelihood rights. In that endeavour, various economic and social models have evolved to understand and recognise the human-centricity at all fronts – whether it be environment or development. However, a balanced approach is missing in viewing these domains holistically and together, and implementing the models as evolved for the 21st century.

The closure of the Sterlite Copper Plant in Thoothukudi, Tamil Nadu in 2018 (Copper Plant) – the manufacturing plant of Vedanta Limited – typifies this debate and thus the objective and aim of this report. Ever since the establishment of the Copper Plant in 1994, its journey has been chequered with protests, public uproar, regulatory scrutiny, executive actions, and judicial interventions emanating from various claims against the Copper Plant flouting environmental norms and adversely impacting the health of the local inhabitants. The biggest protest – which lasted for 100 days – when turned violent in May 2018, the Tamil Nadu Pollution Control Board (TNPCB) and the Tamil Nadu government ordered the permanent closure of the Copper Plant with immediate effect.

When the orders were challenged before the NGT, in November 2018, the Tribunal ordered the reopening of the Copper Plant. However, the same was dismissed by the SC in 2019 stating that the NGT has no jurisdiction to entertain appeals against state government's orders. Consequently, the matter went before the Madras High Court, which in August 2020, confirmed the orders of the TNPCB and Tamil Nadu government. In December 2020, the SC denied any interim relief to Sterlite. However, most recently in May 2021, during the peak of the second wave of the Covid-19 pandemic in India, the Copper Plant was allowed to reopen for the production of medical oxygen. More recently, a group of fishermen and a few villages have petitioned the state government requesting to reopen Copper Plant as it was a major source of their income and livelihood.

There have been various reports and studies that have established the environmental concerns leading to health harms such as chronic fatigue, asthma and respiratory diseases, ear, nose, throat (ENT) disorders, menstrual disorders and much more. However, there is limited

secondary literature analysing the economic impact caused to the people associated and dependent on the Copper Plant in terms of employment (direct and indirect), revenues and profits for dependent businesses, and the overall volume and value of copper trade in India. The secondary data or information available is mainly through news media reports and articles.

One of the biggest impacts because of the closure of the Copper Plant was (and continues to be) faced by the workers/employees of the Copper Plant. **Various media reports highlighted that the net loss of employment (both direct and indirect) comes to almost 30,000 jobs**. Moreover, **the closure is estimated to have significantly impacted the incomes of the people who lost their jobs, reducing their monthly incomes by at least 50% while rendering many jobless.** While the latter was corroborated through interactions with workers/employees in field, it was also found that while the permanent employees working at the Copper Plant were relocated or kept on the job with a decrease in salary, the contractual employees suffered a substantial loss and decline in livelihood.

On those lines, the monetary value of the cumulative net impact in terms of salaries was found to be around Rs. 146 crore since the closure of the Copper Plant in May 2018. This however does not show the full extent of the impact, which goes beyond individuals to families and their kin, especially when it comes to education, insurance, loan repayments, and health. While the estimation of Rs. 146 crore only includes direct employment, it must be noted that the indirect jobs were also gravely impacted, owing to the fact that the associated and dependent businesses on the Copper Plant faced huge consequential impacts.

In terms of the downstream businesses' dependent on the Copper Plant, various media articles reported that **around 400 downstream businesses were associated with the Copper Plant, employing approximately 100,000 people**. Moreover, the Copper Plant was also the only indigenous supplier of phosphoric acid. It was also the key supplier of slag and gypsum to close to 20 cement companies in the region. However, for the downstream businesses' dependent on the Copper Plant for the procurement of mainly five types of raw materials namely gypsum, sulphuric acid, phosphoric acid, copper cathode and copper rod, it was found that there has been considerable impact on the cost of procurement of raw materials after the closure of the Copper Plant. Other than the procurement cost, the time cost of procurement if the raw material is imported, the quality of raw material, the bargaining power of such businesses for price negotiations, the time-cycle of procurement and payments and subsequent liquidity challenges are some of the ways through which the Copper Plant's closure has impacted them. **The net estimated impact on all the downstream businesses in terms of their cost of procurement stands at around Rs. 491 crore since the closure of the Copper Plant.**

Besides downstream businesses, the biggest impact was seen on the service providers associated with the Copper Plant, ranging from mechanical and maintenance, warehousing, Information and Technology, stevedore and cargo, and lorry providers. The livelihoods of thousands who are part of this ecosystem including truckers, contractors, labourers, real estate market, and even tea and miscellaneous shops that came up around the Copper Plant have all been severely impacted since the closure. By rough estimates according to media reports, the **Copper Plant used to spend around Rs. 600 crore per year on logistics, material purchases**

and other requirements which are now non-existent. As per the calculations undertaken through the data collected and available, it was found that **the total loss to the service providers stands at Rs. 1390 crore since the closure of the Copper Plant.** The net impact includes impact on the service providers, workers/employees, associated businesses, and the government.

The impact on the finances of the Copper Plant itself has been the greatest and across different metrics and throughout the supply-value chain, starting from impact on volume of production, impact on revenues, impact on expenditures and impact on profit. For instance, various articles reported that the **Copper Plant became a loss-making venture incurring a cost of as much as Rs. 5 crore per day since its closure.** Sterlite has also claimed that the maintenance damages run to almost Rs. 100 crores in a year to the Copper Plant because of the non-cooperation on part of district authorities, as they were not allowed to access the Copper Plant even for maintenance purposes. When computing the impact on the Copper Plant itself, through the data collection and analysis, it was found that **the overall impact on the Copper Plant in terms of the impact on its Profit After Tax and the sunk costs incurred translates to loss of around Rs. 4,777 crore since its closure**. This further translates to a **loss of Rs. 4.42 crore per day for the Copper Plant since its closure in May 2018**.

Moreover, the government is also losing sizable revenue in form of taxes and duties. Through various media reports, it is estimated that **the Copper Plant paid up to Rs. 2559 crore annually to the exchequer by way of taxes and other statutory contributions**. However, when the impact on the government through loss in taxes and other revenue from power and water consumption by the Copper Plant was calculated basis the data collected and analysed, it was found that **the impact on the government is substantially much higher than media reports at around Rs. 7643 crore since May 2018.**

Lastly, owing to the Copper Plant's closure, the exports and imports of copper and related items have been greatly affected. While the exports have significantly fallen from the year FY 2018-2019 onwards, the imports have risen sharply to cater to the domestic demand. With the **Copper Plant contributing close to 40% to the copper production in India, its closure has amounted to significant losses in terms of Foreign Exchange (Forex), cutting down the country's net production by 46.1%.** From being a net exporter of copper, India has become a net importer thus impacting the country's balance of payments. This loss is estimated to the tune of Rs. 14,000 crore by some experts, as cited in media articles. It was also reported that the copper import increased by 26% to 60,766 tonnes in the June quarter of 2020-21, and further expected to increase in the remaining part of the financial year.

Thus, through the data collected and analysed for the purpose of this report, **the consolidated loss to the economy owing to closure of the Copper Plant on all stakeholders is estimated to be around Rs. 14,749 crore since its closure in May 2018.** The cumulative loss for the entire period of plant closure is roughly around 0.72% of the State Gross Domestic Product (SGDP) of Tamil Nadu.

These grave economic impacts on the varied stakeholders offers a pressing need to find better alternate remedies to balance matters concerning the development-environment conflict in the instant matter. It is thus important to inform the decision-making process at all levels, including the judiciary, keeping in mind the larger objective of human-centricity of economic development and environmental sustainability, with equal considerations to the objective of equity, environment, and economy.

5.4 National Green Tribunal Bar Association vs. Ministry of Environment & Forests and Ors. (Sand Mining Case)

India is expected to become the third largest construction business market by 2025, after China and United States of America. The demand for sand in India substantially outstrips the supply. It is estimated that in the period of 2021-2026, the market for sand will increase at the rate of 6-7% annually. The demand supply imbalance, inter alia, has led to widespread unauthorised sand mining in the country. Illegal mining is lucrative to unscrupulous miners, their labour, administrators and polity.

While on one hand, the mining of major minerals is heavily regulated in India and go through a rigorous process of Environmental Impact Assessment (EIA) and clearances, due attention has not been given to the mining of minor minerals, especially when it comes to small-scale mining, given its smaller scale of operation. For instance, as per the EIA Notification of 2006 (EIA 2006), mining leases of less than 05 hectares (ha) did not require an Environmental Clearance (EC), until the same was amended in 2016.

Background: In 2012, the SC in Deepak Kumar vs State of Haryana mandated that leases of all minor minerals for an area with less than 05 ha will be granted only after environmental clearance by Ministry of Environment, Forest and Climate Change (MoEFCC). Prior to this judgment, MoEFCC notified Environment Impact Assessment Notification in 2006 according to which EC was required only for mining projects with lease area of 05 ha and above, irrespective of minor or major mineral, and not for mining projects with lesser areas. Following the SC judgment in 2012, the NGT on August 5th, 2013 ordered that "no person, company, or authority can carry out any mining activity or removal of sand from any riverbed anywhere in the country until an EC from MoEFCC/ State Environmental Impact Assessment Committee (SEIAA) and licence from competent authorities have been obtained".

Objective and Scope: In light of the above mentioned NGT order, the aim of this study is to analyse the economic impact of sand mining stoppage in Gautam Buddha Nagar, if any, on relevant stakeholders. Time period of the study is from August 2013 to September 2017. The study takes a bottom-up approach to understand only the first order direct impact on key stakeholders such as the government, mining lease holders, associated businesses, and labourers/workers, among others.

Economic Impact: The state of Uttar Pradesh (UP), generally, and the Gautam Buddha Nagar district, specifically, have received a lot of attention for rampant illegal mining of sand. Despite the laws and regulations in place, and many orders directing stoppage of illegal mining

activities along with monitoring of such activities, the state of UP has been largely unsuccessful in curbing such illegalities. **The state of UP was deprived of Rs. 477.93 crore in 2015-16 because of unauthorised mining operations according to Comptroller and Auditor General of India's (CAG) audit report of the Revenue Sector of UP**. Moreover, it was also noted that the government suffered a loss of Rs. 179.57 crore owing to extraction of minerals without ECs. On top of all this, **a penalty of Rs. 282.22 crore was also not recovered by the government against lessees extracting minerals without the renewal of a mining plan in addition to over-extraction beyond the approved quantity.**

As per a 2013 news report the district administration of Gautam Buddha Nagar pegged the illegal sand mining business at Rs 100 crore monthly, out of which, as per the administration, the government hardly gets Rs 1 crore as royalty. Another 2013 media report mentioned that sale of illegally mined sand stood at Rs 100 crore to Rs 200 crore a month in Noida and Greater Noida, a major market for sand from Gautam Buddha Nagar. Ban on sand mining restricts the supply of already scarce sand, driving up prices and in turn increases incentive for illegal mining. After the August 5th, 2013 order of the NGT, stakeholders from construction sector expressed fears of steep rise in sand prices and foresaw delays in completion of projects.

A Confederation of Real Estate Developers' Associations of India (CREDAI) spokesperson, after the said order, projected real estate construction costs to increase three-fold, as sand would have to be imported from Cambodia and Pakistan. He also mentioned that such cost increases are ultimately passed on to the buyers. Additionally, employment in construction sector also takes a hit due to fall in construction activity as has been seen in many states. For instance, Builders Association of India (Mumbai Centre) estimated employment loss for 10 million construction workers in Maharashtra due to a sand mining ban ordered by Mumbai High Court in September 2010.

Primary Findings: As per information received from the concerned department in Gautam Buddha Nagar regarding active leases at the time of the NGT order dated 5th August 2013, revealed that all sand mining leases in Gautam Buddha Nagar had expired on 1st May 2013 and hence there were no leaseholders in the district that were mining legally at that time. No new leases were granted thereafter till 2017 when the new State Mineral Policy was implemented, except under short term permits.

An analysis of the amount of royalty received by the revenue department of Gautam Buddha Nagar shows a downtrend in royalty collection from 2012-13 to 2016-17. **The state government on an average suffered an estimated annual loss of Rs. 3.68 crore in royalty earnings from sand mining in Gautam Buddha Nagar, adding up an estimated total royalty loss of Rs. 12.88 crore during the assessment period i.e., from August 2013 to September 2017**.

While CUTS was able to engage with current leaseholders in a limited manner, due to poor data availability and unwillingness to engage, contacting previous lease and permit holders in understanding impact on them was challenging. However, what is clear is that sand mining continued in Gautam Buddha Nagar under short term permits. It could not be confirmed if any

business that mined sand under a lease prior to the assessment period went out of business owing to no new leases being granted. **A current and active leaseholder, during the stakeholder interactions in field, highlighted the difficulties involved in obtaining leases. It was reported that while the procedure to apply for a lease is now completely online through the e-tendering process, documentation, completion, and registration takes up more than 2-3 months due to challenges such as lack of technical knowledge and typical governmental inertia.**

It was found that the associated businesses of cement and construction industries **faced sand shortage and incurred additional cost in procuring illegal sand at a higher price due to stoppage of sand mining by NGT**, which in comparison to the alternatives such as manufactured sand (M-sand) or crushed rocks was a more feasible and acceptable alternative for them. **According to a stakeholder association, it was highlighted that during the assessment period illegally mined sand was procured at a price which was approximately Rs. 40 to 45 higher than the price of legally mined sand**.

The impact on workers during the assessment period effectively meant them losing their source of income. However, the sand mining industry in Gautam Buddha Nagar saw an increased activity of the nexus advancing illegal sand mining, as has been highlighted in many media reports. With most labourers involved in legal sand mining being paid Rs. 300 to 400 per day, as per interactions with current leaseholders, illegal mining although risky, was far more lucrative for them. **Through stakeholder interaction, it was further found that the remuneration for illegal sand mine labour was approximately Rs. 150 for every trolley of sand that was mined. With each trolley making approximately an average of 15-20 trips per day, each labourer on an average earned close to Rs. 2000 daily.**

Conclusion: Multiple interventions from the judiciary, policy changes and administrative initiatives have failed to curb illegal sand mining leading to hazardous environmental consequences. **Analysing and redesigning the EIA Framework** to follow an **integrated approach** by considering social and health aspects along with **assessment of cumulative impact as opposed to impact of individual leases** will enable regulators and authorities to assess the impacts of mining leases not in silos, but in a holistic manner. In that regard, the concept of 'clusters' that was introduced in the EIA Amendment 2016, takes into account the environmental impact of a group of closely situated mining leases, rather than looking at each mining lease individually.

As the situation stands now, specifically in Gautam Buddha Nagar, the existence and dominance of sand mafia overshadows the legal sand mining activities, as the sand mafia can influence the cost and final prices. Therefore, the miners, as well as the workers, see no apparent disincentive in engaging in illegal sand mining, with weak enforcement and implementation of laws. At the same time, legal sand mining is also touted as expensive and cumbersome as compared to illegal sand mining. Firstly, because the price of legally mined sand is higher than that of sand mined illegally. Thus, one way to incentivise legal sand mining could be for **state governments to reduce/cap the prices of legally mined sand**. Another way is to **simplify the procedure for obtaining permissions, leases, transportation and storage**

permits etc. for legal sand mining. Thus making it difficult and unprofitable for illegal mining operations. Additionally, investment in and **promotion of alternatives such as M-sand** has become crucial to meet the ever increasing demand for sand. Lastly, adequate resources need to be allocated to **strengthen regulatory and monitoring mechanisms** of court decisions to curb illegal sand mining.

5.5 Vardhman Kaushik vs. Union of India & Ors. (NCR Construction Ban Case)

Introduction: New Delhi, India's capital city has been facing severe spells of air pollution since last decade causing adverse impact on environment, public health and economy. The concerns related to adverse impacts due to increasing levels of pollution have been highlighted by many environmentalists and health practitioners. Various strategies and measures have been implemented by respective authorities to reduce the air pollution levels in Delhi.

In 2014, a PIL related to the toxic air of Delhi and its neighbouring region was filed before NGT by a SC lawyer, as he felt that the increasing pollution can be a serious health hazard. The litigation originated from the problem of pollution in Delhi NCR and the failure of the administrative authorities to keep a check on the construction activities that were in violation of the MOEF guidelines and causing pollution. For addressing the mentioned issue an order was passed on 7th April 2015 by NGT directing the concerned authorities to direct stoppage of construction activities on a 2-km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and on Golf Course Road, Gurgaon.

About the Study: The objective of this study was to assess the first order economic impact of the said order, if any, on concerned stakeholders. During the field visit to Delhi NCR for data collection for the case the team met a number of different categories of stakeholders ranging from the Development Authorities [NOIDA and Haryana Shehri Vikas Pradhikaran (earlier known as HUDA)], Pollution Control Boards (UP and Haryana), Real Estate Companies, Labour Associations, and Homebuyer's Associations.

Findings: From the meetings with various stakeholders and review of documents made available to the team on field by concerned government authorities, it was concluded that the authorities did not direct stoppage of construction activities. A set of procedural guidelines guided by the principle of natural justice were followed by all the concerned government authorities for implementation and compliance of the NGT order.

A public notice in various newspapers (English and Hindi) and on the official websites of development authorities along with show cause notice was issued to all builders/contractors/real estate companies who were responsible for the construction activities taking place in Noida, Greater Noida and Gurgaon informing them to comply with the directions laid down by the NGT in its orders dated 7th April 2015 and other guidelines laid down by NGT in its previous orders. A compiled report was also submitted by few of the departments to Central Pollution Control Board (CPCB) based on the compliance reports received from the contactors and builders and the inspection of the sites conducted by them.

While we intended to analyse the economic impact of the 7th April 2015 order by NGT on stakeholders, the same was not possible as the order was implemented following the stated process and hence there was no stoppage of construction activities. However, the interaction with stakeholder associations including Real Estate Associations, Homeowner's Associations, and Labour Associations, helped to gauge the general impact of stoppage of construction activities that have become a regular norm towards the attempt to curb pollution. Since 2017, there have been continuous orders by the NGT/SC to stop construction activities every year during October-November to curb air pollution.

The real estate sector is directly impacted by the stoppage of construction activities, which adversely impacts labourers working on the site as well as homebuyers who invest their hard-earned money. As per media reports, the stoppage of construction activities, cause a substantial delay in the completion of projects and up to three per cent cost overrun[13]. An order by the judiciary of 15 days stoppage of construction activities leads to project delays of at least three months and may also push away potential buyers due to postponement and potential cost escalation.

Conclusion: The ineffectiveness of procedures adopted by the judiciary and the executive in curbing pollution highlights the existence of loopholes in set procedures and system owing to various reasons such as capacity and expertise constraints, paucity of resources, etc. Various authorities and departments, due to constraints faced and no clear division of responsibilities, have failed to ensure proper implementation and compliance of the guidelines and orders. Thus, the executive and the judiciary **urgently need to come up with frameworks that would consist of effective measures and the proper system that would ensure the compliance of the guidelines and regulations passed**.

The problem of air pollution in Delhi has become recurring in nature and requires a long-term, holistic solution that should be based on rigorous research and analysis, and on the contours of enforceability. The SC recently remarked that the measures to curb air pollution must be taken in anticipation and not as ad-hoc measures, which must be backed by scientific studies having statistical models.[14]

Improvements are required in existing mechanisms to make speedy and effective resolution of environmental issues via a well-co-ordinated multi-state, multi sectoral and multi-agency approach. Overall, the problem of pollution in Delhi is a result of the failure of multiple agencies and levels of governance, which involve the executive and judiciary. What is needed is a holistic approach to tackle the problem at various sources and levels. With air pollution in Delhi reaching new peaks, **solutions must include unconventional and probably unpopular measures that tackle short- and long-term causes** and benefit all residents of the city.

[13] https://www.99acres.com/articles/99acres-insite-sequential-construction-bans-delay-housing-projects-in-delhi-ncr.html

[14] https://www.livelaw.in/top-stories/supreme-court-delhi-pollution-crisis-delhi-air-quality-186182

6 Recommendations and Way Forward

The following recommendations are informed from the findings of each of the case studies. Nevertheless, the recommendations sustain the larger objective of human-centricity of economic development and environment sustainability with equal consideration to the objective of equity, environment, and economy:

a. The SC must undertake comprehensive ex-ante economic impact analyses facilitated by a group of experts including economists, environmentalists, sociologists, among others, to address and adjudicate public interest cases involving economic sensitive matters. Such experts could be engaged by exercising explicit and discretionary powers under Specific Relief Act and Code of Civil Procedure, respectively, which empowers the court to get expert opinion and secure their attendance for providing evidence. This would facilitate decision-making backed by scientific evidence and ensure that interests of multitude of direct and indirect stakeholders are acknowledged. Most importantly, it could inform the various options the court could take while pronouncing its decision on the issue, thus, minimising the multiplier adverse effect. Similarly, such analyses should also examine the potential enforcement challenges of the implementing the decision, in cases with explicit conflict of interest. As a public institution and constitutional body, the SC has a crucial responsibility to ensure that the interests of the society, development and environment are balanced and ensure that sustainable development is facilitated. Moreover, under Article 142(1)[15], the SC must consider all dimensions of a matter to arrive at a judicious decision. To this end, a standing roster of experts from different domains could be maintained with the registries of HC and SC, so that a committee could be quickly framed.

b. It is essential to institutionalise cost-benefit assessment during decision making and as a continuous process of monitoring and evaluation by relevant authorities including regulators, state agencies, expert committees, judiciary, etc. This would entail continuous tracking of cost and benefit to different stakeholders as a dynamic tool, rather than a one-off number that is used for final decision. Towards this, a specialised research unit could be formulated with professionals from law, economics, finance, political science, sociology, and environment within the judiciary or the Law Commission, to monitor and evaluate cases of SC, High Courts, Lower Judiciary, Tribunals or even Regulatory Bodies. Regular reporting of the effectiveness of the different judgments on the economy and society, while highlighting key trends,

[15] Article 142(1): The Supreme Court in the exercise of its jurisdiction may pass such decree or make such order as is necessary for doing complete justice in any cause or matter pending before it, and any decree so passed or orders so made shall be enforceable throughout the territory of India in such manner as may be prescribed by or under any law made by Parliament and, until provision in that behalf is so made, in such manner as the President may by order prescribe.

evolving judicial principles, solutions and alternate remedies would facilitate analytical discourse towards balanced decision making. Such an approach could also be facilitated by artificial intelligence and information and communication technology initiatives, as has been increasingly recognised by the SC e-Committee towards transforming country's judicial system and facilitating transparency and efficiency in case management processes. Moreover, a timely case management policy for all the judicial courts would also facilitate expeditious disposal of cases.

c. The impact analyses and assessment framework must qualitatively acknowledge vital indicators of people's welfare, which may be difficult to quantify. A dynamic assessment with qualitative feedback would benefit any envisaged decision, backed by evidence. However, at the other end, in cases where strict adherence to legal provisions may lead to substantive economic losses, the decision making of the SC should be guided by the larger public good. Moreover, the apex court must demand accountability by levying fines and penalties on officers and politicians involved in outright corruption and maladministration cases.

d. The set of proposed recommendations are likely to require a robust capacity building exercise to drive change and achieve the envisaged objectives. Another effective way to resolve the capacity issue would be to delegate the functions of capacity building needs to independent, multi-disciplinary, representative (age, occupation, gender, among others) and inclusive body attached to relevant institutions. At the same time, it is also essential for capacity building in the judiciary, to enable holistic decisions. Similarly, the number of judges and their competencies in the lower judiciary must be increased. The fact that matters escalate to the level of judicial intervention should be given more attention and an attempt must be made to get the perspectives of all related and relevant stakeholders – even though they might not be parties to the case. For better quality of judges, the law on National Judicial Commission could be revived. However, it is equally important for judicial officers to be exposed to (basic) economic issues, to enable them to recognise the need for a holistic and balanced decision and approach. Furthermore, to institutionalise accountability in the judiciary to ensure high standard of jurisprudence analysis and decision-making.

Although, these recommendations attempt to catalyse the process of understanding the multiplier effect of decisions and orders and institutionalising a holistic and balanced thinking in all ranks of decision and policy making, to converge the development, society, and environmental interests for the larger societal welfare. Furthermore, it enshrines consideration of interests of all different stakeholders, which are often relegated in the discourse, towards human-centricity and equal consideration to equity, economy and environment.

7 Consolidated Findings of the Cases

The consolidated impact of the cases has been summarised in the table below, under the indicators of impact on business, government revenues, employees, and induced impact on the economy. In addition, job losses and people affected have been estimated and highlighted in the table.

Case	Period	Estimated economic impact on government revenues (Rs. Crore) [A]	Estimated induced economic impact (due to impact on govt revenues) (Rs. Crore) [A * 2.45][#]	Estimated economic impact on businesses (Rs. Crore) [B]	Estimated economic impact on employees (Rs. Crore) [C]	Consolidated estimated first order economic impact (Rs. Crore) [A+B+C]	Estimated job losses	Estimated number of people affected[^]
Goa Iron Ore Mining	Mar 2018 – Jan 2021	668.39[+]	1637.56	8002.34[*]	393.07	9063.81	14858	68347
Sterlite Copper Plant	May 2018 – May 2021	7641.86	18722.56	6961.43	146.17	14749.46	1481	6813
Mopa Airport	Mar 2019 – Jan 2020	-	-	715	NA	715	1500	6900
Sand Mining	Aug 2013 – Sep 2017	12.88	31.56	NA	NA	12.88	NA	NA
NCR Construction Ban	NGT Order of 7th April 2015	15 days stoppage delays project by at least three months and cost overrun up to three percent.[**]						

2.45 is the capital expenditure multiplier for India. It assumes that if government utilises Re 1.00 for capital expenditure, consequent gains to the economy in subsequent years could be to the tune of Rs. 2.45. Using this multiplier, assuming that relevant governments in the covered matters would have utilised the lost revenue (if available) for capital expenditure purposes, and consequent gains would be have been consistent with the capital expenditure multiplier estimations for India, the table lists the estimated induced economic impact. For details, see Bose and Bhanumurty, Fiscal Multipliers for India, Working Paper 2013-15, September 2013, at https://www.nipfp.org.in/media/medialibrary/2014/02/WP_2013_125.pdf. Also, Reserve Bank of India, Government Finances 2020-21, A Half Yearly Review, December 2020, at https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=19959

+ Rs. 1821.32 crore impact on State Government revenues only

^ Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.

*Include Rs. 182.04 crore revenue deficit of the Mormugao Port other than impact on mining companies and services providers.

NA: Not Available

** Based on secondary research.

As indicated previously, the consolidated findings are constrained by the limited data availability of the covered cases. However, the data available for the Goa iron ore and Sterlite Copper plant matters is more than data available for the other matters. The impact estimation periods for these two matters also substantially converge, and relate to approximately three-year period from mid-2018 to mid-2021.

Consequently, taking into account limitations related to data availability, and assumptions related to its interpretation and analysis, **it has been estimated that during the aforementioned period of approximately three years from mid-2018 to mid-2021, at least about 75,000 persons were adversely impacted, and around 16,000 workers lost their jobs. The government did not receive revenues of around Rs. 8,000 crores, which, if were received and invested as capital expenditure, could have resulted in economic impact of more than Rs. 20,000 crores. The industry lost close to Rs. 15,000 crores in revenues, and workers lost around Rs. 500 crores of income, during the aforementioned period.**

Thus, it can be deduced that when both these orders were in force, **the economic impact owing to inability of relevant governments to make capital expenditure is estimated to be around Rs. 18 crores per day. During this period, the impact on industry is estimated to be around Rs. 13 crores per day. Around 75,000 persons were adversely impacted during this period.**

Annexures

The Goa Foundation vs. M/s Sesa Sterlite Ltd. & Ors. *(Goa Mining Case)*

Table of Contents

List of Tables and Figures

Figures

Tables

Executive Summary

Background: Iron ore has been a mineral of economic significance for Goa since the 1950s. However, around late-2000s concerns of environmental violations and illegal mining in Goa surfaced. Consequently, the Government of Goa (GoG) suspended all mining operations on 10th September 2012 after the Justice MB Shah Commission tabled its report in Parliament on illegal mining in Goa.

On 21st April 2014[16], the Supreme Court (SC), on a petition by Goa Foundation, a civil society group, ruled that all the mining leases expired on 20th November 2007 and thus, all the mining operations since then were illegal. Although, the mining activities were restarted in 2016, after the GoG granted second renewals to 88 mining leases, following an order by the Bombay High Court (BHC)[17]. These renewals were also set aside by the SC on 7th February 2018[18], and termed as illegal, thus suspending the mining operations for the second time with effect from 16th March 2018, as of date. In the bargain, the mining suspension resulted in economic and job losses to the mining companies, dependents, service providers and the state exchequer.

About the Study. The study being presented here was commissioned by NITI Aayog and adopted an evidence-based and bottom-up approach to objectively understand the economic impact of the mining suspension, if any, on the Goan economy and relevant stakeholders of the iron-ore mining sector using primary and secondary research methodologies. The Assessment Period of the impact was March 2018 – January 2021. The study also makes an effort to identify the best possible remedy which would have also been benign to the environment.

Growth and Significance of Iron Ore in Goa. In 1947, about 5,464 tonnes of iron ore was exported, whereas in 2011-12, Goa had an annual iron ore production of 32.61 million tonnes (MT). Almost 99% of the Goan iron ore was exported to China and other eastern countries, as the Goan iron ore is low-grade having low iron (Fe) content and Goa's geographical location gives it an advantage to export at one-fifth of the cost to transport within India. In 2010-11, iron ore mining contributed almost about 20% to the state's Gross State Domestic Product, which declined to 1.64% in 2017-18, a drastic fall.

Impact on State Exchequer. The state public debt increased at a Compound Annual Growth Rate (CAGR) of 10.06% from 2007 through 2021, while the market loans taken by the state increased at a CAGR of 19.93%, consequently due to mining suspension. The total revenue[19] earned by the state government between the financial years 2015-18 was Rs. 1128.38 crore, which declined by 79.51% to Rs. 231.23 crore in the Assessment Period, a difference of Rs. 897.15 crore. As a consequence of the mining ban in Goa, the central and state revenues cumulatively suffered an estimated deficit of Rs. 668.39 crore in taxes paid by the mining companies, whereas the state revenues exclusively suffered an estimated deficit of Rs. 1821.32 crore.

Impact on Mining Companies and Service Providers. The revenues of the mining companies are estimated to have been impacted by Rs. 6976.71 crore between 2018-19 and 2020-21. Whereas, amongst the service providers, the truck owners, barge owners and mining

[16] In Goa Foundation vs Union of India & Ors., (2014) 6 SCC 590

[17] In Lithoferro vs State of Goa, 2015 (3) ABR 32

[18] In The Goa Foundation vs Sesa Sterlite Ltd. & Ors., (2018) 4 SCC 2183

[19] Royalty (excluding e-auction ore), District Mineral Fund, Goa Iron Ore Permanent Fund, and State GST

machinery owners may have an estimated revenue impact of Rs. 609.28 crore, Rs. 193.50 crore, and Rs. 40.45 crore, respectively, in the assessment period.

Parameter	Estimated Impact during Assessment Period (in Rs. Crore)
Estimated Revenue Impact on Mining Companies	-6976.71
Estimated Revenue Impact on Service Providers	-843.23
Total	**-7819.94**

Impact on Livelihood and Employment. About 10,108 workers employed with the service providers (barge owners, truck owners and machines owners) and about 4750 mineworkers (employed with the mining companies) are estimated to have lost employment due to the mining suspension.

Parameter	Estimated Impact
Estimated Salary Loss to Workers of Service Providers (in Rs. Crore)	**-385.56**
Estimated Loss of Jobs for Workers of Service Providers and Mining Companies (in Numbers)	**-14,858**

Impact on Mormugao Port. The Mormugao Port earned about Rs. 228.82 crore from Cargo Handling and Rs. 100.54 crore from Port Charges in 2010-11, which declined to Rs. 60.07 crore and Rs. 86.89 crore, respectively, in 2013-14. Also, about 1161 service providers[20] workers at Mormugao Port in 2017-18, reduced by 34% to about 763 workers in 2018-19. These 398 workers who are estimated to have lost their jobs due to mining suspension, are also estimated to have immediate adverse impact on their livelihood by about Rs. 7.51 crore loss in welfare.

Conclusion. With respect to the matter in its current form, both the iron ore mining suspensions in Goa were completely avoidable. The GoG failed to act judiciously in mitigating the environmental violations that were being reported in mid to late 2000s as well as granting of second renewals on time (before 2007). Even after the SC termed mining illegal from 2007 to 2011, but considering the significance of mining for Goa and livelihood, the court directed the state to issue **fresh** mining leases, as a matter of state policy.

The court also set a cap of 20MT on the annual production of iron ore. The second renewals of 88 mining leases by GoG, on BHC's order allowing renewals despite SC directing for fresh leases, was in haste and to avoid an ordinance by the GoI that would make the grant of leases through bidding or competitive auction mandatory. This led the SC to set aside the second renewals.

Although an appeal against BHC order would have delayed restarting the mining by an extent, however, it would have ensured judicial backing by the SC and certainty for the mining operations.

[20] Steamer Agents, Repair Workshops, Shipchandlers, Surveyors, Launch Owners, and Stevedores

While quashing 88 mining leases, the SC could have directed GoG to restart mining operations within a stipulated time under the court's supervision and facilitated by a committee of subject experts including economists, environmentalists, etc. Such an approach could have been informed by an *ex-ante* impact analysis of the mining suspension, initiated and supervised by the SC itself. The analysis could have also explored the best possible environmental protection meaures to keep the damage to the minimum. It could have mitigated or lessened the adverse impact on many key stakeholders, especially the livelihood of many mining dependents, ensured economic progress while preserving environmental and intergenerational equity. A balanced and informed approach to development, society and environment would ensure sustainable development, wherein public institutions such as the SC increasingly play a crucial role.

After all appeals made to the SC to restart mining in Goa were dismissed, the GoG recently consitituted Goa Mineral Development Corporation, which received Governor of Goa's assent in September 2021.[21] As part of restarting mining, GoG is reported to auction eight mines in December 2021 as **fresh leases** in accordance with the SC judgment.[22]

[21] https://www.heraldgoa.in/Goa/Goa-Governor-gives-assent-to-Goa-Mineral-Development-Corporation/180063

[22] https://timesofindia.indiatimes.com/city/goa/8-mining-leases-tentatively-set-for-auction/articleshow/88017986.cms

1. Introduction

1.1 The overall issue of Goa mining suspension has multiple phases, dimensions and varying interests. The erstwhile Portuguese colonial regime granted mining concessions in perpetuity to many companies and individuals. After Goa was liberated in 1961, the Government of India (GoI) made the Mines and Minerals (Development and Regulation) Act, 1957 applicable to Goa in 1963 and thus attempted to bring concessions and leases at par. However, it was overturned by the Bombay High Court (HC), defending the legacy rights of lessees.

1.2 Some years later, in 1987, the GoI enacted a separate legislation called Goa, Daman and Diu Mining Concessions (Abolition and Declaration of Mining Leases) Act, 1957 (to be referred as the 'Abolition Act'), whereby all the mining concessions were deemed as mining leases with retrospective effect from 20th December 1961. The Abolition Act was challenged before the HC, which upheld the law, but made its application prospective. The HC's order was then challenged before the Supreme Court (SC) by the GoI, which was overturned and the apex court allowed the mining operations to continue. The challenge to the Abolition Act is still pending, which is awaiting a decision of nine-judge bench in Property Owners' Association vs State of Maharashtra.

1.3 Fast forward to 2010, GoI constituted the Justice MB Shah Commission (Commission) to assess the allegations of large-scale illegal mining in Goa and six other states in India. The Commission's report was tabled in the Parliament on 7th September 2012. Some of the key findings of the Commission highlighted illegal iron ore mining in Goa including violation of the Mining Concession Rules, 1960 towards the renewal of leases and violation of environment laws. The Commission also highlighted alleged encroachment of land by mining leaseholders outside leasehold areas, under invoicing, indicative loss of revenue to the State of Goa, etc. As a result, the Government of Goa (GoG) suspended the mining operations in Goa effective from 11th September 2012. Similarly, on 14th September 2012, the environment clearances of the mining leaseholders in Goa were kept in abeyance by the Ministry of Environment and Forests (MoEF), GoI.

1.4 Goa Foundation, a civil society group, subsequently petitioned the SC based on the Commission's Report requesting direction to the GoI and GoG to take steps for termination of mining leases involved in violation of applicable laws, against alleged illegal iron ore mining in Goa. On 21st April 2014, the SC ruled that all the first renewals (granted on 22nd November 1987) of the mining leases in Goa expired on 21st November 2007 and thus, all mining operations since then were illegal. However, the state government could grant fresh mining leases in accordance with law and constitutional provisions.

1.5 After the SC order, the erstwhile mining leaseholders approached the HC requesting a second renewal as they had already paid the stamp duty towards the same. The HC ruled that the state government was bound to grant the leaseholders a **second renewal** from the date of expiry of the license on 22nd November 2007 in view of the principles of promissory estoppel. As a result, the state government formulated Goa Grant of Mining Leases Policy 2014 (GGML) to comply with the directions of the HC and started the mining leases renewal process in November 2014, which was completed in January 2015.

1.6 In September 2015, Goa Foundation challenged the 88 iron ore mining lease renewals through a writ petition in the SC mentioning that since the mining leases expired on 22nd November 2007, thus, the paid stamp duty towards the renewal of mining leases was in

contravention to SC judgment dated 21st April 2014. It asserted that consequently renewals had no validity. On 7th February 2018, the SC cancelled 88 iron ore mining licences in Goa with effect from 16th March 2018 that were issued by the state government between November 2014 and January 2015. The SC ruled that the renewal of mining leases was awarded illegally and noted that HC proceeded on erroneous basis that it could direct State of Goa to grant second renewals in contravention to apex court's judgment dated 21st April 2014. Therefore, the leases so awarded were cancelled.

1.7 As a result, the mining operations in Goa have been in suspension since 16th March 2018. However, the SC in January 2020, allowed transportation of royalty paid iron ore extracted before 16th March 2018. The transportation of iron ore was allowed until the end July 2020. However, due to Covid-19 lockdown in the country, the transportation was extended until the end of January 2021.

2. Objective

2.1 To understand the economic impact of the mining suspension, if any, on the Goan economy and first-order direct stakeholders of the iron-ore mining sector.

3. Methodology

3.1 Approach: The study adopted an evidence-based and bottom-up approach to understand the economic impact, if any, of the mining suspension in Goa, on relevant stakeholders using primary and secondary research methodologies. Also to assess if a remedy could have kept a balance between environment and development.

3.2 Secondary Research: The secondary research entailed a thorough and extensive review of existing literature including various industry and government reports, academic papers, news articles, and secondary data from relevant stakeholders. The following stakeholder mapping was done using extensive review of literature, including reports in news articles:

Figure 1: Stakeholder Mapping

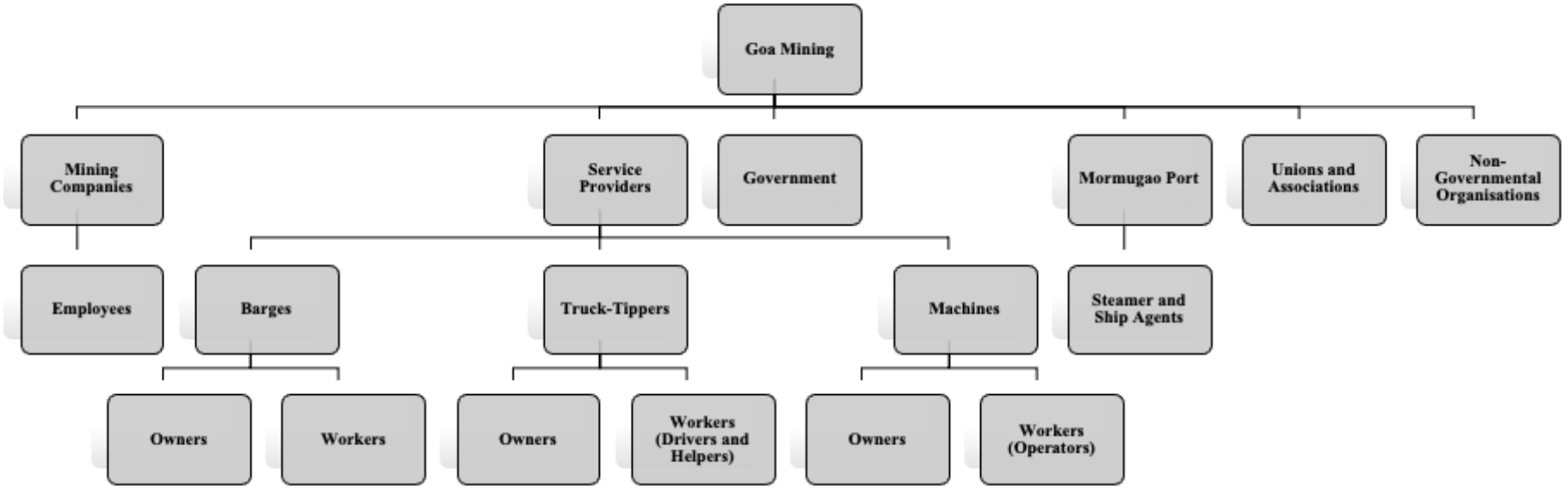


Table 1: Key Queries made to Stakeholders

Category	Key Queries
Mining Companies	• Impact on Revenue • Impact on Mining Industry • Case History • Impact on Employment and Salaries • Impact on Taxes paid • Impact on Trade • Sunk costs
Employees/Workers	• Impact on Livelihood • Impact on Salaries • Availability of Alternate Employment Opportunities
Service Providers	• Impact on Revenue • Impact on Employment and Salaries • Case Perception • Impact on Business • Sunk costs
Government	• Impact on Revenue • Production of Iron Ore in Goa • Case History • Export of Iron Ore
Mormugao Port	• Impact on Revenue • Trade Statistics
Associations, Unions and Non-Governmental Organisations	• Case History • Perception and viewpoints on mining in Goa • Impact of Mining Suspension on Different Stakeholders • Impact on Employment and Livelihoods • Availability of Alternate Employment

3.3 Primary Research

3.3.1 The primary research involved interacting with relevant stakeholders using key informant interviews (KII) and focus group discussions (FGD) through in-person interactions with stakeholders in Goa, telephonic calls, as well as solicited written responses from select stakeholders. A multi-pronged outreach approach was adopted while contacting the stakeholders including appropriate follow-ups and reminders. To effectively leverage the interviews and seek relevant data and information across data points, semi-structured questionnaires were designed for all categories of stakeholders based on extensive literature review.

3.3.2 A semi-structured interview approach was adopted to seek relevant information towards the various identified data points from each category of stakeholder. Interviews were conducted in different regions of Goa including Codli, Cortalim, Curchorem, Dharbandora, Dona Paula, Pale, Panjim, Ponda, Porvorim and Vasco da Gama.

3.3.3 An informed consent was taken from the stakeholders before conducting the interviews. It was agreed in advance that their names, etc. would not be disclosed otherwise they might not have been forthcoming. To maintain the privacy of respondents and confidentiality of information, all the personal information of respondents are kept confidential. The collected data was anonymised and aggregated for analysis.

3.4 Scope

3.4.1 The operations of iron ore mining were suspended twice, first in 2012 by the Government of Goa and then in 2018 by the SC in the Goa Foundation vs Sesa Sterlite Ltd. & Ors. The initial scope of the assessment of impact of iron ore mining suspension was limited to post-SC judgment i.e. from March 2018 to March 2020.

3.4.2 However, an attempt has been made to extend the initial scope of the impact until January 2021. This is because the mining operations are still in suspension in Goa and the field visit enquiry was conducted in January 2021 that provided additional inputs on impact. Hence, the final assessment period of impact of iron ore mining suspension is March 2018 to January 2021.[23]

3.5 Limitations and Assumptions

3.5.1 Due to Covid-19 pandemic and ensuring health safety protocols, the team could only meet a limited number of stakeholders during the field visit. This also resulted in delay in the completion of the study.

3.5.2 The data estimations do not include operations towards e-auctioned iron ore[24]. As mining is a seasonal activity, wherein the mining operations are completely suspended during the monsoon period. Hence, the data estimations have also assumed and excluded the monsoon days during the Assessment Period.[25]

3.5.3 The data estimations are based on primary data collected from a representative sample of stakeholders and hence, the data estimations on impact are limited to the accuracy of responses by such stakeholders.

3.5.4 The actual economic impact could be higher considering that stakeholder representation was limited. Moreover, the scope of study is limited to post-SC Judgment in March 2018, while the mining was suspended earlier in 2012 until 2015. Additionally, the iron ore mining in Goa was at its peak in the preceding years through 2012. Similarly, the SC ordered a cap of 20MT on the annual iron ore production in 2014.

---

[23] See Annexure for more details

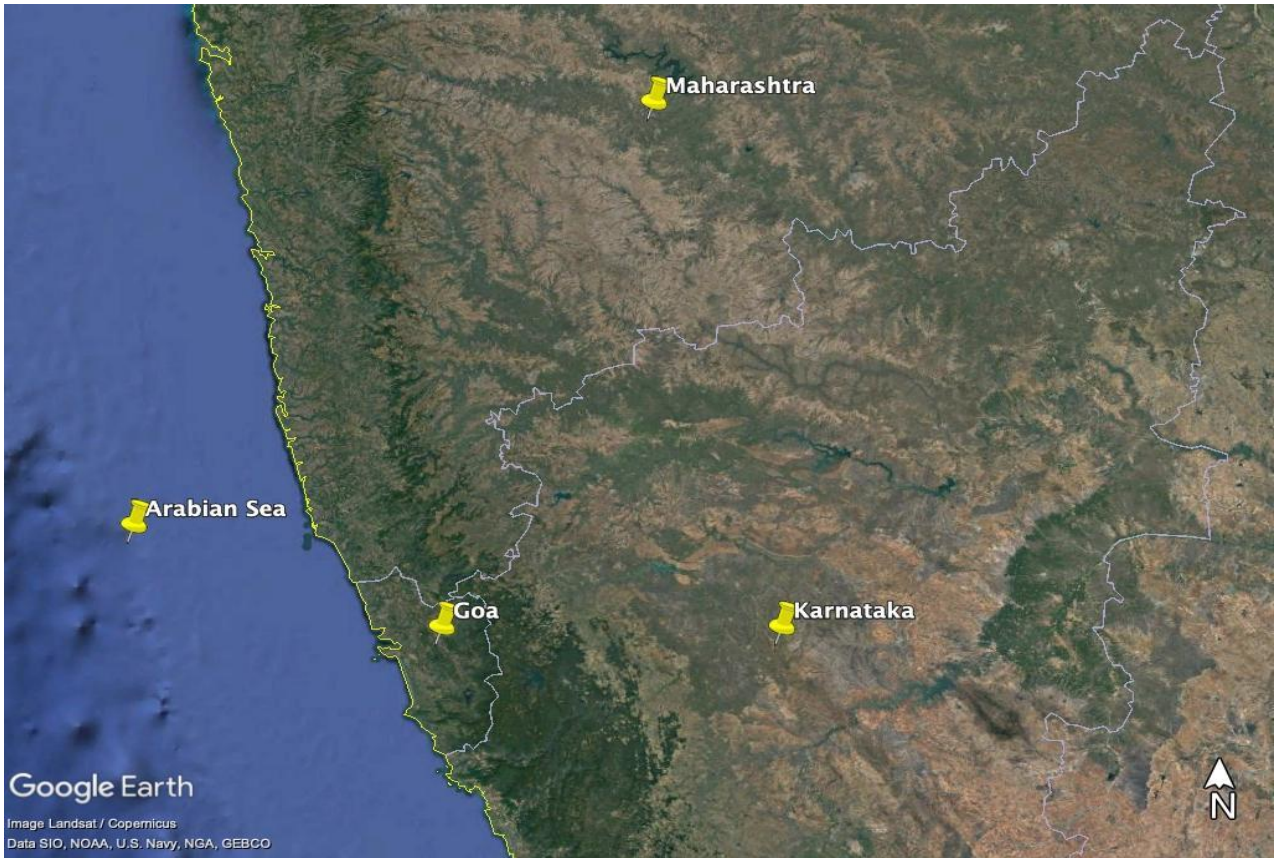
[24] The SC in Goa Foundation vs Union of India & Ors., (2014) 6 SCC 590, ordered e-auction of excavated mineral ores lying in different mines/stockyards/jetties/ports in the State of Goa. About 25 rounds of e-auction have been completed as of March 2021. More details in Section 8 of this report.

[25] See Annexure for more details

4. Background to Iron Ore Mining in Goa

4.1 Goa is the 25th state of the Union of India with an area of 3702 sq km, population of 18.2 lakh (2011 Census), comprising two administrative districts, namely North Goa and South Goa.[26] It shares borders with the State of Maharashtra and Karnataka and coastline along the Arabian Sea. The State of Goa has a unique history of colonial rule and liberation. Goa was invaded and occupied by Portugal in 1510. Their rule lasted for about 450 years, which ended on 19th December 1961 following a police action (as defined by India's political leaders) to liberate Goa alongwith two other enclaves: Daman and Diu held by the Portuguese, by the Indian Army on the 18th and 19th December 1961. No shots were fired and the occupiers surrendered peacefully knowing that they did not have the wherewithal to fight the Indian Army.

Figure 2: Satellite Image showing states of Goa, Maharashtra and Karnataka



Source: Google Earth

[26] https://www.goa.gov.in

Box 1: History of Iron Ore Mining in Goa

The presence of mineral deposits in Goa have reference to historical times. It is reported that Linschoten, a Dutch traveller, highlighted the existence of ore in Goa during the second half of the 16th century. There was interest by the Italians to dig copper and gold in Goa, but was declined by the Portuguese Viceroy fearing undue attention from enemies.[27] Similarly, Portuguese reports from the 17th and 19th century note the existence of iron mines in Goa. Following the model from the British colonies, the Portuguese Government issued legislation to regulate mining activities in colonies in 1906, called as Portuguese Colonial Mining Laws[28]. This legislation granted mining concessions for perpetuity. The interest in mining was unenthusiastic in the beginning and the first four mining concessions were granted only between 1929 and 1931.[29]

The Second World War and subsequent global wave of decolonisation nudged the Portuguese regime to promote the mining industry in Goa to please the local population.[30] Consequently, in 1947 the Portuguese Government granted 17 concessions to various individuals, 42 concessions in 1950 and 144 by 1953.[31] Towards the end of their regime in 1960, the Portuguese granted around 596 concessions to various companies and individuals.[32] In the 1950s, mining became a significant element of the Goan economy. The export of ore from Goa was facilitated primarily by its geographical location in addition to cost-effective trade connectivity with the Asian countries and the *laissez faire* policy of the Portuguese regime. The first sample consignment of iron ore was sent to Japan in 1939 supervised by Vishwasrao Chowgule. The first shipment of manganese ore was also sent by Chowgule & Co. in 1947 to erstwhile Czechoslovakia. Chowgule & Co then sent the first shipment of iron ore to Japan in 1950.[33]

The export of iron ore from Goa has been evolutionary. About 5,464 tonnes of iron ore was exported in 1948, which reached one million tonnes in 1953 and about 6.5 million tonnes (MT) by 1961.[34] In 2011-12, before the iron ore mining was suspended, the annual iron ore production in Goa was about 32.61 MT.[35] Almost 99% of the iron ore from Goa is exported to China and Japan and a lesser proportion to Malaysia, Vietnam and Thailand.

The iron ore found in Goa has low iron (Fe) content and thus, making it a low-value grade iron ore. The Goan iron ore essentially needs to be blended with high-grade iron ore to obtain value from it. Since, India does not have operational capacity that uses low-value grade iron ore or blends it with high-grade iron ore, it is exported to China and other eastern countries, where such capacities are well established. Moreover, Goa's geography and its landscape gives it an advantage to export to China at one-fifth the cost compared to transporting to Indian states such as Karnataka, Orissa, etc, where steel plants are situated. The iron ore mining sites are located near rivers which allows the trucks to transport the ore from mines to rivers and then to the port using barges.

---

27 Gracias, Fatima Da Silva. 2000. Iron Ore Rush and the Quality of Life in Goa 1947-1961. In C J Borges, O G Pereira & H Stubbe, *Goa and Portugal: History and Development* (pp. 72-85). XCHR Studies Series No. 10.

28 https://www.dmggoa.goa.gov.in/downloadfile.php?file=dXBsb2FkLzM1LnBkZg%3D%3D and https://www.dmggoa.goa.gov.in/downloadfile.php?file=dXBsb2FkLzM4LnBkZg%3D%3D

29 Gracias, Fatima Da Silva. 2000. Iron Ore Rush and the Quality of Life in Goa 1947-1961. In C J Borges, O G Pereira & H Stubbe, *Goa and Portugal: History and Development* (pp. 72-85). XCHR Studies Series No. 10.

30 Ibid

31 Ibid

32 Ibid

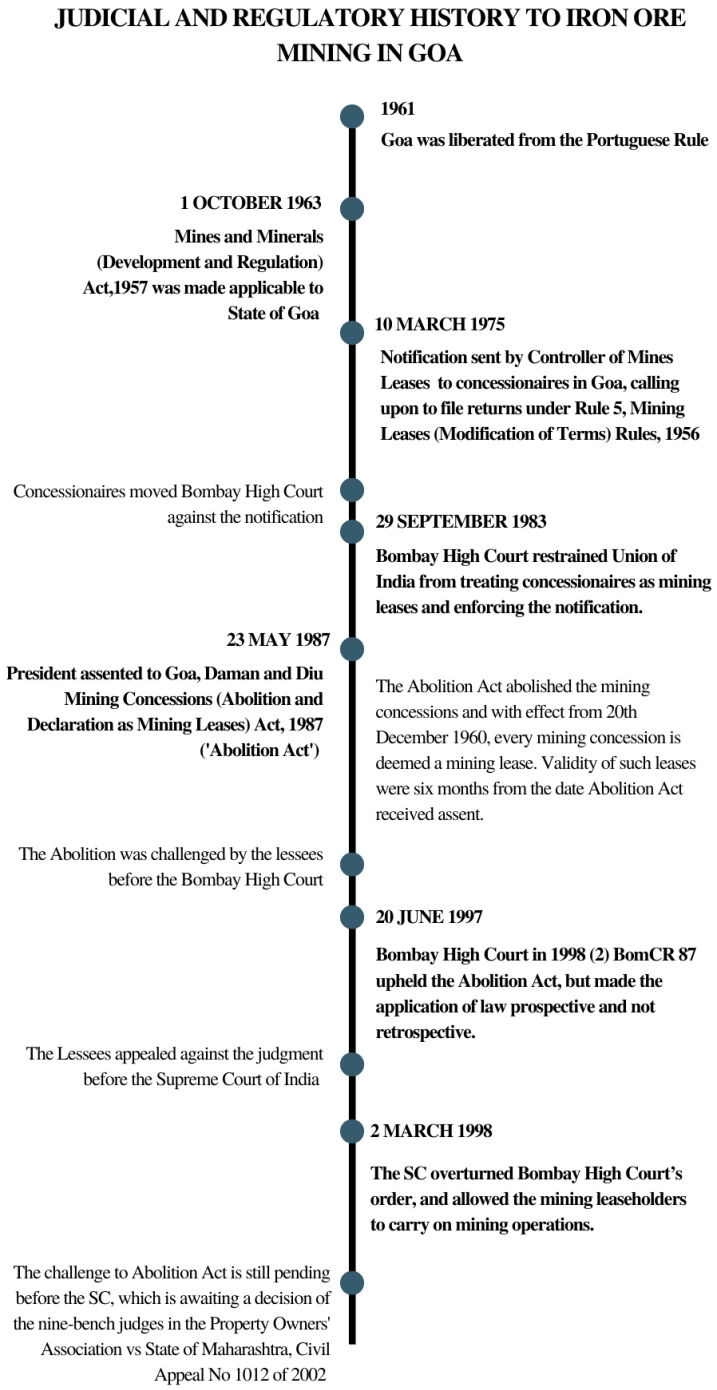
33 Ibid

34 Ibid

35 Inputs received from Directorate of Mines and Geology, Government of Goa.

5. Judicial History of Iron Ore Mining after Goa's Liberation in 1961

5.1 The following timeline presents a history of regulatory actions and judicial issues in iron ore mining in Goa after the state was liberated in 1961 until the end of the 20th century. This timeline finds consonance with some of the arguments, particularly the pending challenge to the Abolition Act that is being made by some of the key mining stakeholders such as the mining companies, service providers, union bodies etc. towards restarting mining operations in Goa, especially in 2020-21.

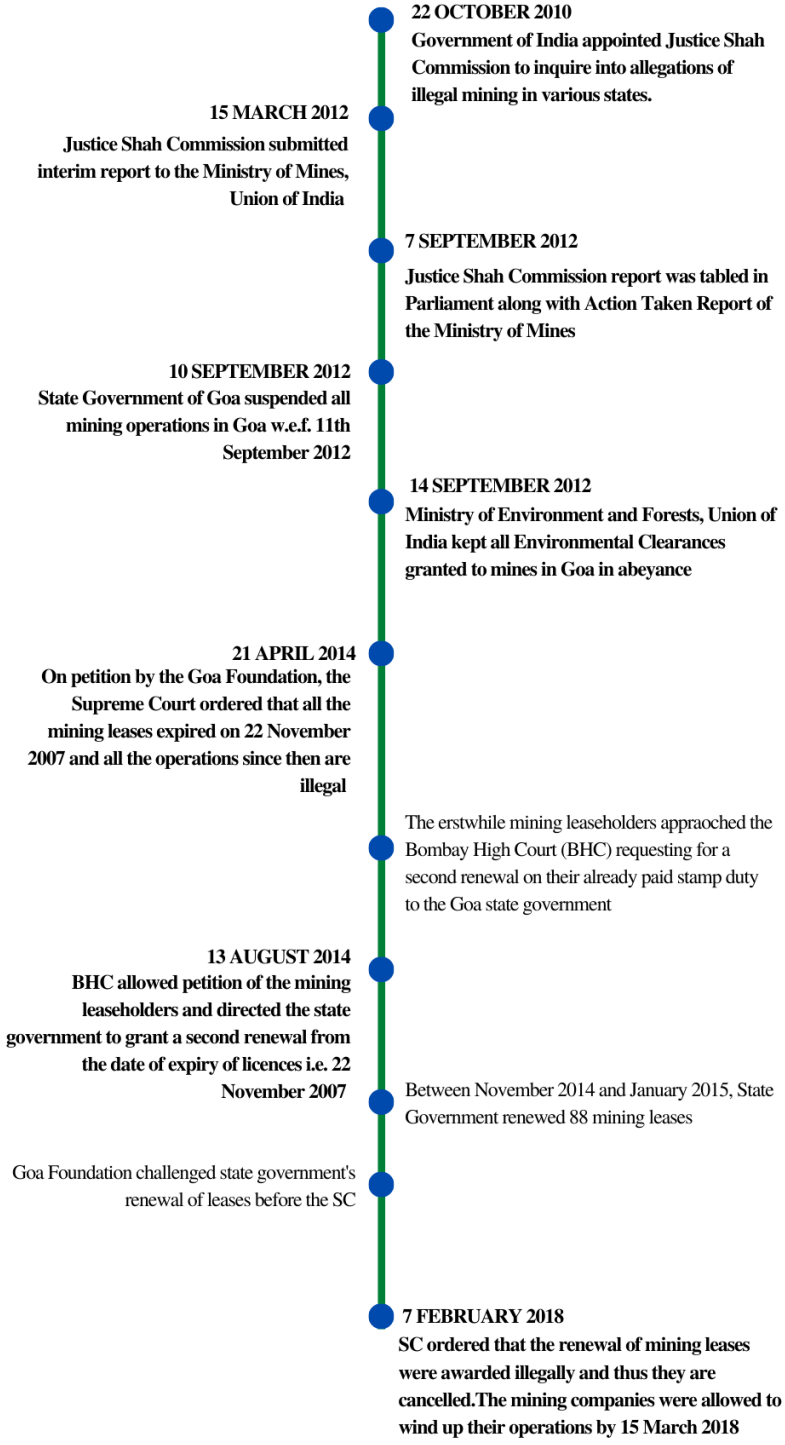


Source: Goa Foundation vs Union of India & Ors., (2014) 6 SCC 590

6. The Case of Suspension of Iron Ore Mining in Goa

6.1 The brief timeline of events leading to the suspension of iron ore mining in Goa is given below:

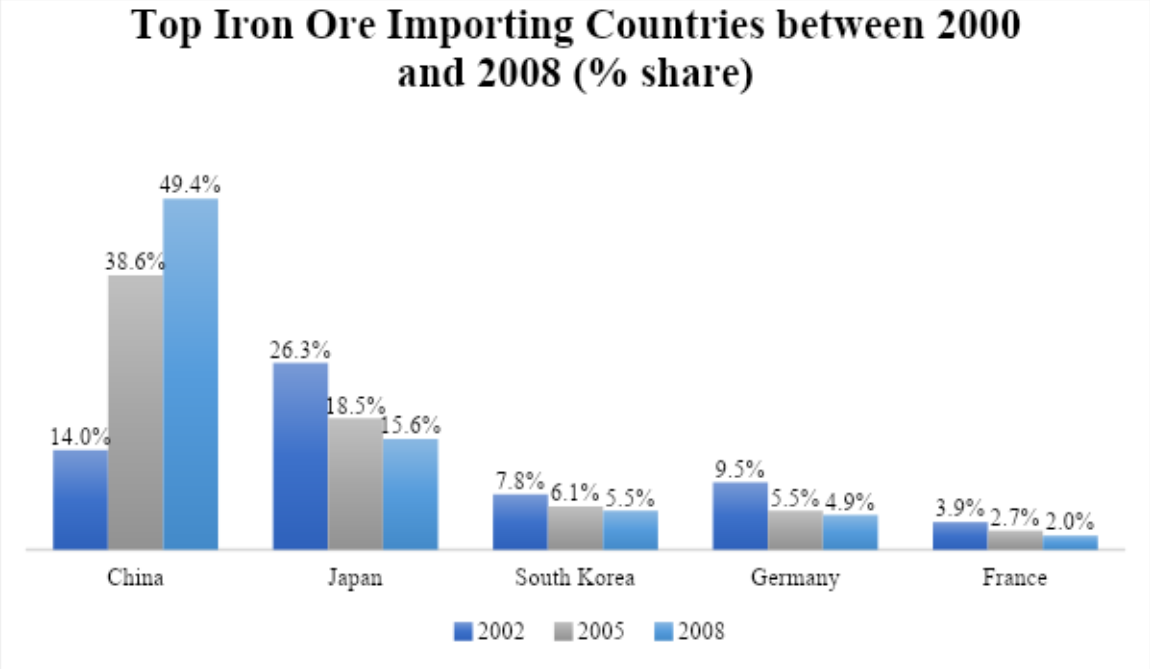
BRIEF TIMELINE OF EVENTS LEADING TO SUSPENSION OF MINING IN GOA



6.2 Although the challenge to the Abolition Act is still pending before the SC, the iron ore mining in Goa continued unhindered until 2012, when the Government of Goa suspended

mining on 10th September 2012, following a report by Justice MB Shah Commission highlighting illegal mining in Goa. Few days later, the Ministry of Environment and Forests also suspended the Environmental Clearances of all the mines in Goa. Until then, the production and exports of iron ore from Goa grew phenomenally due to the increasing demand from the Asian countries.

Figure 3: Top Iron Ore Importing Countries between 2000 and 2008



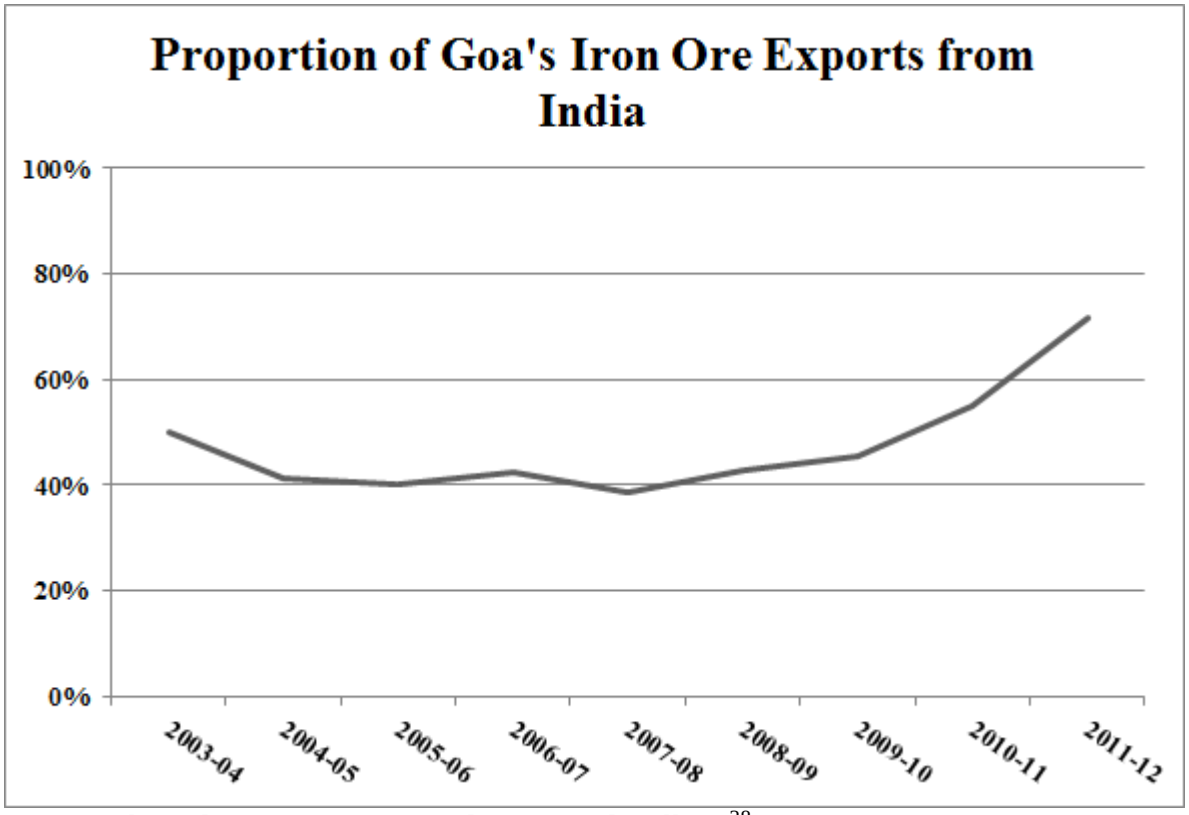
Source: United Nations, Trust Fund of Iron Ore, the Iron Ore Market, 2008-2010

6.3 Figure 3 illustrates the top iron ore importing countries in the world between 2000 and 2008 signifying the increased demand for iron ore in these jurisdictions. In 2005, India was the second largest exporter of iron ore to China after Australia and fulfilled about 25% of China's iron ore needs.[36] Within India's total exports to China, ore, slag and ash constituted about 51.26% of overall exports in 2005-2006.[37] Similarly, the proportion of Goa's iron ore exports from India has been consistently high as seen in Figure 4.

[36] Ou, Lingxiao. 2012. China's Influence on the World's Iron Ore Market – A Supply-Side Perspective. Department of Economics. University of California, Berkeley

[37] Singla, Surinder Kumar. 2015. An Analysis of India's Export Performance with China. Foreign Trade Review. 50(3) 219-230.

Figure 4: Proportion of Goa's Iron Ore Exports from India



Source: The Indian Iron Ore Conundrum, Metal Bulletin[38]

.

[38] https://www.metalbulletin.com/events/download.ashx/document/speaker/6565/a0ID000000X0jb3MAB/Presentation

7. Goa Foundation vs Union of India and Ors. (*Goa Foundation-I*)

7.1 Based on the findings of the Justice Shah Commission's Report, Goa Foundation filed a public interest litigation before the SC requesting directions to the Union and State Government to take steps for termination of mining leases involved in violation of applicable laws, against alleged illegal iron ore mining in Goa.

7.2 During the course of proceedings, the SC passed discrete orders. On 5th October 2012, while issuing notices to the respondents, the court directed the Central Empowered Committee (CEC)[39] to submit a report on the writ petition and suspended all mining operations including transportation of ore. Based on CEC's report, the apex court noted that as a consequence of the Abolition Act, on 23rd May 1987, the concessions were abolished and deemed as leases, and further extended up to 22nd November 1987. However, under the MMDR Act, the leases received first renewal of maximum 20 years, which expired on 22nd November 2007[40].

7.3 On 11th November 2013, the court ordered e-auction[41] of excavated mineral ores lying in different mines/stockyards/jetties/ports in the State of Goa, which is still ongoing. The state government recently completed the 25th round of e-auction, which was held on 24th March 2021.

7.4 The apex court also appointed an Expert Committee headed by Vishwanath Anand, former Secretary, MoEF, to conduct a macro Environmental Impact Assessment Study on the ceiling for annual excavation of iron ore using the principles of sustainable development and intergenerational equity. The Committee made an interim recommendation for an initial cap on annual excavation of 20 MT and in its final report recommended an annual cap of 30 MT, which could be increased to 37 MT with improvement in infrastructure. However, the SC in its final judgment directed an annual cap of 20 MT on iron ore production.

7.5 Importantly, senior advocate Ravi Shankar Prasad representing 33 panchayats noted that about 1.5 lakh people are directly employed in mining in Goa, wherein people have taken loans and purchased trucks for transportation of iron ore. Hence, if mining is completely prohibited, then the livelihood of people dependent on mining will be seriously affected. On this, the court clarified that it cannot prohibit mining altogether, but for mining to continue, the benefits must be extended beyond the lessees. As a result, the court directed that 10% of the sale proceeds of iron ore excavated in the state of Goa must be appropriated to Goan Iron Ore Permanent Fund for sustainable development and intergenerational equity.

7.6 On 21st April 2014, the SC ordered that all the mining leases in Goa expired on 22nd November 2007 and thus, all mining since then was illegal. The court also directed that the

---

[39] The CEC was formed by SC order dated 9th May, 2002 in WP No. 202/1995 titled T.N. Godavarman Thirumalpad vs Union of India and Ors. (in the matter of illegal timber operations in Nilgiris forest land) for monitoring of implementation of SC's orders and to place the non-compliance cases before it, including in respect of encroachment removals, implementation of working plans, compensatory afforestation, plantations and other conservation issues. http://cecindia.nic.in/about-us/

[40] The state government submitted before the apex court that it allowed operations of mines between 2007-2012 on deemed extension, but Goa Mining Policy 2013 disallowed deemed extension.

[41] The Court directed that the proceeds from e-auction sale of mineral ores, the mining leaseholders would be entitled to average cost of extraction, workers would be entitled to 50% wages and allowances and Mormugao Port Trust would be entitled to 50% storage charges. Of the remaining balance, about 10% to be appropriated to Goan Iron Ore Permanent Fund towards sustainable development and intergenerational equity and the remaining amount to be appropriated to the State.

state government can decide in what manner (fresh) mining leases are to be granted in the future, subject to judicial review by the SC.

Box 2: CUTS' Analysis of *Goa Foundation-I*

The mining companies were operating illegally from 2007 and 2012 as has been established by the SC. At the same time, the apex court also attempted to initiate mining operations afresh, understanding that livelihoods of many people were dependent on mining operations, and directing the state government to issue fresh mining leases. The failure of the state government machinery to judiciously manage the renewal process before 2007 and appropriately address several environmental concerns arising out of the mining operations, may have avoided the question of legality of mining operations and mitigate environmental concerns.

8. The Goa Foundation vs Sesa Sterlite Ltd. & Ors.[42] (*Goa Foundation-II*)

8.1 The ***Goa Foundation-II*** matter was a special leave petition filed by Goa Foundation against the judgment and order passed by the HC in *Lithoferro vs State of Goa*, 2015 (3) ABR 32, on 13th August 2014. Herein the HC directed the state government to grant second renewal to mining companies, which have paid the stamp duty citing the principle of promissory estoppel. While the state government cautioned that the SC judgment in ***Goa Foundation-I*** have directed them for fresh issuance of mining leases, the HC clarified that SC's judgment is not an impediment for the government to execute leases. **Moreover, the HC expanded the interpretation of the expression "fresh leases" to mean that renewal of lease is equivalent to fresh grant of leases.**

8.2 As a result, the state government formulated the Goa Grant of Mining Leases Policy 2014 (GGML) to comply with the HC order, which was approved by the Council of Ministers of Goa State on 1st October 2014, and placed on Goa's Directorate of Mines and Geology website on 4th November 2014.

8.3 The state government started renewals of mining leases from 5th November 2014 and completed the process on 12th January 2015. Around the same time, the Union cabinet approved an ordinance to amend MMDR Act on 5th January 2015, which would make the grant of mining leases mandatory only through competitive bidding or auction process. The Ordinance was promulgated by the President on 12th January 2015. This draft MMDR Amendment was also made public on the Ministry of Mines' website on 17th November 2014. Interestingly, between 5th January and 12th January 2015, the state government granted second renewals to 56 mining leases or 63% of the 88 mining leases that were renewed. After the renewals were granted, the state government gazetted the GGML on 20th January 2015[43].

Table 2: Details of 88 renewals granted by the state government

Sr. No	Date of renewal order	Number of orders passed
1	5.11.2014	5
2	6.11.2014	5
3	7.11.2014	3
4	10.12.2014	3
5	24.12.2014	10
6	1.1.2015	3
7	2.1.2015	3
8	5.1.2015	2
9	6.1.2015	22
10	9.1.2015	1
11	12.1.2015	31
	Total	**88**

Source: *Goa Foundation-II*

[42] (2018) 4 SCC 2183

[43] Government of Goa. 2015. The Goa Grant of Mining Leases Policy, 2014. Official Gazette. https://www.dmggoa.goa.gov.in/downloadfile.php?file=dXBsb2FkLzMwMy5wZGY%3D

8.4 On 7th February 2018, the SC clarified that the direction in ***Goa Foundation-I*** was clear, whereas the state government was required to grant **fresh** mining leases. Thus, the renewals are erroneous and are quashed. However, the apex court allowed the mining leaseholders to continue operations until 15th March 2018 and directed to stop all mining operations from 16th March 2018 until fresh mining leases are granted.

8.5 Although, in its commentary on whether the state government should have auctioned the mining leases, the apex court noted that although economic policy matters were hands-off for the courts, except "if such a policy does not serve common good in accordance to Article 39(b) of the Indian Constitution, violates Article 14 of the Constitution, and alienates natural resources to maximise profit of private entrepreneurs side-lining Article 39(b) of the Constitution".[44] To this end, the court must exercise restraint except it is constitutionally unavoidable, or else good governance will suffer.[45]

Box 3: CUTS' Analysis of *Goa Foundation-II*

Within GGML, the state government illustrated two choices – 1) implement SC judgment in ***Goa Foundation-I*** and grant fresh mining leases and 2) abide by the HC judgment (and its interpretation of ***Goa Foundation-I***) and grant second renewal. The state government chose not to challenge HC's order before the SC, to avoid delay in commencing the mining operations. At the same time, the state government erred to rush the renewals between 5th January and 12th January, without notifying the official policy, to avoid the Ordinance that would have made auction and competitive bidding mandatory for the grant of leases. The (mis)interpretation of ***Goa Foundation-I*** by the HC and state government's haste to expedite grant renewals (in contravention to ***Goa Foundation-I***) including no appeal against the HC judgment before granting renewals, so to avoid auction delays, are few of the key reasons that the mining operations are still in suspension. Moreover, the SC noted that about 38 out of 88 mining leases were not operational, thus making the renewal process for such leases futile.

A counterfactual here is that if the state government had challenged the HC judgment before the SC and auctioned the mining leases as per ***Goa Foundation-I***, the mining operations could have been active with policy certainty and judicial backing. Although the process would have delayed restarting the operations by a foreseeable extent, a definite resolution backed by the SC and transparent policy would have ensured that mining is allowed to operate in Goa. An endless suspension of mining activities and its adverse impact on the livelihoods of the mining dependents could have been avoided.

As far as SC's approach is concerned in ***Goa Foundation-II***, perhaps the apex court could have also directed the state government to lay down a time-bound action plan to restart mining in Goa facilitated by a committee consisting of experts in economics and other subject areas within a stipulated timeline. This could have avoided the economic impact on the many mining dependents due to the second suspension of mining activities in Goa. As observed in ***Goa Foundation-I***, it seems the SC forwent the decision making to the state government to decide and act as a matter of policy, subject to judicial review.

[44] Ibid

[45] Ibid

8.6 In January 2020, the SC in *Chowgule & Co vs Goa Foundation and Ors*[46], allowed the transportation of ore extracted before 16th March 2018, on which royalty was paid to the state government and directed that the transportation be completed within six months. However, due to national lockdown caused by the Covid-19 pandemic and delays by the statutory authorities in issuing permits for the transportation of ore, the SC in Chowgule and Company Private Limited vs Goa Foundation and Ors[47], granted extension to transport ore upto 31st January 2021.

[46] (2020) 12 SCC 56

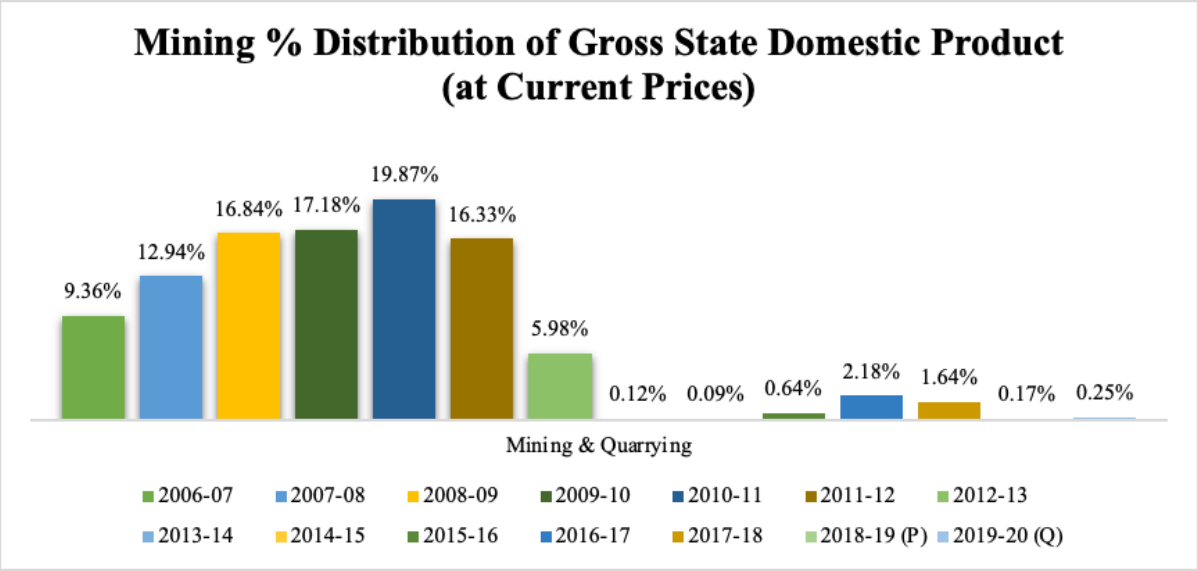
[47] 2020 (9-10) SCJ 544

9. Economic Impact Analysis

9.1 State of Economy

9.1.1 Mining and tourism have been the two primary and significant contributors to the Goa state's economy. In 2010-11, iron ore mining contributed almost 20% to the state's Gross State Domestic Product (GSDP), but has witnessed a decline since, due to the mining suspension. Although, after the iron ore mining restarted briefly in 2016, its contribution to the state's GSDP increased marginally, but declined again thereafter. The state of Goa also has manganese ore and bauxite as minerals of economic importance, but their contribution to the state's GSDP as compared to iron ore is low. Other than these major minerals, Goa also has minor minerals such as basalt, laterite stones and rubbles, river sand, murrum, etc.

Figure 5: Mining % of GSDP (at Current Prices)



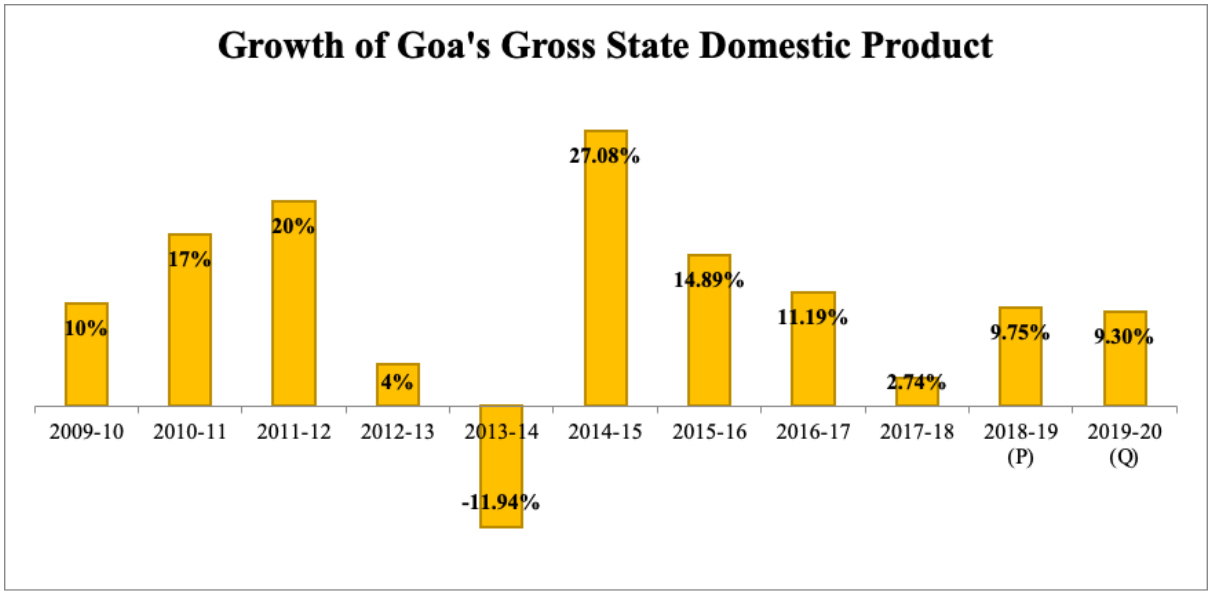
Source: Economic Survey, Government of Goa

9.1.2 Similarly, due to the mining suspension, even the state's GSDP has witnessed a decline, albeit the year 2014-15 was an outlier, but the GSDP for following years still witnessed a continuous decline. Naturally, even the sectoral (mining) growth rate of GSDP has witnessed a negative growth, except for years when the mining was restarted in the years 2015-17. In GGML, the state government has noted that the mining suspension has resulted in a revenue loss of more than Rs. 3000 crore to the state exchequer, which makes about 22% of the state revenues.[48] Similarly, the government noted that banks have more than Rs. 850 crore as loans or advances to service providers.[49]

[48] THE GOA GRANT OF MINING LEASES POLICY, 2014 ...https://www.dmggoa.goa.gov.in › downloadfile

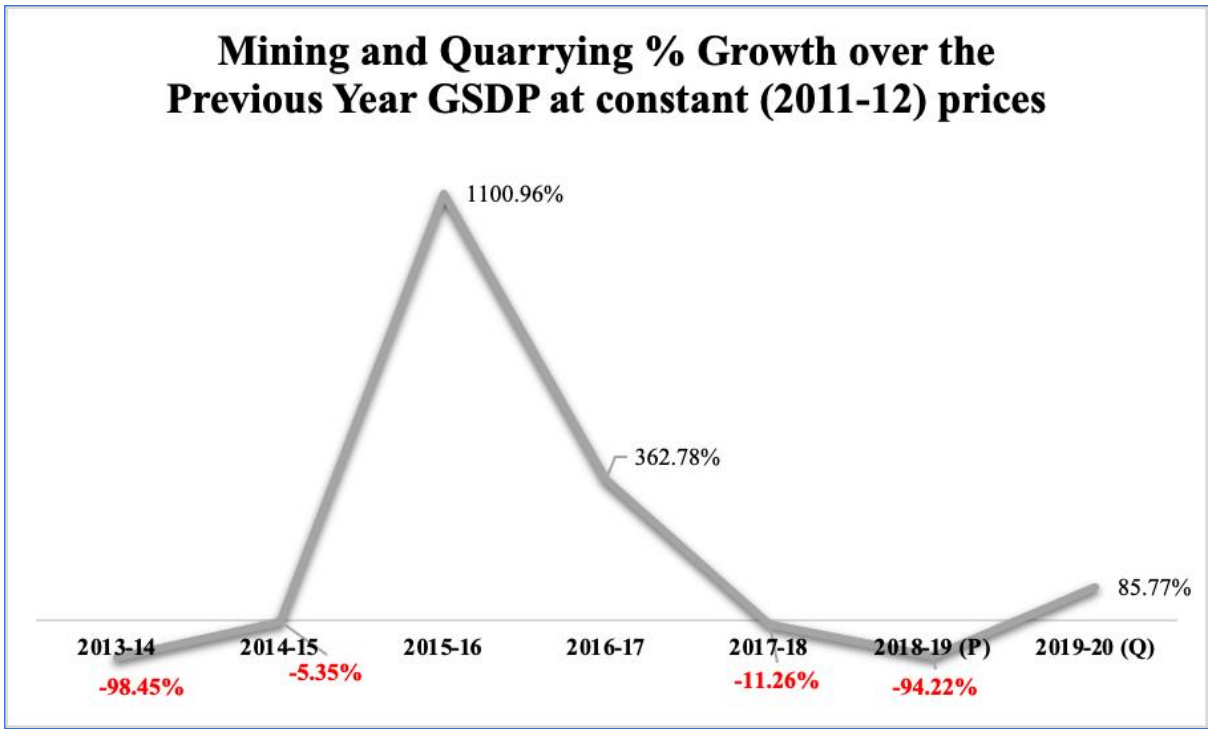
[49] THE GOA GRANT OF MINING LEASES POLICY, 2014 ...https://www.dmggoa.goa.gov.in › downloadfile

Figure 6: Growth of Goa's GSDP over the years



Source: Economic Survey, Government of Goa

Figure 7: Mining and Quarrying % Growth over the Previous Year GSDP at Constant Prices



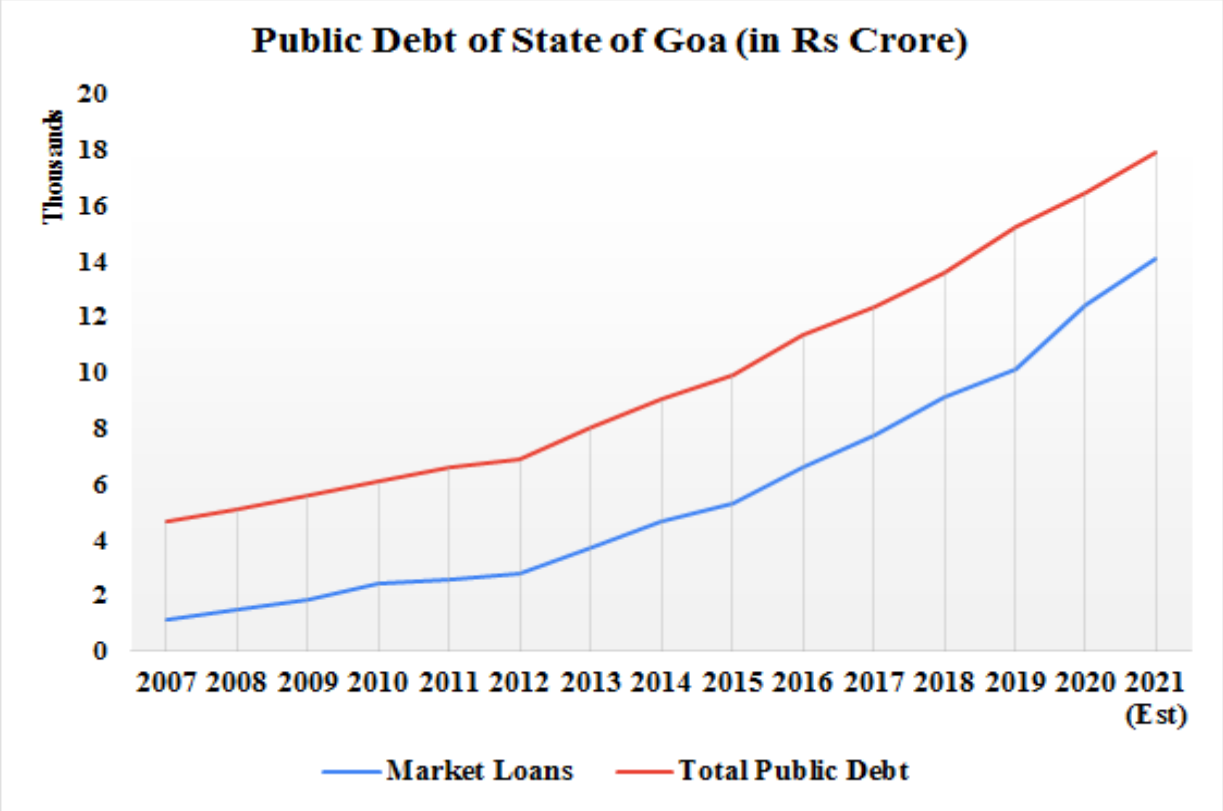
Source: Economic Survey, Government of Goa

9.1.3 As per the report by Indian School of Mines (ISM), Dhanbad, the state government submitted in its brief resume of arguments in ***Goa Foundation-I,*** that a direct loss to the state from mining suspension is Rs. 1400 crore, while the shortfall of Rs. 8000 crore to GSDP of the state on account of mining sector in 2013-14 (at nominal price, if mining operation were

conducted). Overall, the state government reported a total cumulative loss to the economy of the state at Rs. 32,000 crore.[50]

9.1.4 The state's public debt has been burgeoning consistently since the last few years, reportedly on account of lack of state revenues from mining, thus making the state to borrow increasingly from the market. As a matter of fact, the state government in GGML noted that the state earned substantially from mining, and since suspension, the state has been starved of funds to undertake infrastructural projects.[51] **The state public debt increased at a Compound Annual Growth Rate (CAGR) of 10.06%, while the market loans taken by the state increased at a CAGR of 19.93% from 2007 through 2021.**

Figure 8: Public Debt of State of Goa



Source: Economic Survey, Government of Goa

9.1.5 As a consequence of the mining suspension, service providers dependent on mining were negatively impacted. These service providers faced financial, business, and employment loss. To this end, in September 2014, the state government enacted a Debt Relief Scheme[52] for mining affected dependents, which borrowed capital towards purchase of Truck-tipper, Barge or Machines from banks and financial institutions. According to the Economic Survey 2020-21, the state government sanctioned about Rs. 108.42 crore and disbursed about Rs. 97.32 crore

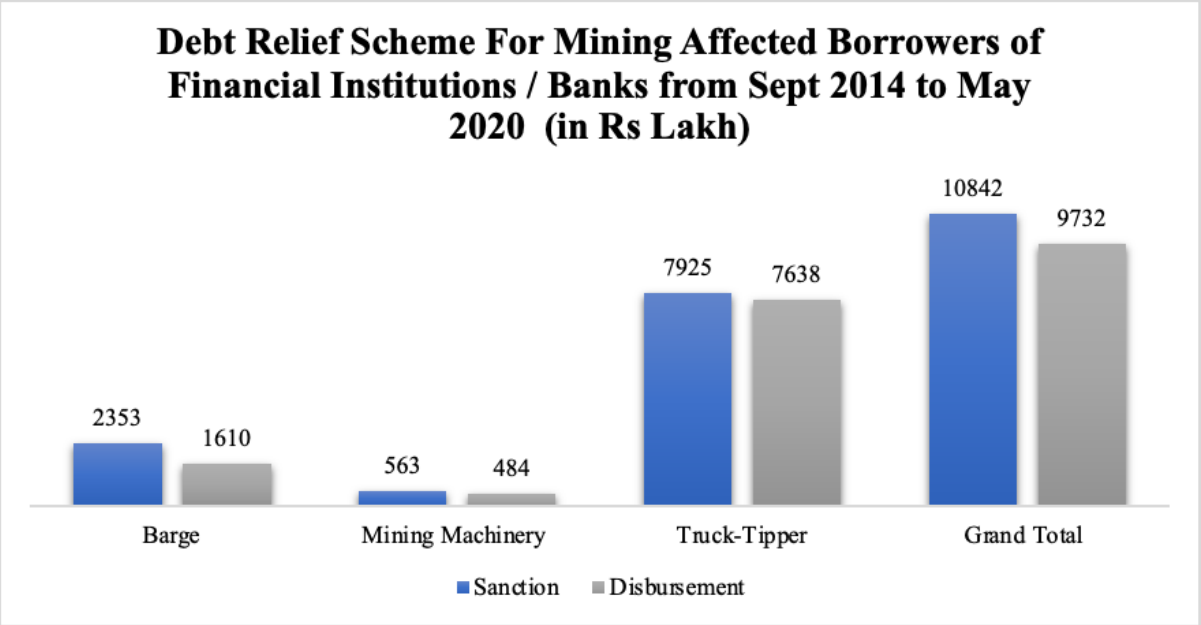
[50] Indian Institute of Technology (Indian School of Mines) Dhanbad. 2020. Study on Impacts of Stoppage of Mining in Goa on Socio-Economics.

[51] THE GOA GRANT OF MINING LEASES POLICY, 2014 ...https://www.dmggoa.goa.gov.in › downloadfile

[52] The subsidy under the scheme is limited to one borrower per family and restricted to maximum three truck-tippers/barges/machinery. The maximum subsidy that could be availed: Truck-tippers: Rs 15 lakh; Machinery: Rs 20 lakh: Barges: 35 lakh Debt Relief Scheme for mining affected borrowers ohttps://www.dmggoa.goa.gov.in › downloadfile

under the debt relief scheme from September 2014 to May 2020 to mining affected borrowers. According to ISM Dhanbad report, the banking sector in Goa consisting of private, public sector and co-operative banks had non-performing assets of about Rs. 440 crore, as a consquence of the mining ban.[53]

Figure 9: Amount Sanctioned and Disbursed to Mining Affected Borrowers under Debt Relief Scheme



Source: Economic Survey 2020-21, Government of Goa

9.2 Employment and Livelihood

9.2.1 The suspension of mining operations in Goa has caused loss of employment and livelihood for the people in Goa. Although there have been variances in the reports on the number of people affected due to mining suspension in Goa. According to the Federation of Indian Mineral Industries, the ratio of direct to indirect employment in the mining sector in India is 1:10, which means that for every direct job created, another 10 indirect jobs are generated along the supply chain (not necessarily limited to territorial jurisdiction). But for states, the ratio could be different - the employment multiplier in the mining sector in Gujarat is 1:3 and in West Bengal is 1:6.[54]

9.2.2 According to a union of mining dependents, as many as 60,000 people have been directly affected and 300,000 people have been indirectly affected due to mining suspension. The associations of the service providers and mining companies suggested a similar number during our interview consultations. According to a non-governmental organisation, unemployment from mining suspension is estimated at not more than 7000 people.[55]

9.2.3 The ISM Dhanbad study reported that loss of direct and indirect employment has affected around 250,000 households in Goa. Most importantly, mining provided an socio-economic

[53] Indian Institute of Technology (Indian School of Mines) Dhanbad. 2020. Study on Impacts of Stoppage of Mining in Goa on Socio-Economics.

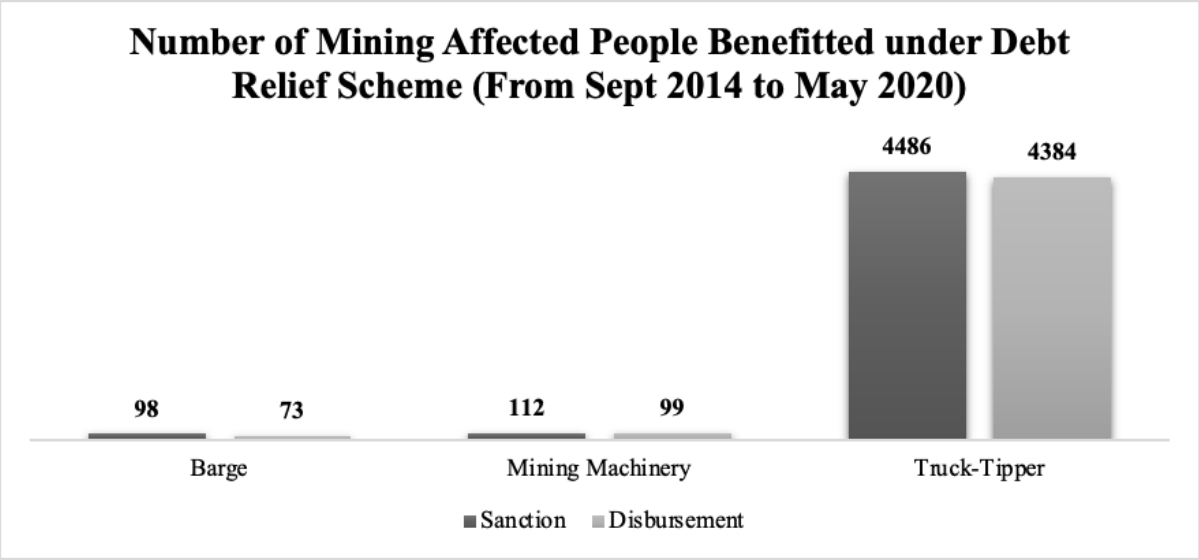
[54] Federation of Indian Mineral Industries. June 2019. Mining Matters for India.

[55] 8. Employment and Mining (Goa Foundation)

basis for the hinterland region in Goa, which do not benefit from tourism, as about seven talukas[56] out of the total 12 talukas are substantially dependent on mining. Similarly, a study conducted by Goa Livelihoods Forum, titled 'Goa Livelihoods Report 2020' noted a similar number of the direct and indirect impact of mining suspension on households and livelihood as was highlighted by the union of mining dependents. Also, the report highlighted that while the per capita income of Goa has reduced by half, the mining suspension has negatively impacted the income and savings by as much as 40% in most of the cases.[57] About 90% of the respondents (n=1360 respondents) in the study viewed the mining industry as favourable to bringing economic benefits, whereas about 59% of the respondents identified livelihood loss as one of the serious issues for the community. Most importantly, about 63% of the respondents noted that the incidences of domestic violence (coupled with alcohol abuse) have increased due to mining closure.

9.2.4 The report further highlighted that for the majority of respondents mining closure has negatively impacted overall economic health, rental income, commercial areas, business and services, cost of living, purchasing capacity, and employment opportunities. The mining suspension has not only affected the mining dependents in terms of income, but pervasively impacted the socio-economic fabric. During the key informant interviews, wife of a truck driver highlighted that the mining suspension led her husband to alcoholism with mental and health issues, while severely impacting their household income and livelihood.

Figure 10: Number of Mining Affected People Benefitted under Debt Relief Scheme



Source: Economic Survey 2020-21, Government of Goa

9.2.5 The state government in GGML noted that about 150,000 people are directly and indirectly dependent on mining.[58] Although, the Fifth Economic Census 2005 conducted by the Department of Statistics, Evaluation and Planning, Government of Goa, reported about

[56] Bicholim, Sattari, Dharbandora, Sanguem, Quepem and partly in Bardez and Mormugao (iron ore logistics) Indian Institute of Technology (Indian School of Mines) Dhanbad. 2020. Study on Impacts of Stoppage of Mining in Goa on Socio-Economics.

[57] Goa Livelihoods Forum. 2020. Goa Livelihoods Report 2020.

[58] THE GOA GRANT OF MINING LEASES POLICY, 2014 ...https://www.dmggoa.goa.gov.in › downloadfile

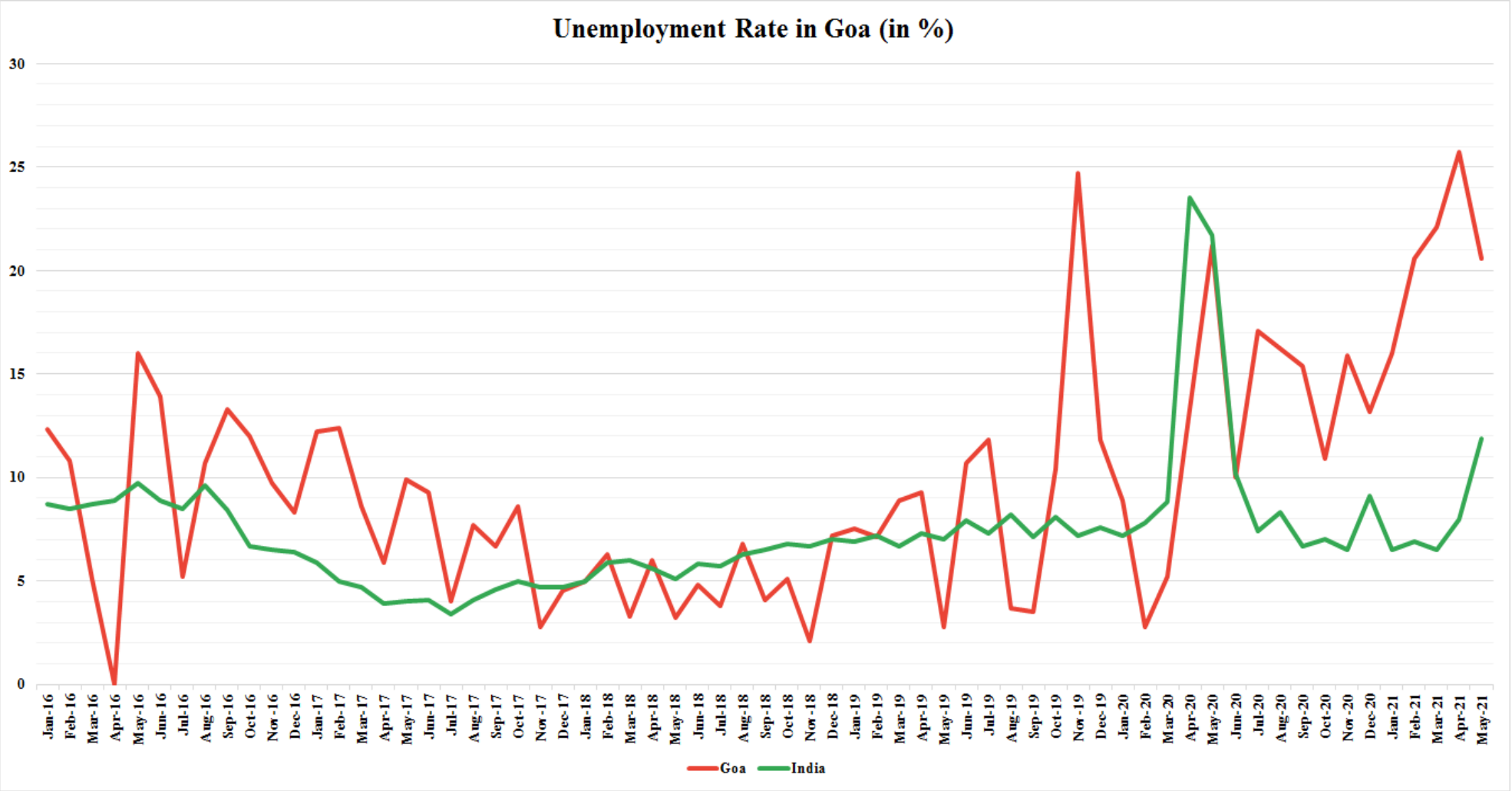
6573 mining employees[59], whereas the Sixth Economic Census, 2012-13 reported about employment of 2657 people, noting reduction of employment in mining due to the suspension.[60] As per the Economic Survey of the Government of Goa, under the state government's debt relief scheme for mining dependents who have outstanding loans, about 4486 truck owners, 98 barge owners, and 112 mining machine owners[61] have benefited from September 2014 until May 2020. Although the unemployment data by the Centre for Monitoring Indian Economy does not show a significant spike in unemployment around the period when mining was suspended after ***Goa Foundation-II*** (Figure 11). Although, clearly an actual and close estimate of the number of people directly or indirectly affected due to the mining suspension is still elusive but most studies and the state government in GGML have cited numbers that are substantive.

[59] https://www.goa.gov.in/wp-content/uploads/2016/05/goa-eco-census-report-2005.pdf

[60] http://www.goadpse.gov.in/Report%20on%206th%20Economic%20Census.pdf

[61] The machine owners provide different types of machineries towards the mining operations at mining sites such as wheel loaders that are used for loading iron ore, dumpers, dozers, excavators, crushers, screeners, etc.

Figure 11: Unemployment Rate in Goa

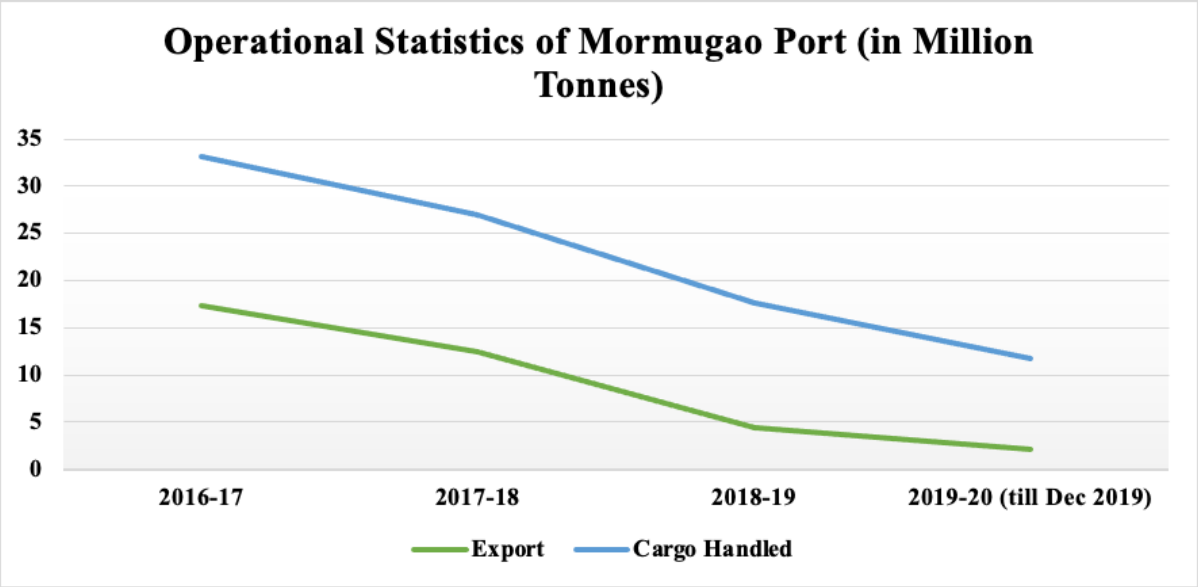


Source: Centre for Monitoring Indian Economy

9.3 Mormugao Port

9.3.1 As Goan iron ore is primarily exported to other countries by ships, the mining suspension has also impacted Mormugao Port and its cargo handling which contributed significantly to the revenues of the port.

Figure 12: Operational Statistics of Mormugao Port



Source: Economic Survey, Government of Goa

10. Review of Environmental Impact

10.1 In the previous sections, the analysis highlighted the historical context of iron ore mining in Goa including legislative and judicial timeline, approach taken by the judiciary, bureaucratic inefficiencies that led to the impasse, and economic impact analysis of mining for the state of Goa. While it is important to note the economic implications of mining, it is equally imperative to highlight the environmental concerns of such activities. Thus, it is most crucial to create a balance between the interests of development with environmental protection and sustainability, while ensuring intergenerational equity.

Figure 13: Open Cast Mine

Source: Wikimedia Commons

10.2 The mining in Goa is open cast, which requires removal of overburden and overlying formations of iron ore. It is reported that to produce a tonne of iron ore, about 2.3 tonnes of mining waste needs to be removed.[62] At large scale, about 15 MT of iron ore would produce about 40 MT of waste, thus creating a logistical storage concern as well as the source of environmental pollution.[63] Many studies have comprehensively highlighted the environmental and health impact of iron ore mining in Goa. According to the Goa Pollution Control Board, "the major environmental impact of mining operations are degradation of land, pollution of air, deforestation, loss of flora and fauna, rehabilitation of affected populations including tribals, and impact on historical monuments and religious places."[64] Another study by the state government's Goa Medical College highlighted that about 38.16% of the mining workers in Goa had hearing loss and 27.7% of workers had defective vision.[65]

10.3 It is pertinent to highlight that during the pendency of ***Goa Foundation-I***, the MoEF constituted an Expert Appraisal Committee (EAC) headed by Vishwanath Anand, a former Secretary at the MoEF. The EAC considered discrete reports prepared by Tata Energy Research Institute, International Development Research Centre, Pollution Control Board etc. In its report, the EAC observed that every proponent with environmental clearance has either violated EC conditions or the declarations were far from truth. The SC also noted that the state government and Goa Pollution Control Board failed in their duty to monitor and supervise adherence to the environmental clearance conditions by the mining companies. The EAC also noted that considering that the groundwater level is at the intersection of the mining operations, the groundwater would either deplete quickly or quality would deteriorate, if (safeguard)

62 https://www.dmggoa.goa.gov.in/miningarea.php

63 https://www.dmggoa.goa.gov.in/miningarea.php

64 http://goaspcb.gov.in/Media/Default/uploads/7)%20Strengthning1.pdf

65 Oliveira A, Cacodcar J, Motghare DD. 2014. Morbidity among iron ore mine workers in Goa. Indian J Public Health;58:57-60. https://www.ijph.in/temp/IndianJPublicHealth58157-561407_153540.pdf

measures are not undertaken.[66] It also noted that an increased iron ore production led to "massive negative impacts on all ecosystems, especially air, water and soil pollution affecting quality of life across Goa " as well as loss of ecological integrity.[67] This is because of enhanced levels of pollutants such as RSPM[68] and SPM[69], sedimentation of materials from iron ore dumps in rivers, estuaries, agricultural fields, etc. [70]

10.4 To ensure continuance of the mining operations, the SC in ***Goa Foundation-I*** set a cap of 20MT on the annual production of iron ore in Goa, based on the macro Environmental Impact Assessment Study done by the EAC on the ceiling for annual excavation of iron ore using the principles of sustainable development and intergenerational equity. While, on environmental grounds, Goa Foundation recommended a starting cap of 5 MT on the annual production with an option to increase or decrease the cap based on environmental reports.[71] They also stated that at these caps, mining can take place in one or two larger mines, concentrating operations in fewer areas and thus, reducing the overall environmental impact. Goa Foundation has also recommended that the money from the sale of minerals must be deposited into a Permanent Fund and distribute a Citizen's Dividend to the people of Goa from such fund to ensure Intergenerational Equity.[72] It is pertinent to note that the petitioner civil society group has come forward with a solution than to oppose mining blindly.

10.5 Another study titled 'Impact of Mining on Environment in Goa: A Review' argued that if mines are located in thick forest areas, removal of trees and vegetation would affect micro-climatic conditions, thus affecting flora and fauna.[73] Land degradation is a primary impact from mining facilitated by the mining waste. Similarly, mining causes depletion of groundwater and associated noise, air and water pollution. Particularly in Goa, mines are located in hillocks, and agricultural lands are located at foothills. During monsoon, the rain water carries large amounts of silt from hillocks into the agricultural lands and water bodies, reducing porosity of soil and affecting the crops.

---

66 Goa Foundation-I

67 Ibid

68 Respirable Suspended Particulate Matter

69 Suspended Particulate Matter

70 Goa Foundation-I

71 Goa Foundation Letter to Chief Minister of Goa dated 13 February 2019

72 Ibid

73 Nayak, G N. 1998. Impact of Mining on Environment in Goa: A Review. Environmental Geochemistry. (Vol 1, No. 2, pp.97-100). https://www.researchgate.net/publication/268805624_Impact_of_Mining_on_Environment_in_Goa_a_review

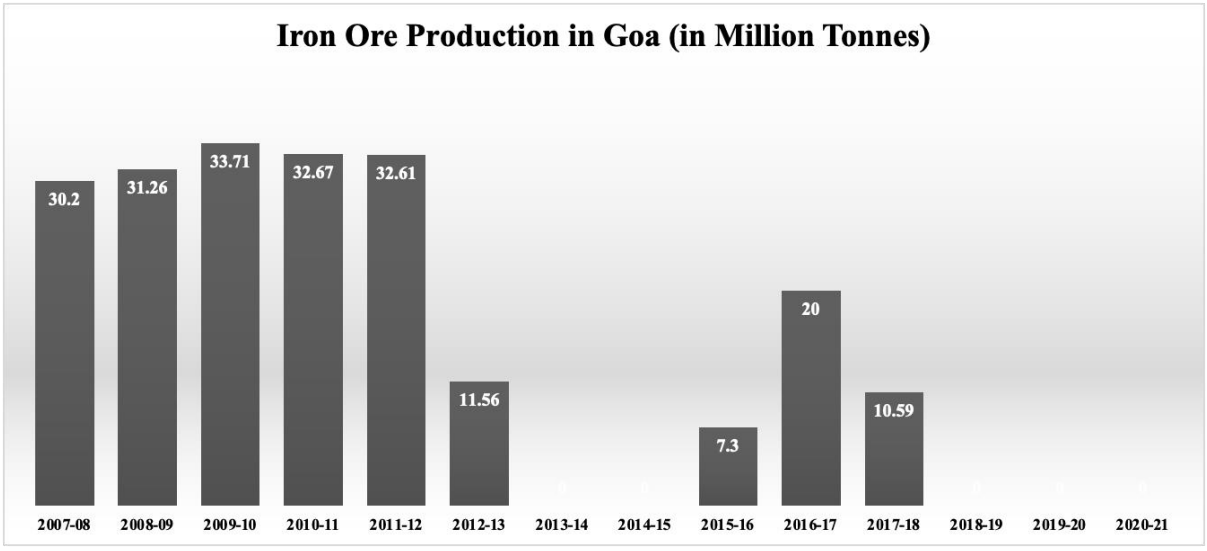
11. Primary Findings and Analysis

This section will further assess the economic impact of the mining suspension from the primary information and inputs received from key stakeholders. It is important to understand and highlight the key linkages between livelihood, economic activity and environment and balance them without disrupting or prioritising either one of them. The technical methodology, data tables, and assumptions made towards the estimations in this section are detailed in the Appendix.

11.1 Impact on State Revenues

11.1.1 The state government primarily earns revenue as Royalty from iron ore mining, while other sources include District Mineral Fund (30% of Royalty Paid), Goa Iron Ore Permanent Fund (10% on Average Sale Price) and State GST. The state earned a royalty of Rs. 2571.09 crore between financial years 2007-08 and 2012-13 and a royalty of Rs. 1128.38 crore between financial years 2015-16 and 2017-18 when mining was restarted after second renewals. **The total revenue[74] earned by the state government between financial years 2015-18 was Rs. 1128.38 crore, which declined by 79.51% to Rs. 231.23 crore between financial years 2018-21, a difference of Rs. 897.15 crore.[75]**

Figure 14: Iron Ore Production in Goa between 2007-08 and 2020-21



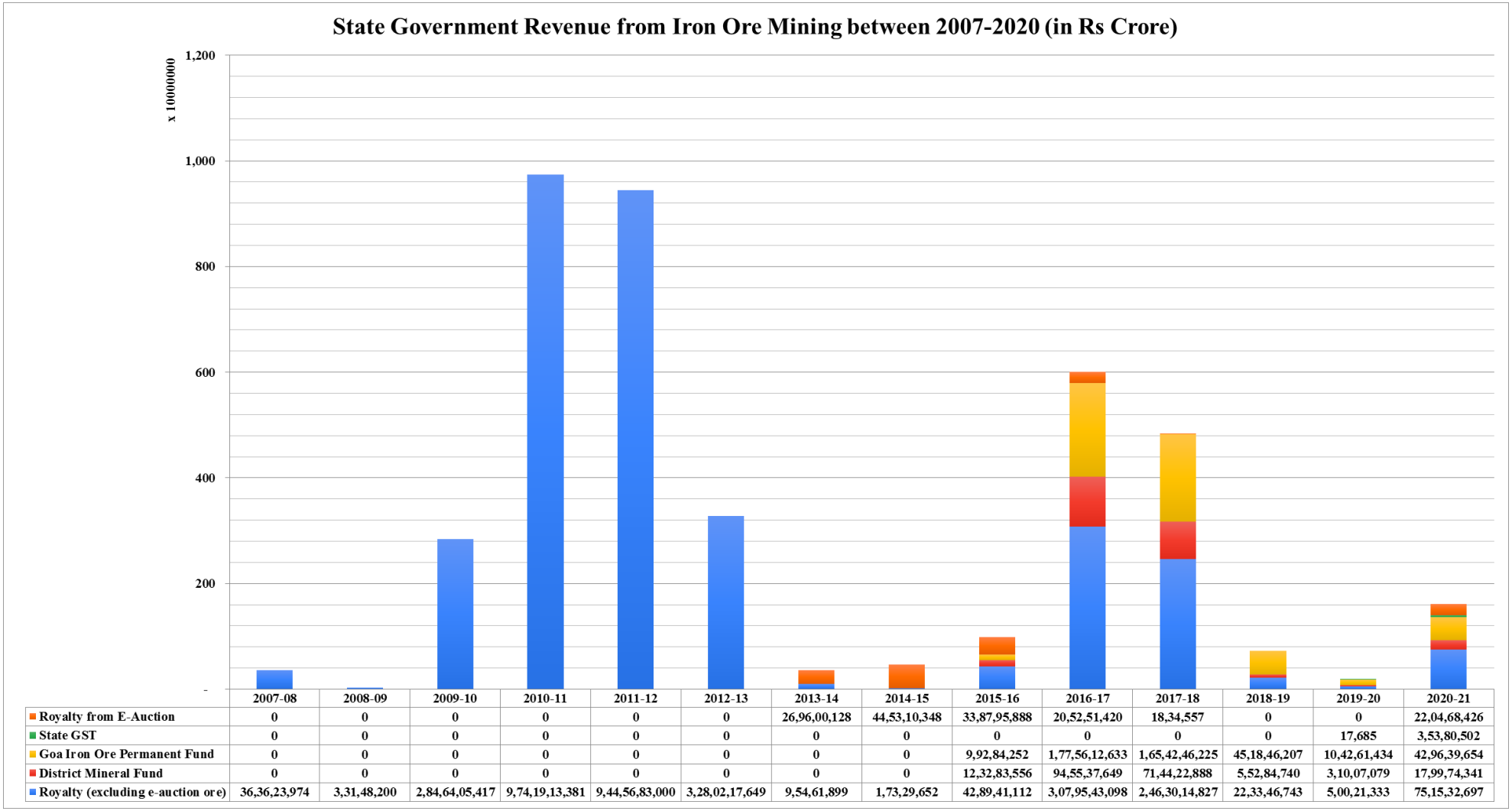
Source: Directorate of Mines and Geology, Government of Goa

11.1.2 The iron ore mining in Goa was at its peak in the years preceding through 2012-13. The state revenue from iron ore mining has been impacted due to the suspension of mining activities after 2012-13 until mining was restarted in 2015-16 and again thereafter in 2018-19, after mining was stopped yet again. The royalty earned by the state during financial years 2013-14 to 2020-21 was Rs. 1370.89 crore, a difference of Rs. 1200.2 crore compared to the royalty earned during the financial years 2007-08 and 2012-13. Even after the mining operations were restarted due to the second renewal of mining leases, the operations were limited as the SC in ***Goa Foundation-I*** had put a cap of 20 MT on the annual iron ore production in Goa.

[74] Royalty (excluding e-auction ore), District Mineral Fund, Goa Iron Ore Permanent Fund, State GST.

[75] See Annexure for more details.

Figure 15: State Government Revenue from Iron Ore Mining between 2007-2020 (in Rs. Crore)



	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Royalty from E-Auction	0	0	0	0	0	0	26,96,00,128	44,53,10,348	33,87,95,888	20,52,51,420	18,34,557	0	0	22,04,68,426
State GST	0	0	0	0	0	0	0	0	0	0	0	0	17,685	3,53,80,502
Goa Iron Ore Permanent Fund	0	0	0	0	0	0	0	0	9,92,84,252	1,77,56,12,633	1,65,42,46,225	45,18,46,207	10,42,61,434	42,96,39,654
District Mineral Fund	0	0	0	0	0	0	0	0	12,32,83,556	94,55,37,649	71,44,22,888	5,52,84,740	3,10,07,079	17,99,74,341
Royalty (excluding e-auction ore)	36,36,23,974	3,31,48,200	2,84,64,05,417	9,74,19,13,381	9,44,56,83,000	3,28,02,17,649	9,54,61,899	1,73,29,652	42,89,41,112	3,07,95,43,098	2,46,30,14,827	22,33,46,743	5,00,21,333	75,15,32,697

Source: Directorate of Mines and Geology, Government of Goa

11.1.3 During the key informant interviews, the government officials pointed out that iron ore mining in Goa contributed about 30% to the state's GSDP when it was at its peak in 2010-2011. Similarly, between 2007-2012, the iron ore exports from Goa were at its peak with approximate annual exports of 50 MT. Although the mining operations were suspended in 2012, the SC decision in ***Goa Foundation-I*** to e-auction mined ore (approximately 16 MT) lying at jetties and plots provided a negligible respite. The government has completed 25 rounds of e-auction and earned total revenue of Rs. 148.12 crore until October 2020 (24th round). The royalty earned from the 25th e-auction was under compilation during the writing of this report.

11.1.4 As a consequence of the mining ban in Goa, **the central and state revenues cumulatively suffered an estimated deficit of Rs. 668.39 crore in taxes paid by the mining companies, whereas the state revenues exclusively suffered an estimated deficit of Rs. 1821.32 crore**. The difference in deficit has been due to the Central GST that the mining companies paid even after the second ban. Specifically, after the first ban of mining in 2012, the central and state government realised a deficit of Rs. 1109.58, whereas after the second ban of the mining in 2018, the government cumulatively earned Rs. 441.19 crore in taxes paid by the mining companies in Goa.[76] However, for state government exclusively, after the first ban, the government realised a deficit of Rs. 1098.52 crore, whereas after the second ban, the government realised a deficit of Rs. 722.80 crore in taxes paid by all the mining companies in Goa.

11.1.5 During the key informant interviews, it was highlighted by a mining companies'assosciation that about USD 3.2 billion export trade opportunity has been lost with Australia and Brazil fulfilling the demand-supply gap, of which about 28% of the state revenue is forgone, equivalent of about Rs. 7000 crore.

11.2 Impact on Mining Companies

11.2.1 The mining companies were adversely impacted due to the suspension of mining operations. **As a consequence, the mining companies' revenues are estimated to have been impacted by Rs. 6976.71 crore between 2018-19 and 2020-21**.[77]

Table 3: Revenue Impact on Mining Companies

Time Period	Revenue Impact (in Rs. Crore)
2018-19	-2374.49
2019-20	-2276.65
2020-21	-2325.57
Total Estimated Impact on Revenue of Mining Companies	**-6976.71**

[76] See Annexure for more details

[77] See Annexure for more details

11.2.2 During the key informant interviews, an association of the mining companies highlighted that the companies have paid about Rs. 900 crore towards stamp duty to the state government and about Rs. 426 crore as fees for utilisation of land under the Land Revenue Code towards the second renewal of their mining leases. The association also highlighted that due to the mining suspension, the mining industry is witnessing an estimated impact of about USD 1.6 billion on annual revenue, of which about 28% (USD 448 million) is the estimated economic impact to the state exchequer.

11.2.3 As the Goan iron ore is uniquely low-grade, the suspension of mining has paved the way for Australia and Brazil to fulfill the demand. Considering the share of Goa's iron ore in the global market was already low, the mining companies expect an uncertain recovery in exports.

11.3 Impact on Service Providers

11.3.1 The mining suspension has adversely affected the service providers - barges, truck-tippers, and machinery owners. Barges transport iron ore from jetties through the river to the port. The truck-tipper transports the ore from the mines to jetties. The mining machineries such as wheel loaders, dumpers, dozers, excavators, crushers, screeners, etc. are used during excavation, loading, screening, and unloading of ore at the mines.

11.3.2 Barges: The mining suspension has affected the barge owners in terms of number of people employed with them, business loan liabilities, investments, sunk costs, and revenues. **As a consequence of the mining ban in 2018, the barge owners may have an estimated revenue impact of Rs. 193.50 crore within the Assessment Period.**[78] Similarly, an estimated 1998 barge workers may have been impacted due to the mining suspension in 2018.[79] The barge owners also indicated to have more than Rs. 300 crore loan liabilities, of which the repayment has been challenging for them.

11.3.3 In 2012, the association of barges had about 304 barges, out of which 224 barges had an iron ore carrying capacity of up to 2000 tonnes (big barge) and 80 barges had an iron ore carrying capacity of below 1000 tonnes (small barge). As of January 2021, the number of barges with the association members declined to 108 barges. The barge owners indicated that about 55 barges were scrapped, while some of the barges were sold at throwaway prices. A major mining company in Goa reported that it contractually engaged approximately an average of 90 barges before the first mining ban in 2012, which declined by about 63.3% to about an average of 33 barges before the second mining ban in 2018, a difference of 57 barges. Similarly, it was indicated that about 360 barges were approximately operating in 2011-12, before the first mining ban, which declined by 81% to only about 70 barges in after the second mining ban.

11.3.4 With no business opportunities available for the barge owners in Goa, about 20% of the barges from Goa were sent to Mumbai and Gujarat to reduce their losses by a certain extent. From the mining operations, the barge owners used to earn an annual revenue of Rs. 90 lakh per barge, while from the barges operating outside Goa, the barge owners annual revenue has been reduced to Rs. 65 lakh per barge. In a usual season of operations, which is from September to May, the barges would make a total of 123 trips at a price of Rs. 82 per tonne and earn a 10% profit margin.

[78] See Annexure for more details.

[79] See Annexure for more details.

Box 4: Barges

The purchasing costs of barges are found to be high. Between 2009-12, about 73 barges were purchased at an average price of Rs. 5-6 crore each and those owners still have an average loan liability of about Rs. 4 crore each. Similarly, the cost of maintenance and repairing barges was found to be very significant considering the volume of steel required and the associated cost of the steel in the market. Usually, on an average, Rs. 50 lakh are required to be spent per barge every three years on repair and maintenance, because of the wear and tear and depreciation in the steel used in barges, owing to its operations in the water. As per regulations, such depreciation is allowed only up to 20-30%. In 2015, after the second renewal of mining leases, about 70 barges spent about Rs. 40 lakh each on repairs and maintenance with the hope that mining would continue unhindered. Overall, members of the association of barge owners have a cumulative outstanding loan liability of Rs. 363 crore and mining suspension is adversely impacting them to sustain and survive.

11.3.5 Truck Owners: The truck owners in Goa have been impacted in terms of revenue, employment and outstanding loan liabilities. Numerous truck owner's associations are functioning in Goa, although the membership size of each association varies. There are two truck owner associations with a representative membership of 4823 truck owners and 3500 truck owners respectively. The membership data for these truck owners is from 2012, thus the cumulative truck owners in 2018 within these two associations are estimated at 5660 members[80]. A major mining company in Goa reported that they contractually engaged about an average of 3500 trucks before the first mining ban in 2012, which declined by about 41.6% to an average of 2044 trucks before the second mining ban in 2018, a difference of 1456 trucks. Similarly, it was indicated that about 12100 trucks were operating in Goa in 2011-12, which declined by 55% to about 5400 trucks in 2017-18 and further declined to 4800 trucks in 2020-21.

11.3.6 Usually, a truck is allowed to carry about 10 tonnes of iron ore. As a consequence of mining suspension, the number of trips made by the truck owners have been adversely reduced due to limited operations to transport ore. As compared to about 4-5 trips made by the trucks every day during active mining operations, the trips reduced to about 1-2 trips in a week towards the transportation of ore. However, the truck owners indicated that they had no business opportunities since the mining suspension. A truck owner of an association stated that each truck generated monthly revenue of Rs. 50,000, while the other association members mentioned that each truck provided them with Rs. 85,000 revenue each month, which has stopped due to suspension of mining operations**. Based on the inputs received during the key informant interviews, the truck owners had an estimated revenue loss of Rs. 609.28 crore in the assessment period.[81]**

11.3.7 Machine Owners: The mining machinery owners provide different types of machineries towards the mining operations at mining sites such as wheel loaders that are used for loading iron ore, dumpers, dozers, excavators, crushers, screeners, etc. The association of

[80] An assumption has been made in the data estimation that considering that iron ore production declined by 38% between 2012 and 2018, the number of members of the truck owners association may have been reduced to that extent. See Annexure for more details.

[81] See Annexure for more details

machine owners had about 254 members with an ownership of more than 600 machines. In 2018, the membership of association members declined to 145 members with a cumulative ownership of 260 machines. This reduction was due to the first suspension of mining in 2012 until 2015. As a consequence of the second suspension of mining in 2018, the number of association members further declined to 110 with a cumulative ownership of 220 machines. A major mining company in Goa reported that they contractually engaged about an average of 228 machines before the first mining ban, which declined by about 46.49% to an average of about 122 machines before the second mining ban, a difference of 106 machines. Similarly, it was indicated that more than 1500 machines were operating in Goa in 2011-12, which declined to about 360 machines in 2017-18 and further declined to about 140 machines in 2020-21. Consequently, the monthly revenue of the machine owners declined from Rs. 1,50,000 per month to Rs. 80,000 per month, as and when work is available. **Based on the inputs received during the key informant interviews, the machine owners had an estimated revenue loss of Rs. 40.45 crore in the Assessment Period.**[82]

Table 4: Estimated Impact on Revenue of Service Providers

Service Providers	Assessment Period (Rs. Crore)
Truck Owners	-609.28
Barge Owners	-193.50
Machine Owners	-40.45
Total Estimated Revenue Loss to Service Providers	**-843.23**

Source: CUTS' own calculation[83]

11.4 Impact on Employment and Livelihood

11.4.1 As a consequence of the mining suspension in 2018, estimated at about 10,108 workers employed with the service providers (barge owners, truck owners and machines owners) have been adversely impacted.[84] These workers are estimated to have lost their employment during the assessment period. Although almost all of these workers may have remained unemployed during the assessment period, a few of them may have found alternate employment as vegetable road-vendors, taxi drivers, waiters, security in private/commercial establishments, etc. **Moreover, about 4750 mineworkers are estimated to have been retrenched by the mining companies due to the mining suspension.**[85] Overall, estimated 14,858 workers (close to 68,347 people[86]) have been adversely affected, as a result of mining suspension.

11.4.2 As indicated by the service providers, their estimated salaries in alternate employment could be as much as 20-30% of the salary they were earning from working with the service providers. To give an example, a barge worker, male and aged 68 years, earned an estimated salary of about Rs. 50,000 per month. However, after the mining suspension, he found a job as

[82] See Annexure for more details

[83] See Annexure for more details

[84] See Annexure for more details

[85] See Annexure for more details

[86] Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.

a security guard with an estimated salary of about Rs. 7000 per month. His wife also started a job since mining suspension and she earns approximately Rs. 10,000 per month, making their total household income at Rs. 17,000 per month i.e. a significant drop of Rs. 33,000 per month or 66% reduction. Similarly, a truck driver had reportedly started driving for taxis and earning approximately Rs. 10,000 per month as compared to their average salary between Rs. 18,000 - 21,000 per month.

11.4.3 The estimated salary loss for each category of service providers is indicated in Table 5. Overall, the estimated salary loss to workers of service providers within Assessment Period is Rs. 385.56 crore.

Table 5: Estimated Impact on Salaries of Workers of Service Providers

Service Providers	Assessment Period (Rs. Crore)
Truck Drivers and Helpers	-190.74
Barge Workers	-173.65
Machines Operators and Helpers	-21.17
Total Estimated Salary Loss to Workers of Service Providers	**-385.56**

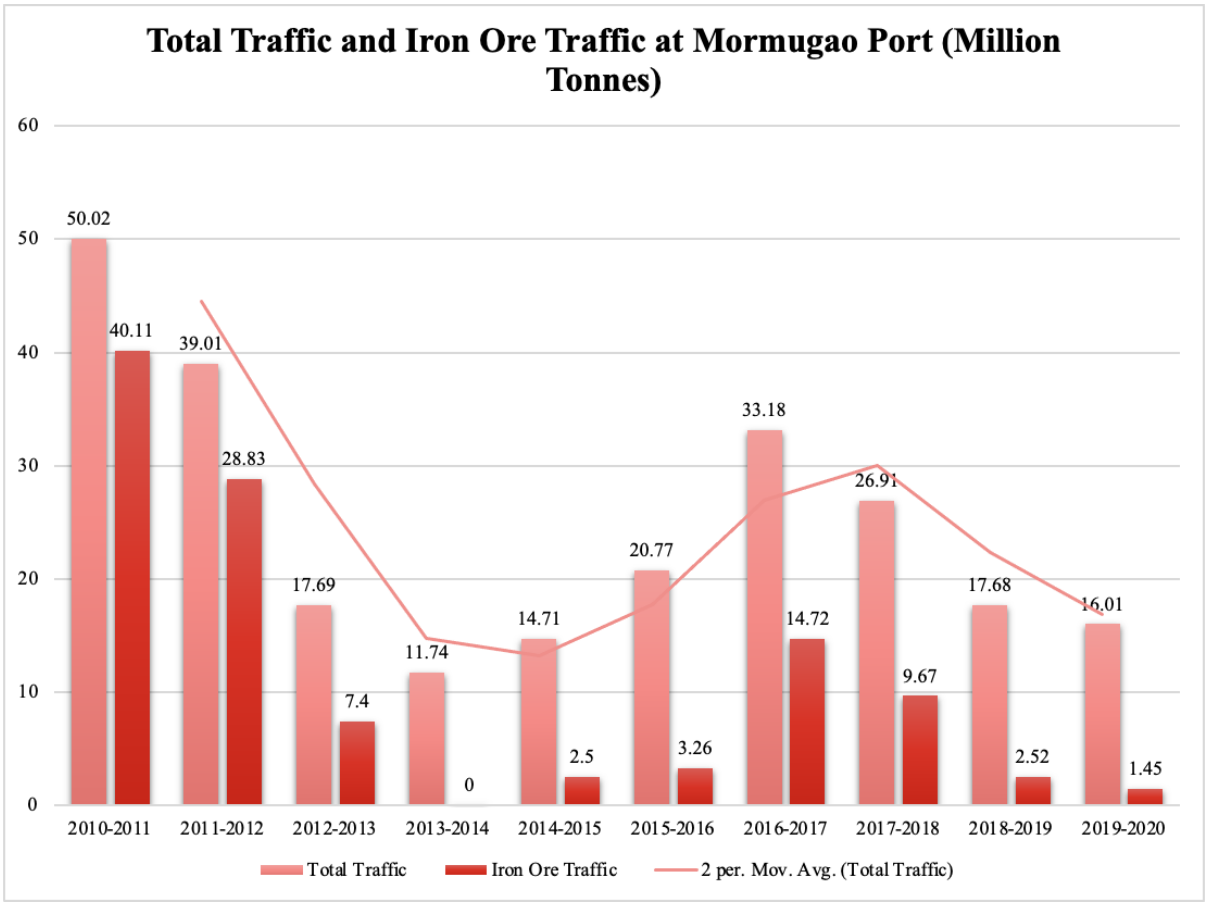
Source: CUTS' own calculation[87]

11.5 Impact on Mormugao Port:

11.5.1 The mining suspension adversely impacted the trade volumes of the Mormugao Port, including affecting its revenues from Cargo Handling and Port Charges. In 2010-11, the iron ore traffic was almost 80% of the total traffic volume at Mormugao Port, which declined significantly over the years. The average iron ore traffic volume between 2010-11 and 2019-20 was almost 33% of the total traffic volume at Mormugao Port.

[87] See Annexure for more details

Figure 16: Traffic at Mormugao Port

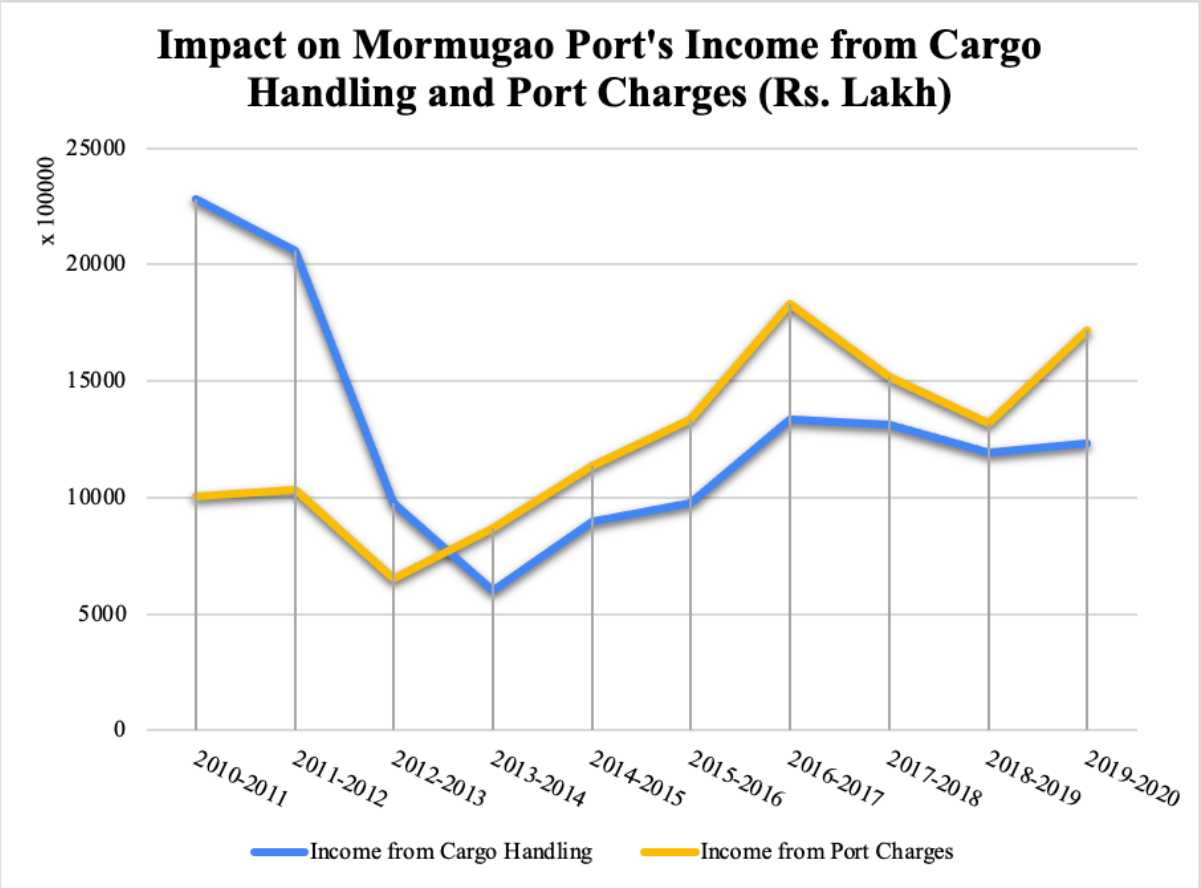


Source: Inputs received during Field Survey[88]

11.5.2 The average total traffic volume for years 2010-12 was 44.51 MT, while the average total traffic volume for years 2018-20 was 16.85 MT. Similarly, the average iron ore traffic for years 2010-12 was 34.47 MT, while the average iron ore traffic for years 2018-20 was 1.99 MT. Consequently, the decline in the traffic handled by Mormugao Port also impacted its revenue.

[88] See Annexure for more details.

Figure 17: Mormugao Port's Income from Cargo Handling and Port Charges



Source: Inputs received during Field Survey[89]

11.5.3 The Mormugao Port earned about Rs. 228.82 crore from Cargo Handling and Rs. 100.54 crore from Port Charges in 2010-11, which shrunk to Rs. 60.07 crore from Cargo Handling and Rs. 86.89 crore from Port Charges in 2013-14, a decline of about 73% and 13% respectively. Importantly, the revenue from Cargo Handling and Port Charges in 2017-18 declined by 2% and 17%, as compared to 2016-17. These revenue from Cargo Handling and Port Charges in 2018-19 further declined to 9% and 13% as compared to 2017-18. However, the revenue from Cargo Handling and Port Charges in 2019-20 increased by 4% and 31% as compared to 2018-19, possibly due to the transportation of ore that was allowed by the SC.

11.5.4 Consequently, due to mining suspension, a number of service providers such as Steamer Agents, Repair Workshops, Shipchandlers, Surveyors, Launch Owners, and Stevedores providing services at Mormugao Port have been adversely impacted. As per the inputs received, about 1161 workers were cumulatively engaged with the service providers at Mormugao Port in 2017-18, which are estimated to decline by 34.30%, to about 763 workers in 2018-19.[90] These 398 workers who are estimated to have lost their jobs due to mining suspension, are also estimated to have immediate adverse impact on their livelihood by about Rs. 7.51 crore.[91]

[89] See Annexure for more details

[90] See Annexure for more details

[91] See Annexure for more details

Box 5: Intergenerational Equity

Intergenerational Equity is a principle of distributive justice, which relates to the use of natural resources and generation of the past, present and future. The premise of this principle is to facilitate balanced use and need of natural resources in the present with that of subsequent generations.[92] This concept was first proposed in 1956 by the Club of Rome warning about resource depletion in the near future because of the rate at which mineral resources were being exploited. As a result, in 1987, the World Commission on Environment and Development (Brundtland Commission) submitted the definition of sustainable development to the United Nations as "to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."[93] The issue of sustainability has multiple dimensions - exclusive focus on environmental change; inclusive sustainable development stance of Brundtland Commission; technological innovation can ensure reduced ecological impact but ensure a growing economy; sustainable economy is shrinking, etc.[94]

The SC in ***Goa Foundation-I*** also recognised the importance of intergenerational equity and directed the state government of Goa to establish a permanent fund called Goa Mineral Iron Ore Permanent Fund for protection of intergenerational equity by reserving 10% of the sale proceeds from the e-auction and 10% of the future sale/export price of iron ore from Goa.[95] As per the scheme, the trust fund is restricted to be utilised for –

- Restoring ecology damaged by mining including tree plantation in mining affected Talukas;
- Desilting of water bodies including dams, rivers;
- Installation of pollution control devices, sewage treatment plants;
- Providing alternate employment for the people residing in Mining talukas used for transportation of minerals;
- Afforestation and soil conservation measures in the mining impact zone, etc.

As a matter of fact, the National Mineral Policy 2019 also recognises natural resources and minerals as shared inheritance with the state being the trustee on behalf of the people and to ensure that future generations receive the benefit of inheritance.[96]

An adversarial line of thought also argues that resource demand and economic price are the guiding force to ensure resource optimisation for the present and future generations, facilitated by scientific and technological advancements, which could enable cyclical use of waste into resources.[97] Thus, natural resource exploitation would not sustain, if there were no demand for such resources in the market.[98] Figure 18 illustrates that the production of iron ore in India as compared to the available iron ore resources in India seems low. Thus, the opportunities for increasing iron ore production in India appear to be substantive, while ensuring intergenerational equity.

92 Federation of Indian Mineral Industries. September 2020. Intergenerational Equity - A Bygone Concept

93 https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd

94 Ozkaynak, B. 2019. Environmental justice, climate justice, and the green economy. Handbook of Green Economics, 93–116.

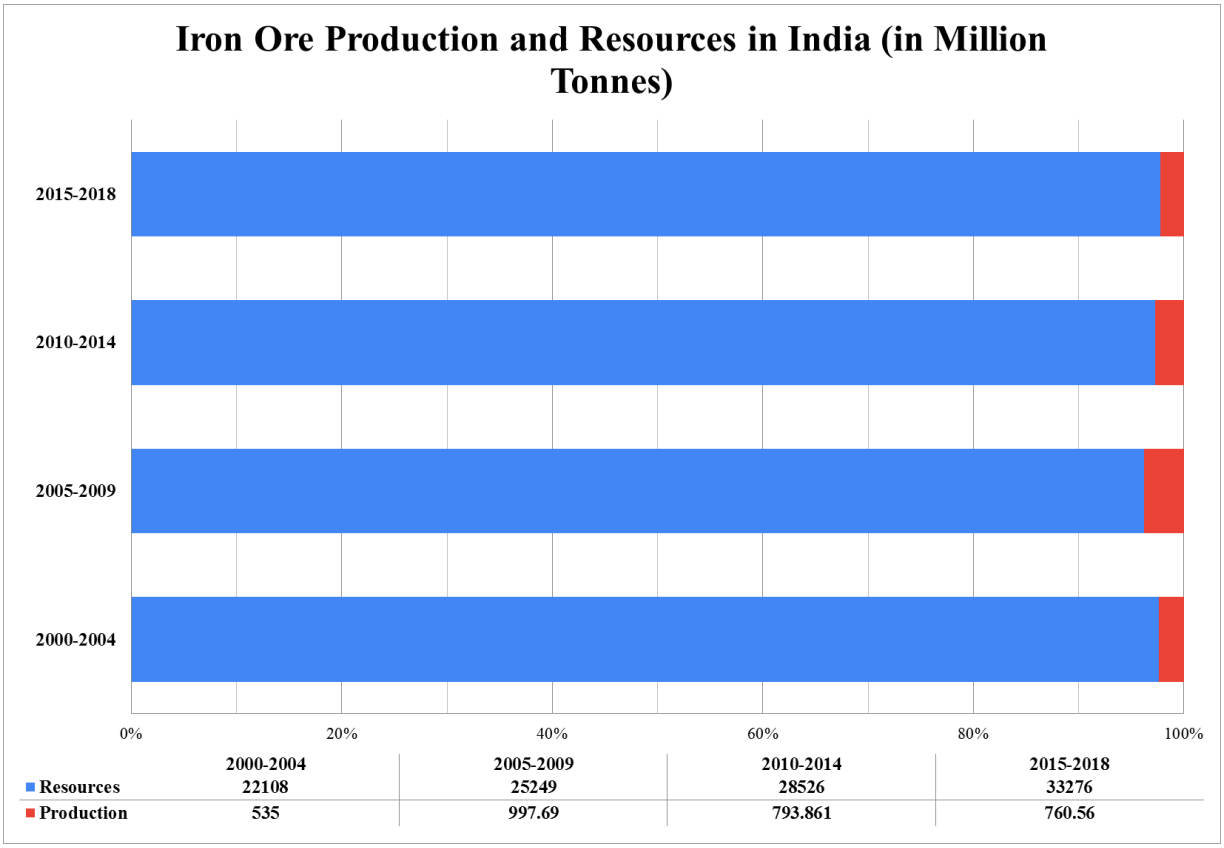
95 Goa Mineral Ore Permanent Fund Trust Scheme. https://www.dmggoa.goa.gov.in/downloadfile.php?file=VXBsb2Fkcy80MDkucGRm

96 https://www.mines.ap.gov.in/miningportal/Downloads/NewDocs/National%20Mineral%20Policy.pdf

97 Federation of Indian Mineral Industries. September 2020. Intergenerational Equity - A Bygone Concept

98 Ibid

Figure 18: Iron Ore Production and Resources in India



Source: Federation of Indian Mineral Industries

12. Conclusion

12.1 The overall issue of suspension of mining has many versions and the narrative evolves based on the category of stakeholder and its interest in the issue. However, certain facts remain undisputed. The iron ore mining in Goa has been a significant contributor to the state's revenue including its GSDP, which has been adversely affected due to the stoppage of mining operations. Moreover, because of repeated suspension of mining activities in Goa, a wide range of stakeholders has been adversely impacted without any future certainty. As a consequence of the mining ban in Goa, the central and state revenues cumulatively suffered an estimated deficit of Rs. 668.39 crore in taxes paid by the mining companies, whereas the state revenues exclusively suffered an estimated deficit of Rs. 1821.32 crore. The worst affected are the mining dependents as their livelihood and income have been severely impacted.

Table 6: Cumulative Economic Impact on Mining Companies and Service Providers

Parameter	Estimated Impact (in Rs. Crore)
Estimated Revenue Impact on Mining Companies	**-6976.71**
Estimated Revenue Impact on Service Providers	**-843.23**
Total Revenue Impact	**-7819.94**

Table 7: Impact on Workers of the Service Providers

Parameter	Estimated Impact (in Rs. Crore)
Total Estimated Salary Loss to Workers of Service Providers	**-385.56**

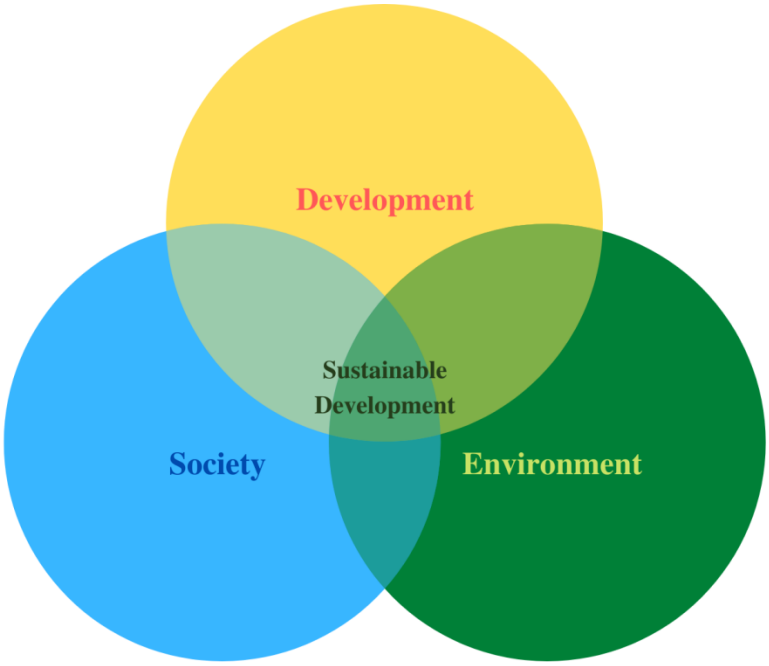
12.2 The whole issue and the various factors that led to the suspension of mining in Goa seems to be avoidable, had the state government acted judiciously to supervise and monitor the many environmental violations by some of the mining companies or timely acting to grant second renewals before 2007. It is also important to highlight that the SC in ***Goa Foundation-I*** matter noted the economic significance of mining for the many mining dependents and thus, allowed a fresh start with fresh mining leases to be issued as a matter of policy to be decided by the state government, but subject to judicial review.

12.3 On a petition by the mining companies before the HC, the court directed the state government to grant second renewals, expanding the interpretation of the ***Goa Foundation-I case*** that renewals are equivalent to fresh issuances. Before the HC and yet again in the GGML, the state government did present the correct interpretation of the SC in ***Goa Foundation-I case***. But the state government chose to not challenge HC's directions before the apex court and instead, followed the HC by granting second renewals comprising 88 mining leases, to avoid delay in restarting the mining operations. This was avoidable yet again and led the SC to annul the second renewals in ***Goa Foundation-II matter.***

12.4 Although considering SC's acknowledgement of socio-economic significance of mining in Goa, the apex court could have directed and overseen the state government to restart mining in Goa within a stipulated time and facilitated by a committee of subject experts including economists, environmentalists, etc. Although the SC forwent the decision of restarting mining to the state government to decide as a matter of policy. However, concerning the adverse impact of mining stoppage on many dependents, perhaps the apex court's intervention would have

been justified. Moreover, this approach by the SC could have been informed and made possible by a comprehensive ex-ante economic impact analysis of mining stoppage in Goa, initiated and supervised by the apex court itself. There are many such orders of the apex court to resolve public interest cases. As a public institution and constitutional body, the apex court has a crucial responsibility to ensure that the interests of the society, development and environment are balanced. That is how sustainable development is also judged.

Figure 19: Venn Diagram of Sustainable Development



Annexure: Detailed Methodology and Data Tables

1. Assessment Period:

1.1 The initial assessment period for the study was March 2018 to March 2020 = total 24 months. The final assessment period for the study is March 2018 to January 2021, as the mining continues to be in suspension and the field visit conducted in January 2021 provided additional inputs on the impact of iron ore mining suspension.

1.2 To note that from 16th March 2018, the mining operations in Goa have been in complete suspension until the 30th January 2020, when the SC allowed the transportation of ore to be completed within six months (upto July 2020). As a consequence of Covid-19 pandemic and national lockdown, the transportation of ore was also suspended. As a result, the SC extended the period for transportation of ore until the end of January 2021.

- Total period for the study is March 2018 to January 2020 = total 34 months
- Monsoon period of 04 months each in 2018, 2019 and 2020 to be excluded as no mining operations are carried out during these period = $3 \times 4\ months$ = 12 months
- Hence the final Assessment Period = $34\ months - 12\ months$ = 22 months

1.3 Thus, the assessment period constitutes 16 months of no mining operations and 6 months of limited operations towards the transportation of ore as per the SC directions.

2. Impact on State

Table 8: Revenue of the State Government from Mining between 2007-08 and 2020-21

Financial Year	Royalty (excluding e-auction ore)	District Mineral Fund	Goa Iron Ore Permanent Fund	State GST	Royalty from E-Auction	Total
2007-08	36,36,23,974	0	0	0	0	**36,36,23,974**
2008-09	3,31,48,200	0	0	0	0	**3,31,48,200**
2009-10	2,84,64,05,417	0	0	0	0	**2,84,64,05,417**
2010-11	9,74,19,13,381	0	0	0	0	**9,74,19,13,381**
2011-12	9,44,56,83,000	0	0	0	0	**9,44,56,83,000**
2012-13	3,28,02,17,649	0	0	0	0	**3,28,02,17,649**
2013-14	9,54,61,899	0	0	0	26,96,00,128	**36,50,62,027**
2014-15	1,73,29,652	0	0	0	44,53,10,348	**46,26,40,000**
2015-16	42,89,41,112	12,32,83,556	9,92,84,252	0	33,87,95,888	**99,03,04,808**
2016-17	3,07,95,43,098	94,55,37,649	1,77,56,12,633	0	20,52,51,420	**6,00,59,44,800**
2017-18	2,46,30,14,827	71,44,22,888	1,65,42,46,225	0	18,34,557	**4,83,35,18,497**
2018-19	22,33,46,743	5,52,84,740	45,18,46,207	0	0	**73,04,77,690**
2019-20	5,00,21,333	3,10,07,079	10,42,61,434	17,685		**8,53,07,531**
2020-21	75,15,32,697	17,99,74,341	42,96,39,654	3,53,80,502	22,04,68,426	**1,61,69,95,620**
Total	**32,82,01,82,982**	**2,04,95,10,253**	**4,51,48,90,405**	**3,53,98,187**	**1,48,12,60,767**	**40,90,12,42,594**

Source: Directorate of Mines and Geology, Government of Goa

Table 9: Status of e-auction in Goa

Round of e-auction	Date of e-auction	Quantity put for e-auction	Quantity of auctioned	Royalty earned by the State Government
1	17-02-2014	5,35,369	5,35,369	
2	05-03-2014	10,73,945	10,73,945	26,96,00,128
3	12-05-2014	5,07,049	5,07,049	
	19-08-2014			
	20-08-2014			
4	21-08-2014	21,42,880	19,09,115	
	06-11-2014			
5	07-11-2014	22,97,000	8,76,000	44,53,10,348
6	19-05-2015	9,99,710	4,39,930	
7	04-08-2015	10,44,786	55,450	
8	08-09-2015	9,23,140	2,11,670	
9	10-09-2015	13,80,980	3,46,970	
10	15-09-2015	12,43,740	1,78,610	
11	22-09-2015	11,19,870	4,17,290	
12	30-09-2015	15,26,980	1,86,400	
13	04-11-2015	13,50,130	2,05,690	
14	24-12-2015	23,77,220	11,72,760	33,87,95,888
15	27-04-2016	21,07,480	5,46,000	5,22,74,640
16	04-10-2016	16,98,634	11,40,860	
17	10-10-2016	20,02,400	1,57,370	
18	22-11-2016	20,37,890	5,91,650	15,29,76,780

Round of e-auction	Date of e-auction	Quantity put for e-auction	Quantity of auctioned	Royalty earned by the State Government
19	21-04-2017	21,59,905	1,86,250	17,22,057
20	04-05-2017	16,25,875	89,940	Lot submerged in water
21	05-05-2017	16,05,130	9,990	1,12,500
22	22-08-2019 23-08-2019	53,40,794	20,59,450	
23	27-05-2020	24,95,387	1,73,980	
24	11-10-2020	30,05,509	11,07,849	22,04,68,426
25	24-03-2021	42,81,149	10,39,530	Under Compilation

Source: Directorate of Mines and Geology, Government of Goa

Table 10: Taxes paid by a major mining company

Taxes (In Crores)		2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
State Government	**Royalty**	320.87	63.38	0	0	3.23	114.21	128.80	48.11	0	0
	District Mineral Fund	0	0	0	0	0.97	34.26	37.7	14.4	0	0
	Goa Iron Ore Permanent Fund	0	0	0	0	2.01	75.94	83.9	32.0	0	0
	Value Added Tax	5.92	6.05	4.90	7.17	6.42	4.84	1.06	0	0	0
	State GST	0	0	0	0	0	0	9.79	8.42	8.29	14.20
Central Government	**Export Duty**		0	0	0	0	0	0	0	0	0
	GST	0	0	0	0	0	0	205.95	342.55	279.75	233.31
	Central Sales Tax	12.14	13.55	10.47	11.35	13.89	18.74	3.90	0	0	0
	NMET	0	0	0	0	0.07	2.3	2.5	0.10	0	0

Source: Major Mining Company

Table 11: Iron ore production of a major mining company

Iron Ore Production (million tons)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Major Mining Company	12.1	3.0	0	0	4.8	9.6	54	0	0	0
All Goa *(Indicative)*	32.61	10.57	0	0	7.3	20	10.59	0	0	0

Source: Major Mining Company

Government's Revenue Deficit

Addition of all tax components paid by a major mining company before first ban for years 2011-12 and 2012-13 (A) = Rs. 421.91 crore

Addition of all tax components paid by a major mining company for years 2013-14 and 2014-15 (B) = Rs. 33.89 crore
Addition of all tax components paid by a major mining company before second ban for years 2015-16, 2016-17, 2017-18 (C) = Rs. 750.58 crore

Addition of all tax components paid by a major mining company for years 2018-19, 2019-20 and 2020-21 (D) = Rs. 981.03 crore

Revenue deficit from taxes paid by a major mining company after first ban = A – B = Rs. 388.02 crore

Revenue deficit from taxes paid by a major mining company after second ban = C – D = Rs. 230.55 crore

Towards total governmen revenue deficit from taxes paid by all the mining companies

Proportion of major mining company's iron ore production as compared to Goa's overall production before first ban = Major Mining Company's iron ore production in 2011-12 and 2012-13 / Goa's overall iron ore production in 2011-12 and 2012-13 = 34.97%

Total revenue deficit for central and state government from the taxes paid by all the mining companies due to first ban = Rs. 388.02 crore / 34.97% = **Rs. 1109.58 crore**

Proportion of major mining company's iron ore production as compared to Goa's overall production second ban = Major Mining Company's iron ore production in 2015-16, 2016-17 and 2017-18 / Goa's overall iron ore production in 2015-16, 2016-17 and 2017-18 = 52.26%

Total revenue deficit for central and state government from the taxes paid by all the mining companies due to second ban = Rs. 230.45 crore / 52.26% = **Rs. 441.19 crore**

Cumulative revenue deficit from taxed paid by all the mining companies due to both the mining bans = Rs. 1109.58 crore + Rs. (-441.19) crore = Rs. 668.39 crore

Total state revenue deficit from taxed paid by all the mining companies

Addition of state tax components paid by a major mining company before first ban for years 2011-12 and 2012-13 (A) = Rs. 396.22 crore

Addition of state tax components paid by a major mining company for years 2013-14 and 2014-15 (B) = Rs. 12.07 crore

Addition of state tax components paid by a major mining company before second ban for years 2015-16, 2016-17, 2017-18 (C) = Rs. 503.13 crore

Addition of state tax components paid by a major mining company for years 2018-19, 2019-20 and 2020-21 (D) = Rs. 125.42 crore

State revenue deficit from taxes paid by a major mining company after first ban = A – B = Rs. 384.15 crore

State revenue deficit from taxes paid by a major mining company after second ban = C – D = Rs. 377.71 crore

Towards total state revenue deficit from taxes paid by all the mining companies

Proportion of major mining company's iron ore production as compared to Goa's overall production before first ban = Major Mining Company's iron ore production in 2011-12 and 2012-13 / Goa's overall iron ore production in 2011-12 and 2012-13 = 34.97%

Total state revenue deficit from the taxes paid by all the mining companies due to first ban = Rs. 384.15 crore / 34.97% = **Rs. 1098.52 crore**

Proportion of major mining company's iron ore production as compared to Goa's overall production second ban = Major Mining Company's iron ore production in 2015-16, 2016-17 and 2017-18 / Goa's overall iron ore production in 2015-16, 2016-17 and 2017-18 = 52.26%

Total state revenue deficit from the taxes paid by all the mining companies due to second ban = Rs. 377.71 crore / 52.26% = **Rs. 772.80 crore**

Cumulative revenue deficit from taxed paid by all the mining companies due to both the mining bans = Rs. 1098.52 crore + Rs. 772.80 crore = **Rs. 1821.32 crore**

3. Impact on Mining Companies

Table 12: Data Inputs provided by a Major Mining Company

Year	Revenue (Rs. Crore)	Company's Iron Ore Production (Million Tonnes)	Total Iron Ore Production in Goa (Million Tonnes)	Cap on Iron Ore Production by SC
2017-18	1524.75	5.43	10.59	20
2018-19	307.23	0	0	20
2019-20	357.42	0	0	20

Table 13: Impact on Employment of Mining Companies

Parameter	White Collar Workers	Blue Collar Workers
Directly Associated (Mining Companies)	1,500	5,500
Ancillary Associated (Service Providers)	1,000	24,000

Table 14: Trucks, barges and machines contractually engaged by a Major Mining Company

Year	Trucks	Barges	Machines
2011-12	3800	90	228
2012-13	3200	90	228
2013-14	00	0	0
2014-15	0	0	0
2015-16	1100	16	55
2016-17	1800	32	142
2017-18	3231	50	170
2018-19	0	19	25
2019-20	2441	45	80
2020-21	2550	45	75

Source: Major Mining Company

Table 15: Indicative number of overall trucks, barges and machines operating in Goa

Year	Trucks	Barges	Machines
2011-12	12100	360	1500+
2012-13	12100	360	1500+
2013-14	0	0	0
2014-15	0	0	0
2015-16	1100	16	55+
2016-17	3200	50	360+
2017-18	5400	70	360+
2018-19	0	70	50+
2019-20	4200	70	140+
2020-21	4800	70	140+

Source: Major Mining Company

Based on the inputs received from a major mining company in Goa, it earned revenue of Rs. 1574.75 crore from its total iron ore production of 5.43 MT in 2017-18 out of the total iron ore production of 10.59 MT in Goa.

Hence, it is being assumed that the remaining 5.16MT $(10.59MT - 5.43MT)$ of ore in 2017-18 would have been produced by all the other mining companies in Goa.

$$Average\ Revenue\ in\ 2017-18\ per\ MT = Company's\ Revenue\ in\ 2017-18 \div Company's\ Iron\ Ore\ Production\ in\ 2017-19)$$

$$Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 = Company's\ Average\ Revenue\ in\ 2017-18\ per\ MT \times Total\ Iron\ Ore\ Production\ in\ Goa\ in\ 2017-2018$$

Thus, the total estimated revenue of the mining companies in 2017-18 = Rs. 2973.68 crore

3.1 Impact Estimation on Mining Companies

Towards calculating **the estimated revenue loss of mining companies in 2018-19**, an assumption has been made that all the mining companies had a decline in revenue as given in Table 10.

$\%\ of\ Revenue\ Loss\ in\ 2018-19 = (Company's\ Revenue\ in\ 2017-18 - Company's\ Revenue\ in\ 2018-19) \div Company's\ Revenue\ in\ 2017-18$ = 79.85%

$$Estimated\ Revenue\ Loss\ of\ Mining\ Companies\ in\ 2018-19 = Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 - (Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 - (Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 \times \%\ Revenue\ Loss\ in\ 2018-19))$$

Towards calculating **the estimated revenue loss of mining companies in 2019-20**, an assumption has been made that all the mining companies had a decline in revenue as given in Table 8 while keeping 2017-18 as the base year.

$\%\ of\ Revenue\ Loss\ in\ 2019-20 = (Revenue\ in\ 2017-18 - Revenue\ in\ 2019-20) \div Revenue\ in\ 2017-18 = 76.56\%$

$$Estimated\ Revenue\ Loss\ of\ Mining\ Companies\ in\ 2019-20 = Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 - (Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 - (Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 \times \%\ Revenue\ Loss\ in\ 2019-20))$$

Since information was not available from the mining company on 2020-21 and calculating **the estimated revenue loss of mining companies in 2020-21**, an assumption has been made that the estimated revenue loss in 2020-21 may be equal to the average of total estimated revenue of mining companies in 2018-19 and 2019-20.

Hence, the $Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2020-21 =$
$[(Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 -$
$(Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 \times$
$\%\ Revenue\ Loss\ in\ 2018-19)) +$
$(Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 -$
$(Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 \times$
$\%\ Revenue\ Loss\ in\ 2019-20))] \div 2$

$$Estimated\ Revenue\ Loss\ of\ Mining\ Companies\ in\ 2020-21 = Total\ Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2017-18 - Estimated\ Revenue\ of\ Mining\ Companies\ in\ 2020-21$$

3.2 Impact Estimation on Employees of Mining Companies

Based on the inputs received by a mining company, about **2000 (all) of their permanent employees were retained and paid salaries**; however, as per the mining company that provided inputs, **the mining industry retrenched about 95% of the mineworkers in Goa**.

Hence, the total estimated number of mine workers impacted due to the suspension of mining =

$$\big((Directly\ Associated\ White\ Collar\ Workers + Directly\ Associated\ Blue\ Collar\ Workers) - Number\ of\ permanent\ employees\ retained\ by\ the\ mining\ company\big) \times 95\%$$

= 4,750 workers

4. Impact on Service Providers

4.1 Truck Owners -

Table 16: Data Points from Truck Owners

Indicators	Association 1	Association 2
Membership	4823	3500
Average loan of members towards trucks	11.1 lakhs	11 lakhs
No. of trips when mining was operational	04 trips per day per truck	04 trips per day per truck
No. of trips towards the transportation of iron ore allowed until 31st January 2021	01 trip per two days per truck	No data provided
Revenue when mining was operational	Rs. 50,000 per month	Rs. 85,000 per month
Revenue from transportation of iron ore allowed until 31st January 2021	Rs. 30,000 per month	Rs. 50,000 - 60,000 per months (Average = 55,000 per month)
Difference in Revenue	Rs. 20,000 per month	Rs. 30,000 per month
Business/Activity during the suspension of mining	None	None
Salary of Drivers	Rs. 21,500 per month	Rs. 18,000 per month
Salary of Cleaners	No data provided	Rs. 8,000 per month

In 2012, the total members of truck owners association 1 and 2 = $4823\ (Truck\ Owners\ Association\ 1) + 3500\ (Truck\ Owners\ Association\ 2)$ = 8323 members.

Considering the number of members of truck owners in both the associations in 2018 was not known, estimation had been done to reduce the number of truck owner members in accordance with the decline in iron ore production between 2012 and 2018 i.e., by 38%.

Hence the cumulative number of member truck owners in 2018 for both the associations = $[4823 - (4823 \times 0.38)] + [3500 - (3500 \times 0.38)] = 2900 + 2170 = 5160\ members$ (rounded off)

While estimating the impact, an assumption has been made that each member in 2018 would own one truck. Hence number of trucks owned by the members of both the associations = 5160×1 = 5160 trucks.

An assumption is made that each truck requires one driver and one cleaner. Thus, the total number of estimated drivers and cleaners in 2018 is 5160 drivers and 5160 cleaners, respectively. Towards the transportation of ore, although the difference in revenue for truck owners is known, but information on the number of trucks engaged during the six month period, as directed by the SC, is not known.

An assumption is made that all trucks were operating at limited capacity and trips, and hence the consequent revenue from the transportation of ore during the limited operations period is reduced.

4.1.1 Impact Estimation on Truck Owners in Assessment Period:

$$
\begin{aligned}
&Estimated\ Revenue\ Impact\ of\ Association\ 1 \\
&\quad = [(Monthly\ Revenue\ per\ truck\ when\ mining\ was\ operational \\
&\quad \times Estimated\ number\ of\ trucks\ in\ 2018 \\
&\quad \times 16\ months\ no\ mining\ operations) \\
&\quad + (Difference\ in\ Revenue\ \times Estimated\ number\ of\ trucks\ in\ 2018 \\
&\quad \times 6\ months\ period\ of\ limited\ operations)
\end{aligned}
$$

$$
\begin{aligned}
&Estimated\ Revenue\ Impact\ of\ Association\ 2 \\
&\quad = [(Monthly\ Revenue\ per\ truck\ when\ mining\ was\ operational \\
&\quad \times Estimated\ number\ of\ trucks\ in\ 2018 \\
&\quad \times 16\ months\ of\ no\ mining\ operations) \\
&\quad + (Difference\ in\ Revenue\ \times Estimated\ number\ of\ trucks\ in\ 2018 \\
&\quad \times 6\ months\ of\ limited\ operations)
\end{aligned}
$$

$$
\begin{aligned}
&Total\ Estimated\ Revenue\ Impact\ of\ Truck\ Owners \\
&\quad = Estimated\ Revenue\ Impact\ of\ Association\ 1 \\
&\quad + Estimated\ Revenue\ Impact\ of\ Association\ 2
\end{aligned}
$$

4.2 Truck Drivers and Cleaners -

4.2.1 Impact Estimation on Welfare of Drivers and Cleaners in Assessment Period:

The estimated welfare impact of Association 1 does not include cleaners as data inputs were not provided by Association 1.

$$\begin{aligned} &Estimated\ Welfare\ Impact\ of\ Association\ 1\ Drivers \\ &= [(Driver's\ Monthly\ Salary\ \times Number\ of\ Drivers \\ &\times Assessment\ Period) \\ &- (Driver's\ Monthly\ Salary\ \times Number\ of\ Drivers \\ &\times period\ of\ limited\ operations)] \end{aligned}$$

$$\begin{aligned} &Estimated\ Welfare\ Impact\ of\ Association\ 2\ Drivers\ and\ Cleaners \\ &= [(Driver's\ Monthly\ Salary \\ &\times Number\ of\ Drivers\ x\ Assessment\ Period) \\ &- (Driver's\ Monthly\ Salary \\ &\times Number\ of\ Drivers\ x\ period\ of\ limited\ operations)] \\ &+ [(Cleaner's\ Monthly\ Salary \\ &\times Number\ of\ Drivers\ x\ Assessment\ Period) \\ &- (Cleaner's\ Monthly\ Salary \\ &\times Number\ of\ Drivers\ x\ period\ of\ limited\ operations)] \end{aligned}$$

$$\begin{aligned} &Total\ Estimated\ Welfare\ Impact \\ &= Estimated\ Welfare\ Impact\ of\ Association\ 1\ Drivers \\ &+ Estimated\ Welfare\ Impact\ of\ Association\ 2\ Drivers\ and\ Cleaners \end{aligned}$$

4.3 Barge Owners

Table 17: Data Points from Barges Owners

Indicators	2012	As of January 2021
Number of Barge Owners	131	58
Number of Barges with Association Members in Goa	304	108
Big Barges (Capacity up to 2000 tonnes)	224	80
Small Barges (Capacity below 1000 tonnes)	80	28
Number of Trips in a season	123	30
Transport Price per tonnage	Rs. 82	Rs. 94.55

Indicators	2012	As of January 2021
Annual revenue per barge when mining operations were active	Rs. 90 lakh (Profit earned was 10%)	
Annual revenue per barge of barges operating outside Goa	Rs. 65 lakh	
Number of workers required for a big barge	9 (1 master, 1 assistant master, 1 engine driver, 1 assistant engine driver, 5 sailors)	
Number of workers required for a small barge	6 (1 master, 1 assistant master, 1 engine driver, 1 assistant engine driver, 2 sailors)	
Number of shifts	2	
Number of workers retrenched in 2012	4788 workers	
Average salary of barge workers	Rs. 40,000 - 44,000 per month	

Total cumulative number of barges owned by the barge owners association in 2012 = 304 barges (224 big barges and 80 small barges)

Since the information received was for 2012 and information about the number of barges owned by the barge owners association in 2018 was not known, estimation had been done to adjust the number of barges for 2018 in accordance with the decline in iron ore production between 2012 and 2018 i.e., by 38%.

Hence the estimated number of barges owned by the barge owners association in 2018 = $304 - (304 \times 0.38)$ = 188 barges. Out of 188 barges, about 139 are estimated to be big barges and about 50 are estimated to be small barges.

As of January 2021, the barge owners informed that about 20% of the total barges are operating outside of Goa. Thus, an assumption has also been made that about 20% of the total barges were operating outside Goa before mining suspension in 2018, which carried on during the assessment period. Also, as of January 2021, towards the transportation of ore about 55 barges were operational. Based on the proportion of big and small barges in 2012, an estimation has been made to calculate the operational big and small barges in 2021. Operational big barges in 2021 $= 55 \times 0.75$ = 41 big barges Operational small barges in 2021 $= 55 \times 0.25$ = 14 small barges.

Additionally, the estimation for impact on barge owners does not include limited operations (transportation of ore) as information on revenue during this period was not available. Towards

calculating the impact on revenue of barge owners, the annual revenue from per barge in Goa has been standardised for per month, to calculate the estimated impact within the assessment period.

$$Standardised\ revenue\ per\ month\ for\ barges\ in\ Goa = (Annual\ Revenue\ from\ per\ Barge\ in\ Goa \div 12\ months)$$

$$Difference\ of\ Annual\ Revenue\ from\ per\ Barge\ outside\ Goa = Annual\ Revenue\ from\ per\ Barge\ in\ Goa - Annual\ Revenue\ from\ per\ Barge\ outside\ Goa$$

$$Standardised\ Difference\ of\ revenue\ per\ month\ from\ barges\ outside\ Goa = (Annual\ Revenue\ from\ per\ Barge\ outside\ Goa \div 12\ months)$$

4.3.1 Impact Estimation in Assessment Period

$$\begin{aligned} Impact\ on\ revenue &= [Standardised\ revenue\ from\ barges\ in\ Goa \\ &\times (Estimated\ Barges\ in\ 2018 \\ &- (Estimated\ Barges\ in\ 2018 \times 0.2)) \times 16\ months\ of\ no\ operations] \\ &+ [Standardised\ difference\ of\ revenue\ from\ barges\ outside\ Goa \\ &\times (Estimated\ Barges\ in\ 2018 \times 0.2) \times 16\ months\ of\ no\ operations] \end{aligned}$$

4.4 Barge Workers -

Total number of barge workers retrenched in 2012 = 4788 workers.

However, in 2012, for 304 barges, the estimated number of barge workers =

$$\begin{aligned} &[((Number\ of\ big\ barges \times Number\ of\ workers\ required\ for\ big\ barges\ per\ shift) \\ &+ (Number\ of\ small\ barges \\ &\times Number\ of\ workers\ required\ for\ small\ barges\ per\ shift)) \\ &\times Number\ of\ shifts] \end{aligned}$$

$$= \big((224\ big\ barges \times 9\ workers\ required\ for\ a\ big\ barge\ per\ shift) + (80\ small\ barges \times 6\ workers\ required\ for\ a\ small\ barge\ per\ shift)\big) \times 2\ shifts$$

=4992 workers.

Since there seems to be a difference in the estimated number of workers based on the number of barges in 2018 and the number of workers retreched in 2012, as shared by the barge owners, a percentage difference between the estimated number of workers based on number of the barges and retrenched workers in 2012 has been calculated to adjust this difference in the estimations = $4992 - 4788 = 204$ (4.09%).

An assumption has been made that the barges that were operating outside Goa did not employ workers from Goa. Similarly, even when the operations in 2012 was at its peak, a difference in the number of estimated and retrenched workers of 4.09% is seen. Thus, this difference is used to adjust the estimations for workers, throughout.

Based on the estimations done for the number of barges in 2018, the estimated number of barges workers in 2018 =

$$[((Estimated\ number\ of\ big\ barges\ in\ 2018 \times Number\ of\ workers\ required\ for\ big\ barges) + (Estimated\ number\ of\ small\ barges\ in\ 2018 \times Number\ of\ workers\ required\ for\ small\ barges))$$

= 2083 workers.

An assumption has been made here that the number of shifts may have been reduced from 02 shifts to 01 shifts as the iron ore production was capped at 20 MT by the SC. Consequently, it would have impacted the number of trips made by the barges towards the transportation of ore.

Adjusting the number of estimated workers in 2018 using the difference of workers retrenched vs estimated in 2012 = $2083 - (2083 \times 0.04)$ = 1998 workers

Towards the transportation of ore, $the\ total\ number\ of\ estimated\ workers =$
$[((Estimated\ number\ of\ big\ barges\ operational\ in\ 2021 \times Number\ of\ workers\ required\ for\ big\ barges) + (Estimated\ number\ of\ small\ barges\ operational\ in\ 2021 \times Number\ of\ workers\ required\ for\ small\ barges))]$ = 454 workers

Adjusting for the difference of 4.09% = $454 - (454 \times 4.09\%)$ = 435 workers

Total number of estimated workers towards the transporation of ore = 435 workers

The average salary of the workers has been calculated as = $(40000 + 44000) \div 2$ = Rs. 42,000 per month

4.4.1 Impact Estimation on Barge Workers in Assessment Period

$$Impact\ on\ livelihood\ of\ barge\ workers = (Number\ of\ estimated\ workers\ in\ 2018 \times Monthly\ Salary \times 22\ months\ of\ Assessment\ Period) - (Number\ of\ estimated\ workers\ towards\ the\ transportation\ of\ ore \times Monthly\ Salary \times 6\ months\ of\ limited\ operations)$$

4.5 Machine Owners

Table 18: Data Points from Machine Owners

Indicators	2012	2018	2021
Number of Members	254	145	110

Indicators	2012	2018	2021
Number of Machines	600	260	220
Machine in Operation	No data available		60
Monthly Average Revenue	Rs. 150,000 per month		Rs. 80,000 - Rs. 90,000 per month (towards limited transportation of iron ore) Average Revenue = Rs. 85,000 per month
Difference in Revenue			Rs. 65,000
Number of Operators (Estimated)	600	260	220
Operator Average Salary	Rs. 18,000 - 25,000 per month (Average = Rs. 21,500 per month)		
Number of Helpers (Estimated)	1200	520	440
Helper Average Salary	Rs. 8,000 - 10,000 per month (Average = Rs. 9,000 per month)		
Average Loan Liability	Rs. 20-25 crore as of January 2021		

The number of members of the association of machine owners and the mining machineries such as wheel loaders, dumpers, dozers, excavators, crushers, screeners, etc. owned by them have continuously declined over the years.

4.5.1 Impact Estimation in Assessment Period

$$
\begin{aligned}
&Impact\ on\ revenue \\
&\quad = [(Number\ of\ members\ in\ 2018 \times Monthly\ Average\ Revenue\ in\ 2018 \\
&\quad \times 16\ months\ of\ no\ operation) \\
&\quad + (Number\ of\ members\ in\ 2018 \times Difference\ in\ Monthly\ Revenue \\
&\quad \times 6\ months\ of\ limited\ operations)]
\end{aligned}
$$

4.6 Machine Operators and Helpers

Based on questions asked during key informant interviews, an assumption has been made that for each machine, one operator is required. Similarly, an assumption is made that for each machine about two helpers are needed. Also, if only 60 machines are operational towards the limited operations, the number of operators and helpers are estimated accordingly.

4.6.1 Impact Estimation in Assessment Period:

$$
\begin{aligned}
&Impact\ on\ livelihood\ of\ machine\ operators\ and\ helpers \\
&\quad = [(Number\ of\ machine\ operators\ in\ 2018\ \times monthly\ average\ salary \\
&\quad \times 22\ months\ of\ assessment\ period) \\
&\quad - (Number\ of\ operational\ machine\ operators\ in\ 2018\ \times average\ salary \\
&\quad \times 6\ months\ of\ limited\ operations)] \\
&\quad + [(Number\ of\ helpers\ in\ 2018\ \times average\ salary \\
&\quad \times 22\ months\ of\ assessment\ period) \\
&\quad - (number\ of\ operational\ helpers\ in\ 2018\ \times average\ salary \\
&\quad \times 6\ months\ of\ limited\ operations)]
\end{aligned}
$$

5. Impact on Mormugao Port

Table 19: Revenue of Mormugao Port from Cargo Handling and Port Charges

Time Period	Income from Cargo Handling (Rs.)	Income from Port Charges (Rs.)
2010-11	2,28,28,87,311	1,00,54,94,114
2011-12	2,05,68,75,460	1,03,10,55,811
2012-13	97,74,60,030	65,34,19,120
2013-14	60,07,56,238	86,89,23,569
2014-15	89,58,49,129	1,13,59,97,274
2015-16	97,60,99,167	1,33,59,97,274
2016-17	1,33,44,05,206	1,83,32,72,279
2017-18	1,31,30,21,032	1,51,96,95,859
2018-19	1,19,14,40,197	1,31,56,87,877
2019-20	1,23,33,61,172	1,71,89,98,468

Table 20: Data Tables on Service Providers at Mormugao Port

Steamer Agents			
Year	**Number**	**Employees**	**Salary**
2009-2010	65	1,000	12,00,00,000
2017-2018	40	500	6,00,00,000
Activity involved	Customs, immigration, port clearance of vessels, representing ship operator, meeting needs of vessel and crew.		
Agency/Manning/Technical attendance of floating cranes/transhippers			
Year	**Number of such cranes/transhippers**	**Employees**	**Salary**
2009-2010	10	200	15,20,00,000
2019-2020	6	120	6,32,00,000

Activity involved	Crewing of transhippers and floating cranes involved in iron ore operations.

Diving Companies				
Year	**Number**	**Employees**	**Salary**	**Turnover**
2009-2010	1	10	1,20,00,000	3,00,00,000
2017-2018	1	6	72,00,000	1,50,00,000
Activity involved	Providing divers for underwater hull cleaning of vessels, checking and underwater photography of hull, and cleaning of propellor.			

Shipchandling				
Year	**Number**	**Employees**	**Salary**	**Turnover**
2009-2010	28	250	90,00,000	10,00,00,000
2017-2018	10	90	32,40,000	3,00,00,000
Activity involved	Providing fresh fruit, vegetables, meat, supplies, stores to vessels			

Surveyors			
Year	**Number**	**Employees**	**Salary**
2009-2010	15	225	5,40,00,000
2017-2018	7	40	96,00,000
Activity involved	Professionals conducting draft survey to ascertain cargo loaded, TML survey to ascertain moisture in cargoes, damage surveys for insurance		

Laboratories			
Year	**Number**	**Employees**	**Salary**
2009-2010	7	120	4,32,00,000
2017-2018	4	30	1,08,00,000
Activity involved	To check grade of iron ore, to check moisture in iron ore		

Launch Owners			
Year	**Number**	**Employees**	**Salary**

2009-2010	35	300	7,20,00,000
2017-2018	35	75	1,50,00,000
Activity involved	Suppliers of engine fitted boats to transport crew and other persons to vessels loading at anchorage		
Custom house Agents			
Year	**Number**	**Employees**	
2009-2010	20	150	
2017-2018	14	50	
Activity involved	Engaged in filing of Shipping documents with Customs Authorities and other related activities under Customs Act		
Stevedores			
Year	**Number**	**Employees**	**Salary**
2009-2010	10	1000	15,00,00,000
2017-2018	5	250	5,00,00,000
Activity involved	Engaged in providing labour and machinery for loading vessels including crane operators, signallers and loading gear		

Table 21: Total and Iron Ore Traffic at Mormugao Port

Year	Total Traffic (in Million Tonnes)	Iron Ore Traffic (in Million Tonnes)
2010-2011	50.02	40.11
2011-2012	39.01	28.83
2012-2013	17.69	7.4
2013-2014	11.74	0
2014-2015	14.71	2.5
2015-2016	20.77	3.26
2016-2017	33.18	14.72
2017-2018	26.91	9.67
2018-2019	17.68	2.52
2019-2020	16.01	1.45

Considering that the data inputs were available only for 2009-10 and 2017-18, an assumption has been made to estimate the number of workers of service providers and their salary for 2018-19 based on the decline in total traffic at Mormugao Port between 2017-18 and 2018-19.

Hence, % decline in total traffic at Mormugao Port between 2017-18 and 2018-19 = $(Total\ Traffic\ in\ 2017-2018\ - Total\ Traffic\ in\ 2018-2019) \div Total\ Traffic\ in\ 2017-2018$ = $(26.91\ - 17.68) \div 26.91$ = 0.3430 or 34.30%

$Total\ number\ of\ workers\ of\ services\ providers\ at\ Mormugao\ Port\ in\ 2017-2018 =$
$Employees\ of\ Steamer\ Agent\ in\ 2017-18\ + Employees\ of\ Agency/Manning/$
$Technical\ attendance\ of\ floating\ cranes/transhippers\ in\ 2017-18 +$
$Employees\ of\ Diving\ Companies\ in\ 2017-18\ +$
$Employees\ of\ Shipchandling\ in\ 2017-18\ + Employees\ of\ Surveyors\ in\ 2017-18\ +$
$Employees\ of\ Laboratories\ in\ 2017-18\ + Employees\ of\ Launch\ Owners\ in\ 2017-$
$18\ + Employees\ of\ Custom\ house\ Agents\ in\ 2017-18\ +$
$Employees\ of\ Stevedores\ in\ 2017-18$
= 1161 workers

Estimated total number of workers of service providers at Mormugao Port in 2018-2019 = $Total\ Number\ of\ workers\ of\ service\ providers\ at\ Mormugao\ Port\ in\ 2017-2018\ -$ $(Total\ Number\ of\ workers\ of\ service\ providers\ at\ Mormugao\ Port\ in\ 2017-2018\ \times$ 34.30%)

= 763 workers (rounded off)

Estimated number of workers of service providers at Mormugao Port lost job = $Total\ number\ of\ workers\ of\ services\ providers\ at\ Mormugao\ Port\ in\ 2017-2018\ -$ $Estimated\ total\ number\ of\ workers\ of\ services\ providers\ at\ Mormugao\ Port\ in\ 2018-2019\ =\ 1161-763$ = 398 workers

These 398 workers are estimated to have loss employment due to mining suspension in 2018.

Total salary of workers of services providers at Mormugao Port in 2017-2018 = $Workers\ Total\ Salary\ of\ Steamer\ Agent\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Agency/Manning/Technical\ attendance\ of\ floating\ cranes/$
$transhippers\ in\ 2017-18\ + Workers\ Total\ Salary\ of\ Diving\ Companies\ in\ 2017-$
$18\ + Workers\ Total\ Salary\ of\ Shipchandling\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Surveyors\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Laboratories\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Launch\ Owners\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Custom\ house\ Agents\ in\ 2017-18\ +$
$Workers\ Total\ Salary\ of\ Stevedores\ in\ 2017-18$

= Rs. 21,90,40,000

Estimated salary of workers of service providers at Mormugao Port in 2018-2019 =

$$Total\ salary\ of\ workers\ of\ service\ providers\ at\ Mormugao\ Port\ in\ 2017-2018 - (Total\ salary\ of\ workers\ of\ service\ providers\ at\ Mormugao\ Port\ in\ 2017-2018 \times 34.30\%)$$

= Rs. 14,39,10,338

Estimated immediate loss of salary of workers of service providers at Mormugao Port = $Total\ salary\ of\ workers\ of\ services\ providers\ at\ Mormugao\ Port\ in\ 2017-2018 - Estimated\ salary\ of\ workers\ of\ services\ providers\ at\ Mormugao\ Port\ in\ 2018-2019 = Rs.21{,}90{,}40{,}000 - Rs.14{,}39{,}10{,}338$ = Rs. 7,51,29,662

Hanuman Laxman Aroskar vs. Union of India (Mopa Airport Case)

Table of Contents

List of Figures and Tables

Figures

Tables

Executive Summary

Background. In 2015, Government of Goa (GoG) received Environmental Clearance (EC) from the Union Ministry of Environment towards the development of a second international airport in Mopa, Goa, as the existing Dabolim airport in Goa was saturated. In 2017, the EC was first challenged before the National Green Tribunal (NGT) by Hanuman Laxman Aroskar and Federation of Rainbow Warriors, which was upheld by the tribunal in 2018. The petitioners then appealed to the Supreme Court (SC) against the NGT order. On 29 March 2019, SC suspended the EC, thereby the construction of Mopa airport, and ordered Expert Appraisal Committee (EAC) to revisit the environmental concerns that were highlighted by the apex court.

The key ground to the EC challenge was failure of GoG to disclose crucial facts in statutory Form-1. On this, Amitabh Kant, CEO of NITI Aayog remarked that SC is treating environment and economic development as binaries and stopping critically important projects such as Mopa airport can irreparably harm investor confidence and foreign investment. In April 2019, EAC revisited the recommendations and laid out additional environmental safeguards and conditions, which was accepted by SC on 16 January 2020 withdrawing the suspension from EC.

About the Study. This study was commissioned by NITI Aayog and adopted an evidence-based and bottom-up approach to objectively understand the economic impact of the stoppage of Mopa airport construction in Goa, if any, on its project cost and timeline including first-order impact on key stakeholders using primary and secondary research methodologies.

Impact on Project Cost and Time Overrun. Due to discrete judicial restraints on the construction of Mopa airport, remobilisation of resources, and Covid-19 pandemic delays, cost of the first phase of the airport increased from Rs. 1900 crore to Rs. 2615 crore, which is a 38% cost overrun. About 1500 workers who were engaged at the project site could have suffered immediate jobs loss due to the suspension of construction work. Due to such delays, GMR Goa International Airport Limited (GGIAL), project concessionaire, also received an extension of 634 days, postponing the commissioning of the first phase from September 2020 to August 2022, which is a time overrun of 21 months. The airport is scheduled to be operationalised on 15th August 2022.

Impact on Financial Dimensions. Under the concession agreement with GoG, GGIAL is required to maintain 70:30 debt to equity ratio towards financing the airport construction. For this, GGIAL secured a financial closure of Rs. 1330 crore of debt funding from Axis Bank, while the remaining Rs. 570 crore equity support was received from GMR Airport Limited (GAL), the holding company of GGIAL.

Due to cost overrun, the financial closure is estimated to increase up to Rs. 1830.5 crore, further expanding bank's exposure to the project. Similarly, GGIAL may need to increase equity support from GAL by about Rs. 215 crore. As per inputs received, the Engineering, Procurement and Construction contract value for Megawide Construction Corporation, the construction contractor for the project, may increase from Rs. 1377 crore to Rs. 1815 crore, which is a 32% increase in value due to price escalation of the relevant materials owing to the delay.

Recommendations and Conclusion. The delay in the construction of the Mopa airport and suspension of EC was avoidable had the GoG made all relevant and necessary disclosures in Form-1 as provided in Environmental Impact Assessment (EIA) Notification, 2006. Thus, it is imperative to fix accountability of agencies/officials involved in the EIA process. An accountable, transparent and effective governance structure would reduce such avoidable litigations.

During the EC appraisal process and judicial challenge, the EAC and NGT failed to discover the concealment of facts by GoG. The shortcomings/loopholes in the appraisal process had a cascading effect on the outcome, including wastage of time, resources and capital. Thus, EIA Notification 2006 must be implemented in letter and spirit and plug any loopholes. Similarly, it is important to review the role of EAC to ensure their ability to critically appraise environmental facets of the projects, while NGT must engage a critical review of merits.

Projects such as the Mopa airport involve numerous stakeholders and high capital with a potential of adverse economic impact. Thus, it is essential to record and address stakeholders concerns, if any, towards the project in a time bound manner. Most importantly, SC must institutionalise a screening mechanism to prioritise listing of cases with economic significance to ensure expedited adjudication and pre-empt avoidable delays and economic losses, as in the Mopa airport case.

1. Introduction

1.1 A proposal for a second airport at Goa was made by the Government of India (GoI) sometime in early 2000s since the existing Dabolim airport was overcrowded. In 2011, the Government of Goa (GoG) made an official application towards the Mopa International Airport to the Ministry of Environment, Forests and Climate Change (MoEFCC) for the grant of Environmental Clearance (EC). The EC for the Mopa airport was granted by MoEFCC in October 2015 after requisite approvals and numerous deliberations by its Expert Appraisal Committee.

1.2 The EC was first challenged in 2017 by the Federation of Rainbow Warriors (FRW) and Hanuman Laxman Aroskar before the Western Zonal Bench of the National Green Tribunal (NGT) to restrain cutting/felling of trees at the project site. This was referred to the Principal Bench of the NGT. The bench directed the GoG to seek permission from relevant authorities before trees are cut/fell. After the permission was received from the Deputy Conservator of Forests to cut/fell trees at the airport site, another appeal was filed against the permission before the Bombay High Court (HC). The HC directed the appeal before the Principal Conservator of Forests, which put conditions on the felling/cutting of trees and compensatory plantation. As a result, HC allowed identification of trees and referred the appeal back to NGT to adjudicate the matter. In August 2018, NGT allowed the cutting/felling of trees and upheld the EC.

1.3 In January 2019, an appeal was filed in the SC against the NGT order on the grounds that GoG failed to disclose crucial information in statutory Form-1 and hence, the EC is liable to be cancelled. As a result, the SC in its judgment dated 29th March 2019 suspended the EC of the Mopa Airport, thus stopping the construction of the Greenfield Airport by the concessionaire GMR Goa International Airport Limited (GGIAL). In the judgment, the SC also directed the Expert Appraisal Committee to revisit its recommendations and assess the environmental concerns as was highlighted by the apex court in its order. Some of the concerns highlighted by the SC include the need to preserve the biodiversity of the Western Ghats including wetlands. Furthermore, it also charged the State of Goa for not providing complete information on the existence of reserve forests that fall within 15 kms[99] radial distance of the proposed Mopa Airport as required under Form-1.

1.4 On the suspension of EC by the SC, Amitabh Kant, CEO of NITI Aayog remarked that the apex court is treating environment and economic development as binaries.[100] He further noted that stopping critically important projects such as Mopa airport, which has potential to enhance India's most popular tourism destination's capacity, could irreparably harm investor confidence and foreign investment.

1.5 In January 2020, the SC lifted the suspension on the EC after EAC deliberated on the environmental concerns as directed by the apex court and recommended additional environmental safeguards/conditions including zero carbon programmes as proposed by GGIAL during the construction and operations of the project. The apex court also directed the National Environmental Engineering Institute, Nagpur to oversee compliance of the conditions

[99] As per EIA Guidance Manual 2010, towards the environment impact assessment process "primary and secondary data have to be collected. Primary data includes study area with 10 kilometres radius from the Aerodrome Reference Point and covers one season other than the monsoon. Secondary data includes data collected within an aerial distance of 15 kilometres for the parameters which are specifically mentioned in column 9 (III) for Form-1 of the 2006 notification and covers one full year." Hanuman Laxman Aroskar vs. Union of India, (2019) 15 SCC 401

[100] https://economictimes.indiatimes.com/blogs/et-commentary/the-need-to-mope-about-mopa/

and recommendations laid out by the EAC. The construction work of the Mopa airport remained suspended from 29th March 2019 until 16th January 2020. As of October 2021, about 41.7% of the construction work had been completed. While the initial commissioning of the first phase of the airport was planned in September 2020, the same got postponed to August 2022. The airport is scheduled to be operationalised on 15th August 2022.

2. Objective

2.1 To understand the economic impact of the stoppage of Mopa airport construction, if any, on its project cost and timeline including first-order impact on key stakeholders.

3. Methodology

3.1 Approach: The study adopted an evidence-based and bottom-up approach to understand the economic impact, if any, due to stoppage of Mopa airport construction, on relevant stakeholders using primary and secondary research methodologies.

3.2 Secondary Research: The secondary research entailed a thorough and extensive review of existing literature including various industry and government reports, academic papers, news articles, and secondary data from relevant stakeholders. The following stakeholder mapping was done using extensive review of literature, including reports in news articles:

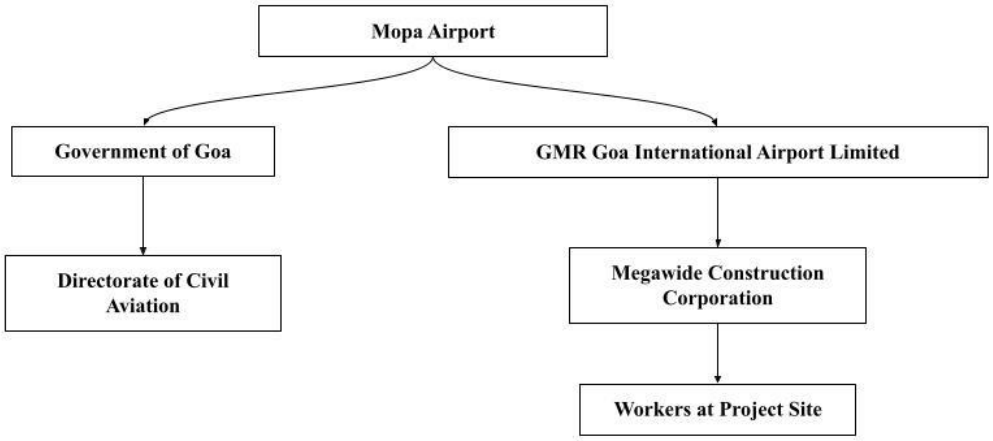


Table 22: Key Queries made to Stakeholders

Category	Key Queries
State of Goa	• Case History • Impact on Project Cost • Impact on Project Timeline • Impact on Concessionaire Agreement • Impact on Employment of Workers at Project Sites • Sunk Costs
GGIAL	• Impact on Project Cost • Impact on Employment and Salaries of Workers at Project Site • Impact on Financial Closure • Impact on EPC Contract • Impact on Project Timeline • Sunk Costs
MCC	• Impact on EPC Contract • Impact on Employment and Salaries of Workers at Project Site • Sunk Costs

3.3 Primary Research

3.3.1 The primary research involved interaction with relevant stakeholders through in-person interaction in Goa and telephonic calls. A multi-pronged outreach approach was adopted while contacting the stakeholders including appropriate follow-ups and reminders. To effectively leverage the interviews and seek relevant data and information across data points, semi-structured questionnaires were designed for all categories of stakeholders based on extensive literature review.

3.3.2 A semi-structured interview approach was adopted to seek relevant information towards the various identified data points from each category of stakeholder.

3.3.3 Informed consent was taken from the stakeholders before conducting the interviews. It was agreed in advance that their names, etc. would not be disclosed otherwise they might not have been forthcoming. To maintain the privacy of respondents and confidentiality of information, all the personal information of respondents are kept confidential. The collected data was anonymised and aggregated for analysis.

3.4 Scope

3.4.1 Considering the environmental clearance of the Mopa airport was suspended from March 2019 to January 2020, the scope of the assessment of impact is restricted to such a period.

However, the data inputs received also emphasise on the impact on the Mopa airport as a result of all judicial restraints including NGT's stay order on felling of trees, remobilisation of resources, Covid-19 pandemic etc.

3.5 Limitations and Assumptions

3.5.1 Due to Covid-19 pandemic and ensuring health safety protocols, the team could only meet a limited number of stakeholders during the field visit (18 January 2021 to 25 January 2021). This also resulted in delay in completion of the study.

3.5.2 The data estimations on impact are limited to the accuracy of responses by such stakeholders.

3.5.3 A few stakeholders such as the GGIAL declined to cooperate towards the information request under the study, even after repeated follow-ups, assurances and reminders. Thus, any such information for those stakeholders have been referenced to secondary sources.

4. Need for Second Airport in Goa

4.1 As per the August 2005 Feasibility Study by the International Civil Aviation Organisation (ICAO), the current Dabolim airport in Goa faces considerable constraints to expansion to meet the increasing economic and tourism needs of the state. The business and residential development around the airport is restricted as the ramp area is limited to approximately five airplanes with insufficient space for taxi and shuttle bus parking, no overnight parking for aircrafts, etc.[101] Similarly, Dabolim is closed to commercial traffic between 0830 to 1230 and 1530 to 1630 hours on weekdays. Along with this, with increasing tourism potential, Dabolim also has limited scope for expansion due to limited land availability. As a result, the report highlighted that to cater to the demand and limited capacity of Dabolim airport, development of an entirely new airport could be the only practical solution.

4.2 Since the Dabolim airport was saturated in terms of annual air traffic, the Government of Goa, sometime in the late 90s, initiated a process to commission studies[102] for a second international airport in Goa. The Dabolim airport is already catering to traffic of about 8.57 million passengers per annum (MPPA), which is reported to be its peak capacity. On 1st May 2000, the GoI approved setting up of a second international airport at Mopa in Goa and noted that the existing Dabolim airport would be closed for civilian operations after commissioning of the new airport.[103] In a subsequent order on 1st July 2010, the GoI revised its earlier position stating that the civil operations at Dabolim airport would continue even after the commissioning of the new international airport at Mopa.[104]

4.3 The need for a second airport in Goa has been questioned by civil society organisations and villagers, who are also petitioners in the Mopa airport case. The process of land acquisition towards the Mopa airport was challenged before the HC including the need for the second airport in Goa by Hanuman Aroskar and other villagers. The HC while dismissing the appeal[105], on 5th December 2013, stated that considering the report by the ICAO including the Master Plan, expansion of Dabolim airport, passenger inflow, capacity to handle the passengers, a second airport in Goa is necessary.[106] The HC also remarked that since the experts have found the need for a second airport and the proposed land bonafide, thus, an appeal over the decision of experts would not be permissible before the HC under Article 224 of the Indian Constitution.

4.4 Moreover, the potential of tourism, especially the potential of passenger footfall at the Goan airport is reported to be significant. The domestic tourism in Goa is reported to have grown at a compound annual growth rate (CAGR) of 19.5% between FY14 and FY19. According to a report by the Centre for Aviation, if air passenger traffic in Goa were to grow at 10% per annum, as a conservative estimate, both Dabolim and Mopa would saturate within a span of

[101] International Civil Aviation Organisation. August 2005. Final Report - New Goa Airport Feasibility Study.

[102] Some of the commissioned studies include a) project report prepared by Engineers and Management Associates, Spain in 1997; b) preliminary technical feasibility study prepared by Airport Authorities of India in May 1998; c) final feasibility report for proposed airport at Goa prepared by International Civil Aviation Organisation (ICAO), Canada in 2005; d) Goa dual airport study prepared by ICAO in 2007; e) report of Six Member Committee chaired by Chief Minister of Goa in 2008; f) airport master plan prepared by Ammann & Whitney, USA and submitted to PPP cell of Government of Goa in 2012.

[103] https://dca.goa.gov.in/wp-content/uploads/2017/12/MoCAapproval1-5-2000.pdf

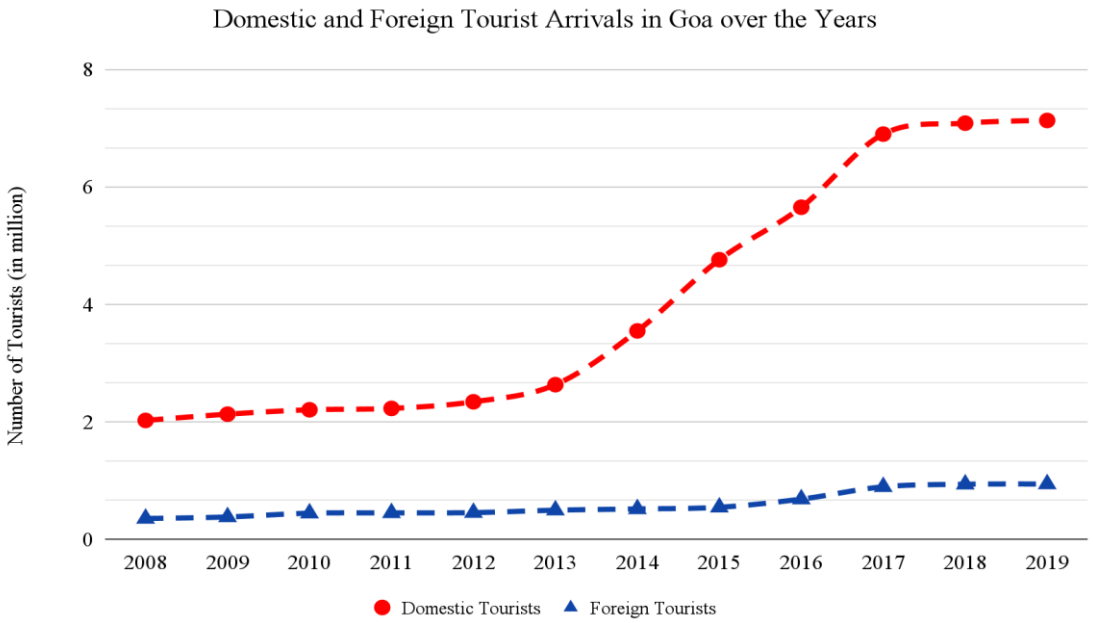
[104] https://dca.goa.gov.in/wp-content/uploads/2017/12/MoCAapproval1-7-2010.pdf

[105] 2014 (1)ABR 508

[106] 2014 (1)ABR 508

over 15 years. Thus, under such a scenario Goa may need to plan for a third airport in the state.[107]

Figure 20: Domestic and Foreign Tourist Arrivals in Goa over the Years



Source: Economic Survey 2020-21, Government of Goa

Box 1: Evolution and Significance of Indian Civil Aviation Industry

The Indian civil aviation industry has had a vivid history. The world's first mail flown by an airplane and India's first commercial flight was made on 18th February 1911 between Allahabad and Naini, which travelled about eight kilometres carrying 6,500 letters during *Mahakumbh.*[108] The airplane was piloted by a French pilot called Henry Pequet. This was a trial exercise, which was later replicated in the United Kingdom between the London suburbs of Hendon and Postmaster's General office in Windsor, Berkshire on 9th September 1911.

In 1932, the scheduled air transport in India was started by Tata Airlines, which became a public company as Air India in 1946. In 1953, the Indian Parliament enacted the Air Corporations Act, which nationalised scheduled air transport companies in India, wherein all the existing privately-owned air companies were merged with the corporation called Indian Airlines. Another corporation was formed as part of nationalisation exercise, called as Air India International, which operated long and medium haul international services.

As part of the economic liberalisation, the Air Corporation Act was repealed in 1994, which paved the way for private operators to operate scheduled services. The industry grew on the back of low cost airlines and various government initiatives such as Open Sky Policy, National Civil

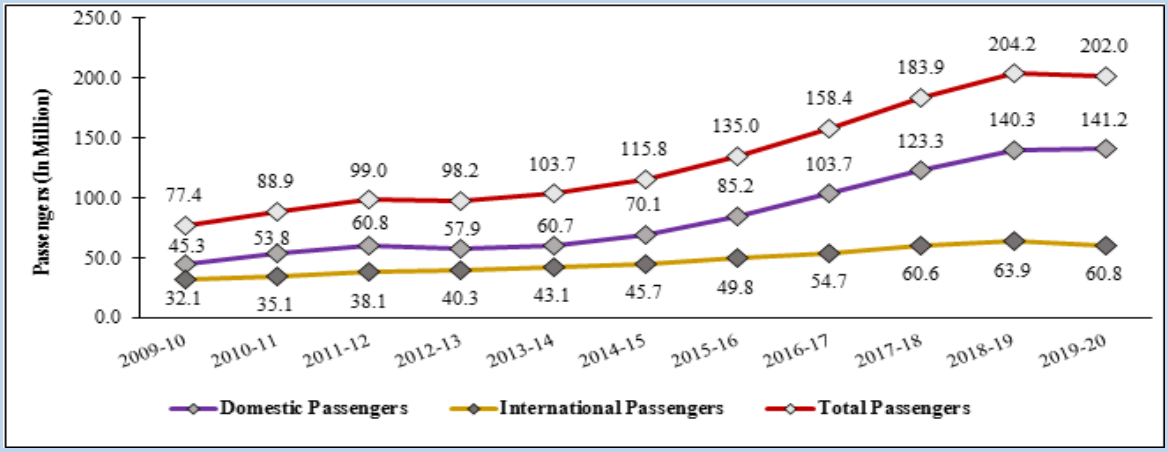
[107] https://centreforaviation.com/analysis/reports/goa-launches-a-ppp-tender-for-construction-of-a-greenfield-second-airport-190096

[108] https://www.apaoindia.com/?page_id=185

Aviation Policy 2016, UDAN Scheme, etc. where from a single passenger in 1932 to more than 147 million air passengers in 2017-18, the Indian civil aviation came a long way. [109]

Currently, India is the third largest domestic aviation market in the world and expected to become the largest by 2030[110]. It is also expected to become the third largest air passenger market by 2024.[111] However, the infrastructure within the aviation sector in India is constrained in terms of availability and capacity of airports including the size of fleets. Whereas, the number of operational airports in India increased from 50 in 2000 to 95 in 2016, while the government has a target to open 100 airports between 2019-2024.[112] Such an ambitious timeline may have been adversely impacted due to the Covid-19 pandemic, but the fact remains that India's civil aviation sector needs more airports for its increasing passenger traffic. The traffic is expected to go up as fares shrink and more people fly rather than travel by rail or road. Furthermore, the pandemic is expected to settle down in the near future considering the hectic pace at which vaccines have been discovered and used on people and research going on in finding cures for the infected people. According to the Civil Aviation Secretary, Government of India, the airports sector is expected to witness an investment of Rs. 90,000 crore in the five-year period, with almost 75.6% coming from private players.[113]

Figure 21: Air Passenger Traffic in India Over the Years



Source: Handbook on Civil Aviation Statistics 2019-20, Directorate General of Civil Aviation

Dabolim Airport in Goa

The Dabolim airport in Goa, which is also called as Goa International Airport, was built in 1955 by the erstwhile Portuguese Government as *Aeroporto de Dabolim*, which was later renamed to *Aeroporto General Benard Guedes*.[114] Until Goa's liberation, the airport was the main hub of the Portuguese India's airline called *Transportes Aereos da India Portuguesa.* It was Major

[109] Chand, Gopal and Dipti Mohapatra. 2020. A study of inception and growth of civil aviation in India. International Journal of Advance Science and Technology (Vol 29, No 10S, pp 6285 - 6296).

[110] https://www.ibef.org/download/Airports-February-2017.pdf

[111] https://www.ibef.org/industry/indian-aviation.aspx

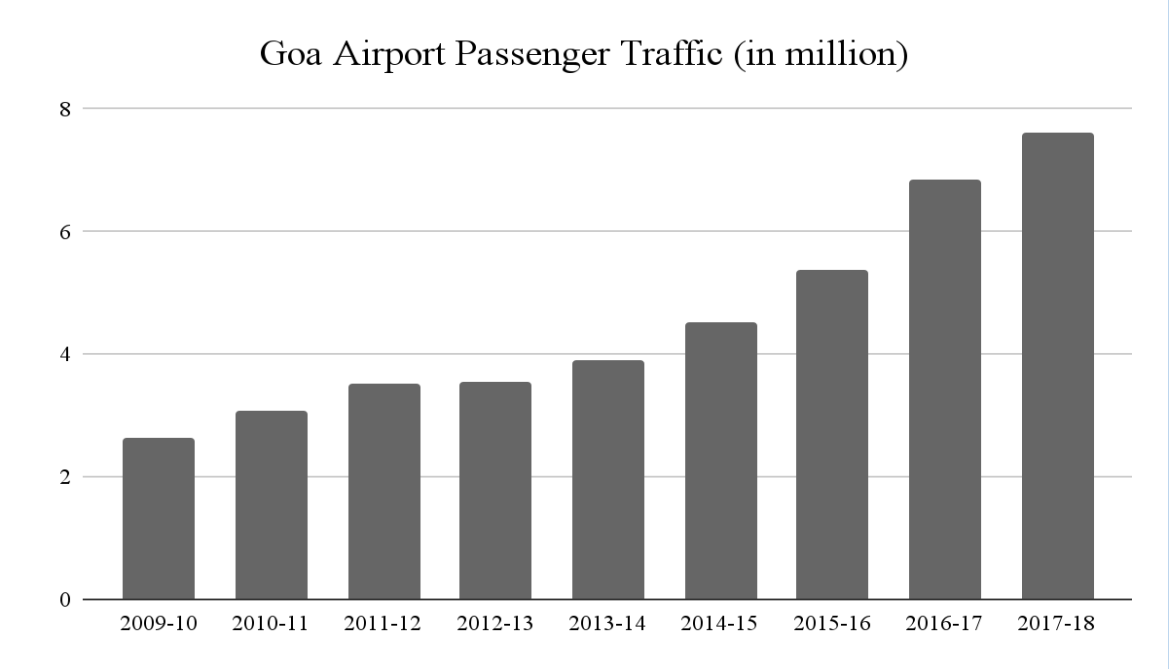
[112] Rathore, Himanshu, Shirsendu Nandi and Suresh Kumar Jakhar. 2020. The future of Indian aviation from the perspective of environment-centric regulations and policies. IIMB Management Review, 32, 434-447 and https://economictimes.indiatimes.com/industry/transportation/airlines-/-aviation/india-plans-to-open-100-airports-in-five-years/articleshow/71821181.cms?from=mdr

[113] https://www.thehindu.com/business/Industry/airports-to-attract-90000-crore-in-investments-over-five-years-civil-aviation-secretary/article37670460.ece

[114] http://goaspcb.gov.in/Media/Default/Public%20Hearing/AAI/Executive_Summary_English.pdf

General K.P. Candeth's military operation in 1961, which took control over the Dabolim airport and later handed over the airport to the Indian Navy.

Figure 22: Goa Airport Passenger Traffic



Source: Indian Brand Equity Foundation[115]

The domestic terminal was constructed in 1983, while the international terminal was built in 1996. Although the airport was initially designed to handle 700 passengers per hour during peak time, it was reported to be handling three times of the designated capacity.[116] The civil enclave of the airport is currently being handled by the Airports Authority of India in a military airbase called INS Hansa.[117] Dabolim airport has restrictions on operations on weekdays as it is used for military flight training during such hours. The Dabolim airport handled about 6.85 million passengers in 2016-17, and was estimated to handle 11.22 passengers by 2020-21.[118]

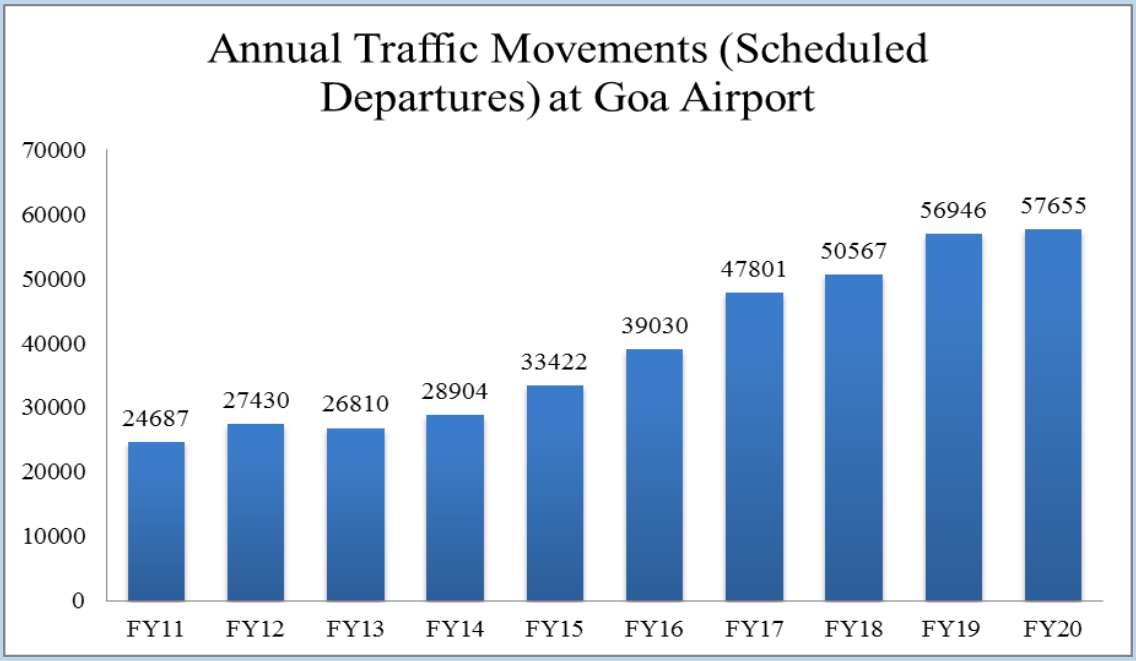
[115] https://www.ibef.org/download/goa-jan-2019.pdf

[116] https://www.airport-technology.com/projects/dabolim-international-airport-goa/

[117] http://www.aera.gov.in/aera/upload/order/59f8636f123b9order161718.pdf

[118] http://goaspcb.gov.in/Media/Default/Public%20Hearing/AAI/Executive_Summary_English.pdf

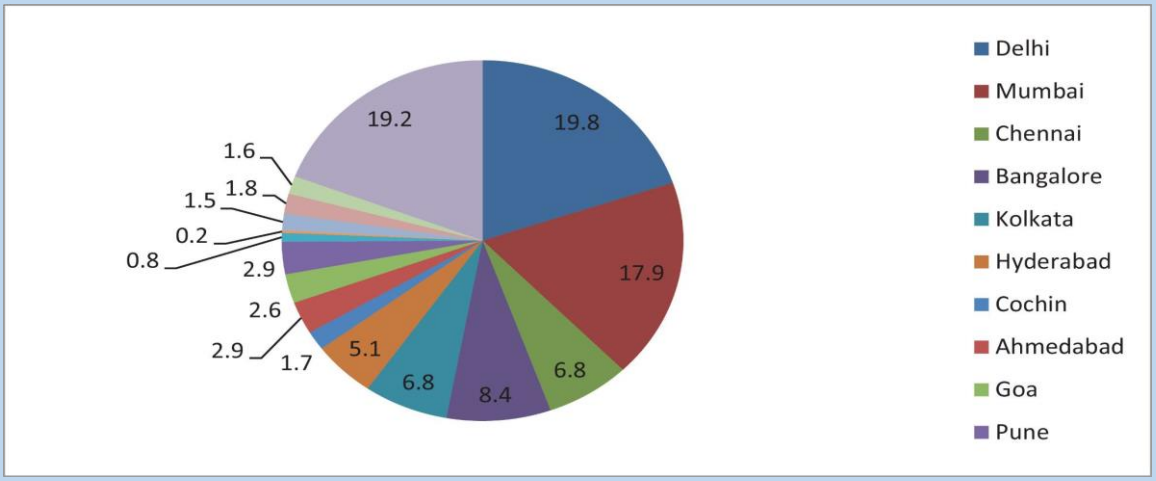
Figure 23: Annual Traffic Movements at Goa Airport



Source: Airports Authority of India

The Goa airport has a market share of about 2.6% in India as compared to other major airports in the country. The passenger traffic at Goa airport grown at a CAGR of 14.2% between 2009-10 and 2017-18. Similarly, the annual traffic movements in terms of scheduled departures from the Dabolim airport increased at a CAGR of 218% between 2011-12 and 2020-21.

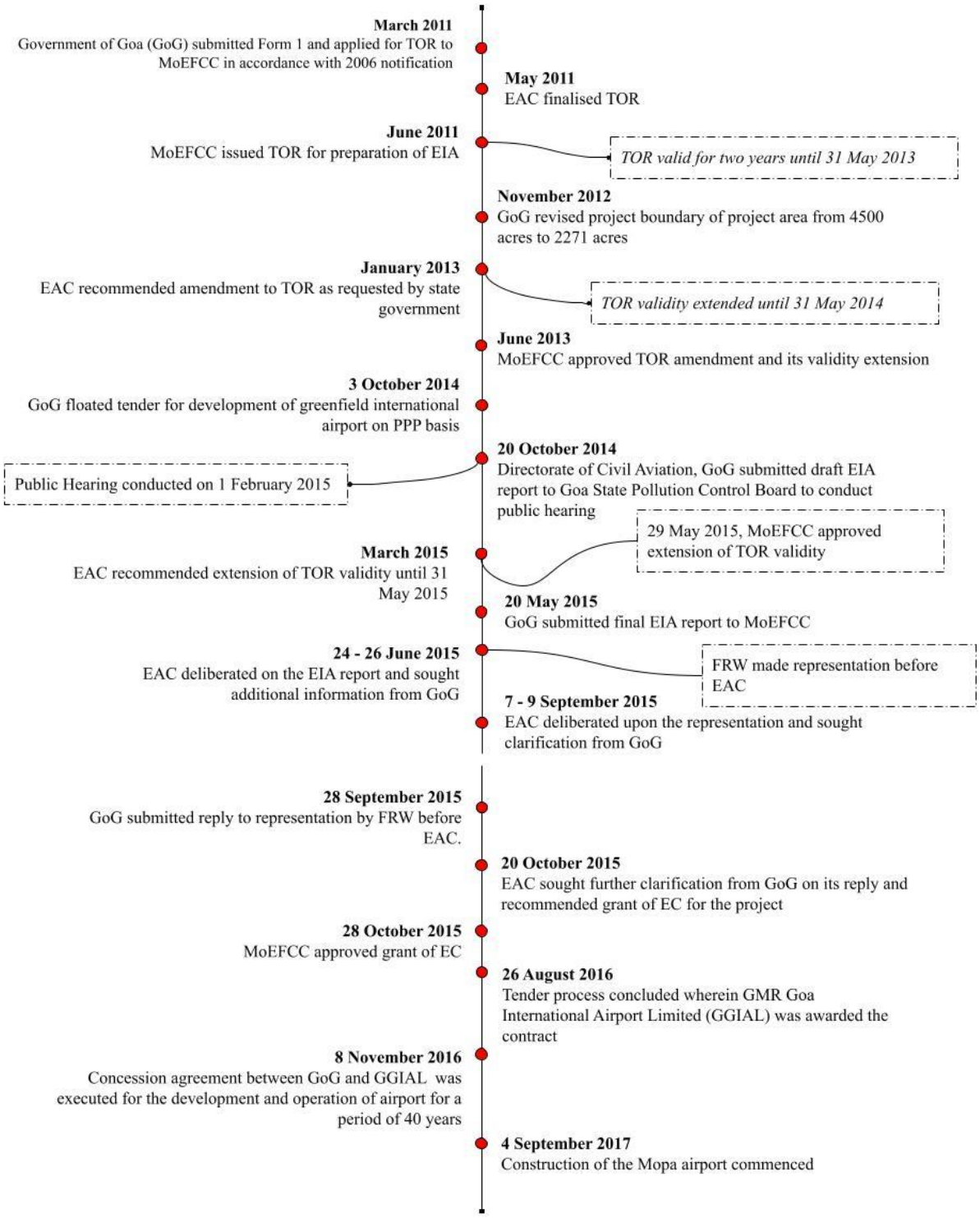
Figure 24: Market Share of Major Airports in India



Source: Rathore, Himanshu, Shirsendu Nandi and Suresh Kumar Jakhar. 2020. The future of Indian aviation from the perspective of environment-centric regulations and policies. IIMB Management Review, 32, 434-447.

4.5 A brief timeline of events leading up to the construction of Mopa Airport is given below:[119]

[119] Hanuman Laxman Aroskar vs. Union of India, (2019) 15 SCC 401



Source: Hanuman Laxman Aroskar vs. Union of India, (2019) 15 SCC 401

5. Mopa Airport

5.1 The new greenfield airport is located near Mopa village in the Pernem taluka of the North Goa district, which is approximately 35 kilometres to the north of Panaji, the capital of Goa state.

Figure 25: Mopa Airport Site as of September 2017

Source: Google Earth

5.2 The airport is proposed to be built in four phases, wherein the development of the next phase would be triggered upon achieving 80% designed capacity of the previous phase at an overall cost of Rs. 3000 crore, which would be revised considering the delay in the project.[120] The proposed phases for the Mopa airport are as follows -

Phase	Annual Passengers
I	4.4 million
II	5.8 million
III	9.4 million
IV	13.1 million

[120] https://dca.goa.gov.in/mopa-airport-highlights/

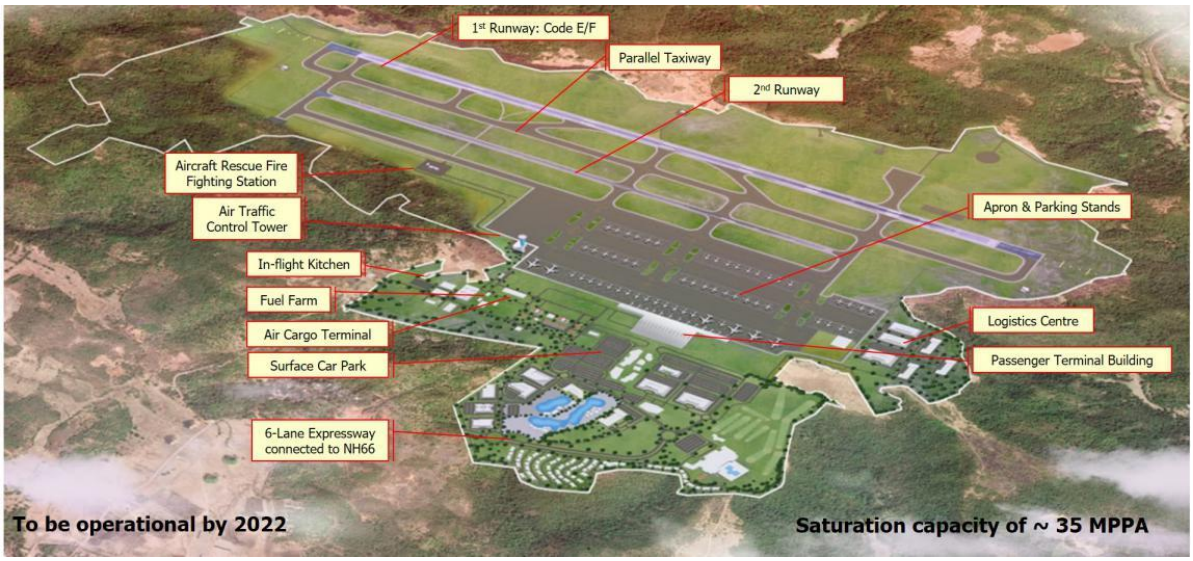
5.3 The ultimate potential of the Mopa airport is 30 million passengers per annum.[121] The traffic projections of the Mopa airport indicate a CAGR growth of 34% between FY23 and FY28. The first phase of the Mopa airport would include one runway with half-parallel taxiway and three runaway exits. Other facilities include terminal building, security area and control points, Ground Servicing Equipment storage, parking, technical area, cargo maintenance, general and business aviation areas, road network, rail connectivity, and airport city (with hotel, offices, business centre, golf course, employees accommodation, etc.)[122]

Mopa Airport Traffic Projections

Financial Year	FY23	FY24	FY25	FY26	FY27	FY28

5.4 Towards the development of the Mopa Airport, the GoG invited Request for Proposals from four shortlisted companies, namely GVK Industries Limited, GMR Infrastructure Limited, Airports Authority of India, and Essel Infraprojects Limited. GMR Goa International Airport Limited[123] was awarded the contract with the highest bid of 36.99% of revenue sharing with the Government of Goa. The concession period for the Mopa airport is 40 years with an option of further extension of 20 years through a bidding process. The Mopa airport is being built under Design, Build, Finance, Operate and Transfer model, wherein GGIAL will design, finance, build and operate the airport for the duration of the concession period.

Figure 26: Mopa Airport Master Plan



Source: Directorate of Civil Aviation, Government of Goa

5.5 The three-year period of construction of the Mopa airport commenced on 4th September 2017 after GGIAL secured financial closure[124] of Rs. 1330 crore from Axis Bank as per the

[121] https://dca.goa.gov.in/wp-content/uploads/2020/10/ASDC-Goa-Brochure.pdf

[122] http://goaspcb.gov.in/Media/Default/uploads/MopaAirportEIAreport.pdf

[123] GMR Goa International Airport Limited was incorporated in 2016 and is a 99.9% subsidiary of GMR Airports Limited, while one 'Golden Share#' is held by the GoG.

[124] According to the Reserve Bank of India, financial closure for greenfield projects is "defined as a legally binding commitment of equity holders and debt financiers to provide or mobilise funding for the project." https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=5622&Mode=0

concession agreement requirement of 70% of debt financing. Thus, the initial date of the commissioning of the first phase of the airport was scheduled on 3rd September 2020.

5.6 Towards the construction of the airport, GGIAL invited global tenders for Engineering, Procurement, and Construction (EPC) processes, for which three companies - Megawide Construction Corporation from Philippines, Larsen & Toubro from India, and Limak Construction from Turkey were pre-qualified for the bid. Megawide Construction Corporation (MCC) was selected as the contractor to construct the airport, considering its lowest bid.[125] While all the bidding companies for EPC were accorded a security clearance by the Ministry of Home Affairs, Government of India, MCC received a second security clearance after the contract with GGIAL was signed.[126] Consequently, the actual construction of the airport began tentatively in October 2018, which is being monitored by Engineers India Limited (EIL) as an independent engineering consultant.[127]

Figure 27: Development of Mopa Airport Site as of October 2018

Source: Google Earth

[125] https://timesofindia.indiatimes.com/city/goa/philippines-company-picked-from-3-to-build-mopa-airport/articleshow/62938614.cms

[126] https://indianexpress.com/article/india/mha-gives-security-nod-for-construction-of-mopa-airport-5405397/ and https://timesofindia.indiatimes.com/city/goa/mopa-airport-design-to-be-ready-in-4-months/articleshow/65775635.cms

[127] https://timesofindia.indiatimes.com/city/goa/govt-appoints-engg-consultant-for-mopa/articleshow/62677260.cms

6. Brief Overview of Judicial Process

6.1 In 2017, the EC was first challenged by petitioners - Federation of Rainbow Warriors and Hanuman Aroskar, as two separate petitions[128] before the Western Zonal Bench of NGT. These petitions were then referred[129] to the Principal Bench of NGT in New Delhi under a single petition in Appeal Nos. 5 and 6 of 2018. Initially, NGT issued an ad-interim order restraining cutting or felling of trees at the project site, which was subsequently modified, withdrawing the restraint after GoG promised that trees would not be felled or cut without valid permission from relevant authorities.

6.2 After GoG received permission from the Deputy Conservator of Forests to fell about 21,000 trees, it was appealed against before the HC by the petitioners. The Bombay High Court directed the matter to be heard before the Principal Conservator of Forests, which stipulated conditions such as enumeration of number of trees to be felled and compensatory afforestation of up to 10 times. The HC accepted the conditions and directed GoG to approach NGT for permission to fell or cut trees. About 54,676 trees were enumerated, including about 1,500 trees that were felled earlier, after permission from the Deputy Conservator of Forest was granted.

6.3 On 21st August 2018, NGT accepted GoG's permission and upheld the grant of EC, while imposing additional conditions to safeguard the environment. Some key conditions included water quality; continuous monitoring of occupational noise exposure limits with audible or visual alarm output capability; plan and implement debris and muck management; undertake mechanical and bio-engineering methods to conserve soil; transplant trees using mechanical devices; plant indigenous species; draw conservancy plan for 'Dipcadi concenense', a plant species; further elaboration on emergency response, measures, rules and responsibility, mitigation, etc. As a consequence, the felling of trees started in September 2018 and ended in January 2019.

Box 2: Environment Clearance Notification 2006

On 14th September 2006, the Ministry of Environment, Forest and Climate Change (erstwhile the Ministry of Environment and Forest) (MoEFCC), issued a notification[130] under which prior Environmental Clearance (EC) was made mandatory for projects Category A[131] and B[132]. The projects were categorised as A or B based on the spatial extent of potential impact on human health, natural and man-made resources.

For Category A projects and activities, prior EC is required from the Central Government in MoEFCC on the recommendation of the Expert Appraisal Committee (EAC). While for all the projects or activities classified as Category B, EC from the State/Union Territory Environment Impact Assessment Authority (SEIAA) is required.

[128] Appeal No. 61 of 2015; Appeal No. 1 of 2016

[129] Appeal Nos. 5 and 6 of 2018

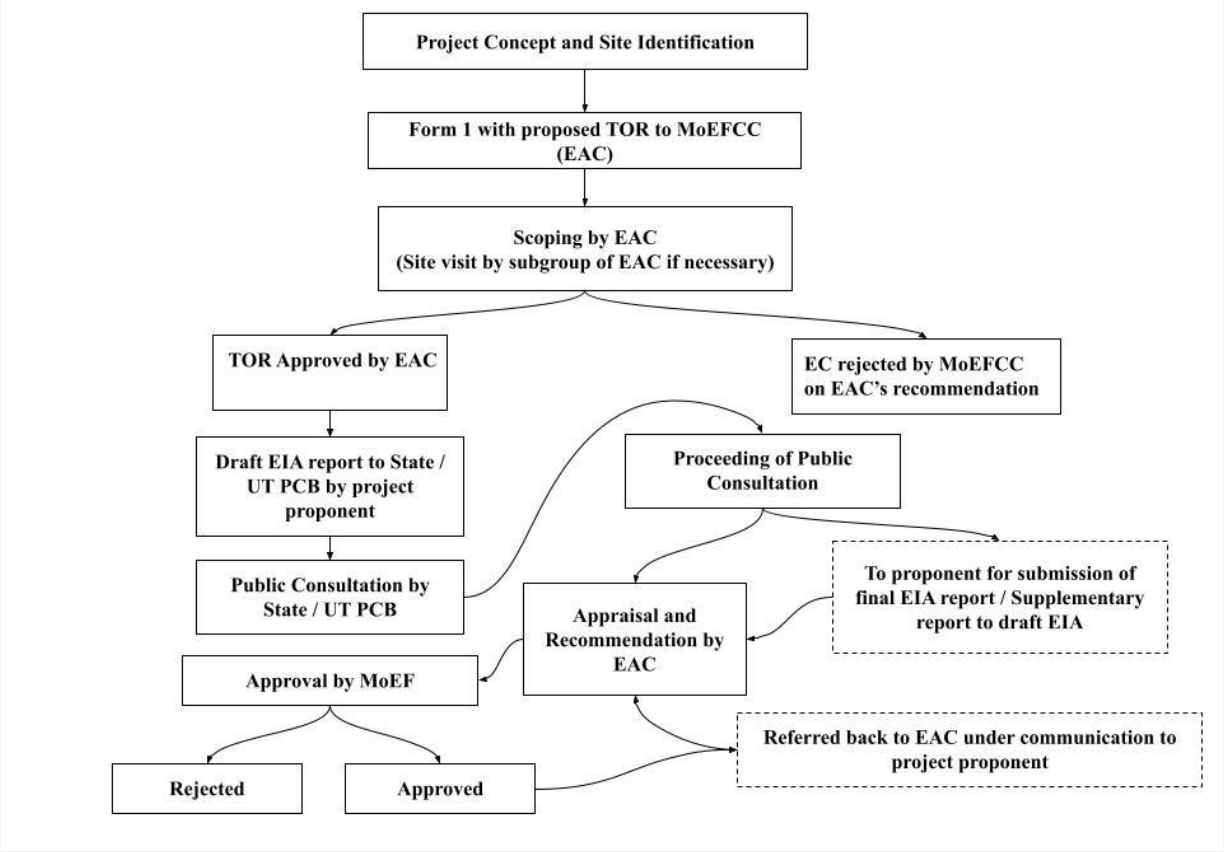
[130] S.O. 1533(E) http://www.environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf

[131] Category A projects would include mining of minerals with ≥ 50 hectares (ha.) of mining lease area of non-coal mine lease and > 150 ha of mining lease area in respect of coal mine lease; all airport projects including airstrips, which are for commercial use; new national highways and expansion of national highways greater than 30 km, etc.

[132] Category B projects would include <50 ha. ≥ 5 ha. of mining lease area of non-coal mine lease, while ≤ 150 ha. ≥ 5 ha. of mining lease area of coal mine lease; all state highway project and state highway expansion projects in hilly terrain (above 1,000 m AMSL) and or ecologically sensitive areas.

The 2006 notification listed four stages of EC process for new projects and also made it mandatory to seek EC in all cases using Form-1 through an application towards the clearance as prescribed in the notification. The four stages in sequential order are: Screening (only for Category B project and activities), Scoping[133], Public Consultation[134], and Appraisal[135].

Figure 28: EC Process for Category A projects



Source: EIA Guidance Manual for Airports, GoI

[133] In scoping, EAC or State level EAC determine detailed Terms of Reference (TOR) addressing all relevant environmental concerns for the preparation of Environmental Impact Assessment (EIA) report and using the information provided in Form-1 including TOR proposed by the applicant.

[134] In public consultation, concerns local people and other stakeholders who have plausible stake in the environmental impact of the project are ascertained. The process has two components: public hearing that shall be conducted by the State/Union Territory Pollution Control Board. The applicant is required to address environmental concerns expressed during the process and make appropriate changes in the EIA.

[135] Detailed scrutiny of all the documents and information including final EIA report, public consultation report by the EAC or State EAC towards the grant of EC. Applicants are also called upon to clarify and furnish further information. At the end of the process, EAC or State EAC makes recommendations towards the grant/rejection of EC.

7. The Mopa Case in the Supreme Court

7.1 An appeal was filed before the SC by Hanuman Aroskar and FRW against the NGT judgment dated 21st August 2018.

7.2 The EC granted towards the construction of Mopa airport was primarily challenged by the petitioners based on the alleged failure by GoG to disclose facts in Form-1, such as presence of wetlands, water sources, water bodies, biospheres, mountains and forests within an aerial distance of 15 kms, and as many as 54,676 trees to be felled, which were substantive. The petitioners also pleaded that the declaration accompanying Form-1 and Clause vi of Para 8 of 2006 notification states that the EC will be liable to be rejected in an event of suppression or mis-statement of material facts.

7.3 Key Observations made by the SC

7.3.1 The SC highlighted that the process under 2006 Notification is facilitated by the information provided in Form-1. The depth of information enables the authorities to evaluate possible impact from the project and provide opportunity to the applicant to address the environmental concerns. Thus, any information which is missing or misleading would impede the functioning and process as laid out in 2006 Notification. Importantly, an intrinsic link between disclosures made in Form-1 constitutes the basis to formulate TOR and ambit of EIA, and final EIA report. Thus any failure to disclose information in Form-1 leads to a deficient EIA report. The final EIA report indicated that the area for the proposed airport in Mopa had only a few trees and mainly bushes.

7.3.2 The SC noted that GoG failed to disclose key information in Form-1 and cannot profess an ignorance about the environment at the airport site. The apex court also pointed out that the EIA report also failed to notice the existence of ecologically sensitive zones within a buffer distance of 10 kms[136] of the project site. While the EIA report listed out 385 plant species and 86 bird species in the 10 km study area from the proposed site, the column in Form-1 where such information was required was left empty by GoG. The court noted that the primary and secondary data of fauna in the EIA report was perfunctory and expressed displeasure on failing to identify the existence of trees that would be felled.

7.3.3 The SC also highlighted that the records do not indicate critical appraisal or analysis by the EAC. The court further noted that GoG also failed to inform EAC of crucial objections and environmental concerns raised during the public hearing, which is a crucial link in the appraisal by EAC. The EAC in its meeting minutes recorded that the project proponent did not conceal facts, which, according to the SC, was a lack of comprehension of its function. According to the SC, EAC did not apply its mind or evaluate concerns as part of appraisal. The apex court also noted that EAC abdicated its role and function and failed to notice environmental facets crucial to its decision making.

7.3.4 On NGT, the SC while recognising NGT as an expert adjudicatory body on environment, noted that the tribunal did not fulfil the requirement of a merits review, which is expected to be done by an expert adjudicatory body vested with appellate jurisdiction. Overall, the SC highlighted that the process of EC had failed, which was further compounded by the absence of merits review by NGT.

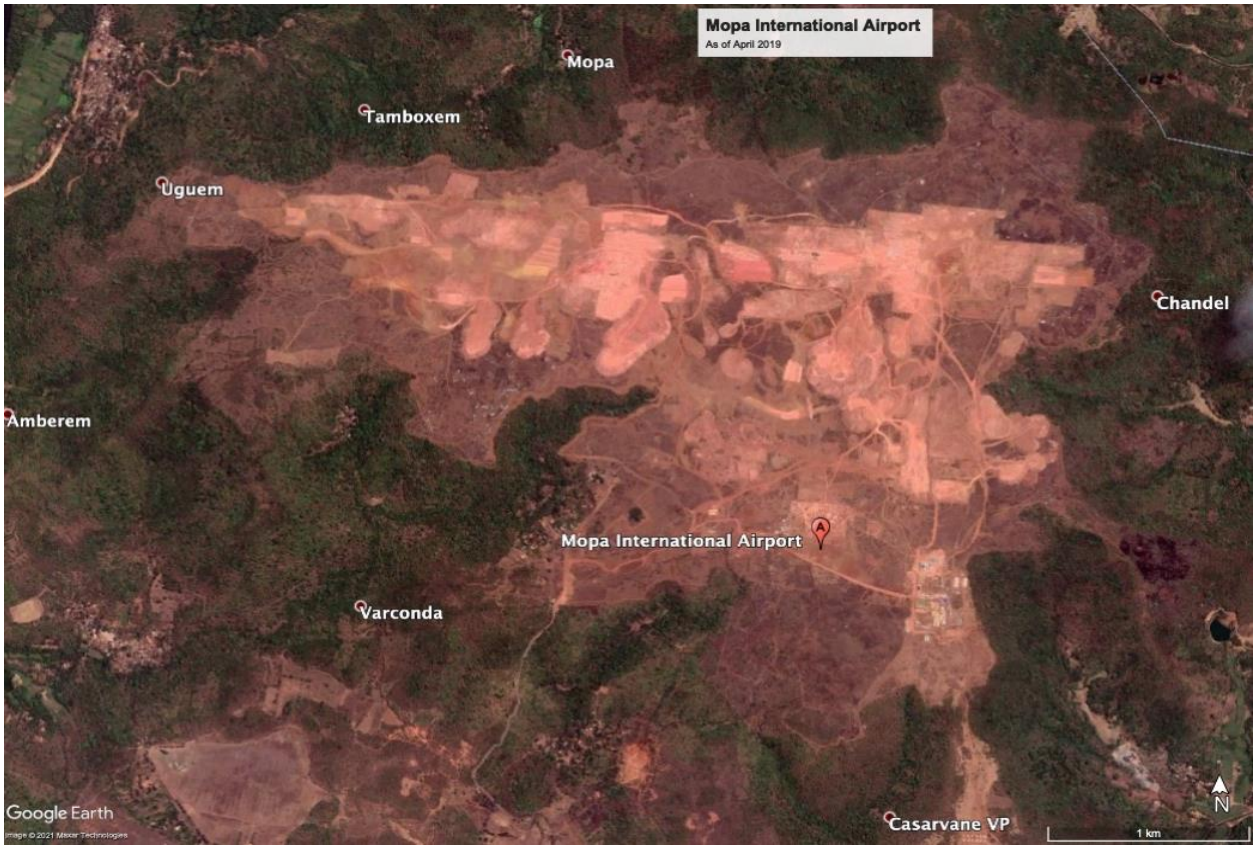
[136] See Footnote 1 for more details.

7.4 Judgment

7.4.1 After highlighting the various gaps in the whole process leading to the grant of EC for the construction of Mopa airport, the SC noted that a wholesome balance between environment and development of infrastructure is required. The SC recognised that for public projects such as an international airport, development must proceed on a considered view of the importance of the prevailing state of environment. Towards this, **the SC on 29th March 2019, directed EAC to revisit the conditions and recommendations made by it for the grant of EC, including the environmental concerns highlighted during the proceedings. Also, EC granted by MoEFCC towards the construction of the Mopa airport was suspended until such period.**

7.4.2 To facilitate an expeditious decision, the EAC was directed to carry out the exercise within one month of the judgment. At the end, to also provide protection for any further litigation, the SC clarified that no other court or tribunal would entertain any challenge to the ultimate decision of the EAC and only SC would pass final orders after the EAC would submit its report.

Figure 29: Development of Mopa Airport as of April 2019



Source: Google Earth

7.5 Revisit of Environmental Concerns by EAC

7.5.1 Post SC judgment dated 29th March 2019, the EAC in its 40th meeting held on 23rd April 2019, deliberated on the observations made by the apex court. The following observations were made by the EAC during its 40th meeting:

1. The earlier Form-1 submitted by GoG did not disclose details of forests on the land and nearby wetlands and waterbodies. The supplementary report filed by GoG considers the deficiency in Form-1 disclosure and has been accordingly compiled by the project proponent.
2. The project proponent to undertake 1:10 compensatory afforestation (plantation of 5,50,000 trees as against 54,176 trees that have been felled). Although, EAC noted that no plantation can replace natural forest and thus disagreed that compensatory afforestation can create richer biodiversity. However, under expert guidance, compensatory afforestation can compensate for the loss to the natural forest to an extent.
3. The project site and villages in the area do not fall under the Eco-Sensitive Zone, albeit the nearest village is about 4.1 kms from the boundary of the project, which is not considered in close proximity. The flight operation would not have adverse impact on flora and fauna in the surrounding area of the airport.
4. Overall, EAC recommended additional environmental safeguards/conditions over and above the conditions also laid out in the EC and by the NGT order dated 21st August 2018.[137]

7.5.2 On 16th January 2020 in Hanuman Laxman Aroskar vs. Union of India and Ors., (2020) 12 SCC 1, the SC noted that evaluation of merits primarily rests with expert authority, while the court can supervise procedural compliance and that all inputs are factored into the decision making process. Consequently, **the apex court lifted the suspension on the EC** and imposed numerous mitigatory conditions based on the revised findings of the EAC cumulatively along with previous conditions imposed during the grant of EC and by the NGT.

7.5.3 The SC also accepted GGIAL's assurance to adopt Zero Carbon Programme during the construction and operational phases of the airport and directed for compliance. Lastly, the apex court directed the National Environmental Engineering Research Institute, Nagpur to oversee compliance with the directions of the court. After the SC lifted suspension from EC, the construction activities at the Mopa Airport site were resumed immediately. As of October 2021, 41.7% of the Mopa airport construction work has been completed.[138]

[137] https://dca.goa.gov.in/wp-content/uploads/2020/07/ADDENDUM-Environment-Clearance-GGIAL-20200313.pdf

[138] https://timesofindia.indiatimes.com/city/goa/mopa-airport-40-complete-runway-work-in-final-stage/articleshow/87244891.cms

Box 3: CUTS' Analysis

The primary basis of the case against the construction of the Mopa airport has been key environmental concerns, which was facilitated by failure to disclose key and complete information about the environment at project site by GoG in Form-1. Such disclosure could have been aptly addressed during the comprehensive process of EC appraisal as provided under 2006 notification. One of the reasons the EC could not stand up to the scrutiny was because it was based on incomplete information provided by GoG in Form-1. Perhaps, the ineptitude of some government officials (or the consultant that may have been hired) in preparing the Form-1 and validating such information before submission may have been one of the reasons for such failure to disclose critical information.

Unsurprisingly, the government is yet to establish accountability/responsibility on who is responsible for the lackadaisical approach in preparing Form-1, which led to the delay in the construction of the airport. The state government could have been judicious in its detailing and review of Form-1 as required by 2006 Notification. Moreover, the whole process as envisioned in 2006 notification, seems to have failed.

The EIA report and process does not seem to have comprehensively studied the environmental dimensions concerning the Mopa airport. The GoG also did not fully disclose concerns reported during the public hearing. Even the EAC failed to critically evaluate and appraise the environmental concerns as part of its role and function to recommend EC. Similarly, the NGT also failed to undertake a detailed and merit review of the facts.

As far as SC's approach is concerned, the apex court quite remarkably balanced the concerns of the environment with the need for a public project as significant as an international airport. The SC did not quash the EC, but suspended it until the EAC revisited the recommendations in view of the concerns that were highlighted by the apex court. The court also clarified that if the EAC were to recommend EC again, then it must impose additional mitigatory conditions. This was also time bound, as the EAC were directed to revisit recommendation within a month of the SC judgment dated 23rd April 2019. Importantly, the SC was cognizant of the fact EAC was an expert body, which was well placed to take appropriate decisions and environmental concerns as was highlighted by the SC.

However, even after the EAC revisited the recommendations in April 2019, within a month of the SC judgment suspending the EC, the apex court failed to ensure a hearing on priority or immediate basis, considering it recognised the public value and economic importance of the project. The SC gave its final judgment in January 2020, eight months after EAC revisited its recommendation and thus, delayed restarting the construction of the airport, as the case was waiting to be listed during these period.

8. Commissioning Timeline of Mopa Airport

8.1 The original date of the commissioning of the first phase of Mopa airport was 3rd September 2020, however due to multiple judicial restraints including NGT restraint to fell and cut trees, suspension of EC by the SC, remobilisation of resources, and Covid-19 pandemic, the GoG granted an extension of 634 days to GGIAL. This extension included a 90 days extension due to Covid-19 pandemic delays. The revised date of the commissioning of the first phase of the airport is 31st August 2022. However, the Chief Minister of Goa recently indicated that the Prime Minister's Office has set 15th August 2022 for the inauguration of the airport.[139]

Figure 30: Runway Earthworks at Mopa Airport Project Site

Source: Directorate of Civil Aviation, Government of Goa

8.2 The Parliamentary Standing Committee on Transport, Tourism and Culture in its 291st Report on Demands for Grants (2021-22) of the Ministry of Civil Aviation also noted that the construction of the Mopa Airport has a time overrun of 634 days on account of numerous restraints by the courts.

8.3 The Standing Committee recommended that "the entire process of commissioning, planning, construction and execution of Greenfield Airports, the environmental and developmental aspects should be thoroughly deliberated upon, examined and duly implemented. Furthermore, various issues might crop up during the process, and should be tackled by the Ministry without any delay and efficiently."[140]

[139] https://timesofindia.indiatimes.com/city/goa/34-of-mopa-airport-work-complete-cm/articleshow/84934705.cms

[140] https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/20/148/291_2021_3_11.pdf

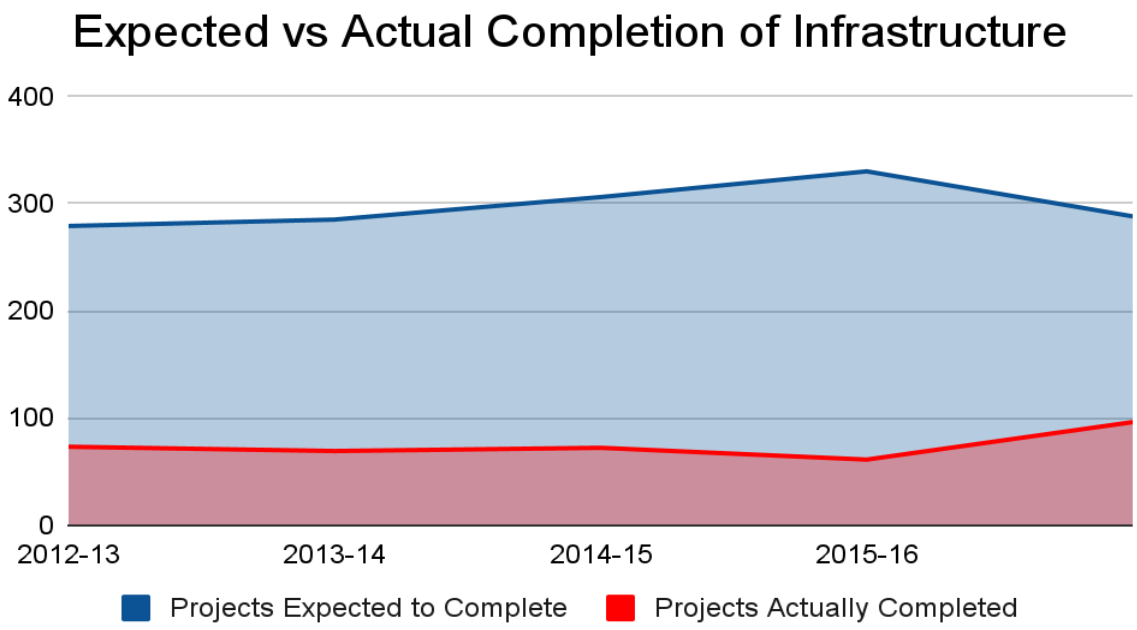
8.4 The Committee further noted that since the commissioning of the Mopa Airport may affect the traffic at the Dabolim Airport. Thus, to maintain growth of passenger footfall, new assets and expanded facilities must be created and utilised at the Dabolim Airport.

9. Project Cost and Time Overruns in Infrastructure Projects in India

9.1 According to the Ministry of Statistics and Programme Implementation (MoSPI)'s Flash Report[141] of November 2019, around 400 infrastructure projects in India have cost overruns[142] of over Rs. 4.00 lakh crores due to project delays and other factors.[143] In addition to these, according to the Ministry of Finance's Economic Survey 2018, court injunctions stalled around 52 projects worth more than Rs. 52,000 crores across ministries and such projects likely increased the project costs by close to 60 percent since these costs are dominantly debt-financed.[144]

9.2 According to the MoSPI Annual Report 2020-21, as on 1st January 2021, about 558 projects out of 1687 projects costing Rs. 21.44 lakh crore were delayed. While for about 450 projects, a total cost overrun of Rs. 4.28 lakh crore was reported by the project implementing agencies.[145] While as per the 422nd Flash Report on Central Sector Projects of value Rs. 150 crore and above, about 19 civil aviation projects are being monitored, out of which 11 projects are delayed on their original schedule.[146]

Figure 31: Expected vs Actual Completion of Infrastructure Projects in India



[141] MoSPI Flash Report is released periodically by the MoSPI on central sector projects (Rs. 150 crore and above only) reporting their status.

[142] "The cost overrun is the difference between the original cost and the actual cost incurred in the completion of the project. It is usually calculated as the percentage of the original cost." Kumar, Sanjay. November 2018. Dominant Factors behind Delay in Commissioning of Infrastructure Projects and the Extent of Delay along with Cost Overrun: An Analysis of Infrastructure Projects Commissioned during Last Five Years.

[143] https://www.businesstoday.in/current/economy-politics/400-infrastructure-projects-hit-by-cost-overruns-of-over-rs-4-lakh-crore/story/395787.html

[144] http://mofapp.nic.in:8080/economicsurvey/pdf/131-144_Chapter_09_ENGLISH_Vol%2001_2017-18.pdf

[145] http://mospi.nic.in/sites/default/files/Annual_Report_2020_21_Eng.pdf

[146] http://www.cspm.gov.in/english/flr/FR_Mar_2021.pdf

Source: Kumar, Sanjay. Dominant Factors Behind Delay in Commissioning of Infrastructure Projects and the Extent of Delay along with Cost Overrun: An Analysis of Infrastructure Projects Commissioned during Last Five Years

9.3 The infrastructure sector is extremely important for the Indian economy, as an estimated Rs. 304 lakh crore of investment is required till 2040 in the sector to sustain the country's developmental needs.[147] The GDP contribution of the construction sector was about Rs. 2.49 lakh crore as of June 2019[148] and Rs. 2.73 lakh crore as of January 2021[149].

9.4 For the civil aviation sector, about Rs. 4.5 lakh crore are needed to build 55 new airports by 2030 at an investment spend rate of approximately Rs. 375 crore annually.[150] However, as is true for the global infrastructure industry, India also grapples with issues of project cost overruns and time overruns[151]. To this end, the Government of India has initiatives such as Pragati[152] and eSuvidha[153] to de-bottleneck critical projects in roads, power and aviation sectors. As per the vision document of the Department of Civil Aviation, Government of Goa, the Mopa airport has a project monitoring committee under the Chief Secretary of the state government and is included under Pragati portal of GoI.[154]

9.5 Amongst the infrastructure projects, construction of airports are considered to be unique and complex in characteristics as they demand high levels of safety and surety in the construction process.[155] In this regard, standards of airport projects must be internationally recognised with a minimum tolerance to construction errors.[156] Similarly, runway maintenance demands precision and quality including the stringent security apparatus of the airport. Furthermore, airports are subjected to discretionary rules, standards and regulations. Although, inflation and interest rates affect cost overruns in long duration airport projects, external political issues play an equally significant role. In Sikkim, the Pakyong airport was delayed by more than 86 months due to resistance from local authorities and public strikes, causing cost and interest escalation.[157]

---

147 Project Management Institute, KPMG. June 2019. Revamping Project Management - Assessment of infrastructure projects and corrective recommendations for performance improvement. Ministry of Statistics & Programme Implementation.

148 Ibid

149 https://www.statista.com/statistics/1069818/india-gdp-contribution-by-construction/

150 Project Management Institute, KPMG. June 2019. Revamping Project Management - Assessment of infrastructure projects and corrective recommendations for performance improvement. Ministry of Statistics & Programme Implementation.

151 "The time overrun or delay is the difference between the original date of commissioning and the actual date of commissioning of the project. It is usually defined in months." Kumar, Sanjay. November 2018. Dominant Factors behind Delay in Commissioning of Infrastructure Projects and the Extent of Delay along with Cost Overrun: An Analysis of Infrastructure Projects Commissioned during Last Five Years.

152 A digital platform where the Prime Minister engages with Secretaries of the Central Government and Chief Secretaries of the State Government to address citizens' grievances and monitor and review important programmes and projects of the Government of India and those that are flagged by the State Governments.

153 A project management system portal to fast track approvals for setting up and commissioning large public, private and PPP projects and to remove implementation bottlenecks in the projects. https://esuvidha.gov.in/

154 https://dca.goa.gov.in/wp-content/uploads/2021/04/Civil-Aviation-Vision-Document-2020.pdf

155 Vandana Bhavsar, Shaun Thomas Alex, Vaishnav P. K., Abraham Jose, Nevin George Koshy and Shubham Atiwadkar (2020): Investigation of critical factors influencing construction of airports: the Case of India, International Journal of Construction Management.

156 Ibid

157 Ibid

9.6 Generally, infrastructure projects in India are exposed to uncertainties and risks such as political turmoil, unavailability of resources, changing regulatory rules, capacity constraints, technology adoption constraints, etc.

9.7 As per the PMI-KPMG report, as on January 2018, 345 projects incurred a cost overrun of Rs. 2.19 lakh crore and 354 projects had an average delay of 45 months. Some of the factors that contribute to overruns include lack of comprehensive upfront planning and risk management, non-collaboration across stakeholders, uncertainties in land acquisition process and regulatory approvals, scarcity of skilled manpower, poor maturity of project management processes.[158] Most importantly, airport construction projects in India face an average delay of 51 months and cost overrun of 59%.[159]

9.8 The PMI-KPMG report also featured case studies of cost and time overrun of a new airport at Pakyong, Sikkim and a new terminal building at civil enclave, Goa's Dabolim airport. The Pakyong airport had a cost overrun of about 95% and a time overrun of 86 months, while the new terminal building at Dabolim airport is reported to have a cost overrun of 15.97% and time overrun of 18 months.[160]

9.9 The Pakyong airport was delayed due to reasons and events such as local protests pertaining to requisite compensation, weak labour and material management, project pre-planning and execution inadequacies, land acquisition challenges, shorter working window, and Gorkhaland bandh. The price escalation of material and labour increased initial cost by Rs. 130 crore, change of scope by about Rs. 25 crore, rehabilitation and compensation cost by about Rs. 116 crore, amongst other factors.[161]

9.10 The new terminal building at Dabolim airport was reportedly delayed due to weak labour management, procurement coordination issues, inadequate planning and execution, change of scope, heavy unseasonal rainfall, delay in approvals. The change of scope added about Rs. 43 crore to the initial cost, while the price escalation for material and manpower added about Rs. 15 crore to the initial cost of the new terminal building at Dabolim airport.[162]

[158] Project Management Institute, KPMG. June 2019. Revamping Project Management - Assessment of infrastructure projects and corrective recommendations for performance improvement. Ministry of Statistics & Programme Implementation.

[159] Ibid

[160] Ibid

[161] Ibid

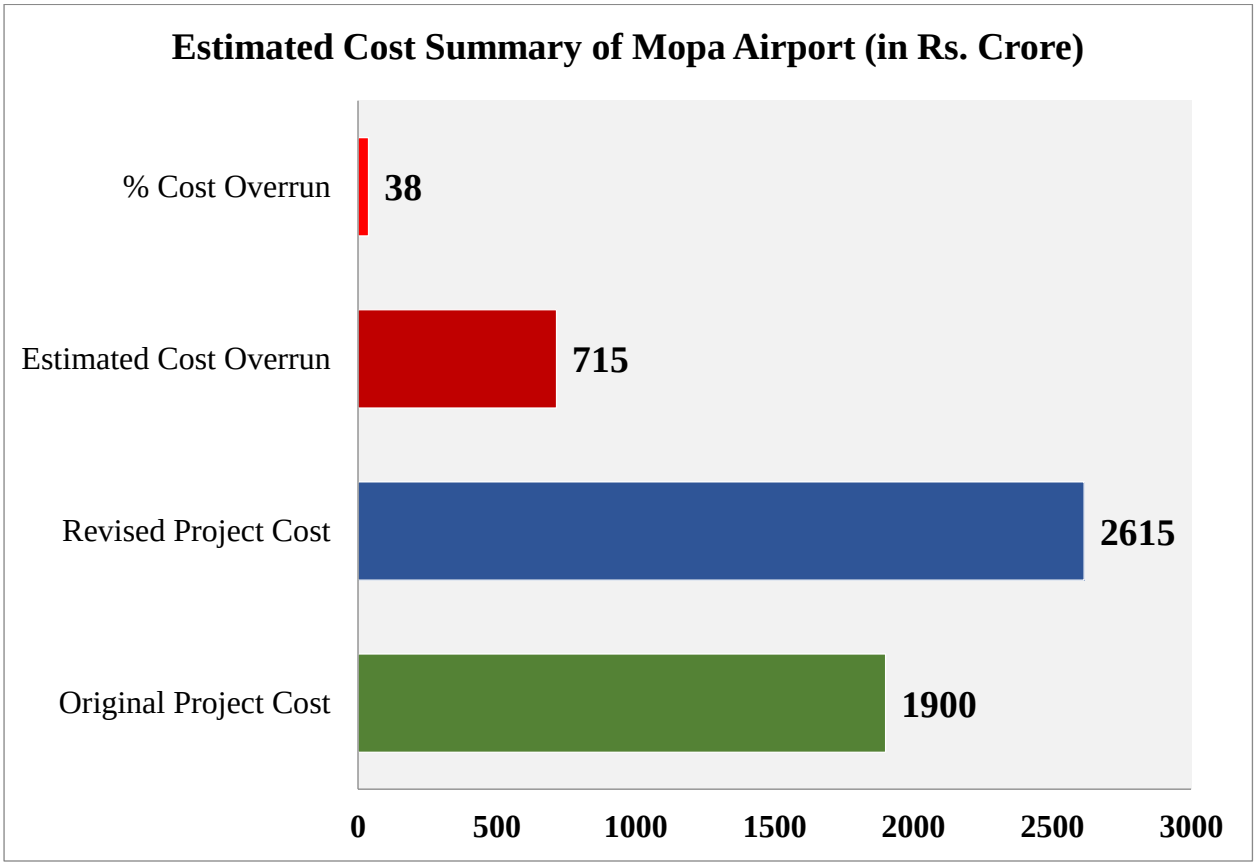
[162] Ibid

10. Finding and Analysis

10.1 Cost Overrun

10.1.1 The original cost of the first phase of the Mopa airport was Rs. 1900 crore. Considering the delay due to various judicial restraints such as the stay order on the felling of trees by NGT, suspension of the EC by the SC, remobilisation of resources etc., first phase of the airport has reported cost overruns. As per the data inputs received from the stakeholders, the cost was estimated to increase from Rs. 1900 crore to between Rs. 2600 crore to Rs. 2650 crore or about between 37% to 39% cost overrun. However, as per a report by Crisil and the Government of Goa, the final revised cost of the first phase of the Mopa airport is Rs. 2615 crore, a 38% cost overrun.[163] The information received from the stakeholders as part of primary research seems to significantly validate the latest development and information regarding cost overrun on the Mopa airport.

Figure 32: Estimated Cost Summary of Mopa Airport



Source: Inputs received from stakeholders

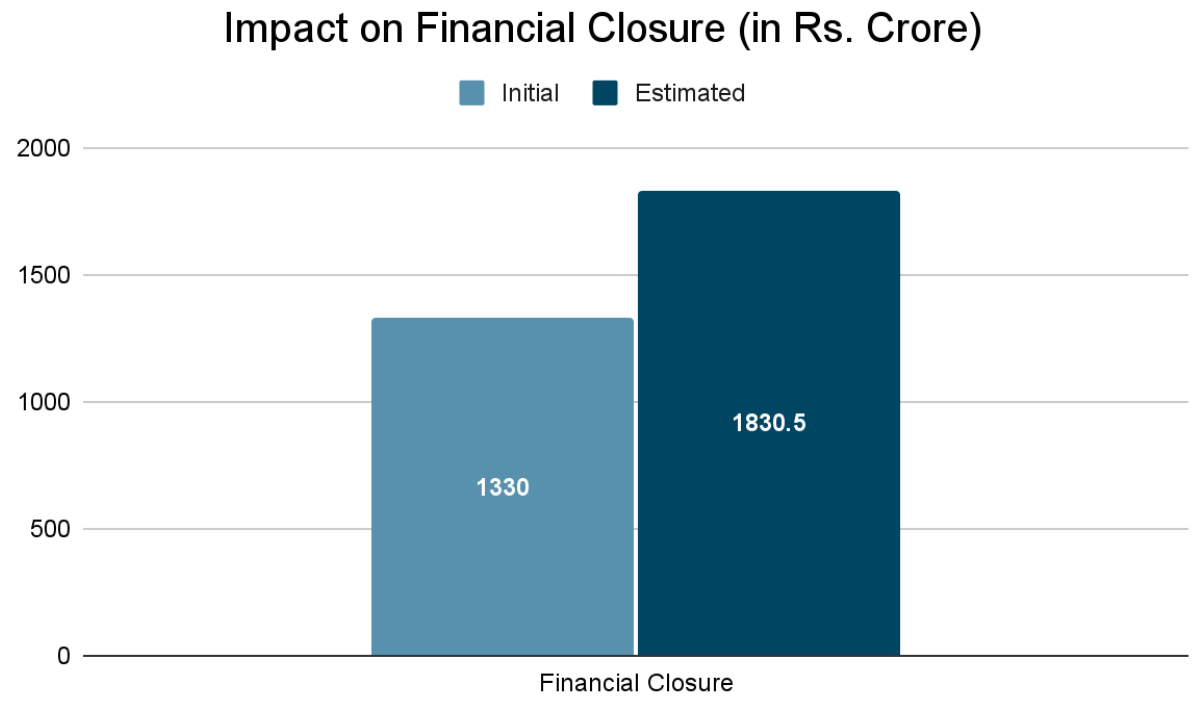
10.1.2 This cost overrun may also impact GGIAL in terms of revising the financial closure from the consortium of banks, as required by the concession agreement between the GGIAL and GoG.

163 https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/GMRGoaInternationalAirportLimited_March%2024,%202021_RR_265659.html and https://timesofindia.indiatimes.com/city/goa/34-of-mopa-airport-work-complete-cm/articleshow/84934705.cms

10.2 Debt Funding

10.2.1 Under the concession agreement between GGIAL and GoG, GGIAL is required to finance 70% of the project using debt and 30% of the project using equity. To this end, GGIAL secured financial closure of Rs. 1330 crore loan from the lender consortium led by Axis Bank towards debt funding. However, as per the inputs received from the field survey, GGIAL has used only about Rs. 153 crore from debt, while using about Rs. 400 crore from the equity or almost 21% of the 30% equity proportion that GGIAL is required to maintain as per the concession agreement. As a result, a potential financial risk may impact the overall airport project. It was pointed out that a disproportionate emphasis on equity may pose a financial risk for the project.

Figure 33: Impact on Financial Closure



Source: CUTS' Analysis

10.2.2 Similarly, considering an increase in the project cost of the first phase of the Mopa airport, the revised financial closure is estimated to escalate from Rs. 1330 crore to Rs. 1830.5 crore[164]. The revised financial closure does not seem to be yet approved by the lender consortium led by Axis Bank and the Department of Civil Aviation, Government of Goa as no such information is publicly available. GGIAL may also need to increase equity support from GMR Airport Limited (GAL) by about Rs. 215 crore to ensure a 70:30 debt to equity ratio towards the financing of the project. Thus, increasing its equity exposure in the funding towards the construction of the Mopa airport. The requirement to increase financial exposure and equity support may also affect the sustainability of the lenders as well as GGIAL.

10.3 Time Overrun

[164] See Annexure for more details

10.3.1 GoG has provided an extension of about 634 days to GGIAL towards the delays in the construction of Mopa Airport due to numerous litigations, judicial restraint on felling of trees, suspension of EC, remobilisation of resource, delays due to Covid-19 pandemic, etc. The first phase of the Mopa airport was scheduled to be commissioned in September 2020, which has been revised to be commissioned in August 2022. **Thus, the Mopa airport has an estimated time overrun of 21 months.**[165] As of July 2021, about 34% of the construction work of the Mopa airport has been reported to be completed.

Figure 34: Development of Mopa Airport as of April 2021

Source: Google Earth

10.3.2 As per the data inputs received from the field survey, statutory operational readiness testing by the Directorate of Civil Aviation is required at least six months prior to the commissioning of the airport. Therefore, the airport should be completed by 28th February 2022 for statutory operational readiness testing. Most importantly, it was reported that about 19.6% of the construction work was completed as of December 2020. This makes the succeeding months as most critical to achieving the deadline of commissioning the first phase of the airport.

10.3.3 The estimated time overrun and delayed commissioning of the first phase of the Mopa airport also affects the ability of the state government to take advantage from the increasing tourism in Goa, which would also contribute significantly to the state's economic growth and exchequer. As a third order impact, on-time commissioning of an international airport would

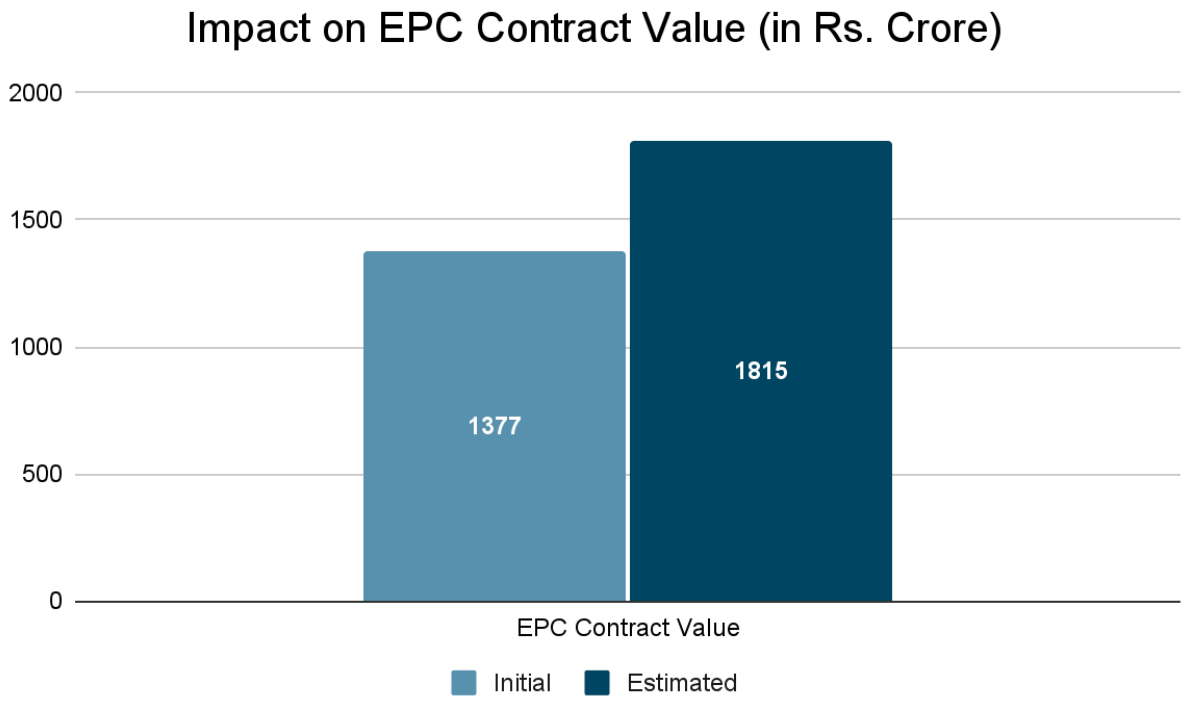
[165] See Annexure for more details.

have created a multiplier effect on employment and livelihood in Goa, which would have benefited the Goan people, considering the state has had an adverse impact on livelihood due to the iron ore mining suspension.

10.4 EPC Contract Value

10.4.1 The cost overrun of the first phase of the Mopa airport, would also impact the Engineering, Procurement and Construction (EPC) contract value for Megawide Construction Corporation, the construction contractor for the project. As per the inputs received, the EPC contract value of MCC was Rs. 1377 crore, and is estimated to increase to about Rs. 1815 crore, or a 32% increase considering price escalation.

Figure 35: Impact on EPC Contract Value



Source: CUTS' Analysis

10.4.2 When the SC suspended the EC on 29th March 2019, about 1500 workers were engaged on the Mopa Airport site. As per the data inputs received, the workers engaged at the Mopa airport site were migrants and it was pointed out that they may have returned to their home state in view of no work activities affecting about 6900 people,[166] owing to the decision. However, as per the inputs received, approximately more than 2500 workers were employed at the airport project site when the construction resumed in 2020 consequently after SC lifted the suspension on EC. It was also pointed out during the field survey, that all the current workers, who are also migrant workers, may have replaced the previous workers when the airport construction activities were stopped in 2019.

[166] Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.

11. Recommendations and Conclusion

11.1 The suspension of the EC and construction of the Mopa airport was avoidable if the GoG had made all the relevant disclosures in Form-1 as provided under 2006 notification. Thus, adhering to the comprehensive EC appraisal. Even the EAC and NGT failed to discover the concealment of facts. Perhaps, the indifferent approach by some of the government officials in preparing the Form-1 led to varied judicial challenges, which consequently led to suspension of the EC and delayed the construction of Mopa airport. The SC remarkably recognised the economic significance of the airport project, while showing a balanced approach to environment and development by deferring its decision to the expert advice of the EAC.

11.2 Inevitably, the discrete delays towards the construction of the Mopa airport such as restraint to fell/cut trees by the NGT and EC suspension by the SC, although facilitated by GoG's failure to disclose facts, increased the cost of the first phase of the airport from Rs. 1900 crore to Rs. 2615 crore or a 38% cost overrun. Similarly, the commissioning of the first phase of the airport was delayed by as much as 21 months, indicating time overrun. GGIAL received an extension of 634 days to commission the first phase of the Mopa airport by 15th August 2022, as against the initial schedule of September 2020.

11.3 The delay is also estimated to increase the financial closure, as required under the concession agreement. The financial closure is estimated to increase from Rs. 1330 crore to Rs. 1830.5 crore. This increase in cost may also require GGIAL to increase its equity support from GAL. Similarly, as per data inputs received, the EPC contract is also estimated to increase by as much as 32%, from an initial value of Rs. 1377 crore to Rs. 1815 crore on account of price escalation. About 1500 workers who were engaged at the project site may have lost their jobs consequently due to the suspension of construction work. Importantly, even after the EAC revisited its recommendations within a month of the SC directive, the matter was listed only in January 2020, keeping the EC suspended for about 8 months.

11.4 **Fix accountability of agencies/officials** involved in Mopa airport's environmental impact assessment process. The initiation of judicial proceedings against developmental projects stemmed from inefficient and inept bureaucracy and its processes, which concealed crucial information. The rule of law requires a regime which has effective, accountable and transparent institutions.[167] This would facilitate a conflict-free process in the context of projects which are at the intersection of development and environment. Thus, it is necessary that the rule of law that imbibes accountability and transparency is implemented and sustained to reduce litigation challenges and if required, stand the test of scrutiny before the judicial bodies.

11.5 **Review of Environmental Impact Assessment Notification of 2006** to ensure its implementation in letter and spirit and plug any loopholes. Although the 2006 notification prescribed a comprehensive review process, the EC appraisal failed to consider crucial information in the Mopa airport case. According to the SC, the 2006 notification embodies the developmental agenda of the country and must comply with the norms for the protection of the environment and its complexities.[168] Thus, it serves to balance development and environment and hence, the 2006 notification attempts to bridge the gap between environment and development by deferring to EAC, which comprises of experts in environment. The 2006 notification is designed in a way that any deficiency in any of the processes, may have a

[167] Hanuman Laxman Aroskar vs. Union of India, (2019) 15 SCC 401

[168] Ibid

cascading effect to the overall outcome. To this end, periodic review and evaluation of the implementation of processes of the 2006 notification is imperative.

11.6 **Review role of agencies and tribunals such as EAC, NGT, etc.** and ensure that they are able to critically appraise the projects including environmental facts and concerns. Considering the comprehensiveness of the EC appraisal process, it requires substantial time, resources and capital. Among other reasons, EAC is constituted to assess the information provided in Form-1 and prepare a comprehensive ToR, which is then evaluated against the EIA report that is prepared by a regulatory body such as the pollution control board. While the appraisal by EAC is structured in a transparent manner, however, any leniency or oversight in evaluating the information could lead to avoidable judicial scrutiny and intervention that may stall projects of economic significance. Similarly, NGT is an adjudicatory body with an appellate jurisdiction over the grant of EC. Thus, any challenge to EC must be accorded a critical review of merits. As the SC pointed out, "the processes of decisions are as crucial as the ultimate decision." [169]

11.7 **Institutionalise dispute resolution.** Considering that in PPP projects such as the Mopa airport, numerous stakeholders and high capital are involved. Thus, any dispute or concern that a stakeholder may have in terms of economic or environmental concerns must be adequately addressed. To this end, an independent institution or committee of experts of diverse subject background, must be set up to address any conflicting interests that may come to their notice, during the development of the project. This institution/committee could also facilitate the EIA process as envisioned in the 2006 notification to remove bottlenecks and address any concern or discrepancy associated with the project.

11.8 **Create process within the judiciary/adjudicatory tribunals** for prompt hearing of projects of economic significance. The Mopa airport case was listed in January 2020, eight months after the EAC revisited recommendations within a month of SC's judgment, thus causing avoidable delay to restarting the construction. Considering that the Mopa airport has a significant cost of Rs 2615 crore (revised cost), perhaps, a screening mechanism could be formed within the SC that prioritises listing of cases with such economic significance. Importantly, the SC had recognised the time sensitivity involved by directing the EAC to revisit recommendation within a prescribed time, yet the apex court itself could not prioritise listing the case,

11.9 Overall, the Mopa airport matter is a landmark case study which highlights the bureaucratic inefficiency which failed to stand scrutiny by the apex court including the failure of the comprehensive EC appraisal process, critical review by EAC as envisioned in 2006 notification, and even the NGT. The core issue i.e. the concealment of facts, that led the SC to suspend EC was avoidable, yet the Mopa airport has an estimated 38% cost overrun and 21 month's time overrun, while an opportunity to spur economic and tourism growth for the state of Goa has been delayed.

[169] Ibid

Annexure

1. Project Cost Overrun

Mopa Airport Project Cost - 1st Phase	UoM	Initial	Revised
	Rs. Crore	1900	2615

Cost Overrun = Difference of the Revised Cost and Initial Cost = 2615 - 1900 = Rs. 715 crore

Percentage increase = (Revised Cost - Initial Cost)/Initial Cost = (2615 - 1900)/1900 = 0.38

Thus, the percentage increase in cost overrun = 38%

2. Financial Closure

GGIAL secured a financial closure of Rs. 1330 crore from Axis Bank consortium**.**

As per the Concession Agreement, GGIAL is required to ensure debt and equity funding for the Mopa airport in the proportion of 70:30.

The Initial Cost of the first phase of the Mopa airport was Rs. 1900 crore. Hence, 70% of Rs. 1900 crore = Rs. 1330 crore. 30% of Rs. 1900 crore = Rs. 570 crore

If the Revised Cost of the first phase of the Mopa airport is Rs. 2615 crore. Then, 70% of Rs. 2615 crore = Rs. 1830.5 crore. While the 30% of Rs. 2615 crore = Rs. 784.5 crore

Thus, GGIAL may need to secure a revised financial closure of Rs. 1830.5 crore as per the Concession Agreement. Also, GGIAL may need to secure additional equity support from GAL = Rs. 784.5 crore - Rs. 570 crore = Rs. 214.5 crore, rounded off to Rs. 215 crore.

3. EPC Contract Value

As per the data inputs received, the initial EPC Contract value towards the first phase of the Mopa airport was Rs. 1377 crore.

As per the inputs received, the contract value is estimated to increase up to Rs. 1815 crore. Thus, the increase in value in percentage = (1815 - 1377)/1377 = 0.318, rounded off to 0.32.

Thus, the contract value is estimated to increase by 32%

4. Time Overrun

The Mopa airport received an extension of 634 days towards the commissioning of the first phase of the airport, which includes a 90 days extension due to delays from Covid-19 pandemic.

Thus, to convert the extension in months, the average number of days in a month in a year= 365 days / 12 months = 30.42 days

Estimated extension in months = 634 days / 30.42 days = 20.84 months, rounded off to 21 months.

The Tamil Nadu Pollution Control Board vs. Sterlite Industries (I) Ltd (Sterlite Copper Plant Case)

Table of Contents

List of Figures and Tables

Executive Summary

The debate of balancing human rights and economic rights is not a new one. Rather, one of the oldest facets of this dichotomy is how to harmonise environment and development and livelihood rights. In that endeavour, various economic and social models have evolved to understand and recognise the human-centricity at all fronts – whether it be environment or development. However, a balanced approach is missing in viewing these domains holistically and together, and implementing the models as evolved for the 21st century.

The closure of the Sterlite Copper Plant in Thoothukudi, Tamil Nadu in 2018 (Copper Plant) – the manufacturing plant of Vedanta Limited – typifies this debate and thus the objective and aim of this report. Ever since the establishment of the Copper Plant in 1994, its journey has been chequered with protests, public uproar, regulatory scrutiny, executive actions, and judicial interventions emanating from various claims against the Copper Plant flouting environmental norms and adversely impacting the health of the local inhabitants. The biggest protest – which lasted for 100 days – when turned violent in May 2018, the Tamil Nadu Pollution Control Board (TNPCB) and the Tamil Nadu government ordered the permanent closure of the Copper Plant with immediate effect.

When the orders were challenged before the National Green Tribunal (NGT), in November 2018, the tribunal ordered the reopening of the Copper Plant, however the same was dismissed by the Supreme Court (SC) in 2019 stating that the NGT has no jurisdiction to entertain appeals against state government orders. Consequently, the matter went before the Madras High Court, which in August 2020, confirmed the orders of the TNPCB and Tamil Nadu government. In December 2020, the SC denied any interim relief to Sterlite. However, most recently in May 2021, during the peak of the second wave of the Covid-19 pandemic in India, the Copper Plant was allowed to reopen for the production of medical oxygen. More recently, a group of fishermen and a few villages petitioned the state government requesting to reopen Copper Plant as it was source of their income and livelihood.

While there have been various reports and studies that have established the environmental concerns leading to health harms such as chronic fatigue, asthma and respiratory diseases, ear, nose, throat (ENT) disorders, menstrual disorders and much more, there is limited secondary literature analysing the economic impact caused to the people associated and dependent on the Copper Plant in terms of employment (direct and indirect), revenues and profits for dependent businesses, and the overall volume and value of copper trade in India. The secondary data or information available is mainly through news media reports and articles.

One of the biggest impacts because of the closure of the Copper Plant was (and continues to be) faced by the workers/employees of the Copper Plant. Various media reports highlighted that the net loss of employment (both direct and indirect) comes to almost 30,000 jobs. Moreover, the closure is estimated to have significantly impacted the incomes of the people who lost their jobs, reducing their monthly incomes by at least 50% while rendering many jobless. While the latter was corroborated through interactions with workers/employees in field it was also found that while the permanent employees working at the Copper Plant were relocated or kept on the job with a decrease in salary, the contractual employees suffered a substantial loss and decline in livelihood. On those lines, the monetary value of the cumulative net impact in terms of salaries was found to be around Rs. 146 crore since the closure of the

Copper Plant in May 2018. This however does not show the full extent of the impact, which goes beyond individuals to families and their kin, especially when it comes to education, insurance, loan repayments, and health. While the estimation of Rs. 146 crore only includes direct employment, it must be noted that the indirect jobs were also gravely impacted, owing to the fact that the associated and dependent businesses on the Copper Plant faced huge consequential impacts.

In terms of the downstream businesses' dependent on the Copper Plant, various media articles reported that around 400 downstream businesses were associated with the Copper Plant, employing approximately 100,000 people. Moreover, the Copper Plant was also the only indigenous supplier of phosphoric acid. It was also the key supplier of slag and gypsum to close to 20 cement companies in the region. However, for the downstream businesses' dependent on the Copper Plant for the procurement of mainly five types of raw materials namely gypsum, sulphuric acid, phosphoric acid, copper cathode and copper rod, it was found that there has been considerable impact on the cost of procurement of raw materials after the closure of the Copper Plant. Other than the procurement cost, the time cost of procurement if the raw material is imported, the quality of raw material, the bargaining power of such businesses for price negotiations, the time-cycle of procurement and payments and subsequent liquidity challenges are some of the ways through which the Copper Plant's closure has impacted them. The net estimated impact on all the downstream businesses in terms of their cost of procurement stands at around Rs. 491 crore since the closure of the Copper Plant.

Besides downstream businesses, the biggest impact was seen on the service providers associated with the Copper Plant, ranging from mechanical and maintenance, warehousing, Information and Technology, stevedore and cargo, and lorry providers. The livelihoods of thousands who are part of this ecosystem including truckers, contractors, labourers, real estate market, and even tea shops that came up around the Copper Plant have all been severely impacted since the closure. By rough estimates according to media reports, the Copper Plant used to spend around Rs. 600 crore per year on logistics, material purchases and other requirements which are now non-existent. As per the calculations undertaken through the data collected and available, it was found that the total loss to the service providers stands at Rs. 1390 crore since the closure of the Copper Plant. The net impact includes impact on the service providers, workers/employees, associated businesses, and the government.

The impact on the finances of the Copper Plant itself has been the greatest and across different metrics and throughout the supply-value chain, starting from impact on volume of production, impact on revenues, impact on expenditures and impact on profit. For instance, various articles reported that the Copper Plant became a loss-making venture incurring as much as Rs. 5 crore per day since its closure. Sterlite has also claimed that the maintenance damages run to almost Rs. 100 crore in a year to the Copper Plant because of the negligence on part of district authorities, as they were not allowed to reopen the Copper Plant even for maintenance purposes. When computing the impact on the Copper Plant itself, through the data collection and analysis, it was found that the overall impact on the Copper Plant in terms of the impact on its Profit After Tax and the sunk costs incurred translates to loss of around Rs. 4777 crore since its closure. This further translates to a loss of Rs. 4.42 crore per day for the Copper Plant since its closure in May 2018.

Moreover, the government is also losing sizable revenue in form of taxes and duties. Through various media reports, it is estimated that the Copper Plant paid up to Rs. 2,559 crore annually to the exchequer by way of taxes and other statutory contributions. However, when the impact on the government through loss in taxes and other revenue from power and water consumption by the Copper Plant was calculated basis the data collected and analysed, it was found that the impact on the government is substantially much higher than media reports at around Rs. 7,642 crores since May 2018.

Lastly, owing to the Copper Plant's closure, the exports and imports of copper and related items have been greatly affected. While the exports have significantly fallen from the year FY 2018-2019 onwards, the imports have risen sharply to cater to the domestic demand. With the Copper Plant contributing close to 40% to the copper production in India, its closure has amounted to significant losses in terms of Foreign Exchange (Forex), cutting down the country's net production by 46.1%. From being a net exporter of copper, India has become a net importer thus impacting the country's balance of payments. This loss is estimated to the tune of Rs. 14,000 crore by some experts, as cited in media articles. It was also reported that the copper import increased by 26% to 60,766 tonnes in the June quarter of 2020-21, and further expected to increase in the remaining part of the financial year.

Thus, through the data collected and analysed for the purpose of this report, the consolidated loss to the economy owing to closure of the Copper Plant on all stakeholders is estimated to be around Rs. 14,749 crore since its closure in May 2018. The cumulative loss for the entire period of plant closure is roughly around 0.72% of the State Gross Domestic Product (SGDP) of Tamil Nadu.

These grave economic impacts on the varied stakeholders offers a pressing need to find better alternate remedies to balance matters concerning the development-environment conflict in the instant matter. It is thus important to inform the decision-making process at all levels, including the judiciary, keeping in mind the larger objective of human-centricity of economic development and environmental sustainability, with equal considerations to the objective of equity, environment, and economy.

1. Introduction

The Sterlite Copper Plant in Thoothukudi, Tamil Nadu (hereinafter referred to as 'Copper Plant') – the manufacturing plant of Vedanta Limited – has helped in the development of the local and national economy. It provided livelihood opportunities to various people and businesses – directly or indirectly dependent on the Copper Plant, in addition to giving a boost to the nation's copper exports. The Copper Plant, when fully operational, employed 14,000 people meaning that 14,000 families (close to 64,400 people[170]) were dependent on the Copper Plant.[171]

However, the journey of the Copper Plant since its inception in 1994, has been chequered with protests, public uproar, regulatory scrutiny, executive actions, and judicial interventions. These

[170] Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.

[171] '14,000 direct jobs at stake, say industry association', The Hindu, 06 July 2018, https://www.thehindu.com/news/national/tamil-nadu/14000-direct-jobs-at-stake-say-industry-associations/article24344377.ece.

emanate from various claims against the Copper Plant flouting environmental norms and adversely impacting the environment and health of the local inhabitants.

On 22 May 2018, the 100th day of the biggest protest against the Copper Plant, resulted in a mayhem in Thoothukudi, leading to the death of 13 people. The protestors, who maintained that the Copper Plant was polluting the environment, were livid over the proposed expansion of the Copper Plant's second unit, which was expected to double production capacity from 4 lakh Metric Tonnes Per Annum (MTPA) to 8 lakh MTPA.[172]

The trigger for these protests was the clearances granted by the State and Central authorities for doubling the Copper Plant's capacity, without conducting a public hearing, as required by law.[173] The massive gathering of over 20,000 protestors was the culmination of 100 days of protest against the proposed expansion. Since February 2018, large-scale protests were taking place in Thoothukudi, claiming that the Copper Plant is polluting the air and groundwater. These protests came a month after 250 residents went on a hunger strike after the Copper Plant announced expansion plans.[174] Fatima Babu, a 67-year-old English professor turned activist spearheaded the campaign against the Copper Plant, popularly known as the 'Anti-Sterlite People's Movement'.[175]

Six days after the protests turned deadly, on 28 May 2018, the Tamil Nadu government ordered the permanent closure of the Copper Plant. "*Under sections of the Water Act, 1974, in the larger public interest, the government endorses the closure direction of the Tamil Nadu Pollution Control Board and also directs the board to seal the unit and close the plant permanently*.", the order read.[176] Prior to the order by the Tamil Nadu government, on 09 April 2018 the Tamil Nadu Pollution Control Board (TNPCB) had rejected the Copper Plant's application to renew its license to operate beyond 31 March 2018.[177] Subsequently, the TNPCB on 23 May 2018 ordered the closure of the Copper Plant with immediate effect and directed the Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) to disconnect electricity supply.[178]

Consequently, Sterlite filed a petition before the National Green Tribunal (NGT) challenging the various orders by the TNPCB and the Tamil Nadu government with respect to the immediate permanent closure of the Copper Plant. The NGT in its order dated 15 December

---

172 Vikram Venkateswaran, 'Anti-Sterlite Protests: What Vedanta Did and How the People Reacted', The Quint, 4 May 2018, https://www.thequint.com/explainers/anti-sterlite-protests-how-it-began-why-violence-vedanta-explainer#read-more.

173 Kunal Shankar, 'How a retired Indian professor took on a mining giant – and won', Aljazeera, 07 January 2021, https://www.aljazeera.com/features/2021/1/7/india-how-a-retired-professor-took-on-a-mining-giant-and-won.

174 'Tamil Nadu: Thousands protest against Sterlite Copper's plan to expand its plant in Thoothukudi', Scroll, 25 May 2018, https://scroll.in/latest/873229/tamil-nadu-thousands-protest-against-sterlite-coppers-plan-to-expand-its-plant-in-thoothukudi.

175 Kunal Shankar, 'How a retired Indian professor took on a mining giant – and won', Aljazeera, 07 January 2021, https://www.aljazeera.com/features/2021/1/7/india-how-a-retired-professor-took-on-a-mining-giant-and-won.

176 'Tamil Nadu government orders permanent closure of Sterlite plant in Thoothukudi', Scroll, 28 May 2018, https://scroll.in/latest/880594/tamil-nadu-government-orders-permanent-closure-of-sterlite-plant-in-thoothukudi.

177 'Tamil Nadu Pollution Control Board refuses to renew Sterlite Copper's license to operate', Scroll, 10 April 2018, https://scroll.in/latest/875153/tamil-nadu-pollution-control-board-refuses-to-renew-sterlite-coppers-licence-to-operate.

178 'NGT orders reopening of Sterlite plant in Tamil Nadu', The Hindu, Business Line, 16 December 2018, https://www.thehindubusinessline.com/news/national/ngt-orders-reopening-of-sterlite-plant-in-tamil-nadu/article25751269.ece.

2018 ordered the reopening of the Copper Plant.[179] Additionally, the Bench directed Sterlite to spend Rs. 100 crores within a period of three years for the welfare of the inhabitants in the area.[180] The Tribunal opined that the Tamil Nadu government's order was unjustifiable. Preceding the final order, a three-member panel was formed to look into the closure of the Copper Plant. The panel visited the Copper Plant in September 2018 to conduct observations, and subsequently in October 2018 also held public consultations in Thoothukudi and Chennai.[181] The panel in its report, submitted to the NGT in November 2018, had said that the decision to shut down the Copper Plant was not sustainable and against the principles of natural justice.[182]

However, the Madras High Court (MHC) restrained the reopening of the Copper Plant for a month and ordered status quo to continue as it existed before the NGT order.[183] Parallelly, the Tamil Nadu government moved the Supreme Court (SC) challenging the NGT order.

In the plea, the government claimed that the NGT had erroneously set aside various orders by the TNPCB and the Tamil Nadu government without considering the data and evidence that proved that the Copper Plant had irreversibly polluted the ground water in and around Thoothukudi.[184] Furthermore, the government argued that the NGT was not a constitutional court like the SC and cannot employ unbridled powers to constitute committees, as it did in the present case.[185] Besides, the appeal also contended that the NGT had no jurisdiction to adjudicate upon the validity of a government order.[186]

Subsequently, on 18 February 2019, the SC rendered its judgment setting aside the NGT order that allowed reopening of the Copper Plant.[187] The SC held that the NGT does not have the jurisdiction to entertain appeals against government orders and order reopening of the plant. At

---

179 *Vedanta Limited v. State of Tamil Nadu & Ors.*, Appeal No. 87/2018 (M.A. No. 1741/2018 & M.A. No. 1747/2018).

180 'NGT orders reopening of Sterlite plant in Tamil Nadu', The Hindu, Business Line, 16 December 2018, https://www.thehindubusinessline.com/news/national/ngt-orders-reopening-of-sterlite-plant-in-tamil-nadu/article25751269.ece.

181 S Senthalir, 'Sterlite Copper row: Activists question neutrality of NGT panel that found closure of plant illegal', Scroll, 29 November 2018, https://scroll.in/article/903809/sterlite-copper-row-activists-question-neutrality-of-ngt-panel-that-found-closure-of-plant-illegal.

182 'Vedanta Sterlite case: NGT sets aside Tamil Nadu order to close copper plant, state to move SC', Scroll, 15 December 2018, https://scroll.in/latest/905817/vedanta-sterlite-case-ngt-sets-aside-tamil-nadu-order-to-close-copper-smelter-plant-permanently.

183 'Sterlite case: Madras High Court restrains Vedanta from reopening Thoothukudi plant for a month', Scroll, 21 December 2018, https://scroll.in/latest/906610/sterlite-case-madras-high-court-restrains-vedanta-from-reopening-thoothukudi-plant-for-a-month.

184 Press Trust of India, 'Tamil Nadu moves SC against order to reopen Sterlite plant', LiveMint, 03 January 2019, https://www.livemint.com/Companies/bOcK38pAZpeE5VBo7GH5UL/Tamil-Nadu-govt-moves-SC-against-NGT-order-on-Vedantas-Ster.html.

185 Krishnadas Rajagopal, 'Tamil Nadu moves SC against NGT order to reopen Thoothukudi Sterlite plant', The Hindu, 02 January 2019, https://www.thehindu.com/news/national/tamil-nadu/tn-moves-sc-against-ngt-order-on-sterlite-plant-at-thoothukudi/article25890451.ece.

186 'Tamil Nadu moves Supreme Court against NGT order allowing Vedanta to reopen Thoothukudi plant', Scroll, 02 January 2019, https://scroll.in/latest/907905/tamil-nadu-moves-supreme-court-against-ngt-order-allowing-vedanta-to-reopen-thoothukudi-plant.

187 *Tamil Nadu Pollution Control Board v. Sterlite Industries (I) Ltd. & Ors.*, Civil Appeal Nos. 4763-4764 of 2013.

the same time, the SC added that Vedanta had the liberty to approach the MHC for interim relief.[188]

The MHC in turn in its judgment dated 18 August 2020 confirmed the orders of the TNPCB and the Tamil Nadu government, dismissing all appeals filed by Sterlite.[189] The MHC held that, "*when it comes to economy pitted against environment, environment will reign supreme. Therefore, economic considerations can have no role to play while deciding the sustainability of a highly polluting industry and the only consideration would be with regard to safeguarding the environment for posterity and remedying the damage caused.*"[190]

The proceedings in the case before the MHC were remarkably different from any other in Sterlite's history. For one, it had six public interest respondents, one of them being Fatima Babu. Moreover, the MHC judgment, along with criticising Vedanta, the alleged violator, also came down heavily on TNPCB, the regulator, and to a lesser degree on the district administration. The MHC opined that the regulator failed to discharge their duties diligently bearing in mind the purpose for which it was constituted. Fatima Babu, the ninth respondent in the case, that the judgment referred to often, also brought to the court's notice various environmental transgressions, whilst alleging that neither the State nor the TNPCB had taken actions against such violations. This was highlighted especially in concerns related to (i) improper location and violation of master plan, (ii) unlawful expansion of the Copper Plant, (iii) repeated non-compliance, (iv) slag dumps, (v) hidden mercury emissions, (vi) unreliable air quality monitoring, and (vii) hazardous waste authorisation, among others.[191]

In December 2020, the SC denied interim relief to Vedanta's plea against the MHC judgment.[192] However, most recently in May 2021, during the peak of the second wave of the Covid-19 pandemic in India, the Copper Plant was brought back to life as the potential answer to the oxygen requirements of Tamil Nadu's Covid patients.[193] Three years on, the concerns of the activists, local groups, and villagers about the Copper Plant stand strong, but they have expressed support for the temporary resumption of operations. To ease concerns of the people, the District Collector R. Senthil has created a citizen-inclusive oversight committee who will

---

188 'Sterlite issue: SC order setting aside NGT verdict welcomed by Thoothukudi residents', The New Indian Express, 18 February 2019, https://www.newindianexpress.com/states/tamil-nadu/2019/feb/18/sterlite-issue-sc-order-setting-aside-ngt-verdict-welcomed-by-thoothukudi-residents-1940308.html.

189 *Vedanta Limited v. State of Tamil Nadu and Ors.*, Writ Petition Nos. 5756, 5764, 5771, 5772, 5773, 5774, 5776, 5792, 5793, 5801 and 21547 of 2019.

190 Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

191 V. Venkatesan, 'Madras HC refuses Vedanta's plea to reopen polluting Sterlite plant. Says government must listen and not scuttle public voices', The Leaflet, 25 August 2020, https://www.theleaflet.in/madras-hc-refuses-vedantas-plea-to-reopen-polluting-sterlite-plant-says-government-must-listen-and-not-scuttle-public-voices/.

192 'SC denies interim relief to Vedanta, refuses reopening of Sterlite plant', Business Today, 13 May 2021, https://www.businesstoday.in/current/corporate/sc-denies-interim-relief-to-vedanta-refuses-immediate-reopening-of-sterlite-plant-in-tamil-nadu/story/423637.html.

193 Soniya Agrawal, 'In Tuticorin, Sterlite Copper is slogging to cope with new medical oxygen supplier avatar', The Print, 20 May 2021, https://theprint.in/india/in-tuticorin-sterlite-copper-is-struggling-to-cope-with-new-medical-oxygen-supplier-avatar/661336/.

have access to CCTV footage of the Copper Plant to assure that copper production has not started.[194]

All these government and judicial orders have had an overarching impact on people in and around Thoothukudi. People associated and dependent on the Copper Plant in terms of employment and business have seen their lives and livelihoods wither away. At the same time, the local and the national economy have been impacted greatly, in the backdrop of the alleged environmental and health harms caused by the Copper Plant. There has been a huge loss in terms of employment (direct and indirect), revenues and profits for dependent businesses, and the overall volume and value of trade in India. At the same time, the environmental concerns leading to health harms such as chronic fatigue, asthma and respiratory diseases, Ear, Nose, Throat (ENT) disorders, menstrual disorders and much more have been established through various reports and studies.

2. Objective

In light of the background and context to the case, this study attempts to dispassionately analyse the first order direct economic impact of the closure of the Copper Plant, if any, on the relevant stakeholders of the ecosystem engaged with the Copper Plant. The purpose is not to understate or undervalue the environment and health harms caused by the Copper Plant, which have been established and analysed by various studies and reports but to analyse hitherto the economic impact on stakeholders who were directly and completely dependent on the Copper Plant. On those lines, the overarching aim is to institutionalise a holistic and balanced thinking in all ranks of decision and policy making, to harmonise the economic and environmental interests for the larger welfare of the society, and to evaluate as to what would be the best remedy to balance the conflict between environment and economic development.

3. Scope

The scope of the study is defined by three parameters as outlined below:

- **Location**: Vedanta's Sterlite Copper Plants are located at two locations – Thoothukudi, Tamil Nadu and Silvassa, Dadra and Nagar Haveli. The scope of the study is limited to the Sterlite Copper Plant located in Thoothukudi, Tamil Nadu since the orders of closure do not concern the plant situated at Silvassa.
- **Extent of Analysis**: The study analyses only the first order direct impact on key stakeholders such as employees/workers, dependent businesses and service providers among others, caused due to the closure of the Copper Plant.
- **Duration**: To meet the purpose and objective of the study, the assessment period has been calculated as 28 months starting from the date of judgment by the SC i.e., 18 February 2019 to 31 May 2021.

[194] Soniya Agrawal, 'In Tuticorin, Sterlite Copper is slogging to cope with new medical oxygen supplier avatar', The Print, 20 May 2021, https://theprint.in/india/in-tuticorin-sterlite-copper-is-struggling-to-cope-with-new-medical-oxygen-supplier-avatar/661336/.

4. Methodology

The study adopted an evidence-based, bottom-up approach to better understand and analyse the economic impact, if any, on relevant stakeholders due to the closure of the Copper Plant. In furtherance of that, an extensive review of existing literature related to the case was conducted, followed by field visits and in-depth interviews with key stakeholders who might have been impacted due to the closure.

4.1. Secondary Research

A thorough review of relevant judicial decisions and literature has been conducted to better understand the history to the case and the varied levels of impact caused which led to the closure of the Copper Plant, and the economic impact in the aftermath of the closure of the Copper Plant to inform the stakeholder mapping and data analysis. Various industry reports, the data received from stakeholder interactions, and official trade data have been relied on to map the impact on the Indian economy, including the local economy of Thoothukudi.

4.2. Stakeholder Mapping and Sampling

Based on secondary literature's insights, an extensive mapping of relevant stakeholders with respect to the Copper Plant was undertaken. The rationale for this exercise was to identify key stakeholders whose perspectives would need to be represented in the research and findings. Table 1 provides an overview of the categories of stakeholders identified and interviewed. Along with that, it also shows the key queries for each category of stakeholder.

Table 1: Overview of the Categories of Stakeholders Identified

Category	Details	Key Queries
Enterprise	Vedanta Ltd. Sterlite Copper	• History to the Case • Impact on Revenue and Profit • Impact on Taxes Paid • Impact on Employment and Salaries
Businesses	Downstream, Service Providers, Upstream	• Perception on the Case • Impact on Cost of Procurement • Impact on Production and Supply • Impact on Revenue • Impact on Quality • Availability of Alternatives to Sterlite
Workers / Employees	Managerial, Supervisory, Contractors, Local Workers, Machine Operators, Maintenance Workers	• Perception on the Case • Availability of Alternative Employment Opportunities • Impact on Salaries • Impact on Livelihood
Associations	Copper, Stevedores, Lorry Owners, Chemical Industries	• Perception on the Case • Impact on Product/Service Specific to the Association
Journalists	Various News Organisations	• History to the Case • Identify Stakeholders • Perception on the Case

Table 1: Overview of the Categories of Stakeholders Identified		
Category	**Details**	**Key Queries**
		• Ground-level Realities and Issues
Government Authorities	State Government, State and Central Pollution Control Boards, Administrative Personnel	• Implementation-level Issues • Regulatory Issues • Environmental Issues and Concerns • Perception on the Case and the Way Forward
Community	Environmental Activists, Villagers, Protestors	• Perception on the Case • Counterfactuals to the Economic Impact • Environment and Health Impacts

To ensure a comprehensive stakeholder outreach, keeping in mind the constraints caused due to the Covid-19 pandemic and other location-specific challenges, purposive sampling was chosen to determine the sample. A list of initial stakeholders was identified through secondary research and email and telephonic interactions, followed by snowballing techniques to identify more stakeholders.

4.3. Tools and Methods of Data Collection

Data collection from primary sources was undertaken through a multi-pronged approach comprising initial email and telephonic interactions followed by extensive field inquiries. The main data collection tools used were Key Informant Interviews (KIIs) and Focused Group Discussions (FGDs) supported by structured and semi-structured questionnaires. In addition to KIIs and FGDs, visits were made to sites near the Copper Plant (including nearby villages), mechanical and maintenance plants, chemical plants, and more to validate findings and capture visuals. Table 2 highlights a detailed break-up of the sample studied.

Table 2: Detailed Break-up of the Sample Studied			
Category	**Details**	**Mode**	**Sample Studied**
Enterprise	Vedanta Ltd. Sterlite Copper	Email + Field Visit	1
Downstream Businesses	Phosphoric Acid	Field Visit	1
	Copper Cathode/Rod	Telephonic	4
Service Providers	Mechanical and Maintenance	Field Visit	6
	Warehouse	Field Visit	1
	Infrastructure & Technology	Field Visit	1
	Stevedore-Cargo	Field Visit	4
	Lorry	Field Visit	2
Workers / Employees	Supervisory, Contractual, Permanent	Field Visit	6
Associations	Copper, Stevedores, Lorry Owners, Chemicals Industries	Field Visit	2

Table 2: Detailed Break-up of the Sample Studied			
Category	**Details**	**Mode**	**Sample Studied**
Journalists	Various News Organisations	Email + Telephonic	4
Community	Residents of Villages Near the Copper Plant	Field Visit	6

4.4. Framework of Data Analysis

The data analysis component for this study can be divided into two broad categories: quantitative and qualitative. For both methods of data analysis, the framework as represented in Figure 1 was followed.

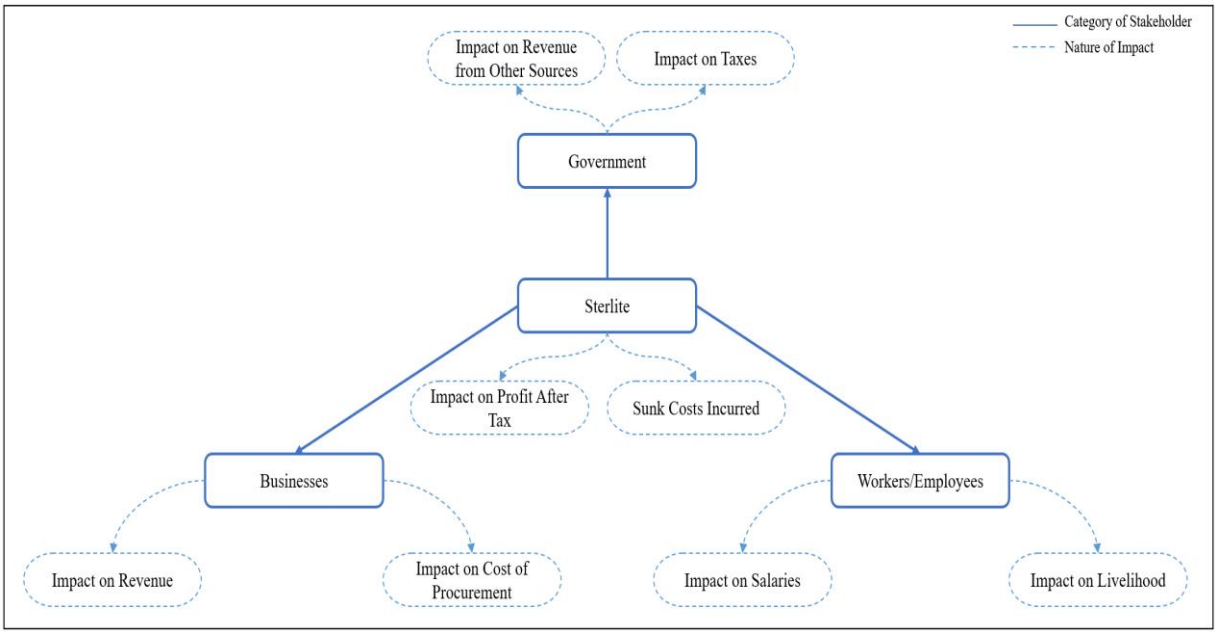


Figure 36: Framework of Data Analysis

The framework was designed after mapping key stakeholders who might have been impacted due to the closure of the Copper Plant. The four main categories of stakeholders which were directly impacted included: the workers/employees, the associated businesses, the Copper Plant itself, and the government. The framework also highlights the nature of impact studied and analysed for each category of stakeholder. This includes:

- **Workers/Employees**: The impact on workers/employees associated with the Copper Plant was analysed through the Copper Plant's salary bills. The data provided by Sterlite was relied on. The rationale being that the number of workers/employees interviewed (telephonically and on field) were not sufficient to enable extrapolations for all workers/employees without risking inflating the overall impact. However, the data received from interactions with workers/employees (contractual employees) was also analysed and triangulated to check consistency between both sets of the data.
- **Businesses**: When analysing the impact on businesses, the category was further divided into two kinds of businesses – downstream businesses i.e., businesses who procured raw material from Sterlite and service providers to the Copper Plant. For downstream

businesses, the impact on cost of procurement was analysed. In furtherance of that, the data provided by Sterlite with respect to the selling price of each product was relied on, along with the Annual Export Import Data Bank (Data Bank) maintained by the Ministry of Commerce and Industry, Government of India. The Data Bank was used to ascertain the price of the same products when imported, basis telephonic interactions with businesses who highlighted that after Copper Plant's closure, their major source of procurement was from international sources. On the other hand, for service providers, the impact on revenue was analysed. The data for revenue was collected through stakeholder interactions and then extrapolated to reflect the probable impact on all service providers associated with Sterlite. The rationale behind choosing to analyse the revenues of service providers was to show the total impact (inclusive of impact on associated stakeholders such as workers).

- **Sterlite**: The impact on the Copper Plant was analysed on the basis of impact on its Profit After Tax (PAT) and the total sunk cost incurred due to closure of the Copper Plant. For that purpose, the data provided by Sterlite was relied on. Considering the data on taxes paid and salary bills of the Copper Plant are analysed separately to ascertain impact on other stakeholders, the PAT figures were used (instead of revenue) to discount double-counting in the analysis. However, to better understand the impact, the impact on the production levels and revenue for the Copper Plant have also been highlighted, although the same have not been used to calculate the net impact.
- **Government**: The impact on taxes paid by the Copper Plant is analysed. At the same time, the impact on the exports and imports (both volume and value) of copper related products has also been highlighted to better understand the impact on the Indian economy. Moreover, the impact on the revenues to the Government by way of fuel costs for power and water that were procured from government run utilities by Sterlite are also analysed. The data provided by Sterlite with respect to taxes paid, fuel costs and percentage of exports of Sterlite's total volume of production was relied on, in addition to the official Data Bank.[195] However, when ascertaining the net impact, only the impact on taxes and revenue from other sources i.e., power and water have been calculated. The impact on the exports and imports of copper related products is not included as the same would first be accrued by the Copper Plant itself, and thus would be included in the impact on PAT for the Copper Plant.

Thus, for the quantitative method of data analysis the metric as explained above were used to ascertain the total economic impact on the ecosystem due to the closure of the Copper Plant.

$$\text{Total Economic Impact} = \text{Workers/Employees}_{(\text{Salary Bills})} + \text{Businesses}_{(\text{Cost of Procurement + Revenue})} + \text{Sterlite}_{(\text{PAT + Sunk Costs})} + \text{Government}_{(\text{Taxes + Revenue from Other Sources})}$$

Pursuant to extrapolating the initial data findings for the total number of stakeholders in each category (based on interactions with stakeholders in field), the findings were further calculated to highlight the impact as per duration (in months). On that line, finding for each category of stakeholder, along with the total economic impact has been calculated for two durations: 'assessment period' which was approximately 28 months from 18 February 2019 to 31 May

[195] The trade data was studied and analysed for two products: Copper Cathode (HS Code – 74031100) and Copper Rod (HS Code – 74081190). The Data Bank can be accessed at https://tradestat.commerce.gov.in/eidb/default.asp.

2021 (as per the defined scope of the study basis, the date of the SC judgement) and 'period of closure', approximately 36 months from 23 May 2018 to 31 May 2021 (defined basis the date of order of the TNPCB suspending operations of the Copper Plant). The impact for the period of closure is calculated to highlight the whole economic impact since the closure of the plant.

Additionally, it has been ensured that all data collected and analysed is specific to the Copper Plant in Thoothukudi and does not include data from the Sterlite Copper Plant located in Silvassa. This ensured minimising variations in the final net impact calculations.

With respect to the qualitative method of data analysis, a case study approach has been adopted, where crucial and relevant insights from the field have been captured to highlight the on-ground realities and challenges. Such case studies have helped enrich the findings and make them more human-centric, in-depth and nuanced.

Based on the framework outlined above, the total economic impact on the ecosystem has been calculated, whilst highlighting the on-ground realities and challenges faced by affected stakeholders. The findings have led to certain general and specific actionable recommendations which might help foster holistic and balanced thinking and decision making at all levels of the government.

4.5. Ethical Considerations

Ethical considerations are crucial while conducting social research given this involves interaction with human respondents, including affected and vulnerable groups. For this purpose, at all stages of the study, ethical codes have been followed, including:

- **Informed Consent**: The research team ensured informed consent of all participating respondents with the aim to eliminate information asymmetry.
- **Privacy**: Unless otherwise agreed, throughout the study, due importance and care has been given to maintaining the confidentiality of information and anonymity of respondents given the sensitive nature of the data and the case being studied.

4.6. Limitations of the Study

While the research methodology and approach has aimed to provide a comprehensive picture, there have been certain limitations as outlined below:

- The Covid-19 pandemic has caused significant operational challenges impacting the field visit component leading to reduced participation of respondents.
- A substantial amount of data was received and relied on from Sterlite itself, minimising the scope of independently verifying all the data.
- The objective of the study also limited the scope to analysing the economic impact, without quantifying and accounting for the monetary value of consequential environmental impacts.
- The sensitive nature of the case being studied also impacted the extent of participation of stakeholders. Furthermore, given the objective of the study, certain categories of stakeholders with different and diverse perspectives were not willing to engage, such as environmentalists, activists, and village administrators, among others.
- Reduced participation, due to reasons mentioned above and otherwise, furthered the non-availability of data through primary sources.

5. Theoretical Framework: Review of Existing Literature

The Copper Plant closure case has various nuances and debates attached to it. Primarily, the debate has been construed to be an environment against development conflict. However, upon a closer look, there are other crucial factors and linkages which require careful exploration and understanding.

5.1. Economic Concerns

The closure of the Copper Plant inflicted wide-scale economic impact on the local economy, the players in the supply-chain of the Copper Plant, the State and Union Government, and livelihood of various people directly and indirectly dependent on the Copper Plant.

According to some estimates, this impact translates to nearly US$ 2.00 billion in the two-and-a-half-year period after the closure of the Copper Plant.[196] With the Copper Plant contributing close to 40% to the copper production in India, its closure has amounted to significant losses in terms of Foreign Exchange (Forex), cutting down the country's net production by 46.1%.[197] This drastic fall in production turned India, a net exporter of copper cathode until 2018, into an importer after 18 years.[198] This loss is estimated to the tune of Rs. 14,000 crores by some experts referring to the economic concept of Domino Effect,[199] as cited in media articles.[200] Moreover, the government is also losing sizable revenue in form of taxes and duties. It is estimated that the Copper Plant paid up to Rs. 2559 crores annually to the exchequer by way of taxes and other statutory contributions.[201]

The Copper Plant itself has become a loss-making venture incurring as much as Rs. 5 crores per day since its closure.[202] In an affidavit submitted to the MHC in 2019, Sterlite claimed maintenance damages of almost Rs. 100 crores in a year to the Copper Plant because of the negligence on part of district authorities, as they were not allowed to reopen the Copper Plant even for maintenance purposes.[203]

---

196 Press Trust of India, 'Closure of Copper Plant Sends Shock Waves to Investors; Leads to Forex Outgo of Rs 40k Crore', 26 August 2020, The Hindu, https://www.thehindu.com/business/Industry/closure-of-copper-plant-sends-shock-waves-to-investors-leads-to-forex-outgo-of-40k-crore/article32445069.ece.

197 S Godson Wisely Dass, 'Shuttered, Thoothukudi Sterlite Copper plant incurs Rs 5 crore loss every day', The New Indian Express, 28 May 2020, https://www.newindianexpress.com/states/tamil-nadu/2020/may/28/shuttered-thoothukudi-sterlite-copper-plant-incurs-rs-5-crore-loss-every-day-2149085.html.

198 M R Subramani, 'This is what the closure of Thoothukudi Sterlite Copper Plant appears to be costing India', Swarajya, 10 February 2020, https://swarajyamag.com/news-brief/this-is-what-the-closure-of-thoothukudi-sterlite-copper-plant-appears-to-be-costing-india.

199 A domino effect or chain reaction is the cumulative effect produced when one event sets off a chain of similar events.

200 S Godson Wisely Dass, 'Shuttered, Thoothukudi Sterlite Copper plant incurs Rs 5 crore loss every day', The New Indian Express, 28 May 2020, https://www.newindianexpress.com/states/tamil-nadu/2020/may/28/shuttered-thoothukudi-sterlite-copper-plant-incurs-rs-5-crore-loss-every-day-2149085.html.

201 Shantanu Guha Ray, 'Sterlite closure hinders Atmanirbhar Bharat, crushes livelihoods', Sunday Guardian Live, 29 August 2020, https://www.sundayguardianlive.com/news/sterlite-closure-hinders-atmanirbhar-bharat-crushes-livelihoods.

202 S Godson Wisely Dass, 'Shuttered, Thoothukudi Sterlite Copper plant incurs Rs 5 crore loss every day', The New Indian Express, 28 May 2020, https://www.newindianexpress.com/states/tamil-nadu/2020/may/28/shuttered-thoothukudi-sterlite-copper-plant-incurs-rs-5-crore-loss-every-day-2149085.html.

203 S Godson Wisely Dass, 'Shuttered, Thoothukudi Sterlite Copper plant incurs Rs 5 crore loss every day', The New Indian Express, 28 May 2020, https://www.newindianexpress.com/states/tamil-nadu/2020/may/28/shuttered-thoothukudi-sterlite-copper-plant-incurs-rs-5-crore-loss-every-day-2149085.html.

In another direct consequence of the Copper Plant's closure, the jobs of close to 14,000 people are claimed to have been lost. If the indirect jobs are considered, the net loss of employment comes to almost 30,000 jobs.[204] The closure of the Copper Plant is estimated to have significantly impacted the incomes of the people who lost their jobs, cutting their monthly incomes by at least 50% while rendering many jobless.[205]

Various media articles also shed light on the fact that while almost all permanent employees have been absorbed by Sterlite in its group companies, the temporary and contractual employees who were dependent on the Copper Plant have been severely hit due to the closure. By rough estimates, hundreds of contractual employees have lost their jobs, with many yet to find alternate employment, and some leaving the town of Thoothukudi.[206]

Furthermore, various connected businesses, either in the upstream or downstream side of the value-chain, have been reported to be drastically affected by the closure of the Copper Plant. By a close estimate, around 400 downstream industries were associated with the Copper Plant, employing approximately 100,000 people. The Copper Plant was also the only indigenous supplier of phosphoric acid, as against imports, one of its main by-products with many downstream businesses' dependent on the same. It was also the key supplier of slag and gypsum to close to 20 cement companies in the region.[207]

Moreover, the Copper Plant was the largest supplier of sulphuric acid in southern India, affecting more than 150 companies due to the stoppage of sulphuric acid supplies.[208] The President of the Chemical Industries Association, S. Ilanahia was quoted in the media saying that the price of the sulphuric acid increased from Rs. 4000 per tonne to Rs. 10,000 per tonne in a matter of months.[209]

The permanent shutdown of the Copper Plant has also crippled the fertiliser and detergent industry with manufacturers being forced to buy raw materials from far-away states leading to financial losses.[210]

Various companies and businesses have faced constraints in the aftermath of the closure of the Copper Plant ranging from reduced levels of production, increased cost of procurement, increased job losses and unemployment, huge penalties owing to the inability of companies to

---

[204] '14,000 direct jobs at stake, say industry association', The Hindu, 06 July 2018, https://www.thehindu.com/news/national/tamil-nadu/14000-direct-jobs-at-stake-say-industry-associations/article24344377.ece.

[205] D Govardan, 'Sterlite workers face uncertain future', The Times of India, 04 June 2018, https://timesofindia.indiatimes.com/city/chennai/sterlite-workers-face-uncertain-future/articleshow/64442388.cms.

[206] Sivapriyan, 'Sterlite Copper closure cripples downstream industries', Deccan Herald, 20 January 2019, https://www.deccanherald.com/business/sterlite-copper-closure-714015.html.

[207] Shantanu Guha Ray, 'Sterlite closure hinders Atmanirbhar Bharat, crushes livelihoods', Sunday Guardian Live, 29 August 2020, https://www.sundayguardianlive.com/news/sterlite-closure-hinders-atmanirbhar-bharat-crushes-livelihoods.

[208] 'Small units, contractors fume over stoppage of sulphuric acid supplies post Sterlite closure', Business Line, 06 July 2018, https://www.thehindubusinessline.com/news/small-units-contractors-fume-over-stoppage-of-sulphuric-acid-supplies-post-sterlite-closure/article24353939.ece.

[209] 'Small units, contractors fume over stoppage of sulphuric acid supplies post Sterlite closure', Business Line, 06 July 2018, https://www.thehindubusinessline.com/news/small-units-contractors-fume-over-stoppage-of-sulphuric-acid-supplies-post-sterlite-closure/article24353939.ece.

[210] Sivapriyan, 'Sterlite Copper closure cripples downstream industries', Deccan Herald, 20 January 2019, https://www.deccanherald.com/business/sterlite-copper-closure-714015.html.

meet their contractual export obligations, and increased reliance on imports transcending to greater cost implications for the end consumers, among others.[211]

The livelihoods of thousands who are part of this ecosystem including truckers, contractors, labourers, real estate market, and even tea shops that came up around the Copper Plant have all been severely impacted since the closure.[212] By rough estimates, the Copper Plant used to spend around Rs. 600 crore per year on logistics, material purchases and other requirements which are now non-existent.[213]

The V.O. Chidambaranar Port too has been affected, to the effect that the Customs Department accrued a loss of Rs. 1000 crores within 6 months of the closure of the Copper Plant.[214] Sterlite used to pay this amount as duty for importing copper concentrate ore.

The impact of the closure of a corporation on stakeholders at all ranks of the supply-value chain, indicates the high dependence of the local economy on such corporations, especially in a town like Thoothukudi, where most services revolve around a few industries that operate there.[215]

The impact on the economy has reverberated across the city and region. Local people, speaking to various media outlets, have said that Thoothukudi owes its growth to the rapid strides that the Copper Plant had made in the last few years. As cited in one media article, a Thoothukudi resident summed up the economic loss to the Thoothukudi city as: "*If we work out an average of Rs. 10,000 salaries for over 20,000 people affected by this closure, together their earnings will make up to Rs. 20 crores every month. Say, if they spend half of it to buy provisions, garments, and other things, it means at least Rs. 10 crores of money have been lost by various businesses, which deal with these products and depend on these incomes.*"[216]

5.2. Environmental and Health Concerns

There have been concerns looming over the adverse environmental footprint of the Copper Plant ever since the first Environmental Impact Assessment (EIA) was carried out by the National Environmental Engineering Research Institute (NEERI) in 1998. Subsequently, NEERI conducted 4 EIA studies between 1998 and 2011.[217] The first EIA was conducted at

---

[211] K.T. Jagannathan and Sangeetha Kandavel, 'Sterlite closure taking a toll on downstream units', The Hindu, 29 August 2018, https://www.thehindu.com/business/sterlite-closure-taking-a-toll-on-downstream-units/article24812870.ece.

[212] Sharan Poovanna, 'Employees, local economy get caught in the crossfire in Sterlite Copper fiasco', LiveMint, 20 August 2020, https://www.livemint.com/news/india/employees-local-economy-get-caught-in-the-crossfire-in-sterlite-copper-fiasco-11597920588699.html.

[213] Sharan Poovanna, 'Employees, local economy get caught in the crossfire in Sterlite Copper fiasco', LiveMint, 20 August 2020, https://www.livemint.com/news/india/employees-local-economy-get-caught-in-the-crossfire-in-sterlite-copper-fiasco-11597920588699.html.

[214] Shantanu Guha Ray, 'Sterlite closure hinders Atmanirbhar Bharat, crushes livelihoods', Sundary Guardian Live, 29 August 2020, https://www.sundayguardianlive.com/news/sterlite-closure-hinders-atmanirbhar-bharat-crushes-livelihoods.

[215] Sharan Poovanna, 'Employees, local economy get caught in the crossfire in Sterlite Copper fiasco', LiveMint, 20 August 2020, https://www.livemint.com/news/india/employees-local-economy-get-caught-in-the-crossfire-in-sterlite-copper-fiasco-11597920588699.html.

[216] M R Subramani, 'How the Thoothukudi Sterlite plant closure has affected the local economy', Swarajya, 25 December 2018, https://swarajyamag.com/economy/how-the-thoothukudi-sterlite-plant-closure-has-affected-local-economy.

[217] Akshit Sangomla, 'Sterlite typifies all that's wrong with environmental governance in India', Down To Earth, 27 June 2018, https://www.downtoearth.org.in/news/governance/sterlite-typifies-all-that-s-wrong-with-environmental-governance-in-india-60877.

the behest of a TNPCB order, that found the Copper Plant to be a polluting entity. However, all subsequent EIA reports by NEERI gave a clean chit to the Copper Plant, despite having highlighted in the 'Observations' section of the reports that the Copper Plant was polluting and environmentally harmful. Nevertheless, the reports concluded that the Copper Plant had not flouted any environmental norms. Such inconsistencies in NEERI reports have been touted as one of the reasons why the environmental harms emanating from the Copper Plant were not addressed and corrected in a timely manner.

For instance, the second report in 1999 found more than the permissible amounts of certain groundwater pollutants in some of its samples including lead, cadmium, selenium, arsenic, magnesium, and copper in and around the factory. On the other hand, the Observations section of the 2011 report stated that the study did not find any marker pollutants like arsenic, zinc and fluorides in the samples collected despite the fact that the data provided in the same study showed that in 50% of the samples from piezometric wells, fluoride concentration was above the permissible limits.[218]

Another notable mention from the 2011 report was the presence of radon, a radioactive gas, in the vicinity of the plant in the range of 5 to 23 Bq/m3,[219] which the report claimed to be insignificant as there are no international or national standards to compare the same. However, as pointed out by various experts, the United States Environment Protection Agency provides for this limit as being 14.8 Bq/m3.[220] There were also traces of iron, magnesium, calcium, and sulphates in excessive amounts in the areas surrounding the factory. However, the 2011 study shifted the blame for this finding to other chemical industries located in the region.[221]

Another scientific environmental concern associated with the Copper Plant relates to the past SO2 gas leakages and the fear of the possibility of it happening again. The gas leak happened twice, in 1997 and 2013. The MHC in its order of August 2020 also took cognisance of this matter, giving due importance to the facts presented by the experts.[222] These were pertaining to the inadequate height of chimney stacks in the sulphuric acid plant leading to exceedingly high levels of SO2 as recorded by the monitoring device at the Copper Plant.

One of the key causes of environmental concern in this case is the copper slag, which is a waste product of smelting operations rich in toxic elements like arsenic, iron, zinc, and lead. According to reports, from 2011 to December 2017, the Copper Plant generated 39,15,901 metric tonnes (MT) of copper slag and disposed of 7,437,327 MT which included the old stock.

---

[218] Akshit Sangomla, 'Sterlite typifies all that's wrong with environmental governance in India', Down To Earth, 27 June 2018, https://www.downtoearth.org.in/news/governance/sterlite-typifies-all-that-s-wrong-with-environmental-governance-in-india-60877.

[219] Bq is Becquerel which is a unit of measurement of radioactivity.

[220] Akshit Sangomla, 'Sterlite typifies all that's wrong with environmental governance in India', Down To Earth, 27 June 2018, https://www.downtoearth.org.in/news/governance/sterlite-typifies-all-that-s-wrong-with-environmental-governance-in-india-60877.

[221] Akshit Sangomla, 'Sterlite typifies all that's wrong with environmental governance in India', Down To Earth, 27 June 2018, https://www.downtoearth.org.in/news/governance/sterlite-typifies-all-that-s-wrong-with-environmental-governance-in-india-60877.

[222] *Vedanta Limited v. State of Tamil Nadu and Ors.*, Writ Petition Nos. 5756, 5764, 5771, 5772, 5773, 5774, 5776, 5792, 5793, 5801 and 21547 of 2019.

Additionally, as per news reports, this slag was dumped at ten places outside the premises and the quantity so dumped was 5,37,765 MT.[223]

In another revelation by local environment activist, Fatima Babu, the Copper Plant was also an emitter of mercury in the environment. As per her claims, the plant emitted 25.91 tonnes of mercury between 2004 and 2018 and did not face the flak of any regulatory authority, while the Hindustan Unilever Plant in Kodaikanal was completely shut down for releasing 7.95 kgs of mercury. This highlights the arbitrary yardsticks and flawed governance principles adopted by the TNPCB in discharging its functions.[224]

Furthermore, the key issue of contention on environmental impact has been the data on quality of air. While there are media articles suggesting that the air quality has not seen much change after the closure of the Copper Plant, there are equally significant contrary analyses that suggest otherwise. For instance, an article citing the findings of TNPCB's data for Fisheries College Monitoring Station (located 5 km from the Copper Plant) provides evidence that SO2 levels and NOx levels remained almost unchanged from 2017-2018 (Copper Plant in operation) to 2018-2019 (Copper Plant closed).[225] However, another dataset from SIPCOT Monitoring Station (2 km from the Copper Plant) suggests that the number of unhealthy-air days declined from 56% in the year ending March 2018, when the Copper Plant was still operating, to 27% in 2018-2019, the year after the Copper Plant was closed. In the same period, the number of days with 'acceptable air' increased from 44% to 73%, after the closure of the Copper Plant.[226]

As per medical studies, media reports and other relevant sources of literature, there are significant health manifestations of the environmental concerns associated with the Copper Plant. In 2008, the Department of Community Medicine, Tirunelveli Medical College came out with a report titled "Health Status and Epidemiological Study Around 5 km Radius of Sterlite Industries (India) Limited, Thoothukudi", that compared the health status of residents of villages around the Copper Plant with the average health status of people prevailing in the State with two other locations (where there were no major industries).[227] A population of 80,725 was covered.

The findings of the report indicated prevalence of brain tumours amongst males 1000 times more than the national incidence rate, 12.6% of deaths attributed to nervous diseases, 13.9% respiratory diseases more in the areas close to the Copper Plant, increased incidence of asthmatic bronchitis at 2.8% which was more than double the State average of 1.29%. Additionally, eczematous skin lesions were high (1.38%) in the region, women in the area had

---

223 Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

224 Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

225 Rajesh Chandramouli, 'Quality of air in Tuticorin remains same even after Sterlite closure: RTI', The Times of India, 05 December 2019, https://timesofindia.indiatimes.com/city/chennai/quality-of-air-in-tuticorin-remains-same-even-after-sterlite-closure-rti/articleshow/72378598.cms.

226 Nityanand Jayaraman, 'Tuticorin air quality improves noticeably after Sterlite closure: TNPCB data', 11 December 2019, https://thewire.in/environment/tuticorin-air-quality-aqi-sterlite-copper-smelting-pollution-sipcot-tnpcb.

227 'Health Status and Epidemiological Study Around 5 km Radius of Sterlite Industries (India) Limited, Thoothukudi', Department of Community Medicine, Tirunelveli Medical College, 2008, https://poromboke.files.wordpress.com/2018/03/health-report-sterlite_edited.pdf.

more menstrual disorders and disorders of the joint and musculoskeletal system were significantly elevated in the villages around the Copper Plant.[228]

The scientific attribution of these issues to the Copper Plant is a complex task, given the various medical nuances associated with such a hypothesis. Certain scientists have also said that Tamil Nadu lacks the technical capacity to properly ascertain and control the impact of heavy industries. That meant that, neither the claims of the anti-Sterlite protestors, nor the denials of Vedanta, could be properly scrutinised. Thus, to establish a linear relationship that the Copper Plant is responsible for all the environmental and health concerns in Thoothukudi will not withstand scientific scrutiny until a long-term study is done.[229]

Sterlite in its submissions before the courts also did not challenge the findings of these studies but maintained that it was doing no harm to the society's health or the environment. According to media reports, many residents of the city firmly believe that the Copper Plant's operations enhance the risk of people being diagnosed with cancer. But there are no credible medical studies which prove this. In fact, according to the Tamil Nadu Cancer Registry Project which is jointly run by the Department of Health and Family Welfare, Government of Tamil Nadu, and the Cancer Institute, Adyar, Thoothukudi ranked below the state average incidence of cancer occurrence for the year 2012-2015 with data for the period of post-closure of the Copper Plant still under generation. Cancer specialists further submitted that there is no credible evidence to relate the Copper Plant and incidences of cancer in the local population which could only be ascertained by long-term epidemiological studies.[230]

5.3. Regulatory Lapses and Governance Issues

There have been allegations of lapses on account of regulatory approvals and processes related to the establishment and operations of the Copper Plant. To begin with, the initial location for setting up the Copper Plant was in Ratnagiri, Maharashtra, which was changed to Thoothukudi on account of the Maharashtra state government flagging concerns related to lives and livelihoods of people in the nearby area.[231] However, the TNPCB granted the No-Objection Certification (NoC) to Sterlite asking the company to carry out an EIA and on the condition that the Copper Plant will be situated 25 kms away from the Gulf of Mannar which is an eco-sensitive zone. However, the MoEF issued the Environmental Clearance before Sterlite conducted the EIA, and subsequently the TNPCB issued a Consent to Establish, however, requiring Sterlite to conduct a Rapid EIA, and with the setback condition of 25 kms. The setback condition was violated, and the Copper Plant was built 14 kms from the Gulf of Mannar

[228] Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

[229] Michael Safi, 'Indian copper plant shut down days after deadly protests', The Guardian, 28 May 2018, https://www.theguardian.com/world/2018/may/28/india-copper-plant-sterlite-vedanta-shut-down-deadly-protests.

[230] Poornima Murali, 'Environment vs Employment: Anger, Suspicion Run Wild in Thoothukudi Amid Wait for Sterlite Order', News18, 30 January 2019, https://www.news18.com/news/india/environment-vs-employment-anger-suspicion-run-wild-in-thoothukudi-amid-wait-for-sterlite-order-2018537.html.

[231] K.T. Jagannathan, 'The aftershocks of Sterlite', The Hindu, 09 September 2020, https://www.thehindu.com/opinion/op-ed/the-aftershocks-of-sterlite/article32555205.ece.

Marine National Park.[232] Ignoring the violation of its own license condition on setback, the TNPCB issued the Copper Plant a license to operate in 1996.[233]

In another allegation of flouting environmental norms, the Copper Plant proposed to increase its production capacity from 391 tonnes to 900 tonnes per day in 2004. Despite the SC Monitoring Committee's categorical recommendation to not go ahead with the expansion, the Ministry of Environment and Forest (now the Ministry of Environment, Forest and Climate Change) granted environmental clearance to this expansion. Later, TNPCB claimed that the Copper Plant was illegally producing more than double the amount of copper that it is licensed to produce. Similarly, the MHC order of August 2020 noted that almost 3.52 lakh metric tonnes of slag was dumped along the river Uppar, something that the authorities failed to keep a check on.[234]

Another example of lack of oversight on part of regulatory authorities relates to the air quality monitoring. There has been evidence brought to the notice of courts claiming that the air quality monitoring devices were not effective and were tampered with while producing data relating to quality of air in specific regions. Furthermore, various activists claimed that the EIA reports were fudged to communicate results favourable to the Copper Plant, despite strong evidence against it.[235] Moreover, the clearances for doubling the Copper Plant's capacity in 2018 were granted by the State and Central authorities without conducting a public hearing, as required by law.[236]

Finally, the executive failed in discharging its role as the guardian of law-and-order situation in the State. The protests in 2018 against the Copper Plant were spearheaded by agitated citizens. The favourable order of rejection of consent to operate by the TNPCB was perceived to be a rare success by such activists, as reported by various media articles. This enhanced the momentum of protests and the local police, on 22 May 2018 – the 100th day of the anti-Sterlite protest – in an attempt to control the crowd, opened fire on the thousands of protestors resulting in the death of 13 people.[237]

All these instances of regulatory lapses and governance issues in the history to the Copper Plant case typifies all that is wrong with environmental governance in India. Thus, the practical reality of such environment-development dichotomy entails a wider compass of issues that have a bearing on 'people' – the key element in environment as well as economy. There are

---

[232] Kunal Shankar, 'How a retired Indian professor took on a mining giant – and won', Aljazeera, 07 January 2021, https://www.aljazeera.com/features/2021/1/7/india-how-a-retired-professor-took-on-a-mining-giant-and-won.

[233] Nitayanand Jayaraman, 'History of Sterlite in Thoothukudi: A story of betrayal by crony regulators', The News Minute, 26 March 2018, https://www.thenewsminute.com/article/history-sterlite-thoothukudi-story-betrayal-crony-regulators-78481.

[234] Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

[235] Nityanand Jayaraman, 'Why the Vedanta-Sterlite judgment matters – an annotated deconstruction', Science, The Wire, 24 August 2020, https://science.thewire.in/environment/vedanta-sterlite-thoothukudi-madras-high-court-judgment-environmental-jurisprudence/.

[236] Kunal Shankar, 'How a retired Indian professor took on a mining giant – and won', Aljazeera, 07 January 2021, https://www.aljazeera.com/features/2021/1/7/india-how-a-retired-professor-took-on-a-mining-giant-and-won.

[237] 'Sterlite protest: 13 dead, over 100 hurt; Harsh Vardhan to look into matter', Business Standard, 25 May 2018, https://www.business-standard.com/article/current-affairs/anti-sterlite-stir-13-dead-public-property-worth-rs-10-2-million-damaged-118052500138_1.html.

ways to quantify the monetary relevance of impacts on environment, health, and governance by keeping people at the centre for measurement. For instance, with detrimental environmental conditions, the health risks on people could increase, resulting in a higher incidence of healthcare-related expenditure by these people. Furthermore, every living human being is also an economic entity which contributes significantly to the development and growth of oneself and the nation. Academicians and policy practitioners have time and again invoked the concept of Value of Statistical Life (VSL) as a means to represent this economic value of one human life. This has been estimated at Rs. 44.69 million by a paper in 2018.[238] There can be quantitative estimations made by using such concepts in order to gauge the monetary impact of environmental pollution, in addition to economic impact assessments which are relatively easier to calculate and estimate.

6. Practical Framework: Findings and Results

This Section covers the findings and results of the economic impact assessment undertaken as part of the study, to gauge the economic impact of the closure of the Copper Plant, if any. As described in the data analysis approach above, the findings are structured to cover the impact on three main categories of stakeholders: workers/employees, businesses, and government. This has then led to the results for the total economic impact on the entire ecosystem of the Copper Plant. The detailed methodology, raw input data and calculations for each category of stakeholder can be found in the Technical Appendix.

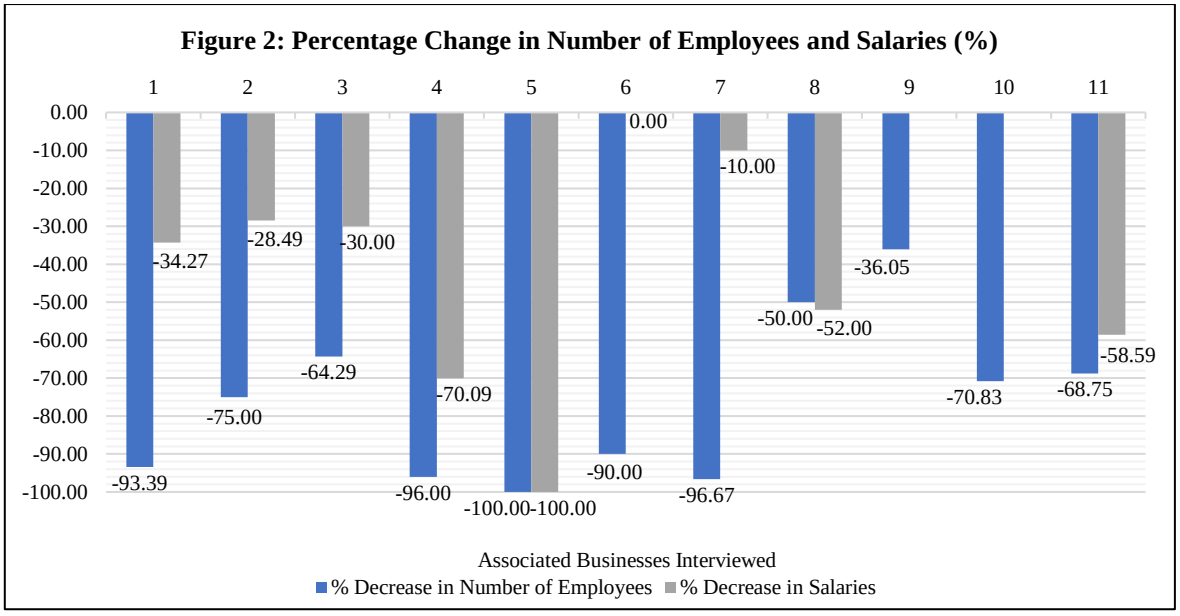
6.1. Impact on Workers/Employees

One of the biggest impacts as a consequence of the closure of the Copper Plant was (and continues to be) faced by the workers/employees of the Copper Plant. Given the scope of the study, the impact on the workers/employees is also limited to direct employment, however, if indirect employment were also to be considered, the impact would be higher.

Having met close to 11 associated businesses (including downstream and service providers), what was made clear was that there has been a disproportionate impact on workers and employees depending on their position and nature of employment. However, in almost all instances, a large number of employees were laid off as businesses could not afford to pay their salaries. At the same time, the employees that were retained saw substantial decrease in their salaries. This is best represented in Figure 2 below, which shows the percentage decrease in the number of employees and salaries for 11 and 09 associated businesses met on field, respectively.[239]

[238] Agamoni Majumder and S Madheswaran, 'Value of Statistical Life in India: A Hedonic Wage Approach', Institute for Social and Economic Change, Working Paper 407, 2018, http://www.isec.ac.in/WP%20407%20-%20Agamoni%20Majumder%20and%20Madheswaran%20-%20Final.pdf.

[239] For associated businesses #9 and #10, data was not provided with respect to the decrease in salaries after the closure of the Copper Plant.



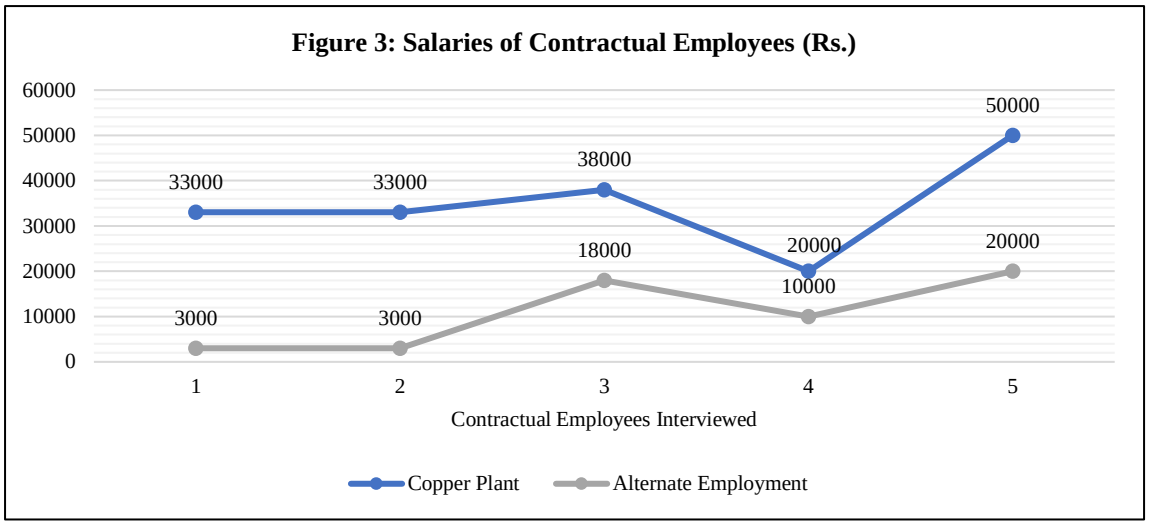
Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

Thus, across all 11 businesses, on average there was a deduction of approximately 77% in the number of employees, and for 09 businesses a 43% reduction in the salaries for the retained employees. There however, have also been extreme impacts, wherein certain businesses were completely shut down, thus causing total retrenchment of all employees. For all 11 businesses, a total number of 1481 people lost their jobs after the closure of the Copper Plant, which means that 1481 families (close to 6813 people[240]) were adversely impacted, due to the decision.

Alternatively, there have been instances where some of the laid off employees were able to find alternate employment. In many cases such alternate employment had a negative impact on the position and salaries of people. A large part of the laid off employees, however, have remained unemployed during the entire period of closure of the Copper Plant. This has impacted the lives and livelihoods of not only the workers and employees, but also those dependent on them.

A similar impact is seen for the direct employees associated with the Copper Plant. Sterlite categorised its employees as permanent and contractual. While the permanent employees were relocated or kept on the job with a decrease in salary, the contractual employees suffered a substantial loss and decline in livelihood. Based on the stakeholder interactions with 05 contractual employees directly working at the Copper Plant, it was found that on an average they incurred approximately 69% loss in their income due to the closure of the Copper Plant. Even though all of them were eventually able to find alternate employment, none of them found it immediately (first six months) after the closure of the Copper Plant, meaning that they had no income for six months. For some of the contractual employees, the current income is also not stable and keeps fluctuating, depending on the availability of work. That is because they had to move on from being mechanical and maintenance workers to undertaking household and manual labour work.

[240] Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

The Figure 3 above shows the salaries earned by the contractual employees when working at the Copper Plant, and the salaries earned at alternate employment post the closure of the Copper Plant. The biggest difference in salaries is for #1 and #2, given they earned Rs. 33,000 when working at the Copper Plant, and now hardly earn Rs. 3000 doing manual labour and household work. It is also interesting to note that from the sample of 05, the first four were mechanical and maintenance workers, while #5 was a supervisor. Thus, while the workers on average saw a decline of 71% in their incomes, the supervisor saw a decline of 60%. Furthermore, the supervisor found a quality alternate job, whereas the workers had no fixed or permanent job. Additionally, it was also found that the total number of mechanical and maintenance workers was close to 150 people, whereas for supervisors it was close to 36 employees. While some from the whole lot (186 employees) might be better placed than others, cumulatively everyone suffered grave impacts in terms of employment, position, and salaries. In fact, we were told that the stakeholders we spoke to are better placed than much of the lot, who have not found any sort of alternate employment.

Such disproportionate impact is graver when comparing the permanent and contractual employees of the Copper Plant. Table 3 shows this impact by analysing the salary bills of Sterlite.[241] Even though some of the employees might have found alternate employment, the same has not been deducted because of lack of enough data.

Table 3: Impact on Employment (Rs. Crores)

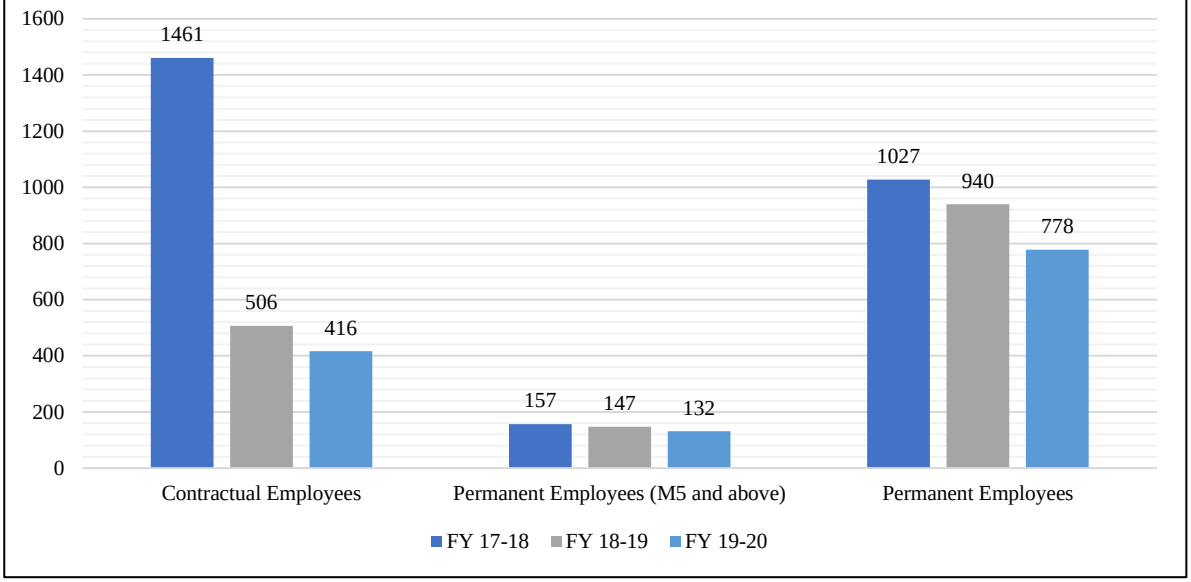
Particulars	Monthly Net Impact	Period of Closure (May'18 – May'21)	Assessment Period (February'19 – May'21)
Impact on Salary Bill of All Permanent Employees	-2.16	-77.84	-60.55
Impact on Salary Bill of All Contractual Employees	-1.90	-68.33	-53.15
Net Impact on Employment		-146.17	-113.70

Source: CUTS' calculations on the basis of the data collected from Sterlite.

[241] The detailed methodology and the raw data are provided in the Technical Appendix.

The difference in the salary bills is also corroborated by the reduction in the number of permanent, permanent (M5 and above[242]), and contractual employees, which is represented in Figure 4 below. However, the data of salary bills was provided only for permanent and contractual employees.

Figure 4: Number of Employees



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

Thus, the net impact on employment due to the closure of the Copper Plant represents (but is not proportionate to) the reduction in the number of permanent, permanent (M5 and above), and contractual employees from 1027 to 778, 157 to 132, and 1461 to 416, respectively from FY 2017-2018 to FY 2019-2020.[243] Clearly, the biggest direct impact was on the contractual employees, whereas the permanent employees were not that greatly affected. The latter is also attributed to the fact that the Copper Plant had a policy of not retrenching permanent employees. The total loss of employment for 1045 contractual employees, means that close to 4807 persons might have been adversely affected (i.e., 1045 families), whereas for permanent employees, 1146 persons (approximately 249 families) might have been adversely impacted due to loss of employment after the closure of the Copper Plant.

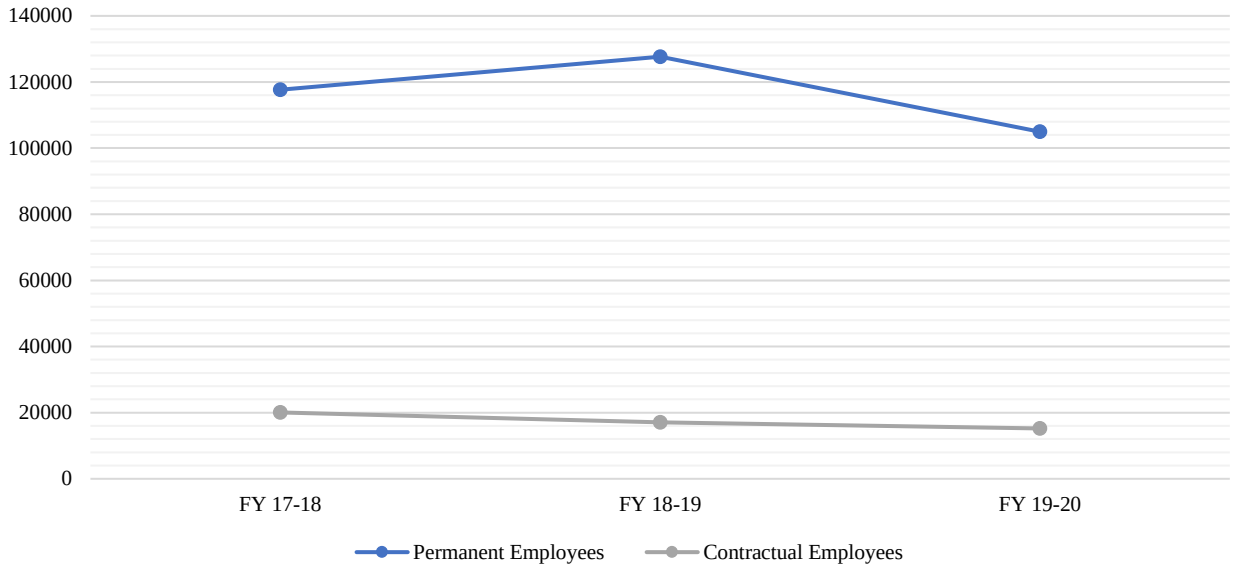
This was however accompanied with a reduced average salary of the retained permanent employees by around 11% and around 24% for the retained contractual employees. Figure 5 highlights this disproportionate impact felt by contractual employees owing to the precarious nature of their employment due to closure of the Copper Plant. This also shows that the immediate impact of the closure of the Copper Plant in FY 2018-2019 was borne by the contractual employees who witnessed a 15% decrease in their average salary. On the other hand, the salaries of the permanent employees saw an increase of approximately 9% in FY 2018-2019 as compared to the previous financial year. However, given that 162 permanent

[242] Associate Managers and above, i.e., the senior management of the company.

[243] The raw data table is provided in the Technical Appendix.

employees were laid off from FY 2017-2018 to FY 2019-2020, the increase in the salary bill could also include lump sum payments or salary arrears. However, that data was unavailable.

Figure 5: Average Monthly Salary Per Employee (Rs.)



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

With respect to contractual employees, it must also be noted that in FY 2017-2018 the average monthly salary per contractual employee was Rs. 20,066 which reduced to Rs. 15,224 in FY 2019-2020. While the difference comes out to Rs. 4842, which might seem a miniscule amount, it is imperative to understand the importance of that difference from the perspective of a contractual employee. A reduction in the number of contractual employees from 1461 to 416, essentially also means that 1045 families (close to 4807 persons[244]) have been greatly impacted. When an entire family is being fed from the income of the employee, a reduction of almost Rs. 5000 per month can have a huge impact, which could cumulate to a loss of Rs. 60,000 per year in income. That could roughly extend to a total loss of Rs. 6.27 crores in income per year for all 1045 families.

It is to be noted here that this impact was also computed in a bottom-up manner by scaling up the net impacts revealed by various workers through the one-to-one interviews during field inquiry, as highlighted for 05 contractual employees in Figure 3. When the same was computed for the whole lot (186 people, as per the conversation on field), the impact came to around Rs. 13 crores and Rs. 16 crores for the assessment period and period of closure, respectively. When the same was extrapolated to 1045 employees (difference between FY 2017-2018 and FY 2019-2020), the impact came to about Rs. 70 crores and Rs. 90 crores for the assessment period and period of closure, respectively (as compared to Rs. 53.15 crores and Rs. 68.33 crores as shown in Table 3). The difference in impact calculated via the two methods can be attributed to the fact that the stakeholders the team interacted with were economically in a better position as compared to the total number of contractual employees associated with the Copper Plant.

[244] Considering the average household size in India is 4.6, as per the '2020 World Population Data Sheet', Population Reference Bureau, https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf.

While the overall figure was not comparable to the impact calculated from the data of Copper Plant's salary costs, there are insightful and thought-provoking case studies which emerged from these consultations. Some of these are highlighted here.[245]

Voices from the Ground: Livelihood Matters!

This is Rohit. He worked with Sterlite for 17 years. He had a steady income of Rs. 33,000 (including incentives and allowances). He used to be able to send Rs. 5000 to his brother and parents.

Now, he hardly earns Rs. 3000, on best days, doing labour and household work. He is unable to send money to his brother and parents. He can't afford to pay for his daughter's education or get his torn shoes fixed.

Meet Akshay. He works with Rohit. He worked with Sterlite for 14 years as a crane maintenance worker. His salary was Rs. 33,000.

Now, he does whatever labour work comes his way. He earns Rs. 300-400 per day. When we met him he hadn't got any work in the last 30 days. His spouse started working and on good days earns Rs. 200-400 per day. They are struggling to repay loans and pay the rent of their house of Rs. 3000.

Abhishek is a maintenance worker. He worked with Sterlite for 15 years doing welding and cutting work. He used to earn Rs. 38,000 and managed to save approximately Rs. 5000 every month.

After Sterlite closed, for the first 6 months, he had no work. His partner started working in fisheries. He got a job after a year with Rs. 18,000 as salary. They don't have savings anymore.

Ronak was a supervisor who had worked with Sterlite for 22 years. When he started in 1998 he used to earn Rs. 4500 per month. By 2018, he was earning Rs. 50,000 per month (including incentives).

Now, he works in another company with a salary of Rs. 20,000 per month. He is struggling to pay back loans he had taken for jewellery and his house. He also has to ensure the payment of 04-05 workers employed under him.

Source: *Stories* through stakeholder interactions in field.

As shown in Table 3, the monetary value of the cumulative net impact stands at around Rs. 114 crores and Rs. 146 crores for assessment period and period of closure, respectively. This however does not show the full extent of the impact, which goes beyond individuals to families and loved ones, especially when it comes to education, insurance, loan repayments, and health.

6.2. Impact on Businesses

The impact on the relevant businesses is classified into three sub-components, namely downstream businesses, service providers, and the Copper Plant itself.

A. Downstream Businesses

Stakeholder consultations with representatives of several downstream businesses revealed that there has been considerable impact on the cost of procurement of raw materials after the closure of the Copper Plant. Other than the procurement cost, the time cost of procurement if the raw material is imported, the quality of raw material, the bargaining power of such businesses for price negotiations, the time-cycle of procurement and payments and subsequent liquidity challenges are some of the ways through which the Copper Plant's closure has impacted them.

While the key product for the Copper Plant was copper and related products, the manufacturing process also yielded associated products such as sulphuric acid, phosphoric acid, and gypsum.

[245] The names have been changed to maintain confidentiality and protect the identity of individuals.

The Copper Plant thus contributed raw materials vital to agriculture and numerous other industries and businesses, including automobile, consumer durables, electrical and construction sectors. Given that Sterlite enjoyed 36% market share in India in 2018,[246] and the Copper Plant alone supplied close to 38% of the country's copper needs,[247] a fluctuation in its output would eventually have an adverse impact on the downstream industries and businesses. This would also lead to a dependence on expensive imports.

There were mainly five types of raw materials that various downstream businesses procured from the Copper Plant namely gypsum, sulphuric acid, phosphoric acid, copper cathode and copper rod. For estimating the impact, the cost of procurement incurred from the Copper Plant was compared with the new cost of procurement from importing the raw materials.[248] Table 4 below shows the percentage change in the procurement costs for all five categories of raw materials.

Table 4: Percentage Change in the Procurement Costs for All Raw Materials[249]

Particulars	Sterlite Per MT Value (Rs.)	Import Per MT Value (Rs.)	% Change
Gypsum	262.80	1353.97	415.21
Sulphuric Acid	3700.00	3995.60	7.99
Phosphoric Acid	36639.40	47834.60	30.56
Copper Cathode	448878.04	443169.19	-1.27
Copper Rod	448878.04	448534.72	-0.08

Source: CUTS' calculations on the basis of the data collected from Sterlite and Data Bank.

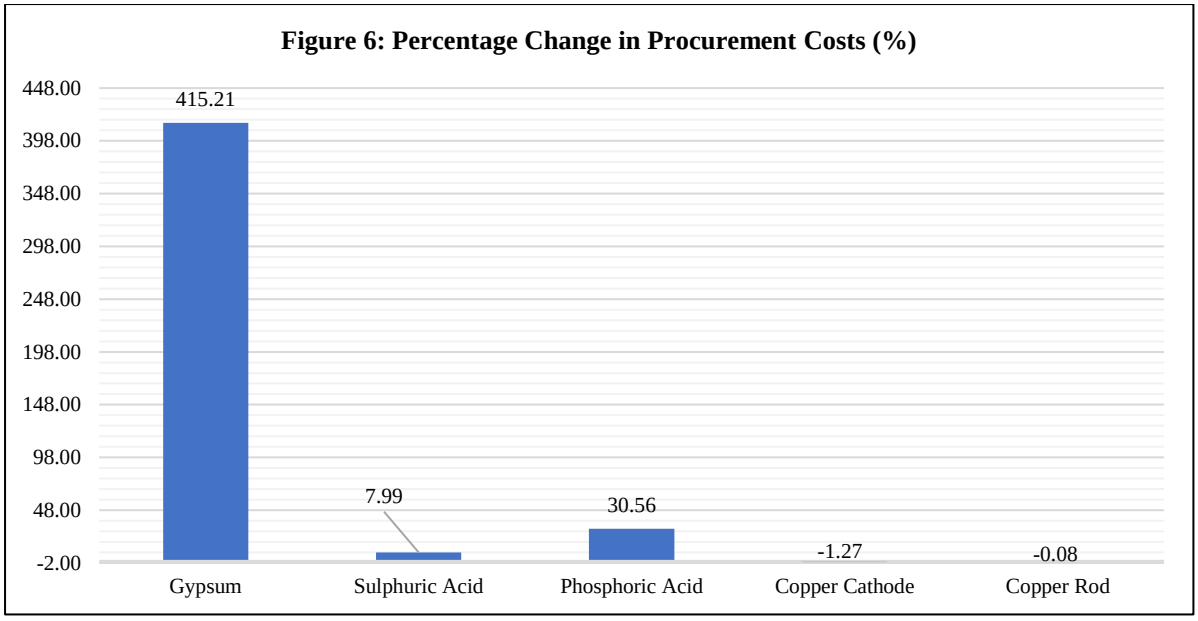
This shows that the biggest impact was for gypsum downstream companies, which saw an increase of approximately 415% in cost per MT. The next substantial increase in value per MT is seen for phosphoric acid of approximately 31%, as evident from Figure 6.

[246] 'Copper Manufacturing: The Future-proof Sector', Vedanta – Sterlite Copper, 19 July 2018, https://sterlitecopper.com/blog/2018/07/19/copper-manufacturing-the-future-proof-sector/.

[247] Sivapriyan, 'Sterlite Copper closure cripples downstream industries', Deccan Herald, 20 January 2019, https://www.deccanherald.com/business/sterlite-copper-closure-714015.html.

[248] The detailed methodology and the raw data are provided in the Technical Appendix.

[249] The data of imports value is of FY 2019-2020, whereas for the Copper Plant is when it was operational, however we do not have data on the specific year.



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite and Data Bank.

However, it is interesting to note that for copper related products – cathode and rod – the import value was lesser as compared to the value by the Copper Plant, by 1.27% and 0.08%, respectively. This is attributed to the fact that from April to January 2020, the imports of refined copper from Japan almost doubled and accounted for 77% of the total imports, with which India has a Free Trade Agreement (FTA).[250] Thus, downstream copper makers preferred imported copper over domestic cathode due to the fall in international prices and lower duties (preferential tariff of 0.9% on imports of copper cathodes) under the FTA with Japan. This low tariff under the FTA with Japan would also mean that the government might not have earned a substantial revenue for FY 2019-2020, given that of the total volume of imports of copper cathode of 1,42,322.56 MT, 77% i.e., 1,09,588.37 MT was imported from Japan.

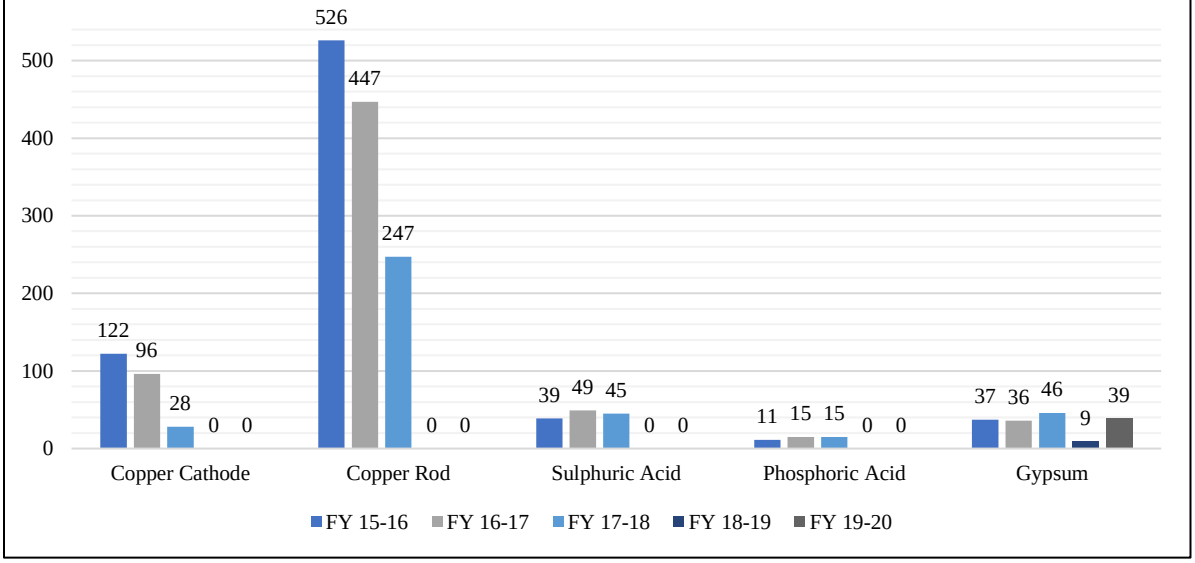
It must also be noted that a huge number of downstream businesses were dependent on the Copper Plant, which was then essentially reduced to zero after the closure of the Copper Plant, for all raw materials except for gypsum. This is best represented in Figure 7 below. The comparatively higher number of downstream businesses procuring gypsum in FY 2018-2019 and FY 2019-2020 could be attributed to the fact that one of the ways to produce gypsum is through fossil-fuelled power plants, which in the case of Sterlite was still operational after the closure of the Copper Plant.

Barring gypsum downstream businesses, the number of all other dependent downstream businesses came to zero in FY 2018-2019 and FY 2019-2020. This means that for almost all

[250] Rajesh Chandramouli, 'India is net copper importer for 1st time in 18 years', The Times of India, 04 May 2020, https://timesofindia.indiatimes.com/business/india-business/india-is-net-copper-importer-for-1st-time-in-18-yrs/articleshow/75524122.cms.

downstream businesses, the cost of procurement would have increased substantially as shown in Table 4 above.

Figure 7: Number of Downstream Businesses Dependent on the Copper Plant



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

When such change in the procurement costs was extrapolated to the volume of raw materials procured by downstream businesses (basis the volume of production by the Copper Plant), it was found that the phosphoric acid downstream businesses faced the most adverse impact. This is due to the fact that the Copper Plant produced large amounts of phosphoric acid, and when operational, was the only indigenous supplier compared to imports of this raw material. Table 5 below shows the impact on all downstream businesses (differentiated on the basis of the type of raw material procured).

Table 5: Impact on Downstream Businesses: Cost of Procurement (Rs. Crores)

Particulars	Monthly Impact	Period of Closure (May'18 – May'21)	Assessment Period (February'19 – May'21)
Impact on Gypsum Downstream Businesses	-5.24	-188.77	-146.82
Impact on Sulphuric Acid Downstream Businesses	-2.18	-78.54	-61.08
Impact on Phosphoric Acid Downstream Businesses	-15.38	-553.52	-430.51
Impact on Copper Cathode Downstream Businesses	8.98	323.28	251.44
Impact on Copper Rod Downstream Businesses	0.17	6.13	4.77
Net Impact on Downstream Businesses		-491.42	-382.21

Source: CUTS' calculations on the basis of the data collected from Sterlite and Data Bank.

The net estimated impact, as shown in Table 5, on all the downstream businesses stands at around Rs. 382 crores and Rs. 491 crores for assessment period and period of closure, respectively.

As mentioned earlier, the biggest impact on downstream businesses – besides procurement costs – was on the quality of raw materials. Through the stakeholder consultations it was found that the small amount of raw material procured from domestic sources or even imported, did not match the quality that was supplied by the Copper Plant. At the same time, the greater dependence on imports incurred various other costs to downstream businesses given the longer time duration in procuring, disruption of supply chains and lack of stability. Given that most of the downstream businesses had a long-standing relationship with Sterlite, it was also found difficult to establish trust with new suppliers. All these factors greatly impacted businesses making it difficult to operate at optimal levels.

One such story of a downstream business dependent on the Copper Plant for sulphuric and phosphoric acid is shown below. It mainly produced Hexafluoro-silicic Acid (H_2SiF_6) and Sodium Fluorosilicate (Na_2SiF_6).

With the drastic decrease in the volume of production by 97%, along with an increase in the cost of procurement by 122%, the business has had to lay off multiple employees. While earlier – when the Copper Plant was operational – it employed close to 121 employees, now it employs only 08. On average the 08 employees have seen a 34% reduction in their salaries, which includes 01 labourer, 06 staff members, and 01 manager.

At the same time, the taxes paid by the business also drastically decreased. When fully operational, the business used to export 300 MT at Rs. 30,000 per MT at 0.01% applicable tax, and the remaining 150 MT was sold domestically at Rs. 35,000 per MT at 18% GST per month. Thus, when fully operational, the business paid a tax of approximately Rs. 1.00 crore annually. After the closure of the Copper Plant, the domestic sales of the business were brought down to zero, as its production capacity had reduced to only 10 MT per month. The entire volume was exported at an increased price of Rs. 41,000 per MT at 0.01% applicable tax per month. However, even with the increased price, the monthly taxes paid by the business reduced to Rs. 41, leading to an annual tax of Rs. 492.

Woes of A Downstream Business: Still Hopeful for the Reopening of the Copper Plant

When speaking to the manager of a factory of a downstream business dependent on the Copper Plant for sulphuric and phosphoric acid, he very candidly said that after the closure of the Copper Plant, the quantity and volume of work has drastically decreased from 450 MT to 10 MT per month. At the same time, the cost of procurement has increased from Rs. 18,000 to Rs. 40,000 per MT. With added costs, inferior quality of products, and other operational and logistical challenges faced due to broken supply-chains, businesses have been disincentivised from seeking alternatives, fuelled further by the hope that the Copper Plant will reopen.

Left to Right: Dilapidated factory site due to lack of maintenance and unused and scrap

Source: Stories through stakeholder interaction in field.

The net impact on downstream businesses as highlighted in Table 5 thus does not include the impact on employees of downstream businesses, nor does it include the impact on the government due to impact on taxes paid. Nevertheless, the impact at every level is evident and grave, across all stakeholders in the ecosystem. Thus, when a business gets impacted, all related stakeholders to that business (employees, associated businesses, government), get impacted as well. Considering the especially vulnerable position of employees, it is also found that more often than not, they are the ones who are impacted the most because of a direct impact on the business or company they are associated with.

B. Service Providers

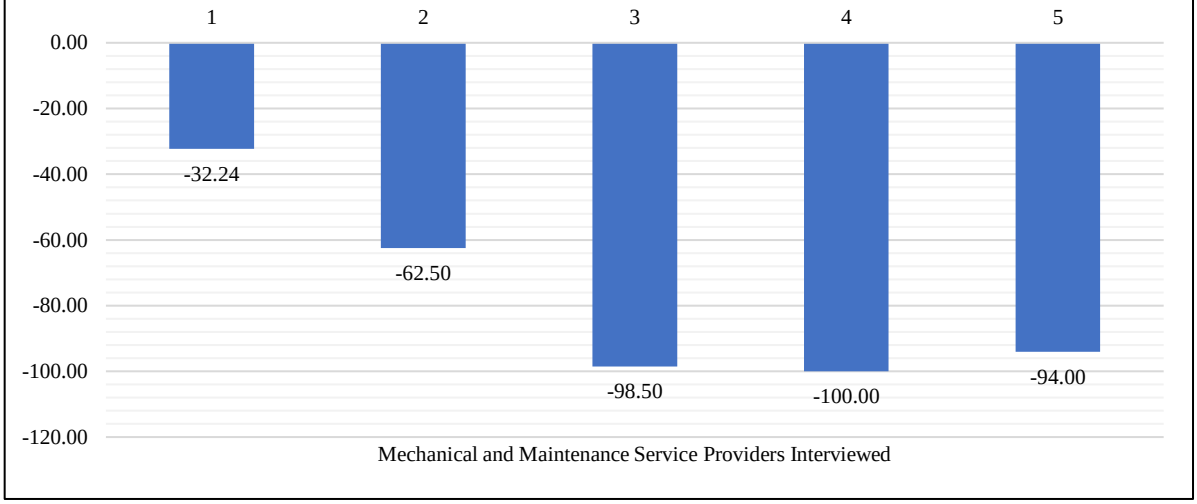
Besides downstream businesses, the biggest impact was seen on the service providers associated with the Copper Plant. The stakeholder consultations ranged from mechanical and maintenance, warehousing, Information and Technology (IT), stevedore and cargo, and lorry service providers.

For each category of service provider, the impact has been extreme and grave resulting in drastic losses in revenue, increase in job losses and reduction in salaries, and decrease in taxes paid.[251]

[251] The detailed methodology and the raw data are provided in the Technical Appendix.

For **mechanical and maintenance service providers** (MMSP), stakeholder consultations with 05 businesses revealed that the loss in revenue ranged from 32% to 100% compared to the revenue when the Copper Plant was operational.

Figure 8: Percentage Change in Revenue for Mechanical and Maintenance Service Providers (%)



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

MMSP #4 had a revenue of Rs. 03 crores when the Copper Plant was operational, which essentially became zero after the closure of the Copper Plant. The proprietor of the business earlier also managed to save close to Rs. 60 lakhs, however after the closure of the Copper Plant that was also reduced to zero. This extreme and grave impact on the revenue for MMSP #4 had an adverse impact on the employees associated with the business as well, where all 120 employees were laid off, who had an average salary of Rs. 30,000 per month.

For the first 04 MMSPs, on average there was an 85% decrease in the number of employees, accompanied with a decrease of approximately 46% in salaries for the retained employees.[252] The reduction in revenues also impacted the taxes paid by the interviewed service providers, which ranged from 63% to 100% as compared to the taxes paid when the Copper Plant was operational.

Another factor which has hindered the operations of these service providers after the closure of the Copper Plant is related to the slow and inadequate payment systems at other companies and businesses. All 05 MMSPs put forth the point that with Sterlite, there was a steady and constant flow of income, with no delay in payments. However now, with alternate companies and businesses, the payment is almost always delayed, which greatly impacts their day to day lives. One of the stakeholders said, "*With Sterlite, there was a steady, fixed and regular income. There was good circulation of money. With others, the payment is almost always delayed affecting our day to day lives.*"

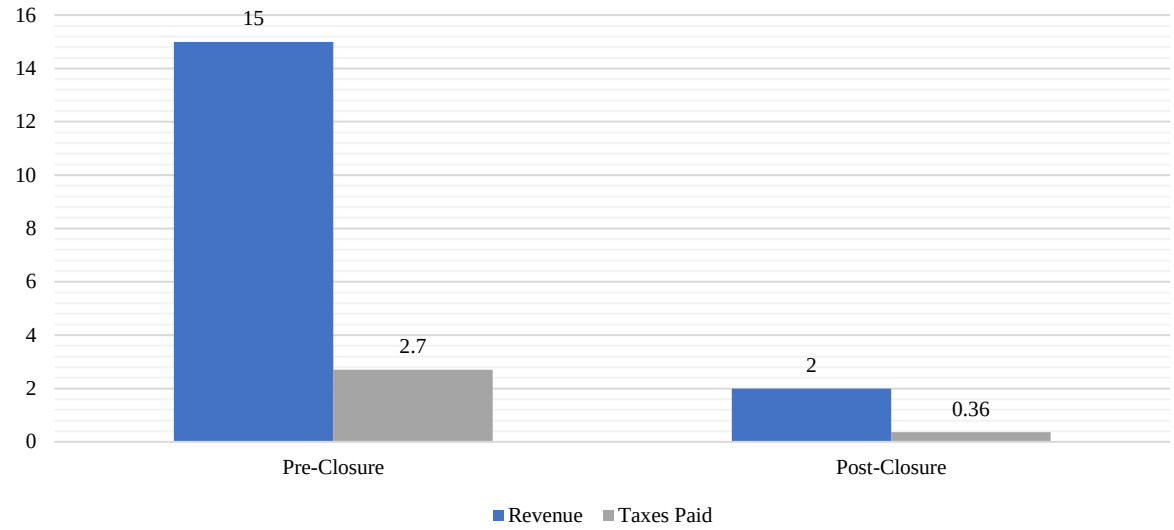
During the stakeholder consultations it was also found that the city of Thoothukudi has seen a drastic decrease in investments, particularly after the closure of the Copper Plant. On these

[252] The data for number of employees and salaries for MMSP #5 was not available.

lines, the proprietor of MMSP #1 said that "*Thoothukudi is said to be the second city in Tamil Nadu to Chennai with scope for great development….but because of the Sterlite plant closure, investments have almost zeroed, and development has stopped.*"

With respect to the **warehousing service provider** (WSP), the impact was considerably graver, given the fact that the majority of Copper Plant's storage and warehousing demands was met by one service provider (close to 70%). Thus, the business saw a drop in its revenue from Rs. 15 crores to Rs. 02 crores, which in turn impacted the taxes paid which also reduced by approximately 87% from Rs. 2.7 crores to Rs. 0.36 crores.

Figure 9: Revenue and Taxes Paid by Warehousing Service Provider (Rs. Crores)

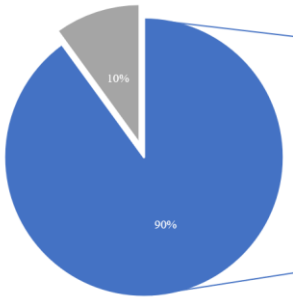


Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

The drastic decrease in revenues of approximately 87% also gravely impacted the employees associated with the service provider. Whereas the business employed 300 people when the Copper Plant was operational, now it employs only 10. However, the average salary has comparatively not decreased hugely from Rs. 15,000 to Rs. 13,500 per month – a decrease of 10% as opposed to approximately 97% with respect to decrease in number of employees.

A similar situation pertains to the **IT service provider** (ITSP), who catered to almost 90% of the IT needs of the Copper Plant.

***"Identity of Thoothukudi is Sterlite!"* – IT Service Provider**



Particulars	Pre-Closure	Post-Closure
Annual Revenue (Rs. Crores)	2	0.55
Taxes Paid (Rs. Crores)	0.36	0.10
Number of Employees	40	20
Average Salary (Rs.)	25,000	12,000

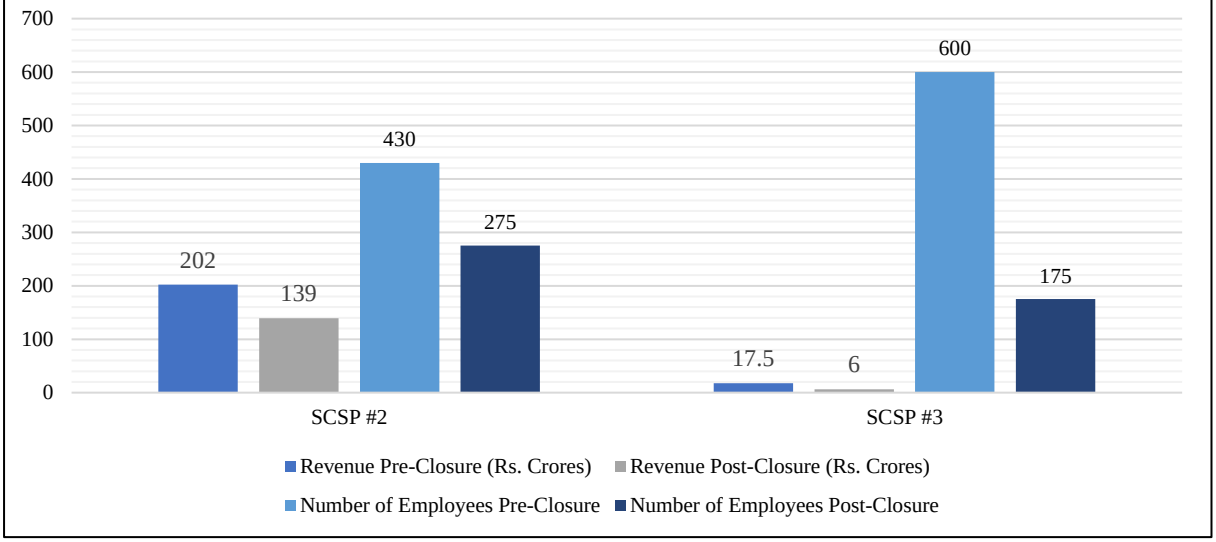
"*The buying power of people has substantially decreased. There has been a trickle-down effect in the personal purchases of individuals, leading to an adverse impact on businesses. It is a cycle of atrocities which people will not get out of unless Sterlite is reopened, or alternate and stable employment is provided.*"

Source: Stories through stakeholder interaction in field.

While the ITSP witnessed an overall decrease of close to 76% in its revenue, it also had to lay off 50% of its employees to be able to continue the business with reduced costs. During the stakeholder consultation with the owner of the business, it was found that the closure of the Copper Plant has had a ripple effect to the extent that the purchasing capacity of individuals in Thoothukudi has been severely affected. This in turn has impacted the business of IT as well, as the requirements of other companies and personal purchases have also decreased. For instance, the ITSP earlier had an Annual Maintenance Contract (AMC) worth Rs. 30 lakhs with the V.O. Chidambaranar Port, thus supplying close to 300-400 IT products every year. Now, the AMC is reduced to Rs. 17 lakhs, and the supply of 300-400 IT products is fulfilled once every two years.

The impact on the V.O Chidambaranar Port due to the closure of the Copper Plant is also seen when assessing the impact on the **stevedore and cargo service providers** (SCSP). The 03 stakeholder consultations with these service providers showed that they were some of the most gravely impacted stakeholders. While one of the service providers was not comfortable revealing the exact figures in terms of its revenue and salaries for employees, the data from other two service providers – SCSP #2 and SCSP #3 – showed that their revenue decreased by 31% and 66%, respectively. The comparatively less impact on revenue for SCSP #2 was also proportionately found with respect to the decrease in number of employees at 36% from 430 to 275 employees. Similarly, for SCSP #3, the number of employees reduced by almost 71% from 600 to 175, also proportionately to its decrease in revenue.

Figure 10: Revenue and Number of Employees for Stevedore and Cargo Service Providers



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

Figure 10 clearly shows that SCSP #2 is bigger than SCSP #3, in terms of revenue. Perhaps because of which, SCSP #3 had to let go of the majority of its employees. Interestingly, out of the 600 employees for SCSP #3, 250 were permanent out of which 175 were retained. The remaining 350 were temporary employees, all of whom were laid off. This yet again highlights the precarious nature of temporary employment, and how these workers and employees are the first and the worst impacted.

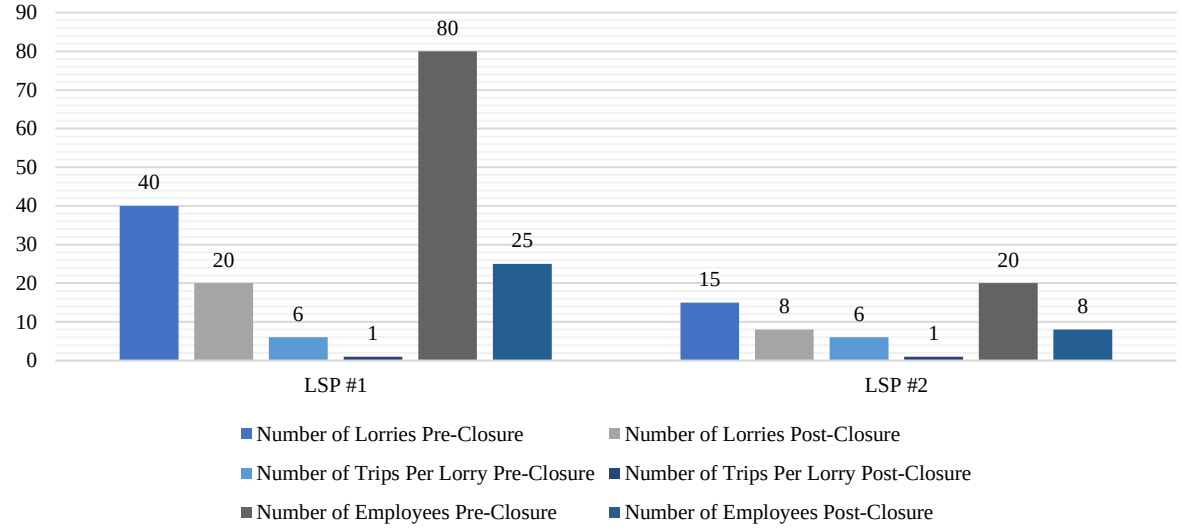
The SCSPs also echoed the concern that there is a dire need for investments in Thoothukudi, along with bringing in more industries and companies to minimise such over-dependence on one particular company. "*Reopening of the Sterlite plant will generate more jobs, increase demand and supply, leading to more investments in Thoothukudi and the copper industry….the government should provide incentives to industries and companies to come to Thoothukudi.*" – said the owner of one of the stevedore and cargo companies.

The losses for **lorry service providers** (LSP) have been heavy as well, given the fact that the Copper Plant used hundreds of lorries to transport its finished goods to other parts of the country. According to insights from stakeholder consultations, there used to be close to 400 operational lorries when the Copper Plant was operational. Now there are hardly 250 operational lorries. At the same time, there were a total of 36 lorry owners in the city, with an average of 11 lorries per lorry owner. Thus, it is likely that many lorry service provider businesses closed shop given the decline in the total number of operational lorries.

Through interactions with 02 LSPs, it was also found that 04-05 lorry owners had committed suicide after the closure of the Copper Plant as they were unable to repay their loans. The interactions with the lorry owners revealed that LSP #1 had 40 lorries when the Copper Plant was operational, out of which he sold 20, 08 are being used for alternate work at a coastal

power plant, and 12 are sitting idle. On the other hand, LSP #2 had a total of 15 lorries, out of which he sold 07 in 2018 itself. Currently, he has 08 lorries, out of which only 04 are functional.

Figure 11: Number of Lorries, Trips Per Lorry, and Number of Employees for Lorry Service Providers



Source: CUTS' analysis and calculations on the basis of the data collected from stakeholder interactions in field.

Additionally, while for both lorry owners, earlier each lorry would make close to 06 trips a day, now it only makes 01 per day. This is because there is no requirement for the same anymore. Thus, lorry owners on average are incurring a loss of Rs. 04 lakhs per lorry after the closure of the Copper Plant. This led the lorry owners to lay off a huge number of workers (drivers and cleaners). While LSP #1 earlier employed 80 workers, now employs only 25. Similarly, LSP #2 now employs only 08 workers as opposed to 20 earlier.

To sustain his family and have a constant source of income, the LSP #1 opened an automobile spare parts shop in February 2020. Aware of the fact that every individual in Thoothukudi is struggling, he sells his products on credit for up to 20-25 days, also acknowledging the fact that he is in a better position than many who have not found any alternate employment and are struggling to repay loans or feed their families.

Table 6: Impact on Service Providers: Revenue (Rs. Crores)

Particulars	Annual Impact	Monthly Average	Period of Closure (May'18 – May'21)	Assessment Period (February'19 – May'21)
Impact on Mechanical and Maintenance Service Providers	-69.86	-5.82	-209.59	-163.01
Impact on Warehouse Service Providers	-13.00	-1.08	-39.00	-30.33
Impact on IT Service Providers	-1.61	-0.13	-4.83	-3.76
Impact on Stevedore-Cargo Service Providers	-372.50	-31.04	-1117.50	-869.17
Impact on Lorry Service Providers	-6.43	-0.54	-19.29	-15.00

Table 6: Impact on Service Providers: Revenue (Rs. Crores)				
Particulars	**Annual Impact**	**Monthly Average**	**Period of Closure (May'18 – May'21)**	**Assessment Period (February'19 – May'21)**
Net Impact on Service Providers			-1390.21	-1081.27

Source: CUTS' calculations on the basis of the data collected from stakeholder interactions in field.

Table 6 above shows the impact on each category of service provider, while also highlighting the net impact for all service providers. The calculation estimates the total loss at Rs. 1081 crores and Rs. 1390 crores for the assessment period and period of closure, respectively. Given this vast impact on the revenues of service providers, it can be assumed that there must have been a wider and deeper impact on the dependents of these businesses including workers/employees, associated businesses and the government.[253]

Grave Unquantified Second Order Impacts

There are various non-accounted unquantified factors which have exacerbated the impact on downstream businesses and service providers, especially on the employees associated with such businesses – which do not make part of the direct first order impact being studied because of the closure of the Copper Plant. One major advantage that businesses had when the Copper Plant was operational, was the constant money circulation in the economy. Through stakeholder consultations insights were gathered that Sterlite perhaps even paid less compared to other companies, but the preference for Sterlite was due to the fact that the payments were done timely and regularly. This helped keep the money moving in the economy and enable individuals to live their day to day lives and make regular payments themselves.

After the closure of the Copper Plant, there has been a massive circular impact also affecting landlords, road-side stalls, hotels, petrol pumps and much more. For instance, a particular stakeholder consultation brought to light the impact on a local hotel, where certain contractual employees of the Copper Plant used to go for lunch every day. That generated an income of close to Rs. 90,000 annually for the hotel. That has now reduced to zero. Similarly, there were close to 50-100 road-side stalls and vendors, and now only 01 in 05 is open – with minimal or no income.

Source: Stories through stakeholder interaction in field.

Such financial distress has also made it difficult for individuals or businesses to get loans in Thoothukudi. For instance, when interviewing a stevedore and cargo service provider, we were told that ICICI Bank has stopped financing vehicle loans from the Thoothukudi District due to an increase in non-repayment of loans on vehicles.

Thus, the net impact highlighted in Table 6, even though covers impact on all related stakeholders, still does not fully quantify the impact that individuals have faced due to the closure of the Copper Plant.

[253] The detailed methodology and the raw data are provided in the Technical Appendix.

C. Copper Plant

The impact on the finances of the Copper Plant itself is the greatest, across different metrics and throughout the supply-value chain, starting from impact on volume of production, impact on revenues, impact on expenditures and impact on profit. Even though for calculating the total economic impact, the impact on Profit After Tax (PAT) has been used to avoid double counting, it is imperative to see the impact on various factors which eventually led to the impact on PAT.[254]

The main products produced by the Copper Plant were copper related products – copper anode, cathode, and rod. The by-products of the production of these were sulphuric acid, phosphoric acid, and gypsum. While the total volume of production of the Copper Plant reduced by 83% from FY 2017-2018 to FY 2019-2020 – the 17% production attributed to gypsum in FY 2019-2020 – the remaining 05 products saw a 100% reduction in the same period i.e., the production came to a halt.

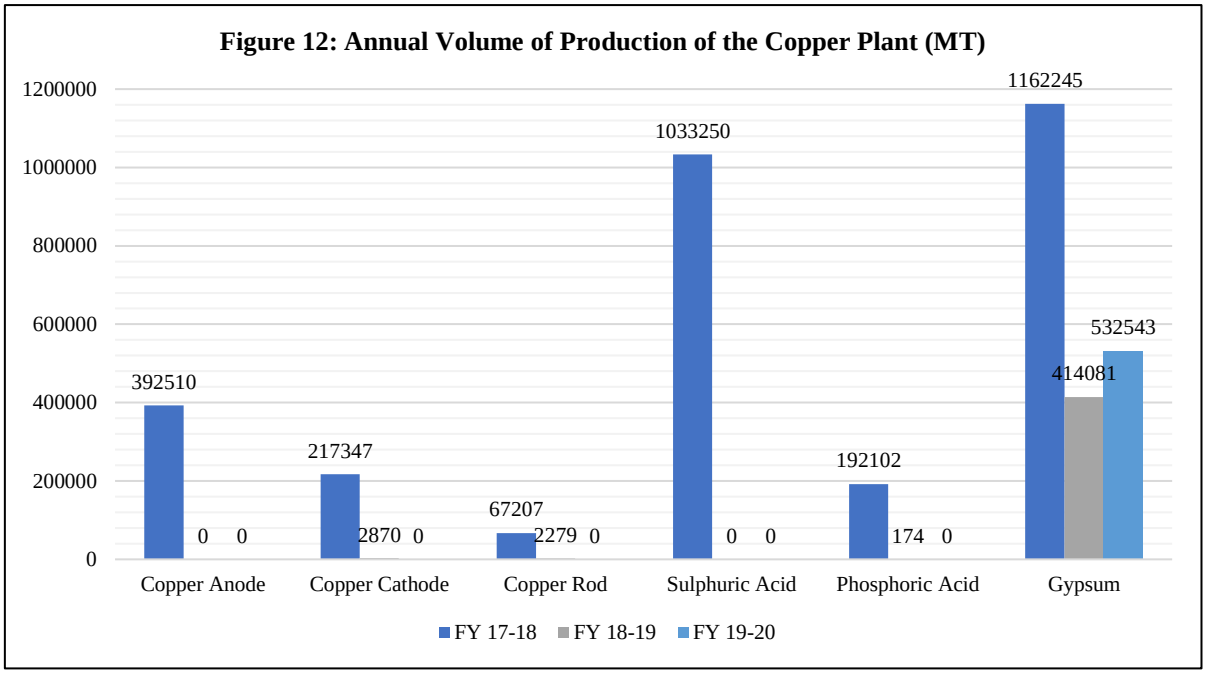
Table 7: Annual Volume of Production of the Copper Plant (MT)

Particulars	FY 2017-2018	FY 2018-2019	FY 2019-2020
Copper Anode	392510	0	0
Copper Cathode	217347	2870	0
Copper Rod	67207	2279	0
Sulphuric Acid	1033250	0	0
Phosphoric Acid	192102	174	0
Gypsum	1162245	414081	532543

Source: CUTS' calculations on the basis of the data collected from Sterlite.

It must also be noted that the production dropped significantly from FY 2017-2018 to FY 2018-2019, given that the Copper Plant has been shut from May 2018. While the production for copper anode and sulphuric acid dropped to zero in FY 2018-2019 itself, the production for phosphoric acid saw a catastrophic drop of almost 100%, exactly of 99.91%. Similarly, the production levels for copper cathode and rod also saw close to zero production with a decrease of 99% and 97%, respectively. This is best represented in Figure 12.

[254] The detailed methodology and the raw data are provided in the Technical Appendix.



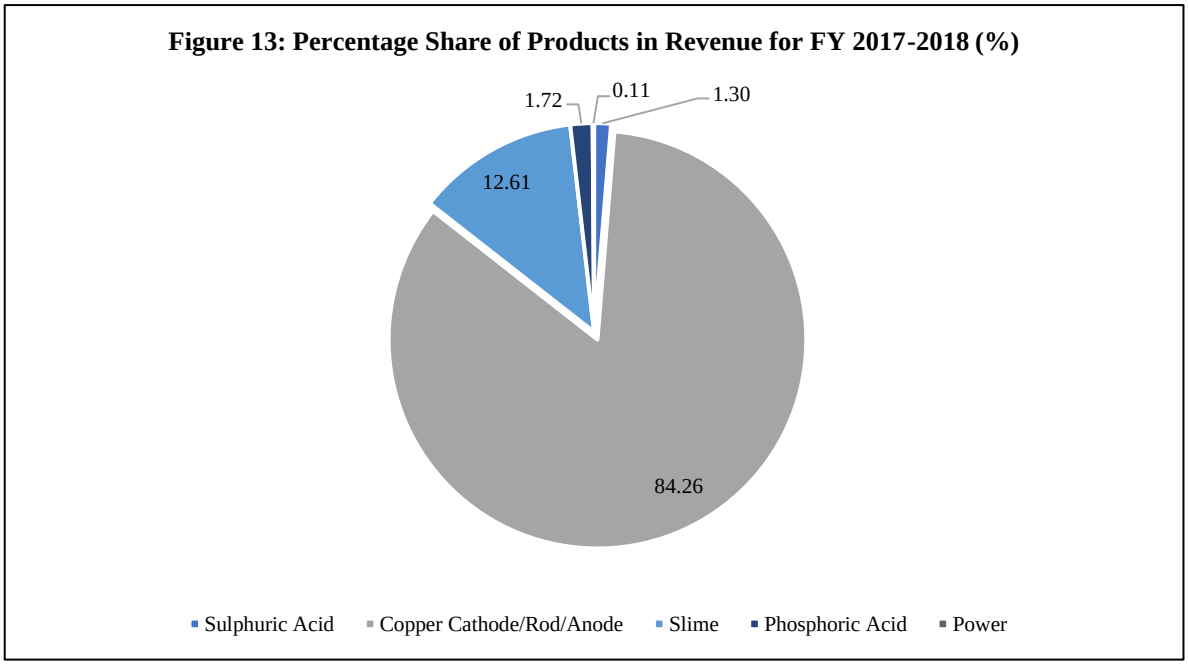
Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

The drastic decrease in volume of production for almost all products is also indicative of the reduced capacity utilisation for each product. The greatest decrease is witnessed with respect to copper anode, the capacity utilisation for which dropped to 0% in FY 2019-2020 as compared to 98% in FY 2017-2018. Similarly for copper cathode and rod, the capacity utilisation also dropped to 0% in FY 2019-2020 from 89% and 67% in FY 2017-2018, respectively. This indicates the extent of non-utilisation of resources and capital after the closure of the Copper Plant, which according to consultations with representatives from Sterlite, means that the machinery and the resources will degenerate due to disuse. Consequently, a substantial amount of capital will have to be used to restore the equipment and machinery and restart the overall operations of the Copper Plant. The fact that Sterlite was not allowed to reopen or enter the Copper Plant even for maintenance purposes, will further increase costs when (and if) it reopens.

In fact, when the Copper Plant was given permission to reopen to produce oxygen to help address the shortage of the same during the second wave of the Covid-19 pandemic, the estimated cost incurred to reopen only parts of the Copper Plant came to about Rs. 40 crores for operations, and Rs. 30 crores as capital expenditure.

The closure of the Copper Plant and the subsequent halt on production, has had a grave impact on the revenue/sales turnover of the Copper Plant as well. The copper related products – cathode, anode, and rod – were the highest revenue generating products, contributing 84% to the total revenue for FY 2017-2018. Figure 13 below highlights the percentage share of all products in the total revenue for FY 2017-2018.

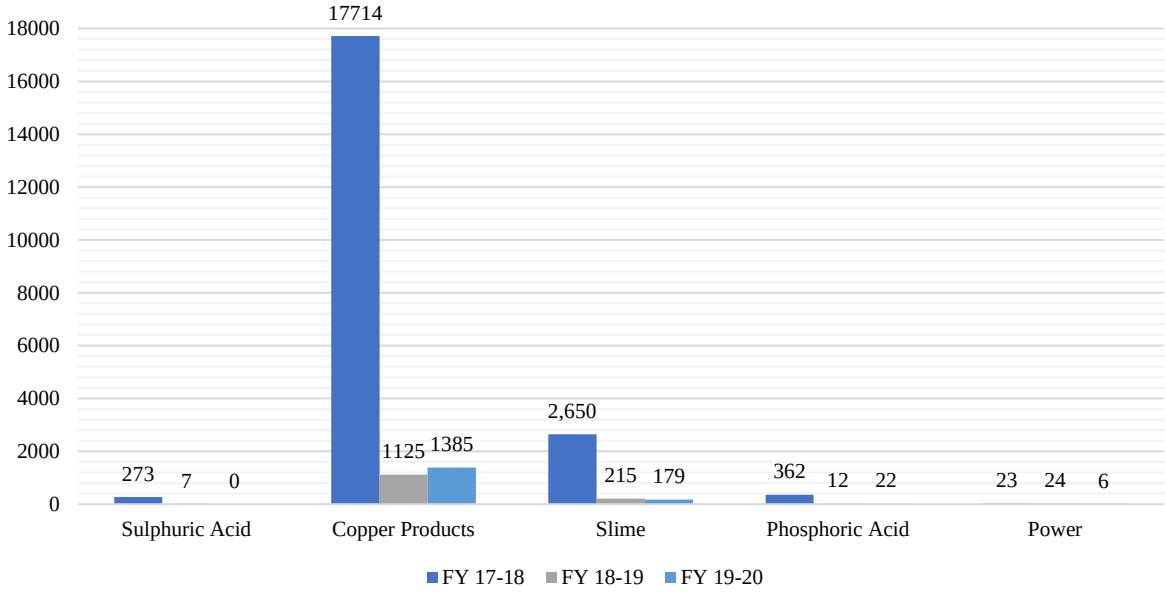
Figure 13: Percentage Share of Products in Revenue for FY 2017-2018 (%)



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

Consequently, the total revenue of the Copper Plant saw a reduction of 92% from Rs. 21,102 crores in FY 2017-2018 to Rs. 1592 crores in FY 2019-2020. Figure 14 shows the impact on the revenues for all products.[255]

Figure 14: Total Revenue of the Copper Plant (Rs. Crores)



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

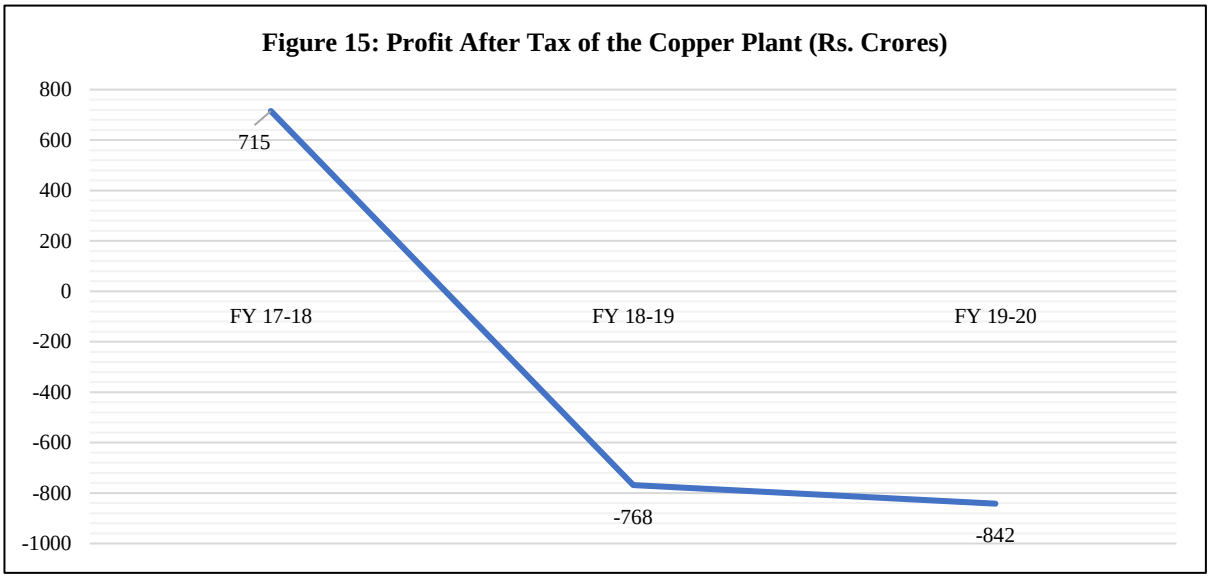
This revenue decrease of 92% from when the Copper Plant was operational to after it was closed, is reflected in the impact on the workers/employees and the associated businesses as highlighted in the previous sections. Considering, the expenses with respect to salary bills,

[255] Copper Products includes copper rod, copper anode, and copper cathode.

taxes, payment to suppliers, procurement costs for the Copper Plant itself – all are borne annually through the revenues, the drastic decrease in the same has affected all stakeholders and processes that make part of the supply-value chain for the Copper Plant. As per the revenue expenditure data for the Copper Plant, the employee cost decreased by 53% from FY 2017-2019 to FY 2019-2020. The biggest expenditure that saw a decrease – expectedly since the Copper Plant was not operational – was with respect to procurement and manufacturing expenses which declined approximately 92% in the same period.

The decrease in the volume of production, leading to a drastic decrease in revenue and expenses towards employees and procurement, among others, has had a proportionate impact on the PAT for the Copper Plant. The PAT drastically decreased by close to 218% from Rs. 715 crores in FY 2017-2018 to a loss of Rs. 842 crores in FY 2019-2020.

Figure 15: Profit After Tax of the Copper Plant (Rs. Crores)



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

Figure 15 highlights that the Copper Plant became a loss-making entity immediately after its closure in FY 2018-2019, which was further exacerbated in FY 2019-2020.

Moreover, it must also be noted that the TNPCB had issued the Consent to Establish for the expansion project of the Copper Plant till 2023. This meant that the work with respect to the expansion project had started, and the Copper Plant incurred substantial cost in that process. However, with the closure of the Copper Plant, and by extension, the halt in the work for the expansion project, Sterlite incurred major costs at the Copper Plant, which are not recoverable – in other terms, sunk costs. It becomes imperative to include these costs in the final impact on the Copper Plant, without which the impact will not show a complete picture. As per the data received from Sterlite, the Copper Plant incurred a total sunk cost due to expansion till the plant was closed of around Rs. 699 crores. This loss in sunk costs has been added to the loss in profit after tax to reach the total impact on the Copper Plant, as is highlighted in Table 8 below.

Table 8: Impact on the Copper Plant: Profit After Tax and Sunk Costs (Rs. Crores)			
Profit After Tax			
Particulars	**Monthly Net Impact**	**Period of Closure (May'18 – May'21)**	**Assessment Period (February'19 – May'21)**
Impact on Profit After Tax	-113.28	-4078.15	-3171.89
Total Sunk Cost			-699
Total Impact on Copper Plant		-4777.15	-3870.89

Source: CUTS' calculations on the basis of the data collected from Sterlite.

Thus, the overall impact on the Copper Plant translates to loss of around Rs. 3871 crores and Rs. 4777 crores for assessment period and period of closure, respectively. This further translates to a loss of Rs. 4.42 crores per day for the Copper Plant since its closure in May 2018.

6.3. Impact on Government

The Copper Plant, when operational, was contributing to the revenues of the government by means of paying taxes and procuring fuel such as power and water from government-owned entities.

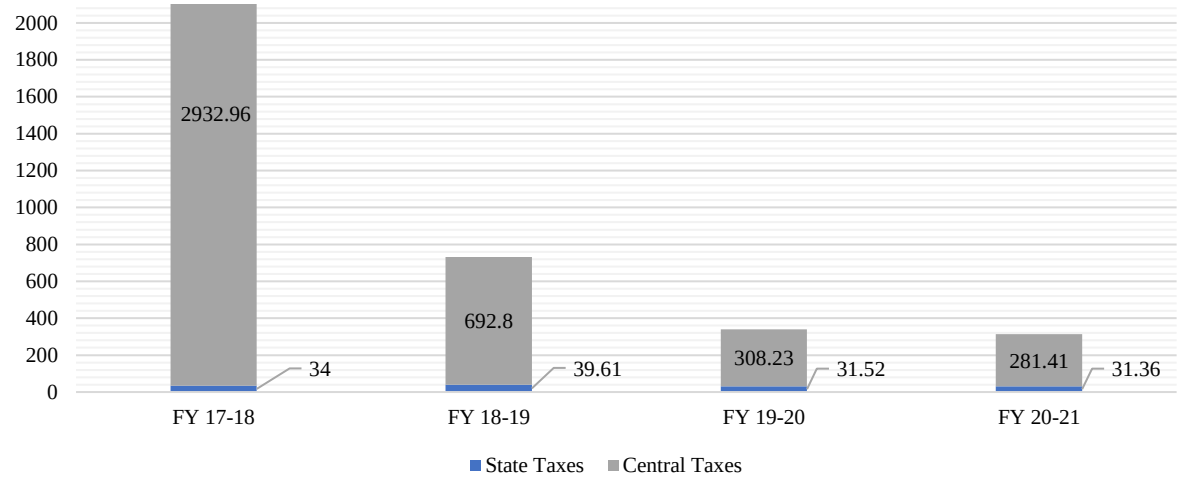
With the reduction in the revenues of the Copper Plant, the overall taxes paid by it also witnessed a substantial decrease. Table 9 highlights the taxes paid by the Copper Plant before the closure and after the closure.

Table 9: Taxes Paid by the Copper Plant (Rs. Crores)				
Particulars	**FY 2017-2018**	**FY 2018-2019**	**FY 2019-2020**	*FY 2020-2021*
State Taxes	34.00	39.61	31.52	31.36
Central Taxes	2932.96	692.8	308.23	281.41
Total Taxes	2966.96	732.41	339.75	312.77

Source: CUTS' calculations on the basis of the data collected from Sterlite.

The state taxes paid by the Copper Plant witnessed a reduction by almost 8%, from Rs. 34 crores in FY 2017-2018 to Rs. 31.36 crores in FY 2020-2021. Comparatively, the central taxes saw a huge decline, with a reduction of around 90% from Rs. 2932.96 crores to Rs. 281.41 crores in the same period. This is best represented in Figure 16 below.

Figure 16: Taxes Paid by the Copper Plant (Rs. Crores)



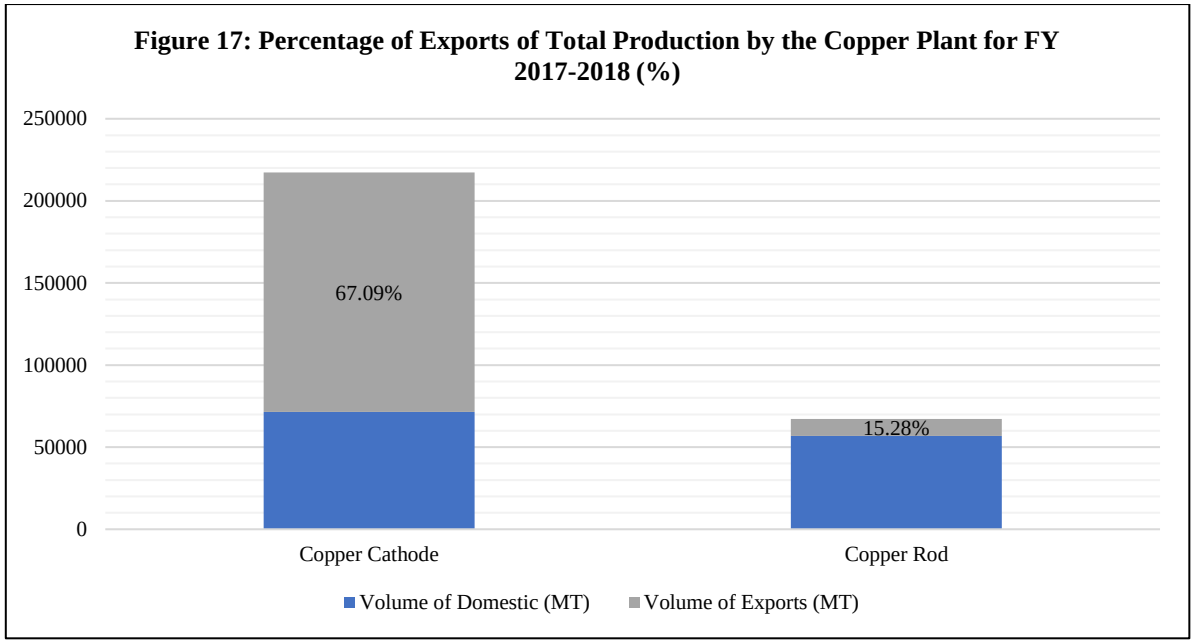
Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

At the same time, the total tax paid by the Copper Plant also witnessed a proportionate decline of approximately 89% from Rs. 2966.96 crores in FY 2017-2018 to Rs. 312.77 crores in FY 2020-2021.

Disaggregated data received from Sterlite indicates that the biggest contributor to central taxes (and thus to the total taxes) paid when the Copper Plant was operational, were duties on exports and imports – it made up for close to 81% of the total central taxes, and 76% of the total taxes paid. After the closure of the Copper Plant, as per the data received, the duties on exports and imports became zero from FY 2018-2019 onwards. This is attributed to the fact that the exports of products (copper cathode and copper rod) of the Copper Plant were reduced to zero after its closure.

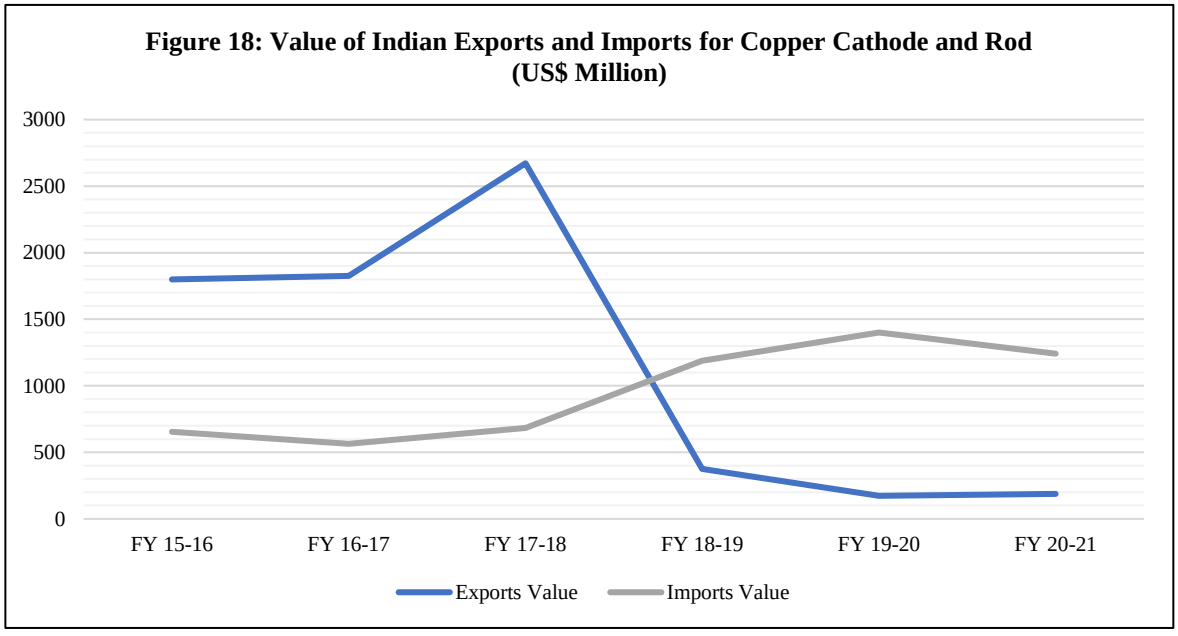
The Copper Plant, when it was operational in FY 2017-2018 exported 1,45,812 MT and 10,269 MT of copper cathode and copper rod, respectively. For copper cathode, the exports reduced to 50 MT in FY 2018-2019, and then to zero in FY 2019-2020, whereas for copper rods, the exports dropped to zero in FY 2018-2019 itself.

When looked at in comparison to the total volume of production which stood at 2,17,347 MT and 67,207 MT for copper cathode and rod in FY 2017-2018, respectively, the Copper Plant exported roughly 67% and 15% of copper cathode and rod, respectively. Figure 17 below represents this.



Source: CUTS' analysis and calculations on the basis of the data collected from Sterlite.

Thus, owing to the Copper Plant's closure, the exports and imports of copper and related items have been greatly affected. While the exports have significantly fallen from the year FY 2018-2019 onwards, the imports have risen sharply to cater to the domestic demand. This is best represented in Figure 18 which highlights the trends of exports and imports of copper cathode and copper rod combined in India.



Source: CUTS' analysis and calculations on the basis of the data collected from Data Bank.

In addition to the taxes paid by the Copper Plant which generated revenues for the Government, the Copper Plant also added to the revenue of the government-owned entities from other sources such as those emanating from the consumption of power and water. With respect to

power consumption, the Copper Plant procured most of its power requirements from the Sterlite Copper Captive Power Plant itself. However, a certain quantity was procured from the Tamil Nadu Electricity Board (TNEB), which generated revenue for TNEB. On the other hand, the Copper Plant procured all its water requirement directly from the Tamil Nadu Water Supply and Drainage Board (TWAD). Table 10 below gives an overview of the power and water quantity procured and the cost per unit for each in the years prior to closure.

Table 10: Fuel Procurement and Costs through State-owned Entities: Power and Water			
Particulars	**FY 2015-2016**	**FY 2016-2017**	**FY 2017-2018**
Power Consumption TNEB (MU)	0.50	0.50	1.00
Power Consumption TNEB (kWh)	500000	500000	1000000
Power Cost Per kWh (Rs.)	5.62	4.58	4.44
Total Power Cost (Rs.)	2810000	2290000	4440000
Water Consumption (M3)	3754217	3790880	3491420
Water Cost Per Unit (Rs.)	65	105	174
Total Water Cost (Rs.)	244024105	398042400	607507080
Total Procurement Cost (Power + Water) (Rs.)	246834105	400332400	611947080

As per Table 10 above on average the Copper Plant used to spend Rs. 41.97 crores annually for the procurement of power and water, which was a direct source of revenue for the government-owned entities. After the closure of the Copper Plant in 2018, it can be assumed that this revenue would have been reduced to zero, with nil consumption of power and water by the Copper Plant.

While calculating the impact on the government due to the closure of the Copper Plant, the taxes paid and the costs towards procurement of power and water were used as the metric.[256] Table 11 below highlights the overall impact on the government.

Table 11: Impact on Government: Taxes Paid by Sterlite and Procurement Costs (Rs. Crores)			
Particulars	**Monthly Net Impact**	**Period of Closure (May'18 – May'21)**	**Assessment Period (February'19 – May'21)**
Impact on State Taxes	0.01	0.49	0.38
Impact on Central Taxes	-208.79	-7516.44	-5846.12
Impact on Revenue from Other Sources (Power + Water)	-3.50	-125.91	-97.93
Net Impact on Government		-7641.86	-5943.67

Source: CUTS' calculations on the basis of the data collected from Sterlite.

[256] The detailed methodology and the raw data are provided in the Technical Appendix.

Thus, the impact on the government through loss in taxes and other revenue from power and water consumption is around Rs. 5944 crores for the assessment period and Rs. 7642 crores for the period of closure.

6.4. Total Economic Impact

The sum total of all the aforementioned components of the impact of closure of the Copper Plant, including the impact on workers/employees, businesses and government is summarised in the following table.

Table 12: Total Economic Impact on the Ecosystem Due to Closure of the Copper Plant (Rs. Crores)

Particulars	Period of Closure (May'18 – May'21)	Assessment Period (February'19 – May'21)
A. Impact on Employment (Sterlite)		
Permanent Employees	-77.84	-60.55
Contractual Employees	-68.33	-53.15
Total Impact on Employment	***-146.17***	***-113.70***
B. Impact on Business		
Gypsum Downstream	-491.42	-382.21
Sulphuric Downstream	-78.54	-61.08
Phosphoric Downstream	-553.52	-430.51
Copper Cathode Downstream	323.28	251.44
Copper Rod Downstream	6.13	4.77
Mechanical and Maintenance Service Providers	-209.59	-163.01
Warehousing Service Providers	-39.00	-30.33
IT Service Providers	-4.83	-3.76
Stevedore-Cargo Service Providers	-1117.50	-869.17
Lorry Service Providers	-19.29	-15.00
Sterlite (PAT + Sunk Costs)	-4777.15	-3870.89
Total Impact on Businesses	***-6961.43***	***-5569.75***
C. Impact on Government		
Taxes	-7516.44	-5846.12
Revenue from Other Sources	-125.91	-97.93
Total Impact on Government	***-7641.86***	***-5943.67***
Total Economic Impact on Entire Ecosystem	***-14749.46***	***-11627.12***

Thus, the consolidated loss to the economy owing to closure of the Copper Plant is estimated to be around Rs. 11,627 crores and Rs. 14,749 crores for assessment period and period of

closure, respectively. The cumulative loss for the entire period of closure is roughly around 0.72% of the State Gross Domestic Product (SGDP) of Tamil Nadu.[257]

7. Recommendations and Conclusion

The results and findings of this assessment of economic impact of the closure of the Copper Plant have highlighted certain crucial learnings. The underlying aim of the recommendations is to find best alternate remedies to prevent critical matters concerning the development-environment debate to escalate to a problem requiring judicial intervention and rather be adequately addressed by effective appraisal, monitoring and implementation by the executive and regulators. Furthermore, the objective is to also inform the decision-making process at all levels, including judiciary. The learnings from this study are used to draw the following recommendations, keeping in mind the larger objective of human-centricity of economic development and environmental sustainability, with equal considerations to the objective of equity, environment, and economy.

a. **Ensuring Human-centric Vision as a Guiding Principle of Institutions**: The first and foremost recommendation is to institutionalise a human-centric approach towards dealing with issues relating to economy, environment, and development. This has to be instilled at different tiers of governance, regulatory bodies, judiciary, polity and the larger society. In order to achieve that, concerted efforts have to be made which informs a renewed vision and approach towards economy and environment. The economy needs to transcend from being an abstract creature, the size of which is currently measured through metrics like the GDP, to an enabler of well-being of all people. This implies having a metric of measurement premised on welfare of people as the key indicator.[258] Similarly, environmental and ecological concerns should also be contextualised and envisioned in the larger perspective of the quality of life of humans and the flora and fauna in the region. The 'Doughnut Economics' model by Kate Raworth offers a vision of placing human-centricity in the middle and recognising that the economy is embedded within and dependent upon society and the living world.[259]

   For instance, with respect to the Copper Plant case in question, the Tamil Nadu government, TNPCB, MHC, and the SC could have tried to find a balance which would have ensured that the communities adversely affected because of the environmental and health concerns are also given some relief, whilst making sure that the workers and businesses dependent on the Copper Plant have alternatives to fall back on after its closure.

b. **Institutionalising Cost-benefit Assessment as a Continuous Process**: In order to have a more economically informed and environmentally responsible decision-making by relevant authorities including independent regulators, state agencies, expert committees, judiciary or any other institution, there is a need to adopt a cost-benefit assessment

[257] SGDP of Tamil Nadu taken as Rs. 20.54 trillion as per data for the year 2020-2021 by Ministry of Statistics and Programme Implementation (MoSPI), Government of India.

[258] Amit Kapoor and Bibek Debroy, 'GDP is not a measure of human well-being', Harvard Business Review, 04 October 2019, https://hbr.org/2019/10/gdp-is-not-a-measure-of-human-well-being.

[259] 'About Doughnut Economics', Doughnut Economics Action Lab, https://doughnuteconomics.org/about-doughnut-economics.

framework during decision making and as a continuous process of monitoring and evaluation.[260] This entails using the framework as a dynamic tool of information which continuously tracks the costs and benefits to different stakeholders, rather than a one-off number used for making the final decision. Ideally, this should be housed as a mandate of independent regulators in case of sectors that are regulated or can be a function of any relevant authority or agency of the State Governments, such as the State Pollution Control Boards.

However, it becomes equally important to act on the findings of such cost-benefit assessments as and when they are found to be problematic, especially with respect to environmental norms. For instance, despite the TNPCB having real-time update about the level and extent of pollution by the Copper Plant, there was hardly any affirmative action taken against such environmental digressions, other than ordering the closure of the Copper Plant multiple times before 2018 as well. Such extreme closure orders have far-reaching implications on the livelihoods of many who are dependent on the Copper Plant. Instead, the Copper Plant should have been fined heavily, or directed rigorously to course correct under third party supervision to inspire confidence of people. Thus, it is equally important to make the cost-benefit assessment approach and decision making transparent, consultative, and collaborative.

c. **Moving Beyond Only Numbers**: The cost-benefit assessment framework also needs to be made more realistic and responsive to ground realities which might not be easy to quantify. For instance, a social or environmental cost or benefit can be measured as a qualitative metric, in addition to quantifying the impact of such costs or benefits. This ensures that due importance is accorded to vital indicators of people's welfare which cannot be measured in numbers. Additionally, this also fits well with a dynamic cost-benefit assessment exercise which can capture such qualitative aspects as and when certain developments happen.[261] Such an exercise will put all the relevant information in one place regarding the potential pros and cons of any envisaged decision, thus, allowing an informed decision-making process.

d. **Placing a System of Checks and Balances**: A major function of institutionalising the dynamic, quantitative-cum-qualitative cost-benefit assessment framework will be to keep necessary checks and balances in place so that sensitive matters do not go out of hand. Such a framework can be customised to raise red flags to the immediate authorities in case of any ill-effect perceived due to any existing or planned development. Additionally, this system of checks and balances can be continuously updated and even made to operate on a real-time basis using advanced data collection and analysis tools. The continuous cost-benefit monitoring framework as well as subsequent decision-making processes should adhere to the principles of transparency, accountability, and participatory modes of governance.

---

[260] 'Cost-Benefit Analysis and the Environment: Further Developments and Policy Use', Organisation for Economic Cooperation and Development (OECD), September 2018, https://www.oecd.org/env/tools-evaluation/CBA-brochure-web.pdf.

[261] 'Appendix A: Qualitative Factors Assessment Tools', U.S. Nuclear Regulatory Commission, https://www.nrc.gov/docs/ML1528/ML15281A052.pdf.

In the case of the Copper Plant, if an effective system of checks and balances would have been institutionalised since its establishment in Thoothukudi, perhaps the environmental violations could have been addressed better and corrected. In leading up to the closure of the Copper Plant, the enforcement agency of the Tamil Nadu government should have also ensured that the protests were in control and did not get violent, which led to the death of 13 people. While the Justice Aruna Jegadeesan Commission constituted to probe the police firing recommended the government to give compensation to the affected, perhaps greater checks and balances were required to ensure that the police firing did not happen in the first place.[262] Furthermore, the recommended compensation and jobs to certain eligible candidates in the families of the deceased were awarded only in late-2020 and early-2021.

e. **Revamp the Existing Legislations**: For a system of checks and balances to be implemented, it is equally essential to amend and revamp the existing legislations to minimise regulatory overlaps. At the same time, it is critical to ensure that specialised regulators – such as the NGT – are vested with powers and allowed to adjudicate on all specialised matters as the case may be. While the National Green Tribunal Act, 2010 (NGT Act) allows persons (including individuals, companies, firms, among others) to appeal against orders passed by the State Government under specific provisions of the enactments under Schedule I,[263] NGT does not have the jurisdiction to adjudicate on State Government orders under all provisions. This despite the fact that the overarching jurisdiction of the NGT is defined as "*over all civil cases where a substantial question relating to environment (including enforcement of any legal right relating to environment) is involved…*".[264]

   The fact that the NGT was constituted as a specialised tribunal to only look into environmental cases, its jurisdiction should be expanded to include adjudication of State Government orders in all circumstances. In the present case, the process followed by the NGT preceding its judgment in December 2020, was laudable and appropriate given the contours of the case – it constituted a three-member panel, that visited the Copper Plant in Thoothukudi, and held public consultations in Thoothukudi and Chennai, subsequent to which it submitted its report to the NGT.[265]

   However, the SC on appeal, set aside the order by the NGT stating that the tribunal does not have overarching powers to adjudicate on matters related to State Government orders. There is a need to amend the provisions of the NGT Act to allow the tribunal to adjudicate on all things-environment. These tribunals are established precisely to unburden the

[262] 'Compensation handed over to victims of anti-Sterlite protest', The Hindu, 05 June 2021, https://www.thehindu.com/news/cities/Madurai/compensation-handed-over-to-victims-of-anti-sterlite-protest/article34739545.ece.

[263] Schedule I lists the legislations with respect to which the NGT has jurisdiction. These include (i) The Water (Prevention and Control of Pollution) Act, 1974, (ii) The Water (Prevention and Control of Pollution) Cess Act, 1977, (iii) The Forest (Conservation) Act, 1980, (iv) The Air (Prevention and Control of Pollution) Act, 1981, (v) The Environment (Protection) Act, 1986, (vi) The Public Liability Insurance Act, 1991, and (vii) The Biological Diversity Act, 2002.

[264] Section 14(1), The National Green Tribunal Act, 2010, https://greentribunal.gov.in/sites/default/files/act_rules/National_Green_Tribunal_Act,_2010.pdf.

[265] The panel was headed by Justice Tarun Agarwala, former Chief Justice of the Meghalaya High Court, together with two experts, one being a representative of the Central Pollution Control Board and another a representative of the Ministry of Environment and Forest.

normal courts which are overloaded and to become a specialised tribunal which can focus on its limited remit.

f. **Capacity Building**: The set of proposed recommendations are likely to require a robust capacity building exercise to drive change and achieve the envisaged objectives. Given the high degree of status-quoist forces in the existing establishments, it would be a difficult task to push for such an exercise without the adequate pull-factor emanating from the establishment themselves. Another effective way to resolve the capacity issue would be to delegate the functions of such assessment to independent, multi-disciplinary, representative (age, occupation, gender, among others) and inclusive body attached to the office of the relevant institutions.

   However, along with capacity building there must be mechanisms to fix accountability linking it to performance appraisals for government officers. The fact that the Copper Plant was established before the company conducted the EIA, or that it was established by violating the setback condition of being 25 kms away from the Gulf of Mannar point to the fact that there was no sense of accountability, or worse, no fear of the same, either by the Sterlite representatives or the government officials. This also indicates the limited and lax monitoring by the relevant officers and regulators. At the same time, it is also essential for such capacity building in the judiciary, to enable holistic decisions. The fact that matters escalate to the level of judicial intervention should be given more attention and an attempt must be made to get the perspectives of all related and relevant stakeholders – even though they might not be parties to the case. Given the limited resources and multiple constraints of the judiciary, along with the persistent problem of backlog of cases, it might be prudent for the judiciary to engage expert committees or *amicus curiae* more often to get perspectives of experts. However, it is equally important for judicial officers to be trained on (basic) economic issues, to enable them to recognise the need for a holistic and balanced decision and approach.

g. **Community Driven Approach**: Against the backdrop of all the recommendations laid above, perhaps the most important would be for the government, regulators, and the judiciary to take a more community driven approach. This was witnessed in the proceedings before the MHC, where six public interest litigants were party to the case, representing the community and the aggrieved. This enabled the MHC to know and hear the perspectives of the community. However, even then, the community was only the aggrieved because of environmental and health concerns, and not the workers and employees who were aggrieved because of lack of basic financial needs also leading to health concerns.

   One way to perhaps engage the community throughout the dichotomy of environment-development could be to empower them to monitor the operations of such companies, as has been done currently when the Copper Plant is reopened for the production of oxygen. At the same time, it must also be ensured that companies utilise their Corporate Social Responsibility funds appropriately, and especially for the neighbouring and local communities. In cases where there are environmental violations, such funds should be used for and towards the sustainable development of the community – this however does not mean that the companies should be allowed to continue polluting.

These recommendations can catalyse the process of institutionalising a holistic and balanced thinking in all ranks of decision and policy making, so as to converge the development and environmental interests for the larger welfare of the society.

Technical Appendix

Impact on Workers/Employees

To estimate the monetary impact on livelihoods of workers of the Copper Plant, payments of salaries were considered as the metric. The average monthly salary costs were computed for pre-closure and post-closure period, and this was used to compute the net impact for the entire assessment period and closure of period.

Workers/Employees: Impact on Sterlite's Salary Bills: Raw Input Data and Calculations			
Particulars	**FY 17-18**	**FY 18-19**	**FY 19-20**
No. of Employees			
Permanent Employees	1027	940	778
Contractual Employees	1461	506	416
Salary Bill (Rs. Crores)			
Monthly Salary Bill of all Permanent Employees	145	144	98
Monthly Average of Salary Bill of all Permanent Employees	12.08	12	8.17
Monthly Salary Bill of all Contractual Employees	35.18	10.37	7.6
Monthly Average of Salary Bill of all Contractual Employees	2.93	0.86	0.63

Impact on Employment (Rs. Crores)				
Particulars	**Pre-closure for 14 months[266]**	**Monthly Average of 14 months**	**Post-closure for 22 months[267]**	**Monthly Average of 22 months**
Impact on Salary Bill of All Permanent Employees	169.00	12.07	218.00	9.91
Impact on Salary Bills of All Contractual Employees	36.91	2.64	16.24	0.74

Impact on Downstream Businesses

The metric used to compute the impact of closure of the Copper Plant on downstream businesses was not revenue or PAT figures. This is because the revenues of many downstream businesses have not been significantly affected after the Copper Plant's closure as the businesses have made alternate arrangements to procure their raw material needs. However,

[266] April 2017 to May 2018.

[267] June 2018 to March 2020.

given they have faced the biggest adverse impact on their cost of procuring such raw materials, the same was used as the metric.

For estimating the impact, an assumption was made that all the downstream businesses previously procuring these raw materials from the Copper Plant shifted to importing their respective raw materials. The new cost of procurement was taken from the national average unit price of import of the raw material taken from the Annual Export Import Data Bank maintained by the Ministry of Commerce and Industry, Government of India. This was juxtaposed against the data for procurement costs from the Copper Plant at the time when it was operational and after its closure. This impact was then proportionally extrapolated to the entire volume of procurement of the respective raw materials from the Copper Plant.

Downstream Business: Impact on Cost of Procurement: Raw Input Data and Calculations		
Imports Data for the Products FY 2019-20[268]		
Particulars	**Quantity (MT)**	**Per MT Value (Rs.)**
Gypsum[269]	5144266	1353.97
Sulphuric Acid[270]	1986614.63	3995.60
Phosphoric Acid[271]	2498617	47834.60
Copper Cathode[272]	142322.56	443169.19
Copper Rod[273]	80570.72	448534.72
Sterlite Data for the Products		
Particulars	**Monthly Difference in Volume of Production (14 months Pre-closure – 22 months Post-closure) (MT)**	**Per MT Value (Rs.) (FY 2017-2018)**
Gypsum	48055.65	262.8
Sulphuric Acid	73803.57	3700
Phosphoric Acid	13717.05	36639.4
Copper Cathode	15450.24	448878.04
Copper Rod	4741.31	
Particulars	**Impact on Sample Downstream Businesses (Rs.)**	**Estimated Impact on All Downstream Businesses (Rs.)**
Gypsum	-1091.17	-52436884.43
Sulphuric Acid	-295.60	-21815985.92
Phosphoric Acid	-11195.20	-153565163.31
Copper Cathode	5708.85	88203172.92
Copper Rod	343.32	1627804.64

[268] Source: Annual Export Import Data Bank, Ministry of Commerce and Industry, Government of India.

[269] HS Code: 25201010

[270] HS Code: 28070010

[271] HS Code: 28092010

[272] HS Code: 74031100

[273] HS Code: 74081190

Impact on Service Providers

For computing the impact on various service providers, the impact on a select sample size of the different types of such service providers was used as the metric. This impact was then proportionally scaled up for the total number/size of the respective types of service providers.

Service Providers: Impact on Revenue: Raw Input Data and Calculations (Rs. Crores)		
Mechanical and Maintenance Service Providers		
Sample Size		5
Total Number of MMSPs		25
Particulars	**Pre-Closure (Rs. Crores)**	**Post-Closure (Rs. Crores)**
MMSP #1		
Annual Revenue	11.97	8.11
Impact on Annual Revenue		-3.86
MMSP #2		
Annual Revenue	2	0.75
Impact on Annual Revenue		-1.25
MMSP #3		
Annual Revenue	5.00	0.08
Impact on Annual Revenue		-4.93
MMSP #4		
Annual Revenue	3	0
Impact on Annual Revenue		-3
MMSP #5		
Annual Revenue	1.00	0.06
Impact on Annual Revenue		-0.94
Particulars	**Average Annual Impact on Sample (Rs. Crores)**	**Estimated Annual Impact on All MMSPs (Rs. Crores)**
Revenue	-2.79	-69.86
Warehousing Service Provider		
Sample and Total Number of WSPs		1
Particulars	**Pre-Closure (Rs. Crores)**	**Post-Closure (Rs. Crores)**
Annual Revenue	15	2
Impact on Annual Revenue		-13
Estimated Impact on WSP		-13
Information & Technology Service Provider		
Share of ITSP #1 amongst the Total Number of ITSPs		90%

Service Providers: Impact on Revenue: Raw Input Data and Calculations (Rs. Crores)		
Particulars	**Pre-Closure (Rs. Crores)**	**Post-Closure (Rs. Crores)**
ITSP #1		
Annual Revenue	2	0.55
Impact on Annual Revenue		-1.45
Estimated Impact on All ITSPs		-1.61
Stevedore-Cargo Service Provider		
Sample Size		2
Total Number of SCSPs		10
Particulars	**Pre-Closure (Rs. Crores)**	**Post-Closure (Rs. Crores)**
SCSP #1		
Annual Revenue	202	139
Impact on Annual Revenue		-63
SCSP #2		
Annual Revenue	17.5	6
Impact on Annual Revenue		-11.5
Particulars	**Average Annual Impact on Sample (Rs. Crores)**	**Estimated Annual Impact on All SCSPs (Rs. Crores)**
Annual Revenue	-37.25	-372.5
Lorry Service Providers		
Total Number of Lorries		150
Particulars	**Pre-Closure (Rs. Crores)**	**Post-Closure (Rs. Crores)**
LSP #1		
Total Number of Lorries	15	8
Difference in Number of Lorries		7
Impact on Annual Revenue		-0.3
Loss Per Lorry		-0.04
Estimated Impact on All LSPs		-6.43

Impact on the Copper Plant

The metric used for denoting the impact of closure of the Copper Plant on the business of Sterlite is the PAT figures of the Copper Plant. This is premised on the rationale that the value of sales revenue or turnover is used for other expenditures made by the Copper Plant including taxes, salaries, other revenue expenditures. Thus, the impact on the Copper Plant's business computed through revenues would inherently include the impact on Government through taxation, impact on payment to suppliers, and impact on workers/employees through salaries, which are separately calculated. Hence, to avoid double counting of the net impact, the PAT values have been used, as represented in the following table.

Two assumptions were made for this calculation. First, the annual revenue figures for any financial year can be completely attributed to the operations of the Copper Plant, as the predominant source of revenue is through sales. Second, the annual revenues can be evenly distributed across the months of operations in any particular financial year. Using these assumptions, the average monthly net difference of PAT before and after the closure of the Copper Plant was computed. However, to calculate that the monthly average for FY18-19, 10 months have been taken into account, as the copper plant was operational for two months in the same year.

Sterlite: Impact on Profit After Tax: Raw Input Data and Calculations (Rs. Crores)

Particulars	FY 17-18	FY 18-19	FY 19-20
Profit After Tax	715	-768	-842
Monthly Average	59.58	-76.8	-70.17

Towards calculating the Pre-Closure PAT for 14 months = (Monthly Average of FY 17-18*12) + (Monthly Average of FY 18-19 * 2) = 561.4

Monthly average of 14 months Pre-Closure PAT = 561.4/14 = 40.1

Post-Closure PAT for 22 months = (Monthly Average of FY 18-19 *10) + (Monthly Average of FY 19-20 * 12) = -1610

Monthly average of 22 months Post-Closure PAT = 73.18

Monthly net impact = Monthly average of 22 months Pre-Closure PAT – Monthly average of 14 months Pre-Closure PAT = -113.28

Total Impact on the Profit After Tax for Period of Closure = -113.28 * 36 months = -4078.15

Total Impact on the Profit After Tax for Period of Assessment = -113.28 * 28 months = -3171.89

Impact on Government

Some of the total annual tax payment made by Sterlite was on account of the operations of the plant while a certain part of the tax payments was on account of other conditions including deferred taxation from previous year, license fees, amongst others. Given that the Copper Plant was completely shut for the financial year 2019-2020, it was assumed that all tax payments made in that particular year were on account of factors other than the Copper Plant's operations. This figure was subtracted from the tax payment values of previous financial years to arrive at the estimated annual tax payments attributed to the Copper Plant's operations.

In order to estimate the impact on tax revenues for the period of closure and assessment period, it was assumed that the annual tax paid (attributed to the Copper Plant's operations) can be evenly distributed across the number of months for which it was operational during that year. Following this, using the monthly average tax values for pre-closure period and post-closure period, a monthly impact was calculated which was then extrapolated proportionally to the assessment period and period of closure.

Government: Impact on Taxes Paid by Sterlite: Raw Input Data and Calculations (Rs. Crores)				
Particulars	**FY 17-18**	**FY 18-19**	**FY 19-20**	**FY 20-21**
State Taxes	**34.00**	**39.61**	**31.52**	**31.36**
Central Taxes	**2932.96**	**692.80**	**308.23**	**281.41**
Total Tax Paid	**2966.96**	**732.41**	**339.75**	**312.77**

Towards calculating the Impact on State Taxes:
Difference of State Taxes in FY 18-19 as compared to FY 17-18 = 34 – 39.61 = -5.61
Difference of State Taxes in FY 19-20 as compared to FY 17-18 = 34 – 31.52 = 2.48
Difference of State Taxes in FY 20-21 as compared to FY 17-18 = 34 – 31.36 = 2.64
Monthly Net Impact on State Taxes = (Difference of State Taxes in FY 18-19 as compared to FY 17-18 + Difference of State Taxes in FY 19-20 as compared to FY 17-18 + Difference of State Taxes in FY 20-21 as compared to FY 17-18) / 36 = -0.01
Impact on State Taxes during the Period of Closure = -0.01 * 36 = -0.49
Impact on State Taxes during the Assessment Period = -0.01*28 = -0.38

Towards calculating the Impact on Central Taxes:
Difference of Central Taxes in FY 18-19 as compared to FY 17-18 = 2932.96 – 732.41 = 2240.16
Difference of Central Taxes in FY 19-20 as compared to FY 17-18 = 2932.96 – 339.75 = 2624.73
Difference of Central Taxes in FY 20-21 as compared to FY 17-18 = 2932.96 – 312.77 = 2651.55
Monthly Net Impact on Central Taxes = (Difference of Central Taxes in FY 18-19 as compared to FY 17-18 + Difference of Central Taxes in FY 19-20 as compared to FY 17-18 + Difference of Central Taxes in FY 20-21 as compared to FY 17-18) / 36 = 208.79
Impact on Central Taxes during the Period of Closure = 208.79 * 36 = 7516.44
Impact on Central Taxes during the Assessment Period = 208.79 * 28 = 5846.12

Towards calculating the Loss of Revenue to the Government from Other Sources:
Monthly Net Impact = (Total Procurement Cost in FY 2015-16 + Total Procurement Cost in FY 2016-17 + Total Procurement Cost in FY 2017-18) = 125.91 / 36 = 3.5
Total Revenue Loss for Government from Other Sources during the Period of Closure = 3.5 * 36 = 125.91
Total Revenue Loss for Government from Other Sources during the Period of Closure = 3.5 * 28 = 97.93

National Green Tribunal Bar Association vs. Ministry of Environment & Forests and Ors. *(Sand Mining Case)*

Table of Contents

List of Figures and Tables

Executive Summary

India is expected to become the third largest construction business market by 2025, after China and United States of America. The demand for sand in India outstrips the supply. It is estimated that in the period of 2021-2026, the market for sand will increase at the rate of 6-7% annually. The demand supply imbalance, inter alia, has led to widespread unauthorised sand mining in the country. Illegal mining is lucrative to unscrupulous miners, their labour, administrators and polity.

While on one hand, the mining of major minerals is heavily regulated in India and go through a rigorous process of Environmental Impact Assessment (EIA) and clearances, due attention has not been given to the mining of minor minerals, especially when it comes to small-scale mining, given its smaller scale of operation. For instance, as per the EIA Notification of 2006 (EIA 2006), mining leases of less than 05 hectares (ha) did not require an Environmental Clearance (EC), until the same was amended in 2016.

Background: In 2012, the Supreme Court (SC) in Deepak Kumar vs State of Haryana mandated that leases of all minor minerals for an area with less than 05 ha will be granted only after environmental clearance by Ministry of Environment, Forest and Climate Change (MoEFCC). Prior to this judgment, MoEFCC notified Environment Impact Assessment Notification in 2006 according to which EC was required only for mining projects with lease area of 05 ha and above, irrespective of minor or major mineral, and not for mining projects with lesser areas. Following the SC judgment in 2012, the National Green Tribunal on August 5th, 2013 ordered that "no person, company, or authority can carry out any mining activity or removal of sand from any riverbed anywhere in the country until an EC from MoEFCC/ State Environmental Impact Assessment Committee (SEIAA) and license from competent authorities have been obtained".

Objective and Scope: In light of the above mentioned NGT order, the aim of this study is to analyse the economic impact of sand mining stoppage in Gautam Buddha Nagar, if any, on relevant stakeholders. Time period of the study is from August 2013 to September 2017. The study takes a bottom-up approach to understand only the first order direct impact on key stakeholders such as the government, mining lease holders, associated businesses, and labourers/workers, among others.

Economic Impact: UP generally, and the Gautam Buddha Nagar district, specifically, have received a lot of attention for rampant illegal mining of sand. Despite the laws and regulations in place, and many orders directing stoppage of illegal mining activities along with monitoring of such activities, the state of UP has been largely unsuccessful in curbing such illegalities. The state of UP was deprived of Rs. 477.93 crores in 2015-16 because of unauthorised mining operations according to Comptroller and Auditor General of India's (CAG) audit report of the Revenue Sector of UP. Moreover, it was also noted that the government suffered a loss of Rs. 179.57 crores owing to extraction of minerals without ECs. On top of all this, a penalty of Rs. 282.22 crores was also not recovered by the government against lessees extracting minerals without the renewal of a mining plan in addition to over-extraction beyond the approved quantity.

As per a 2013 news report the district administration of Gautam Buddha Nagar pegged the illegal sand mining business at Rs 100 crore monthly, out of which, as per the administration, the government hardly gets Rs 1.00 crore as royalty. Another 2013 media report mentioned that sale of illegally mined sand stood at Rs 100 to Rs 200 crore a month in Noida and Greater Noida, a major market for sand from Gautam Buddha Nagar. Ban on sand mining restricts the supply of already scarce sand, driving up prices and in turn incentive for illegal mining. After the August 5th, 2013 order of the NGT, people from construction sector expressed fears of steep rise in sand prices and foresaw delays in completion of projects. A Confederation of Real Estate Developers' Associations of India (CREDAI) spokesperson, after the said order, projected real estate construction costs to increase three-fold, as sand would have to be imported from Cambodia and Pakistan. He also mentioned that such cost increases are ultimately passed on to the buyers. Additionally, employment in construction sector also takes a hit due to fall in construction activity as has been seen in many states, for instance, Builders Association of India (Mumbai Centre) estimated employment loss for 10 million construction workers in Maharashtra due to a sand mining ban ordered by Mumbai High Court in September 2010.

Primary Findings: Information received by CUTS from the concerned department in Gautam Buddha Nagar regarding active leases at the time of the NGT order dated 5th August 2013, revealed that all sand mining leases in Gautam Buddha Nagar had expired on 1st May 2013 and hence there were no leaseholders in the district that were mining legally at that time. No new leases were granted thereafter till 2017 when the new State Mineral Policy was implemented. However, sand mining might have continued under short term permits.

An analysis of the amount of royalty received by the revenue department of Gautam Buddha Nagar shows a downtrend in royalty collection from 2012-13 to 2016-17. **As per CUTS' calculations, the state government on an average suffered an annual loss of Rs. 368 lakhs in royalty earnings from sand mining in Gautam Buddha Nagar, adding up a total royalty loss of Rs. 1288 lakhs during the assessment period i.e., from August 2013 to September 2017**.

While CUTS was able to engage with current leaseholders in a limited manner, due to poor data availability and unwillingness to engage, contacting previous lease and permit holders in understanding impact on them was challenging. However, what is clear is that sand mining continued in Gautam Buddha Nagar under short term permits. It could not be confirmed if any business that mined sand under a lease prior to the assessment period went out of business owing to no new leases being granted. **A current and active leaseholder, during the stakeholder interaction in field, highlighted the difficulties involved in obtaining leases. It was reported that while the procedure to apply for a lease is now completely online through the e-tendering process, documentation, completion, and registration takes up more than 2-3 months due to challenges such as lack of technical knowledge and typical governmental inertia.**

It was found that the associated businesses of cement and construction industries, **faced sand shortage and additional cost incurred in procuring illegal sand at a higher price due to stoppage of sand mining by NGT**, which in comparison to the alternatives such as

manufactured sand (M-sand) or crushed rocks was a more feasible and acceptable alternative for them. **A credible source from a cement dealers' association cited that during the assessment period illegally mined sand was procured at a price which was approximately Rs. 40 to 45 higher than the price of legally mined sand**.

The impact on workers during the assessment period effectively meant them losing their source of income. However, the sand mining industry in Gautam Buddha Nagar saw an increased activity of the nexus advancing illegal sand mining, as has been highlighted in many news reports. With most labourers involved in legal sand mining being paid Rs. 300 to 400 per day, as per interactions with current leaseholders, illegal mining although risky, was far more lucrative for them. **Through stakeholder interaction it was further found that the pay for illegal sand mine labour was at Rs. 150 for every trolley of sand that was mined. With each trolley making approximately 15-20 trips per day, each labourer on an average earned close to Rs. 2000 daily.**

Conclusion and Recommendations: Multiple interventions from the judiciary, policy changes and administrative initiatives have failed to curb illegal sand mining leading to hazardous environmental consequences. **Reanalysing and redesigning Environmental Impact Assessment Framework** to follow an integrated approach by considering social and health aspects along with **assessment of cumulative impact as opposed to impact of individual leases** will enable regulators and authorities to assess the impacts of mining leases not in silos, but in a group. In that regard, the concept of 'clusters' that was introduced in the EIA Amendment 2016, takes into account the environmental impact of a group of closely situated mining leases, rather than looking at each mining lease individually.

As the situation stands now, specifically in Gautam Buddha Nagar, the existence and dominance of sand mafia overshadows the legal sand mining activities, as the sand mafia can influence the cost and final prices. Therefore, the miners, as well as the workers, see no apparent disincentive in engaging in illegal sand mining, with weak enforcement and implementation of laws. At the same time, legal sand mining is also touted as expensive and cumbersome as compared to illegal sand mining. Firstly, because the price of legally mined sand is higher than that of sand mined illegally. Thus, one way to incentivise legal sand mining, could be for **state governments to reduce/cap the prices of legally mined sand**. Another way is to **simplify the procedure for obtaining permissions, leases, transportation and storage permits etc**. for legal sand mining. Thus making it difficult and unprofitable for illegal mining operations. Additionally, investment in and **promotion of alternatives such as M-sand** has become crucial to meet the ever increasing demand for sand. Lastly, adequate resources need to be allocated to **strengthen regulatory and monitoring mechanisms** of court decisions to curb illegal sand mining.

1. Introduction

Following China and the United States of America, India is expected to become the third largest construction business market by 2025, adding 11.5 million homes a year.[274] The 12th Five-Year Plan (2012-2017), which was also India's last Five-Year Plan, projected an investment of 10% of the national Gross Domestic Product (GDP), amounting to approximately Rs. 45 lakh crores, in extensive infrastructure development. The continuous urbanisation and increase in the population, has also furthered the accelerating growth of India's construction industry. The government increased its committed expenditure on infrastructure development by 20.9% from Rs. 4.9 lakh crores in FY 2017-18 to Rs. 6 lakh crores in FY 2018-19. In fact, in the Budget 2021-2022, the government allocated 34.5% more (budgeted expenditure) to infrastructure development as compared to FY 2020-21.[275] Furthermore, it is expected that the construction industry will record a Compound Annual Growth Rate (CAGR) of 15.7% by 2022 with an average output growth of 7.1% each year.[276]

One of the predominant materials used in the construction sector is sand, used for making concrete and brick – key elements to any construction project or activity.[277] It is estimated that sand constitutes nearly 40% of the raw materials used for any type of construction project – residential, commercial or infrastructure.[278] The sand market in India also saw an increase in demand from 630 million tonnes in 2010 to 833 million tonnes in 2020, owing to the boom in the construction sector.[279] It is estimated that in the period of 2021-2026, the market for sand will increase at the rate of 6-7% annually.[280]

A study conducted by the Indian Institute of Technology, Bombay, also projected that the annual demand for sand in urban India is 60 million metric tonnes per year alone, at an average of 1.00 kg per person per day.[281] However, sand is a scarce commodity, with India witnessing

---

274 Sudeshna Sen, 'India to be world's 3rd largest construction mkt by 2025', Economic Times, 01 July 2013, https://m.economictimes.com/india-to-be-worlds-3rd-largest-construction-mkt-by-2025/articleshow/20856489.cms.

275 Geethanjali Nataraj, 'Union Budget 2021: Infrastructure clearly the focus area in the Budget', Financial Express, 09 February 2021, https://www.financialexpress.com/opinion/union-budget-2021-infrastructure-clearly-the-focus-area-in-the-budget/2190720/.

276 Maier Vidorno, 'Construction Sector Overview – 2020', https://www.maiervidorno.com/industry-expertise/construction/.

277 'Material Consumption Pattern in India: A Baseline Study of the Automotive and Construction Sectors', Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, March 2016, https://www.international-climate-initiative.com/fileadmin/Dokumente/2016/GIZBaselineEReport_Final.pdf.

278 Ashish R. Puravankara, 'Dealing with sand shortage in South India', Economic Times, 17 July 2018, https://realty.economictimes.indiatimes.com/realty-check/dealing-with-sand-shortage-in-south-india/3139.

279 'Material Consumption Pattern in India: A Baseline Study of the Automotive and Construction Sectors – Executive Summary', Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, March 2016, https://www.international-climate-initiative.com/fileadmin/Dokumente/2016/GIZBaselineReportSummary_SinglePages.pdf.

280 'India Sand Market Outlook', Expert Market Research, https://www.expertmarketresearch.com/reports/india-sand-market.

281 Badri Chatterjee, 'Demand for sand in urban India is 60 mn metric tonnes per year: Study', Hindustan Times, 21 November, 2019, https://www.hindustantimes.com/cities/demand-for-sand-in-urban-india-is-60mn-metric-tonnes-per-year-study/story-wjl78UaUMeuTwXfrrz7DfN.html.

widespread cases of violent conflicts over illegal trade of sand.[282] The business of sand is often infested with criminal mafia and corrupt administration officials throughout the country. The sand available in plenty in our desert areas is not suitable for construction. In fact, India is now importing sand for construction.[283]

Due to the scarcity of sand, the construction sector broadly and the real estate sector in specific has not been able to meet its targets as envisaged under the 10th Five-Year Plan. In 2007, when the 11th Five-Year Plan began, there was a backlog in building 24.7 million houses, which further intensified to 42 million unbuilt houses by the 12th Five-Year Plan. To this end, the Union Ministry of Urban Development projected a shortage of sand of 91,666.7 million tonnes by the end of 2011.[284]

To understand the situation better, the Ministry of Mines constituted a committee in 2017 to undertake an analysis across 14 sand-producing states. The committee in its report of 2018 highlighted that, in all states, the demand for sand outstrips the supply except in Haryana, Uttarakhand, and Madhya Pradesh. It was highlighted that such deficit is partly due to the judicial bans on sand mining with a lack of solution in ensuring ways to meet the growing demands. Certain instances were cited such as the National Green Tribunal (NGT) banning sand mining in Maharashtra in 2017, and the Uttarakhand High Court imposing a 4-month state-wide ban on sand mining, which disrupt the demand supply ratio.[285]

Sand, under the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), is classified as a minor mineral under the Section 3(e).[286] Furthermore, Section 15 delegates to state governments complete freedom with respect to the formation of rules, and the granting of leases for minor minerals. Section 23C of the MMDR Act also gives the state governments complete authority in the framing and implementation of rules in order to prevent illegal sand mining, its transportation, storage and usage. Curbing and cracking down on illegal sand mining, therefore, falls under the state governments' administrative and legislative jurisdiction.

Considered one of the necessary evils of the modern world, mining in general, and sand mining specifically, provides materials such as rutile and zircon, to name a few, that are useful in industries such as ceramics and refractories, metal production and oil and gas recoveries.[287] While the activity does improve the quality of lives and provides an impetus for economic development, over time, excessive and illegal mining in addition to lack of regulation and lack

---

[282] Rajendra P Kerkar, 'Rampant illegal sand mining threatens Khandepar village', Times of India, 09 September 2020, https://timesofindia.indiatimes.com/city/goa/rampant-illegal-sand-mining-threatens-khandepar-river/articleshow/78006198.cms.

[283] Ishan Kukreti, 'India can rely on sand imports till time it is viable', Down to Earth, 30 June 2018, https://www.downtoearth.org.in/coverage/environment/india-can-rely-on-sand-imports-till-the-time-it-is-viable-60892#:~:text=India%20has%20178%20m%2Dsand,of%20Mines%20in%20March%202018.

[284] 'Look back at the decade: Sand', Down to Earth, 29 December 2019, https://www.downtoearth.org.in/news/mining/look-back-at-the-decade-sand-68569.

[285] 'Look back at the decade: Sand', Down to Earth, 29 December 2019, https://www.downtoearth.org.in/news/mining/look-back-at-the-decade-sand-68569.

[286] Mines and Minerals (Development and Regulation) Act, 1957, https://mines.gov.in/writereaddata/UploadFile/MMDR%20Act,1957.pdf.

[287] National Industrial Sand Association, https://www.sand.org/page/Products.

of alternatives, amongst other challenges, has brought along with it negative impacts on the environment, in addition to the socio-economic and health conditions of the locals.

While on one hand, the mining of major minerals is heavily regulated in India and go through a rigorous process of Environmental Impact Assessment (EIA) and clearances, due attention has not been given to the mining of minor minerals, especially when it comes to small-scale mining, given its smaller scale of operation. This lack of focus has led to rampant illegal mining and minimal consideration of the adverse environmental consequences emanating from small-scale mining of minor minerals. For instance, as per the EIA Notification of 2006 (EIA 2006), mining leases of less than 05 hectares (ha) did not require an Environmental Clearance (EC), until the same was amended in 2016.

The matters of illegal sand mining, violation and poor implementation of regulatory requirements pertaining to environmental protection, community rights and over-extraction, have thus necessitated the intervention of the judiciary, particularly the Supreme Court of India (SC) and the NGT. India has been one of the first countries to recognise healthy environment as a right to life. In 1991, the SC interpreting Article 21 of the Constitution of India underscored that the "*right to live is a fundamental right under Article 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life. If anything endangers or impairs that quality of life in derogation of laws, a citizen has right to have recourse.*"[288]

1.1. Background to the Sand Mining Case

In that backdrop, the SC and the NGT played a key role in making ECs mandatory for small-scale mining of minor minerals below 05 ha. In February 2012, in the matter of *Deepak Kumar v. State of Haryana & Ors.*,[289] the SC cautioned against illegal and unscientific mining practices of minor minerals in small-scale leases, underscoring the serious environmental impact of the same. The order was passed following deliberations over the validity of auction notices for minor minerals extracted from lease areas below 05 ha in several districts in Haryana, mainly earmarked at the foothills of fragile Himalayan ranges known as the Shivalik hills which are spread over the districts of Panchkula, Ambala and Yamuna Nagar. It was noted that no EIA had ever taken place for mining in these areas, especially on the riverbeds, thereby causing serious environmental and ecological degradation in them. The SC took cognisance of the fact that the overall environmental impact from mining of minor minerals can be largely attributed to these leases often being less than 05 ha and thus not requiring ECs under the EIA 2006.

In that context it noted that though individual mines of minor minerals, being small in size, may have insignificant impact, their collective impact on a regional scale is adverse. Thus, it was the first time that the matter of ECs for small-scale mines was taken up. It observed that, "*over the years, India's rivers and riparian ecology have been badly affected by the alarming rate of unrestricted sand mining which damages the ecosystem of rivers and the safety of*

[288] *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420, Supreme Court of India, 09 January 1991, https://indiankanoon.org/doc/1646284/.

[289] *Deepak Kumar etc. v. State of Haryana & Ors.*, I.A. Nos. 12-13 of 2011 in Special Leave Petition (C) No. 19628-19629 of 2009, Supreme Court of India, 27 February 2012, https://indiankanoon.org/doc/60071241/.

bridges, weakens riverbeds, destroys natural habitats of organisms living on riverbeds, affects fish breeding and migration, spells disaster for the conservation of many bird species, increases saline water in the rivers, etc."[290]

Thus, while adjudicating on the contentions of the petitioner, the SC noted that no proper studies had been conducted to understand the possible environmental impacts before issuing the auction notices. Even though this was lacking under the pretext of the leases being small-scale, thus not requiring ECs, the SC did not consider that to be a valid reason to disregard the adverse impact caused by such leases.[291]

At the same time, the SC noted that this matter is not isolated to Haryana, and similar issues had come up for deliberation for other states as well, including Rajasthan and Uttar Pradesh (UP). With that observation, the SC directed that the operation of mines of minor minerals including small-scale leases, need to be strictly regulated. The bench directed all state governments to make necessary changes to their minor mineral regulatory framework(s) in order to integrate and address the environmental impacts of such mining.

In that regard, the SC referred to two documents: a report on Environmental Aspects of Quarrying of Minor Minerals, 2010[292] and a model Mining Framework for Minor Minerals, 2010.[293] Both the documents contain guidelines with respect to definition of minor mineral, size and period of the mine lease, the requirement of a mining plan, mine closure and reclamation and rehabilitation, among others.

During the time of the order, the states were given a 06-month period for revising their policies, with the SC further directing that till the time such revisions happen, "*leases of minor minerals including their renewal for an area of less than 05 ha be granted by the States or Union territories only after getting EC from the MoEF*."[294]

More than a year after the SC judgment of February 2012, the issue relating to environmental degradation arising out of sand mining was raised before the NGT in the case of *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors*, which is the matter being studied in this report.[295] The matter under deliberation was with respect to large scale illegal, impermissible and unscientific sand mining on the banks of Yamuna, Ganga, Chambal,

---

[290] *Deepak Kumar etc. v. State of Haryana & Ors.*, I.A. Nos. 12-13 of 2011 in Special Leave Petition (C) No. 19628-19629 of 2009, Supreme Court of India, 27 February 2012, https://indiankanoon.org/doc/60071241/.

[291] Srestha Banerjee, 'Mining and Jurisprudence: Observations for India's mining sector to improve environmental and social performance', Brookings India, June 2020, https://www.brookings.edu/wp-content/uploads/2020/07/Mining-and-Jurisprudence_F.pdf.

[292] 'Environmental Aspects of Quarrying of Minor Minerals', Ministry of Environment and Forests, Government of India, March 2010, http://www.indiaenvironmentportal.org.in/files/Rpt_IA.pdf.

[293] The document has also been referred to as the 'Minor Minerals Conservation and Development Rules, 2010'. See more at: 'Environmental Aspects of Quarrying of Minor Minerals – Evolving of Model Guidelines', Ministry of Mines, Government of India, https://ibm.gov.in/writereaddata/files/07152014151559Report_minor.pdf.

[294] *Deepak Kumar etc. v. State of Haryana & Ors.*, I.A. Nos. 12-13 of 2011 in Special Leave Petition (C) No. 19628-19629 of 2009, Supreme Court of India, 27 February 2012, https://indiankanoon.org/doc/60071241/.

[295] *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Original Application No. 171 of 2013, National Green Tribunal, 05 August 2013, https://cdn.downtoearth.org.in/dte/userfiles/images/02-NGT_judgement.pdf.

Gaumti and Revati rivers without prior EC and/or in violation of the conditions stipulated under the EC, if granted.

The draft application by the applicants referred to various media articles surrounding the suspension of an Indian Administrative Service (IAS) officer posted as Sub-Divisional Magistrate (SDM) in Greater Noida in Gautam Buddha Nagar in UP. The SDM was suspended on 28 July 2013, who along with the mining officials of the state geology department, cracked down on the illegal mining of sand in and along the Yamuna and Hindon rivers.[296] The draft application brought to light the presence of the sand mafia while stating that, "*those who have opposed to such sand-mining, including the field level officials have been victimized as is apparent from the newspaper reports.*"[297]

The applicants further highlighted that according to the SC order in *Deepak Kumar v. State of Haryana*, the person carrying on mining activities in less than 05 ha is also expected to take EIA clearance from the respective authority. The NGT bench in light of that noted that removal of minerals from riverbeds is posing a serious threat to the flow of rivers, survival of forests upon riverbanks and most seriously to the environment of riverbanks, especially of the five rivers mentioned above.

The draft application by the NGT Bar Association further stated that the violations committed in UP have caused losses amounting to lakhs of crores of rupees to the state exchequer.[298] While referring to various media articles, the draft application also emphasised the importance of sand as critical to maintain the ecology of a river system.[299] The applicant further referred to the SC judgment of February 2012, while stating that the state authorities have not taken adequate measures to ensure that mining is not carried on without prior EC. The applicant, relying on Section 20 of the National Green Tribunal Act, 2010 (NGT Act) also emphasised that the NGT, while deciding the matter, must apply the principles of sustainable development, precautionary principle, and polluter pays principles.[300]

In light of that, the NGT through its order dated 5th August 2013 took cognisance of the concerns raised by the applicant and issued notices to all respondents.[301] In the meantime, the

---

296 ''Upright' suspended IAS officer Durga just wanted to preserve environment', Hindustan Times, 02 August 2013, https://www.hindustantimes.com/india/upright-suspended-ias-officer-durga-just-wanted-to-preserve-environment/story-uKNVO02yeEXSkFX2tFIC2M.html; Soma Basu, 'IAS officer was punished for taking on SP leaders involved in sand mining', Down to Earth, 31 July 2013, https://www.downtoearth.org.in/news/ias-officer-was-punished-for-taking-on-sp-leaders-involved-in-sand-mining-41816.

297 *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Compilation No. I (Paper Book), National Green Tribunal, https://cdn.downtoearth.org.in/dte/userfiles/images/01-Sand%20Mining_Bar.pdf.

298 *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Compilation No. I (Paper Book), National Green Tribunal, https://cdn.downtoearth.org.in/dte/userfiles/images/01-Sand%20Mining_Bar.pdf.

299 Smriti Kak Ramachandran, 'Sand mining issue: "Impact cannot even be calculated"', The Hindu, 02 August 2013 (updated: 02 June 2016), https://www.thehindu.com/news/cities/Delhi/sand-mining-issue-impact-cannot-even-be-calculated/article4981212.ece.

300 *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Compilation No. I (Paper Book), National Green Tribunal, https://cdn.downtoearth.org.in/dte/userfiles/images/01-Sand%20Mining_Bar.pdf.

301 Respondents included Ministry of Environment and Forest; State Level Environment Impact Assessment Authority; State of Uttar Pradesh; Geological Survey of India; Uttar Pradesh Department of Geology & Mining; Uttar Pradesh Department of Irrigation; Central Pollution Control Board; Uttar Pradesh State Pollution Control Board; Gautam Buddha Nagar District Magistrate; and Gautam Buddha Nagar Superintendent of Police.

NGT declared that "*we restrain any person, company, authority to carry out any mining activity or removal of sand, from river beds anywhere in the country without obtaining Environmental Clearance from MoEF/SEIAA and license from the competent authorities.*"[302]

The next day after NGT's order, on 6th August 2013, the Ministry of Environment and Forest (MoEF, now Ministry of Environment, Forest and Climate Change (MoEFCC)) constituted a committee to examine the allegations of rampant illegal sand mining in UP's Gautam Buddha Nagar and assess its impact on environment, while directing the committee to submit its report by 09 August 2013.[303] The three-member committee was headed by Dr. Saroj, Director in the MoEF along with G C Meena, Deputy Collector of Mines at the Dehradun-based Indian Bureau of Mine, and K Garg, Director of the MoEF's regional office in Lucknow.[304] The committee was set up in the aftermath of the suspension of the SDM, along with a wide coverage in media reports (both electronic and print) of the menace of alleged illegal sand mining in Gautam Buddha Nagar.

Consequently, the report submitted to the environment ministry on 9th August 2013 stated that it is evident that rampant, unscientific and illegal mining has been going on at various locations in the Gautam Buddha Nagar district along the Yamuna river.[305] The report stated that this is in violation of the various environmental regulations, the MMDR Act, and the directions given by the SC and the NGT. The committee further suggested that specific river stretches should be identified, and mining permits should be granted stretch-wise for riverbed sand mining so that the requisite safeguard measures can be implemented and monitored by the regulatory authorities. Additionally, it recommended that the depth of mining may be restricted to 3m/water level, and that the proponent should prepare a mine plan which must be duly approved by the state department of mines and geology.[306]

The committee report also reiterated the findings from the SC judgment and the NGT order that prior EC is mandatory irrespective of the area of the mining lease. Moreover, the report also stated that the cumulative impact of sand mining in the area needs to be studied along with an annual replenishment study.[307]

---

[302] *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Original Application No. 171 of 2013, National Green Tribunal, 05 August 2013, https://cdn.downtoearth.org.in/dte/userfiles/images/02-NGT_judgement.pdf.

[303] Office Order, 'Constitution of a Committee to enquire into the adverse environmental impact of the alleged illegal sand mining in Gautam Buddha Nagar, Uttar Pradesh – reg.', Ministry of Environment and Forest, Government of India, 06 August 2013, http://moef.gov.in/wp-content/uploads/2018/08/Office-Order.pdf.

[304] 'MoEF panel to probe 'illegal' sand mining in Gautam Buddha Nagar', The Indian Express, 08 August 2013, https://indianexpress.com/article/cities/lucknow/moef-panel-to-probe-illegal-sand-mining-in-gautam-budh-nagar/.

[305] Press Trust of India, 'Rampant mining going on in Gautam Budh Nagar: Panel', Business Standard, 10 August 2013, https://www.business-standard.com/article/current-affairs/rampant-mining-going-on-in-gautam-budh-nagar-panel-113081000406_1.html.

[306] Neha Sethi, 'Environment committee finds illegal sand mining in Gautam Budh Nagar', LiveMint, 11 August 2013, https://www.livemint.com/Politics/fzIGEppWpXkfPJkRtubt6M/Govt-panel-finds-evidence-of-illegal-sand-mining.html.

[307] Neha Sethi, 'Environment committee finds illegal sand mining in Gautam Budh Nagar', LiveMint, 11 August 2013, https://www.livemint.com/Politics/fzIGEppWpXkfPJkRtubt6M/Govt-panel-finds-evidence-of-illegal-sand-mining.html.

On 14 August 2013, the NGT passed another order directing all states to file affidavits on certain identified issues.[308] This order came in the aftermath of the applicant contending that despite the order of the SC of February 2012, the respective states have failed to check illegal mining. In furtherance of that, various documents were also placed on record to show that despite the order of the NGT dated 5th August 2013, illegal mining has been going on in all the states and in a very high magnitude. Particular reference and emphasis were made on the various media reports about the indiscriminate, illegal, and unauthorised mining going on in Gautam Buddha Nagar in UP.

As per media reports, the UP government, albeit reluctantly, admitted before the NGT during the hearing that illegal sand mining was going on in the state and not a single EC was granted for it in the Gautam Buddha Nagar district.[309]

Subsequently, the NGT came down heavily on the states, especially the Deputy Commissioner and Superintendent of Police, stating that it was expected that they would ensure compliance of the orders by the SC and the NGT, however, both have miserably failed to implement these orders. It also took cognisance of the illegal mining happening in Tamil Nadu and Kerala. After hearing the applicant, the bench further prohibited illegal and unauthorised sand and minerals mining without leave of the authorised authority on beaches or on coastal areas.[310]

Consequently, the state of Madhya Pradesh (MP) filed an application before the NGT for extension of time for compliance with the directions as contained in the SC order, and the same was permitted. Thereafter, the state of MP submitted its compliance report in May 2013, claiming that primarily it is only the states of MP and Rajasthan that have complied with the orders of the SC and enacted the amended rules. However, the state of MP filed an appeal before the SC under Section 22 of the NGT Act.

The appeal was on the grounds that as a result of the orders by the SC and NGT in February 2012 and August 2013, respectively, even legal mining activity – having all the necessary approvals as per the applicable law – is required to be shut down if it does not have approval of the MoEF or State Environmental Impact Assessment Committee (SEIAA). This is problematic because as per the MP state law, the EC has to be given by the District Level Environment Committee (DLEC). The state of MP contended that in exercise of its power under Section 15 of the MMDR Act, it amended Rule 49 of the Madhya Pradesh Minor Mineral Rules, 1996 and constituted a DLEC which can grant or refuse the Environment Management Plant (EMP) of quarry lease and trade quarry.[311] Thus, it was contended that the DLEC is competent to give environmental clearances for carrying on of mining activity in areas less

---

[308] *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Original Application No. 171 of 2013, National Green Tribunal, 14 August 2013, http://www.indiaenvironmentportal.org.in/files/illegal%20mining%20NGT%2014Aug13.pdf.

[309] Press Trust of India, 'UP govt admits before green tribunal about illegal sand mining', Business Standard, 14 August 2013, https://www.business-standard.com/article/current-affairs/up-govt-admits-before-green-tribunal-about-illegal-sand-mining-113081400898_1.html.

[310] *Ibid.*

[311] As per the Madhya Pradesh Minor Mineral Rules, 1996 quarry lease is defined as "a mining lease for minor minerals as mentioned in Section 15 of the Act" and trade quarry is defined as "a quarry for which the right to work is auctioned". See more at: 'M.P. Minor Minerals Rules, 1996', http://www.bareactslive.com/MP/MP443.HTM.

than 05 ha. Subsequently, it was submitted that an Interlocutory Application (IA) was filed before the NGT for subsequent modification of the order dated 5th August 2013 to include DLEC in addition to MoEF and SEIAA as a competent authority to grant EC. However, it was contended by the state of MP that no order was passed by the NGT as a result of which "*the sand mining activity in the entire State of Madhya Pradesh has come to a standstill and consequently, a lot of connected business activities have been adversely affected*."[312]

However, the SC through its order dated 16 August 2013 disposed of the appeal while requesting the NGT to take up the IA and pass orders within a week, if possible. Subsequently, the matter came up for hearing on 23 August 2013 before the NGT. Referring to the provisions of the Environment (Protection) Act, 1986 and the EIA 2006 along with SC's judgment of February 2012, the NGT noted that there was a clear mandate that all activity of mining of minerals (sand) irrespective of the area would require EC from MoEF or SEIAA prior to operating the mining activity.[313] Section 15 of the MMDR Act gives limited power to the state government to frame rules for regulating grant of lease or license for quarrying of mines or minerals in respect of minor minerals.

Thus, the NGT through its order dated 28 August 2013 opined that "*it will be difficult to give a liberal or wider meaning to the language of Section 15 of the Act of 1957 on the principle of plain interpretation…the Union Parliament is competent to legislate and has so enacted these laws. It is only by virtue of delegated legislation…that the State Government can frame rules, which thus, must be construed strictly and subject to the provisions of the Section.*"[314]

While addressing the concern of financial loss as raised by the state of MP, the NGT stated that the fact that there has been a large number of cases of illegal mining in the state and huge amounts have to be recovered on account of penalty and charges, itself shows that the state regulations have been inadequate leading to huge illegal mining and great revenue loss to the state. Thus, the argument advanced by the state is "self-destructive".

"*Stringent regulation of mining of minerals is required. Due care, caution and prevention should be taken to ensure that no degradation of environment takes place*", opined the NGT while finding no merits in the application by the state of MP and dismissing the same.[315]

---

312 *National Green Tribunal Bar Association v. The Secretary, Ministry of Environment and Forests and Ors.*, Miscellaneous Application Nos. 685 and 708 of 2013 in the Original Application No. 171 of 2013, National Green Tribunal, 28 November 2013, http://www.indiaenvironmentportal.org.in/files/sand%20mining%20NGT%2028Nov2013.pdf.

313 *National Green Tribunal Bar Association v. The Secretary, Ministry of Environment and Forests and Ors.*, Miscellaneous Application Nos. 685 and 708 of 2013 in the Original Application No. 171 of 2013, National Green Tribunal, 28 November 2013, http://www.indiaenvironmentportal.org.in/files/sand%20mining%20NGT%2028Nov2013.pdf.

314 *National Green Tribunal Bar Association v. The Secretary, Ministry of Environment and Forests and Ors.*, Miscellaneous Application Nos. 685 and 708 of 2013 in the Original Application No. 171 of 2013, National Green Tribunal, 28 November 2013, http://www.indiaenvironmentportal.org.in/files/sand%20mining%20NGT%2028Nov2013.pdf.

315 *National Green Tribunal Bar Association v. The Secretary, Ministry of Environment and Forests and Ors.*, Miscellaneous Application Nos. 685 and 708 of 2013 in the Original Application No. 171 of 2013, National Green Tribunal, 28 November 2013, http://www.indiaenvironmentportal.org.in/files/sand%20mining%20NGT%2028Nov2013.pdf.

However, the 5th August 2013 order of the NGT did put into quandary, not just the sand mining industry, but also allied businesses such as cement companies, and the building and construction companies to name a few. Given that sand is one of the most essential elements of construction, in addition to being a scarce resource, it was feared that the NGT order might exacerbate illegal mining and smuggling activities.[316] Subsequently, it was in September 2017 that fresh mining leases were issued in Gautam Buddha Nagar for sand mining.

2. Objective

In light of the background and context to the case, the aim of this study is to analyse the economic impact of sand mining stoppage in Gautam Buddha Nagar, if any, on relevant stakeholders from August 2013 to September 2017. The sand from Yamuna riverbed is widely used in the National Capital Region (NCR) comprising Delhi, and adjoining suburbs in UP, Haryana, and Rajasthan. Thus, for effectively assessing the economic impact, the Gautam Buddha Nagar region was chosen. Additionally, the infrastructure companies, construction contractors, and cement industries located in UP and Delhi are identified as key in assessing the economic impact, if any.

3. Scope

The scope of this analysis is defined by the following parameters:

- **Location**: Even though sand mining is carried out across India at multiple locations, the scope of this study is limited to studying and analysing the sand mining activities carried out in the Gautam Buddha Nagar district located in UP.
- **Extent of the Analysis**: The study analyses only the first order direct impact on key stakeholders due to sand mining not taking place in Gautam Buddha Nagar such as the mining lease and permit holders, associated businesses, and labour, among others.
- **Duration**: To provide an objective analysis of the economic impact, if any, due to sand mining not taking place in Gautam Buddha Nagar, the 'assessment period' has been considered from August 2013 – when the NGT restrained mining activity without EC – to September 2017 – when the granting of mining leases resumed in Gautam Buddha Nagar.

4. Methodology

The study has taken an evidence-based, bottom-up approach to better understand and analyse the economic impact, if any, on relevant stakeholders due to sand mining not taking place in Gautam Buddha Nagar during the assessment period i.e., August 2013 to September 2017. In furtherance of that, an extensive review of existing literature related to the case was conducted, followed by field visits and in-depth interviews with key stakeholders who might have been impacted due to sand mining not taking place.

[316] Ramnath Subbu, 'Sand Mining Ban puts builders in a bind', The Hindu, 09 August 2013, https://www.thehindu.com/business/Industry/sand-mining-ban-puts-builders-in-a-bind/article5007162.ece.

4.1. Secondary Research

A thorough review of relevant judicial decisions and literature has been conducted to better understand the history to the case and the varied levels of impact caused which led to sand mining not taking place during the assessment period, and the subsequent economic impact, if any. Various reports and official revenue data (from the Directorate of Geology and Mining, Government of UP) have been relied on to map such economic impact.

4.2. Stakeholder Mapping and Sampling

Based on the insights gained from the secondary literature, an extensive mapping of relevant stakeholders associated with sand mining in Gautam Buddha Nagar was carried out. This enabled a better understanding of the relevant stakeholders who could have been impacted because of sand mining not taking place during the assessment period, and consequently, their perspectives which added value to the overall research and findings of this study. Table 1 provides an overview of the categories of stakeholders identified and interviewed.

Table 1: Overview of the Categories of Stakeholders Identified

Category	Details	Key Queries
Leaseholders	Sand Mining Leaseholders	• Impact on Revenue and Profit • Impact on Livelihood • Impact on Taxes Paid • Perception on the Case
Employees / Workers / Labourers	Mine Workers, Labourers	• Perception on the Case • Availability of Alternative Employment Opportunities • Impact on Salaries • Impact on Livelihood
Companies	Contractors, Builders, Real Estate Companies, Suppliers of Sand and Cement	• Impact on Revenue and Profit • Impact on Taxes Paid • Impact on Employment and Salaries • Perception on the Case
Associations	Mineral Association, Truckers' Association, Cement Manufacturers Association	• Perception on the Case • Impact on Product Specific to the Association
Journalists and Researchers	Various Media Outlets and Civil Society Organizations	• History to the Case • Identification of other Stakeholders • Perception on the Case • Ground-level Realities and Issues
Government Authorities	Revenue Department, Directorate of Geology and Mining, New Okhla Industrial Development Authority, Yamuna Expressway Industrial Development Authority, Village Representatives	• Data Related to Sand Mining • Implementation-level Issues • Regulatory Issues • Environmental Issues and Concerns • Perception on the Case

Table 1: Overview of the Categories of Stakeholders Identified		
Category	**Details**	**Key Queries**
Community	Villagers	• About River Sand Mining • Perception on Illegal Sand Mining • Impact on Sand Mining due to Orders • Environmental Impacts

4.3. Tools and Methods of Data Collection

Data collection from primary sources was undertaken through email and telephonic interactions followed by on-field inquiries in Gautam Buddha Nagar. The main data collection method used were Key Informant Interviews (KIIs) supported by structured and semi-structured questionnaires. In addition to KIIs, the field visit helped further strengthen and validate the findings of this study. Table 2 highlights a detailed break-up of the sample studied.

Table 2: Detailed Break-up of the Sample Studied			
Category	**Details**	**Mode**	**Sample Studied**
Leaseholders	Sand Mining Leaseholders	Telephonic	3
Employees / Workers / Labourers	Contractual, Daily-wage Labourers	Field Visit	10
Companies	Real Estate Companies	Email + Field Visit	1
	Construction Companies	Telephonic + Field Visit	1
	Organizations supporting the preparation of EIA reports and procuring ECs	Telephonic + Field Visit	1
Associations	Cement Associations	Telephonic	1
Journalists and Researchers	NGOs / NPOs	Email + Telephonic	4
Government Authorities	Gautam Buddha Nagar Revenue Department	Email + Field Visit	8
Community	Villagers	Field Visit	6

The research team ensured that all stakeholders that were contacted and interacted with, consented to the information being shared. Furthermore, at all stages of the study, due importance and care has been given to maintaining the confidentiality of information and anonymity of respondents given the sensitive nature of the data and the case being studied, unless otherwise agreed upon.

4.4. Data Analysis

The data analysis for this study followed the process of identifying relevant stakeholders who may have been impacted due to sand mining not taking place in Gautam Buddha Nagar, as has been elaborated in the previous sections. The four main categories of stakeholders which were found to be directly impacted included: the leaseholders, the labourers and workers, the associated businesses including cement companies and real estate companies among others, and the government.

While maximum efforts were made to ensure that the data collected was specific and related to the assessment period when sand mining was not taking place, certain data, such as application fee, transit pass booking fee, shared by the concerned government departments include cumulative estimates for river sand mining, basement sand mining, and brick kilns to name a few, and the breakdown of the same was not available.

4.5. Limitations of the Study

While maximum efforts were made to ensure representation of a complete and comprehensive picture, there have been certain limitations including:

- The scope of the study is limited to studying and analysing the economic impact, if any, during the assessment period when sand mining was not taking place in Gautam Buddha Nagar. Such scope thus excludes an extensive evidence-based analysis with respect to the health, social, and environmental concerns and impacts.
- The sensitive nature of the case being studied also impacted the willingness of stakeholders to participate.
- Non-availability of data from primary stakeholders was a major hurdle. Furthermore, sand being a minor mineral, it was a challenge to gather data even through government sources, in addition to the non-availability of directly attributable data as for most, breakup of the data was not available.
- The Covid-19 pandemic impacted the field visit leading to reduced participation of respondents and limited number of meetings per day considering safety protocols, while some potential respondents even refused to meet due to the fear of infection.

5. Theoretical Framework: Review of Existing Literature

In a rapidly urbanising nation such as India, the demand for sand is high and, on the rise, given its role in the construction sector. A 2013 report by an American based industry market organisation, Fredonia Group, estimated that the demand for sand in India by 2020 is expected to be at 1430 million tonnes. In another report by the Fredonia Group, it was pointed out that developing regions of the world, especially those located in the Asia/Pacific, Africa/Mideast regions will respond to the steep increase in sand through high incidences of illegal sand mining, due to the lower availability of alternative options in the region.[317]

[317] 'Shrinking availability of sand shifts consumer preferences to substitutes', Fredonia Group, 10 January 2020, https://www.freedoniagroup.com/Content/News/2020/01/10/Shrinking-Availability-of-Sand-Shifts-Consumer-Preference-to-Substitutes.

The various nuances to sand mining in India have re-started the debate of having to find a balance between society, environment and development. However, upon a closer look, there are other crucial factors and linkages which require careful exploration and understanding.

5.1. Legal and Regulatory Framework Governing Sand Mining in India

The MMDR Act, 1957 of India regulates the mining activities in the country. As per section 3(e) sand is classified as a 'minor mineral'.[318] Further under the MMDR Act, the legal and administrative control over minor minerals vests with the state governments, who have the power to make rules to govern minor minerals.[319] As per the Seventh Schedule of the Constitution of India, the regulation of mines and mineral development is also included in both List I – Union List and List II – State List, Entry 54 and 23, respectively. The latter is however subject to the provisions of List I with respect to regulation and development under the control of the Union.[320] Accordingly, as per their objectives, different state governments have made different rules for awarding, regulating, and administering the sand concessions granted under those rules.

Issues of illegal mining, environmental damage, high sand prices and quality of sand – all of which are interlinked – are prevalent across many States. The MoEFCC released the Sustainable Sand Mining Management Guidelines, 2016 to promote scientific mining of sand and encourage environmentally friendly management practices. The key objectives of the guidelines include:[321]

- To ensure that sand and gravel mining is done in an environmentally sustainable and socially responsible manner.
- To ensure availability of adequate quantity of aggregate in sustainable manner.
- To improve the effectiveness of monitoring of mining and transportation of mined out material.
- Conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system.
- To avoid aggradation at the downstream reach especially those with hydraulic structures such as jetties, water intakes etc.
- To ensure the rivers are protected from bank and bed erosion beyond its stable profile.
- To ensure no obstruction to the river flow, water transport and restoring the riparian rights and in-stream habitats.

---

318 "Minor mineral" means building stones, gravel, ordinary clay, ordinary sand other than sand used for prescribed purposes, and any other mineral which the Central Government may, by notification in the Official Gazette, declare to be a minor mineral: 'Mines and Minerals (Development and Regulation) Act, 1957', Act No. 67 of 1957, Ministry of Mines, Government of India, https://mines.gov.in/writereaddata/UploadFile/MMDR%20Act,1957.pdf.

319 Section 15, MMDR Act stipulates that State Governments have the power to make rules for regulating the granting of leases for minor minerals. Section 23C of the MMDR Act stipulates that the State Governments have the power to make rules for preventing illegal mining, transportation, and storage of minerals: 'Mines and Minerals (Development and Regulation) Act, 1957', Act No. 67 of 1957, Ministry of Mines, Government of India, https://mines.gov.in/writereaddata/UploadFile/MMDR%20Act,1957.pdf.

320 'The Constitution of India, 1950', As on 9th September 2020, Legislative Department, Ministry of Law and Justice, Government of India, https://legislative.gov.in/sites/default/files/COI.pdf.

321 'Sustainable Sand Mining Management Guidelines, 2016', India Environment Portal, 09 June 2016, http://www.indiaenvironmentportal.org.in/content/430504/sustainable-sand-mining-management-guidelines-2016/.

- To avoid pollution of river water leading to water quality deterioration.
- To prevent depletion of groundwater reserves due to excessive draining out of groundwater.
- Streamlining the process for grant of EC for sustainable mining.

To look into the various issues relating to sand mining and to prepare a framework that can be adopted by states while undertaking sand mining, a committee chaired by the Union Secretary, Ministry of Mines comprising of officials of state governments was constituted vide order dated 18 May 2017. Subsequently in March 2018, the Ministry of Mines released the Sand Mining Framework.[322] In the process of the creation of the framework, a group was constituted which was tasked to visit various states to understand the ground situation. In that endeavour, the group visited 14 states and studied the policies and processes governing sand mining in states across different elements in the process chain.[323]

Figure-1 below highlights the key elements in the process chain of sand mining. Thus, once the state's objectives are set, the process needs to be designed as per the paradigm in Figure-1. However, a reverse flow of information, analysis and feedback is also essential for setting and/or modifying state objectives.[324]

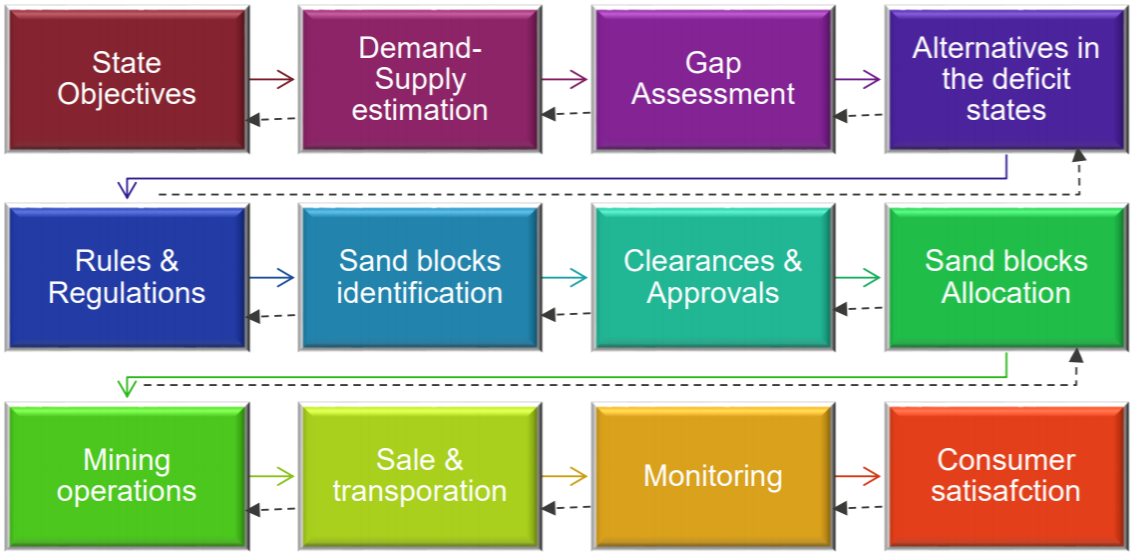


Figure 37: Key Elements in the Process Chain of Sand Mining.
(Source: Sand Mining Framework, Ministry of Mines)

In addition to an exhaustive legal and regulatory framework with respect to sand mining – or mining in general – a critical component has been the regulations governing the EIA process in India. EIA's become critical as it institutionalises a process of evaluating the likely environmental impacts of a proposed project or development. The EIA 2006 under the

322 'Sand Mining Framework', Ministry of Mines, Government of India, March 2018, https://www.mines.gov.in/writereaddata/UploadFile/sandminingframework260318.pdf.

323 States include Assam, Andhra Pradesh, Chhattisgarh, Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and Uttarakhand.

324 'Sand Mining Framework', Ministry of Mines, Government of India, March 2018, https://www.mines.gov.in/writereaddata/UploadFile/sandminingframework260318.pdf.

Environment (Protection) Act, 1986 came into force on 14 September 2006 and replaced the first EIA Notification of 1994. However, the EIA 2006 and its subsequent amendment in 2009 (EIA Amendment 2009), did not make ECs compulsory for small-scale mining projects, which allowed mining under small leases without any environmental assessment.[325] Thus, without an EIA, the environmental impacts of such small-scale mining were not notified or studied under the EIA 2006. Subsequently, the environmental impacts of mining minor minerals and their monitoring in cases where mine leases are less than 05 ha became a major concern.

The EIA 2006 noted that mining of minerals in any mine lease area greater than or equal to 50 ha, will fall under Category A, and will require EC from the Union environment ministry and an Expert Appraisal Committee (EAC). At the same time, projects involving mine lease area between 05 to 50 ha will fall under Category B and require clearance from the SEIAA and State Expert Appraisal Committee (SEAC). The notification did not mention mine leases of less than 05 ha, nor did it have any provision for their clearance.[326] That could perhaps be because the categorisation of projects and activities was done on the basis of the "*spatial extent of potential impacts and potential impacts on human health and natural and manmade resources*."[327] Thus, it can be inferred that the EIA Notification 2006 did not make ECs compulsory for small-scale mining projects, as they were not seen as projects that could cause a high impact.

The EIA Amendment 2009 further divided the mine lease area into two broad categories – non-coal mine lease and coal mine lease. It further noted that for non-coal mining projects, an EC will be required for mine leases greater than or equal to 50 ha, while for coal mining projects, the mine lease area specified was greater than 150 ha. Both these were placed under Category A. Furthermore, Category B constituted of non-coal mining leases falling between 05 to 50 ha and coal mining leases between 05 to 150 ha. Both categories required clearances in accordance with the EIA 2006. While the EIA Amendment 2009 differentiated between coal and non-coal mining, it did not distinguish between major and minor minerals, nor did it mention anything regarding mine lease areas below 05 ha.[328]

After years of deliberation, the MoEFCC amended the EIA 2006 to bring small-scale mining projects under its ambit in 2016 (EIA Amendment 2016), making ECs compulsory for mining of minor minerals in areas less than or equal to 05 ha. It further provided for the establishment of the District Environment Impact Assessment Authority (DEIAA) and District Expert Appraisal Committee (DEAC) to evaluate EC proposals for small-scale leases for minor

[325] 'Regulating Small-Scale Mining of Minor Minerals: A Comprehensive Framework Beyond Environmental Clearances', Centre for Science and Environment, 2016.

[326] 'Regulating Small-Scale Mining of Minor Minerals: A Comprehensive Framework Beyond Environmental Clearances', Centre for Science and Environment, 2016.

[327] 'Environment Impact Assessment Notification 2006', Ministry of Environment and Forest, 14 September 2006, http://www.environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf.

[328] Srestha Banerjee, 'Regulating small-scale mines below 5 ha', Down to Earth, 09 August 2013, https://www.downtoearth.org.in/news/regulating-smallscale-mines-below-5-ha-41892.

minerals.[329] Figure 2 below highlights the categorisation of projects and activities, after the EIA Amendment 2016.

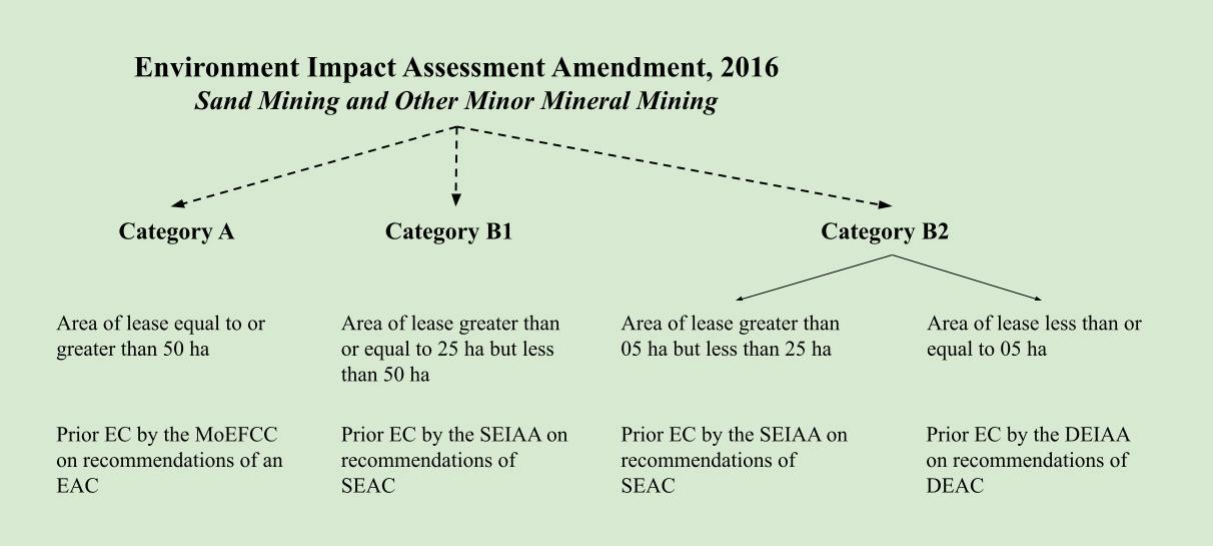


Figure 38: Categorisation of Projects and Activities Post-EIA Amendment 2016.
(Source: CUTS' Analysis based on the EIA Amendment 2016)

A significant provision introduced in the EIA Amendment 2016 was with respect to 'cluster mining', wherein it was recognised that mining of minor minerals happens mostly in clusters. Thus, the EIA or EMP – documents prepared by the applicants prior to receiving an EC – will have to be prepared for the entire cluster in order to capture all the possible externalities. A cluster will be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogenous mineral area.[330]

The EIA Amendment 2016 also specified the requirement of a District Survey Report (DSR) for sand or riverbed mining and for mining of other minor minerals. It stipulates that such survey report needs to be prepared for each minor mineral in each district separately. The main objective of the report is to determine areas where mining can be allowed and where it must be prohibited.[331]

Despite such an extensive legal and regulatory framework governing sand mining in India, in the recent past it had been observed that apart from management and systematic mining practices, there was an urgent need to have a guideline for effective enforcement of regulatory provisions and their monitoring. In that backdrop, the MoEFCC introduced the Enforcement & Monitoring Guidelines for Sand Mining in 2020.[332] These guidelines are supplemental to the Sustainable Sand Mining Management Guidelines of 2016 and were prepared after taking into

[329] Srestha Banerjee, 'EIA notification amended to bring small-scale mining under its ambit', Down to Earth, 28 January 2016, https://www.downtoearth.org.in/news/mining/eia-notification-amended-to-bring-small-scale-mining-under-its-ambit-52628.

[330] 'Environment Impact Assessment Amendment, 2016', Ministry of Environment, Forest and Climate Change, 15 January 2016, http://environmentclearance.nic.in/View_order.aspx?rid=36.

[331] 'Environment Impact Assessment Amendment, 2016', Ministry of Environment, Forest and Climate Change, 15 January 2016, http://environmentclearance.nic.in/View_order.aspx?rid=36.

[332] 'Enforcement & Monitoring Guidelines for Sand Mining', Ministry of Environment, Forest and Climate Change, January 2020, http://environmentclearance.nic.in/writereaddata/SandMiningManagementGuidelines2020.pdf.

consideration various orders and directions by the NGT in matters pertaining to illegal sand mining, in addition to the reports submitted by expert committees and investigation teams.

The main objectives of the guidelines are stated to be (i) identification and quantification of mineral resources and its optimal utilisation, (ii) regulate sand and gravel mining in the country since its identification to its final end-use by the consumers and the general public, (iii) use of IT-enabled services and latest technologies for surveillance of sand mining at each step, (iv) reduction in demand and supply gaps, (vi) setting up the procedure for replenishment study of sand, (v) post environmental clearance mechanism, (vi) procedure for environmental audit, and (vii) control the instance of illegal mining.[333]

While the legal and regulatory framework governing sand mining in India is robust and comprehensive, its implementation has been questioned. At the same time, the multiple laws and regulations, both at the central and state level, make compliance complex and cumbersome for businesses, thus adding to the ambiguities in the process of legal sand mining.

5.2. Laws Governing Sand Mining in Uttar Pradesh

There are various laws and regulations introduced by the state of UP to govern and regulate sand mining in the state. However, these state regulations have on various occasions overlapped with the central regulations, thus furthering the compliance burden for businesses. At the same time, the implementation of the state regulations has also been inadequate and insufficient adding to one of the main reasons why illegal sand mining in the state has not been controlled and regulated as desired.

In that context, regulation of minor minerals has mainly three key components: the granting of concessions, awarding of clearances and consents including monitoring of clearance and consent conditions, and addressing issues of illegal mining.

In pursuance to the MMDR Act which delegates the power to state governments to make rules in respect of minor minerals and the prevention of illegal mining, transportation and storage of minerals, the UP government introduced the Uttar Pradesh Minor Mineral (Concession) Rules, 1963 (MMC Rules) and the Uttar Pradesh Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2002 (UP Rules, 2002), respectively. However, on 20 December 2018, the UP government rescinded the UP Rules, 2002 and made a new set of rules – the Uttar Pradesh Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2018 (UP Rules, 2018).

[333] 'Enforcement & Monitoring Guidelines for Sand Mining', Ministry of Environment, Forest and Climate Change, January 2020, http://environmentclearance.nic.in/writereaddata/SandMiningManagementGuidelines2020.pdf.

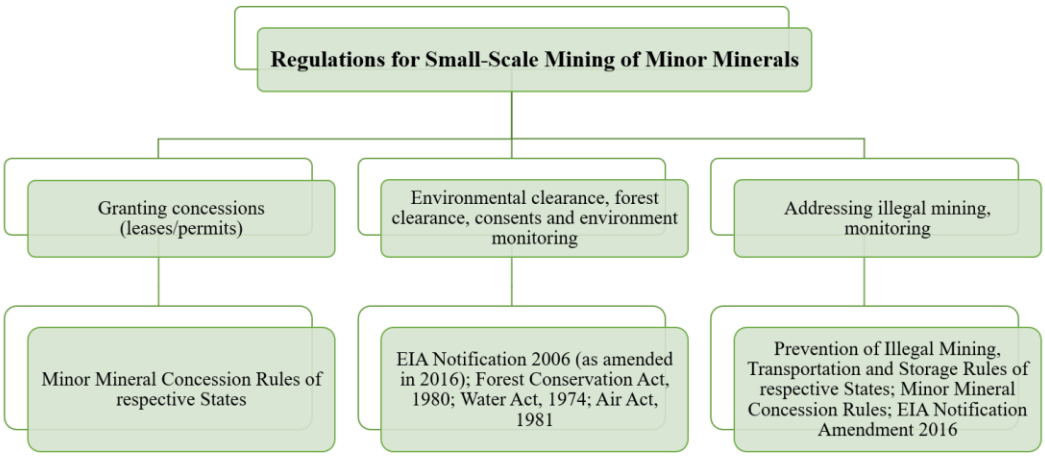


Figure 39: Regulatory Framework for Small-Scale Mining.
(Source: Regulating Small-Scale Mining of Minor Minerals, Centre for Science and Environment)

The MMC Rules primarily outline the mechanism for granting of leases for various minor minerals and issues related to it, which mainly stipulates that mining leases in UP can be given on a first-come-first-serve basis.[334] However, they can also be awarded by inviting bids through auction, tender, or auction-cum-tender after the UP government declares the areas which may be leased by such processes.[335] In order to make the leasing process transparent, the 35th amendment to the MMC Rules in December 2012 introduced e-auctioning and e-tendering. The 37th amendment in October 2014 stipulated provisions for grant of mining leases for riverbed mining specifically.[336]

With respect to grant of mining leases, the MMC Rules stipulate that a minimum area for grant of a mining lease for sand, morrum, bajri or boulder, or any of these in mixed state exclusively found in riverbed must ordinarily be 05 ha.[337] It also states that the period of mining lease will be a fixed period of 05 years, however if the state government is of the opinion that in the interest of mineral development, it is necessary to do so, it may grant a mining lease for any period exceeding 10 years but not more than 15 years. The rules also state that the selected applicant, within one month of issuance of the letter of intent, must submit the mining plan for approval. Subsequently within one month of approval of the mining plan, the applicant must submit the application for grant of EC to the competent authority. With respect to all minor minerals, mining operations shall be undertaken in accordance with the mining plan which must detail the yearly development scheme, aspect of reclamation and rehabilitation of mined out areas.

Once the applicant has been granted approval for a mining lease for sand, the MMC Rules also stipulate that, 25% of the annual lease amount must be deposited by the applicant within 07

[334] Rule 9, 'The UP Minor Minerals (Concession) Rules, 1963', http://www.bareactslive.com/ALL/up867.htm.

[335] Rule 23, 'The UP Minor Minerals (Concession) Rules, 1963', http://www.bareactslive.com/ALL/up867.htm.

[336] Srestha Banerjee, 'EIA notification amended to bring small-scale mining under its ambit', Down to Earth, 28 January 2016, https://www.downtoearth.org.in/news/mining/eia-notification-amended-to-bring-small-scale-mining-under-its-ambit-52628.

[337] However, the MMC Rules further state that in case of non-availability of such extent of area i.e., minimum 05 ha, then this sub-rule will not apply.

days. Moreover, the leaseholder is required to pay royalty in lieu of any mineral extracted from the mining lease area, whose rates can be notified from time to time. The state government has the authority to exclude, enhance or reduce the royalty rates, given that the change does not occur more than once in three years and at a rate more than 20% of the pit's mouth value.[338]

The MMC Rules also make it clear that the mining operations shall only start after obtaining the EC, if required, and during that process, the applicant shall be bound to complete all desired formalities to resolve the objections raised by the competent authority within the stipulated time frame as per the EIA 2006. Consequently, the mining lease will only be executed after approval of the mining plan and within one month from the date of issuance of the EC certificate.

Rule 41 of the MMC Rules also imposes certain restrictions and conditions on the holder of a lease, one of which states that the lessee is "*bound to keep vigilance for not polluting the environment of the lease-hold area and nearby area in connection with mining operation and also maintain ecological balance of the area.*"[339] It further stipulates that if at any time it is found that the mining operations are leading to environment pollution or imbalance of ecology, the lease may be prematurely terminated, after having given the lease holder the opportunity of being heard.

The fact that illegal mining is rampant in the state of UP has been established time and again. Most recently, the NGT constituted an Oversight Committee (OC) to look into the matter of illegal sand mining in the Prayagraj District in UP.[340] The OC filed its report stating that especially in the Prayagraj District, illegal sand mining is taking place without a mining plan which is in utter violation of environmental norms and is a grave threat to environment and ecology. It also emphasised on the fact that illegal mining invariably leads to reckless damage to the environment and thus, utmost efforts are required in surveillance, patrolling and enforcement.[341]

This is despite the UP Rules, 2018, which lay down the regulations for preventing illegal mining, transportation, and storage. These Rules when introduced in 2018 were followed by two Government Orders (GO) dated 31 December 2018 and 25 January 2019. The GO dated 31 December 2018 provided that the existing license holder under UP Rules, 2002 shall be given one month's time to dispose of their stored mineral materials and in case the licensee fails to do so, it shall be treated as the property of the state and then shall be disposed of in accordance with the orders issued by the UP government. The GO of 2018 further laid down the detailed procedure for its application and one of the conditions of the license stipulated that 90% of the stored minerals (including sand) must be disposed of on or before 30 June 2019 and after disposal a declaration shall be made to the District Magistrate in the first week of October

[338] The UP Minor Minerals (Concession) Rules, 1963, http://www.bareactslive.com/ALL/up867.htm.

[339] Rule 41, 'The UP Minor Minerals (Concession) Rules, 1963', http://www.bareactslive.com/ALL/up867.htm.

[340] 'Illegal sand mining in UP is a grave threat to environment and ecology: NGT told', India Legal, 20 March 2021, https://www.indialegallive.com/constitutional-law-news/courts-news/illegal-sand-mining-in-up-is-a-grave-threat-to-environment-and-ecology-ngt-told/.

[341] 'Illegal sand mining in UP is a grave threat to environment and ecology: NGT told', India Legal, 20 March 2021, https://www.indialegallive.com/constitutional-law-news/courts-news/illegal-sand-mining-in-up-is-a-grave-threat-to-environment-and-ecology-ngt-told/.

of 2019. This GO was subsequently amended on 25 January 2019, whereby it was provided that the one-month time granted to license holders is extended till 28 February 2019.[342]

With respect to storage license and its renewal, the UP Rules, 2018 categorically state that the license for storage will be granted on the condition that the licensee shall not pollute the environment by storing the minerals or while utilising them in the processing plant or beneficiation plant of the factory.[343] Additionally, the UP Rules, 2018 stipulate that all despatch of minerals by the holder of the mining lease, mining permit or the prospecting license by a carrier must be accompanied with an e-transit pass or transit pass in duplicate.[344]

The UP government in 2017, in a measure to take on illegal mining in the state, introduced the Mining Policy of 2017 (MP, 2017) as well.[345] The MP, 2017 laid down various aims and objectives in furtherance of good governance, anti-corruption, sustainable socio-economic development, mineral conservation, and a balance between environment and ecology, among others. It further states that the share of the state in the total revenue receipt from minerals should be increased from 1.85% in 2017 to 3% in the next 05 years. The MP, 2017 also emphasises the need for greater transparency in the process of allocation of mining leases, and hence highlights the importance of e-tendering, e-auction, and e-bidding.

5.3. Illegal Sand Mining in Uttar Pradesh

Uttar Pradesh has a vast reserve of mineral deposits with the potential to further economic growth along with creating local employment opportunities. However, like many other developing regions with large mineral deposits, UP faces a challenge of striking the right balance between exploiting the mineral resources for economic development and prosperity whilst minimising the adverse social, environmental, and health impacts.[346]

Forming one of the largest states in India, UP comprises an area of about 2,40,928 square-kilometres (sq km). The rich wealth of the state lies hidden below a variety of rocks of different ages found in the mountain ranges of Himalayas in the North and Vindhyan ranges in the South.[347] Mineral based industries have been substantial contributors to the economy, including that of coal, sulphur, silica sand and limestone.[348] Furthermore, the minor minerals in UP include limestone, brick earth, building stone and sand, to name a few.

---

342 *M/S Sunrise Stone Crusher Pvt. Ltd. v. State of UP and Others*, Writ No. 14286 of 2019, Allahabad High Court, 31 May 2019, https://indiankanoon.org/doc/20669222/.

343 Rule 7, 'UP Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2018, http://www.bareactslive.com/ALL/up909.htm.

344 Rule 11, 'UP Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2018, http://www.bareactslive.com/ALL/up909.htm.

345 'Mining Policy, 2017', Department of Geology and Mining, Government of Uttar Pradesh, http://dgmup.gov.in/pdf/geology-policy-241018.pdf.

346 Dr. Kumud Dubey, 'Socio Economic Impact Study of Mining and Mining Policies on the Livelihoods of Local Population on the Livelihood in the Vindhyan Region of Uttar Pradesh', NITI Aayog, 2017, http://niti.gov.in/sites/default/files/2019-01/Socio-Economic-Impact-Study-of-Mining-and-Mining-Polices.pdf.

347 Dr. Kumud Dubey, 'Socio Economic Impact Study of Mining and Mining Policies on the Livelihoods of Local Population on the Livelihood in the Vindhyan Region of Uttar Pradesh', NITI Aayog, 2017, http://niti.gov.in/sites/default/files/2019-01/Socio-Economic-Impact-Study-of-Mining-and-Mining-Polices.pdf.

348 Dr. Kumud Dubey, 'Socio Economic Impact Study of Mining and Mining Policies on the Livelihoods of Local Population on the Livelihood in the Vindhyan Region of Uttar Pradesh', NITI Aayog, 2017, http://niti.gov.in/sites/default/files/2019-01/Socio-Economic-Impact-Study-of-Mining-and-Mining-Polices.pdf.

Sand is available in all rivers flowing through the state of UP. The most preferred type of sand is the coarse and clean sand without flaky minerals as that has greater strength and contributes to lower construction costs. In light of this, it has been termed as Category 1 sand, which is available in the Prayagraj district flowing through the Ganga and Yamuna River; in Firozabad and Ghaziabad through the Yamuna river; in Varanasi through the Ganga and Karamnasa river; and in Gorakhpur through the Ghaghra and Dandi rivers, to name a few.[349]

UP generally, and the Gautam Buddha Nagar district, specifically, have received a lot of attention for rampant illegal mining of sand in the state. Despite the laws and regulations in place, and many orders directing stoppage of illegal mining activities along with monitoring of such activities, the state of UP has been unsuccessful in curbing such illegalities or even controlling it. Even after the suspension of the SDM in Greater Noida in Gautam Buddha Nagar, leading to NGT's order of August 2013, various news media articles corroborated the fact that nothing has changed, and massive illegal mining of sand continues to take place. According to a news article soon after the NGT order, it was found that an estimated 3000-3500 dumpers and about 3000-3400 tractor trolleys get loaded with sand that was illegally mined by close to 50 excavation machines stationed on the riverbed in various villages in Greater Noida.[350]

Since the extent of illegal mining is so massive, and small-scale minor minerals have been covered under the regulations of procuring ECs rather recently, the scale of mining for minor minerals including sand has been difficult to ascertain and poorly documented. Having said that, it has been clear that the demand for sand is on a rise and has been for years now. This is attributed majorly to the boom of the construction sector, for which sand is a key resource. However, it has also been highlighted that, "*India does not have any regulatory and monitoring framework to excavate sand in a sustainable manner…people used to think sand is a low-value, minor mineral that is inexhaustible. But that will have to change now because the demand is too huge*."[351]

When the data for sand mining for the state of UP and the Gautam Buddha Nagar, respectively, are studied, such discrepancies with respect to illegal sand mining become clear. Table 3 and 4 below highlight the sand mining data for UP and Gautam Buddha Nagar, respectively. For instance, even though there has been relentless growth in the amount of sand mined in UP, the same is not corroborated by the figures for sand mining in Gautam Buddha Nagar district. It is also important to note here that NOIDA and Greater NOIDA in the Gautam Buddha Nagar district are major hubs for building and infrastructure developing in UP supplying sand to Delhi. And thus, the sand mined from the state, and the district specifically, has a huge market.

---

[349] Minor Minerals, Directorate of Geology and Mining, Government of Uttar Pradesh, http://dgmup.gov.in/en/page/minor-minerals-list.

[350] Akash Vashishtha, 'Durga Shakti Nagpal gone, illegal mining on Yamuna bed still flourishes', India Today, 04 May 2014, https://www.indiatoday.in/india/north/story/durga-shakti-nagpal-gone-mining-on-yamuna-bed-still-flourishes-191473-2014-05-04.

[351] Rama Lakshmi, 'India's illegal sand mining fuels boom, ravage rivers', The Washington Post, 19 May 2012, https://www.washingtonpost.com/world/asia_pacific/indias-illegal-sand-mining-fuels-boom-ravages-rivers/2012/05/19/gIQA3HzdaU_story.html.

Sand production in UP has been rising over the years and in 2014-15, the state produced close to 296 lakh cubic meters of sand, with an estimated value of Rs. 53,427 lakhs.

Table 3: Sand Mining in Uttar Pradesh (2012-2015)			
Year	**Royalty (Rs. Lakhs)**	**Production (Cubic Meters)**	**Estimated Value (Rs. Lakhs)**
2012-13	3,875	13,840,393	24,913
2013-14	6,619	22,062,467	39,712
2014-15	8,905	29,681,667	53,427

Source: Regulating Small-Scale Mining of Minor Minerals, Centre for Science and Environment.

Moreover, the Gautam Buddha Nagar district in UP, holds a significant share of mining in the state, according to the DSR of 2017. The data on sand mining in Gautam Buddha Nagar is represented in Table 4 below.

Table 4: Sand Mining in Gautam Buddha Nagar (2012-2015)			
Year	**Royalty (Rs. Lakhs)**	**Production (Cubic Meters)**	**Estimated Value (Rs. Lakhs)**
2012-13	294	1,050,000	1,890
2013-14	272	906,667	1,632
2014-15	320	1,066,667	1,920

Source: Regulating Small-Scale Mining of Minor Minerals, Centre for Science and Environment.

However, as mentioned above, the data for the state and the district both are underrepresented. For example, in 2014-15 the sand production in Gautam Buddha Nagar was declared to be 1,066,667 cubic metre as compared to 29,681,667 cubic metres for the whole state. This means that legally, only about 3.6% of all sand mining that took place in UP happened in Gautam Buddha Nagar. This seems to be underrepresented and underestimated, considering the huge demand that the sand mining in the state of UP is expected to meet.[352]

The DSR of 2017 of Gautam Buddha Nagar, which highlights details for sand or riverbed mining along with other minor minerals in the district, provides additional information with respect to the royalty/revenue received and production of sand from 2014-2017.[353] The same is highlighted in Table 5 below.

Table 5: Sand Mining in Gautam Buddha Nagar (2014-2017)		
Year	**Royalty (Rs.)**	**Production (Cubic Meters)**
2014-15	18,68,88,655	31,15,093
2015-16	18,54,56,572	23,52,612
2016-17	30,50,12,376	85,49,573

[352] 'Regulating Small-Scale Mining of Minor Minerals: A Comprehensive Framework Beyond Environmental Clearances', Centre for Science and Environment, 2016.

[353] 'District Survey Report of Minor Mineral: Gautam Buddha Nagar District', District Level Environment Impact Assessment Authority, November 2017, https://cdn.s3waas.gov.in/s30e01938fc48a2cfb5f2217fbfb00722d/uploads/2018/02/2018021838.pdf.

Source: District Survey Report, 2017 of Gautam Buddha Nagar.

In 2015, the NGT while hearing a plea by the NGT Bar Association, directed for the submission of a detailed report on illegal sand mining in Gautam Buddha Nagar carried out in violation of the orders of the NGT of 2013. The plea of the applicant, based on newspaper reports, pertained to a bridge that was illegally constructed on the Yamuna river in Noida's Chak Basantpur village to link it with Faridabad for transporting illegally mined sand from Noida to Faridabad.[354] Consequently, the NGT banned sand mining on the Yamuna, displeased by the allegations that legal permits were being shown by sand miners for conducting illegal mining, despite orders by the NGT of 2013. The NGT directed that, "*no mining activity, both legal and illegal, should be carried out on the banks of the Yamuna till the next date of hearing*."[355]

Illegal Mining Continues, the 'Sand Mafia' Wreaks Havoc

The rampant and continuous illegal sand mining heightened the anguish of people in UP. For instance, on 29 December 2017, a man jumped in front of the Chief Minister's convoy in Lucknow in an attempt to draw the state government's attention towards the illegal riverbed sand mining in Sonebhadra district in UP. Such rampant illegal mining fuels the black market that is both preyed on and protected by the 'sand mafia'.

Various instances have been reported all over India where the sand miners have killed law enforcement officers who have attempted to halt the stripping of mining of India's rivers. There have also been instances where the miners have murdered reporters who have exposed the forbidden practice of excavating waterways.

In 2018, a sand trader was tied to a cot and set on fire allegedly by sand smugglers after he objected to the illegal mining in the Trans-Ganga area. In the same year, sand mafia at the Kosi river in Rampur, UP attacked a police team and tried to throw them into the river. There have been instances of protests as well, for instance when over 300 farmers started the 'Jal Satyagrah' by entering the waters of the Ken river to protest against sand mining in the area due to which their crops were getting damaged.

Source: Drawn from various news articles.

However, various measures and steps have been taken by the government in curbing illegal sand mining and enforcing the laws and regulations with respect to the same. For instance, in 2018, the UP government lodged a police complaint against three top forest officials for calling tenders for mining sand in reserved forests, which cannot be done without the permission of the Union Government. Towards the end of 2018, 55 people were also booked for illegal

[354] Press Trust of India, 'Illegal sand mining in Gautam Budh Nagar: NGT notice to Centre', Business Standard, 26 October 2015, https://www.business-standard.com/article/pti-stories/illegal-sand-mining-in-gautam-budh-nagar-ngt-notice-to-centre-115102600782_1.html.

[355] 'National Green Tribunal bans Yamuna sand mining', The Indian Express, 03 November 2015, https://indianexpress.com/article/cities/delhi/national-green-tribunal-bans-yamuna-sand-mining/.

mining based on a tip-off that illegal sand mining was taking place on the Ganga canal. Based on the tip-off then, several raids were conducted, but the miners managed to escape.

In a NGT order dated 19 February 2014, in the case of *National Green Tribunal Bar Association v. Ministry of Environment & Forests & Ors.*, it is highlighted that in UP, 129 offenders were caught while doing illegal mining in Gautam Buddha Nagar, subsequent to which the police authorities had served notices to 94 of them.[356] While 49 of the offenders were present for the hearing and given two weeks to file a reply as to why they should not be penalised for degradation of environment and ecology resulting from the illegal mining, the state was granted liberty to serve notices again to the remaining 35 offenders.[357]

Far away from Gautam Buddha Nagar, in the Deoria district of UP, the police launched an interesting drive in an attempt to save the heritage and archaeological wonder of the Sujawan Dev temple. Tons of sand illegally taken from the Yamuna river were seized and thrown back into the river.[358]

Thus, despite the laws and regulations introduced by the government of UP, illegal sand mining has not seized to exist. In fact, various regulatory lapses and governance issues have advanced and furthered illegal mining in the state, as is elaborated in the **subsequent** sections.

[356] *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Original Application No. 171 of 2013, National Green Tribunal, 19 February 2014, http://www.indiaenvironmentportal.org.in/files/sand%20miningNGT%2019Feb2014.pdf.

[357] *National Green Tribunal Bar Association v. Ministry of Environment and Forests and Ors.*, Original Application No. 171 of 2013, National Green Tribunal, 19 February 2014, http://www.indiaenvironmentportal.org.in/files/sand%20miningNGT%2019Feb2014.pdf.

[358] Bhim Singh Rawat, 'Uttar Pradesh Sand Mining 2018: Key NGT orders slap for MoEF', South Asia Network on Dams, Rivers and People (SANDRP), 07 February 2019, https://sandrp.in/2019/02/07/uttar-pradesh-sand-mining-2018-key-ngt-orders-slap-for-moef/.

5.4. Regulatory Lapses and Governance Issues

With the illegal sand mining in UP growing day by day, various media articles have also pointed to the culpability of the police and the administration in helping the sand miners to continue with illegal mining, rather than penalising them as per the laws and regulations.

The Nexus of Police, Administration, and Sand Mafia's Culpability

While most mining takes place between 11pm and 5am, policemen are stationed at these locations to inform and protect the illegal sand miners from raids and outside interventions. Various instances after midnight, late in the night, a group of tractors and dumpers have been observed handing over money to the police patrol. Parked on the muddy stretches, various private vehicles can also be spotted, as a sign of danger as people are told that well armed men remain stationed in these private vehicles at various spots every night, to ensure that nobody ventures into the riverbed.

Journalists have reported that while posing as customers whilst speaking to tractor trolley drivers, it was revealed to them that while it cost the drivers Rs. 2800 for transporting the sand, they sold it for Rs. 8500. Similarly, a load of sand lifted by a dumper for Rs. 5000 was sold for anything between Rs. 14,000 to Rs. 15,000 in the market.

Why do the villagers engage in illegal sand mining? Because of lack of employment opportunities in the village, forcing them to engage in such activities, which acts as a source for quick and good money, often at a very high cost to their health and safety.

The nexus between the police, the administration, and the sand mafia along with the extent of the sand mining on the riverbed in the region becomes clearer with the understanding of how the system of payments works. Many journalists remain silent spectators to illegal mining, some even take money as reward for their silence. And where does the money come from? The nexus explained earlier – the police, who is said to collect the money from the mafia; officials of the mining department; and the owners of the trucks that ferry the illegally mined sand.

Source: Drawn from various news articles.

While the UP government in December 2017 passed the Uttar Pradesh Control of Organised Crime Act, with the aim to crack down on organised crime, including illegal mining, it's implementation and enforcement shows that the state government's campaign has targeted the poor, while leaving untouched the nexus that enables, and rather is a part of, illegal mining.[359] In late 2013, the NGT also came down heavily on the UP government for its investigation into instances of illegal sand mining. The NGT stated that it was unhappy with the way the

[359] Khabar Lahariya, 'In Bundelkhand's illegal sand mining ecosystem, journalists (and others) are paid for their silence', Scroll, 22 April 2018, https://scroll.in/article/876156/in-bundelkhands-illegal-sand-mining-ecosystem-journalists-and-others-are-paid-for-their-silence.

investigation was conducted, as most of the people who were arrested were drivers of vehicles used for removal of sand, and not the owners or the people heading the illegal sand mining operations. "*The police and mining authority issued notices to the persons who were poor drivers…We express our anguish and do not appreciate the approach that has been adopted by the authorities*.", the NGT bench said.[360]

In a particular report by the *Khabar Lahariya*, it was highlighted that while speaking to one of the farmers who attempted to oppose the passage of tractors transporting sand he said, "*When you try and resist them, they say they have government-approved contracts and leases and will not leave before taking the sand and that no one is going to take any action on them. They come with the pradhan and his men, who speak on their behalf. They're moneyed and powerful, so you stop resisting them*."[361]

Such practices hint at the regulatory lapses and governance issues that further the stronghold of the nexus enabling massive amount of illegal sand mining in the state. The builders who are always on the lookout for cheap sand, procure the same from mafia that illegally mines the sand by evading royalty. If a licensed operator after paying royalty to the state sells sand at a price of Rs. 20,000 per dumper, the illegal miners sell the same quantity for anything between Rs. 8000 to Rs. 10,000.[362] Thus, for each truck or dumper of sand mined illegally from the riverbed, the builders have to pay only half of what they would have to pay for a licensed truck of sand.

It has thus been clear that even after orders by the SC and the NGT banning illegal sand mining and making compulsory the requirement of ECs, irrespective of the size of the mining lease, the UP government has been unable to take effective actions and control the menace of illegal sand mining in the state. Soon after NGT's order dated 5th August 2013, the UP government in fact also admitted before the tribunal that illegal sand mining was going on in the state and no ECs were granted for such mining in Gautam Buddha Nagar. The petition leading to a subsequent hearing on 14 August 2013 contended that, "*Uttar Pradesh state authorities have failed and/or have intentionally not taken appropriate legal action against the project proponents (those carrying out mining) and thus have abetted and wilfully connived in allowing such illegal sand mining to take place in complete violation of environmental and other applicable laws*."[363]

---

360 Press Trust of India, 'Sand mining: NGT unhappy with UP investigation', The Economic Times, 09 October 2013, https://economictimes.indiatimes.com/news/politics-and-nation/sand-mining-ngt-unhappy-with-up-investigation/articleshow/23823755.cms.

361 Khabar Lahariya, 'A reporter's account of illegal mining in Bundelkhand's Mahoba', The Wire, 16 February 2018, https://thewire.in/politics/reporters-account-illegal-mining-bundelkhands-mahoba.

362 'Why illegal sand mining is profitable in UP?', Business Standard, 02 August 2013, https://www.business-standard.com/article/current-affairs/why-illegal-sand-mining-is-profitable-in-up-113080200907_1.html.

363 Press Trust of India, 'UP govt admits before green tribunal about illegal sand mining', Business Standard, 14 August 2013, https://www.business-standard.com/article/current-affairs/up-govt-admits-before-green-tribunal-about-illegal-sand-mining-113081400898_1.html.

Subsequently, on 23 August 2013 the NGT directed the UP government to show definitive results of the action taken by it to ensure implementation of the tribunal's order.[364] The NGT stated that the results must show the number of people sentenced to prison, the number of heavy machineries seized, and damages imposed upon those engaged in sand mining without clearance.[365]

With the nexus – police, administration, and the sand mafia – advancing illegal mining in UP, various processes as required by law are also not followed and fulfilled, processes which otherwise could have helped control the illegalities and the increase in criminal activities. For instance, with the EIA Amendment 2016 empowering district level committees and authorities to issue mining permissions for scall-scale mining of minor minerals, it was expected that the monitoring and enforcement against illegal mining will become stringent. The EIA Amendment 2016 also specified the requirement of undertaking a DSR for sand or riverbed mining along with for mining of other minor minerals. This was touted as an important process and measure, that would enable the authorities (DEIAA along with the DEAC) to determine areas where mining can be allowed and where it must be prohibited and prepare such reports for each minor mineral in every district, separately.

However, the only DSR that is available in the public domain on the official website of the Gautam Buddha Nagar District, is that from 2017.[366] Moreover, when the DSR 2017 of Gautam Buddha Nagar is compared to that of other districts such as Kushinagar and Hamirpur, it is observed that the reports from the latter regions were significantly more detailed, including the information on existing mining quarries with location and areas, method of mining, remedial measures, and restoration, to name a few.[367] This hints at a lack of consistency in the contents of the report from different regions. At the same time, the reports, especially that of Gautam Buddha Nagar of 2017, does not seem to be technically strong in determining the impact as well as the potential of sand mining in the district. This is despite the fact that the DSR 2017 of Gautam Buddha Nagar specifies the contents and structure of the report, which shall include overview of mining activity in the district, list of mining leases in the district, details of royalty or revenue received in the last 03 years, land utilisation pattern in the district, and geology and mineral wealth, among other specifics.

---

364 Press Trust of India, 'Illegal sand mining: National Green Tribunal directs UP to show "definitive results"', The Economic Times, 23 August 2013, https://economictimes.indiatimes.com/news/politics-and-nation/illegal-sand-mining-national-green-tribunal-directs-up-to-show-definitive-results/articleshow/22001749.cms.

365 Press Trust of India, 'Illegal sand mining: National Green Tribunal directs UP to show "definitive results"', The Economic Times, 23 August 2013, https://economictimes.indiatimes.com/news/politics-and-nation/illegal-sand-mining-national-green-tribunal-directs-up-to-show-definitive-results/articleshow/22001749.cms.

366 'District Survey Report of Minor Mineral: Gautam Buddha Nagar District', District Level Environment Impact Assessment Authority, November 2017, https://cdn.s3waas.gov.in/s30e01938fc48a2cfb5f2217fbfb00722d/uploads/2018/02/2018021838.pdf.

367 See: 'Preliminary Draft Report: District Survey Report for (Planning & Execution of) Minor Mineral Excavation (In-situ Rock): Hamirpur District', District Level Environmental Impact Assessment Authority, February 2018, https://cdn.s3waas.gov.in/s3115f89503138416a242f40fb7d7f338e/uploads/2016/09/2018041981.pdf and 'Final District Survey Report for Minor Minerals – Sand Mining – 2017: Kushinagar District', District Level Environment Impact Assessment Authority, 2017, https://cdn.s3waas.gov.in/s39de6d14fff9806d4bcd1ef555be766cd/uploads/2018/04/2018042140.pdf.

However, in 2018, the NGT ordered that the SEIAA will be the authority to give permission for mining on plots of less than 05 ha, thus quashing the directive that empowered the district-level committees to issue permission in their respective districts. This order came in the backdrop of NGT issuing a notice to the MoEFCC in 2016 in response to a plea filed by environmentalists, including Vikrant Tongad, a resident of Greater Noida. The petitioners essentially raised objections to the EIA Amendment 2016, specifically on the point of empowering district level committee to issue mining permissions. The contentions were based on the fact that the district level committee did not seek objections from the public before permissions were granted, which was made mandatory by the NGT, especially before allotting plots of size between 05 to 25 ha. Moreover, the NGT also observed that there was a practice of breaking a large plot into smaller ones to give permissions for mining.[368]

Such rampant illegal mining in UP, and the inability of the state government to regulate or control it, led the Allahabad High Court in early-2016 to direct the Central Bureau of Investigation (CBI) to probe illegal mining in the state of UP. Following the directive, the CBI registered seven preliminary enquiries, out of which three pertaining to Hamirpur, Shamli and Kaushambi districts were converted to FIRs.[369] According to the CBI, public servants had facilitated mining by illegally granting fresh leases. They renewed existing leases and permitted mining by the existing lease holders during the obstructed period even though the NGT had barred it. Moreover, the officials allowed unauthorised persons to excavate and commit theft of minor minerals, in addition to extorting money from lease holders and drivers of the vehicles transporting minor minerals.[370] The CBI also stated that irregularities had been found in the allocation of sand mining leases and the searches undertaken were aimed at collecting material and document evidence related to the case. The FIR also stated that "*the role of the then mining ministers during the period between 2012 and 2016 may be looked into during the course of the investigation*", thus hinting at the involvement of officials at the highest rank in allowing and advancing illegal mining in the state.[371] Consequently, some time in October 2019, the CBI carried out more searches at various locations in UP after filing a fresh FIR against 12 people, including two senior IAS officers serving as secretaries in the UP government.[372] The covid-

[368] Vinod Rajput, 'State green panel to give permission for mining: NGT', Hindustan Times, 27 September 2018, https://www.hindustantimes.com/noida/state-green-panel-to-give-permission-for-mining-ngt/story-DVPKplricQHwM3oApYFwSP.html.

[369] Press Trust of India, 'CBI searches three districts of UP in connection with illegal mining scam', Business Standard, 10 July 2019, https://www.business-standard.com/article/pti-stories/cbi-searches-three-districts-of-up-in-connection-with-illegal-mining-scam-119071000259_1.html.

[370] Devesh Pandey, 'Illegal minor mineral mining case: CBI searches across Uttar Pradesh', The Hindu, 12 June 2019, https://www.thehindu.com/news/national/up-illegal-mining-case-cbi-conducts-searches-at-22-locations/article27846914.ece.

[371] Namrata Biji Ahuja, 'Illegal sand mining leases case: CBI conducting searches in UP, Uttarakhand', The Week, 01 October 2019, https://www.theweek.in/news/india/2019/10/01/illegal-sand-mining-leases-case-cbi-conducting-searches-in-up-uttarakhand.html.

[372] '2 IAS officials booked in UP sand mining case', Hindustan Times, 02 October 2019, https://www.hindustantimes.com/india-news/2-ias-officials-booked-in-up-sand-mining-case/story-MC1iv3Q6jEpttv52DLbbSL.html.

19 pandemic, and the ensuing nation-wide lockdown affected the investigation, as officials stopped conducting raids.[373]

At every step and for all processes, it has been noted that the UP government, at both state and district levels, has not been effective in implementing the letter and spirit of the laws, thus leading to ineffective and minimalistic enforcement and regulation of illegal mining in the state.

5.5. Environmental Concerns and Health Hazards

The most pertinent fallouts of illegal sand mining are environmental and social, including health hazards. The rampant (illegal) mining of a resource as crucial as sand, coupled with ineffective regulations and enforcement, has the potential to exacerbate the environmental consequences. Unregulated and unchecked sand mining can potentially lead to erosion and loss of habitat. With the role it plays as a biotic component in the aquatic ecosystem, the depletion of a resource as pertinent as sand causes the enlargement of river mouths, and the deepening of water bodies. Various ecologists have said that unauthorised and illegal sand mining reduces the recharge of rivers, while depleting the groundwater table in many areas. It also increases the risk of flooding and harms the soil by making it saline. For instance, environment experts claim that it was rampant illegal mining for years that was responsible for the devastating floods in the Gwalior-Chambal region in 2021 – floods that claimed the lives of many, while rendering thousands homeless.[374]

Thus, despite numerous court orders and laws and regulations in place, rivers and creeks continue to be ravaged for sand to fuel a boom in construction. It is said that the result is an impending environmental disaster.[375]

Moreover, at various places across India, farmers have also been complaining that the river water has engulfed their rice farms because of excessive sand excavation. Fishermen say it is killing fish and wells in riverside villages are drying up in many areas.[376] One of the bigger problems is also that big and heavy machinery is often used to embed mechanised suction pumps into the creek to pull out the sand more quickly. However, that has a graver impact on the environment, as when big machines are used, nature is not given enough time to recover and replenish.[377]

---

373 Bhim Singh Rawat, 'UP riverbed mining overview: NGT, CBI, Govts cannot stop the menace', South Asia Network on Dams, Rivers and People (SANDRP), 27 May 2020, https://sandrp.in/2020/05/27/up-riverbed-mining-overview-ngt-cbi-govts-cannot-stop-the-menace/.

374 'Illegal sand mining caused flood in Gwalior-Chambal region, say experts', The Free Press Journal, 11 August 2021, https://www.freepressjournal.in/bhopal/illegal-sand-mining-caused-flood-in-gwalior-chambal-region-say-experts.

375 Rama Lakshmi, 'India's illegal sand mining fuels boom, ravages rivers', The Washington Post, 19 May 2012, https://www.washingtonpost.com/world/asia_pacific/indias-illegal-sand-mining-fuels-boom-ravages-rivers/2012/05/19/gIQA3HzdaU_story.html.

376 Paul Salopek, 'Inside the deadly world of India's sand mining mafia', National Geographic, 26 June 2019, https://www.nationalgeographic.com/environment/article/inside-india-sand-mining-mafia.

377 Paul Salopek, 'Inside the deadly world of India's sand mining mafia', National Geographic, 26 June 2019, https://www.nationalgeographic.com/environment/article/inside-india-sand-mining-mafia.

A report by the United Nations Environment Programme of 2019 states that the extraction rates are exceeding the natural sand replenishment rates.[378] The increasing volume of extraction, often illegally, results in river and coastal erosion, threats to freshwater and marine fisheries and biodiversity.[379]

The effects of illegal sand mining have been seen throughout UP. For instance, in 2019, police in Banda, a city in UP mounted a round-the-clock vigil on the Ken river due to illegal sand mining that is rampant across the almost dry river. A few days before the police started the vigil, miners had diverted the last remaining stream of water in the river to take out more sand. Banda, where water supply is already very infrequent, saw a total cut-off of water supply.[380] This led to protests with people flagging banners reading, "No Water, No Vote", across the town. Kabrai, another city in UP, faced a similar water crisis which led the administration to declare it a 'grey zone' in June 2019.[381] Such water crisis is compounded by large scale illegal mining, affecting groundwater level.

It has been observed for too long now, that the sand mining taking place around the Ken river has been at far beyond the sustainable levels.[382] Almost all the rules and precautions of relatively safer sand mining have been violated, and those who question such recklessness have been threatened with violence, or sometimes worse.[383]

In a village called the Kolawalpur Raipur in Banda district, which is along the Ken river and one of the worst affected in terms of water scarcity, things became worse recently. While the river was damaged gravely by large scale mining using heavy machines, several workers were also not paid their wages. At the same time, compensatory payments were also not made to farmers whose fields were converted to roads for the trucks carrying sand.[384] At various places, including the Bundelkhand region which is spread over 13 districts of UP and MP, the number of stray cattle is also very high, that rely on river water to quench their thirsts. Thus, when rivers are severely depleted, it can prove disastrous for them.[385]

---

[378] 'Sand and Sustainability: Finding new solutions for environmental governance of global sand resources', United Nations Environment Programme, 2019, https://wedocs.unep.org/handle/20.500.11822/28163.

[379] Mayank Aggarwal, 'The world is extracting sand faster than it can replenish it', Mongabay, 14 June 2019, https://india.mongabay.com/2019/06/the-world-is-mining-sand-faster-than-it-can-replenish-it/.

[380] Bhim Singh Rawat, 'UP riverbed mining overview: NGT, CBI, Govts cannot stop the menace', South Asia Network on Dams, Rivers and People (SANDRP), 27 May 2020, https://sandrp.in/2020/05/27/up-riverbed-mining-overview-ngt-cbi-govts-cannot-stop-the-menace/.

[381] Bhim Singh Rawat, 'UP riverbed mining overview: NGT, CBI, Govts cannot stop the menace', South Asia Network on Dams, Rivers and People (SANDRP), 27 May 2020, https://sandrp.in/2020/05/27/up-riverbed-mining-overview-ngt-cbi-govts-cannot-stop-the-menace/.

[382] Bharat Dogra, 'Thirsty Bundelkhand prepares for another summer', News Click, 02 May 2020, https://www.newsclick.in/Bundelkhand-UP-MP-Water-Crisis-Climate-Change-Ken-River.

[383] Khabar Lahariya, 'In Bundelkhand's illegal sand mining ecosystem, journalists (and others) are paid for their silence', Scroll, 22 April 2018, https://scroll.in/article/876156/in-bundelkhands-illegal-sand-mining-ecosystem-journalists-and-others-are-paid-for-their-silence.

[384] Khabar Lahariya, 'In Bundelkhand's illegal sand mining ecosystem, journalists (and others) are paid for their silence', Scroll, 22 April 2018, https://scroll.in/article/876156/in-bundelkhands-illegal-sand-mining-ecosystem-journalists-and-others-are-paid-for-their-silence.

[385] Bharat Dogra, 'Thirsty Bundelkhand prepares for another summer', News Click, 02 May 2020, https://www.newsclick.in/Bundelkhand-UP-MP-Water-Crisis-Climate-Change-Ken-River.

While different judicial bodies in India have stressed for the need for and importance of an EIA framework, there has been minimal or no emphasis on the need for the EIA process to have extensive involvement of the public and governmental agencies in the initial phases. The EIA's conducted in developed countries take an integrated approach in analysing the social and health consequences of carrying out a particular project, something that is gravely missing in the EIA process in India.[386]

It is important to integrate these aspects into the EIA process, as it has been found that those engaged in sand mining often get exposed to hazardous chemicals, impacting their health and safety. A study conducted in 2017, analysing the hazards and health risks encountered by manual sand labourers in Karnataka, found that they were subjected to grave risks. The authors of the study developed an assessment schedule, recruited thirty sand labourers from random docks, and carried out systematic observations in analysing onsite evaluation and self-reported health complaints.[387] It was identified that 93.34% of the participants complained of musculoskeletal pain and discomfort in knees, ankles, hips, thighs, and shoulders while 70% complained of lower back issues. The study also noted that there was a widespread prevalence at 66.6% of sensory deficits, while reporting that 76.6% participants suffer from ear pains. All workers complained of dermatological and ophthalmic involvements and highlighted the lack of health and safety measures like protective devices.[388] A study conducted in UP in Allahabad also found that respiratory diseases were common in generally all mine workers in addition to hearing and water related problems.[389]

Thus, the effects of excessive sand extraction in India can be summed up as: soil erosion, landslides, water table loss, infertility of farmland, disturbances of ecosystems and marine life, beach disappearances, collapsing bridges, and grave and hazardous health and safety risks.[390]

5.6. Economic Concerns

The menace of illegal sand mining, leading to various instances of sand mining ban has directly and indirectly caused grave economic impacts across stakeholders such as leaseholders, labourers, allied businesses and the state government. Illegal mining flourishes for many reasons with the primary reason being demand for sand surpassing supply. With ban on mining the supply further gets curtailed driving up prices and in turn incentive for illegal mining. As per a 2013 news report the district administration of Gautam Buddha Nagar pegged the illegal sand mining business at Rs 100 crore monthly, out of which as per the administration, the

386 'Understanding EIA', Centre for Science and Environment at https://www.cseindia.org/understanding-eia-383.

387 Sidhiprada Mohpatra, Alfiya Shaikh, Priyanka Nayak and Rajesh Navada, 'Hazards and Health Risks Encountered by Manual Sand Dredgers from Udupi, India: A Cross Sectional Study', Journal of Clinical and Diagnostic Research, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5583914/.

388 Sidhiprada Mohpatra, Alfiya Shaikh, Priyanka Nayak and Rajesh Navada, 'Hazards and Health Risks Encountered by Manual Sand Dredgers from Udupi, India: A Cross Sectional Study', Journal of Clinical and Diagnostic Research, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5583914/.

389 Dr. Kumud Dubey, 'Socio Economic Impact Study of Mining and Mining Policies on the Livelihoods of Local Population on the Livelihood in the Vindhyan Region of Uttar Pradesh', NITI Aayog, 2017, http://niti.gov.in/sites/default/files/2019-01/Socio-Economic-Impact-Study-of-Mining-and-Mining-Polices.pdf.

390 Nick Meynen, 'The new oil? The global battle for sand is getting ugly', Scroll, 04 May 2017, https://scroll.in/article/836336/the-new-oil-the-global-battle-for-sand-is-getting-ugly.

government hardly gets Rs 1 crore as royalty.[391] The same report mentioned that a dumper of sand which costed Rs 5,000-6,000, would go up to Rs 25,000 when sand was in short supply. Another 2013 media report mentioned that sale of illegally mined sand stood at Rs 100 to Rs 200 crore a month in Noida and Greater Noida, a major market for sand from Gautam Buddha Nagar.[392]

Supply shortage of sand due to ban on sand mining impacts the real estate sector hard and as per statements made by real estate sector experts, might well be increasing illegal mining.[393] After the August 05, 2013 ban by the NGT, people from construction sector expressed fears of steep rise in sand prices due to the ban and foresaw delays in completion of projects.[394] Lalit Kumar Jain, National Chairman, Confederation of Real Estate Developers' Associations of India (CREDAI) told The Hindu after the judgement that project costs could increase three-fold as sand would have to be imported from Cambodia and Pakistan, and that at the end it will be passed on to the buyers.[395] Similar concerns have been raised elsewhere, a CREDAI spokesperson mentioned an estimated 4% rise in cost of construction due to ban on sand mining during monsoon period in MP in 2015.[396]

Additionally, employment in construction sector also takes a hit due to fall in construction activity after ban on sand mining, reports from Tirupathi in Andhra Pradesh chronicle the pitiable condition of daily wage workers due to a sand mining ban in 2019. It was reported that while 75% of daily wage workers that lined up for work in front of a temple in Tirupathi got work previously, only 35% got work after the said sand mining ban.[397] Builders Association of India (Mumbai Centre) estimated employment loss for 10 million construction workers in Maharashtra due to a sand mining ban ordered by Mumbai High Court in September 2010.[398]

Despite many bans and crackdowns all over India and in UP, illegal sand mining is still a bane that drains the environment and exchequer at the same time. The Comptroller and Auditor General of India (CAG) audit report of the Revenue Sector of UP for 2015-16 highlighted that the state was deprived of Rs. 477.93 crores because of unauthorised mining operations. The report made it clear that this loss was a result of the Department of Mining and Geology not

---

391 Purusharth Aradhak 'A fresh batch of sand miners were arrested in the ensuing battle against illegal sand mining being waged along the banks of the river Yamuna. If estimates of the Gautam Budh Nagar district administration are to be believed, the illegal sand mining business is worth Rs 100 crore per month. But according to officials, the administration hardly gets Rs one crore as royalty.', Times of India, 25 June 2013, https://timesofindia.indiatimes.com/a-fresh-batch-of-sand-miners-were-arrested-in-the-ensuing-battle-against-illegal-sand-mining-being-waged-along-the-banks-of-the-river-yamuna-if-estimates-of-the-gautam-budh-nagar-district-administration-are-to-be-believed-the-illegal-sand-mining-business-is-worth-rs-100-crore-per-month-but-according-to-officials-the-administration-hardly-gets-rs-one-crore-as-royalty-/articleshow/20763138.cms

392 Sahil Makkar, 'The economics of sand mining in NCR', August 10, 2013, Business Standard, https://www.business-standard.com/article/economy-policy/the-economics-of-sand-mining-in-ncr-113081000039_1.html

393 Ramnath Subbu, 'Sand mining ban puts builders in a bind', August 09, 2013, The Hindu, https://www.thehindu.com/business/Industry/sand-mining-ban-puts-builders-in-a-bind/article5007162.ece

394 Mansi Taneja & Shine Jacob, 'Ban on illegal sand mining to hurt real estate sector', Business Standard, August 6 2013, https://www.business-standard.com/article/companies/ban-on-illegal-sand-mining-to-hurt-real-estate-sector-113080600408_1.html

395 Ramnath Subbu, 'Sand mining ban puts builders in a bind', August 09, 2013, The Hindu, https://www.thehindu.com/business/Industry/sand-mining-ban-puts-builders-in-a-bind/article5007162.ece

396 Dainik Bhaskar, September 3 2015, http://ekhanij.mp.gov.in/appprevious/Documents/FormsFormate/03-09-15.pdf

397 Avinash P Subramanyam, Deccan Chronicle, July 13 2019, https://www.deccanchronicle.com/nation/current-affairs/130719/ban-on-sand-leaves-labourers-in-tatters.html

398 https://zeenews.india.com/news/maharashtra/sand-mining-ban-in-maharashtra-threatens-mega-projects_659907.html

"*monitoring the submission of mandatory quarterly returns, realisation of difference of royalty on revision of rate and assess the price of minerals and interest on late payment of royalty*."[399] It further said that the concerned district mines officers failed to cross check facts that led to unauthorised excavation and transportation of sand, gravel, stone chips and boulders. Moreover, it was also noted that the government suffered a loss of Rs. 179.57 crores owing to extraction of minerals without ECs. On top of all this, a penalty of Rs. 282.22 crores was also not recovered by the government against lessees extracting minerals without the renewal of a mining plan in addition to over-extraction over and above the approved quantity.[400] It has been noted that various other state governments also incur heavy losses due to illegal sand mining. For instance, the Minister of Department of Mines and Geology, Bihar said that the state government incurs an average annual loss of up to Rs. 700 crores due to illegal sand mining.[401]

On the other hand, various media articles have also shed light on the cascading effect that the scarcity of supply of sand has had on multiple sectors, especially the real estate and cement industries.[402] The rampant illegal sand mining acts as a black market for economic activity to take place outside the government-sanctioned or regulated processes. One of the main reasons for the existence and growth of this (and any other) black market is usually attributed to corruption, selectively lenient regulation, and prohibition. It is found that it is more 'profitable' for miners to break the law and mine at night rather than follow the regulation and try to get permits.[403] In other words, the disincentives to operate illegally, or incentives to operate legally, are both low. This becomes problematic not only because the sand mafia has been known to be criminally dangerous against people in order to access rivers and beaches, but also because there is no way to know how much sand is actually being mined.[404]

It has also been found and noted that the regulation against illegal mining has made it practically difficult for honest businesses to run and function in the market. The same gets exacerbated as the sand mafia, with its close political connections, wields complete control over the leasing mechanism, forcing huge losses to companies and businesses undertaking sand mining legally.[405]

---

399 Press Trust of India, 'Illegal mining: Uttar Pradesh lost Rs 478 cr revenue in 2015-16 says CAG', Firstpost, 19 May 2017, https://www.firstpost.com/business/illegal-mining-uttar-pradesh-lost-rs-478-cr-revenue-in-2015-16-says-cag-3457296.html.

400 Press Trust of India, 'Illegal mining: Uttar Pradesh lost Rs 478 cr revenue in 2015-16 says CAG', Firstpost, 19 May 2017, https://www.firstpost.com/business/illegal-mining-uttar-pradesh-lost-rs-478-cr-revenue-in-2015-16-says-cag-3457296.html.

401 Debashish Karmakar, 'Illegal sand mining costs Bihar Rs 700 crore a year: Minister', Times of India, 18 July 2021, https://timesofindia.indiatimes.com/city/patna/illegal-sand-mining-costs-bihar-rs-700-crore-a-year-minister/articleshow/84509186.cms.

402 Virendra Singh Rawat, 'UP mining ban hits realty sector hard, cement traders threaten stir', Business Standard, 26 April 2017, https://www.business-standard.com/article/economy-policy/up-mining-ban-hits-realty-sector-hard-cement-traders-threaten-stir-117042600821_1.html.

403 Emily Tastet, 'Stealing Beaches: A law and economic policy analysis for sand mining', LSU Journal of Energy Law and Resources, Volume 07, Issue 02, 08 May 2019, https://digitalcommons.law.lsu.edu/cgi/viewcontent.cgi?article=1166&context=jelr.

404 Ishan Kukreti, 'How will India address illegal sand mining without any data?', Down to Earth, 30 September 2017, https://www.downtoearth.org.in/news/mining/flouted-with-impunity-58736.

405 'Mines, mafia and the demand for sand', LiveMint, 15 August 2013, https://www.livemint.com/Opinion/H4nUCl6HRq7y0qpCNOK9wK/Mines-mafia-and-the-demand-for-sand.html.

Through an anthropological study conducted in Haryana, it was found that in just one district, illegal sand miners were making a daily profit of Rs. 500,000. It was also found that the price of sand increases roughly four-fold from the time of extraction to the point of selling. As mentioned earlier, the sale price of illegally mined sand is about half that of legally mined sand. There are various reasons attributed to this including higher wages paid to workers who manually dig the sand and royalties paid to the government in addition to bribes that are demanded by local officials for permitting even legitimate commercial activity – all these increase the sales prices of legally mined sand.[406]

It has also been found, specific to Tamil Nadu, that local administrators, in an endeavour to conceal the extent of loss of revenue due to illegal mining, stonewall requests for information about the amount of sand being extracted. Unofficial estimates have also found that Tamil Nadu's revenue loss from coastal sand stands at anywhere between Rs. 200 and 300 billion (Rs.20,000 crores and Rs.30,000 crores), and from riverine sand at Rs. 300 billion.[407]

Such extensive revenue losses to the government would have the potential to impact the government's ability to invest in development schemes and fulfil its duties and obligations of ensuring the citizen's rights to health, education and water, among others. Thus, when governments enter into lopsided contractual arrangements that unduly favour companies or fail to monitor whether companies are satisfying their tax or contractual obligations, they risk missing opportunities to advance and invest in basic human rights, as eventually it leads to greater revenue losses for the government.[408] This has been especially true in the context of extractive industries such as sand mining.

6. Primary Findings and Analysis

This section presents the findings and analysis of the data and information received from stakeholders and interactions during the field visit to Gautam Buddha Nagar in UP. The findings are structured to cover the impact on the government, leaseholders, associated businesses and mining workers and labourers. A recurrent observation across majority of the stakeholders was that illegal sand mining is rampant and was an easily accessible alternative for workers and dependent businesses during the assessment period i.e., August 2013 to September 2017.

6.1. Impact on Government

Sand mining is a source of revenue to the state government through, royalty paid by leaseholders, transit pass booking fees and application fees. Additionally, the leaseholder pays 10% of the royalty to the District Mineral Foundation (DMF), 2% TDS and applicable GST. Currently the royalty for sand mining stands at Rs. 65 per cubic meter. The application fee to

[406] Prem Mahadevan, 'Sand Mafias in India: Disorganized crime in a growing economy', Global Initiative, July 2019, https://globalinitiative.net/wp-content/uploads/2019/07/Sand-Mining-in-India-Report-17Jul1045-Web.pdf.

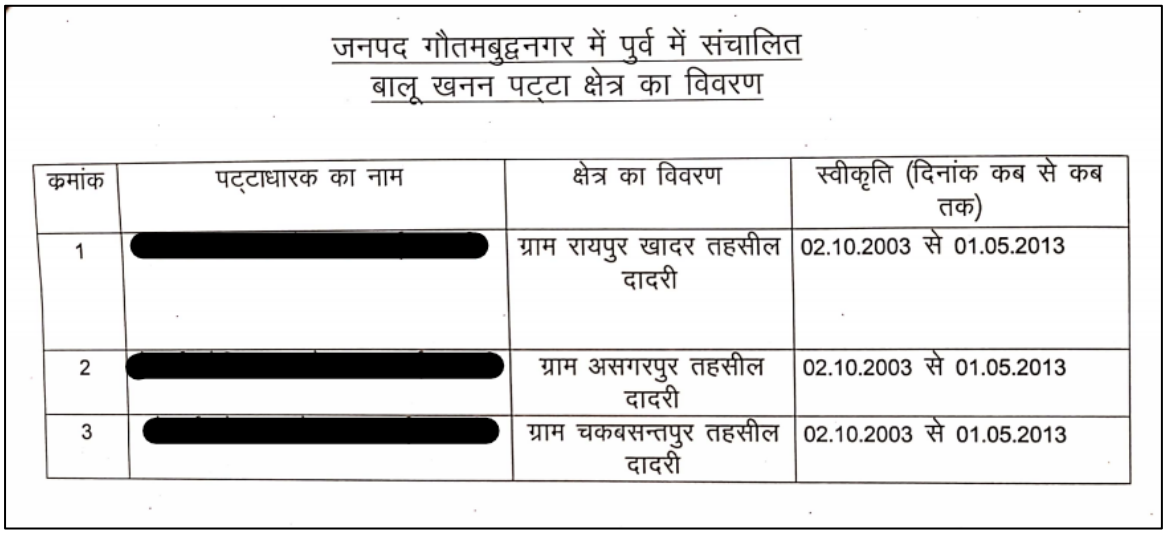
[407] Prem Mahadevan, 'Sand Mafias in India: Disorganized crime in a growing economy', Global Initiative, July 2019, https://globalinitiative.net/wp-content/uploads/2019/07/Sand-Mining-in-India-Report-17Jul1045-Web.pdf.

[408] Chris Albin-Lackey, 'Out of Control: Mining, Regulatory Failure, and Human Rights in India', Human Rights Watch, 14 June 2012, https://www.hrw.org/report/2012/06/14/out-control/mining-regulatory-failure-and-human-rights-india.

apply for mining permission for sand and other minerals is Rs. 2000 per application irrespective of it being accepted or rejected by the mining department. The fees to stock mined materials before its sales is Rs. 10,000. Both processes are now online and do not require the mining leaseholder to visit the government office. A transit pass is required for the transportation of mined sand to the end user, which is issued by the government, through which the government earns a transit pass booking fee.

Even though CUTS obtained information on all the above revenue sources, **we were only able to obtain revenue details from royalty exclusively for ordinary sand.** The data for application and transit pass booking fee was not available exclusively for sand mining. Even for royalty, the data includes ordinary sand and is not exclusively for sand mined from the river. However, the data does include sand mined from the basements of infrastructure projects such as buildings, while the NGT order applied primarily to sand mined from the Yamuna river.

Information received from the concerned department in Gautam Buddha Nagar regarding active leases at the time of the NGT order dated 5th August 2013, revealed that all sand mining leases in Gautam Buddha Nagar had expired on 1st May 2013 and hence there were no leaseholders in the district that were mining legally at that time. No new leases were granted thereafter till 2017 when the new State Mineral Policy was implemented.



जनपद गौतमबुद्धनगर में पुर्व में संचालित
बालू खनन पट्टा क्षेत्र का विवरण

क्रमांक	पट्टाधारक का नाम	क्षेत्र का विवरण	स्वीकृति (दिनांक कब से कब तक)
1	[redacted]	ग्राम रायपुर खादर तहसील दादरी	02.10.2003 से 01.05.2013
2	[redacted]	ग्राम असगरपुर तहसील दादरी	02.10.2003 से 01.05.2013
3	[redacted]	ग्राम चकबसन्तपुर तहसील दादरी	02.10.2003 से 01.05.2013

Figure 40: List of Leaseholders Granted Mining Leases in Gautam Buddha Nagar (2003-2013).

(Source: Data procured from Government Sources; Names have been redacted to ensure anonymity and confidentiality.)

One of the biggest impacts during the assessment period from August 2013 to September 2017 has been faced by the state government. An analysis of the amount of royalty received by the revenue department of Gautam Buddha Nagar shows a downtrend in royalty collection from 2012-13 to 2016-17. This is best represented in the Figure 5 that highlights the trend of revenue generated in Gautam Buddha Nagar. As can be seen from the figure, the royalty from the mining of ordinary sand in 2013-14 was only Rs. 835 lakhs as compared to Rs. 16 crores in

2012-13. It rose in 2014-15 only to slide down in 2015-16 and 2016-17. A sharp jump is seen in 2017-18 when fresh leases began to be granted.

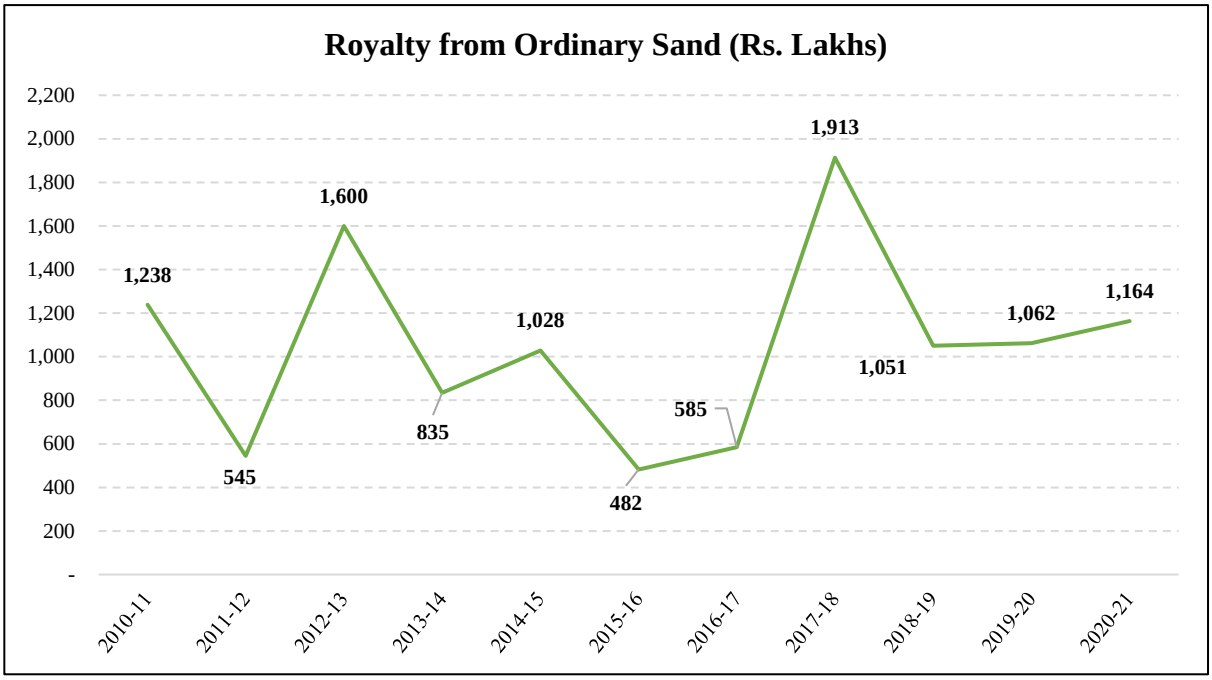


Figure 41: Royalty from Sand Mining in Gautam Buddha Nagar (2010-2021).

(Source: Data procured from Government Sources)

Furthermore, Figure 6 below represents the percentage drop in royalty collection from ordinary sand as compared to 2012-13. During the period of 2013-14 to 2016-17, the royalty earnings of the government were 36% to 70% below the earning in 2012-13. Also noticeable is the jump in earnings once new leases became functional in 2017-18. **As per CUTS' calculations, the state government on an average suffered an annual loss of Rs. 368 lakhs in royalty earnings, adding up a total royalty loss of Rs. 1288 lakhs during the assessment period i.e., from August 2013 to September 2017**.[409]

[409] See appendix table A1 for details.

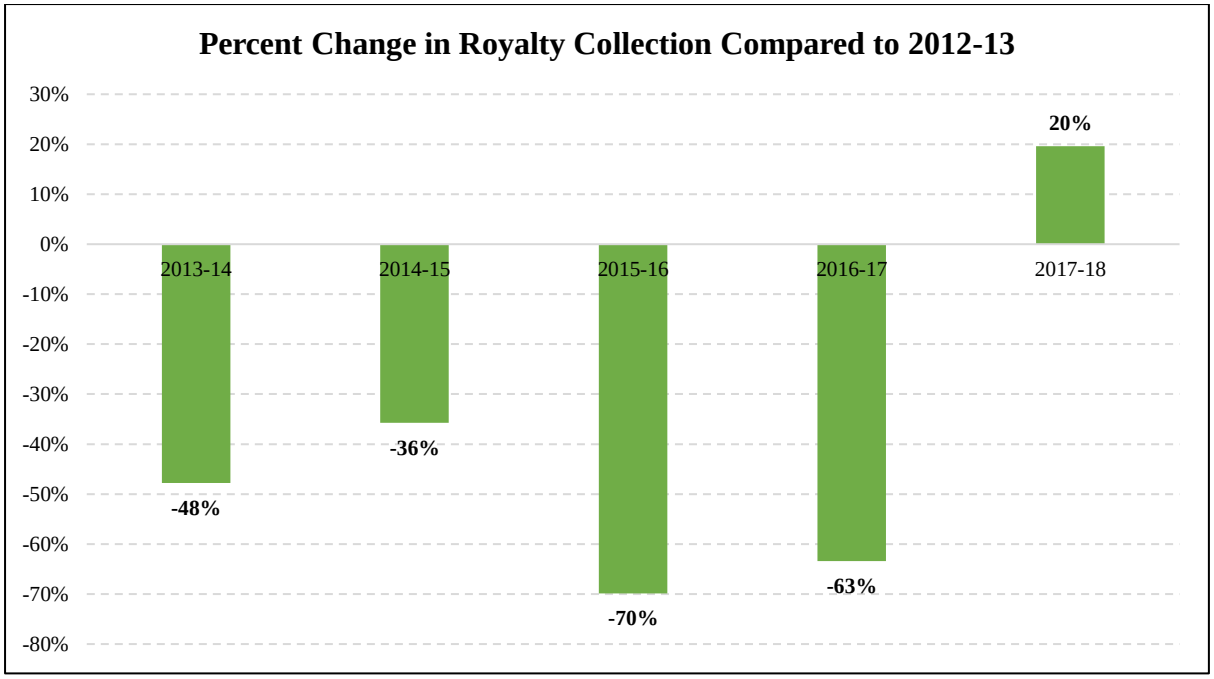


Figure 42: Percent Change in Royalty from Sand Mining in Gautam Buddha Nagar Compared to Base-Year 2012-13.

(Source: CUTS' Analysis based on data procured from Government Sources)

While the information for the data plotted above was received through the mining department in Gautam Buddha Nagar, some information on royalty and value of production (2012-13 to 2014-15) is also available via a study conducted by the Centre for Science and Environment (CSE).[410] Despite the data source for this report and the CSE study being the same, we found a discrepancy in the royalty amount, but decided to consider the data provided by the government department that was acquired most recently by CUTS as a basis for analysis. Interestingly, the DSR 2017 available on the Gautam Buddha Nagar district website too, cites the CSE report as its source of data on these variables.

The transit pass is a document that used to be issued by the mining authority of each state. The document consists of details such as the pickup and drop off location of the mineral, the name of the leaseholder, the quantity and type of mineral being transported. Government authorities informed that if vehicles are found to be transporting illegally mined sand, or have no valid pass, they are fined five times the cost of sand being carried in addition to the royalty calculated on the same. The collection from transit pass booking fee shows a declining trend from before the assessment period which sustained post 2013-14 as well. A slight increase, and a fall thereafter, however, is attributed to the fact that the government has been taking additional measures in moving the process online. Therefore, the process of application, making payments and waiting for approvals is all completed on the authorised website, reducing the necessity for a physical book for the transit pass.

[410] Srestha Banerjee, 'Regulating small scale mining of minor minerals', Centre for Science and Environment, 2016, https://www.cseindia.org/content/downloadreports/8531.

Form eMM11 is furnished by the lessee to the vehicles carrying mineral out of the mining Area. The vehicle driver must carry a printed copy of the form during his journey to the destination. The delivery also must be completed within the time stated in the eMM11 form.[411]

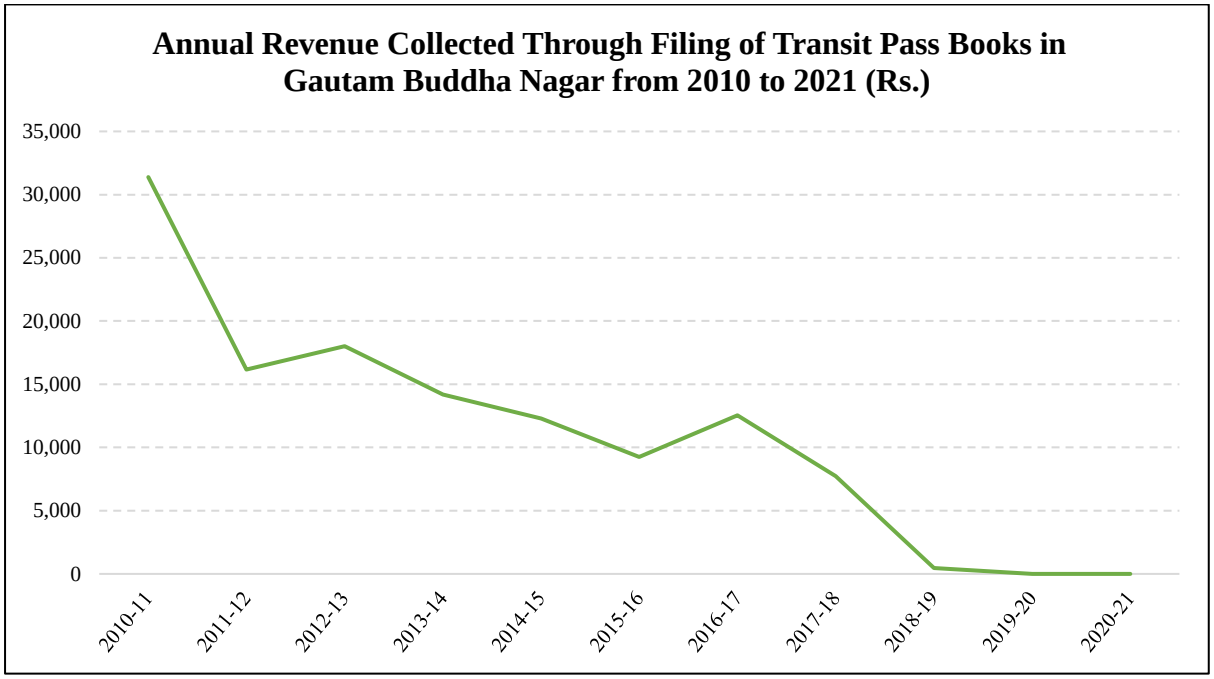


Figure 43: Average Revenue Collected through Filing of Transit Pass Books in Gautam Buddha Nagar (2010-2021).
(Source: Data procured from Government Sources)

An analysis of the collection from application fee also shows a decline post 2013-14, however it increases once leases began to be granted again in 2017.

[411] Uttar Pradesh Mine Mitra, https://www.upminemitra.in/.

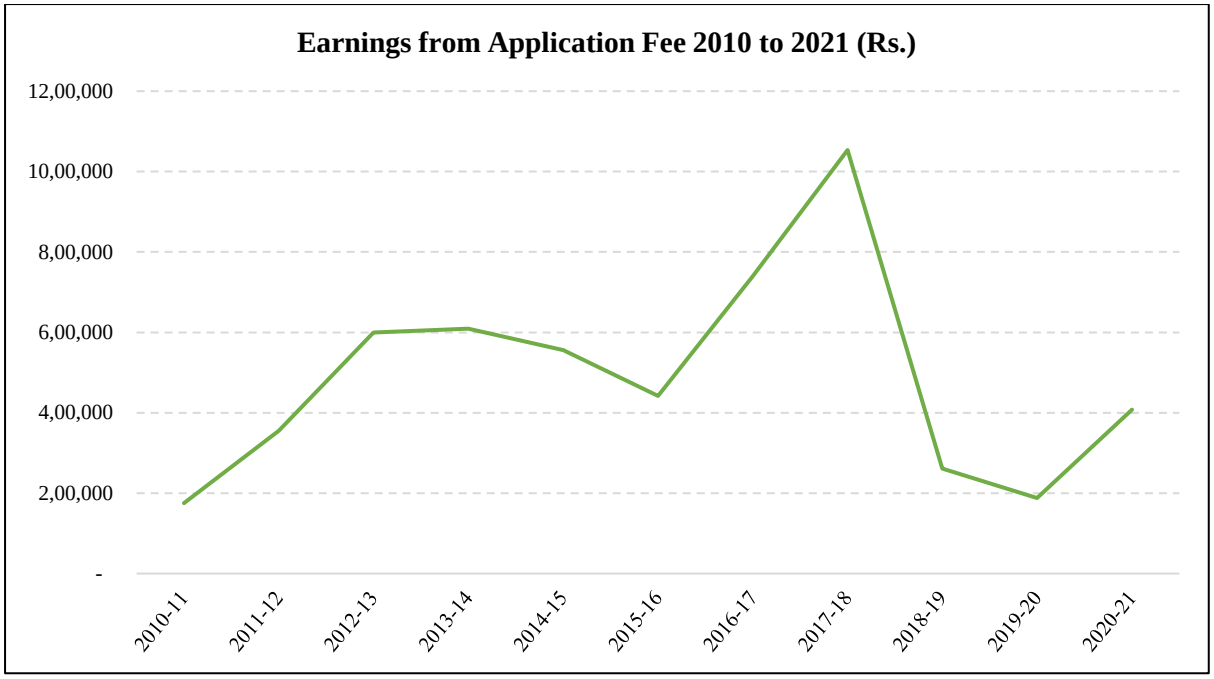


Figure 44: Earnings from Application Fee in Gautam Buddha Nagar (2010-2021).
(Source: Data procured from Government Sources)

As mentioned earlier, illegal sand mining flourished during the assessment period. Newspaper reports cataloguing the experience and on-ground investigations abound on this issue.[412] CUTS' analysis of information received on earnings from enforcement and recovery shows that there was no increase in these indicators during the assessment period. This points to laxity on the part of administration towards curbing illegal mining at a time when it was reported to be very high due to scarcity of legally mined sand. Enforcement authorities are responsible for tracking the excess quantity of minerals mined, illegal sales and transportation practices carried out and penalising those engaging in illegal mining by the processes of seizing the vehicle, filing an FIR and through court appearances. It also entails the practice of providing a notice to the defaulters in giving them an opportunity to explain their perspective as well, in addition to imposing fines and penalties.

[412] 'National Green Tribunal bans Yamuna sand mining', The Indian Express, 03 November 2015, https://indianexpress.com/article/cities/delhi/national-green-tribunal-bans-yamuna-sand-mining/
https://www.indiatoday.in/india/north/story/durga-shakti-nagpal-gone-mining-on-yamuna-bed-still-flourishes-191473-2014-05-04.

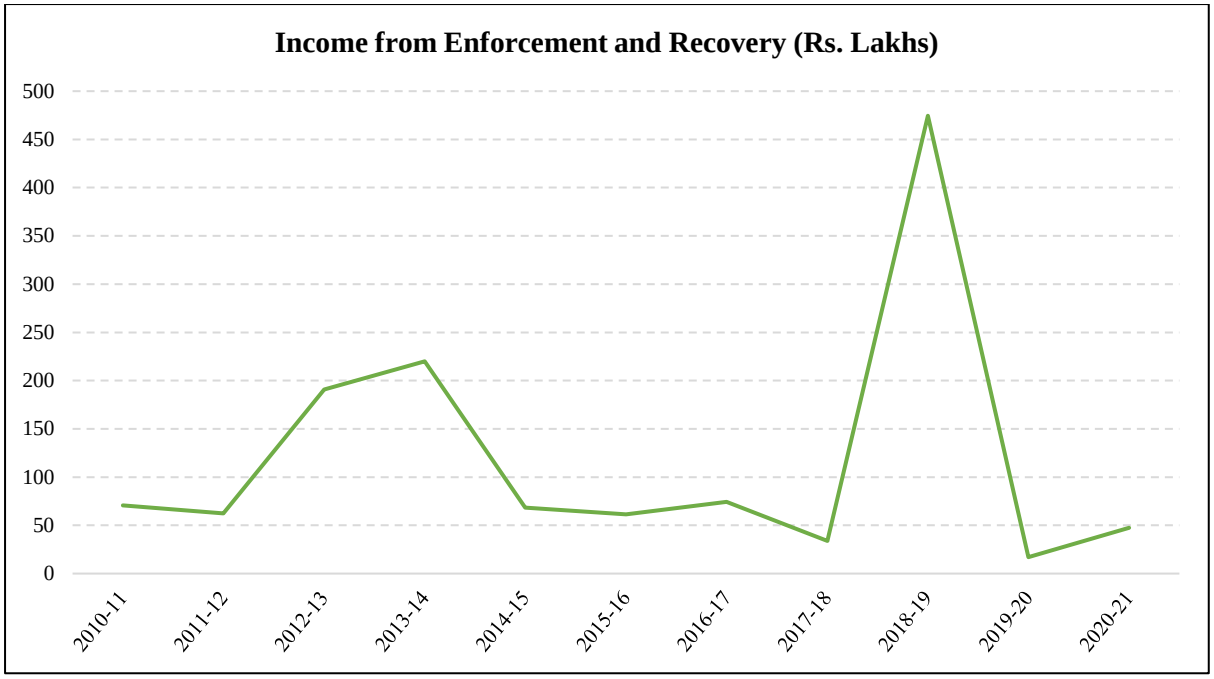
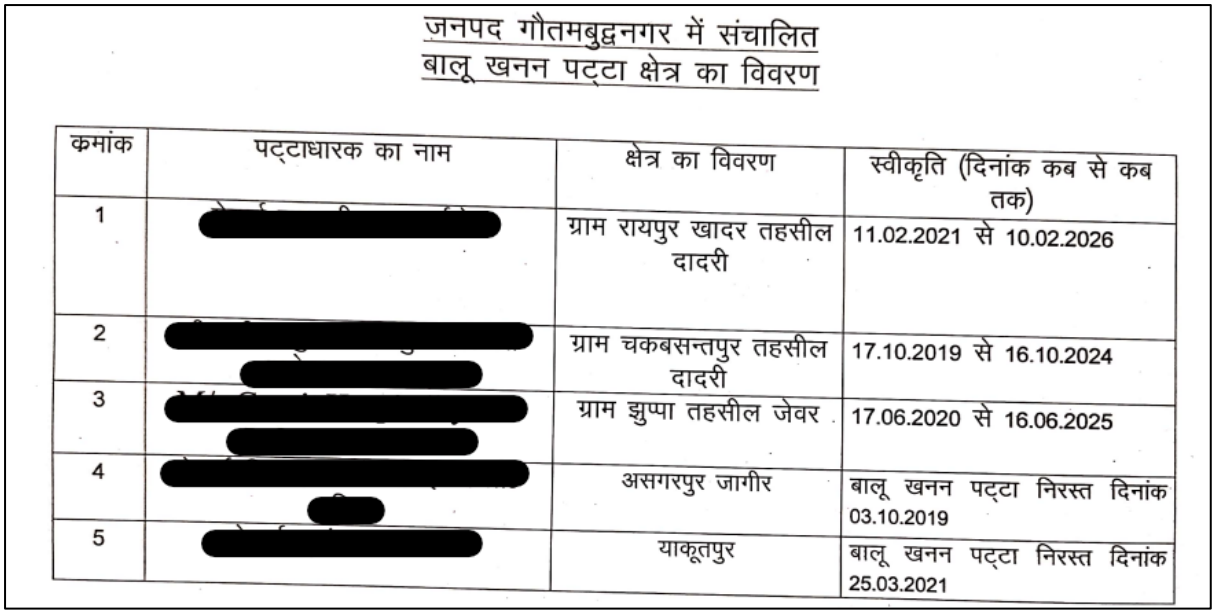


Figure 45: Average Revenue Collected through Enforcement and Recovery in Gautam Buddha Nagar (2010-2021).

(Source: Data procured from Government Sources)

6.2. Impact on Mining Lease and Permit Holders

As per the DSR 2017 of Gautam Buddha Nagar, river bed sand mining was permitted either through mining leases or through short term permits. As mentioned previously all mining leases expired in May 2013 and none were granted during the assessment period from 2013-14 to 2016-17. However, short term mining permits may have continued to be granted in Gautam Buddha Nagar as is evident from information available in the DSR 2017. Information accessed by CUTS reports 04 mining leases that are currently active in Gautam Buddha Nagar and 02 that were cancelled, as highlighted in Figure 10 below.



जनपद गौतमबुद्धनगर में संचालित
बालू खनन पट्टा क्षेत्र का विवरण

कमांक	पट्टाधारक का नाम	क्षेत्र का विवरण	स्वीकृति (दिनांक कब से कब तक)
1	[redacted]	ग्राम रायपुर खादर तहसील दादरी	11.02.2021 से 10.02.2026
2	[redacted]	ग्राम चकबसन्तपुर तहसील दादरी	17.10.2019 से 16.10.2024
3	[redacted]	ग्राम झुप्पा तहसील जेवर	17.06.2020 से 16.06.2025
4	[redacted]	असगरपुर जागीर	बालू खनन पट्टा निरस्त दिनांक 03.10.2019
5	[redacted]	याकूतपुर	बालू खनन पट्टा निरस्त दिनांक 25.03.2021

Figure 46: List of Current Leaseholders in Gautam Buddha Nagar.
(Source: Data procured from Government Sources; Names have been redacted to ensure anonymity and confidentiality.)

No information was available on permit holders during the assessment period and as mentioned earlier, production numbers are inconsistent and unreliable. Hence, they cannot be used to estimate any sort of impact on lease and permit holders.

While CUTS was able to engage with current leaseholders in a limited manner, due to poor recording and documentation, contacting previous lease and permit holders in understanding impact on them was challenging. However, what is clear is that sand mining continued in Gautam Buddha Nagar under short term permits. It could not be confirmed if any business that mined sand under a lease prior to the assessment period went out of business owing to no new leases being granted.

A current and active leaseholder, during the stakeholder interaction in field, highlighted that while the procedure to apply for a lease is now completely online through the e-tendering process, documentation, completion, and registration takes up more than 2-3 months due to challenges such as lack of technical knowledge and governmental laxity. With the most recent rate of sand sold at Rs. 20-25 per cubic foot, the leaseholder currently engages 20-25 fixed employees who are paid an amount of Rs. 15,000-18,000 per month depending on their responsibilities. In engaging daily wage labourers, the leaseholder mentioned that depending on the work and availability, 30-40 labourers are hired from neighbouring villages, and they are paid Rs. 400 to 500 per day.

6.3. Impact on Associated Businesses

It was identified through stakeholder interactions that the associated businesses such as cement and construction companies in the Gautam Buddha Nagar region during the assessment period found it far easier to move to illegally mined sand.

Another stakeholder in the construction business had pointed out that it was during the assessment period that there was a shift in their construction techniques, at least for mega

projects. While traditional construction uses a lot of sand in the building process, the new techniques use prefabricated structures and steel in reducing the dependence on sand, and unskilled labour. Even though prefabricated structures can be comparatively more expensive, construction businesses preferred and opted for the same as an alternative, as that took away the reliance on river mined sand and dealing with ambiguous and uncertainty in regulations.

Thus, it was found that the associated businesses of cement and construction industries, as identified through stakeholder consultations, did not face severe consequences during the assessment period apart from the additional cost incurred in procuring illegal sand at a higher price, which in comparison to the alternatives such as manufactured sand (M-sand)[413] or crushed rocks was a more feasible and acceptable alternative for them. A credible source from a cement dealers' association cited that during the assessment period illegally mined sand was procured at a price which was approximately Rs. 40 to 45 higher than the price of legally mined sand.

6.4. Impact on Labourers and Workers

The impact on labourers and workers during the assessment period effectively meant them losing their financial stream of income. However, with sand being an important minor mineral whose demand is inelastic, the sand mining industry in Gautam Buddha Nagar saw an increased activity of the nexus advancing illegal sand mining, as has been highlighted at various sections in this report.

With most labourers involved in legal sand mining being paid Rs. 300 to 400 per day, as per interactions with current leaseholders, illegal mining although risky, was far more lucrative for them. Through stakeholder interaction it was further found that the pay for illegal sand miners was at Rs. 150 for every trolley of sand that was mined. With each trolley making approximately 15-20 trips per day, each labourer on an average earned close to Rs. 2000 daily.

[413] Artificial sand produced from crushing hard stones into small sand sized angular shaped particles, washed and finely graded to be used as construction aggregate.

Another source of livelihood that people turned to was agriculture, although it did not pay as much as illegal sand mining and some labourers reported hardships due to this. Due to

The Woes and Necessities Compelling Workers Engaging in Illegal Sand Mining

Rajesh (name changed), a local person in Gautam Buddha Nagar, who was engaged in legal sand mining, and then moved to illegal sand mining highlighted that one of the reasons for this shift was the stream of income that helped in supporting his family. Rajesh pointed out that the practice of illegal sand mining was most active at night, and that illegal miners were paid on the basis of each trolley of sand mined.

While a lot of people he knew took to an alternative stream of income through agriculture, the sustainability of the same was in question, given that those who moved to agriculture were forced to take their children out of reputed educational institutions and take recourse of alternatives that were financially more viable.

Source: Stories through stakeholder interactions in field.

reluctance on the part of leaseholders as well as labourers to interact with us as well as lack of availability of data from concerned government departments it was not possible to make any estimations of impact on labourers, if any, during the assessment period.

7. Recommendations and Conclusion

The findings of this study with respect to the impact due to sand mining not taking place in Gautam Buddha Nagar during the assessment period are used to provide the following recommendations with equal consideration to society-development-environment.

a. **Reanalysing and Redesigning Environmental Impact Assessment Framework**: The EIA framework in India is currently not strong and comprehensive enough to include and thus address holistic issues. Designed as a decision-making tool, EIAs ideally, should compare alternatives for a project whilst identifying the one that best represents the combination of economic and environmental costs and benefits.[414] Properly conducted EIAs also have the potential to minimise conflicts by promoting community participation, informing decision makers, and helping lay the base for environmentally sound projects. At the same time, the EIA process in developed countries is found to follow an integrated approach, by taking into account social and health aspects as well. However, the Indian EIA regulations have no provision to enable such an integrated approach, which is important to understand the costs and benefits of a project in a holistic manner.

b. **Factor in Cumulative Impact**: In addition to institutionalising an integrated approach in the EIA process, it is also important for the EIA framework, along with other central and state regulations with respect to environment and sand mining to take into account

[414] 'Understanding EIA', Centre for Science and Environment, https://www.cseindia.org/understanding-eia-383.

cumulative effects. This would enable regulators and authorities to assess the impacts of mining leases not in silos, but in a group, to understand the effect they might have. In that regard, the concept of 'clusters' that was introduced in the EIA Amendment 2016, takes into account the environmental impact of a group of closely situated mining leases, rather than looking at each mining lease individually.

Furthermore, citizens should be involved and invited to participate in the decision-making process with respect to capping the number of leases that could be granted in a particular area. This could ensure that the cumulative impact is minimal and economic activity is continued.

c. **Disincentivise Illegal Mining and Incentivise Legal Mining**: While amending and redesigning the EIA and other relevant laws and regulations, it is important to establish measures to ensure that illegal sand mining can be curbed. In that regard, it becomes essential to ensure that the existing regulations are implemented adequately and effectively in a manner that can mitigate the nexus of police, administration, and sand mafia.

   In addition to adequate implementation, measures must also be taken to disincentivise illegal sand mining. As the situation stands now, specifically in Gautam Buddha Nagar, the existence and dominance of the nexus overshadows the legal sand mining activities, as the sand mafia can influence the cost and final prices. Therefore, the miners, as well as the workers, see no apparent disincentive in engaging in illegal sand mining, with weak enforcement and implementation of laws.

   At the same time, legal sand mining is also touted as expensive and cumbersome as compared to illegal sand mining. Firstly, because the price of legally mined sand is higher than that of sand mined illegally. Thus, one way to incentivise legal sand mining, could be for state governments to reduce/cap the prices of legally mined sand. Another way is to simplify the procedure for obtaining permissions, leases, transportation and storage permits etc. for legal sand mining. That would require greater political will and a coordinated approach.

d. **Promoting the use of Alternatives**: Given the high projected demand for sand and rapidly depleting resources, it is imperative that alternatives to sand are found and promoted. One such alternative is M-sand, during field interviews we were informed that although different state governments have been creating awareness on the use of M-Sand as an alternative to the river sand, many builders are wary about its usage, due to the fear that M-Sand is adulterated with quarry dust, making it unsafe for buildings. There should be efforts to tackle such fears and also refine the technology for producing M-sand to improve its performance in construction. Recently, the government of Rajasthan launched the manufactured sand (M-sand) policy to incentivise and promote the production and use of M-sand. Other states such as Tamil Nadu have also declared intentions to promote and regulate M-sand. More such efforts are needed at the national level.

e. **Institutionalising Robust Review, Monitoring and Feedback Mechanisms**: Courts across jurisdictions can institutionalise a comprehensive and robust institutional mechanism to review, monitor and assess the implementation of their orders. This can be

done by leveraging the existing administrative machinery and line departments which can be organised in the form of an ad-hoc task force, or any other standing body as part of the relevant courts. Another key feature of such an institutional setup must be to assess the challenges of implementation on a case-by-case basis in order to form a feedback loop and inform the courts and other authorities about prospective challenges that might affect any future orders and their implementation.

For instance, with respect to sand mining, the SC and the NGT could have developed such review and monitoring mechanisms, that would have enabled them to take stock of the extent of implementation of their orders. This would also mean reviewing the existing legislations and assessing whether they are equipped to enable stakeholders to implement judicial orders. Such review and assessment mechanisms can then ensure that environmental and social concerns are addressed, thus enabling the continuance of economic activity.

f. **Adequate Regulatory Capacity and Resource Allocation**: To ensure the above-mentioned recommendations can be implemented, the challenges with respect to regulatory capacity and lack of resources must be addressed. For instance, even though the District Survey Report is a good measure and if implemented well can help mitigate environment impacts due to sand mining, it must also be taken into account that the district and/or state level authorities and committees constituted to undertake such tasks, have limited capacity and resources to be able to do so. To overcome the same, the District Mineral Foundation fund must be utilised optimally towards such capacity building.

Appendix

Table A1: Analysis of Average Annual Loss of Royalty	
Particulars	**Rs. Lakhs**
Pre-assessment period royalty collected between 2010-11 to 2013-14	3800.4
Post-assessment period royalty collected between 2013-14 to 2016-17	2512.8
Assessment period loss from 2013-14 to 2016-17	1287.6
Average annual loss of royalty during the assessment period	367.9

Source: CUTS' analysis and calculations on the basis of the data procured from Government Sources.

A 3.5-year pre-assessment period and post-assessment period has been considered. Half of the royalty collected in the financial year of 2013-14 is assigned to pre-assessment period and half is assigned to post-assessment period given that all the sand mining leases in Gautam Buddha Nagar expired in May 2013, and subsequently the NGT order calling for restraint on mining activity without environmental clearance was passed in August 2013.

Vardhman Kaushik vs. Union of India & Ors. (NCR Construction Ban Case)

Table of Contents

List of Figures, Tables and Boxes

Figures

Tables

Boxes

Executive Summary

New Delhi, India's capital city has been facing severe spells of air pollution since last decade causing adverse impact on environment, public health and economy. The concerns related to adverse impacts due to increasing levels of pollution have been highlighted by many environmentalists and health practitioners. Various strategies and measures have been implemented by respective authorities to reduce the air pollution levels in Delhi.

In 2014, a PIL related to the toxic air of Delhi and its neighbouring region was filed with National Green Tribunal by a Supreme Court lawyer, as he felt that the increasing pollution can be a serious health hazard. The litigation originated from the problem of pollution in Delhi NCR and the failure of the administrative authorities to keep a check on the construction activities that were in violation of the MOEF guidelines and causing pollution. For addressing the mentioned issue an order was passed on 07th April 2015 by NGT directing the concerned authorities to direct stoppage of construction activities on a 2-km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and on Golf Course Road, Gurgaon. The objective of this study was to assess the first order economic impact of the said order, if any, on concerned stakeholders.

During the field visit to Delhi NCR for data collection for the case the team met a number of different categories of stakeholders ranging from the Development Authorities [NOIDA and Haryana Shehri Vikas Pradhikaran (earlier known as HUDA)], Pollution Control Boards (UP and Haryana), Real Estate Companies, Labour Associations, and Homebuyer's Associations.

From the meetings with various stakeholders and review of documents made available to the team on field by concerned government authorities, it was concluded that the authorities did not direct stoppage of construction activities. A set of procedural guidelines guided by the principle of natural justice were followed by all the concerned government authorities for implementation and compliance of the NGT order.

A public notice in various newspapers (English and Hindi) and on the official websites of development authorities along with show cause notice was issued to all builders/contractors/real estate companies who were responsible for the construction activities taking place in Noida, Greater Noida and Gurgaon informing them to comply with the directions laid down by the NGT in its orders dated 7th April 2015 and other guidelines laid down by NGT in its previous orders. A compiled report was also submitted by few of the departments to Central Pollution Control Board (CPCB) based on the compliance reports received from the contactors and builders and the inspection of the sites conducted by them.

While we intended to analyse the economic impact of the 7th April 2015 order by NGT on stakeholders, the same was not possible as the order was implemented following due process and hence there was no stoppage of construction activities. However, the interaction with non-government entities like Real Estate Associations, Homeowner's Associations, and Labour Associations, helped to gauge the general impact of stoppage of construction activities that have become routine recently. Since 2017, there have been continuous orders by the

NGT/Supreme Court to stop construction activities every year during October-November to curb air pollution.

The real estate sector is directly impacted by the stoppage of construction activities, which trickles down to labourers working on the site as well as homebuyers who invest their hard-earned money, impacting the latter two the most. The stoppage of construction activities, cause a substantial delay in the completion of projects and up to three per cent cost overrun.[415] An order by the judiciary of 15 days stoppage of construction activities leads to project delays of at least three months and also pushes away potential buyers. The impact of stoppage of construction activities further trickles down to daily wage labourers impacting their livelihood badly and also to homebuyers as they had to bear cost of delay of projects.

The ineffectiveness of procedures adopted by the judiciary and the executive in curbing pollution highlights the existence of loopholes in set procedures and system owing to various reasons such as capacity and expertise constraints, paucity of resources, etc. The various authorities and departments due to constraints faced and no clear division of responsibilities have failed to ensure proper implementation and compliance of the guidelines and orders.

Thus, the executive and the judiciary urgently need to come up with frameworks that would consist of effective measures and the proper system that would ensure the compliance of the guidelines and regulations passed. The problem of air pollution in Delhi has become recurring in nature and requires a long-term, holistic solution that should be based on rigorous research and analysis, and on the contours of enforceability. Improvements are required in existing mechanisms to make speedy and effective resolution of environmental issues via a well-co-ordinated multi-state, multisectoral and multiagency approach.

In conclusion, the problem of pollution in Delhi is a result of the failure of multiple agencies and levels of governance, which involve the executive and judiciary. What is needed is a holistic approach to tackle the problem at various sources and levels. With air pollution in Delhi reaching new peaks, solutions must include unconventional and probably unpopular measures that tackle short- and long-term causes and benefit all residents of the city.

[415] https://www.99acres.com/articles/99acres-insite-sequential-construction-bans-delay-housing-projects-in-delhi-ncr.html

1. Introduction

1.1 About the case

1.1.1 The skies of Delhi National Capital Region (NCR) are often found grappling with deadly smog which frequently blankets the capital as well as the surrounding cities. The problem of environmental pollution is not new for this region, it has been experiencing 'severe' air quality under a blanket of thick haze as pollution levels at most times of the day are seen crossing the permissible standards by multiple times.

1.1.2 In the year 2014, a petition was filed by a Supreme Court lawyer, Vardhman Kaushik before the National Green Tribunal related to the toxic air of Delhi and its neighbouring region as he felt that the increasing pollution can be a serious cause of health hazard. The environmental lawyer expressed his concern to a media house as "*My limited plea was that the causes for the rising air pollution should be identified and curbed. I made a submission and sought a direction to authorities to build cycle tracks, install air filters, and make a web portal for people to complain about activities like waste burning*[416],".

1.1.3 Addressing the case with a series of orders, the National Green Tribunal (NGT) in its order dated 7th April 2015 in *Vardhman Kaushik vs. Union of India & Ors*. directed the State of Uttar Pradesh, Haryana, and NCT Delhi, along with the New Okhla Industrial Development Authority (NOIDA), Greater NOIDA, and the Haryana Urban Development Authority (HUDA) (HUDA together with NOIDA and Greater NOIDA, referred to as development authorities), to direct stoppage of construction activities on a 2-km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and on Golf Course Road, Gurgaon. The NGT had referred to certain print media articles, dated 6th April 2015 titled as 'Death by Breath: Construction Destruction'[417] published in Indian Express to reach to the finding that the construction activities on the identified 2-km stretch were being carried on in violation of previous orders of NGT (dated 26th November 2014 and 4th December 2014) and the Environmental Impact Assessment Guidance Manual for Building, Construction, Townships, and Area Development Projects 2010 (Guidelines 2010) issued by the Ministry of Environment, Forest and Climate Change (MoEF).

1.1.4 The order stated that "***Vide our order dated 26th November, 2014 and 4th December, 2014, we have passed clear direction as to the steps which the person responsible for construction, carrying construction material and dealing with debris should take. Hence, it is clear that this reported construction as mentioned above is in blatant violation of those directions. Besides this, all the construction activities have to be carried on in following the Ministry of Environment guidelines/manual for Township and Area Development Project, 2010."***

[416] https://www.hindustantimes.com/delhi/delhi-air-pollution-case-from-an-innocuous-petition-to-ngt-s-ban/story-ucoqACWxatho9RxOEHhNdM.html

[417] Death by Breath: Construction destruction', Pritha Chatterjee and Aniruddha Ghosal, The Indian Express, 6th April 2015, https://indianexpress.com/article/india/india-others/death-by-breath-construction-destruction/

1.1.5 The litigation originated from the problem of pollution in Delhi NCR and the failure of the administrative authorities to keep a check on the construction activities taking place in the city that were not following the MOEF guidelines and causing pollution. The judgment passed on 7th April 2015, by a bench headed by NGT chairperson Justice Swatanter Kumar also addressed the issues related to other two serious causes of air pollution that were burning of plastic and other wastes including agriculture or horticulture waste in open and pollution resulting from vehicular traffic and industrial emission.

1.1.6 Earlier, under the same petition, the bench in its order dated **4th December 2014** had addressed the issues related to causes of air pollution in Delhi NCR by passing a slew of **stringent measures/directions to be followed while carrying out construction activities in addition to the MOEF guidelines, 2010**.

1.1.7 The NGT often referred to as 'green body' also addressed the issues of vehicular pollution and burning of waste in its orders passed on 26th November 2014 and 28th November 2014.

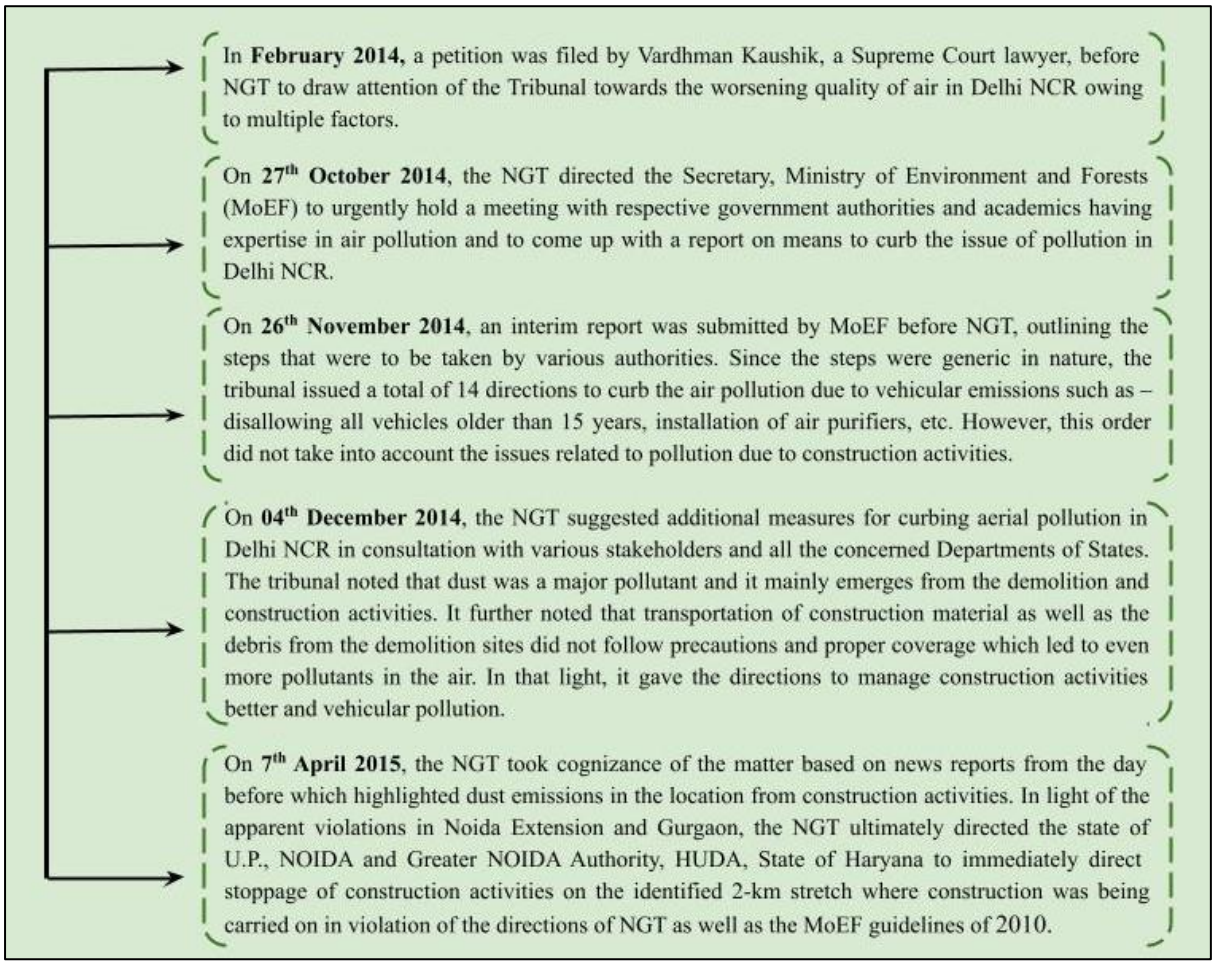
1.1.8 While addressing the issue to curb the outgrowing environment hazard, the judgment of 7th April 2015 also states that the steps that were required to be taken in the long and short term remained unexecuted and were not complied with. It highlighted that the lack of execution and implementation of earlier orders of NGT by the concerned government authorities and departments has resulted in an increased level of air pollution. The judgment mentioned that "*The slackness and casual attitude of the Authorities of the state Government is exhibited from the very fact that the air pollution is increasing and has reached to an alarming level which would make it difficult for the people of Delhi even to breathe freely much less fresh air*."

1.2 Judicial Process

1.2.1 An application was filed in the matter of *Vardhman Kaushik vs. Union of India* in 2014, whilst addressing the problem of increasing pollution in the area with a series of judgments, the green body tried to come out with suggestive measures or decisions directed towards the most prominent causes of air pollution.

1.2.2 While the case was initiated in 2014 and was disposed off in 2018, the figure below only details the judicial process in the brief period that led to the NGT's order of 7th April 2015. During the duration of the case, judgments on other sources causing air pollution in Delhi NCR such as the burning of plastics and wastes, vehicular emissions and treatment of wastage from construction sites and industries were also passed.

Box 1: Judicial Process



2. Objective

2.1 The objective of the study was to assess the economic impact of the above-mentioned order of 7th April 2015 in Vardhman Kaushik vs. Union of India by the NGT. An evidence-based bottom-up approach was adopted to identify stakeholders that may have been directly impacted due to the selected order.

3. Scope

3.1 Extent of Analysis: The scope of the study was limited to estimating the first order direct impact on key stakeholders who might have been affected due to NGT's order of 7th April 2015, such as real estate companies, contractors and builders, labourers and homebuyers.

3.2 Location: The study and data collection for the case were focussed on the specifically impacted areas in Delhi NCR, i.e., the two-km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and Golf Course Road in Gurgaon. However, we were not able to meet the homebuyers living in and around the 2 km stretch as it was difficult to locate them because of a lack of clarity with the location of the stretch. Also since most of the real-estate companies, contractors, and labourers involved were based out of Delhi NCR, the interviews and field

visits were conducted with the stakeholders based in Delhi NCR. The homebuyers/residents associations and labours association of Delhi NCR were also approached.

4. Methodology

4.1 Secondary Research

4.1.1 An extensive review of the literature was undertaken to understand the ecosystem of the real estate sector, functioning and powers of different concerned government authorities and departments and to identify different stakeholders that may have been directly impacted by the said decision of NGT.

4.1.2 Various media articles and opinion pieces were also reviewed to identify the media personnel who rigorously covered the issue. The articles also helped in identifying the active real estate projects and contractors in 2015 at the 2km mentioned stretch in both Noida and Gurgaon.

4.1.3 The team also studied the powers and jurisdiction of NGT in the context of this particular judgment and also attempted to understand the ecosystem of the real estate sector pertaining to various environment clearances and certain requirements to be fulfilled by the company or the contractor before, during and after completion of a real estate project.

4.2 Stakeholder Mapping and Sampling

4.2.1 Since the scope of the study was to assess the first order direct impact of the decision, the same criterion was adopted to identify the stakeholders. The following is a list of the categories of all stakeholders identified:

- Contractors/Builders/Real Estate Companies
- Employees/Workers/Labourers
- Home Buyers
- Real Estate Associations
- Investors/Financial Institutions
- Journalists
- Development Authorities
- Pollution Control Boards

4.2.2 The various development authorities responsible for regulating construction activities and government agencies responsible for deciding environmental clearance applications related to construction in NCR were identified to better understand the procedural aspect of implementing the directions of NGT.

4.2.3 Similarly, various journalists who had extensively covered the issue of increasing air pollution due to construction activities in Delhi-NCR including covering NGT's order of 2015 were also identified.

4.2.4 The stakeholder mapping was based on an extensive review of literature, understanding the workings of development authorities and respective State Pollution Control

Boards, and reviewing the media articles and reports (newspaper articles). Table 1 below lists the stakeholders identified and interviewed. Along with that, it also shows the key queries for each category of stakeholder.

Table 23: Overview of Stakeholder Mapping and Break-up of Sample Studied

Stakeholder Category	Stakeholder Category Details	No. of Stakeholders Identified and Contacted	No. of Stakeholders Interviewed	Key Queries
Companies	Contractors, Builders, and Real Estate Companies	22	04	- Understand the procedure of compliance of NGT's order - Impact of stoppage of construction activities - Impact on steel and cement businesses
Employees/ Labourers	Contractual and Permanent Labourers	02 labour associations	Met in total 20-25 male and female labourers that included both contractual and permanent labourers	- Impact on non-permanent employees employed with contractors and builders - Impact on daily wage labourers and workers - Impacts on communities (families of wage labourers and workers)
Associations	Homebuyers, Real Estate and Labour Associations	04	03	- Impact of stoppage of construction activities (on each of the stakeholder)
Journalists	Various media outlets	07	01	- Perception on the case - Identify projects around the 2-km patch
Government Authorities	Pollution Control Board, and Development Authorities	07	05	- Identification and details of projects around the 2-km patch - The procedure of implementation of NGT's order

4.3 Methods of data collection

4.3.1 For primary data collection, a semi-structured questionnaire for each of the stakeholders was prepared and was used as an interview tool as well as the data entry form.

4.3.2 The following methodological steps were undertaken to facilitate research and data collection during the field visit:

- Identification of stakeholders through review of secondary literature including print media articles and relevant orders of NGT.
- Consulting real estate sector experts to better understand the sector as a whole as well as to understand the various processes involved in construction activities.
- Contacting and reaching out to stakeholders, journalists, development authorities, government agencies, and real estate experts. A multi-channel approach was adopted with appropriate follow-ups and reminders.
- Understanding the functions and powers of concerned government authorities and departments to better understand the implementation and compliance of the order.

- Designing a semi-structured questionnaire and identifying data points for all categories of stakeholders, journalists and development authorities, and government agencies, based on an extensive secondary literature review.
- Interviews were conducted usually in Noida, with a few meetings held in Gurgaon and Ghaziabad. All meetings were held at the respective interviewee's offices.
- Follow-ups via phone and emails were conducted with various government departments to fill in the data points related to the case.
- The team also just walked into the offices of concerned authorities and conducted interviews as they were not able to reach out to them or fix appointments on the phone or by email.
- A field visit report was also prepared to summarise the findings from the field.

4.4 Challenges and Limitations

The following have been the limitations and roadblocks faced during the study:

- The pandemic interrupted the fieldwork and data collection as it was difficult to fix appointments, especially with government authorities.
- Due to risk mitigation protocols associated with the pandemic, there were a limited number of stakeholders that the team could meet per day.
- Some stakeholders were unwilling to meet in person citing the pandemic as a reason.
- The ongoing farmers protest also affected the number of meetings as it was difficult to cross borders between Delhi-Ghaziabad and Delhi-Gurgaon.
- Most real estate companies were unwilling to meet and contribute to the study since they were reluctant to share financial information and data related to their business.
- There was a certain level of 'recall bias' while interacting with stakeholders which are attributed to the fact that the NGT order dates back to 2015 along with the fact that it did not cause major disruption because of the way it was implemented by concerned authorities.
- Another challenge faced was that most of the government officials who were responsible for complying with NGT's order of 2015 were transferred or deputed to different offices or locations. Thus, the current officers could assist the team on-field and provide information only based on the documents and files at hand, and hence were not able to share the first-hand experience related to the implementation of the order.
- It was also difficult to identify the '2 km' stretch specified in the judgements as the location points of the stretch were not mentioned clearly in the judgement.

5. Review of Literature

5.1 What's Polluting Delhi's Air?

5.1.1 India's capital territory Delhi is considered among the world's urban agglomerations with the most toxic air[418]. It has been noted that the air quality of India's capital city and its surrounding region remains quite poor during most months of the year. There are various

[418] Arpan Chatterji, Air Pollution in Delhi: Filing the Policy Gaps, Observe Research Foundation, December 2020.

reasons for worsening levels of pollution in Delhi NCR, which include human activities and a deficit in planning and governance[419].

5.1.2 The concern over the issue of Delhi's air pollution can be traced back to the early 1980s when a Public Interest Litigation (PIL) was filed by the crusader green advocate, M.C. Mehta in the Supreme Court (SC) of India in 1985. In response to Mehta's petition, the SC directed the Delhi administration to file an affidavit specifying the steps it had taken to reduce air pollution[420], despite this, the problem has only worsened day by day.

5.1.3 Being a metropolis, Delhi has grown across many sectors – industry/power plants, transport, housing and agriculture in neighbouring states. All these sectors have seen an increase in human activities, which has been considered an important factor in the rising levels of pollution as well as health risks in the city[421]. One of the main reasons attributed to the growth across all these sectors has been the massive growth in the population of the city (due to migration majorly for job/career opportunities). The MoEF in its whitepaper on 'Pollution in Delhi with an Action Plan' has stated that the growing economic activities and opportunities have been touted as one of the reasons why the levels of pollutants have not been controlled effectively.[422]

5.1.4 The pollutant components in the air are sometimes increased due to strong winds which bring dust and various types of emissions from nearby and distant regions, thus temporarily exacerbating air pollution. However, human activities at the local and regional level are more threatening as well as majorly responsible for the release of toxic fumes and dust in the environment leading to deterioration in the air quality[423].

5.1.5 The sources of air pollution are generally divided into two categories, one referred to as **diffused sources** which include ground sources like vehicle exhaust, re-suspended dust due to vehicle movement and construction activities, open waste burning, residential cooking and heating, these influence the immediate vicinity and then they diffuse and disperse. The other category is **emissions** from industries and power plants with high stacks, which tend to move farther distances (depending on local meteorological conditions) and end up polluting not only the area where they are sourced but also distant areas[424].

5.1.6 The table below lists different types of pollutants and their sources. Out of all the pollutants, particulate matter (PM2.5 and PM10) is the one of the most critical for human health[425]. A report published by the Central Pollution Control Board (CPCB) in 2011 on the air

[419] Rumi Aijaz, The Herculean Task of Improving Air Quality: The Case of Delhi and NCR, ORF Issue Brief, November 2018.

[420] Urvashi Narain and Ruth Greenspan Bell, Who Changed Delhi's Air? The Roles of the Court and the Executive in Environmental Decision making, December 2005.

[421] Sarath Guttikunda, Air Pollution in Delhi. Economic & Political Weekly, 2012

[422] Whitepaper on Pollution in Delhi with an Action Plan, MoEF, Government of India

[423] Rumi Aijaz, The Herculean Task of Improving Air Quality: The Case of Delhi and NCR, ORF Issue Brief, November 2018.

[424] https://urbanemissions.info/blog-pieces/whats-polluting-delhis-air/https://urbanemissions.info/blog-pieces/whats-polluting-delhis-air/

[425] https://urbanemissions.info/blog-pieces/whats-polluting-delhis-air/

quality analysis of six cities, showed that Delhi had the highest emission of PM10. Most of PM10 comes from dust - on the roads due to constant vehicular movement, at the construction sites and the seasonal dust storms[426].

Table 24: Sources of Air Pollution

POLLUTANT	SOURCE	CONDITIONS
Particulate matter	Traffic	Summer and winter
	Forest fires	
	Wood smoke	
	Infiltrates indoors	
Ultrafine particulate matter (< 0.1 µm in diameter)	Diesel traffic	Close to busy roads
Ozone	Secondary to aero-chemical reaction to nitrogen oxides and volatile organic compounds	Summer afternoons; heat and sunshine
Nitrogen dioxide	Traffic	Close to busy roads
Carbon monoxide	Traffic	Close to busy roads
Sulfur dioxide	Industrial plants—combustion and refining of coal, oil, and metal-containing ores	Close to industrial sources
	Gasoline, although sulfur content has recently been reduced	

Source: https://www.orfonline.org/research/air-pollution-delhi-filling-policygaps/#_edn38

5.1.7 The Delhi NCR which includes the capital and the satellite cities of Gurgaon and Faridabad (Haryana) as well as Ghaziabad and Noida (Uttar Pradesh), is also a major construction hub in India[427]. The construction of new buildings, commercial and residential societies and long duration projects such as of Delhi Metro Rail Corporation (DMRC), etc., contributed significantly to the alarming rise of air pollution in Delhi[428]. Fine dust arising from the construction sites and demolition activities is one of the significant contributors to the poisonous mixture referred to as 'smog' – which can also be seen with naked eyes in Delhi NCR. According to Delhi Pollution Control Committee (DPCC) officials, 30 percent of air pollution in the territory is caused by dust from construction sites and has a major contribution to PM 10[429].

5.1.8 Delhi has been witnessing construction activities in large numbers for years now and the dust deposits at construction sites have taken a toll on the air quality of Delhi NCR[430]. A study conducted by IIT Kanpur published in 2016, highlighted that road dust is the top contributor in the levels of PM10 and PM2.5 in Delhi at 56 percent and 38 per cent respectively

426 *Ibid*

427 https://www.india-briefing.com/news/delhis-pollution-crisis-impact-business-15631.html/

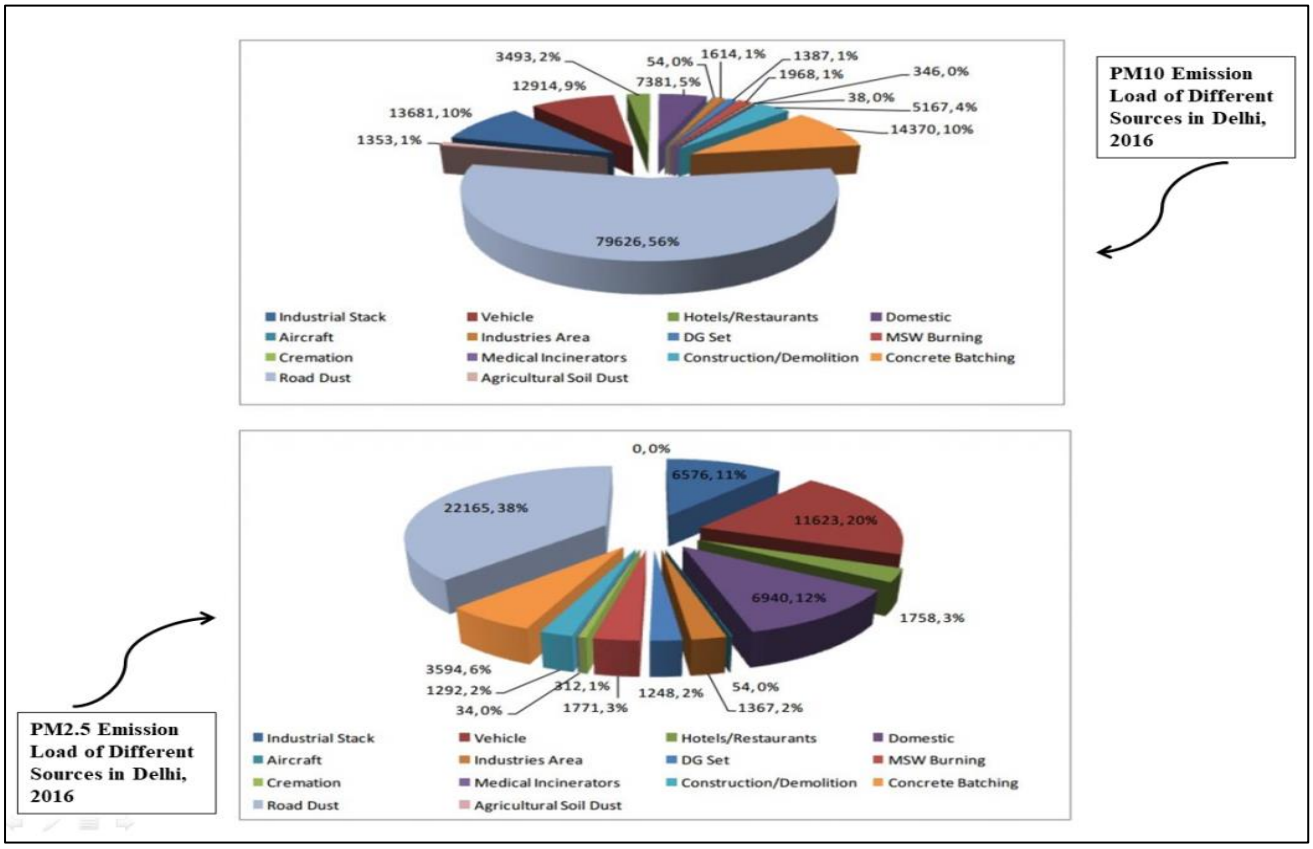
428 https://www.dailypioneer.com/2016/delhi/construction-dust-adds-30-to-air-pollution.html

429 https://urbanemissions.info/blog-pieces/whats-polluting-delhis-air/

430 https://www.downtoearth.org.in/news/air/delhi-air-pollution-identifying-perpetrators-and-fixing-responsibility-56240

as is evident from figure 1 below[431]. The figure below shows the distribution of different sources of air pollution for Delhi which increases the level of PM10 and PM2.5 in the air.

Figure 47: Particulate Matter Emission Load of Different Sources in Delhi



Source: https://www.downtoearth.org.in/news/air/delhi-air-pollution-identifying-perpetrators-and-fixing-responsibility-56240

5.1.9 Various studies have been conducted which attribute the current state of air pollution also to coal-fired power plants, vehicular pollution, burning of crop residue and industrial as well as vehicular emissions. Private transport, both passenger and commercial vehicles, is also very much responsible for an increasing portion of the energy consumption, emissions, and harmful exposure. The dense traffic produces large-scale vehicle exhaust and road dust pollution, which sometimes double the ambient pollution[432]. In winter, vehicles contribute 25 per cent to PM2.5 concentration in air, with diesel vehicles contributing a large share to both PM10 and PM2.5 levels[433].

5.1.10 Another factor that is pointed out every year around the months of October- November is the crop residue burning in Punjab and Haryana and its immediate impact on Delhi's urban air quality. Although it is not part of the regular emissions inventory for Delhi, it does cause ambient pollution, because of the long-range transmission of pollutants[434]. Studies on Delhi's

[431] https://www.hindustantimes.com/delhi-news/debris-mounds-at-construction-sites-across-delhi-may-impact-efforts-to-fight-air-pollution/story-WDUUaSiNjFadTq4PsjI2fN.html

[432] Sarath Guttikunda, Air Pollution in Delhi. Economic & Political Weekly, 2012

[433] https://www.downtoearth.org.in/news/air/delhi-air-pollution-identifying-perpetrators-and-fixing-responsibility-56240

[434] [434] https://urbanemissions.info/blog-pieces/whats-polluting-delhis-air/

air quality have also revealed that the air quality is also influenced by variable climatic conditions during different seasons in the city. The capital city is landlocked between the states of Haryana, and Uttar Pradesh, and the Himalayas in the north. Since the process of burning of crop residue often coincides with falling temperatures and slow wind speeds during October and November — the meteorological conditions that can lead to temperature inversions[435], which trap smoke in place[436], hence resulting in a dense layer of smog over Northern Plains, largely over Delhi NCR.

5.1.11 Hence, as stated, there are number of sources of air pollution that significantly contribute to the toxicity in the air of Delhi NCR. The judicial and quasi-judicial bodies (Higher courts and NGT) along with the executive, from time to time have tried to address the adverse impacts of these pollutants by adopting measures such as odd-even schemes, prohibiting bursting of firecrackers, issuing guidelines and measures for carrying out construction activities, etc. Such measures show the intent of the government and judiciary to curb the adverse impacts of air pollution but the proposed solutions have been temporary and unable to systematically address the sources of pollution.

5.1.12 The measures taken by the government were 'preventive' in nature as it only tried to prohibit the activities that were emitting harmful pollutants, and were not sustainable or permanent solutions. Thus despite going with the band-aid solutions, there is a necessity to adopt a holistic and cohesive approach and to bring all the stakeholders on board for policy deliberation and ensuring effective enforcement and implementation of the action plan.

5.2 Impact of increasing pollution on the capital city and neighbouring regions

5.2.1 Our country has been particularly vulnerable to air pollution over the last two decades, owing to population growth, increasing numbers of vehicles, use of fuels, industrialisation, and ineffective enforcement of environmental regulations. In 2019, Delhi had the highest ambient particulate matter pollution exposure in the country[437].

5.2.2 One of the hazardous contributors to the polluted air of Delhi is the city's construction sites and the production of raw materials such as bricks and concrete, which causes lung diseases particularly among children and the elderly[438].

5.2.3 Among particulate matter, in comparison to PM10, PM2.5 poses the greatest health risk as they are minuscule and sink deep into a person's lungs and bloodstream. Exposure of such fine particles for the long term has been linked with an increased rate of chronic bronchitis, reduced lung function, and increased mortality from lung cancer and heart diseases. At the same time, PM10 particles are particularly dangerous because they are small enough to pass through the throat and the nose and enter the lungs. The inhalation may lead to issues like

[435] It is the reversal of normal behavior of temperature (air temperature usually decreases with height) in troposphere in which a layer of cool air at the surface is overlain by a layer of warm air. The inversion act as cap on the upward movement of air from layers below.

[436] Arpan Chatterji, Air Pollution in Delhi: Filing the Policy Gaps, Observe Research Foundation, December 2020

[437] *Ibid*

[438] https://www.theguardian.com/cities/2017/feb/15/delhi-deadly-dust-how-construction-sites-choking-city

coughing, wheezing to asthma attacks, as well as hypertension, strokes, and premature deaths[439].

5.2.4 Some literature also stated that pollution also has a deep economic impact on the Gross Domestic Product (GDP) of a country. Other than impacting biodiversity and ecosystems, it can also bring down productivity and prove expensive due to workforce disruptions and by increasing health costs[440]. A report published by the World Bank in 2016 revealed that the rising air pollution has cost India more than 8.5 per cent of its GDP in 2013. Currently, it is reported that India is incurring an annual economic loss of $37 billion that is 1.4 per cent (approx.) of its GDP due to failure in reducing air pollution levels in the country[441].

5.2.5 A 2015 study conducted by the Indian Institute of Technology, Bombay, calculating the impact of air pollution due to exposure to PM10, reported that economic cost rose by around 135% for Delhi from 1995 to reach $6.39 billion in 2015. This cost is in terms of health and productivity, the study also reported there were 29 million cases of restricted activity days[442] and 0.12 million hospital visits in 2015 due to worsening of air quality due to emissions from vehicle exhaust, construction dust and industrial processes[443].

5.3 Real Estate Sector and its contribution to toxic air of Delhi, NCR

5.3.1 The southern and eastern fringes of Delhi have seen a sudden spurt in high-rise buildings and construction sites in the last decade. Due to the growing population of the Indian capital, which is already the second most populous city in the world, neighbouring areas such as Noida have become a universe of worksites, cranes, and workers[444]. Like much of Delhi, most of the neighbouring regions of Delhi can be seen blanketed in thick smog and heavy dust that cakes windows and clogs throats.

5.3.2 The construction sector has been rapidly growing in India, especially from the last two decades due to demand from a growing population. This has eventually led to the setting up of more brick and cement manufacturing industries. In the case of Delhi, most of the brick kilns are located along the periphery of the city. The two prominent highlighted sources of air pollution occurring due to the construction activities in the real estate sector are – brick manufacturing and re-suspended dust[445] (due to vehicular movements carrying raw materials, raw materials kept uncovered and demolition activities on construction sites).

5.3.3 A study conducted in the year 2015, stated that poor building standards and antiquated practices make construction and demolition the third-largest contributor of coarse pollutants

---

439 Arpan Chatterji, Air Pollution in Delhi: Filing the Policy Gaps, Observe Research Foundation, December 2020

440 https://weather.com/en-IN/india/pollution/news/2018-10-31-economic-impacts-of-pollution

441 Economic cost of pollution | Business Standard Editorials (business-standard.com)

442 RAD is a day in which an individual spends over half of the day in bed or cutting down on usual activities because of illness or injury.

443 https://timesofindia.indiatimes.com/city/mumbai/air-pollution-killed-81000-in-delhi-mumbai-cost-rs-70000-crore-in-2015/articleshow/56656252.cms

444 https://www.theguardian.com/cities/2017/feb/15/delhi-deadly-dust-how-construction-sites-choking-city

445 Arpan Chatterji, Air Pollution in Delhi: Filing the Policy Gaps, Observe Research Foundation, December 2020

that is particulate matter 2.5 and 10[446]. The process of mixing concrete, uncovered piles of rubble[447] that spill out, no fences to avoid whipping of dust by winds and also lack of capacity to process construction wastes are a few of the processes at construction sites[448] that make Delhi's air hazardous.

5.3.4 The business of manufacturing bricks in the northern part of India is dominated by small-scale individual operators who usually hire seasonal wage workers on daily basis and rely on conventional fixed-chimney bull's-trench kilns that are more polluting and energy-inefficient as compared to the newer, cleaner technologies. Along with this, the urban clusters of small-scale manufacturers, such as leather tanneries, smelters, and metalworking shops account for a large portion of pollution in Delhi[449].

5.3.5 According to various studies road dust arising mainly due to construction activities forms a large part of the coarse PM10 pollution. The proportion of road dust in pollution level is not quantifiable as it depends on the number of causes such as vehicle movement on the roads, road types, silt loading on roads and at construction sites, and meteorological conditions[450].

5.3.6 The outskirts of NCR is roughly covered by 360 brick kilns, mostly in the Jhajjar, Faridabad and Ghaziabad regions, whose peak business months are from December to June. Since during winters, winds are relatively faster in comparison to other seasons and gases do not stay suspended in one place, it leads to a rise in their emissions[451].

5.3.7 A study[452] was conducted by a Delhi-based think tank Council on Energy, Environment and Water (CEEW) in 2019 to understand and compare the data from different emission inventories[453] on different sources of air pollution in Delhi NCR covered extensively by source apportionment studies[454] (CPCB 2010; IIT Kanpur 2016; TERI 2018; SAFAR 2018; Guttikunda 2018). The study highlights different sources of air pollution that have been substantially contributing to increasing air pollution in the Delhi NCR along with the construction activities.

5.3.8 The two figures below show the sector-wise variation of the contribution of different sectors in increasing the level of PM2.5 and PM10 respectively, across the four studies. It can be cropped out from the figures that for PM 2.5 industries, transport and road dust remain the

446 https://www.theguardian.com/cities/2017/feb/15/delhi-deadly-dust-how-construction-sites-choking-city

447 pieces of broken brick, stone, etc., especially from a damaged building

448 https://www.theguardian.com/cities/2017/feb/15/delhi-deadly-dust-how-construction-sites-choking-city

449 Sarath Guttikunda, Air Pollution in Delhi. Economic & Political Weekly, 2012

450 *Ibid*

451 Arpan Chatterji, Air Pollution in Delhi: Filing the Policy Gaps, Observe Research Foundation, December 2020

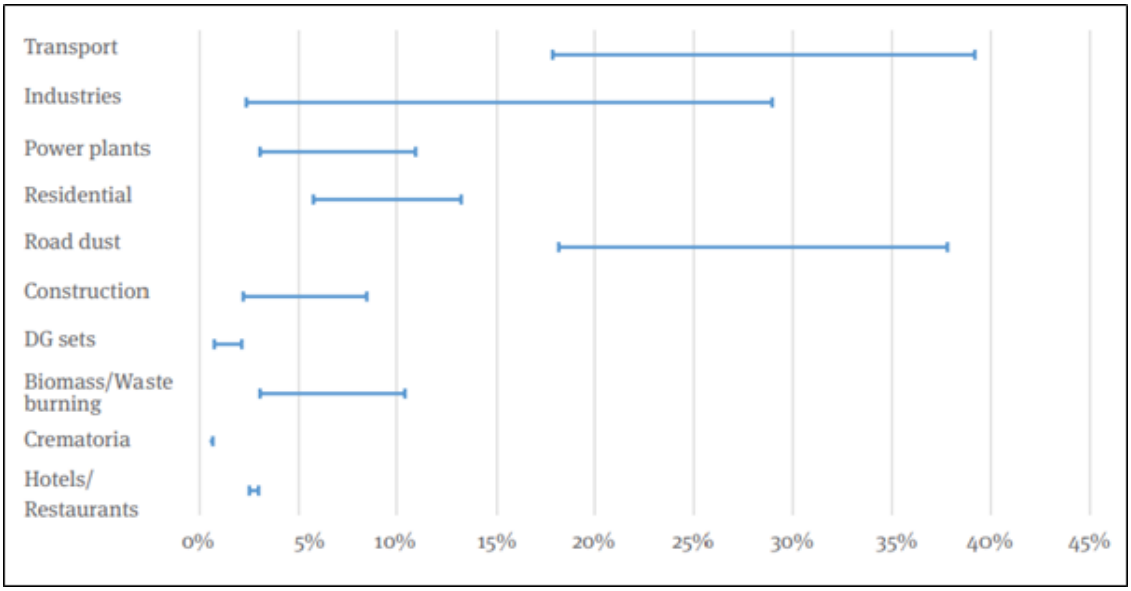
452 Ishita Jalan and Hem H. Dholakia, Understanding Uncertainties in Emissions Inventories, March 2019. https://www.ceew.in/sites/default/files/sources-of-pollution-in-delhi-2019.pdf

453 An emissions inventory of a given study region is a stock of all its pollution-emitting sources

454 A study primarily based on measurements and tracking down the sources through receptor modelling helps in identifying the sources & extent of their contribution.

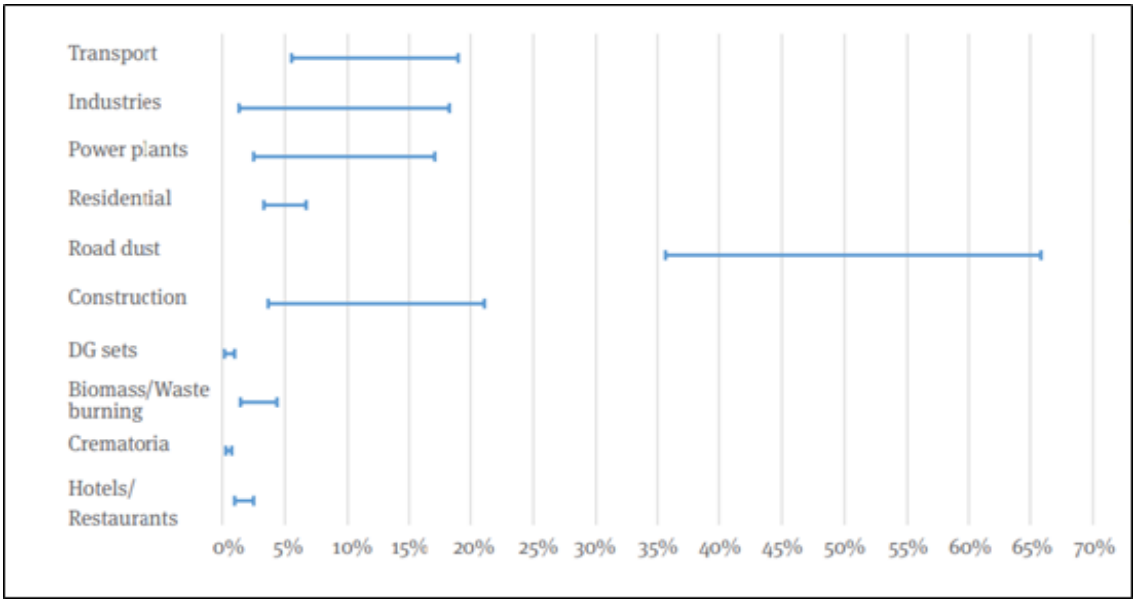
major contributor and for PM10 the larger contribution is mainly from road dust, construction activities, and industries.

Figure 48: Sector- wise variation in emissions inventory for PM2.5 (%)



Source: https://www.ceew.in/sites/default/files/sources-of-pollution-in-delhi-2019.pdf

Figure 49: Sector-wise variation in emission inventory for PM10 (%)



Source: https://www.ceew.in/sites/default/files/sources-of-pollution-in-delhi-2019.pdf

5.3.9 The data trends from the study suggest the road dust and construction activities are the main contributors to the increasing air pollution in Delhi NCR along with other sources such as transportation, industrial emissions and power plants. Hence, the problem requires a system or approach that would reduce emissions from each of these sources and disproportionately focussing on only addressing one or two sources of pollution may not improve the situation.

5.3.10 Air pollution in Delhi is not a seasonal problem. It has been reported that year-round, the level (of air pollution) remains three times higher than the national standard in the city due to different sources of pollutants. Many researchers, researching the subject are of the view that unless the annual concentration drops down significantly, the impact of pollution will not reduce[455].

5.3.11 Governments have tried to mitigate air pollution by adopting a number of regulatory measures for prevention, control and abatement of air pollution by launching programmes, passing guidelines and strict orders. These actions were emergency measures taken up in Delhi when the air quality of the region had already 'deteriorated'. Experts pointed out that the measures such as closing schools, closing brick kilns in winters and stoppage on construction activities were reactive antipollution measures that do not protect the poorest and do not enact structural change[456]. To fight air pollution, governments not only need emergency measures when pollution spikes, but year-round air pollution reduction drives across sectors.

5.3.12 Experts have suggested that Delhi needs a less reactionary and more consistent and dynamic response system to battle the toxic air quality along with the need to work on reducing emissions from different sources in the National Capital Region and the entire Indo-Gangetic Plain. This requires inter-sectoral approaches that need to be implemented properly[457].

5.4 National Green Tribunal – Functions and Jurisdiction

5.4.1 National Green Tribunal is a judicial body that was set up to exclusively deal with environmental concerns, it was tasked with the responsibility to provide "speedy environmental justice" by adjudicating cases that fall under original, appellate and special jurisdiction[458] relating to environmental protection, conservation of forests and other natural resources, as well as providing relief and compensation to people adversely affected by industrial accidents[459]. The body has the power to take decisions in civil jurisdiction in cases involving the environment using various provisions and any person aggrieved by an order/direction of any of the Appellate Authorities involving subjects in the legislations mentioned in Schedule I of the National Green Tribunal Act, 2010 may approach the Tribunal.

5.4.2 The tribunal has the power to regulate its procedure and is guided by the principle of natural justice[460]. While NGT has the power of enforcing laws on administrative agencies but in case of criminal offences can only issue recommendations for punishment which can be challenged in courts[461]. NGT is mandated to dispose of the case within 06 months from the

[455] https://www.business-standard.com/article/current-affairs/odd-even-may-not-cut-delhi-air-pollution-an-expert-from-iit-explains-why-119111000305_1.html

[456] https://theprint.in/environment/severe-pollution-is-back-in-delhi-experts-call-for-action-plan-that-responds-to-forecasts/334086/

[457] https://www.business-standard.com/article/current-affairs/odd-even-may-not-cut-delhi-air-pollution-an-expert-from-iit-explains-why-119111000305_1.html

[458] https://www.cambridge.org/core/journals/transnational-environmental-law/article/environmental-justice-in-india-the-national-green-tribunal-and-expert-members/2E26B50742FFB8BB743557132DC7DD66

[459] https://themorningcontext.com/chaos/inside-the-attempt-to-hobble-the-ngt

[460] https://greentribunal.gov.in/methodology-ngt

[461] https://link.springer.com/article/10.1007/s11356-018-1763-2

date of filing of the complaint to provide speedy trial and speedy justice in all related matters as it will prevent potential environmental damage[462].

5.4.3 Section 4 of the NGT Act 2010, states that the tribunal will have a Chairperson who would have the power to invite any expert member in the related field to assist in the case if necessary. The tribunal should have maximum of 20 and a minimum of 10 judicial members at any given time. Along with the judicial members, the tribunal should consist of subject experts as full time employees and equal representations of both judicial members and subject experts should be ensured[463].

5.4.4 In general, the role of the green body has been progressive towards environmental protection and the rights of marginalised people in particular. An increasing trend can be observed in the number of environmental judgments delivered by the NGT since it was set up, indicating that the environmental concerns along with environmental justice in the country have been growing every year[464].

5.4.5 NGT has changed environmental jurisprudence in India, but there has been evidence of disagreement between various interests and institutions involved in environmental regulation and environmental jurisprudence. The growing power and jurisdiction of the NGT have resulted in concerns being expressed by the ministry, high courts and state governments[465]. The green tribunal has been allegedly blamed for overstepping its jurisdictions and taking actions for which it has not been empowered under the NGT Act.

5.4.6 There have been a number of times when questions were raised on NGT's decision by MoEF specifically. For instance, the NGT order in Kalpavriksh & Others vs. Union of India & Others, where it directed the ministry to review the qualifications of expert appraisal committee members who recommend environmental clearances for projects under the Environmental Impact Assessment Notification 2006, was heavily criticised by the ministry[466].

5.4.7 The High Court of Madras also expressed concerns regarding the use of the *suo motu* power by NGT, stating that "*There is no indication in the National Green Tribunal Act or the rules made thereunder with regard to the power of NGT to initiate suo motu proceedings against anyone, including statutory authorities*[467]."

5.4.8 Along with the criticisms, it has been noted that right from its inception phase the NGT has also faced administrative roadblocks, mostly related to capacity constraints and shortage of manpower, both technical and judicial[468]. The NGT Act contemplates 10 benches in five zones — northern, southern, central, eastern and western and mandates the appointment of a

462 https://greentribunal.gov.in/methodology-ngt

463 http://nopr.niscair.res.in/bitstream/123456789/34715/1/IJMS%2044%284%29%20445-453.pdf

464 https://link.springer.com/article/10.1007/s11356-018-1763-2

465 https://www.cambridge.org/core/journals/transnational-environmental-law/article/environmental-justice-in-india-the-national-green-tribunal-and-expert-members/2E26B50742FFB8BB743557132DC7DD66#fn59

466 http://www.penacclaims.com/wp-content/uploads/2018/09/Ashna-Kothiyal.pdf

467 https://timesofindia.indiatimes.com/city/chennai/green-tribunal-case-of-impractical-overreach/articleshow/46978175.cms

468 https://thewire.in/environment/nearly-a-decade-old-is-the-national-green-tribunal-losing-its-bite

chairman and 20 members — 10 judicial and 10 expert — who constitute the benches. However, according to a media report published in October 2020, the existing strength of the tribunal was 6 members and a chairperson[469]. In an article published in Down to Earth, September 2019, it was mentioned that "*in the last nine years, the NGT has never got the minimum strength of ten judicial and ten expert members to address the increasing number of environmental litigations across the country. Currently, with only four judicial and two expert members, the NGT appears paralysed*."[470]

5.4.9 Since NGT also aims to dispose of cases in six months, the lack of manpower and resources is one of the major hurdles that it faces, which leads to an increase in number of pending cases before the tribunal and also the green court has to rely on external assistance to gather evidence or monitor their orders either by appointing committees or experts[471].

5.4.10 The green court has been also questioned for the decline in the quality of its decisions as there have been reports that most cases were either dismissed on hyper-technical grounds or the NGT has refused to adjudicate on the merits of the case[472]. Experts have not also pointed out that often NGT's directions are not implemented but that the tribunal has no powers to follow-up, nor is there a mechanism for it to re-work its orders if found infeasible to implement[473]. On the same line, many experts believe that the role of has been limited NGT in our country and has less power and jurisdiction in comparison to similar bodies in other nations.[474]

5.4.11 The National Green Tribunal in its decade long time period has acted as an 'effective deterrent' in response to various violations of environmental laws but has also witnessed various challenges to its decisions, taking the matter to upper courts[475]. No doubt that the interventions by the green judiciary have turned out to be path-breaking in the environmental legal fraternity of the country but not all the judgments/decisions turned out to be effective as they should be due to various reasons such as limited defined powers, resource constraints, etc. Since the issue of environment, in general, is more serious, and to ensure efficient functioning of the green tribunal and for maintaining the balance between development, society and environment there is an urgent need to overcome challenges and constraints faced by the green tribunal.[476]

5.5 Executive Responsibility: Their Role and Functions

469 https://theprint.in/environment/ngt-needs-a-full-house-of-20-members-to-properly-function-but-has-been-running-on-just-6/534383/

470 https://www.downtoearth.org.in/blog/environment/whither-the-national-green-tribunal--66879

471 https://www.thehindu.com/news/cities/Delhi/ngts-new-approach-to-pending-cases-raises-eyebrows/article24787684.ece

472 The emasculation of NGT - The Hindu BusinessLine

473 Turning a decade-old, NGT faces some tough questions - The Hindu BusinessLine

474 Why National Green Tribunal is not as powerful as UK Environment Agency (downtoearth.org.in)

475 Justice D.Y. Chandrachud, *Indian Environmentalism*, International Journal of Environment, 2017.

476 https://www.thequint.com/voices/opinion/india-covid-pandemic-govt-vaccine-policy-mess-oxygen-crisis-bed-shortage-high-courts-supreme-court-intervention-accountability-of-executive#read-more

5.5.1 On the executive front, many initiatives over the last decades were introduced to prevent and control Delhi's pollution problem. Broadly the initiatives ranged from formulation and implementation of policies, laws, rules, schemes and norms to introducing the application of technologically advanced sectoral solutions such as switching to CNG vehicles especially in public transport, conversion of coal-based thermal plants into gas-based plants as well as institutional reforms and awareness building[477].

5.5.2 The concern related to the air pollution in Delhi is dated back to 1997, when the Environment Ministry released a White Paper on Delhi's air pollution, outlining the major sources, ministries' potential strengths to control emissions and proposed a multi-sectoral action plan for the next five years that was through 2002. Again in 2015, the Government of Delhi came up with a 42- point action plan to address all the known sources of air pollution in the city with a timeline that spread from 60 days to a year. By this time, the pollution had increased multifold and had become a public health issue[478].

5.5.3 It was in 1997 that the use of Compressed Natural Gas (CNG) was encouraged and most of the public transport was switched to CNG. Small industries and brick kilns were also relocated to the periphery of the city. While these initiatives did help in improving the air quality, they seem to have been ineffective in comparison to the growing number of sources of air pollution[479]. For instance, the benefits of switching to alternative fuels were outdone by the increase in the number of private vehicles on the streets, freight movement and construction material and debris by trucks and increasing demand for electricity leading to the use of in situ generator sets, and industrial growth[480].

5.5.1 The issue, as well as solutions identified by the government, have been almost the same from 1997 to 2015 such as improving public transportation, improving waste management efforts, addressing the problem of dust due to various activities, just that it has become more widespread and intense. Hence, the issue and the key solutions have been on the table for almost the last 20 years but the government has failed in terms of coming up with a proper framework to address the problem as well as lacking in implementation and proper monitoring of proposed solutions. A solution like the odd-even scheme is only effective for the short term and is merely a stop-gap solution. For a city like Delhi, the massive problem requires more permanent solutions with a strong institutional setup.

5.5.2 There are multiple holes in the functioning of concerned government departments in terms of accountability and coordination[481]. These gaps still exist despite the creation and institutionalisation of quasi-judicial authorities like the NGT, passing orders and judgements advancing environmental goals and interests. Also at many times, various such orders have been passed by NGT calling out the responsibility and need for accountability of government officials, whilst highlighting the lax attitude and inadequacy in the executive branch of the

[477] Rumi Aijaz, The Herculean Task of Improving Air Quality: The Case of Delhi and NCR, ORF Issue Brief, November 2018

[478] https://www.theguardian.com/cities/2017/feb/15/delhi-deadly-dust-how-construction-sites-choking-city

[479] Sarath Guttikunda, Air Pollution in Delhi. Economic & Political Weekly, 2012.

[480] *Ibid*

[481] *Ibid*

government. Despite such orders and directions, much has not changed. For instance, recently when the NGT summoned the Commissioner of the Brihanmumbai Municipal Corporation (BMC) over increasing pollution in water bodies, on appeal before the SC, the apex court's bench directed against NGT's order stating that officials should be given reasonable time to file compliance (especially in the backdrop of the workload during the covid-19 crisis).[482] However, this is not an isolated instance, and various times higher courts or government orders have facilitated government officials to escape from their responsibilities and accountability.

5.5.3 In January 2021, the Delhi government also came up with the Draft Master Plan - 2041, for the coming 20 years which will act as a "strategic and enabling framework to guide future growth of the city". While it has been highlighted in the document that poor quality of air in Delhi, NCR is one of the major concerns, but the problem has been accompanied with an explanation that a "*large fraction of air pollution in Delhi comes from outside its geographic boundaries, implying that regional level action would be necessary".* The plan did highlight that 45 per cent of pollution in Delhi NCR is due to dust and there is a need for dust management during construction and demolition activities, but has not suggested any specific plan to deal with the problem. The document also states that vehicular pollution is also a major contributor to air pollution and 20 per cent of air pollution in the city is from the transportation sector. To minimise vehicular emission detailed strategies for reducing the number of daily vehicular trips and encouraging the use of public transport and active travel modes have been proposed[483].

5.5.4 Even though the Draft Master Plan, 2041 recognises and highlights the menace of air pollution and the various contributors to the growing levels of the same, it still does not outline a concrete plan to address this problem. However, the draft plan was out in public and comments were invited by the state government. This is especially problematic given that the plan outlines a framework for the next 20 years, which is touted as the most important to control climate change and save the environment. This indicates a lack of complete and full understanding on the part of the government about the graveness of the problem of air pollution[484].

5.5.5 Another major point of concern is the government bodies set up to deal with pollution specific issues, such as pollution control boards, are quite ineffective. The Central and State Pollution Control Boards were set up to monitor and control the pollution in the states and the country. The boards are conferred with appropriate authority under various legislations to declare air pollution control areas, implement relevant dust regulations, inspect and/or restrict the use of specific industrial and manufacturing processes and formulate guidelines for dust mitigation measures[485]. Even municipal authorities have powers to regulate construction and its associated harmful activities. However, in both cases there is ineffective enforcement due to governance deficit.

---

[482] Supreme Court stays NGT action against BMC Commissioner (indialegallive.com)

[483] https://dda.org.in/pdf/july13/Final%20MPD%202041%20-%20e%20Gazette_%20English.pdf

[484] *Ibid*

[485] https://www.ceh.org.in/wp-content/uploads/2020/11/NAAQS-report_final_revised_22-10-20.pdf

5.5.6 There have been reports stating that Pollution Control Boards (PCBs) lack the manpower or expertise to actively maintain and calibrate their instruments. In 2020, it was also reported that these bodies have been facing an acute shortage of technical experts for a long. The regional offices usually have a handful of officials who are tasked with various responsibilities and conducting regular inspections at the industries and construction sites is pushed back in their list of priorities as that often requires them to travel to far-off places. This is also weakening their efforts to enforce air quality standards and monitor pollution[486]. Because of the shortage of manpower adequate number of inspections cannot be conducted in a timely manner[487]. The same was conveyed to the research team on the field by officials of different state government departments.

5.5.7 In this regard, recently NGT passed a judgement directing the Haryana State Pollution Control Board (HSPCB) to strengthen its capacity both in terms of human resources and technical equipment required. The judgement was passed in the case of *Shailesh Singh vs. State of Haryana & Ors.*, filed in 2018 for revising the existing inspection and monitoring mechanism by SPCBs[488].

5.5.8 The boards in the last decade have been successful in maintaining a proper database for Air Quality Index (AQI) and have a reliable pollution prediction system in place but the lack of capacity to effectively use data for compliance as well as the lack of coordination between various departments at the State and Central level often leave directives unimplemented[489].

6. A brief analysis of the select order

6.1 The order passed by the NGT in *Vardhman Kaushik vs. Union of India & Ors.* on 7th April 2015 addressed concerns related to the deteriorating ambient air quality in Delhi NCR. The order mentioned print media articles dated 6th April 2015 that highlighted concerns related to the increase in air pollution due to construction activities in Delhi-NCR. These articles were part of an investigative series launched by The Indian Express titled 'Death by Breath'[490], on air quality in Delhi. One of the articles[491], which has been specifically referred to by the NGT's order of 2015, highlights the worsening pollution levels in Delhi-NCR, with specific reference to construction sites on a 2-km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and on Golf Course Road, Gurgaon.

6.2 The articles stated that there was a continuous increase in the quantity of particulate matter in the air which led to serious health issues and breathing problems for residents of Delhi-NCR. The article pointed to the construction sites on the 2-km stretch stating that they

---

[486] https://www.timesnownews.com/india/article/pollution-boards-have-become-mere-advisory-bodies-report/679486

[487] https://www.ceh.org.in/wp-content/uploads/2020/11/NAAQS-report_final_revised_22-10-20.pdf

[488] How this landmark NGT order will shape the future of India's pollution control bodies (downtoearth.org.in)

[489] https://www.ijert.org/research/air-noise-control-and-analysis-in-construction-industry-IJERTV9IS010194.pdf

[490] 'Death by Breath: A look at key studies on Delhi's pollution and how warnings were ignored', The Indian Express, https://indianexpress.com/article/cities/delhi/death-by-breath-delhi-pollution/#:~:text=The%20Indian%20Express%20launched%20an,last%20year%20on%20March%2031.&text=Here%20are%20a%20few%20stories,and%20experts%20were%20acted%20upon.

[491] 'Death by Breath: Construction destruction', Pritha Chatterjee and Aniruddha Ghosal, The Indian Express, 6th April 2015, https://indianexpress.com/article/india/india-others/death-by-breath-construction-destruction/.

were blatantly violating the MoEF Guidelines 2010.[492] In addition to construction activities, the article cited vehicular emissions as one of the biggest contributors to the deteriorating air quality in Delhi-NCR.

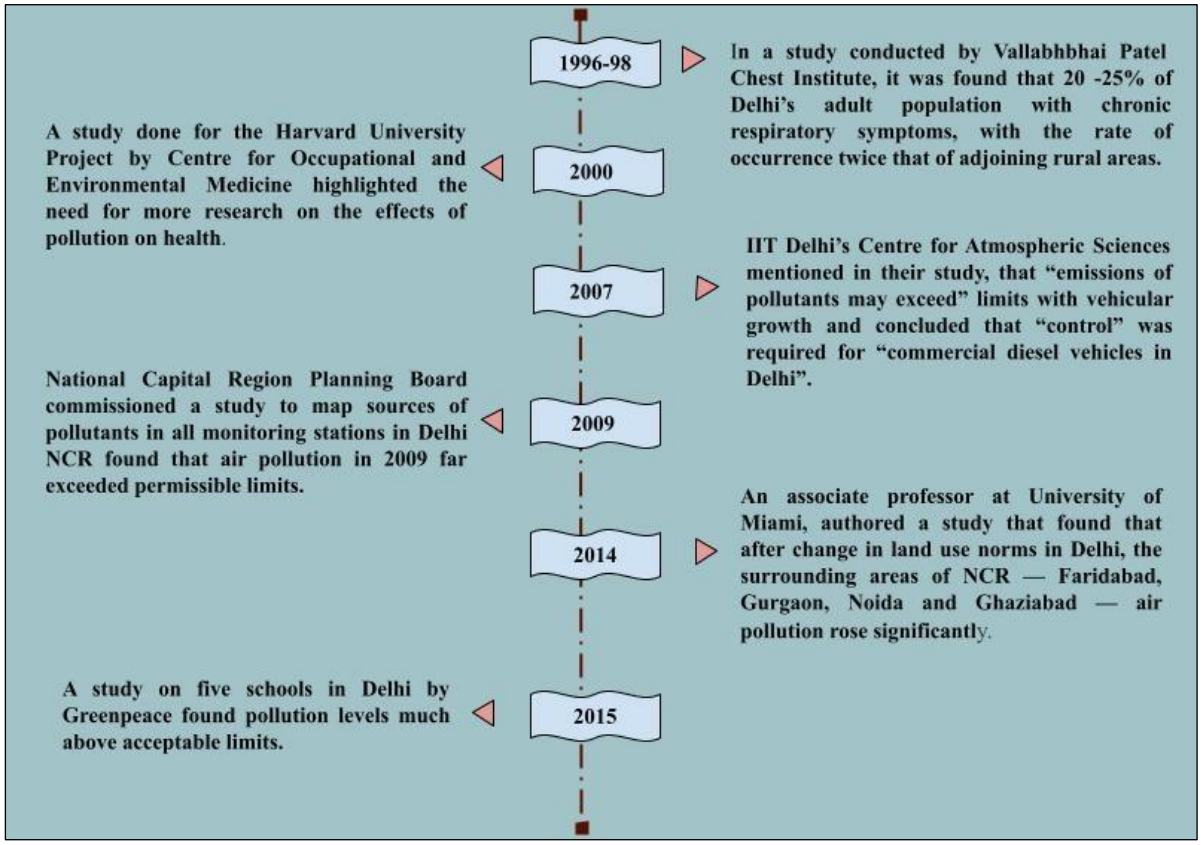
6.3 The NGT order dated 7th April 2015 mentions that these print media articles were based on scientific studies and were supported with data. The judgment stated that "*In the recent past the media particularly the print media has highlighted the adverse impact of deteriorating Ambient Air Quality in the NCR, Delhi and particularly Delhi city perse*. *The articles widely published are based on scientific studies and are well supported by data*." Under the investigative series, the Indian Express in April 2015 started with a series under which it published articles that exclusively covered the problem of air pollution in Delhi NCR. The first one in series titled '**Delhi Pollution: The Studies no one acted on'**, highlighted that since 1997 at least 15 key studies were conducted and published to mark out the growing air pollution in Delhi NCR and its impact, but none of them were followed up[493]. lists some of the studies undertaken from 1997-2015 that have highlighted the increasing concerns around the issue of air pollution in Delhi NCR mentioned in the article.

6.4 With this series, the articles tried to highlight the issues with different sources of pollution and one of them that was published on 6th April 2015, covered the adverse impact on the air quality of Noida and Gurgaon because of the construction activities taking place without following measures passed by the ministry and NGT. The same was cited by NGT in its order of 7th April 2015 and expresses concern about the deteriorating air quality of the region.

[492] 'Environmental Impact Assessment Guidance Manual for Building, Construction, Townships, and Area Development Projects', Ministry of Environment, Forest, and Climate Change, February 2010, https://www.dpcc.delhigovt.nic.in/uploads/sitedata/pdf/(3)building-construction_may-10.pdf.

[493] https://indianexpress.com/article/india/india-others/delhi-pollution-the-studies-no-one-acted-on/

Box 2: Lists of studies undertaken to highlight the impact of increasing air pollution in Delhi



The order also mentioned that despite high levels of pollution, no mitigating measures were undertaken by the contractors/builders at the construction sites. The construction activities were carried out in blatant violation of NGT's previous orders dated 26th November 2014 (related to dust emissions due to construction allied activities), 28th November 2014, 04th December 2014 (vehicular pollution) and the MoEF Guidelines 2010. In this context, referring to the print media articles, the NGT stated that, "*In these circumstances we hereby direct state of U.P., NOIDA and Greater NOIDA Authority, HUDA, State of Haryana and NCT, Delhi to immediately direct stoppage of construction activities of all the buildings shown in the report as well as at other sites wherever, construction is being carried on in violation to the direction of NGT as well as the MoEF guideline of 2010.*"

6.5 The MoEF Guidelines 2010 list certain directions to be followed while undertaking construction activities to ensure minimum levels of pollution. In 1994, the MoEF) made Environmental Clearance (EC) for certain developmental projects mandatory under the provisions of the Environment (Protection) Act, 1986. Before the '**EIA Guidance Manual – Building, Construction, Townships and Area Development**', there was a common manual for all the sectors prescribing the prior requirements to obtain clearances. The EIA guidance manual was drafted with the objective that it would help the project proponent/consultant in the preparation of the EIA report including conducting public hearings to gather information

about the related environmental concerns. Additionally, it will also help the regulatory authority to review the EIA report.[494]

6.6 In addition to directing development authorities to direct stoppage of construction activities, the order also directed them to submit a compliance report by 10th April 2015. The compliance report was with respect to both the order dated 7th April 2015 along with a compilation of all original records showing actions that were taken by all or any of the directed government authorities or State governments for compliance with the directions that were issued by the Tribunal so far.

6.7 However, the order dated 10th April 2015 did not mention or speak about the submission or lack of the same of the compliance reports as directed under the previous order. The 10th April 2015 order laid down additional directions to be followed by builders/contractors responsible for undertaking construction activities. There were in total 17 directions that mainly ranged from directing builders to mandatorily put tarpaulin at construction sites; no storage of any construction materials on any part of the streets or roads; all the workers should use masks while working on sites, among others. The NGT also directed all authorities to issue notices to all builders that they should strictly adhere to and comply with the directions contained in this order along with the MoEF Guidelines of 2010. The last direction in the list of 17 by the Tribunal was again towards the development authorities, pollution control boards and state governments directing them to ensure complete and expeditious compliance of all other directions mentioned with immediate effect.

6.8 While highlighting the main causes of the increasing levels of pollution in Delhi-NCR, the NGT's order of 10th April 2015, notes that 'development in all fields is an essential feature of a developing country and therefore a balance in terms of environment and economic gains should be maintained. The order states that the **NGT is not oblivious to the difficulties that may come in the way of bonafide purchasers and builders from the restraining orders. But it is not only legal but even a social and corporate responsibility of the builders to carry on construction activities strictly in accordance with the prescribed rules**. The judgment also explained that builders or contractors should not put public health at stake and the same is quoted from the judgment, "*They must ensure that for small economic gains they do not expose the public including their purchasers and workers to serious diseases and adversely affecting the public health at large. The constitutional right to life, decent and clean environment has to take precedence over the right of an individual to carry on business activity*."

6.9 What is important to note is that the right of an individual to carry on business activity is equally important to enable them to enjoy and exercise their right to life to the fullest – an aspect which, more often than not, is ignored. The right to life also includes the right to a 'decent' life, one that cannot be envisioned without basic opportunities for economic activity enabling individuals to earn their livelihood. The right to health and education mandate monetary transactions, which for people without jobs, becomes difficult. Thus, as important

[494] Environmental Impact Assessment Guidance Manual, 2010 http://www.naredco.in/pdfs/Environmental%20Impact%20Assessment%20Guidance%20Manual.pdf

and critical as the right to life is, so is the right to carry on business, the right to earn, and the right to have a decent livelihood.

7. Findings

7.1 The team visited Delhi NCR for data collection for the case and met a number of different categories of stakeholders ranging from the Development Authorities [NOIDA and Haryana Shehri Vikas Pradhikaran (earlier known as HUDA)], Pollution Control Boards (UP and Haryana), Real Estate Companies, Labour Associations, and Homebuyer's Associations. While on the field the team also visited the 2.00 km patch in NOIDA for which the orders were passed by NGT. The two locations that are Charmurti Chowk and Golf Course Road, Gurgaon have been marked on the map below.

Figure 50:Map showing the two locations mentioned in the order

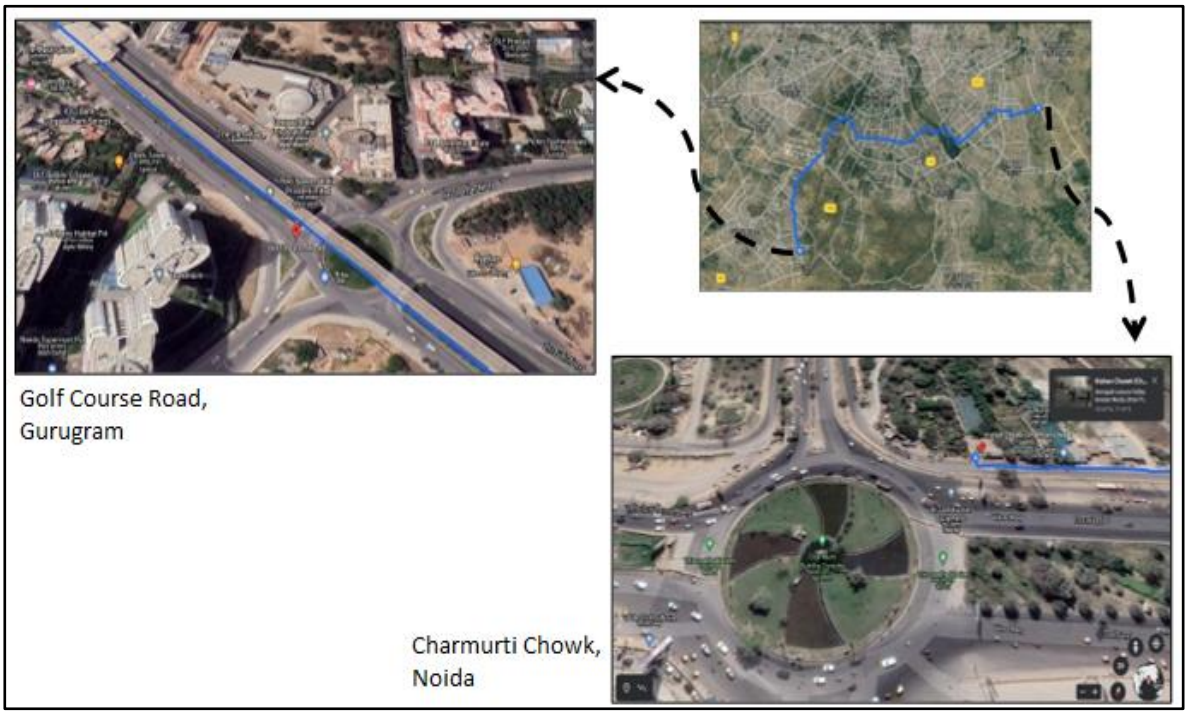
Source: Google Maps

7.2 It was difficult to locate the patch as the location points mentioned in the judgment "**construction activities have been referred to that of 2 km stretch from NH-24 to Charmurti Chowk in NOIDA Extension and Golf Course road, Gurgaon**"[495] were quite ambiguous and unclear. It was also not mentioned clearly that there were two separate patches located at different locations and the starting and endpoints from where the 2km should be measured was also not clearly explained. While one of the stakeholders from the real estate sector did mention that the newspaper cited the wrong location for the Gurgaon region and gave two reasons for that, the picture printed in the article showing dust at the construction sites (also cited in the judgment) was from a different location than mentioned in the order which did not have any active construction sites at that time. Secondly, on the same day, there

[495] 7/04/2015 Vardhman Kaushik vs. Union of India, NGT. https://greentribunal.gov.in/gen_pdf_test.php?filepath=L25ndF9kb2N1bWVudHMvbmd0L2Nhc2Vkb2Mvb3JkZXJzL0RFTEhJLzIwMTUtMDQtMDcvY291cnRzLzEvZGFpbHkvMTU5MjIxMTc5MjIwMzk1NzI3NzE1ZWU3Mzk1MGVjOThhLnBkZg==

was a dust storm in the city which could have impacted the suspended particulate matter in the air. The person also acknowledged that the stretch mentioned in the judgment i.e., 'NH-24 to Charmurti Chowk in NOIDA Extension and Golf Course Road, Gurgaon' can in no way be justified as a '2-km' stretch, given that two regions Noida and Gurgaon (now referred as Gurugram) are located on opposite sides of Delhi (which is located in between Noida and Gurgaon). This was also corroborated by stakeholders including real estate companies and associations. The google earth image of both the locations has been placed below in figure 5.

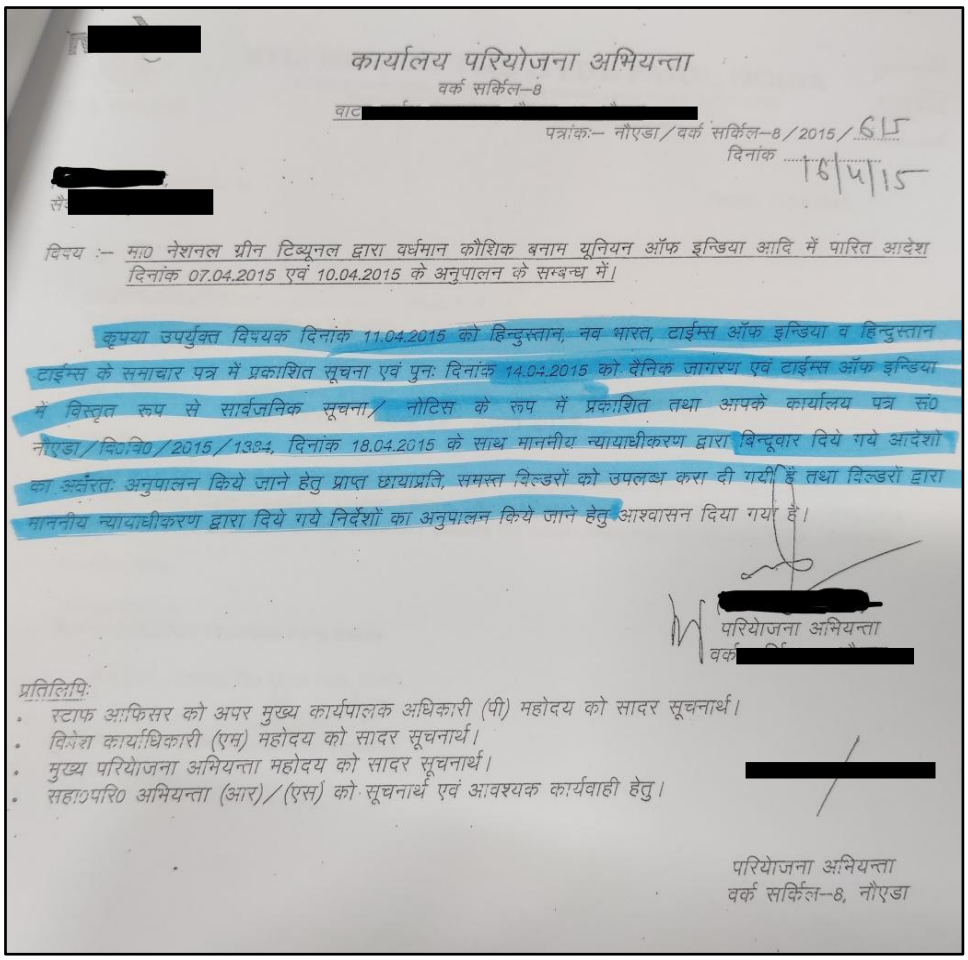
Figure 51: Google images of the two locations mentioned in the order



Source: Google Earth

7.3 From a review of select documents made available to the team by NOIDA staff during the field visit, it appears that the NOIDA implemented both NGT's orders dated 7th April 2015 and 10th April 2015 together. A public notice (notification of which has been attached below in fig.6) in various newspapers (English and Hindi) and on its official website was issued on 11th April 2015, informing all builders/contractors/real estate companies who were responsible for the construction activities taking place in Greater Noida and Noida to comply with the directions laid down by the NGT in its orders dated 7th April and 10th April 2015. A similar public notice (figure 6) was issued again on 14th April 2015.

Figure 52: Notification of Public Notice Issued in various newspapers by NOIDA



कार्यालय परियोजना अभियन्ता
वर्क सर्किल–8

पत्रांकः– नौएडा/वर्क सर्किल–8/2015/615
दिनांक 16/4/15

विषय :– मा0 नेशनल ग्रीन टिब्यूनल द्वारा वर्धमान कौशिक बनाम यूनियन ऑफ इन्डिया आदि में पारित आदेश दिनांक 07.04.2015 एवं 10.04.2015 के अनुपालन के सम्बन्ध में।

कृपया उपर्युक्त विषयक दिनांक 11.04.2015 को हिन्दुस्तान, नव भारत, टाईम्स ऑफ इन्डिया व हिन्दुस्तान टाईम्स के समाचार पत्र में प्रकाशित सूचना एवं पुनः दिनांक 14.04.2015 को दैनिक जागरण एवं टाईम्स ऑफ इन्डिया में विस्तृत रूप से सार्वजनिक सूचना/ नोटिस के रूप में प्रकाशित तथा आपके कार्यालय पत्र सं0 नौएडा/बि0वि0/2015/1384, दिनांक 18.04.2015 के साथ माननीय न्यायाधीकरण द्वारा बिन्दूवार दिये गये आदेशों का अक्षरतः अनुपालन किये जाने हेतु प्राप्त छायाप्रति, समस्त बिल्डरों को उपलब्ध करा दी गयी हैं तथा बिल्डरों द्वारा माननीय न्यायाधीकरण द्वारा दिये गये निर्देशों का अनुपालन किये जाने हेतु आश्वासन दिया गया है।

परियोजना अभियन्ता

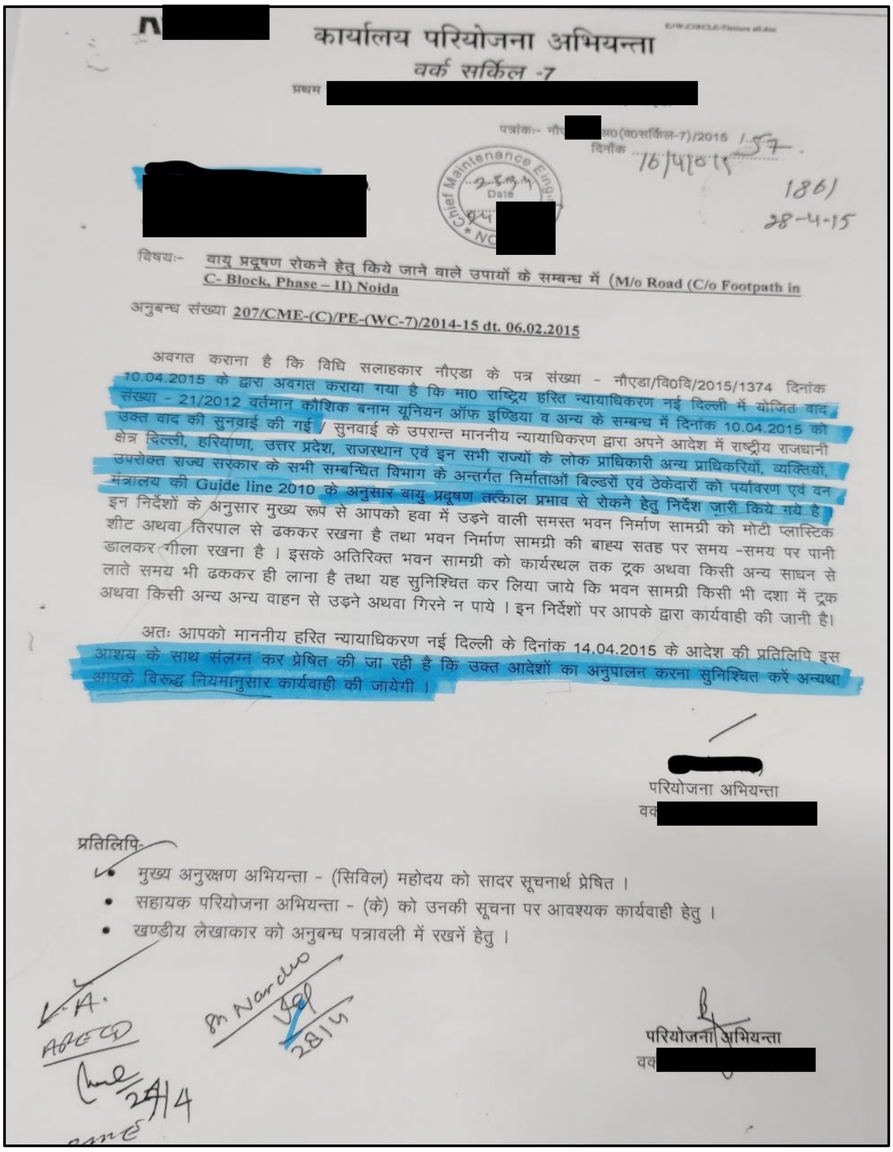
प्रतिलिपिः
- स्टाफ आफिसर को अपर मुख्य कार्यपालक अधिकारी (पी) महोदय को सादर सूचनार्थ।
- विशेष कार्याधिकारी (एम) महोदय को सादर सूचनार्थ।
- मुख्य परियोजना अभियन्ता महोदय को सादर सूचनार्थ।
- सहा0परि0 अभियन्ता (आर)/(एस) को सूचनार्थ एवं आवश्यक कार्यवाही हेतु।

परियोजना अभियन्ता
वर्क सर्किल–8, नौएडा

Source: Data collected through stakeholder interaction in the field

7.4 The NOIDA even issued individual notices (attached below as fig.7) to the builders/constructors/real estate companies (builders) responsible for any construction activities instructing them to ensure compliance with the directions issued in the NGTs order dated 10th April 2015 and the MoEF Guidelines 2010. The notices explained broad steps expected from the builders and pointed out that non-compliance will result in appropriate actions such as stopping of construction activities. Interestingly, it appears that an additional set of notices were issued to builders referring to both NGTs orders dated 7th and 10th April 2015 (however, only the order dated 10th April 2015 was annexed to such notices) and directing the builders to ensure compliance with immediate effect.

Figure 53: Individual Notice issued to the contractor by NOIDA


N[redacted]

कार्यालय परियोजना अभियन्ता

वर्क सर्किल -7

प्रथम [redacted]

पत्रांकः- नौए[redacted]प्र0(व0सर्किल-7)/2015 / 57

दिनांक 16/4/015

[redacted]

विषयः- वायु प्रदूषण रोकने हेतु किये जाने वाले उपायों के सम्बन्ध में (M/o Road (C/o Footpath in C- Block, Phase – II) Noida

अनुबन्ध संख्या 207/CME-(C)/PE-(WC-7)/2014-15 dt. 06.02.2015

अवगत कराना है कि विधि सलाहकार नौएडा के पत्र संख्या - नौएडा/वि0वि/2015/1374 दिनांक 10.04.2015 के द्वारा अवगत कराया गया है कि मा0 राष्ट्रिय हरित न्यायाधिकरण नई दिल्ली में योजित वाद संख्या - 21/2012 वर्तमान कौशिक बनाम यूनियन ऑफ इण्डिया व अन्य के सम्बन्ध में दिनांक 10.04.2015 को उक्त वाद की सुनवाई की गई / सुनवाई के उपरान्त माननीय न्यायाधिकरण द्वारा अपने आदेश में राष्ट्रीय राजधानी क्षेत्र दिल्ली, हरियाणा, उत्तर प्रदेश, राजस्थान एवं इन सभी राज्यों के लोक प्राधिकारी अन्य प्राधिकरियों, व्यक्तियों, उपरोक्त राज्य सरकार के सभी सम्बन्धित विभाग के अन्तर्गत निर्माताओं बिल्डरों एवं ठेकेदारों को पर्यावरण एवं वन मंत्रालय की Guide line 2010 के अनुसार वायु प्रदूषण तत्काल प्रभाव से रोकने हेतु निर्देश जारी किये गये है। इन निर्देशों के अनुसार मुख्य रूप से आपको हवा में उड़ने वाली समस्त भवन निर्माण सामग्री को मोटी प्लास्टिक शीट अथवा तिरपाल से ढककर रखना है तथा भवन निर्माण सामग्री की बाह्य सतह पर समय -समय पर पानी डालकर गीला रखना है । इसके अतिरिक्त भवन सामग्री को कार्यस्थल तक ट्रक अथवा किसी अन्य साधन से लाते समय भी ढककर ही लाना है तथा यह सुनिश्चित कर लिया जाये कि भवन सामग्री किसी भी दशा में ट्रक अथवा किसी अन्य अन्य वाहन से उड़ने अथवा गिरने न पाये । इन निर्देशों पर आपके द्वारा कार्यवाही की जानी है।

अतः आपको माननीय हरित न्यायाधिकरण नई दिल्ली के दिनांक 14.04.2015 के आदेश की प्रतिलिपि इस आशय के साथ संलग्न कर प्रेषित की जा रही है कि उक्त आदेशों का अनुपालन करना सुनिश्चित करें अन्यथा आपके विरूद्ध नियमानुसार कार्यवाही की जायेगी ।

[redacted]

परियोजना अभियन्ता

वर्क[redacted]

प्रतिलिपि-

- मुख्य अनुरक्षण अभियन्ता - (सिविल) महोदय को सादर सूचनार्थ प्रेषित ।
- सहायक परियोजना अभियन्ता - (के) को उनकी सूचना पर आवश्यक कार्यवाही हेतु ।
- खण्डीय लेखाकार को अनुबन्ध पत्रावली में रखनें हेतु ।

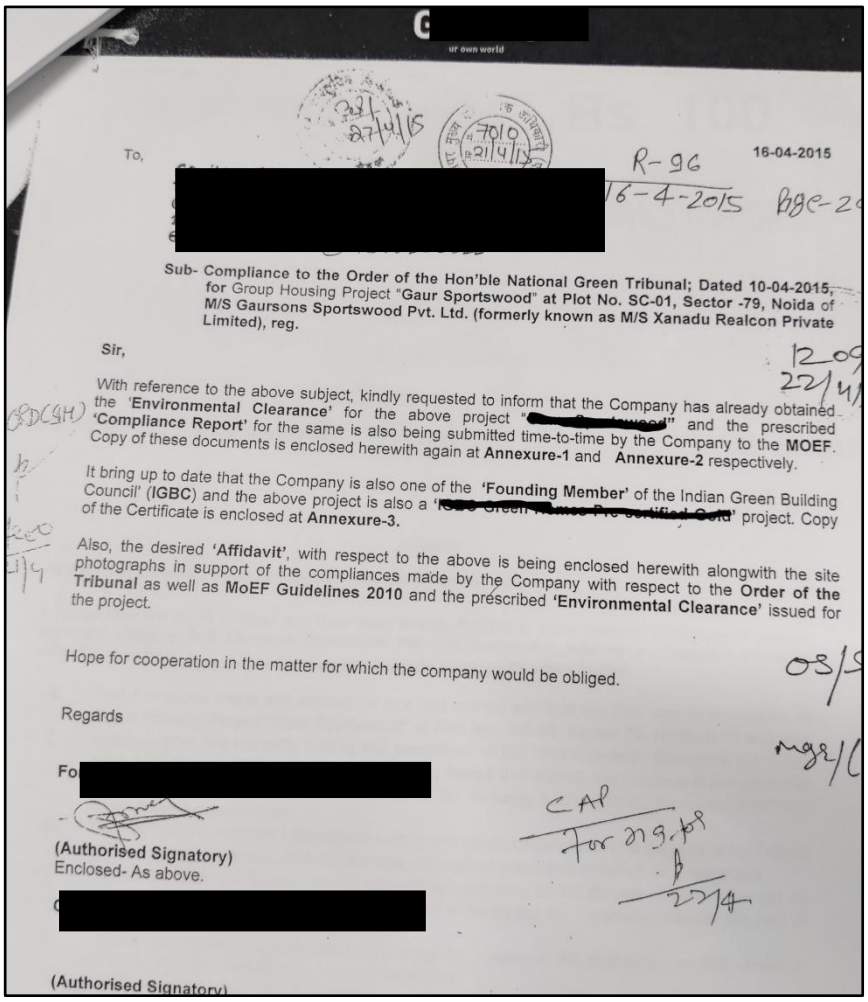
परियोजना अभियन्ता

वर्क[redacted]

Source: Data collected through stakeholder interaction in the field

7.5 From an internal communication within NOIDA, that was accessed by the team, it was understood that NOIDA was expecting that companies would ensure compliance (and will continue to comply) with directions issued under the notice regarding the NGT order dated 10th April 2015, and would submit an affidavit to NOIDA in this regard. The communication indicates that 83 companies had submitted affidavits to NOIDA indicating compliance. The team was also able to access some of these affidavits (attached below as fig.8) and was also given to understand that some companies even submitted photographs showing that NGT orders and MoEF Guidelines 2010 were being followed while undertaking construction activities. As reported by the officials, based on the affidavits and documents submitted by the contractors and builders compliance reported was submitted to NGT.

Figure 54: Affidavit submitted by one of the real estate companies to NOIDA



G [redacted]
ur own world

To,
[redacted]

16-04-2015

Sub- Compliance to the Order of the Hon'ble National Green Tribunal; Dated 10-04-2015, for Group Housing Project "Gaur Sportswood" at Plot No. SC-01, Sector -79, Noida of M/S Gaursons Sportswood Pvt. Ltd. (formerly known as M/S Xanadu Realcon Private Limited), reg.

Sir,

With reference to the above subject, kindly requested to inform that the Company has already obtained the **'Environmental Clearance'** for the above project "[redacted]" and the prescribed **'Compliance Report'** for the same is also being submitted time-to-time by the Company to the **MOEF**. Copy of these documents is enclosed herewith again at **Annexure-1** and **Annexure-2** respectively.

It bring up to date that the Company is also one of the **'Founding Member'** of the Indian Green Building Council' (**IGBC**) and the above project is also a '[redacted]' project. Copy of the Certificate is enclosed at **Annexure-3.**

Also, the desired **'Affidavit'**, with respect to the above is being enclosed herewith alongwith the site photographs in support of the compliances made by the Company with respect to the **Order of the Tribunal** as well as **MoEF Guidelines 2010** and the prescribed **'Environmental Clearance'** issued for the project.

Hope for cooperation in the matter for which the company would be obliged.

Regards

Fo[redacted]

(Authorised Signatory)
Enclosed- As above.

[redacted]

(Authorised Signatory)

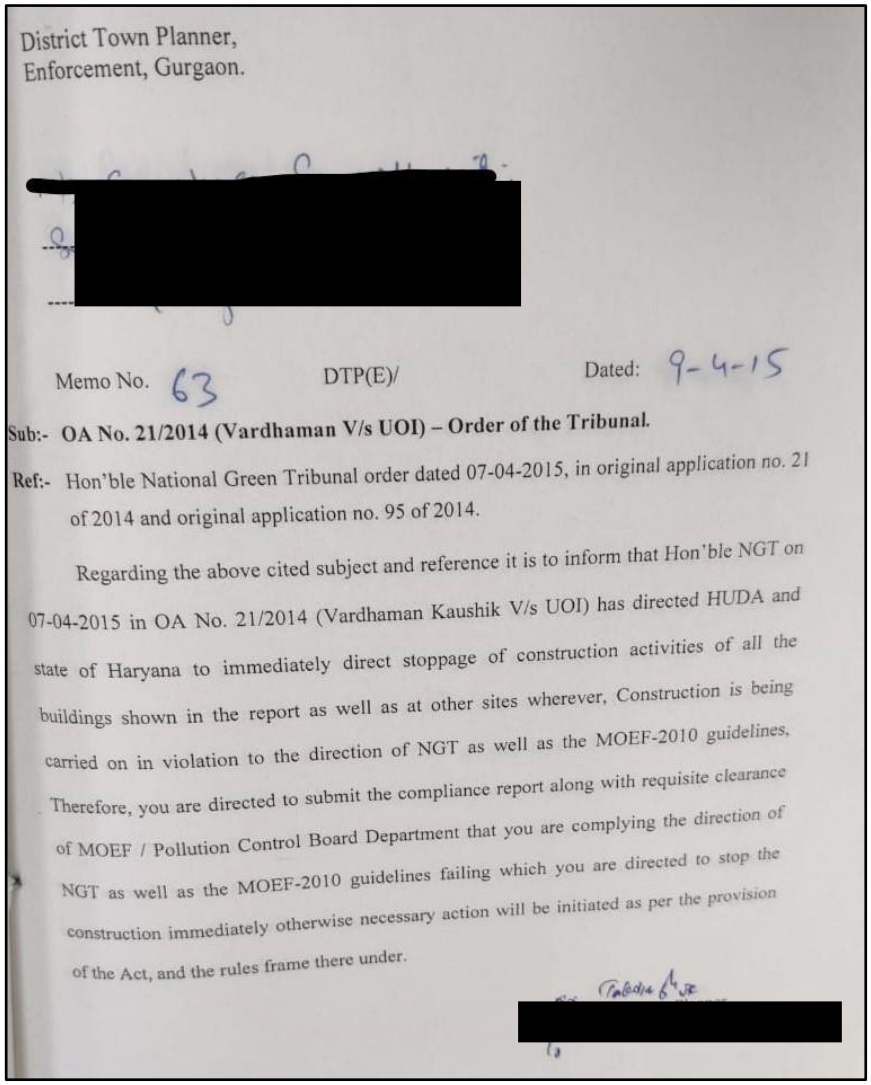
Source: Data collected through stakeholder interaction in the field

7.6 The team queried about the implementation of NGT's order of 7th April 2015 at Haryana Sehari Vikas Pradhan (HSVP), Gurgaon Office. While the Officer on Duty tried to find out from different divisions how the authority implemented this particular order but almost everyone contacted could not recall such notices or particular information concerning the order as most of them were not posted at their current positions and offices in 2015.

7.7 The authorities at the Town and Planning department, HSVP were able to recall the case and had access to the documents related to it. The authorities recollected that they had sent certain show cause notices to companies in 2015 which had project sites at Golf Course Road, Gurgaon, and talked about the implementation procedure, which was similar to that informed by NOIDA. They also mentioned that NGT's orders in such cases are implemented following the principles of "natural justice", and thus they have never directly given an order to any company/construction site for stopping construction work. A set procedure is always followed - a show cause notice is issued, asking the companies to submit compliance reports, failing which they will be directed to stop construction work. In section 19 of the NGT Act, it has been stated that the procedures of the tribunal would be guided by the principle of natural

justice also it has the power to regulate its procedure and power to receive evidence on affidavits.[496] Once they do receive compliance reports, officers from the development authorities go for site inspections, after which they decide whether to let things continue as is, impose fines, or direct stoppage. As informed by the authorities, they had sent show-cause notices to close to 20 companies, almost all of whom submitted compliance reports. The below-attached figure 9 is a copy of the notice issued by the HSVP to one of the real estate companies of Gurgaon.

Figure 55: Notice Issued by HSVP to builders



District Town Planner,
Enforcement, Gurgaon.

[redacted]

Memo No. 63 DTP(E)/ Dated: 9-4-15

Sub:- OA No. 21/2014 (Vardhaman V/s UOI) – Order of the Tribunal.

Ref:- Hon'ble National Green Tribunal order dated 07-04-2015, in original application no. 21 of 2014 and original application no. 95 of 2014.

Regarding the above cited subject and reference it is to inform that Hon'ble NGT on 07-04-2015 in OA No. 21/2014 (Vardhaman Kaushik V/s UOI) has directed HUDA and state of Haryana to immediately direct stoppage of construction activities of all the buildings shown in the report as well as at other sites wherever, Construction is being carried on in violation to the direction of NGT as well as the MOEF-2010 guidelines. Therefore, you are directed to submit the compliance report along with requisite clearance of MOEF / Pollution Control Board Department that you are complying the direction of NGT as well as the MOEF-2010 guidelines failing which you are directed to stop the construction immediately otherwise necessary action will be initiated as per the provision of the Act, and the rules frame there under.

[redacted]

Source: Data collected through stakeholder interaction in the field

7.8 During the meetings with the Pollution Control Board, the concerned official also acknowledged the same procedure and informed that the PCB also issues show-cause notices in response to such orders by NGT as they are being guided by the principle of natural justice. The procedure is similar to that of development authorities as per section 19 of the NGT Act 2010. We were also given to understand from the stakeholder consultations that development

[496] The NGT Act, 2010 https://greentribunal.gov.in/sites/default/files/act_rules/National_Green_Tribunal_Act,_2010.pdf

authorities and pollution control boards conducted inspections at select locations to verify compliance claims made by the companies. The authorities did acknowledge that due to capacity and resource constraints they can't inspect each and every site.

7.9 Two of the real estate companies and the real estate associations that the team met also mentioned that this indeed was the procedure followed in response to NGT's order. They had also submitted an affidavit to the development authority stating that the construction activities at their project sites were carried out in compliance with all previous orders by the NGT and the MoEF Guidelines 2010.

7.10 Given the above process, it appears that the development authorities did not direct stoppage of construction activities and the procedure for implementation and compliance by these authorities does not go against the NGT order. They simply follow certain procedural guidelines as explained above guided by the principle of natural justice. This was validated during interactions of the team on-field with government officials from the development authorities - NOIDA and HSVP and the Pollution Control Boards - Uttar Pradesh Pollution Control Board (UPPCB) and Haryana Pollution Control Board (HPCB), along with real estate associations, and other stakeholders. The HSPCB did report that a compiled report was submitted by them to Central Pollution Control Board (CPCB) based on the compliance reports received from the contactors and builders and the inspection of the sites conducted by them.

7.11 It can be concluded from the findings that the NGT did try to address the problem by passing orders which were diligently implemented by the concerned authorities in accordance with laid down procedure. The notices were issued by development authorities and compliance certificates were submitted by contractors and real estate companies. Since there were large numbers of construction sites, with their available resources the authorities did inspect some of them randomly and were satisfied. Hence, there was no stoppage of any of the construction activities in both regions.

7.12 The procedure highlights that there exist loopholes in set procedures and system owing to various reasons such as capacity and expertise constraints, etc. because of which both the judiciary and the executive fail to achieve the objective which it intended to with their efforts and thus needs to revisit the measures and procedures adopted in order to its goal.

7.13 Impact on Stakeholders

While interacting with non-government entities like Real Estate Associations, Homeowner's Associations, and Labour Associations, we were able to gauge the general impact of the stoppage of construction activities that have become routine recently. Since 2017, there have been continuous orders by the NGT/Supreme Court to stop construction activities every year during October-November to curb air pollution. While we intended to analyse the economic impact of the 7th April 2015 order by NGT on stakeholders, the same was not possible as the order was implemented following due process and hence there was no stoppage of construction activities. Moreover, considering that the order being studied from 2015, it was also observed that various stakeholders experienced the recall bias, i.e. they were able to share impacts faced because of orders in which construction activities were stopped post 2015.

a. Real Estate Companies

7.13.1 The real estate sector is one of the categories that faces the first-hand effects of the stoppage of the construction activities which trickles down to labourers working on the site as well as homebuyers who invested their hard-earned money for their dream of having 'their own home'. However, the real-estate companies and contractors can pass on their losses to a certain extent to these two categories of stakeholders. Thus the orders by courts not only impact them but further boil down to workers and homebuyers which leads to disruption in the supply chain, loss of livelihoods, and increases unemployment.

7.13.2 As informed by one of the real estate companies on the field, for instance, an order by the judiciary of 15 days stoppage of construction activities leads to a delay of at least three months for real estate companies due to various reasons such as movement of labourers, rearranging equipment and machineries, etc[497] requires certain of time and capital. The stoppage of work impacts the projects that are near completion the most since these are the projects that have soaked in major investment and are near to possession and final payments. A particular case cited was from 2019, when an interim order in November to stop construction activities in Delhi NCR for 05 days was given by Supreme Court, which got extended till February 2020[498]. Due to uncertainty many of the daily wage workers moved to other places in search of work as a result of reverse migration[499] and thus when the sites reopened it took a long time for contractors and developers to bring the labourers back, as either most of them had engaged themselves with other work or had moved back to their native places.

7.13.3 According to an analysis conducted by ANAROCK Property Consultants in 2020, the average completion time for both small and large residential projects is the highest in Delhi-NCR among all cities for projects launched and completed between 2010 and 2020. The average time taken for smaller projects (100-500 units each) to complete in Delhi was approximately 1.7 years more than southern region, while for larger projects (>500 units each) it was estimated almost 1.3 years more in comparison to the south[500].

7.13.4 Another problem mentioned by the companies was sunk costs related to construction stoppages. Companies usually hire non-permanent employees based on requirements varying from project to project that include labourers, technicians, supervisors. They also rent equipment and construction materials. The orders passed by Judiciary do not come along with a fixed time period and are increased in intervals, hence creating losses and sunk costs in terms

497 https://economictimes.indiatimes.com/industry/services/property-/-cstruction/construction-ban-may-delay-delhi-ncr-projects/articleshow/72000373.cms?from=mdr

498 https://www.hindustantimes.com/india-news/ban-on-overnight-construction-in-delhi-ncr-lifted-rules-supreme-court/story-4xztBJVEX3fOLNZuBKUnpN.html#:~:text=The%20court%20had%20imposed%20a,and%20around%20the%20national%20capital.&text=The%20Supreme%20Court%20on%20Friday,construction%20activities%20in%20Delhi%2DNCR.

499 https://www.news18.com/news/india/how-delhis-pollution-is-giving-birth-to-reverse-migration-and-joblessness-2004467.html

500 https://economictimes.indiatimes.com/industry/services/property-/-cstruction/construction-ban-will-derail-recovery-of-real-estate-sector-say-developers/articleshow/79173983.cms?from=mdr

of salaries, rents and advance payments made for the materials by the companies. The reorganising of labourers, rearranging the machineries and purchasing of raw materials leads to delay in projects as well as puts a financial burden on builders and contractors[501].

b. Homeowners/Buyers of Commercial Properties

7.13.5 A delay in the completion of projects is passed on and has a direct impact on homeowners, as there are various added costs for them. During the field visits our interaction with a homeowner's association brought out certain nuances and highlighted the impacts on them due to the stoppage of construction activities. For instance, many homebuyers might be living on rent, which they continue to pay for the duration of delay as well, despite having paid a booking advance and few instalments as well for a house in the project scheme.

7.13.6 Another aspect that came to the fore was that even though builders and developers face hardships, the losses they incur are easily passed on to the homeowners in many cases, in terms of an increase in price after the construction work restarts delaying the handing over the possession of the property which places a burden over the homebuyers. On such cases home buyers get their arms twisted on some vague clauses in their purchase agreements with the builders.

7.13.7 During on-field discussions with a homebuyer's association, we were informed that there are a number of projects that have been delayed due to the recurrent construction stoppage orders related to pollution during the last 2-3 years. This has led to delay in gaining possession by homebuyers by almost 5 years. In 2016, the government came up with the Real Estate Regulation and Development Act (RERA) for the protection of interest of buyers and one of the important provisions under the act is that in case of delay in possession of the property, the sellers need to pay interest to buyers for the delayed time period[502]. This provision had not been quite effective as the interest paid by sellers is very low[503]. The box below has the story from the field.

[501] https://economictimes.indiatimes.com/industry/services/property-/-cstruction/construction-ban-may-delay-delhi-ncr-projects/articleshow/72000373.cms?from=mdr

[502] https://www.financialexpress.com/money/rera-protects-interests-of-homebuyers-know-its-benefits/2270545/

[503] https://economictimes.indiatimes.com/wealth/personal-finance-news/1-year-of-rera-not-much-has-changed-for-the-homebuyer/articleshow/63939353.cms?from=mdr

Box 3: Story of homebuyer of Greater Noida impacted due to stoppage of construction activities

During the field visit we spoke with a resident of Greater Noida, West who booked a 3BHK flat in 2011 in the Radicon Vedantam housing project. The person was to gain possession of the flat by 2014. To cover up the cost of flat he took out a loan at 9% annual interest rate. Due to various reasons the construction activities in Delhi NCR were stopped a number of times. This led to delay in project completion because of which the financial burden on the person increased. The possession for the property was handed over to him in 2019. The added burden to his expenses was in terms of additional rent (paid for his existing flat) and increased stamp duty. He had to continue paying the rent along with a 10 per cent annual increase in the same; this also impacted the instalments that he was supposed to pay to the bank for loan repayment. An added cost was also incurred in terms of increase in stamp duty as from 2014 to 2019 there was increase in stamp duties by 2-3 per cent.

c. Labourers

7.13.8 Another set of stakeholders that get directly impacted by such orders are labourers on construction sites. The labourers working at the construction sites in Delhi are migrants that have moved from different parts of the country to earn livelihood for themselves and their families. Since it was difficult to find the labourers that worked on the sites of the mentioned patch at the time the order was passed, the team interacted with labourers on another construction site in Delhi. These labourers had been in the city for the last 5-6 years and had faced the impacts due to orders for the stoppage of construction activities.

7.13.9 One of the major problems faced by the labourers is that their livelihood runs on daily wages and the stoppage of work impacts life-sustaining needs such as daily food and other necessities. Also for most of them, the project site serves as a shelter and hence shutting down of the construction site for an uncertain time period forces them to move to other places. It is also not easy for them to migrate to other states to look for work as for most of them their daily earnings range from Rs 250-300. With their hand-to-mouth existence, it becomes difficult to migrate to other places as it involves costs towards travelling and accommodation. With the given wages, they are hardly able to meet their basic needs (two square meals a day) and thus stoppage of construction for one day also deeply impacts them[504].

7.14 Causal Loop Diagram: Lack of co-ordination between the Executive and Judiciary

7.14.1 Based on the literature review and the data collected from the field and stakeholder interactions, the below figure represents a causal loop diagram that explains the role of different

[504] https://www.news18.com/news/india/how-delhis-pollution-is-giving-birth-to-reverse-migration-and-joblessness-2004467.html

factors that go directly or indirectly into the process of increasing pollution and thus diluting the effects of a number of initiatives taken by the government.

7.14.2 The diagram below (fig. 10) explains that it is not only the Judiciary that is responsible for the decisions taken but there exists number of factors forming a causal loop that comes into the picture impacting the decision. The loop shows that it is the responsibility of both the executive and the judiciary to abide by their roles and functions to address a social concern. The lack of coordination between two bodies at multiple levels has resulted in the failure in addressing the problem of increasing air pollution in Delhi NCR.

7.14.3 The problem of increasing air pollution in Delhi is something that has grown over the decades and had become more intense now. At some point or another the administration have failed at their level in the process of making effective rules, ensuring their proper implementation, and monitoring and thus the matters reach the judiciary. **Due to constraints faced in terms of capacity, resources and expertise**[505] by different concerned government departments, they are not able to come up with frameworks that would consist of effective measures and the proper system that would ensure the compliance of the guidelines and regulations passed. Also, for most of the cases, no strict actions were taken against the government authorities for their casual attitude and failure in ensuring compliance of orders and directions by the NGT and the ministry, despite highlighting failure in ensuring compliance of its order on number of occasions.

7.14.4 While the increasing population and boom of infrastructure in Delhi have been the reason due to which air pollution increased, this should have been handled by the governments at the right time i.e. ex ante, and not when the air in Delhi NCR became 'unbreathable'. The executive bodies and the judiciary tried to address the issue by adopting emergency ex post measures but they were not effective for long-term, due to which the problem multiplied.

7.14.5 During the last few years, with a plea to a**ddress the environmental concerns and health hazards due to pollution**, there has been an increase in the number of Public Interest Litigation (PILs) filed with NGT by various activists and lawyers owing to health hazards due to increase in the levels of pollutants. **Due to the time and capacity constraints that have been highlighted by a number of NGT judges and members,** it had failed to consult experts or to conduct a proper analysis of the issue and thus relied on external reports either by the government departments or conducted by media houses or civil society to pass the Judgement.[506]

7.14.6 In the case of Delhi pollution, there are various other causes of the pollution in the city which have been addressed by passing strict laws, adopting different approaches specially to reduce pollution due to vehicular emissions, industrial emissions and dust emissions due to various activities. But, the issue of pollution due to construction activities has been addressed

[505] https://theswaddle.com/indias-pollution-regulators-are-ineffective-due-to-a-lack-of-expertise-resources-report/

[506] https://www.downtoearth.org.in/blog/environment/whither-the-national-green-tribunal--66879

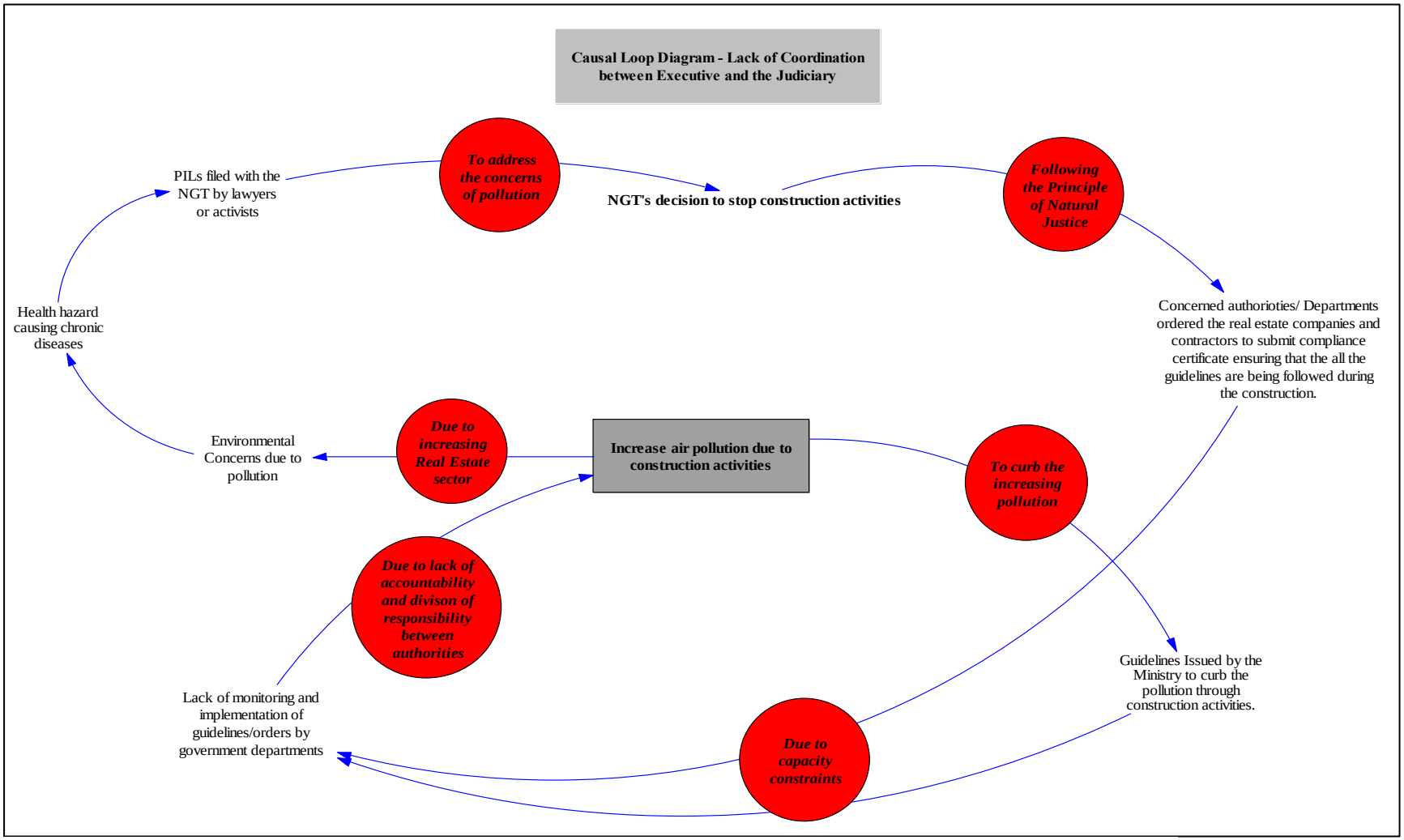
only either by passing guidelines to curb the pollution, by putting a stoppage to construction activities or by penalising the law-breakers.

7.14.7 The various authorities and departments due to various reasons such as shortage of manpower, time constraints, expertise and no clear division of responsibilities had failed in ensuring that the guidelines and regulations are properly followed by the contractors and developers on construction sites. In fact, these are often ignored by them as it adds to their costs.

7.14.8 The authorities responsible for the implementation of both the set of orders are the same those that initially failed due to the above-explained reasons. Hence it leads to a loop that explains that despite several initiatives taken by executives and numbers of orders passed by the judiciary, the problem of increasing air pollution in Delhi NCR has still not been resolved.

7.14.9 Delhi's pollution has different causes and different dimensions of environmental protection and its management has taken a serious turn in the present era. The proper functioning and coordination of judiciary and executive become an important aspect in addressing a public interest issue, both play a critical role in shaping the environmental laws and policies.

Figure 56: Causal Loop Diagram



Source: CUTS Analysis

8. Conclusions and Recommendations

Air pollution in Delhi and its neighbouring regions is not a short-term crisis but is a chronic problem that has accelerated in the last 6-7 years and not only the NGT but the Supreme Court has also given directions to curb the problem of increasing air pollution. It has become a recurring problem that requires a long-term, holistic solution that should be based on rigorous research and analysis, and on the contours of enforceability.

8.1 Adopting a multisector and multiagency approach

There is an urgent need for government and regulators to relook at the current approach adopted to address the issue of increased air pollution. Environmental concerns such as pollution tend to be caused via multiple sources and hence require systematic coordination between different administrative agencies and governments of different states to tackle it. Hence improvements are required in existing mechanisms to make speedy and effective resolution of environmental issues via a well-co-ordinated multi-state, multisectoral and multiagency approach.

The union government had also tried to rearrange the existing legal framework for regulation and environmental issues to address the current issues related to the environment. In 2015 a committee was appointed to suggest amendments to six environment laws[507] to bring them in line with requirements to factor in the current economic and development needs. One of the recommendations by the committee was to create new "umbrella law" – Environment Laws (Management) Act (ELMA), with the intent to induct the concept of "utmost good faith" which would also help in reducing the 'inspector raj'. The act was drafted by private law firms and the draft was released in public for comments which were criticised by experts and environment lawyers[508].

The problem of air pollution in Delhi has increased manifold owing to various reasons such as the increase in sources of pollutants, lack of coordination between government authorities in terms of division of responsibilities and accountability, etc. For many years the Union and State Governments have tried to address the issue of increased toxicity in the air of the capital city, yet the problem has only got worse.

8.2 Resource constraints faced by concerned authorities

There is also the requirement to strengthen the concerned authorities such as PCBs and Development Authority in terms of manpower, expertise and infrastructure. From the time, these bodies had been set up there has been an expansion of duties and responsibilities over the course of time both at the board and operational level. Thus, there is a pressing requirement to recruit technical and scientific manpower at PCBs and experts at development authorities. This also highlights the necessity for a periodic institutional impact assessment to ensure adequate

[507] Environment (Protection) Act, 1986; Forest (Conservation) Act, 1980; Wildlife (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981; and The Indian Forests Act, 1927

[508] India's umbrella environment law idea triggers renewed concerns - Hindustan Times

resources in terms of human capacity (experts, technicians and other staff) and other technical and financial resources to ensure proper implementation of policies and regulations on-ground.

One of the reasons that do not allow effective implementation of various environmental guidelines as well as the decisions by the courts is that concerned administrative agencies are not adequately equipped with the manpower and technical expertise to deal with the problem or to ensure proper implementation of proposed measures. The same was also acknowledged by the departments when the team met with them in their offices.

As there has been an increase in the number of industries, private vehicles on the road and number of constructions sites in Delhi and NCR the shortage of staff also leads lack of monitoring and inspection of sites to ensure effective compliance of the orders and guidelines by the judiciary and the executive.

8.3 Strengthening the NGT

The green body in its decade long journey has passed a number of path breaking judgements and has been effective in resolving many environmental disputes with its "4 D approach of dismiss, dispose, delegate and deserve".[509] NGT deals with issues arising in different areas of the environment and thus it is important to strengthen the body with technical and subject matter experts from different fields to help the judiciary to come to decisions with a holistic approach. It has also been seen that because of the shortage of judges, the cases registered with zonal benches are also being heard by judges of the principal bench via video conferencing. The adoption of technology is a much appreciated step, but it is important to have adequate appointments of judges at all four zonal benches as it will reduce the burden and also decisions made would be time-efficient.

There exist a number of reasons that pull down NGT's graph of consistency and progress such as capacity crunches, varied expertise, and also time constraints. Although the NGT should comprise expert members apart from the judicial members appointed for the resolution of environmental disputes, most of its decisions have relied on court-appointed expert committees[510]. It has been noted that the tribunal has been facing a major crunch in terms of both judicial appointments as well experts from different sectors or areas of concern.

8.4 Effective compliance and monitoring mechanism

There should be clear and coordinated mandates and roles across and within concerned authorities and departments in the government to ensure the compliance of orders and guidelines passed by the judiciary. This will help avoid finger-pointing among different government authorities, something which was evident during our field interactions with various authorities responsible for implementation and monitoring. It is important to fix responsibility and hold the executive answerable to ensure compliance.

[509] https://thewire.in/environment/nearly-a-decade-old-is-the-national-green-tribunal-losing-its-bite

[510] *Ibid*

The judiciary should also monitor the implementation of its directions, appointing monitoring committees to inspect and ensure compliance could be one of the ways. It should pass strict conditional orders for the implementation of environmental judgments and should also be clearly defining the responsibilities and accountability for the concerned government authorities of different states.

While the decision-making is purely dependent on the understanding and ability of the Judges, the compliance and monitoring of the decisions also play a major part. The effectiveness of judgments especially related to environmental concerns can only be ensured with proper compliance and monitoring processes. It has been often pointed out by NGT that the government bodies have failed in ensuring compliance with orders and guidelines passed by NGT and thus leaving the problem or issue unresolved.

In the case of Delhi NCR, there are a number of different government agencies responsible for ensuring the implementation of the guidelines or regulations formulated to address the issues. While some of them report to the union government, some to the state government (Delhi), while some are under the control of neighbouring states as a result creating confusion and lack of coordination among them[511].

8.5 Adopting a holistic and balanced approach

The formulation and decision-making processes of policies and the measures should be in the manner that it should take a holistic approach and assess the impacts on the lives and livelihood of the humans that are involved in activities that cause air pollution. The policies and measures should be more empathetic towards the vulnerable working class and should ensure that the poorest are not paying the cost of such measures.

The measures and directions given by both the judiciary and the executives to curb the adverse impact of air pollution in Delhi were prohibitory steps taken to control the emission of pollutants through different sources. The stopgap measures on the other hand have severely impacted the livelihoods for many daily wage labourers such as informal workers working on construction sites or in sand and rock quarries, at brick kilns, etc. Most migrant workers live in slums around industrial areas or construction sites where the air quality index remains 'severe' and working at polluting factories or construction sites, they are directly exposed to pollutants, thus facing maximum exposure to health hazards[512]. The measures adopted so far do reduce their exposure to toxic air conditions but at the cost of their livelihood. Thus facing a 'double whammy' situation, being worst affected by both the problem of increasing air pollution and the measures adopted to curb it.

8.6 Citizens' awareness and engagement

Lastly, the consciousness and awareness among the common people need to be evoked, for this both the judiciary as well as an executive during any decision-making process need to

[511] https://www.livemint.com/Opinion/Cq1XFnxfqjkKyA8mRIsg2M/Why-Delhis-air-pollution-problem-never-gets-solved.html

[512] https://thewire.in/labour/human-cost-of-quick-fix-air-pollution-control-measures

explain, justify and convince concerned stakeholders to get them on board to protect the environment and move ahead towards sustainable development[513]. Creating awareness about the adverse impact of increasing air pollution among the residents of the Delhi NCR, encouraging the residents to switch to greener fuel alternatives and making them aware that how their actions such as the burning of plastic refuse, dead organic matter, or even certain food materials can lead to harmful effects.

In conclusion, the problem of pollution in Delhi is a result of the failure of multiple agencies and levels of governance, which involve the executive and judiciary. What is needed is a holistic approach to tackle the problem at various sources and levels. The approach adopted at present only focuses on treatment over cures and cures over prevention, which might be necessary during a period of emergency, but is short-sighted. With air pollution in Delhi reaching new peaks, solutions must include unconventional and unpopular measures that tackle short- and long-term causes and benefit all residents of the city.[514]

[513] NGT, International Journal of Environment, 2017

[514] https://www.healthaffairs.org/do/10.1377/hblog20200130.710866/full/