The killers of sand
A case study on how a shortage of sand is breaking down India from within
Abstract

This is a study on the Indian government's use of mercantilism and imperialism in their policy choices in regards to the diminishing supply of sand. Because of this the study will revolve around the globally growing problem that is a sand shortage and how the Indian government is aiming to handle the problem. What consequences the solutions have had and how different levels inside the government are working against each other. Then the rising phenomenon that is the Indian sand mafia will be analyzed, who are their partners and benefactors. How come they could emerge and what exactly is a sand mafia? These are some of the questions this thesis will answer.

Keywords: Imperialism. Mercantilism. India. Sand
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1 Introduction

“After water and air, sand is the natural resource that we consume more than any other—even more than oil. Every concrete building and paved road on Earth, every computer screen and silicon chip, is made from sand. From Egypt's pyramids to the Hubble telescope, from the world's tallest skyscraper to the sidewalk below it, from Chartres' stained-glass windows to your iPhone, sand shelters us, empowers us, engages us, and inspires us. It's the ingredient that makes possible our cities, our science, our lives—and our future. And, incredibly, we're running out of it.” - (Beiser, 2019)

The world is running out of its third most consumed resource, sand. A resource more used than oil might soon be gone. While there are already wars fought over oil, what might happen when the world starts starving for sand? Will we see wars fought over it, will we see countries harden their control over what remains or will another resource take its place in this constantly innovating and evolving world?

This thesis aim is to answer these questions raised from an academic standpoint. Questions such as what might a country do if its key resource starts to run dry? To my help, I will make use of International Relations (IR) theories such as new imperialism and mercantilism to generate answers. These theories will be operationalized so they fit in a case study specific methodology and that they are applicable towards my empirical material surrounding sand. Now the case will be based in the 2010s with a focus on India as they are in a big construction boom and sand is the main feature of this boom (Beiser, 2019).

1.1 Purpose

The purpose of this research is to offer an IR academic perspective on a growing problem. As a sand shortage is a rather new phenomenon in the world, and in academia, there exists little to no academic research on the topic of diminishing sand supply. However, there is quite a lot of research on other resources such as oil and minerals and how a shortage of them might be
related to conflict (Grossman, 1991; Klare, 2001; Humphreys, 2005; Acemoglu et al., 2011). So my aim is to fill this hole in academia about what might happen if sand runs out. What policies and other crisis management tools might a country use to counteract the problem of diminishing resources? Another aim of this thesis is to relate how this shortage of sand might have created a sectorial specific imperialism in 2010s India. I will expand on what I mean with sectorial imperialism in the forthcoming theoretical section. So, this thesis has two goals in mind: relate sand shortage towards potential policy changes and towards a potential new form of imperialism.

The research question of this thesis is: To what extent does the global expansion of construction industries lead to sectorial-specific imperialism in the 2010s against the Indian population and environment?

2 Background

2.1 Microelectronics

In the 1980s a phenomenon titled the microelectronic revolution spread across the globe. It triggered a widespread belief in this new revolutionising invention of the microchip. Everyone wanted a part of the new technology as microelectronics had been shown to drastically reduce the manpower it would take to produce a product. This is exemplified in Tom Forester's anthology *The Microelectronics Revolution* (1981) with the following section.

A color TV once contained 1200 components. Now, with chips, it only contains 450. One of the new electronic telex machines takes eleven hours to assemble, compared with seventy-five hours for the old electromechanical ones. A semi-automated textile mill incorporating microelectronic technology was opened in August 1978 at Atherton, Manchester. It covers 8500 square meters and employs ninety-five people. The first new mill to be built in this old industrial area for fifty years, it replaced three mills covering 45,000 square meters and employing 435 people. - (Forester, 1981: xv-xvi).

Forester's chapter speaks on almost every aspect of this new revolutionising invention. How it will affect the factory workers, the management staff, everyday office work and the social impact (Forester, 1981). However, the environmental impact was left out from the discussion
which is unfortunate as this new invention takes a lot of resources to produce. One specific resource is sand, a vital ingredient in the production of microelectronics as they are made from silicone, and silicon is created from sand (Liles, 2012). This lack of an environmental aspect can be rectified as in 1981 when the book was published, one of microelectronics' main ingredient was not on the verge of running out, but in today's world sand is starting to run dry (Ruz, 2011). So, microelectronics dependency on silicon-sand is becoming a problem (Beiser, 2019: 100-119). A thing to note however is that silicon-sand is not the biggest user of sand as a resource. The main user of sand as a resource is the construction industry with its concrete dependency (ibid: 217-235).

2.2 Construction

John Raftery described an increasing trend in Asia where foreign construction companies are out-competing local once. This is due to a lack of knowledge within the local construction sector and foreign companies possessing technical expertise and management know-how that is much higher than their local counterparts (Raftery, 1998: 731-733). This problem of out competition is potentially solved through a foreign-private partnership where the local company supplies the foreign with local labour and local knowledge. In return, the local company obtains access to foreign companies’ technology as well as their expert knowledge.

Around 33% of international earnings by contractors in 1996 (amounting US$42.453 billion) were earned from Asia (ENR, 1997). This reflects in part the substantial investment of Asian economies in the built environment, as well as their dependence on imported construction services. - (Raftery, 1998: 730).

Right now, countries such as China and India are aiming to catch up and compete against western powers (Meredith, 2007). To achieve this they have to make great infrastructure investments and such improvements match increased use of concrete by China. Looking at their last three years and comparing them to the US, China has used more concrete within three years than the US has within 100 years (Swanson, 2015). China has used 6.6 gigatons of concrete in the last 3 years while the US has used 4.5 gigatons of concrete in the last 100 years (Gates, 2014). India is also trying to match Chinas expansions with its 1.4 trillion dollar infrastructure investments (The Times of India, 2019a). These investments will be the
construction of 100 smart cities starting, five industrial corridors, 6 mega ports and 8 megacities with a capacity for around 7.7 to 31 million citizens each (Invest India, 2019).

What makes the concrete industry our main focus point is that sand makes up ⅔ of concrete (Beiser, 2019:207-235). So the use of 6.6 gigatons of concrete by China is all based on sand. Another huge sand consumer is land reclamation projects such as the 835 million tons of sand that were used in the creation of three artificial islands in Dubai (Peduzzi, 2014: 208–218). While these are some special examples of mega construction this Figure 1 is showing the use of sand in general construction.

**Figure 1: Sand usage**

<table>
<thead>
<tr>
<th>Type of building</th>
<th>Sand usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average family house</td>
<td>200 tons of sand</td>
</tr>
<tr>
<td>Hospital</td>
<td>3,000 tons of sand</td>
</tr>
<tr>
<td>1 kilometre of highway</td>
<td>30,000 tons of sand</td>
</tr>
<tr>
<td>Nuclear power plant</td>
<td>12,000,000 tons of sand</td>
</tr>
</tbody>
</table>

Source: Trademachines, 2018; Sand Wars, 2013

**2.3 Differences in sand**

When you think of sand you might wonder how come it is running out? You got golden beaches with miles upon miles filled with sand or vast desert like the Sahara desert overflowing with sand. It is here the difference between desert sand and sea sand comes into play. Because desert sand and construction sand is quite different. For millions upon millions of years, the wind has polished the desert sand into a smooth and round texture, every grain of sand is round unlike its water counterpart. The sand that lies on the seafloor is this jagged edge textured sand with sharp edges, unlike its smooth desert counterpart. This plays a vital part in the construction sector as the desert sand does not bind because of it so round and smooth so using it in construction is not recommended. Thus desert sand is not used as it is quite inferior towards sea sand and because of this thesis will exclude desert sand from further analysis.
Onwards to the sea sand, even here we find big differences between sea sand and river sand, as in ocean sand you have a higher percentage of chloride than in river sand. River sand contains about 0.01–0.06 % of chloride ions while sea sand contains 0.05–0.07 % of chloride ions (Karthikeyan, 2017). This is relevant because chloride corrodes iron and as iron is the main foundation in reinforced concrete structures using sea sand would endanger and weaken the structure substantially. However there exists a solution to this and that is to rinse the sea sand, but this is expensive and is time-consuming. Thereby it is time-efficient and cheaper to use the already chloride-free river sand. So using sea sand and desert sand in constructions is out of the picture for today's construction companies. This leaves river sand as the only viable and useful supply of construction sand.

2.4 Environmental movements in India

Because this thesis will proceed with an environmental viewpoint and its main unit of analysis is the depletion of India's most used natural resource, a background towards India's environmental movements will now be presented here.
India's environmental movements are facing hard challenges if they are to succeed in getting a larger following. As things stand today the environmental movements are sporadic and riddled with infighting, there exists no single coherent unit that can organise them (Dietz 179-191). However, it does exists are many small environmental groups that are village or region-specific. The problem with that is that they are fighting each other over their own goals and agendas. Instead of working together to get the environment on the political agenda and help it penetrates into a larger market these groups are fighting each over where the new dam should be placed, or what solutions are the best for their specific village, instead of focusing what is best for India (Dubash, 2011: 1-27; Dietz: 179-191). To conclude the environmental movements of India are weak and lacks resources to put up a fight against environmental exploitation.

3 Theoretical Framework

Theories can have many functions and they come in many different shapes and forms. They are the lenses we use to look at the world through and they help determine how we see the world, and what we believe the world is made off. However, different theories all have different explanations for why a phenomenon happened. Some explanations can be similar to each other while others can offer completely different answers. What they all do is offer guidance for the methodology applied to a reachers problem (Bryman, 2016). In this, the theory offers a guide on how the material should be viewed. As such this thesis will make use of two IR theories to explain and offer answers to the research question. This because using two theories broadens the scope the material is looked through without losing focus on the goal of the research. These two theories will be new imperialism and mercantilism as they represent the research question the best. In that, they both focus on resource control and state policy setting in their explanations and views of how the world works.

3.1 New Imperialism

New imperialism is built by theories such as Karl Kautsky, John A. Hobson and Vladimir Lenin. What these theorists did was take the old and obsolete theory that is classical imperialism and modernised it. They helped shift its focus onto states and private
corporation's pursuit of territorial acquisitions overseas, instead of classic imperialism focus of colonisation. This modernisation helped new imperialism gain traction again as the world had moved on from classical colonisation onto a form of capital colonisation through capitalism (Lenin, [1917] 1965; Magdoff, 1969).

Under this modernisation period, researchers such as Vladimir Lenin and Harry Magdoff emerged as such they will be this thesis new imperialists representatives. This because they offer deep explanations on how the state will react when its resources are threatened. This reaction is a strive for control over the raw resource supply through political policy means or direct military might (Magdoff 1969: 35-37). Lenin also describes this reaction in that the state uses territorial control to secure resources for future profits through political policy or direct military control. (Lenin [1917] 1965: 5-6 92-93). What Magdoff does is offer a deeper analysis on how the state might achieve this control over the resources. This through the development of a partnership between the private corporations and the state (Magdoff 1969: 12-14 35-40). The partnership is built on mutual interest instead of being an alliance.

The result of these developments is a new network of international economic and political relations (network consisting of private corporations and states)*. The network itself changes in shape and emphasis over time as a result of wars, depressions, and different rates of industrialisation. [...] The significant theme is the different degrees of dependency in an international economy, an international economy is continuously ferment as a result of the battles among giant corporations over the world scene and the operations of these corporations along with their state governments to maintain domination and control over weaker nations - (Magdoff, 1969: 39) *Clarification added by thesis author

Overall, imperialism as a theory offers an explanation on how the state would react if its resource supply was threatened. This through the forming of a partnership between the state and the private sector were the consequences of this partnership would matter little. Because the resource-hungry states sole focus is on securing these resource, be it through direct military control or policy measures (Magdoff 1969: 12-14 35-40).
3.2 Mercantilism

Defining mercantilism is a rather hard thing to do as dependent on the author its views and scope is significantly different. One can, however, give some general points in its creation and history.

Mercantilism is a theory that falls under the realist school of thought and started to grow strong in the 16th Century because mercantilism was an important tool is the state-building. Especially important in helping states determining their trade policies as this early iteration of mercantilism was especially focused on establishing a favourable balance of trade (Hettne, 1993b: 234-252). A key belief in mercantilism is that “the economic welfare of the state can only be secured by government regulation of a nationalistic character.” - (Hettne, 1993b: 234-252). Another example of this key belief "the attempt of governments to manipulate economic arrangements in order to maximise their own interest” - (Gilpin, 1975).

Now, during the 18th-century mercantilism faced hard criticism from the liberal school of thought through theorists such as Adam Smith and David Ricardo. This criticism was successful in temporarily ending mercantilism reign as the dominant policy dictating ideology (Cohn, 2000). Though mercantilism did not completely die out from this relentless assault from the liberal theorists, as neomercantilism was revitalised and enveloped the nation-state logic in broadening its scope to adapt towards a modern world (Hettne, 1993a: 211-232).

Neomercantilism differs from mercantilism in two different ways. The first in their belief of “the regionalization of the world in more or less self-sufficient blocs where political stability and social welfare are major concerns” - (Hettne, 1993b: 234-252). The second is they do not “believe in the viability of an unregulated world economy” - (Hettne, 1993b: 234-252). This means that they believe the world market needs an international political regime to regulate it as it is a fragile system (Hettne, 1993a; 1993b).
Another key mercantilistic belief is in the use of state-sanctioned monopolies. In this, the states impose government monopolies on the market to establish control and a way to choose their preferred partner.

Mercantilism, which reached its height in the Europe of the seventeenth and eighteenth centuries, was a system of statism which employed economic fallacy to build up a structure of imperial state power, as well as special subsidy and monopolistic privilege to individuals or groups favored by the state. Thus, mercantilism held exports should be encouraged by the government and imports discouraged. - (Rothbard, 1997: 43)

To conclude mercantilism we get the definition of mercantilism as“[…] all mercantilist manifestations have the strengthening of state power as their basic concern, although the historical contexts may give a great variety of forms for this concern.” (Hettne, 1993b: 234-252).

Overall, mercantilism does not differ significantly from new imperialism, they are both focused on the reasons and means the state use to gather control. Mercantilism focus is on the strengthening of the state’s interests through projects to expand the power base of the nation-state. While new imperialism shares this belief in that the state will strive to control the resources to maintain a power base. Mercantilism and new imperialism both have a focus on a partnership between the state and the private sector. What differentiate them here is that new imperialism is focused on the result of this partnership as they believe this partnership will lead towards exploitation of the weak. Meanwhile, mercantilism pays little mind towards the oppressive side of this partnership, or if they do the state's interest comes first.

<table>
<thead>
<tr>
<th>Author</th>
<th>Theory</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lenin</td>
<td>New imperialism</td>
<td>The state uses territorial control to secure resources for future profits through political policy or direct military control.</td>
</tr>
<tr>
<td>Author</td>
<td>Theory</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Magdoff</td>
<td>New imperialism</td>
<td>If the state and private companies share an interest in a distinct sector or industry it will evolve into a form of partnership between the state and the private sector.</td>
</tr>
<tr>
<td>Magdoff</td>
<td>New imperialism</td>
<td>The state will strive to control the raw resource supply through political policy means or direct military might.</td>
</tr>
<tr>
<td>Hettne</td>
<td>Mercantilism</td>
<td>Strengthening of the state’s interests through projects to expand the power base of the nation-state</td>
</tr>
<tr>
<td>Rothbard</td>
<td>Mercantilism</td>
<td>The use of state-issued monopolistic privilege to individuals or groups favoured by the state</td>
</tr>
</tbody>
</table>


3.3 Sectorial specific focus

This theoretical framework of mercantilism and new imperialism will be applied to a sectorial point of view. This means that my framework will only be applied to the construction sector in India to better generate thesis relevant answers and further narrow down the research scope. This focus on a specific sector will give this thesis the best answers regarding the research question as I am able to divert my full attention towards the potential problem of sectoral specific imperialism or sectoral mercantilism in India. In defining a sector we get that
a sector is a part of society that can be separated from other parts because of its own special character (Cambridge dictionary n.d). Another more descriptive definition of a sector is:

A sector is an area of the economy in which businesses share the same or a related product or service. It can also be thought of as an industry or market that shares common operating characteristics. Dividing an economy into different sectors allows for more in-depth analysis of the economy as a whole - (Kent, 2019)

So this thesis will make use of these two descriptions of a sector in regards to the construction sector in India. With a construction sector is an area where the businesses share the same product or service. In regards to this thesis, those products or services are house foundations built on sand, roads constructed with the help of sand or houses built by concrete in India. So businesses operating in the construction industry and use sand in their constructions will be the point of reference when this thesis mentions sector unless stated otherwise.

4 Methodological Approach

The aim of this section is to establish a clear bridge between the empirical data and the theories of this thesis (Feldman, 2019). To establish such a bridge, the use of scientific methods and methodology is a vital part in social research. However, there are many different research methods so selecting one that fits your specific research is imperative. You have to have the right tools, as in a good research method to get the desired outcome (Crotty, 1998: 1-15). The right tool for this thesis is a case study research method focused on a singular case with a historic timeline as a starting point.

4.1 Case study

Using Bryman as a starting point we get that in a case study the term ‘case’ is principally associated with a location such as community or organization where the researcher attempts to reveal the unique feature of the case. The case is an object of interest to the researcher, where the researcher aims to provide an in-depth examination of it (Bryman, 2016: 60-61). Another view of case study is presented by Robert Yin in “A case study is an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly
evident” Yin (2018:15). So using these two social scientist's definitions as the basis for a case study I will now present my case: The construction sector in India from a sectorial specific viewpoint where it will try to establish if and how a sectorial form of imperialism is affecting India's environment and population.

4.2 Case selection

The background section explained how the environmental movement in India is weak while the country simultaneously has a large construction boom.

In this construction boom, India is rapidly expanding its construction sector throughout its regions. Now, what is making this an interesting phenomenon to research about is that these plans are state-sponsored and sometimes cooperation between different countries has lead to the funding and planning of these construction projects. For example, the Japanese government has invested in the Delhi Mumbai Industrial Corridor (Department for promotion of industry and internal trade, 2018). Now achieve this goal of a developed infrastructure India is using its Public-Private Partnerships (PPP) program where the Indian government outsources its construction projects to private companies (Department of economic affairs, n.d). This creates a bond between the private companies and the Indian government where they both rely on each other to succeed. If not the construction project is completed the private company does not get paid and the government does not get its new road or port. This bond will be one of the empirical analysis’s main focus points.

Another thing to note is that the Indian government is actively seeking foreign investments in its infrastructure projects with the likes of sites such as investindia.gov.in/sector/construction where they market themselves for foreign companies to invest. So India is semi reliant on foreign investment to help them achieve their goals.

Lastly why I selected India to be my case is that India is facing a sand crisis. As sand is the most used material in the construction sector with being a vital ingredient in both concrete and sand foundation for houses and highways (Beiser, 2019). With this resource rapidly diminishing India is facing a shortage of sand but the private construction corporations want to keep building to not lose money (Babu, 2019). This shortage is creating quite a big
predicament for the construction sector in India as they need to keep building to not lose money, but at what cost? (BBC, 2019). That question is what this paper will analyze. The extent to which this sand is lacking and how the construction boom might have led towards a sectorial specific imperialism towards India's population and environment.

4.3 Measures

Now to establish a working analysis I have to bridge the gap between method and the empirical material. Just like how we developed factors in the theory section to bridge the gap between theory and method we will develop measurements or indicators to bridge this gap between method and material (Feldman, 2019). These measurements are derived from my empirical material and are a way to measure what my theoretical factor is suggesting or implying. So these measurements will later in this thesis be applied to the empirical material to generate theory related answers. I will now present them in table one below in order of theory instead of an order when they will be used.

**Table 2: Factors and Measurements**

<table>
<thead>
<tr>
<th>Theory</th>
<th>Factors</th>
<th>Measures</th>
</tr>
</thead>
</table>
| New Imperialism | If the state and private companies share an interest in a distinct sector or industry it will evolve into a form of partnership between the state and the private sector. | Articles showing a shared interest between the government and private construction corporations.  
The existence of Private Public partnership contracts between the government and private construction companies.  
Government procurement contracts awarded to sand importing companies. |
| Mercantilism  | The existence of state-issued monopolistic privilege to individuals or groups favoured by the state. | The existence of government tariffs and anti-import rules and regulations in regards to construction sand.  
Amount of sand in specific harbors and regions seized and blockaded shipments by the Indian state.  
The existence of a government determined price for imported sand measured in US dollar or Indian rupee. |
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The existence of government issued licenses.</td>
</tr>
<tr>
<td>Strengthening of the state’s interests through projects to expand the power base of the nation-state.</td>
</tr>
<tr>
<td>The existence of projects to expand the power base of the nation-state in the form of Infrastructure improvements being planned or constructed such as new roads, new cities and new ports.</td>
</tr>
<tr>
<td>Length and amount of new roads being constructed or planed for construction.</td>
</tr>
<tr>
<td>Amount of new cities being constructed or planed for construction.</td>
</tr>
<tr>
<td>Amount of newports being constructed or planed for construction.</td>
</tr>
</tbody>
</table>

### 4.4 Potential Limitations of a Case study

Oluwafemi Emmanuel Idowu presents a general criticism of case study research method in the book *Criticisms, Constraints and Constructions of Case Study Research Strategy* (2016). Here he presents arguments such as “case study research is often charged with causal determinism, non-replicability, subjective conclusions, absence of generalizable conclusions and biased case selection”- (Idowu, 2016: 185). In other words, the author argued that the potential constraints of a case study are that it is not generalizable to a wider picture, the researcher’s own feelings may influence the case study in confirmation bias and a case study is difficult to replicate as it is specific to that case. The positives far outweigh the negatives as a case study offers a deep understanding of the studied case and if the researcher is transparent in his or her’s case selection the researcher bias is not a constraint. I address this causal determinism critique with the use of multiple measurements and multiple theories to get a wider picture. As for the nonreplicable critique, the use of a factors and measurements model much help limit this weakness, as you can apply this model on other cases through the use of measurements that are not case-specific bound. Then on the subjective conclusion critique, I have shown with the indicator and measurements what will be used to generate conclusions. These measurements are also worded in a way so they avoid offering a
subjective interpretation and thus a subjective conclusion. Now with the focus on specific sectors, different conclusions can be offered if this theoretical framework and measurements where to be applied onto another sector. Hence offering more of a generalizable conclusion through more studies using this thesis theoretical framework. To avoid a bias selection the background and case selection sections have shown why India was chosen. Then the sampling system will explain how the empirical database was constructed.

5 Source Material

In this section, the basis for my material selection and my empirical database will be presented. This material will then be source criticised based on University of Leeds guide Evaluating Information Checklist (n.d) and presented in five steps: 1) authority, 2) objectivity, 3) timeliness, 4) supporting evidence and 5) relevance. Each of these steps will be applied to my material to critically examine the material for any weaknesses.

5.1 Sampling System

The database for this thesis will be built on academic literature discussing the global construction sector and the use of sand. My main piece of information for this is the book The World in a Grain by Vince Beiser (2019). In it, Beiser discusses the evolution surrounding sand as a resource and its potential problems while offering some good numbers and calculations about the use of sand. Another source is charts and statistics from statista.com, I will use their graphs and charts to help show this global growth of the construction sector.

Then the empirical material database will consist of most newspapers and Indian government published policy documents. In generating these newspapers general google searches with keywords such as “sand mining India” and “sand mafia India” where used. From these searches, the following newspapers in table 2 were chosen based on the amount of hits generated by the keywords searches they provided. These newspapers represent different regions of the world. We have the British newspaper The Guardian, the American newspaper New York Times, the Indian newspaper Times of India and lastly the American scientific magazine National Geographic. What this does is offer this thesis a broader picture and not to become bias in using only Indian or Western newspapers.
### Table 3: Newspaper database

<table>
<thead>
<tr>
<th>Keywords</th>
<th>The Guardian</th>
<th>NY Times</th>
<th>Times of India</th>
<th>National Geographic</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Sand mafia India”</td>
<td>10 hits</td>
<td>3 hits</td>
<td>100+ hits</td>
<td>3 hits</td>
</tr>
<tr>
<td>“Sand mining India”</td>
<td>26 hits</td>
<td>7 hits</td>
<td>100+ hits</td>
<td>3 hits</td>
</tr>
</tbody>
</table>

Source: Authors construction based on keyword searches from the following sites: www.theguardian.com, www.nytimes.com, timesofindia.indiatimes.com and www.nationalgeographic.com

To build a database from Times of India’s many results the time limit from October 2019 to January 2020 was put in place. From this time period articles surrounding violence and deaths related to sand mining was selected. This selection resulted in eight articles that will make up the thesis database from Times of India.

### 5.2 Source criticism

In source criticism the database the five steps from the University of Leeds will be used 1) authority, 2) objectivity, 3) timeliness, 4) supporting evidence and 5) relevance. This will be applied towards my database in the following manner under table 1 to determine the quality of the source

### Table 4: Evaluation of statista.com

<table>
<thead>
<tr>
<th>statista.com</th>
<th>Authority</th>
<th>Objectivity</th>
<th>Timeliness</th>
<th>Supporting evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>statista.com</td>
<td>Private organisation owned by Stroeer Content Group GmbH</td>
<td>No apparent objectivity.</td>
<td>Easy to see the editing history</td>
<td>No supporting evidence is needed or published on statista as it is pure statistics.</td>
</tr>
</tbody>
</table>

References are all traceable. Charts are for public use. Well maintained website.
Relevance

The information is very relevant to my thesis.

Source: Authors construction based on statista.com and University of Leeds Evaluation information document.

From table 1 we get that statista is a highly trusted source for information. One thing to note is that every different chart or diagram has a different author and sources. So an individual source criticism has been done on the different charts that will be used for this thesis. Another thing to note is that Stockholms University is supportive of statista.com (Stockholms universitetsbibliotek, 2016)

To save space and time this extensive table format will not be shown here, but the results of these source examinations will be presented. First, the results from The Guardian are: The Guardian is a safe source to use, they operate under a donations based business model and are a private organisation owned by the Scott Trust. They are objective in their articles and all of their references are traceable. Conclusions are that The Guardian is a safe source.

New York Times is the next to be examined. They too are a private organisation and owned by The New York Times Company. They are objective in their articles and every one of their articles are referenced with traceable references. Conclusions New York Times is safe to use.

In the evaluation of Times of India, an interesting phenomenon emerged, that Times of India was reliant on government support in the form of funding to be profitable (Media Bias Fact Check, 2019). During recent politics the Indian government cut funding towards The Times of India, speculations emerged that this cut was because they were unhappy with the reports Times of India had issued towards the governments politics, perhaps they had printed something that put the government in an unfavourable light (Ghoshal, 2019). So I have to keep this in mind when I use articles from the Times of India and be extra careful to source criticism every individual article. Other than this funding feud Times of India is a reliant source. Their references are traceable, they use supporting evidence and they are objective in their articles.
On National Geographics nothing stands out. They are a private organisation owned by National Geographic Partners. They use field studies performed by in house reporters in some of their articles, other they use freelancing experts to write stories for them (Salopek, 2019).

The empirical analysis will use these five newspapers as the main sources and database, but papers such as The Hindu, Down to Earth and the Washington Post will be used as supporting evidence and they have all gone through the same five-step source criticism as the main sources.

So as a conclusion the sources are good from a source criticism perspective but in using Times of India I will need to keep in mind that the Indian government was sponsoring them. Another thing I need to do is to keep critically analyze the articles and not just trust them because I have done it once I do not need to do it again. Source criticism should always be applied to the material and not forgotten.

6 Empirical Analysis

6.1 Global growth

The world is facing a global trend of growth in the construction sector with an increasing population (Department of economic and social affairs (n.d), which raises the demand for housing. Then the introduction of the automobile lead towards new and bigger types of roads and highways are needed (Wagner, 2019). Then with the increase in trade between nations has increased the demand for new ports and harbours to be able to fulfil these trade demands (O’Connell, 2019). The following figures and data charts all points towards increasing global growth in the construction sector.

Graph 1 shows the global population data and its trend of ever-increasing, a disclaimer here is that by 2075-2100 the population will face a decline but this thesis focus is on 1950-2025 in regards to this chart and between these years the trend is steady growth. What this means in regard to this thesis is new houses are needed to room these people. Graph 2 shows the global export volumes in dollars of trade goods and in it we see an increase from the 2000s 6.45
trillion U.S. dollars to 2019’s 19.5 trillion U.S. dollars in world trade goods. This is a huge number and is indicating quite strongly that the world is trading more and more thus a need for new ports and harbours are created. Then we have chart 1 that depicts the global growth in the residential construction sector. With the exception of Australia every country on that list has been or is facing growth in the construction sector. Lastly, we have chart 2 that shows the spending in the construction sector. These spendings are like the other charts going in an upward trajectory with an increase in global construction spending from 2014’s 9.5 trillion US dollars to a prognosis of 14 Trillion US dollars spent on construction by 2025.

**Graph 1: Total population of the world**

Source: Department of economic and social affairs (n.d) 
www.population.un.org/wpp/Graphs/DemographicProfiles/Line/900
Graph 2: Trends in global export volume of trade in goods from 1950 to 2018


The common denominator of these charts are growth, every one of these sectors or industries is facing growth. The world is facing a global growth and especially the construction sector to fill the growing needs of all these new people.

6.2 Indian boom

To tie this global growth towards our case of India this section will be using the measures that were presented in the previous section 2.1 global growth in accordance with developing new measures. Such measures will be an Indian specific construction boom with a focus of their industrial corridors projects and then the extent of urbanisation throughout India.

This boom is created through India's aim to potentially become a superpower in the near future (Meredith, 2007). To become this superpower India needs to develop and expand its
infrastructure, and this is just what the Indian government is doing with their multiple construction projects. In using picture 1 and 2 below we see the sheer size of these infrastructure improvements. In that, it is estimated that India will spend 1.4 trillion USD on infrastructure projects in the coming five years (The Times of India, 2019a). Some of these improvements are the development of new smart cities, these smart cities are a way to face the growing problem of urbanisation that India is facing. The urbanisation is what spurred the construction boom. With an ever-increasing number of people moving into the cities a need for bigger and broader cities has emerged.

Urban expansion in India will happen at a speed quite unlike anything the country or the world has seen before. It took nearly 40 years (from 1971 to 2008) for India’s urban population to rise by nearly 230 million; it will take only half that time to add the next 250 million. This expansion will affect almost every state. For the first time in India’s history, five of its largest states will have more of their population living in cities than in villages. This interactive graphic offers a map of urbanization by state and notes which cities are poised to surpass the 4-million mark in population. - (Mckinsey & Company, 2010)

The plan to meet this new demand is with 100 new smart cities. These smart cities will be able to hold this growing urbanising population and give them housing. The dark side of these housing planed is that they are concrete cities, everything is built using concrete and standing on sand foundations Invest India (2019).

**Picture 2: Urban Infrastructure Development Improvements**

Source: Invest India (2019)
Another massive construction project in India is its industrial corridors. These five planned corridors are in the form of mega highways connecting India's industries together with each other while also offer a means to transport produced goods to ports and airports. Take the industrial corridor of Delhi–Mumbai, it involves 24 industrial regions, eight smart cities, two international airports, five power projects, two mass rapid transit systems, and two logistical hubs (The Economic Times, 2016). And that is only numbers of one of the five corridors being planned.

**Table 5: Length of the Corridors**

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi-Mumbai Industrial Corridor</td>
<td>1483 km</td>
</tr>
<tr>
<td>Amritsar-Kolkata Industrial Corridor</td>
<td>1839 km</td>
</tr>
<tr>
<td>Bengaluru Mumbai Economic Corridor</td>
<td>Not given</td>
</tr>
<tr>
<td>Chennai Bengaluru Industrial Corridor</td>
<td>Not given</td>
</tr>
<tr>
<td>Vizag Chennai Industrial Corridor</td>
<td>800 km</td>
</tr>
</tbody>
</table>

Source: Authors construction based on numbers given by [www.makeinindia.com/article/-/v/delhi-mumbai-industrial-corrid-1](http://www.makeinindia.com/article/-/v/delhi-mumbai-industrial-corrid-1)
To summarise the length of these corridors we have 4,122 kilometres of highway being constructed. Using numbers given by Denis Delestrac in his documentary Sand Wars (2013) we know that one kilometre of highway requires 30,000 tons of sand. That makes it so 4,122 kilometres of highway would roughly require 123,660,000 tons of sand. That is a staggering number, and it has not taken into account the international airports being built beside each of these corridors or the six new mega ports and 100 new smart cities. The required amount of sand needed is astronomically-high.

What connects these infrastructure improvements towards global growth is the partners involved in these industrial corridors. For example, the Japanese government has invested in the Delhi Mumbai Industrial Corridor so it is a shared project between the Indian state and the Japanese state (Department for promotion of industry and internal trade, 2018). Then in the Bengaluru-Mumbai Economic Corridor, the UK Government department UK Trade and Investment are listed as an advisor towards this construction project (Makeinindia, n.d). Japan is also involved in the Chennai Bengaluru Industrial Corridor where the Japan International Cooperation Agency sent a study team to help the Indian government develop a comprehensive integrated master plan (Makeinindia, n.d). So what we have is a bilateral cooperation between different governments to build India's industrial corridors. This can be explained in Graph 2 from the global growth section where we see that the global export volumes of trade in goods have risen exponentially. Leading to more trade flowing between countries, it is logical that Japan and the UK would want to help develop India's infrastructure as they see trade benefits from bigger export possibilities from India. What we have is how global growth has helped spur on India's construction boom. The numbers of regions under a sand deficit are quite staggering,

All these states are witnessing a construction boom. Going by Census 2011, all states except Andhra Pradesh have more than 35 percent of their population in urban centres. Across the country, the construction sector has grown at a Compound Annual Growth Rate of 6 percent between 2016 and 2010, up from 2.95 per cent during 2011-15, according to the Central Statistics Office. But there is not enough sand to meet the growing demand.

In 2017-18, the Ministry of Mines (MoM) conducted a survey of 14 major sand producing states. Its estimates show that the demand of sand far outstrips supply in all the states, except Haryana, Uttarakhand and Madhya Pradesh. Tamil Nadu, which
experiences the maximum deficit of 65 per cent, has the highest demand for sand. But it produces only 18 million tonnes per annum (MTPA). Its neighbour on the eastern coast, Andhra Pradesh experiences a 50 per cent deficit of its total demand. Karnataka experiences a deficit of 20 per cent (see ‘Precious resource’). Rajendra Kumar Kataria, secretary of Karnataka’s State Department of Commerce and Industries, says the state is now left with just 26 million tonnes of river sand reserves. - (Kukreti, 2018)

Overall, we have is global growth in the form of more trade between countries, a rapidly increasing population and with it a global increase in the construction sector. This populations increase can be seen in India as they are believed to become the world's most populated country by 2024 (UN Department of Economic and Social Affairs, 2017). The population growth mixed with the increasing urbanisation and the infrastructure developments are leading towards a boom in the construction sector (Kukreti, 2018). Thus increasing the demand for sand, but the sand supply is running out. This has created a deficit between the supply of sand and the demand as the supply is long from satisfying the construction market.

6.3 Sand deficit

In analysing the extent of this sand deficit, the theories of mercantilism and imperialism are called for. This because they are focused on how a state might react when its precious resources and material are threatened. So, through measures such as the implementation of regulations and rule works, we will see if mercantilism and/or imperialism has taken root in India under the 2010s.

The effect of this growing deficit between the supply and demand for sand is the creation of an underground sand market. Because the legal and traditional means to mine sand is not enough to satisfy the growing market, opportunists saw their chance to make some quick money and started to mine riverbeds, floodplains and even beaches (Salopek, 2019). As time went by, the interested to mine sand increased among the population and soon environmental problems started to emerge. This because the sand miners dug up riverbeds that collapsed rivers and made beaches disappear overnight (Chandrasekhar, 2016). Another big problem was the control over the miner, the Indian government lacked any control over these miners as they would emerge all over the country in their exploitations to fulfil the construction markets demand (Romig, 2017)
This is when the Indian government started to realize the magnitude of the sand miners in the country they started to implement efforts to combat the nationwide sand mining. While at the same time seize control over this valuable resource. These controlling efforts were the implementation of regulations like the *Plant Quarantine Order 2003*, where any import of soil (sand) needs to be registered and approved by the Indian government. This was in 2003 but the quarantine order is still in effect today and has been built upon by regulation that enforces that every shipment of imported sand has to be sold by government-appointed prices, and by the government branch: Public Works Department (PWD) (Government of India Ministry of Mines, 2018). The imported sand also has to go through government-appointed controls when it arrives at a port or harbour (Kukreti, 2018) This way the Indian government has complete control over imported sand as they regulate the price sand sells for through the PWD. They also have established a way to control and select their preferred private partnership in sand importing, much like the mercantilist theory dictates in giving privilege to individuals or groups favoured by the state (Rothbard, 1997: 43).

Then we have the *Tamil Nadu Minor Mineral Concessions Rules, 1959* rule where it dictates that the government in India is the one issuing licenses for mining activities inside India. This was built upon by the *Mines and Minerals Act 1957* where it is determined that regional governments can issue small permits towards minor metal mining. Because sand is classed as a minor metal the regional governments could now issue sand mining licenses towards private actors.

A thing to take away from these regulations is that the Indian government is using Electronic auctions to sell the rights to mine sand (Government eAuction system, n.d) These auctions work on a three-year basis, so companies bid for the rights to sand mines. It is the Indian government appointed PWD that determines who gets awarded the sand mine and mining right over India (Government of India Ministry of Mines, 2018). This too points towards a mercantilistic approach in that the Indian government, through its PWD office determine its partners and exclude everyone else (Rothbard, 1997: 43).
Another regulation implemented more recently is the nationwide sand mining ban using machinery issued by the National Green Tribunal under the *Sustainable Sand Mining Management Guidelines of 2016*. This dictates a nationwide stop in sand mining with machines across India. Thus, every sand mine and river miners across India was ordered to stop.

In using the imperialism and mercantilistic perspective on the Indian government's rules and regulations we see that the Indian government is striving to control the raw resource supply of sand through political policy control. We also have mercantilism in that it is the Indian government that determines who gets the sand mining contracts with the implementation of the quarantine act. (Government of India Ministry of Mines, 2018).

### 6.4 State private relationships

Now that we know that the Indian government is using imperialistic and mercantilistic policy tools in its strive for control over sand we will shift our focus towards the implications in this relationship. The theories will be used to determine the full extent of this relationship between the state and their preferred actors.

In the implementing these direct sand controlling policies the Indian state locked out the entire construction sector. Every construction site nationwide stood still as their main resource was under a strict mining restriction. This created problems for the Indian government and the regional governments as their infrastructure improvements like the 100 smart cities and the industrial corridors to stood still. Because this nationwide ban on sand mining a black market emerged to fulfil the needs of the construction sector. This black market is made up by the Indian sand mafia, but this mafia is not a traditional mafia in a sense as it is made up of loosely connected criminal gangs and smugglers, that all operate within the illegal sand mining sector instead of the more traditional family-style mafia (Salopek, 2019). What ties this illegal sand mining network together with the traditional mafia is their use of extortion, bribery and violence (ibid). These changes are indicating towards a form of sectoral imperialism as a potential developed relationship between the regional governments of Indian
and the illegal mining operations could exist. This because the size of this illegal sand mining operations and the lack of countermeasures taken by the regional governments.

To get a better picture if there exists a relationship between the two parties, the use of interviews done by news reporters and researchers on-site with field studies will be used. These interviews are with members involved in various ways in sand mining. Be it from sand mafia members, shipping company owners or environmental activists. What they all refer to is government involvement with the sand mafia, but they leave out names, size or the extent of involvement. The government is this dark player in the background. One can question their bias as they are directly involved in the sand mining and might have a bias in spreading this information but the fact remain that they are all referring to government involvement in the illegal sand mining.

Ashok Kumar who is a counsel in the Madras High Court writes that “On paper, PWD conducts sand mining auctions once every one-three years and awards mining rights to those who win the bid. But in reality, only a handful of regulars win the contracts every time, be it under the government of All India Anna Dravida Munnetra Kazhagam party or Dravida Munnetra Kazhagam”. - (Kurek, 2018). In the same article, Vijayraj, the owner of a sand import company writes “PWD sees us as competition to these players and is thus trying to snuff us out,” -(Kurek, 2018).

Then in an interview with Sumaira Abdulali, the president of the Awaaz foundation she declares “A lot of the people who control the sand mafia control the construction companies and the construction material producers too. In addition to that, they are also controlling the administration through their political contacts. The whole value chain, right from extraction to construction.” - (Sand Wars, 2013: 26.20)

Lastly, under National Geographics investigation towards the consequences of sand mining in India, its reporters got stopped by the local sand mafia. The sand mafia wanted help by reporters as they were paying to much in bribes, it left little out for their own profits. Under this meeting, the reporters interview the leader of the local gang “Yadav says India’s sand mafia will not go away soon because it includes many business people and politicians. The
police’s cut of the “royalties” alone, he claims, inflates the price of his region’s finite river sands from 15,000 rupees (about $200) a truckload to between 40,000 and 80,000 rupees. It is outrageous. All he asks for is fairness—his share” - (Salopek, 2019)

However, what gives more concrete information in the extent of the government involvement with the sand mafia are these scandals:

The biggest of these scandals is the Uttar Pradesh sand mining scandal. This refers to the exposure that members of the Uttar Pradesh regional government were found collaborating with illegal sand miners in that they had given illegal sand leases and permissions for mining activities. Because this scandal is an ongoing investigation by the Central Bureau of Investigation (CBI) we do not know the full extent of corruption and favouritism. What we do know is that Uttar Pradesh cabinet minister Gayatri Prajapi and 6 other Indian Administrative Service officers are the as of now released big names involved. Then we have 5 mining officers, 2 geologists and 24 persons classed as others involved in this scandal. Another big point in this scandal is that the Uttar Pradesh’s government had been very slow in implementing the nationwide ban on sand mining and had taken no countermeasures against these illegal miners (Chakraborty, 2019).

In the Maharashtra region, there have been accusations towards its regional government of cooperating with the sand mafia. Now, Maharashtra is the forerunner of construction in India and has recently been accused of lagging behind in its implementing of the sand mining regulations of Sustainable Sand Mining Management Guidelines of 2016. So the region in India that is building the most is reluctant and staling its implementation of controlled sand mining (Nambiar, 2019).

Another state in India that is accused of being very lenient towards sand miners is Goa. It was recently discovered that Goa is giving sand miners that was caught by the police and arrested a very low fine and then released immediately them from prison. Even in some cases letting them go back to their mining equipment and trucks (The times of India, 2019b).
Then the Punjab and Haryana High Court had ordered a Special Investigation Team (SIT) to investigate Punjab's regional government because it was believed to cooperate with the sand mafia. So 2016 the court released a statement after the investigation was complete saying “The officers of the state of Punjab are either complicit or in connivance with persons responsible for illegal mining” - (Grewal, 2017)

And lastly, we have the note issued by the supreme court of India to the regions of Maharashtra, Tamil Nadu, Andhra Pradesh, Punjab and Madhya Pradesh on the alarming extent of illegal sand mining activities in their regions and the lack of implementing countermeasures against these illegal sand miners (Nambiar, 2019).

In connecting these scandals towards this thesis main theories we have the factor from imperialism 

*if the state and private companies share an interest in a distinct sector or industry it will evolve into a form of partnership between the state and the private sector.*

What we have here with these accusations from sand mafia members, shipping company owners and environmental activists mixed in with these scandals is a form of a partnership, the governments of their respective regions have given mining leases and permissions to private actors so they can mine sand. The politicians get in return either sand for their construction projects or direct bribes. A problem that emerges is we do not know the full extent of this partnership as most of these scandals are under investigation and they are regionally specific. However, as Harry Magdoff describes it this partnership is dependent on the situation and mutual interest (Magdoff 1969: 12-14 35-40). This partnership is more of a prid quo pro relationship than an alliance, but still a form of imperialism and mercantilism as there exists a partnership between the government and the private sector. Here we also see room for mercantilism in the Electronic auctioning system where all power is given to the PWD to choose which private company gets awarded the mining right. This is what Vijayaraj the owner of a sand import company is accusing the PWD of doing. In that, they are only giving mining rights to the same companies every year and sees every other company as being a competitor to the PWD sponsored companies (Kurek, 2018).

Overall, both imperialism and mercantilism are applicable in this case of illegal sand mining in India. What differentiates imperialism from mercantilism, in this case, are the results of
this partnership. Because imperialism is more focused on the results of these partnerships while mercantilism pays it little to no mind. So, we need to use imperialism to get the full extent of this partnership and to be able to answer our research question of *too what extent a form of sectoral imperialism can be found in India's construction sector.*

### 6.5 Environmental harm

One important indicator of imperialism is the extent to which the weaker party is harmed by a certain form of economic or industrial developments. Be it environmental harms or social repression. I will measure this environmental harm through the use of the United Nations study *Sand rarer than one thinks* (Pascal Peduzzia 2014) where we get the following environmental impacts of sand mining in India:

**Table 6: Environmental Impact of Sand Mining**

<table>
<thead>
<tr>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity loss in that sand mining has a negative impact on related ecosystems (for example fisheries and other water life such as the dolphin population and removal of egg-laying habitats).</td>
</tr>
<tr>
<td>Land losses in the form of inland and coastal erosion.</td>
</tr>
<tr>
<td>Infrastructure collapse through damages to bridged, roads, coastal infrastructures.</td>
</tr>
<tr>
<td>Landscape damages from the transport of sand towards concrete factories.</td>
</tr>
<tr>
<td>Hydrological function in changes to water flows, flood regulations and marine currents.</td>
</tr>
<tr>
<td>Water supply is damaged through the lowering of the water table and pollution.</td>
</tr>
<tr>
<td>Climate damages through emissions from transport and in the production of concrete.</td>
</tr>
</tbody>
</table>

Source: Peduzzia (2014); Salopek, (2019)

The loss of basking and egg-laying habitats is achieved through the wide use of dredgers (Peduzzia, 2014). A dredger is like a big vacuum cleaner that sucks up the riverbed and sea bed in its extraction of sand. Now here we also make use of another infographic from UNEPs *Sand rarer than one thinks* (Peduzzia, 2014) where they created a picture outlining the harm and dangers of a dredger.
As for who does the dredging in India, we have the government-sponsored corporation Dredging Corporation of India (DCI), through means that remind of mercantilism the Indian government is restricting the dredging market with giving a monopoly to DCI (Mehta, 2006: 240). This also ties in with sectorial imperialism as we have a direct government-private corporation partnership where they each benefit from each other and the results of this partnership are not in focus. As these dredging ships are still widely used today (dredging corporation of India, n.d) It does not have to be these multimillion-dollar dredging ships that destroys the riverbeds as using a shovel and bucket to dig up the river bottoms and removes the water life’s natural habitat, it's just these automated ships does it on such a larger scale than the farmer with a shovel and bucket.

The other big environmental impact of sand mining is the land loss and infrastructure collapses along the rivers where sand mining takes place. Because when you dig up sand from the rivers the riversides start to erode. This is going so far that houses and bridges have started to collapse because the sand they were supported by had eroded away (Parmar, 2016). This is not only an ecological impact of sand mining but also an infrastructure impact as both the riversides and the houses and roads are disappearing because of widespread illegal sand mining (Salopek, 2019). Now, these are the result of the illegal sand mining, and to some
extent this sectorial imperialistic partnership. For without this partnership the Indian government could possibly have limited and eradicated the widespread illegal sand mining.

6.6 Human harm

Another important indicator of imperialism is the extent to which human beings are harmed by certain forms of economic or industrial development. I will measure this through the use of news articles published surrounding violence and conflicts in regards to illegal sand mining. This because the Indian sand mafia in its illegal sand mining is notorious for stirring up violence and harming other humans, be it police officers, regular workers and journalists (Beiser, 2017a). The following table 1 will give an example of this violence from a time period of from October 2019 to January 2020.

**Table 6: Violence surrounding illegal sand miners**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/10-2019</td>
<td>Woman injured in mining mafia attack.</td>
<td>A woman living in a village where illegal sand was happening near got attacked by “hired goons” from the sand mafia when she complained to them</td>
</tr>
<tr>
<td>24/10-2019</td>
<td>Six police officers injured after attack from sand mafia</td>
<td>One police officer dead and six injured following a raid towards an illegal sand mining operation.</td>
</tr>
<tr>
<td>16/11-2019</td>
<td>Man attacked for telling officials about illegal sand mining in Narol</td>
<td>After informing the mines and minerals department of an illegal mining operation the informer got attacked by the sand miners, resulting in serious injuries towards his wrist. The informer then got threatened towards death if he informed the miners department again.</td>
</tr>
<tr>
<td>20/11-2019</td>
<td>Sand mafia try to mow down cop during a night raid</td>
<td>During a raid night raid on illegal sand miners a miner tried to ram the police with his tractor.</td>
</tr>
</tbody>
</table>
These are quite a lot of cases just in three months surrounding deaths and violence between illegal sand miners and various police officers and government officials. Then we have cases of fighting between sand mafia members and journalists in India.

First, we have Jagendra Singh who was investigating illegal sand mining in northern India, shortly before his death he wrote a social media post saying “Politicians, thugs, and police, all are after me. Writing the truth is weighing heavily on my life.” After his post he got killed (Watts, 2019).

Then we have Karun Misra, another journalist writing about the sand mafia in India. In an interview conducted by indiaspend.com with Misra’s friend by it is said that Misra got a warning that “something was going to happen to him on either the 11th or 12th of February”, the day after he got the warning he got shot to his death. This murder was after Misra had refused briberies and ignored threats issued by the sand mafia (Campbell, 2016).
Lastly, we have the journalist Sandeep Sharma who wrote a news story about the sand mafias ties with local police officers. Sharma had recorded evidence of a senior police officer taking bribes by the sand mafia. Sharam was later overwhelmed with threats so he sought out protection from the police but was denied this. The police then seized his camera equipment where the recording of this bribery was stored. After the incident with the police, he was killed in a motorcycle accident which many believe to be an orchestrated murder of Sharam as his motorcycle was hit by a big truck (Watts, 2019). Reporters Without Borders has noted that journalists “who cover India’s sand mafia are often the victims of violent reprisals” (ibid).

Some of these cases represent infighting between local villages and are not related to illegal sand mining or just unfortunate traffic accidents. But the sheer number of reports surrounding deaths and violence-related towards sand mining is staggering. A quick search for “sand mafia” in the Indian newspaper Times of India we get hundreds of cases of violence surrounding sand mafia in India. These cases in table 1 are only from a three month period while illegal sand mining has been going on for years in India but they still show a trend of violence surrounding sand mining.

In connecting these cases towards the theory we see the full extent of the imperialism in India with death and violence following it. We see that the partnership between the regional governments and the sand miners is leading towards an increase in violence and deaths surrounding sand mining. For without this partnership maybe the extent of illegal sand mining could be controlled and counteracted.

7 Conclusion

7.1 Introduction

To conclude the analysis we will go back to the research question of this thesis: To what extent does the global expansion of construction industries lead to a sectorial-specific imperialism in the 2010s against the Indian population and environment?
The research method conducted a timeline focused case study of India where the global increase of the construction sector and the Indian construction boom was put in the centre. Through the use of a sector adapted theoretical framework this thesis was able to draw conclusions such as an adaption from the Indian government of mercantilism and imperialism in regards to the rules and regulations concerning sand mining. These regulations are in the form of centralizing control over sand mining and sand import as this resource is running out. What more is the development of a partnership between the Indian government and private sand miners and importers. This through the use of mercantilistic and imperialistic policy choices such as choosing a preferred partner and excluding everyone else and implementing non-tariff barriers. After these policy implementations, the use of imperialism through this sectorial lense has shown us the full extent of this partnership with a focus on the victims.

7.2 Summary of policy choices

This section will summarize the policy choices made by the Indian government with the use of imperialism and mercantilism. This to better understand the extent and timeline of which these theories are the functioning as the guide towards India's policy changes. It was through measures such as policy documents that this thesis could derive the following:

Mercantilism is first seen is with the introduction of the plant quarantine act 2003, where every importer of sand is required to have a government-issued import license and it is required to sell through the government-controlled Public Works Departments auctions. In this, the Indian government has centralised control over sand import and blocking non-state supported actors from importing sand, through non-tariff barriers in the form of the Public Works Department and license requirements. This regulation also establishes a preferred partnership system where the Indian government is the one choosing their preferred partners in sand trading and excluding the other sand importers.

Then with the Introduction of Tamil Nadu Minor Mineral Concessions Rules, 1959 the Indian government is here too centralising control and establishes a barrier over sand mining with a license requirement to mine sand. What this rule is doing is giving the Indian government the
sole control over who can mine sand and who cannot. They are the once choosing their prefered actors through a state-issued monopoly. Or so they thought.

With the introduction of Mines and Minerals Act 1957 the twenty-eight regional governments in India could now issue mining licenses. So sand miners can go to regional governments and get their license instead of going to the Indian government in a way to circumvent the state monopoly.

This Mines and Minerals Act 1957 is what causes the sectorial imperialism to spring forth as the regional government were able to keep issuing sand mining licenses and ignore the orders from the supreme court of India, and the Indian government's nationwide sand mining ban. This lead to some of India's regional governments adopted a sectorial imperialism policy where they started to cooperate with private actors in illegal sand mining. This cooperation is built on mutual benefit between the private sector and the regional governments where the regional governments get sand for their construction projects and bribes while the private actors get to make quick money in sand mining.

7.3 Summary of partnership between regional government and private miners

Now in showing this sectorial imperialism, the thesis made use of measures such as different scandals and accusations from people involved in the various ways with the sand mining industry. Through these accusations we got a picture that the regional governments are involved with the sand mafia on a personal level as they keep issuing sand mining licenses and trying to scare away whistleblowers. With the scandals we see that on a holistic level the regional governments are delaying the implementation of this nationwide sand mining ban and are also directly involved with the sand mafia.

What we have here is on the higher government level the Indian state is trying to implementing a mercantilistic policy stance on sand, but on a regional level sectorial imperialism is rampant. So we have two different government organisations working against each other in their policy goals.
7.4 Results of this imperialistic and mercantilistic policy choices

Using imperialism as our basis to better understand the full extent of this partnership between the regional governments and the sand miners. This because imperialism is more keen to analyse the effects of such a state-private partnership. Now in this partnership we get a result of conflicts and death between the Indian population and heavy damages towards India’s environment.

To summarise it all up with answering our research question, we get that the global expansion of the construction industry is leading towards mercantilism and sectorial imperialism, at least in India and in regards to the policy choices concerning the construction sector. The extent of this imperialism is also seen as harmful towards India's population and environment.

7.5 Further studies

The topic of sand offers an intriguing and important field of study in academia. It is a growing problem that spans the world, not only India so there exists a lot more research to be done. First a comparative case study with China would be grand. In such a study one could use this thesis theoretical framework and measurements and apply it on China to see if the results are the same as the Indian case or on what points they differentiate. This because China is the world's largest consumer of concrete and India the second largest. China also possess the world's largest sand mine in the form of the Lake Poyang on the Yangtze River and has the same environmental problems India is facing with collapsing riverbanks and infrastructure damage (Beiser, 2017b). After the completion of such study, it would be of highly interesting to compare them both and see if China has adopted the same policy choices as India and if there exists a similar case of a sectorial specific imperialism inside China's borders.

Another case this framework could be applied on is Dubai or Singapore. They are both massive consumers of sand for land reclamation purposes as they are expanding their territories because of urbanisation. In this expansion, they also make use of river and sea sand as desert sand is to round for use in land reclamation. Here the use of sand is creating geopolitical issues as when you artificially expand your land with land reclamation programs
you also expand your maritime borders and they have to be remapped. Thus, a study of the use of sand to expand borders would be quite interesting from a security perspective. A potential case would be China's use of sand to build islands in the South China Sea to get a political claim over these valuable shipping routes and how this is affecting the politics of Asia from a security standpoint ((Beiser, 2018).

Now on the security topics of sand applying a resource war theoretical framework on sand would also be an interesting study. This because both China and India is both under construction booms and is rapidly improving their respective infrastructures with concrete. So, with sand becoming more and more scarce what would happen between these emerging superpowers as they both are sand dependent from a resource wars perspective?

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