

Restricting Negligent Wastage / Pilferage at sites for Infrastructure Projects

by

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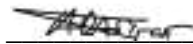
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Dedication

This work is dedicated to all the site personnel and related administrators sitting at the office who have dedicated their time, energy and intellect to reduce negligence and pilferage at construction sites for small and medium enterprises in developing countries throughout the world. This work would be taken as a path breaker and would lead to the right direction of material and manpower reconciling at construction sites in a hassle free and easy approach that would make lives much easier and a continuing vigil can be kept continuously at the construction site.

“Many of life’s failures are people who did not realize how close they were to success when they gave up” – Thomas Edison.

Acknowledgements

There are a lot of people who have been around me with their words of encouragement and positive vibes which has done a pivotal role in shaping my positive approach towards finishing this elaborate journey.

First and foremost I must name my parents, Subir Ganguly and Indrani Ganguly who have been a constant supporting my ways to go forward in life. They have always guided me with their experience and expertise and with their everlasting love and believe in my abilities.

My wife, Moumita has always been behind my back and always tried to hold me up in times of failures and grief.

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And lastly, but definitely not the least, my guide and DBA mentor, Dr Anna Provodnikova who has been an inspiration and a constant source of guidance.

My sincere thanks to all of you. My journey of this degree would not have been possible without all your support.

ABSTRACT

Restricting Negligent Wastage / Pilferage at sites for Infrastructure Projects

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2024

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Indian topography offers various challenges in building infrastructure as it has different and adverse terrains, starting from plains to mountains and coastal belts. Investment in Indian infrastructure sector is a whopping 35percent of GDP. Across construction sites I have observed that, negligent wastage or pilferage of construction raw materials vary from 7 to 25 percent or even higher. Therefore, in this current competitive industry, it is imperative to restrict this wastage cost to a bare minimum otherwise survival of the institution would be at stake. There is no structured and generalized model till date in India that can be adopted by small and medium enterprises at a competitive price. So, to help them minimize this negligent wastage /pilferage it is imperative to make a model which would be productive for small and medium enterprises. Larger enterprises have gone for models that suit their business styles but those are not widely popular for their complexity and definitive use for the individual company, neither the smaller enterprises can afford the manpower and expenses required to run such a program. This wastage for mid-level and smaller companies can be controlled by the implementation of a model framework that requires easy to manage data points and proper intervention if the alerts are

raised. The framework will ensure that the data points can be easily entered by site advisors in remote locations who have very less technological adoption or construction education. The aim of the study is to specifically restrict negligent wastage/ pilferage of construction materials at Project Site and to identify and build an intervention framework that helps in reducing the spillage. So, we intend to collect data across small and medium enterprises in a model state like West Bengal which has all the potential terrains through a frame of questionnaire to understand the industry-wide practices across unstructured small and medium enterprises in Eastern India to reduce this negligent wastage and draw a generic model to be applied across sites of construction to benefit the industry.

Directed by: Soumik Ganguly

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CHAPTER I INTRODUCTION

1.1 Introduction

In India, investment in infrastructure is about 35% of the GDP. Indian topography offers various challenges in building infrastructure as it has different and adverse terrains starting from plains to mountains to coastal belts (Gautam et al, 2009).

West Bengal can be considered as a model state in this regard as, in the North, it requires constructions in the rugged and high altitudes of Himalayas, in the west, it requires construction in the red soil of the plateau, in extreme south, construction is required in the marshy areas of Sunderbans along with sandy coastal regions and rest is the Gangetic plain.

As a construction engineer, having worked across numerous construction projects for the last 14 years spanned mostly across the state of West Bengal as well as in different other parts of India. It has been clearly observed across construction sites amongst and across countries that the wastage generally varies from 7 till 25 percent in some project sites. This wastage depends on a lot of factors like site location, surveillance, manpower training, interference from outside, improper and irregular reconciliation of materials, negligent and compromising behaviour etc.

So, in this current competitive industry, it is imperative to restrict this wastage cost to a bare minimum, otherwise survival of the institution would be at stake.

There is no structured and generalized model till date in India that can be adopted by small and medium enterprises at a competitive price to help them minimize this negligent wastage /pilferage. Larger enterprises have gone for models that suit their business styles but those are not widely popular for their complexity and definitive use for the individual company. Neither the smaller enterprises can afford the manpower and expenses required to run such a program.

The wastage is more difficult to control for mid-level (turnover below 250 crores) or smaller companies (50 crores or less) as they cannot implement costly project management software like SAP available in the market.

This wastage for mid-level and smaller companies can be controlled by the implementation of a model framework that requires easy to manage data points and proper intervention if the alerts are raised.

The aim of the study is to specifically restrict negligent wastage/ pilferage of construction materials at Project Site and to identify and build an intervention framework through a series of questionnaire and data that can be taken from the specific industry that helps in reducing the spillage.

Hence, we would like to understand the industry-wide practices, across unstructured small and medium enterprises in Eastern India, undertaken to reduce this negligent wastage and frame as pillage proof generic model that can be applied across sites to benefit the industrial together.

1.2 Problem Statement

The importance of getting a better understanding of the utilization of construction materials at site is increasing because the natural resources are slowly getting scarce and our ecology and global weather is getting affected due to the recklessness of the human race which is trying to change anything and everything around in order to suite its own convenience not thinking about the long-term impact that nature would bestow upon them. The utilization and reuse of materials has been dealt with negligently enough around the globe which has already left huge unutilized stockpiles and have hugely depleted our natural resources.

Material's storage, handling, operation factors, designated design along with

documenting factors and procurement factors constitute in totality the central source of waste materials in building construction sites. Amongst the cause of construction waste are unwarranted client changes in penultimate stage, tradesmen induced errors, non-compliance of purchased products from specs and lack of site material management.

“A report of U.S. Environmental Protection Agency, USEPA (2003) states that, “170 million tons of waste got released in the US in 2003 and 1,900 demolition and construction landfills operate in the USA for disposal of waste”. At the same time, “2 billion tons of waste is yearly generated in the EU and the percentage of construction waste is 31%” (Al-Hajj and Hamani, 2011).

“Inclusion of both the incidence of material losses and the execution of unnecessary work constitute waste, which adds to expenditure but do not add value to the product” (Polat and Ballard, 2004).

The research identifies the key categories of material waste in the construction sites of Ghana to include procurement, design and documentation issues, operational challenges, and those related to storage and handling of materials. Additionally, the survey findings revealed that the most significant causes of material waste are last-minute customer demands, errors by craftsmen or workers, improperly specified purchased items, and insufficient control over materials at the site.

The most discarded materials on construction sites in Ghana are blocks, concrete, cement/mortar, and timber. The report recommends that proper handling and storage procedures be put in place as well as reuse and recycling of waste materials to reduce wastage on sites. This

will greatly benefit the national economy as well as add value to individual clients by reducing material waste.

In order to, assess and understand these practices and reverse the existing malpractices it has become imminent to draw and impose a frame within which the industry can sustain otherwise, the viability and existence of the small and medium enterprises as a whole can become a supervening impossibility. So, we need to draw models to contribute in easing the current scenario and make a brighter future for the enterprises as well as the flora and fauna around us.

1.3 Purpose of Research

The proposed research has a long-term goal of providing a better understanding and better management and procurement of materials at site. The primary objective is to put an end to misevaluations and misrepresentations at site which leads to wastage and pilferage. Also, the study essentially would restrict the negligent wastage and pilferage at site through systematically checking for material expenditures in line with the contemplated requirement at site as per design criteria. Also, it would be amply clear as to how and where the accuracy of materials lies, as to what was evaluated as a background to quote the rates for getting the project. It is pertinent to mention that this would also lead to identifying factors within the assessment in the pretender stage that had contributed towards reduction of profitability or in other words which have been misevaluated in the pretender stage.

To be even more specific the research has the following objectives which would make it a complete model for small and medium enterprises to restrict wastage and pilferage at construction site level:

1. To restrict negligent wastage at site.
2. To restrict and put a stop of pilferage at site.
3. To signify the use of daily reconciliation of materials and get Profit and loss implications as per materials consumed on a day-to-day basis.
4. To get clear idea of the grey areas or unexplored areas of assessment of quantity of materials in the pretender stage.
5. To create awareness by recording the amount of reusable materials available at site.
6. To help save the ecology and flora and fauna by restricting use of excessive virgin materials.

The outcome of this research will be helpful and valuable to all organization of small and medium size. It would put an end to wastage and pilferage in the construction site thereby ensuring that the ecology is saved from unnecessary mining of raw materials and limit use of fossil fuels which in turn would restrict depletion of the ecology and would reduce pollution around the mining and construction area to a large extent. Hence this has a very special social and environmental aspect.

1.4 Significance of the Study

There is no structured and generalized model till date in India that can be adopted by small and medium enterprises at a competitive price and the data input methodology being easy and can be handled by anyone at site to help them minimize this negligent wastage /pilferage. Larger enterprises all around the globe have gone for models that suit their business styles but those are not widely popular for their complexity and definitive use for the individual company.

Neither the smaller enterprises can afford the manpower and expenses required to run such a program.

The wastage is more difficult to control for mid-level (turnover below 250 crores of INR) or smaller companies (50 crores or less of INR) as they cannot implement costly project management software like SAP available in the market.

This wastage for mid-level and smaller companies can be controlled by the implementation of a model framework that requires easy to manage data points and proper intervention if the alerts are raised. Besides this model will be a simple reconciliation model which will be updated with each progressing activity and materials received and released from the stackyard or stockpile.

1.5 Research Questions

Besides the main questions which would complete the gap which has been left from numerous previous works of wastage, theft and vandalism at sites are to be reckoned as most important. To ensure and entrust ourselves to such an essential act of definite and immediate use, we need the following research questions that need to be addressed:

1. How much do we assess the actual requirement and how to streamline the requirement as per need?
2. Considering small and medium enterprises how to identify the reusable materials already present at site and how sensitive are these data for EPC and SBD contracts?
3. During the execution phase how to reconcile the actual requirement at site with that assessed in the pretender stage and how to draw alerts in case of spillage?
4. How to control and restrict pilferage and wastage in regular phases of construction, keeping an eye on the requirement of materials set as per designs approved?

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

To get acquainted with what researches have already been performed and what perspectives have been proposed and brought forward of other studies, the researcher has to spent time in understanding, reading, practicing and noting existing publications, articles, papers and other information useful to the subject available in the website.

The literature reviews scrutinised and read for this research lays out the current knowledge and experience available for the topic under consideration. By defining the boundaries of what is known, the identification of gaps in existing knowledge becomes imperative and clear. The literature review will also be used to identify existing material that supports the research topic in question. This chapter also looks to highlight important research that has been performed, and point out links between existing theories and practices.

2.2 Review of Literature

It has been tried to understand and adjudicate all the problems existing at the site level all across the globe and understand the gaps amidst other positive practices existing at site. Those have been portrayed in seriatim along the tenure of this chapter which would

indeed be of great help and would serve as examples of works done around in construction sites in different countries, terrains and regions across the globe.

2.3 A study of a building site in Ghana

According to research conducted in Ghana by Agyekum, Ayarkwa, and Adjei-Kumi (2013), the construction industry has a considerable and direct influence on various other sectors through its procurement of inputs and supply of goods to these industries.

Society could significantly reduce costs by minimizing waste in the construction sector. The study identified the main sources of waste on construction sites as procurement, design and documentation, operations, and materials handling and storage. Factors contributing to material waste include last-minute changes requested by clients, errors made by tradesmen, purchased materials that do not meet specifications, and inadequate management of materials on-site. The conclusions of the paper were drawn from a structured questionnaire study involving 226 construction projects.

According to the sustainable development model, many countries are working to achieve a balance between conserving the natural environment and advancing the built environment, as we learned during our study.

“Only by switching from the conventional linear production process to a cyclic process centered on material waste prevention, reuse, and recycling can this balance be achieved” (Al-Hajj and Hamani, 2011; du Plessis, 2002).

Design	Operational	Material storage and Handling	Procurement
Insufficient focus given to coordinating product dimensions.	Mistakes made by tradespeople or workers.	Damages incurred during transportation.	Errors in ordering (e.g., ordering significantly more or less).
Changes made to the design while construction is in progress	Negligence-related accidents.	Improper storage causing harm or decay.	Lack of options to purchase small amounts.
Designers experienced in the method and sequence of construction	Work accomplished that has been compromised	Materials provided in an unbound state.	Purchase items that are not in compliance with the specifications.
Lack of focus on the standard sizes offered on the market.	Incorrect use of materials necessitating replacement.	Use any material near the work area.	
Designers lack of knowledge about alternative products	Required amount. Insufficient clarity due to inadequate planning.	Hostile behaviour exhibited by Project team members and workers.	
	Equipment malfunction		

Source: Al-Hajj and Hamani (2011); Polat and Ballard (2004); Formoso et al. (2002); Alwi et al. (2002); Poon et al. (2001)

The client must be the driving force behind waste reduction. The client must make waste a priority in the project brief and set a challenge for the team to complete the work with minimal material consumption. According to Poon and Jailon (2002), the following guidelines must be followed in order to successfully reduce waste:

- ☐ Adopt a mindset that reduces waste
- ☐ Plan to avoid waste
- ☐ Instead of using the in-situ approach, use prefabrication.
- ☐ Adopt a site waste management plan
- ☐ Adopt appropriate material handling and procurement procedures.

A significant amount of solid trash is produced by various domestic and other activities, and the construction sector is unquestionably one of the biggest garbage producers.

The environmental and statistical data from a number of nations make this quite evident. According to the US Environmental Protection Agency, USEPA (2003), “170 million tonnes of waste were generated in the USA in 2003 and that 1,900 construction and demolition (C&D) landfills operate in the USA to receive disposed material waste”. “About 2 billion tons of waste is generated every year in European Union (EU-15) and the share of construction waste is 31%” (Al-Hajj and Hamani, 2011).

“Inclusion of both the incidence of material losses and the execution of unnecessary work constitute waste, which generates additional expenditure but do not add value to the product” (Polat and Ballard, 2004)

Three primary categories of waste exist in the infrastructure sector: material waste, time waste, and machinery waste (AlMoghany, 2006; Ekanayake and Ofori, 2000).

KEYMATERIALS	RE-USE	RECYCLE	REDUCTION
Timber	If you plan to reuse timber onsite, you should always inspect it beforehand to confirm that it meets the necessary quality standards and is suitable for its intended purpose. Timber can be salvaged from various sources onsite, such as floorboards, rafters, doors, window frames, and fencing. Temporary formworks can be utilized multiple times before requiring disposal.	Timber that cannot be re-used on site, should always go to a recycling depot, where it can be de-nailed, cleaned and cut to size. Among other things, timber may be recycled into landscaping pellets, mulching and Chip board for new kitchen units.	Alternative materials can replace timber eg. Bamboo being used in formworks; Standardized building components, Drywall partition and Conventional timber panels can be used; We can also adopt alternative construction Methods.
Cement/Mortar	Preparing to establish an on-site cement/mortar wastes reuse, recovery and recycling systems, and educating workers on the reuse and recycling of cement/mortar wastes on the worksite.		Extraction of purchase management, material control and material management
Concrete	Concrete waste can be reused for temporary work.	Concrete can be recycled as aggregate for concrete production.	Accurately calculating And what about ordering the right amount of concrete; A use of prefabricated building components; and a use of alternative construction methods

Blocks	<p>Offer the customer leftover (full) blocks;</p> <p>Remove block off-cuts for use as aggregate or decorative landscaping cover;</p>	<p>Include a clean-up payment for services provided under the block layer's subcontract to support recycling and to discourage wasteful practices on site.</p>	<p>Order blocks more</p> <p>The best practice for take-off is accuracy;</p> <p>Prevent soil contamination, so that the bottom layers of blocks can remain usable;</p> <p>Store blocks in a firm flat location to prevent breakages from tipping over; find a way to cut blocks more systematically to make both sides usable and breakages to a minimum.</p>
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The research identifies the key categories of material waste in the construction sites of Ghana to include procurement, design and documentation issues, operational challenges, and those related to storage and handling of materials. Additionally, the survey findings revealed that the most significant causes of material waste are last-minute customer demands, errors by craftsmen or workers, improperly specified purchased items, and insufficient control over materials at the site.

The most discarded materials on construction sites in Ghana are blocks, concrete, cement/mortar, and timber. The report recommends that proper handling and storage procedures be put in place as well as reuse and recycling of waste materials to reduce wastage on sites. This will greatly benefit the national economy as well as add value to individual clients by reducing material waste.

2.4 Study of different construction sites in Nagpur, India

According to a different research conducted in India by Agrawal and Madhura (2021), the construction sector is the country's second-largest industry, behind agriculture. Also, one of India's biggest jobs is the infrastructure construction sector. India's substantial growth has been accompanied by an equally impressive expansion in the construction sector. The infrastructure construction business is expected to grow rapidly in the near future due to the enormous increase in demand for infrastructure. In recent years, material waste from the building sector has been viewed as a significant issue. Research and observations from a variety of building sites across different countries have demonstrated that even tiny amounts of construction materials are ultimately wasted.

The building business depends heavily on materials, but not all of them are used at the construction site, leading to stacks of unneeded materials that eventually become waste. In addition to negatively impacting the contractors' profits, this waste has a significant environmental impact. Waste from construction materials presents disposal challenges and is challenging to recycle.



Fig: The 5R technique of construction waste management

It may be possible to reduce waste and its negative impact on the environment by implementing some modifications in the way the building industry operates. The administration of materials in the Indian construction sector is now done by hand, which is extremely inaccurate, time-consuming, and unsatisfactory. There is an urgent need to make optimum use of the diminishing construction raw resources, which are primarily mined, due to the limited supply and rising expense of construction materials.

According to the Oxford Economics and Global Construction Perspectives report, India is poised to emerge as the third-largest construction market globally by 2025 (Fearnley, Robinson, and Leonard, 2023).

India is a resource-constrained economy, so construction materials are always in short supply. If such materials are wasted on a large scale, then their prices will increase infinitely with time. Because of the scarcity, even the projects costs rise and it becomes a pure time cost overrun. Another big problem is that of the disposal. We need new methods for the recycling of construction debris as we are running out of space for waste disposal.

Construction waste materials have great effects on the construction process. This was aimed at reducing the effects of construction waste both on the project and the surrounding environment.

Almost all the estimation work in India is carried out manually, prone to immense labor, time, and cost. Another major problem faced in recent times is the availability of materials; proper utilization will help in timely and economical project completion.

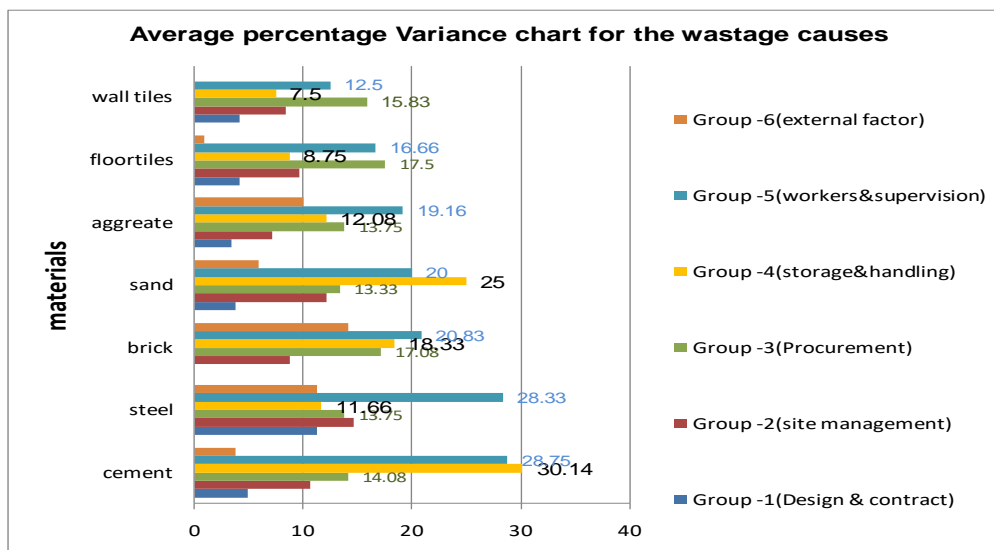
2.5 Study at Jalgaon construction sites

Another study by Patil (2015) begins with the definition of waste and learns about the various factors that influence waste on the job site. Examples of this include the following: "Wastage" is defined as "any losses produced by activities that generate direct or indirect costs but do not add any value to the product from the point of view of the client." It also refers to the difference between the estimated and actual consumption of an individual item and the total factor consumption of all inputs in a construction project.

The most prominent causes of waste in the projects examined are unquestionably contractor negligence, inexperienced labour, a lack of skilled labour, rework brought on by a worker's error, poor material management, unhygienic and unstorable conditions, the failure to use leftover materials, incorrect handling, and misuse.

Due to high contamination levels and a great deal of variety, building materials waste is challenging to recycle, and major cities frequently lack the area necessary for its disposal (Bossink and Brouwers, 1996). Because it typically enables the identification of areas for possible improvement and the primary sources of inefficiency, waste measurement is a useful tool for evaluating the performance of production processes.

Waste measures work better to support process management than traditional financial measures because they make it possible to accurately model some operational costs and produce information that is typically useful to employees, which makes it easier to implement decentralised control.

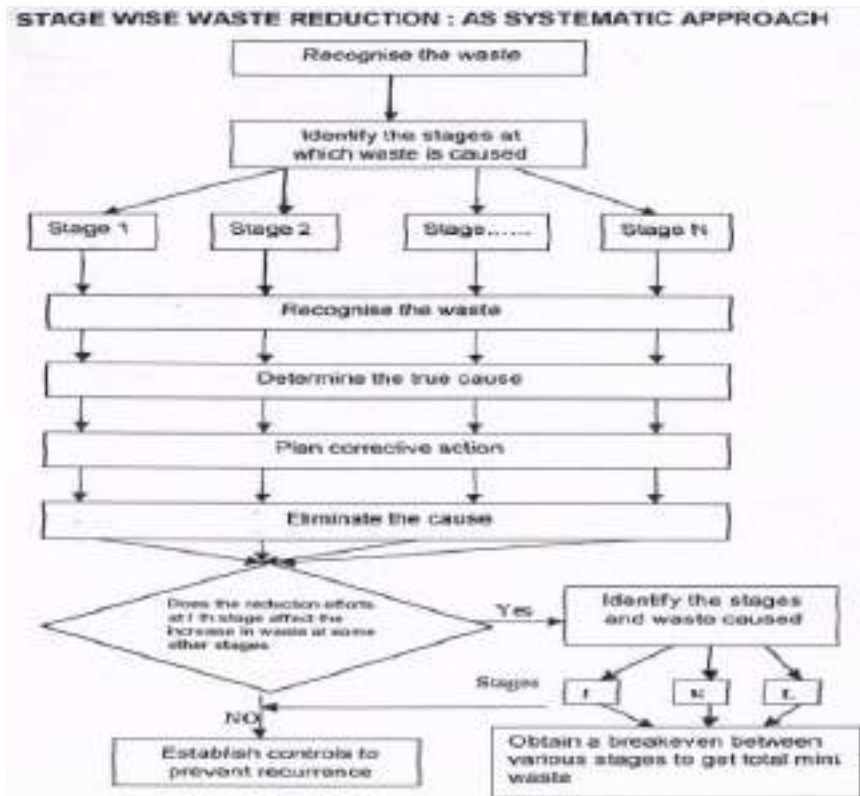


A chart showing the wastage quantum of the materials used at the instant sites is depicted above for reference.

2.6 Study on housing projects

The four Ms—material, manpower, money, and machine—are essential in the building industry. According to Meghani, Vyas, Bhavsar, and Hingu (2011), building materials make up 60–70% of the project cost, depending on the type of housing project. By minimising waste or maximising the use of resources (material), the material waste management function can lower the overall project cost. It is generally considered that there is a relatively high degree of waste in the building industry. Even though it is challenging to quantify all construction waste, incomplete research from different nations has shown that waste accounts for a sizable portion of production expenses.

“Waste has been monitored using a variety of metrics, including excessive material consumption” (Skoyles, 1976; Bossink and Brouwers, 1996), “quality failure costs” (Cnudde, 1991), “maintenance and repair expenses, accidents, and wasted time” (Oglesby et al. 1989).



2.7 Study on imperative reasons of wastage

In order to provide the infrastructure needed for socioeconomic growth, the construction sector is crucial. It uses a lot of raw resources and is one of the largest polluters of the environment. Additionally, it produces a lot of garbage from building. The production of building waste has a significant negative influence on the environment. Even though numerous studies have shown that environmental issues are becoming more serious, contractors and builders are still not very aware of the need to minimise waste. The purpose of this study is to look into the degree of trash on building sites, its causes, and methods for preventing it. Three ideas exist for trash management. They are referred to as

the three R's: reduce, reuse, and recycle. The most important strategy for reducing construction waste is to reduce.

The amount of garbage generated during construction projects can be considerably decreased by focussing on the possible waste producing locations. Using weighted average and coefficient of variation criteria, a systematic questionnaire survey was carried out to gather empirical data on the levels of practice of waste minimisation measures and their substantial contribution to waste reduction. The characteristics for material waste are the basis for the questionnaire's design. The study's findings are used to make recommendations for cutting waste on building sites. A standardised survey questionnaire was used to perform the investigation. Attributes regarding design and documentation, site management and practices, procurement, materials handling, storage and transportation, operational, as well as waste environmental attributes are among the attribute groups which have been identified as being instrumental in waste generation in construction projects.

To identify the primary characteristics of construction waste creation, the data was analysed using SPSS version 12.0 software and the t-test statistical approach of comparing means.

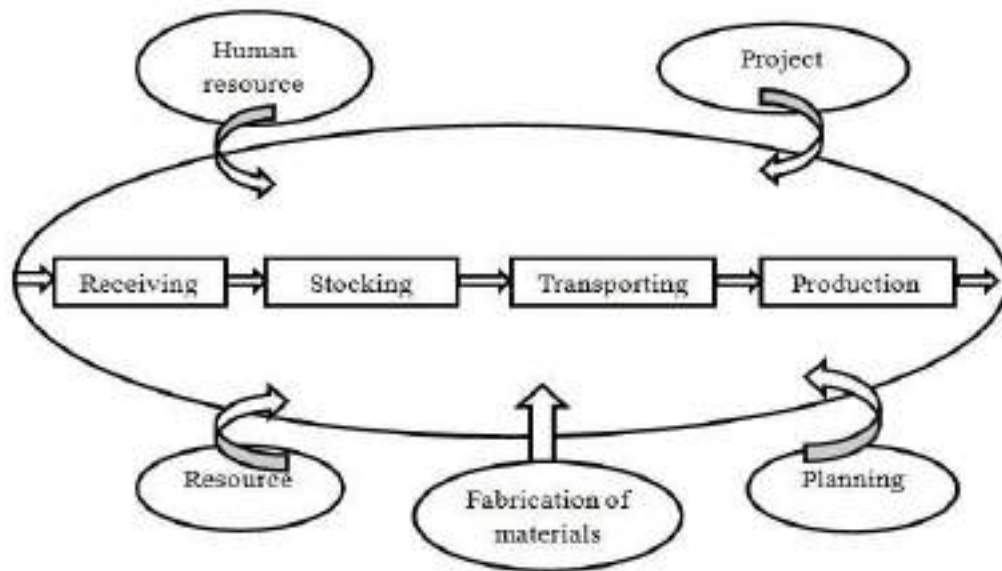


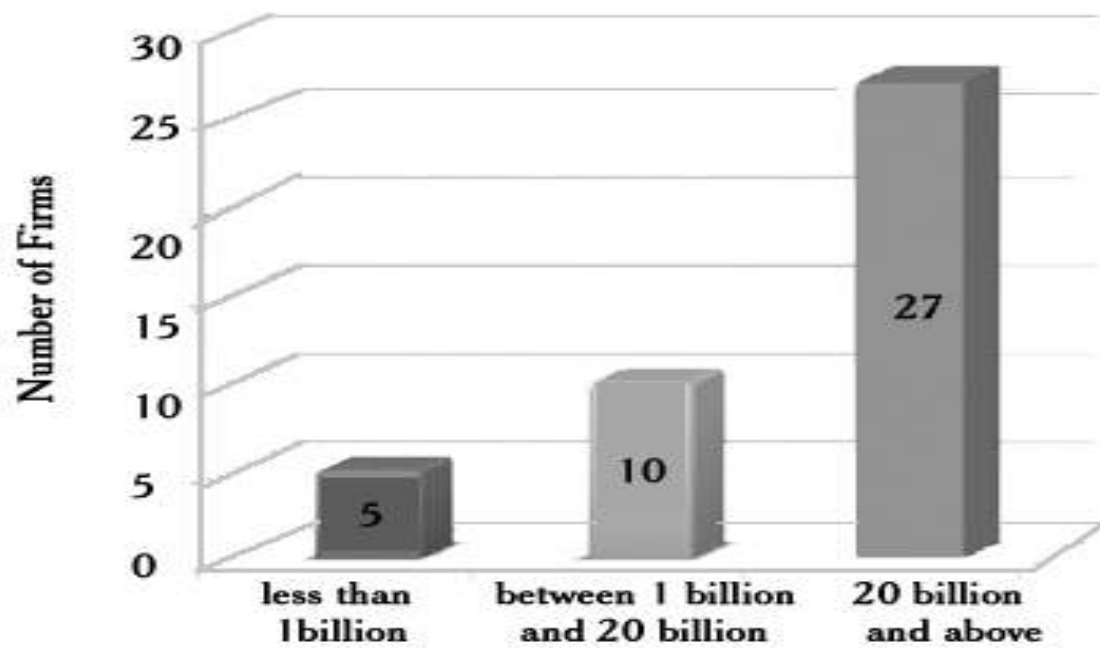
Figure -Waste according to its origin (source: Formoso et al., 1996)

According to the study, the most important factors in each of the waste generation categories were: design modifications made during construction; improper material management, which allowed for inappropriate and incorrect storage facilities at the site, resulting in damage or deterioration; mistakes made by tradesmen; and severe weather conditions. One of the key minimisation strategies is adequate material storage. It is advised to utilise a basic construction waste management system that can assess the origins of these wastes, identify troublesome waste producing sites, and offer statistics on waste quantities. It was believed that prefabricating construction components will greatly reduce waste and maximise resource efficiency (Sasidharani and Jayanthi, 2015).

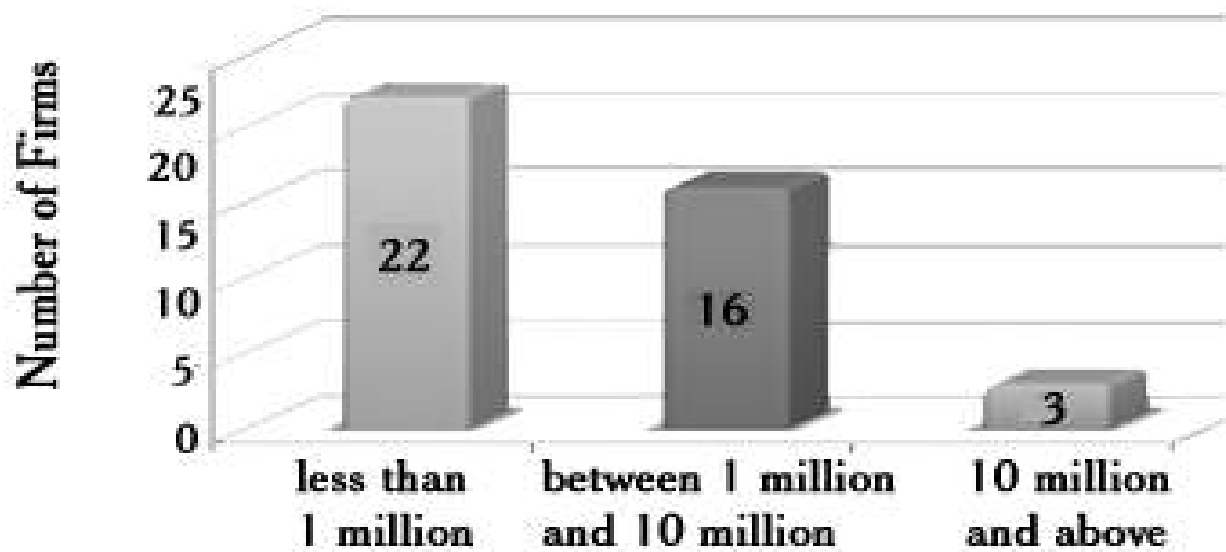
2.8 Study in building sites over vandalism and security concerns

According to a different study by Farinloye, Odusami, and Adewunmi (2013), theft and vandalism are major concerns around construction sites. The frequency of theft and vandalism can occasionally be influenced by the type of construction, which includes building housing projects, roads, highways, dams, airports, and stadiums. In order to reduce the endemic effect, this study examines the types of theft and vandalism as well as security control on construction sites using a variety of security solutions. For the study, a purposive sample strategy was used. In addition to reviewing the literature, opinion poll questionnaires were given to construction experts throughout the three types of construction firms: large, medium and small.

Both descriptive and inferential statistics were used in the analysis of the gathered data. According to the study, large construction companies are more likely than medium and small firms to encounter theft and vandalism. Construction experts concur that determining the reasons behind losses is crucial, and they value every security measure.

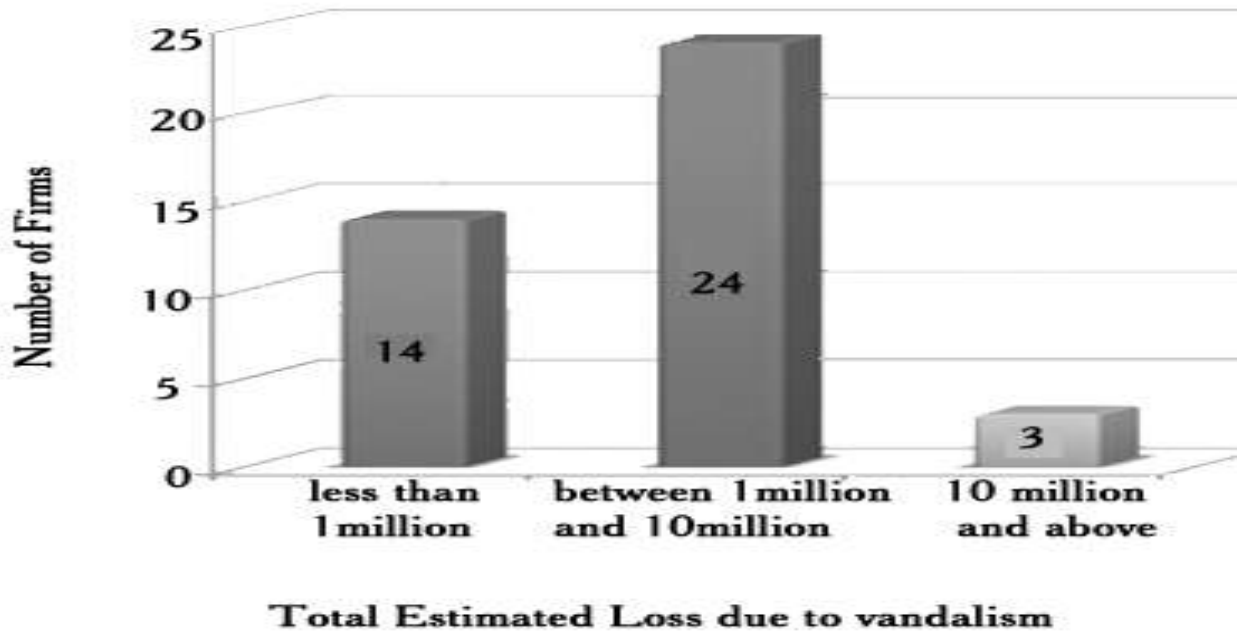


Annual Naira Volume of work Performed



Estimated Total Loss of Theft in 5years

The U.S. construction industry suffers direct losses of about \$1 billion annually as a result of the theft of tools, supplies, and equipment from construction sites. Reducing this number requires a deeper comprehension of the traits of theft. In order to determine factors including the frequency of theft, average financial losses, and recovery rates, this study examines more than 15,000 occurrences from the National Incident-Based Reporting System (NIBRS). According to the survey, contractors lost around \$6,000 on average for each event. With an average loss of almost \$42,000 per occurrence and the highest likelihood of recovery (55%), trucks are the most costly targets for theft. Less than 7% was the recovery rate for all targets, though.



The study's findings offer the most comprehensive and precise data on the traits of construction theft to date. The report also outlines best practices, such as using monitoring systems, to lower thefts. Additionally, the use of cutting-edge tracking and marking technologies to protect costly cars and equipment and facilitate their recovery is covered. It is anticipated that the results will help law enforcement and contractors develop strategies for decreasing construction item thefts and increasing the chances of their recovery (Shrestha and Osborne, 2019).

2.9 Study of theft in Western Ghana

Another study by Ablordepey, Moo, and Akortsu (2020) in western Ghana identified theft as a significant issue in the construction sector. Persistent theft affects both the overall success of the construction sector and the potential profitability of a project. The goal of this study is to investigate the best and most suitable security measures that may be used at Ghanaian building sites in order to reduce or completely eradicate the prevalence of theft there. This study was carried out in Ghana's upper west, where the population of contractors is comparatively uniform. Contractors were given questionnaires as part of a quantitative research approach used for the study.

The data analysis's findings ranked different security measures according to their mean frequency. When construction sites are situated in both highly and sparsely populated areas, lighting, fencing, and gate locking were found to be more effective than other security measures at preventing theft. According to the findings, hiring a watchman is the most effective and popular security measure on building sites, while the least popular ones

include security cameras, alarm systems, and warning signs. Sites would probably be protected from theft if the most important security measures were implemented well and other security measures were taken into consideration. This would also ensure that the money spent on site security was worth it.

2.10 Reducing theft in North Carolina

According to a study on Charlotte, North Carolina's building boom, the number of kitchen equipment taken from newly constructed homes increased significantly as a result. In order to solve the issue, the Charlotte-Mecklenburg Police Department implemented a problem-oriented policing project that lasted for more than two years, as detailed in the paper. For 25 builders working in one of the police service districts north of the city, a thorough examination of security procedures and theft concerns was conducted. As a result, it was suggested that appliance installation be postponed until the new owners had moved in, so eliminating potential targets for theft.

Twelve of the bigger builders consented to test this strategy for six months, although police conducted routine checks during that time and discovered that builder compliance varied.

Nevertheless, research revealed that the policy of postponing installation worked well. The district saw a decrease in appliance theft, and there was no indication that thefts were moving to neighbouring districts. The final examination of the challenges police face when working on problem-oriented initiatives emphasises the critical importance of crime analysis and looks at strategies for enhancing police agencies' analytical capabilities.

The original idea of problem-oriented policing was to draw attention to the police's efficacy rather than just their efficiency. Proponents of problem-oriented police argue that reacting to occurrences as they happen, no matter how effectively, is insufficient. Instead, if the police are to be effective, they must find patterns in the incidents they deal with on a regular basis, analyse these patterns (called problems) thoroughly, and look for innovative ways to intervene earlier in the casual chain to make these incidents less likely to happen again. These innovative tactics go beyond the conventional police responses, which rely on law enforcement to find, apprehend, and prosecute criminals.

Instead, with a strong emphasis on prevention, problem-oriented policing promotes a thorough investigation of alternative potentially effective approaches, either alone or in conjunction with others, without giving up the employment of the criminal law where it is likely to be the most effective response. Therefore, the ultimate and unwavering goal is to boost efficacy by broadening the range of alternative replies and choosing an approach that may lessen the issue (Goldstein, 1979, 1990)

The foundation of problem-oriented policing is the growing recognition—supported by an increasing number of studies—that significant categories of crime have historically resisted conventional enforcement techniques. For instance, foot and vehicle patrols are ineffective at preventing crime in private areas.

The impact of crackdowns on street offences is rarely long-lasting. When crimes are committed at long intervals, stakeouts rarely result in arrests. When the criminal has left the scene, quick action is typically ineffective. For all but a small percentage of significant offences, criminal inquiry is too time-consuming and ineffective. Additionally,

due to overworked court systems and the lack of appropriate sanctions or other types of disposition available to judges, the arrest and prosecution of minor property violators is frequently ineffective. Due to these restrictions, several of the criminal categories that the mentioned tactics target are occasionally classified as "non-suppressible." Thefts from home building sites in Charlotte, North Carolina, which are the offences this project addresses, would be considered non-suppressible crimes.

As can be seen here, they were naturally hard to dissuade and did demonstrate resistance to standard police techniques. However, the Charlotte Mecklenburg Police Department (CMPD) lowered them as a result of a problem-oriented effort. The project's original goal was to demonstrate a thorough, methodical implementation of the problem-oriented policing philosophy. Following the decision to utilise construction site theft as the illustrative problem, the project's second goal was to empower the CMPD to use the problem-oriented technique to address the issue more successfully. This essay summarises the problem's lessons learnt, outlines the efforts made to mitigate it, and provides evidence that the solution was successful.

“This response is categorised as a type of target elimination in the context of situational crime prevention” (Clarke, 1997). Therefore, this report not only details the CMPD's effectiveness in lowering construction site thefts through the use of the problem-oriented technique. It also makes a tiny contribution to the target removal literature. As the study progressed, the lessons learnt about using problem-oriented policing offered yet another advantage that would be useful to the broader policing community. This is particularly perplexing since the core reasoning behind problem-oriented policing is

frequently, and quite rightly, characterised as straightforward or simply common sense (Read and Tilley, 2000).

This study provided a rare chance to pinpoint some of the elements that contribute to the concept's limited number of complete applications—that is, the elements that, in reality, complicate an apparently straightforward procedure. Three factors made this chance special: 1. The project was ambitious; 2. It received more support than is typically given by a police agency; and 3. The authors, who were as involved in the project as we were, were familiar with the concept (Goldstein with problem-oriented policing and Clarke with situational crime prevention, which is a concept that parallels and complements problem-oriented policing in many ways).

Therefore, one of the main goals in writing this paper was to discuss some of the challenges encountered when implementing problem-oriented policing, to pinpoint the obstacles that were faced, and to list some actions that must be taken in order to fully reap the benefits of this approach.

It takes a lot of trial and error to get started because of the basic state of affairs. It's not a tidy procedure. It is a fairly messy procedure, to be sure. Getting one's hands filthy is necessary. It necessitates gathering information and frequently settling for less than ideal. It necessitates updating and frequently adding to current data.

It reveals unforeseen challenges, occurrences that are difficult to quantify, and hazy findings and outcomes. It necessitates having the flexibility to turn around and start afresh. These are some of the factors that contributed to the project's high time, resource, and coaching requirements. And for these reasons, we felt it was worthwhile to document

every aspect of our very small-scale investigation. As Clarke and Goldstein (2003) claim, publication enables others to build upon these efforts, which in turn highlights the need for a refined capacity within policing to undertake such inquiries and develop a solid commitment within policing to acquire new knowledge about the problems police are expected to face.

2.11 Careless site practice in Abuja, Nigeria

Construction professionals handle effective materials management on construction sites with negligence. This could lead to a number of problems, including inadequate materials flow, project delays, low-quality work, and material waste generation. Nigerian construction professionals in Abuja are unaware of the repercussions of these obstacles on building projects. The impact of inadequate materials management on material waste, job quality, and project profitability in Nigerian construction projects is examined in this paper. The study used a qualitative research methodology that includes group case study investigations. The study's population consisted of ten carefully chosen case studies from ongoing construction projects in Abuja.

In order to watch and document the construction processes, people's behaviour, actions, and interactions pertaining to materials management, the researchers used direct covert observation as their study instrument. Observed construction operations included the use of resources on site, the loading and unloading of materials from storage facilities and procurement, as well as the handling and transportation of goods on site. To observe

and record the impact of inadequate materials management, recording sheets with checklists were pre-set with statements (Likert items) and responses. A three-point Likert scale was used to score the statements. To get the modal values, descriptive methods were used to examine the observed/collected data.

According to the study's findings, inadequate materials management has a significant impact on the amount of material waste generated on construction sites, moderate effects on building project quality, and both significant and moderate affects on construction projects' profitability.

Based on these results, it can be said that efficient material management in building projects will minimise waste production, improve the calibre of construction work, and provide the highest possible level of profitability for building contractors. Therefore, it is advised that Nigeria's construction sector work with government organisations to create standards for creating a waste management strategy for the sector.

2.12 Material management and losses

“Materials management is defined as the process to provide the right material to the right place on time and in the right quantity, in order to minimize the cost of a project” (Kulkarni, Sharma and Hote, 2017). “The main goal of materials management is to ensure a smooth flow of materials from the time the materials are ordered until they are used. In order to make materials management on site effective, a proper integrated materials handling process that includes the planning, identification, procuring, storage, receiving and distribution of material, should be in place” (Dallasega and Rauch, 2017).

“In the construction sector, structures are physically erected utilising the tools, supplies, materials, management, and supervision required to complete the job” (Clough, Sears, and Sears, 2000). Numerous companies are involved, including customers or owners, engineers, architects, contractors, suppliers, and vendors. It also encompasses the diverse and frequently intricate process of creating one-of-a-kind, sizable, and immovable goods using a supply of resources (cash, machinery, materials, and labour).

“Unfortunately, even the most skilled project managers face challenges due to the complexity, unpredictability, and dynamism of the majority of construction projects” (Duy, Ogunlana, and Thi Xuan, 2004). “Their problems also include a lack of storage space, damage and waste, pricing volatility, supply delays, and shortages of supplies” (Asmara, 2015; Kasim, 2011; Ying, Tookey and Roberti, 2014).

“Construction materials management is defined as a reduction in the amount and environmental effect of material waste generated, by reducing the quantum of materials used in a construction project” (Adafin, Daramola and Ayodele, 2010). “Construction companies, which support an integrated material management process, practice the design and construction of new structures or the re-modelling of existing structures, in order to use materials more efficiently” (Kulkarni et al., 2017; Muleya and Kamalondo, 2017). “This means that an excellent management system for handling materials from the design stage to the usage of the materials throughout the construction period contributes to the overall performance improvement of construction projects in terms of duration, budget, quality,

productivity, and material waste” (Asmara, 2015; Arijeloye and Akinradewo, 2016; Kulkarni et al., 2017).

“Construction companies that do not implement a proper materials control and management system often experience cost and time overruns, substandard work, disputes, and abandonment” (Adafin et al., 2010; Acta Structilia 2021Adewuyi, 2012; Ameh and Itodo, 2013). “Improper materials control results in careless handling of materials, excessive expenditure on materials, profit loss for the contractor, and loss for the supplier when mishandled materials are rejected and returned” (Omotosho, 2006).

The impact of PMM (poor materials management) on material waste, job quality, and project profitability in Nigeria's construction sector was examined in this paper. According to the study's findings, PMM significantly influences the production of material waste on any building site, as evidenced by the following claims:

Implementing a materials waste management policy, accounting for materials waste, managing site waste management plan cost data, managing waste-related KPIs, and having a negative influence on the waste management plan are all made more difficult by PMM.

The following claims support the study's finding that PMM has a moderate impact on Abuja construction projects' quality: PMM has a detrimental effect on the quality of certain materials on site; it undermines the management-established quality standard and makes conducting materials quality audits challenging.

It was discovered that PMM had both high and moderate effects on profitability in the Nigerian construction sector in Abuja. The claims were that PMM causes

inefficient material accounting, which impacts profitability, and that PMM promotes waste, which lowers profitability.

These results support the notion that efficient material management in building projects will minimise waste production, improve the calibre of construction work, and maximise profits for building contractors (Albert, Shakantu, and Ibrahim, 2021).

2.13 Construction waste and environmental depletion

Construction debris has produced major environmental issues in many large cities, according to a different research by Tam (2011). Because so much infrastructural and building work has been done, there are more buildings being demolished during construction. There is a shortage of landfills because to the growing demand for disposal sites for endlessly demolished trash. As a result, cutting waste production becomes a major global concern. By reducing waste, it is necessary to make sure that construction operations and end products adhere to environmental regulations and best practices. Avoiding the creation of material waste is the best way to handle it.

The challenge of developing a technique and applying it to benchmark future building projects is one of the main obstacles to waste minimisation on a construction site. In order to address this shortfall, McGrath developed a waste minimisation system known as Site Methodology to Audit Reduced Target Waste (SMART Waste), which audits, reduces, and targets waste generated on construction sites in order to improve material recovery for reuse and reduce waste generated on future sites. The audited waste arising is utilised as a standard for implementing the systems. Teo and Loose further viewed a theory

of waste behaviour for the construction sector to explore attitudinal forces that shape behaviour at the operational level, and they suggested that managers help improve workers' attitudes towards waste and help them find economic incitements.

Although efforts have been made to recycle materials including concrete, mortar, steel, and soil, as well as to promote recycling and sustainable resource usage in building activities, there aren't many studies demonstrating the effectiveness of these implementation strategies. This study looks at the rates of recyclable and reusable trash for the six main categories of building materials: concrete, glass, metal, paper, plastic, and wood. Five local case studies and a practical survey provided the data used for the analysis. The analysis can show which kinds of materials are successfully recycled and used again in building procedures. On the other side, obstacles to recycling and reusing various materials must be found.

The results of the survey can therefore guide the development of strategies to increase the percentages of recyclable and reused materials across a range of construction material types and to identify economic drivers.

Coordination between all parties engaged in the design and building processes is crucial to reducing the amount of waste generated on-site, and regular meetings to discuss waste issues should be held. The "3Rs"—reducing concrete by employing prefabricated building components, reusing steel formwork for its maximum applications, and recycling steel to generate income—make it easier to minimise waste during routine construction operations. Despite the fact that encouraging reuse, recycling, and reduction has been recommended in the construction industry for a number of years, various levels

of management assistance do not appear to be able to adequately raise environmental consciousness.

Lack of knowledge on how to deal construction waste is the primary cause of inefficient and unproductive reuse, recycling, and reduction activities. Several strategies for recycling, reducing, and reusing construction materials are proposed based on the conversations with industry professionals.

2.14 Summary

After carefully going through the aforementioned researches and the significant steps taken to emancipate the sites in question from the different problems faced at site, in each research the researcher has taken prominent steps and have outlined the problems in such a way , so as to give the best and easiest solution.

Although theft, vandalism, wastage at site, ecological depletion, security concerns, theft of machineries etc. have been taken up case wise categorically the most intrinsic problem of reconciliation has not been taken into consideration maybe to avoid the complexity of the study. The super facial problems have been dealt with which is of utmost importance but reconciliation is the gap which has to be taken care elaborately.

CHAPTER III: METHODOLOGY

3.1 Overview of the Research Problem

The research project will be based on a series of questions in form of a questionnaire which would be given to small and medium enterprises within the state of West Bengal who are working in the field of infrastructure development from the Himalayas in the north till the Bay of Bengal in the south. The data thus collected would be primary data collected from the companies itself and would prove to be an extremely important and vociferous document for framing the system, taking into consideration how the questionnaire is answered. Superficial methods and ways of control of theft can be related with other literature review and after getting due primary data from the small and medium enterprises the same can be implemented in toto. But this would just serve as an external factor to control theft or dacoity at site, rest all the materials, mineral components, petroleum products and other construction raw materials are to be reconciled using the frame set through quantitative analysis of the primary data collected from actual source. Through this we would be able to overcome the failures that has long been persisting at construction sites like reduction of profitability for negligent wastage and pilferage, daily reconciliation of materials, comparison of materials and POL with required amount contemplated in the pre tender stage, comparison of requirement and actual requirement at site as per sanctioned designs and construction drawings.

The main modelling would be done through a systematic synchronized approach

which will decipher the interim ingredients and would bear the much needed fruit which would put an end to negligent wastage and pilferage amongst construction sites in small and medium enterprises.

3.2 Research Framework

The methodology for developing this entire model framework along with the main steps to be adhered to are presented below in seriatim:

1. First, we have to frame the questionnaire. The important aspects that have to be retrieved through this questionnaire would be as follows:
 - i) Understanding and stating the type of project.
 - ii) Input the material wise data used while quoting the rates in pre tender stage.
 - iii) Input the material wise data that is sanctioned post approval of designs.
 - iv) Draw the differences and point out the lapses in assessing.
2. Identify the amount of reusable materials found at site for the instant work.
3. Tally and redo the differences after use of reusable materials to arrive at the final figure of raw materials needed.
4. Start procurement of materials as per annexure of materials needed for the instant project.
5. Process alerts in case of any spillage of any materials while procuring.
6. Weekly reconciliation statement against amount of work done.
7. Assess negligent wastage or pilferage if any during phase wise completion of milestones.

We have to approach the small and medium enterprises from the state of West Bengal, select their works from different terrains in the state, get data of the raw materials procured by them against items of work to be done. Then we have to compare data of each raw materials like cement, steel, stone chips, boulder, bitumen etc. as per requirement at site for the instant project in consideration and go on seeking data from the selected enterprises across their sites.

3.3 Primary data collection

The entire primary data would be collected from individuals present at the construction site and we can have enough clarity on the types of negligent wastage and pilferage happening at site across all kinds of terrains. It would also be very interesting to note if specifically, any raw material is wasted in different terrains of work, then we would also think about better handling or carriage and book keeping of the quantities of the same materials or design a separate cross-checking module for the same while designing the essential framework.

The thesis will be structured in different specific parts. In the first part of this thesis, the overview of the total industry and need of the moment to stop negligent wastage and pilferage would be conveyed in details. Then through references of literature review done in multiple continents the importance and viability and of course the social and ecological impact of the whole research would be explained in details. Furthermore, the

problem statement, research questions and significance of them will also be demonstrated in this part.

Then comes the part to frame the questions needed in the questionnaire which would be generalized across the data to be collected. Then raw material and progress data across sites would be collected in tune with the reconciliation model which would give a constant progress to utilization of materials idea. Also a few concepts relevant to the project would be introduced and elimination processes would be done to collect the best data.

In the third part, methodological frame works including models shall be elaborated after having a vivid idea of the systems prevailing at site. These frame works will help with the congregation of the various objectives of the study which are essential to put forward the aim of the research while in the fourth part, the major findings of the study shall be presented in view with the aim of the research. In the last part, a conclusion consisting of all the important segments of this thesis shall be concisely presented. This research, including the thesis writing, will commence immediately.

3.4 Actions associated with site measures

Initiating the restricting measures across construction sites require thorough planning and systematic implementation of rigorous daily measures that has to be looked over meticulously to give proper shape to the construction site before implementation of the reconciliation model which can put an end to all wastage and pilferage in the site. Those regulations can be construed to be measures of restricting and encasing the wastage and or

pilferage that happens in the site level across all construction sites. In order to do the same a few measures are to be implemented at site in order to emphasize on the wastage area which can be tabulated in seriatim as follows:

- ☐ Ensuring strict oversight and management of materials.
- ☐ Raising awareness of the impact of waste and educating employees.
- ☐ Planning and ordering materials accurately.
- ☐ Enhancing security measures.
- ☐ Implementing incentive programs.
- ☐ Boosting the quality of materials.
- ☐ Upgrading storage facilities.
- ☐ Establishing effective communication between upper management and staff.
- ☐ Utilizing in-house crafted items to minimize cutting, burning, and handling waste.
- ☐ Setting conditions to reduce waste during negotiations with workers and contractors.
- ☐ Developing accurate methods for measuring sand, aggregate, and other raw materials.
- ☐ Improving the transportation system.

3.5 Research Purpose

There are many problems in construction industry. Construction waste and pilferage at worksite is one of the major issue. By implementation of proper techniques of management, surveillance and reconciliation of construction material, this problem can be solved.

- This study is designed to assist construction engineers in reconciling and correcting resource consumption.
- It also seeks to lower the costs associated with site clearance and landfill management following the completion of construction.
- The study will be executed with the goal of achieving a significant reduction in transportation expenses.
- This framework aims to address the issue of material wastage, which contributes to the depletion of ecology and natural resources.
- Ongoing reconciliation of materials from the pre-tender stage through to project completion will help mitigate waste and theft on-site.
- Effective construction waste management has the potential to decrease energy and water usage, thereby lessening the greenhouse effect.
- Continuous monitoring of sites will be implemented through the installation of GPS and CCTV cameras throughout the stockyard and construction area.

3.6 Research Design

The primary source of information for this research is the life experience of the participants of the research, their interpretations, their cognizance to items of work, processes implemented at site and views of the experience of building up infrastructure projects from scratch through sheer hard work, dedication and uninterrupted focus gelled up with perseverance. Therefore, elementary quantitative approach through simple mathematics and numbers from the quantity of items that has been brought in at site has been applied to this research to demonstrate its critical features. Furthermore, the researcher conducting the interviews must be the main instrument to obtain the data has also been maintained.

The researcher used quantitative interviews to speak to several participants holding roles ranging from mid-senior to executive roles including owner-promoters. All participants were in the field of infrastructure development based in India.

The research methodology section will show that the questions asked during the interview were designed to be specific and focused. This direct and specific nature of the questions led to various sub-questions that the researcher posed to the interviewee based on their responses. Such an approach encouraged the interviewees to recall, analyze and put forth their experiences and provided an invaluable source of information for the research. Such an approach helps ask further questions to obtain productive and useful information, insight and learning more.

By applying mathematical clubbed with technical data to analyze the qualitative data gathered, this research would encourage and inculcate the process of writing into the overall process, leading to the research taking some interesting ideas being explored.

3.7 Population and Sampling

The collection of numerical data that places consumer insights in a quantifiable perspective is known as quantitative data collection. In order to extract statistically sound data that may be generalised to a larger population, it usually involves a number of respondents who are specific to the sector of employment. Comparing quantitative data to qualitative data collecting enables comparison of insights with larger base sizes, resulting in statistical significance. Businesses can slice and examine their data in a number of ways, examining their results across various behavioural and demographic groupings as well as other areas of interest.

For businesses that want fast, dependable, tangible insights, quantitative data collecting is a crucial tool because it is simpler and faster than qualitative input. Companies must select a high-quality sample that is representative of their actual target market—one that is made up of people of all ages and genders rather than just one—in order to use quantitative data to support their business decisions. For instance, individuals who purchase and/or consume orange juice at a specific frequency or who purchase a range of orange juice brands from various retailers may be included in a study on orange juice usage and attitudes.

One method of getting responder feedback without using digital tools is through offline surveys. This could resemble telephone surveys, in which respondents are

questioned over the phone, or postal questionnaires, which are distributed to a sample population and asked to return the questionnaire by mail (such as the Census). Data collection for offline surveys is undoubtedly slower than for internet surveys, and they can become more costly if the population is hard to reach (requiring a higher incentive). If the mail is not lost or intercepted, anonymity is preserved, just like with online polls. Data from offline surveys is still given in an aggregated, numerical format, even though the data collection process differs significantly from that of online surveys.

Another common method for doing research or surveying a group is in-person interviews. They can be viewed as a survey, but they are conducted verbally, in person, or virtually. These days, online interviews are growing in popularity since they are less expensive and logistically simpler to set up than in-person interviews, while still enabling the interviewer to see and hear the respondent in their own words. Interviews can be used quantitatively, even though many are gathered for qualitative research. For example, in a telephone survey, the interviewer walks the respondent through a survey with primarily closed-ended questions (yes/no, multiple-choice, or questions with rating scales that ask how strongly the respondent agrees with statements).

Structured interviews have the benefit of allowing the interviewer to pace the questionnaire, ensuring that the respondent gives each topic adequate thought. Additionally, it adds a human touch, which some responses may find more interesting. It all depends on your research questions, the survey topic, and the audience you're studying. However, for more delicate topics, respondents could feel more comfortable filling out an internet survey because they feel more anonymous.

3.8 Data Collection

Data for this research was collected from sources which are precisely primary and few secondary superficial techniques. Primary data is typically defined as the first occurrence of a piece of work. For the purpose of this research, primary data is obtained from the interviewees from the semi-structured interviews.

Secondary data and more precisely techniques and recommendations has been obtained from literature reviews, there the researcher has meticulously studied several articles, journals, papers and books to gain as much information as possible that is relevant to this ongoing research.

The researcher interviewed several mid to senior level staff for this research. The questions were prepared in advance, and were shared with the interviewees, so they could better prepare for the process.

3.9 Data Analysis

Data collection for quantitative research very often involve interviewing people who have experienced the subject of research in their professional or daily lives. The researcher generally makes decisions on who the relevant interviewees are and hence it is imperative that the researcher also possess the relevant knowledge about the subject matter. This knowledge and experience is obtained through the life experience of the researcher themselves, and the literature review that the researcher conducts to fully inform themselves of the topic under scrutiny.

In addition to this, analyzing life experiences is both complex and time-consuming and is open to interpretation by the researcher. It is therefore imperative and judicious that the researcher spends enough time to develop a system to analyze and interpret the data collected.

According to popular research guidelines and life experience of the researcher generally the following steps are taken regarding the data retrieved from the responses:

- “Know your data” – Understanding the data collected is imperative for good analysis. In quantitative analyses, the data to be analyzed should be reviewed several times, so that the data and the context is well understood by the researcher. Further, recordings should be listened to several times and notes must be made by the researcher that may come useful through the rest of the process. Additionally, the researcher must filter out less informative and potentially biased data.
- “Focusing on the analysis” – The researcher must first review what the goals of the research are and what they aim to find out. This can be done by focusing on the question or topic. Here, the researcher focuses on how the interviewees responded to the open-ended questions asked during the interview. The data is organised by question, to better identify the consistencies and divergences received in the prolonged interview process.
- “Selectively categorizing the information” – In quantitative analysis, information can be categorized by applying numerical codes to variables, and use them in the

research. The data is organized by themes, patterns and coherent categories. This is the most concentrating and discrete part of the process, but is also the most important part of quantitative analysis. Data should be organized in a concise way, since quantitative data can be cumbersome and complex. By doing so, data retrieval can be simplified and save the researcher's effort. Data can be categorized into themes by using abbreviations of the theme or themes being applied. During the process of categorization, new, or emerging themes may arise, and should also be categorized. In addition to that each category should have labels for relevant subcategories

- “Identifying patterns and connections” – As data is organized into themes and categories, patterns and connections will begin to emerge within and between categories. The researcher is now responsible for determining the importance of these patterns and attributing varying levels of relative importance based on their frequency and the context in which these patterns emerged. The relative importance of patterns can also be determined by mapping data the central and sub questions the research seeks to answer.
- “Interpretation of data” – Using the themes and connections formed in the previous steps, the researcher will attempt to explain the findings of the interview. During this phase, it is important to focus on interpreting the data correctly and concisely, and not get distracted by details and in-depth descriptions of the data. In other

words, data interpretation is the process of attaching meaning and significance to the analysis. Here, the researcher will form a list of important points and findings through the categorization and sorting of the data performed earlier

In summary, the researcher must follow the above steps, especially categorization of the data. To accomplish this, the researcher will first transcribe the video of each interview into text, and then read each interview several times to get familiar with the data being worked with. Multiple readings are also required so that the context of each answer is not missed or misinterpreted by the researcher, highlighting key passages and information that may have been overlooked in previous readings.

3.10 Research Design Limitations

There are several limitations to this study that would further restrict the applicability of its findings. Perhaps the experiences of the interviewees are not at all representative of the experiences of mobile gaming companies in India; after all, this qualitative study was conducted through interviews, in a limited sample size, and interviewees were selected using random sampling and a screener survey. It should be emphasized, though, that the rigor and richness of data produced and analyzed through these interviews is far more important than the number in the sample.

Additionally, even though the interviewees had plenty of time to prepare, it's likely that they didn't remember events exactly as they happened and might have overlooked

information that could have impacted the research's findings. Furthermore, the interviewees' relevant experience and status as subject-matter experts at the time of the interview are important assumptions of this study. Last but not least, even though the interviewers were told and guaranteed that their responses would remain private, it's possible that they didn't fully capture their actual experiences.

3.11 Conclusion

Both qualitative and quantitative research design approaches have been investigated by the investigator. When the phenomenon being studied is connected to the participants' own experiences, a quantitative research approach might be used. A semi-structured interview with open-ended, probing questions and a screener survey to screen possible interview subjects were the research tools utilised in this study. The primary source of data for this study came from the interviewees' responses, with some of the answers being contextualised by the screener survey responses. The aforementioned sections provided and addressed the different data gathering, coding, and analytic methods employed in this study.

Here, the methods for interview transcription, relationship building with the retrieved data, and research outcomes are also explained. Lastly, the research's shortcomings were mentioned and examined. The greatest first-hand information has been gathered from people who hold management-specific jobs, and conclusions have been drawn from this data.

CHAPTER IV: RESULTS

4.1 Research Questions

In primary data collection, individuals with construction site and managerial experience are approached and a set of questions are provided in order to assess the specific problems and mitigating ideas.

1. How much do we assess the actual requirement and how to streamline the requirement as per need?
2. Considering small and medium enterprises how to identify the reusable materials already present at site and how sensitive are these data for EPC and SBD contracts?
3. During the execution phase how to reconcile the actual requirement at site with that assessed in the pretender stage and how to draw alerts in case of spillage?
4. How to control and restrict pilferage and wastage in regular phases of construction, keeping an eye on the requirement of materials set as per designs approved?

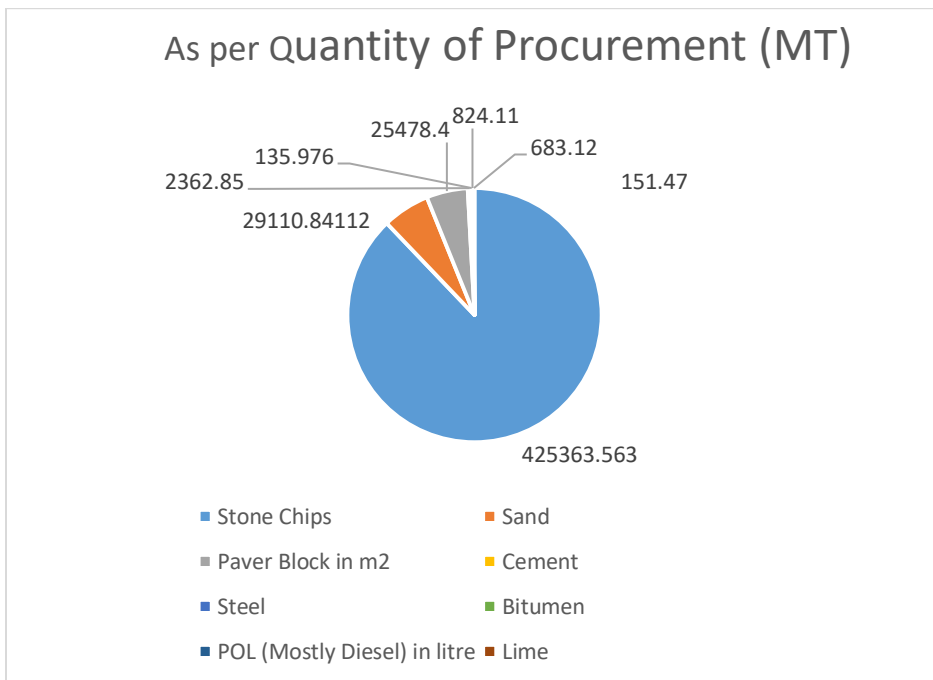
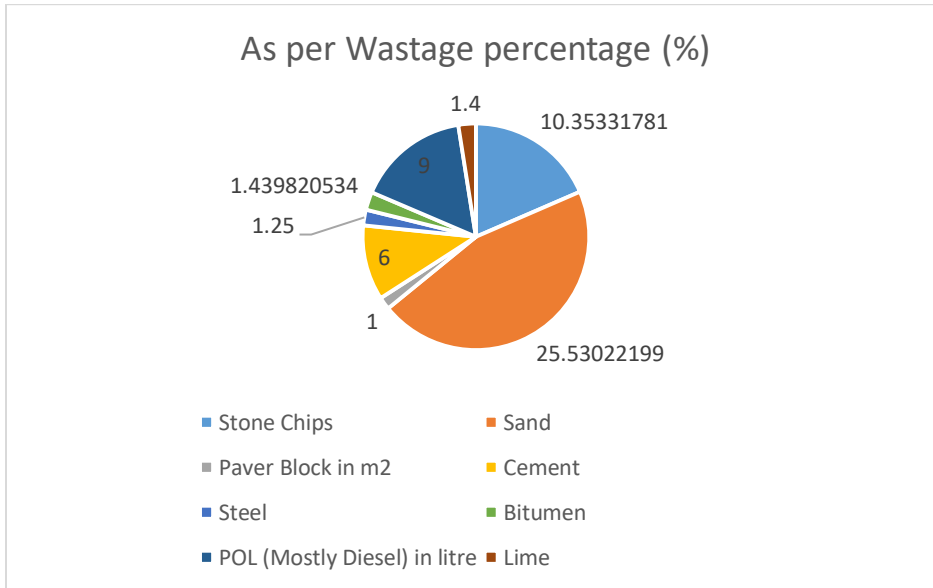
The above are the specific answers that are to be derived through a series of questionnaire and data to be collected from different individuals in the

managerial level in order to come down to the concrete solution taking into consideration all the pros and cons of the work.

4.2 Summary of Findings

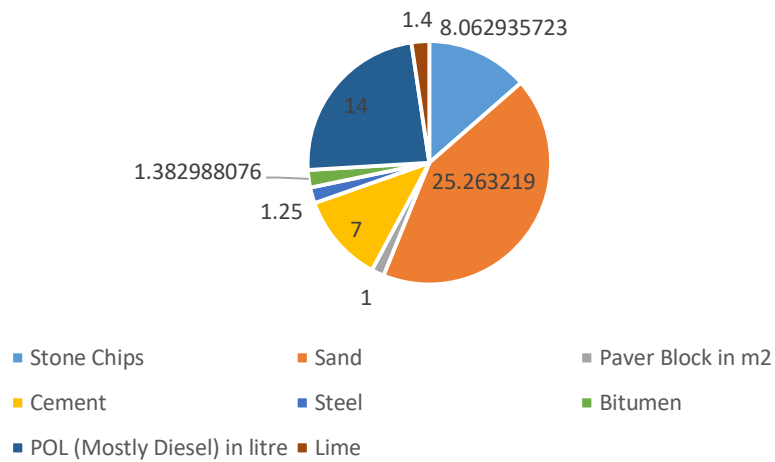
After getting the specific answers to the questionnaire, those have been clearly put in a pie chart in order for an immediate understanding of the materials to be procured at site and their weightage. Also side by side the percentages of wastage that occurred in the specific sites have been put in on another piechart. Projects of highways including flyovers and cross drainage structures have been mostly seen to be majority of the responses and it clearly makes one understand the pattern of negligence material wise across sites.

1)Response 1

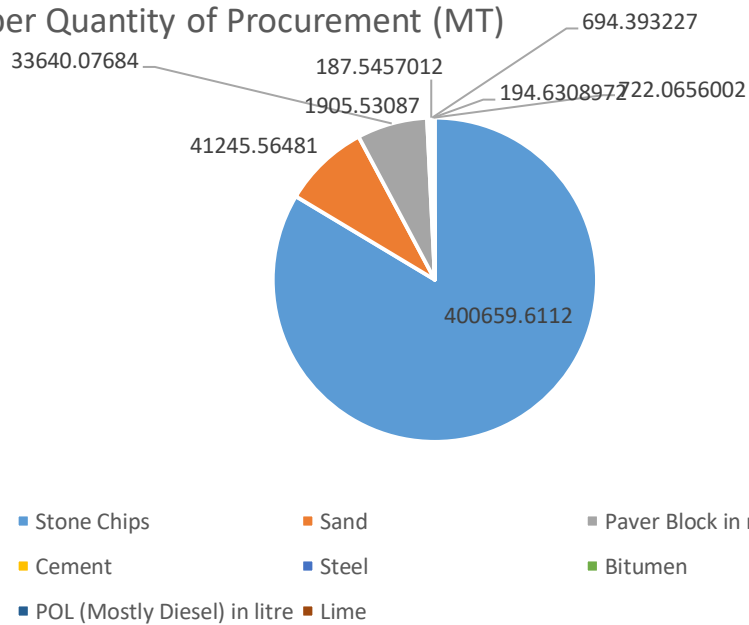


2)Response 2

As per Wastage percentage (%)

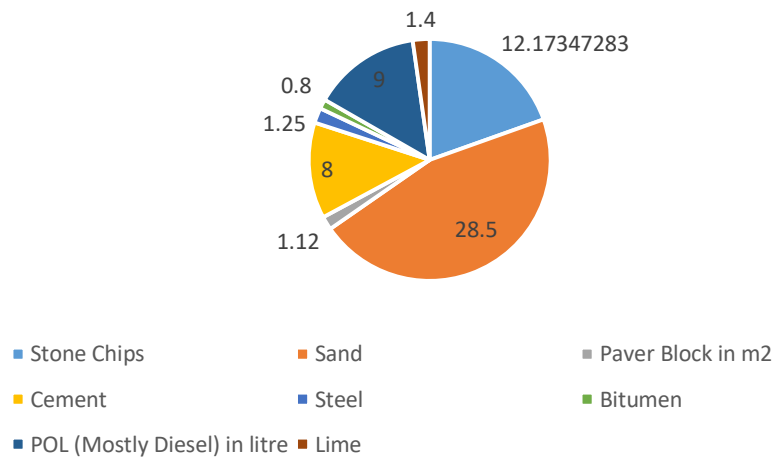


As per Quantity of Procurement (MT)

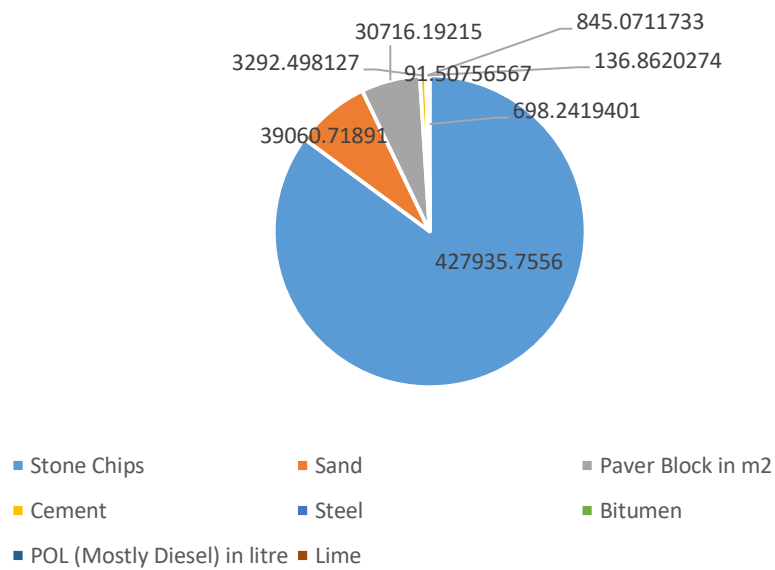


3)Response 3

As per Wastage percentage (%)

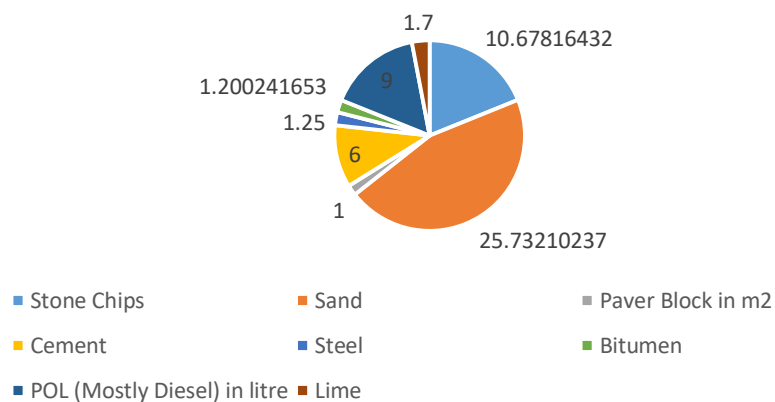


As per Quantity of Procurement (MT)

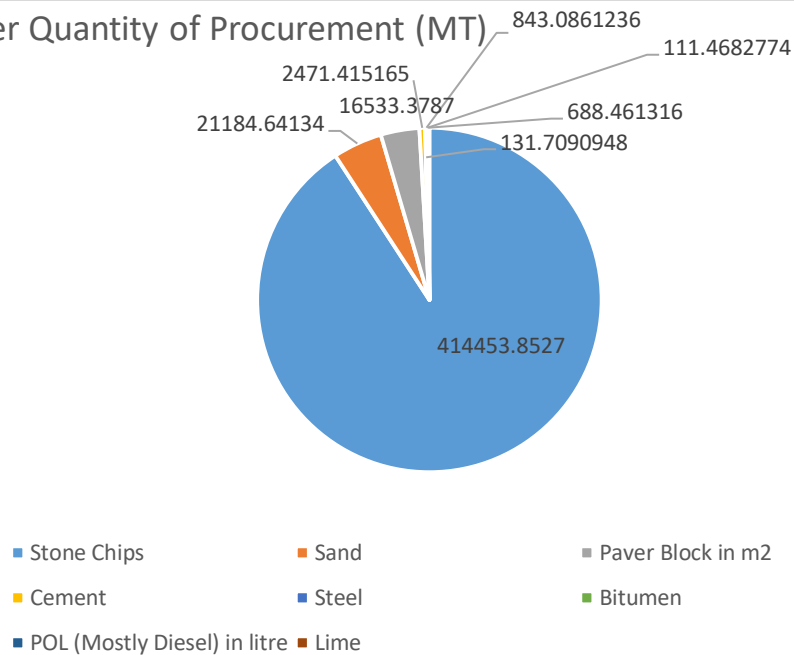


4)Response 4

As per Wastage percentage (%)

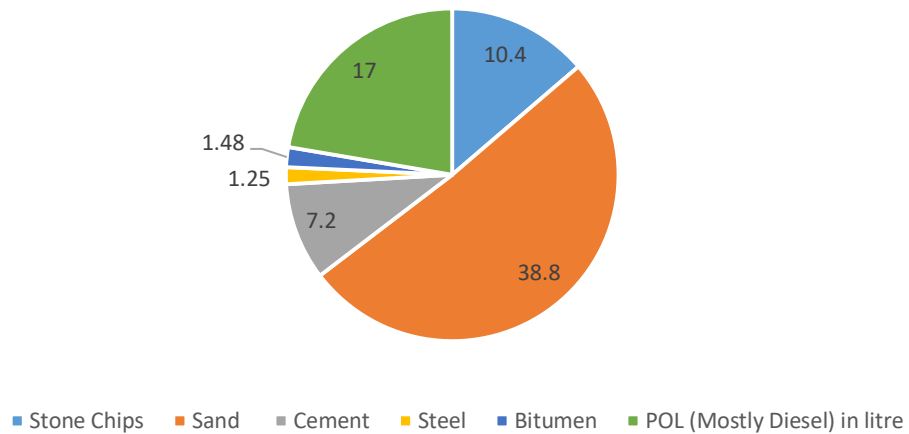


As per Quantity of Procurement (MT)

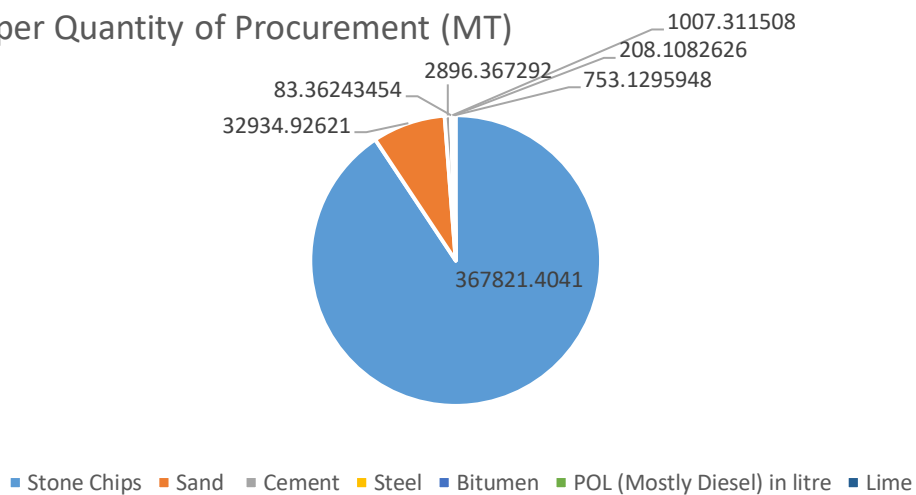


5)Response 5

As per Wastage percentage (%)

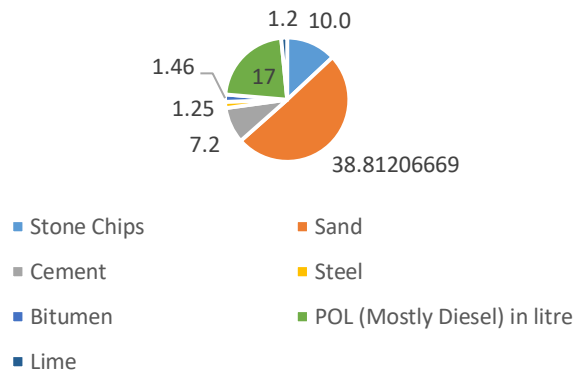


As per Quantity of Procurement (MT)

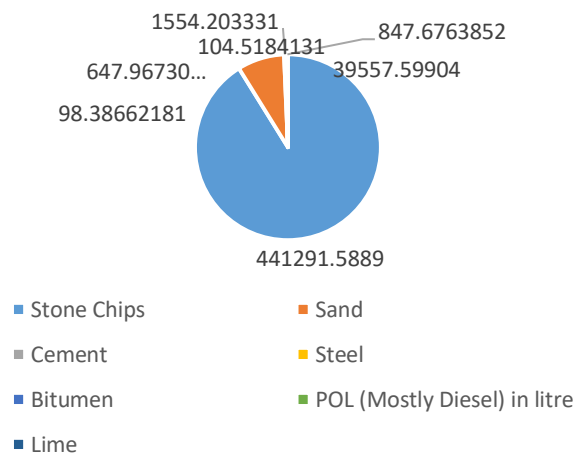


6) Response 6

As per Wastage percentage (%)

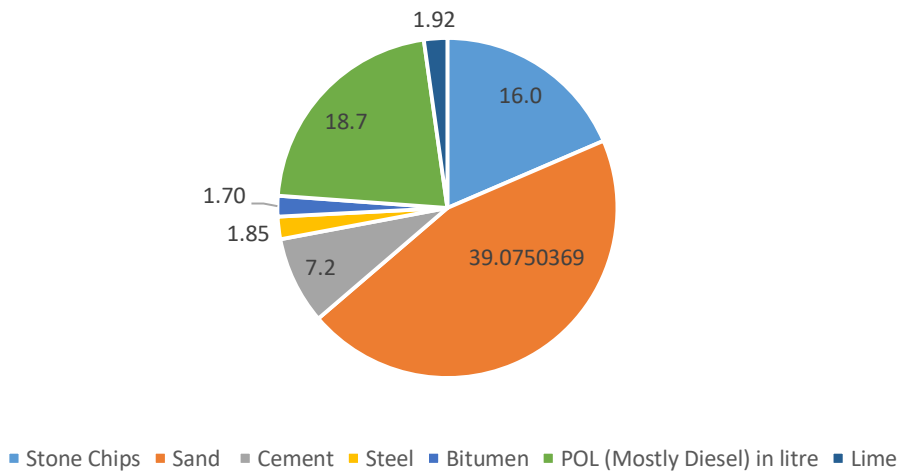


As per Quantity of Procurement (MT)

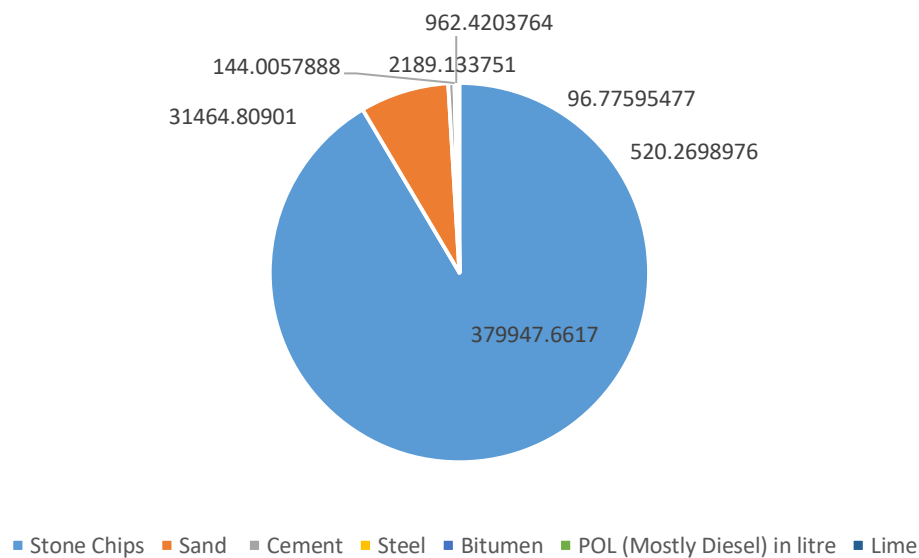


7)Response 7

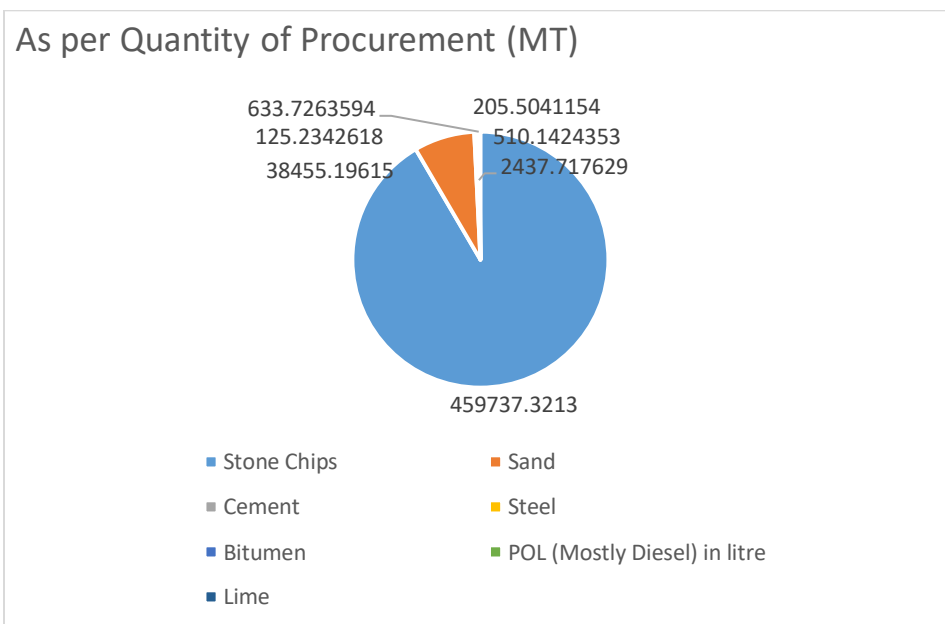
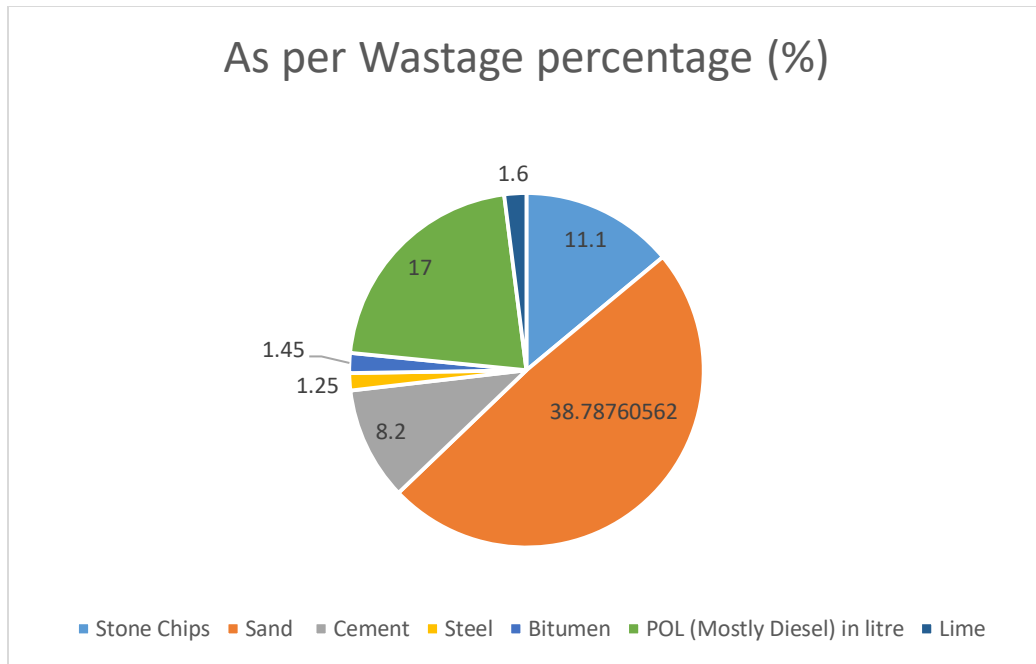
As per Wastage percentage (%)



As per Quantity of Procurement (MT)

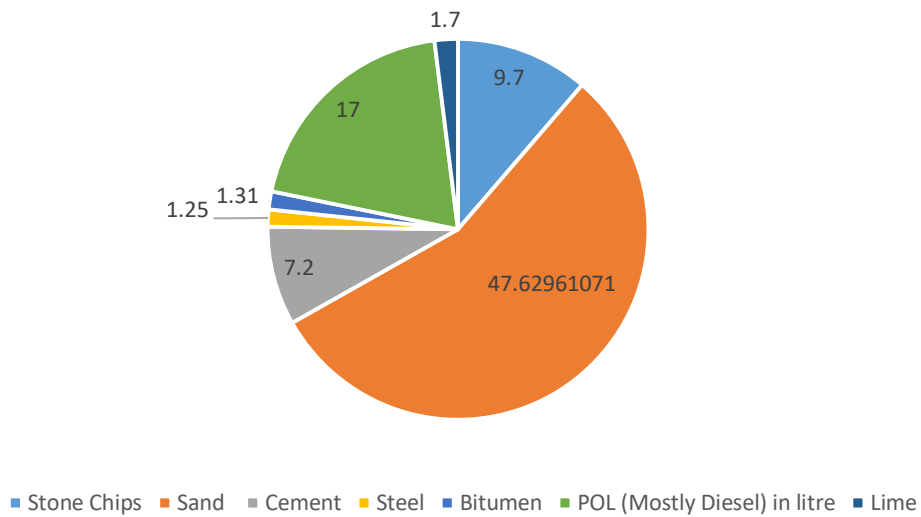


8)Response 8

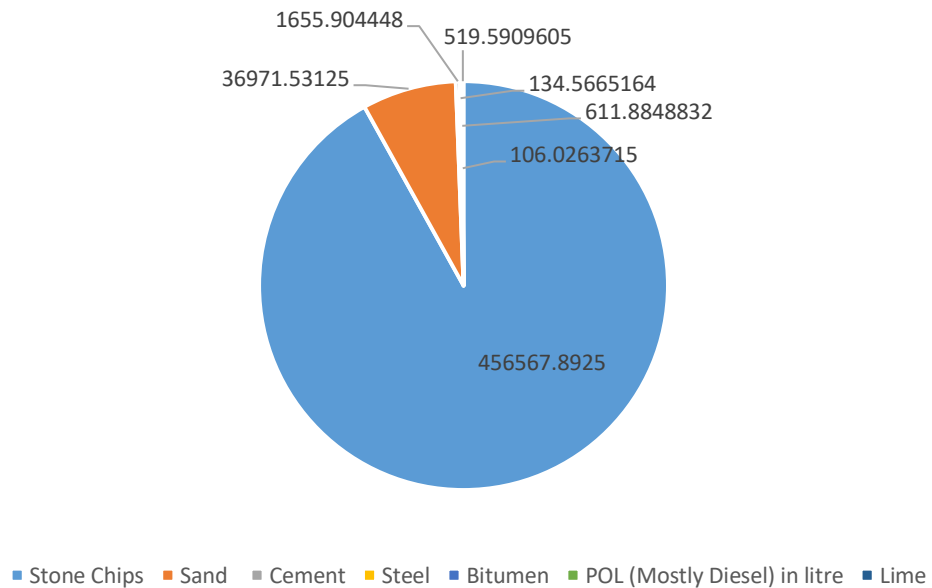


9) Response 9

As per Wastage percentage (%)

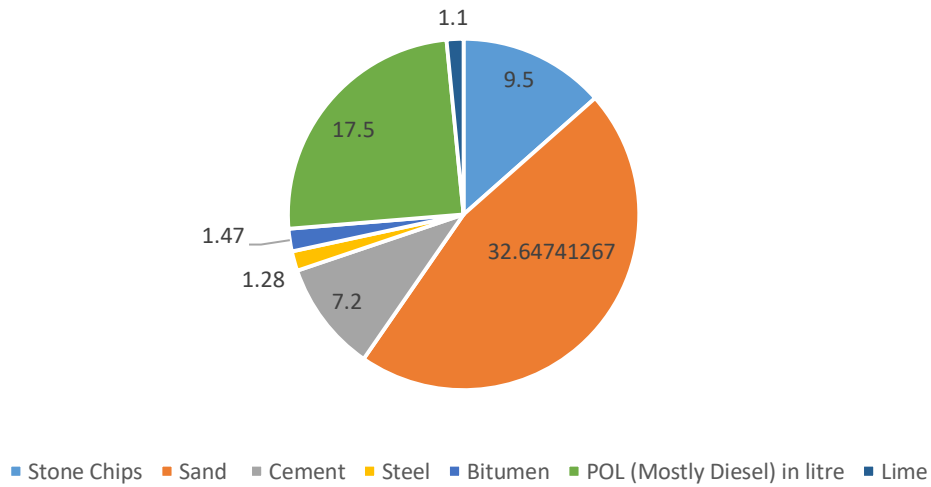


As per Quantity of Procurement (MT)

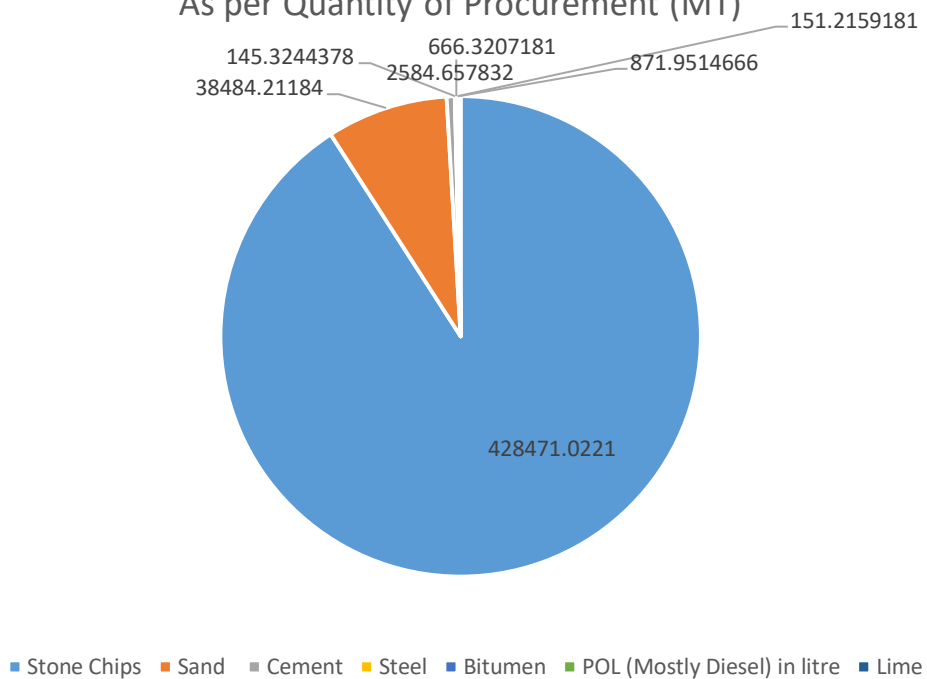


10) Response 10

As per Wastage percentage (%)

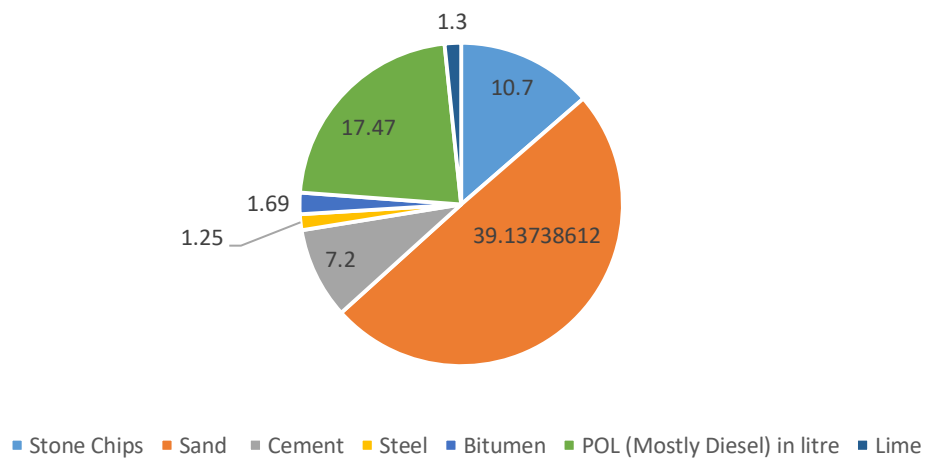


As per Quantity of Procurement (MT)

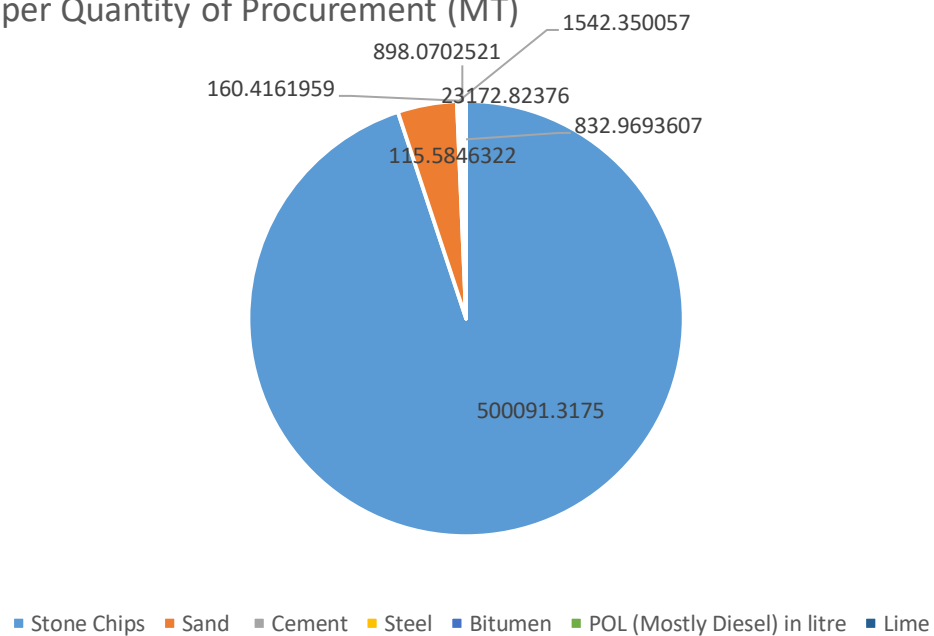


11) Response 11

As per Wastage percentage (%)

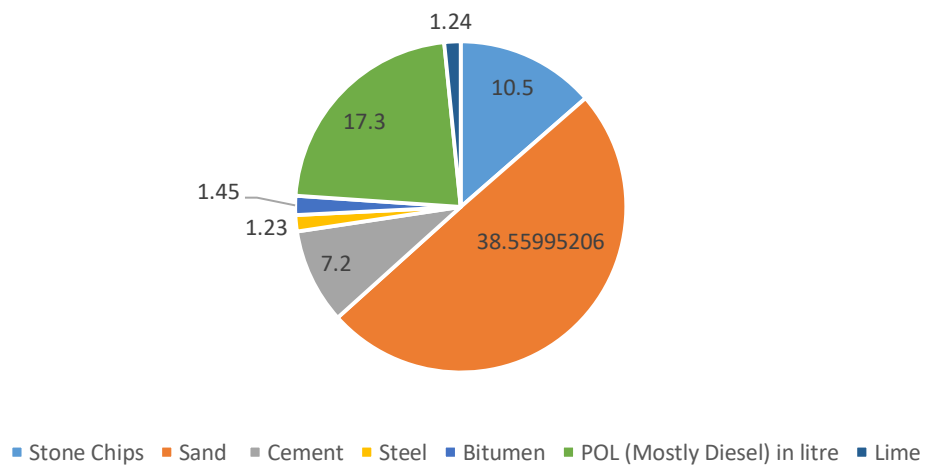


As per Quantity of Procurement (MT)

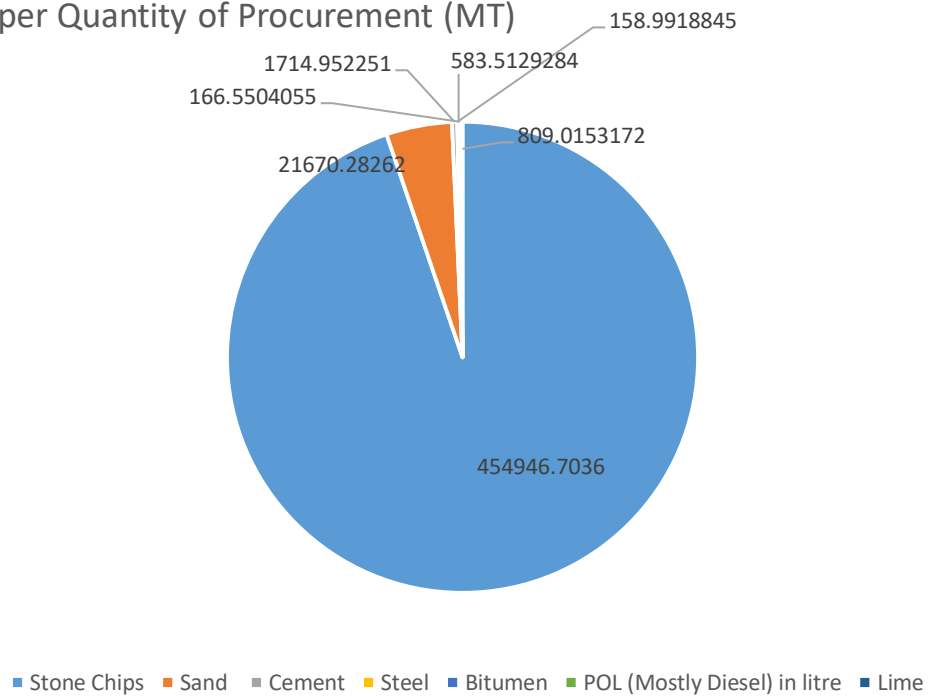


12) Response 12

As per Wastage percentage (%)

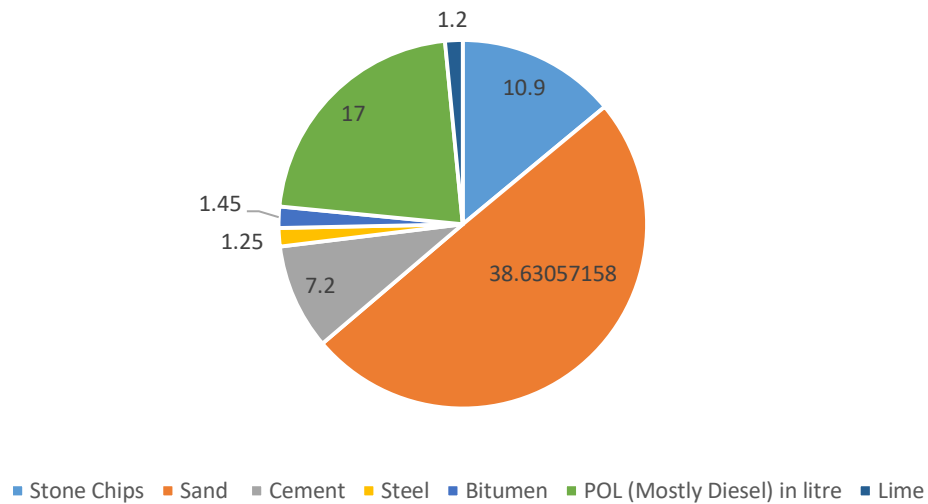


As per Quantity of Procurement (MT)

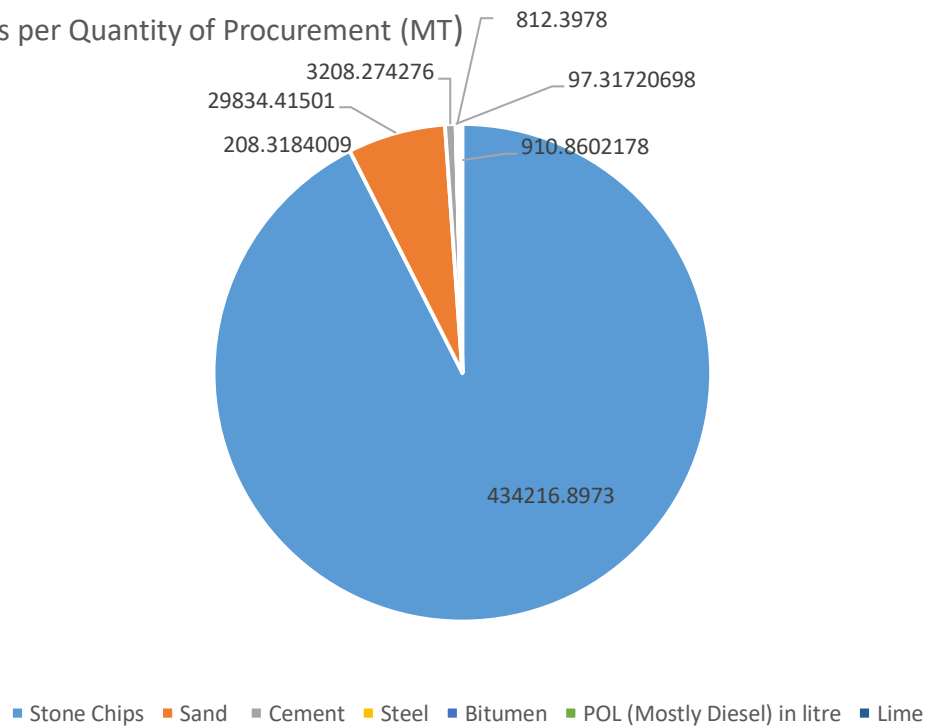


13) Response 13

As per Wastage percentage (%)

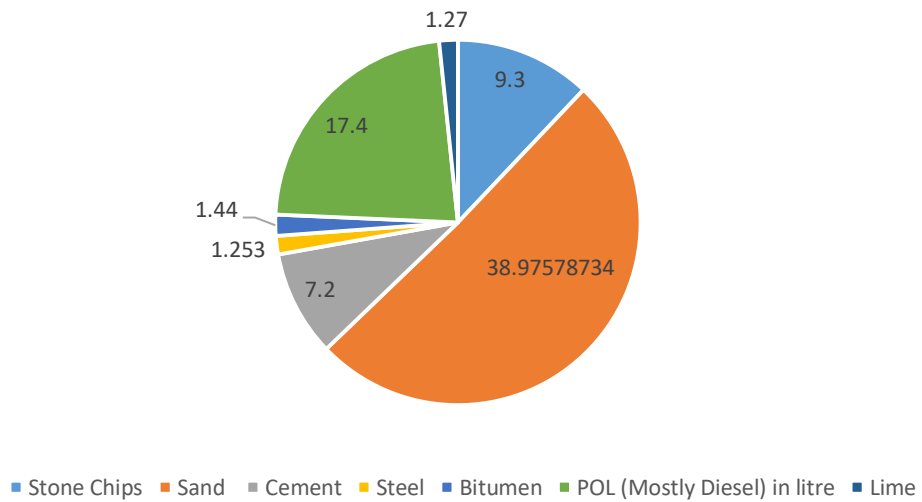


As per Quantity of Procurement (MT)

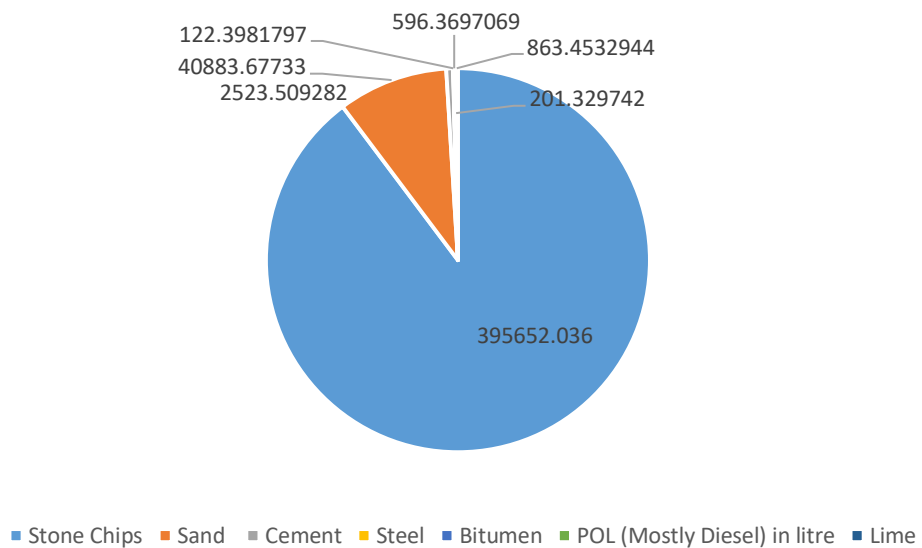


14) Response 14

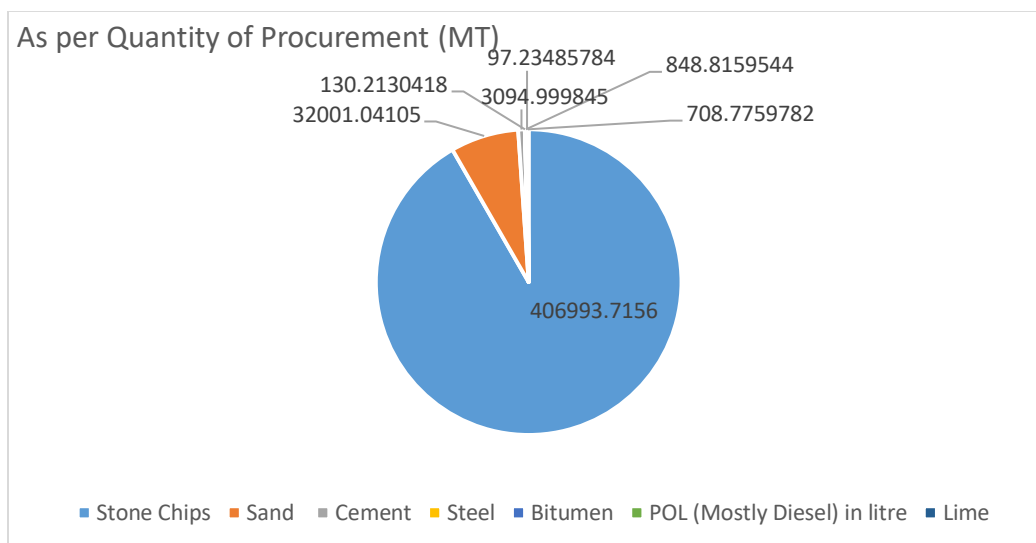
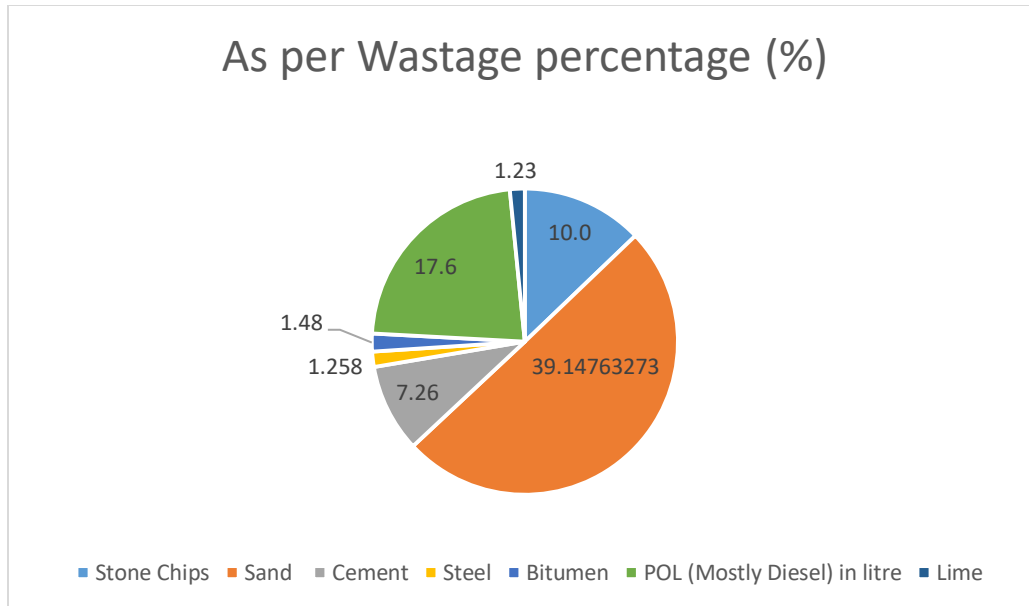
As per Wastage percentage (%)



As per Quantity of Procurement (MT)

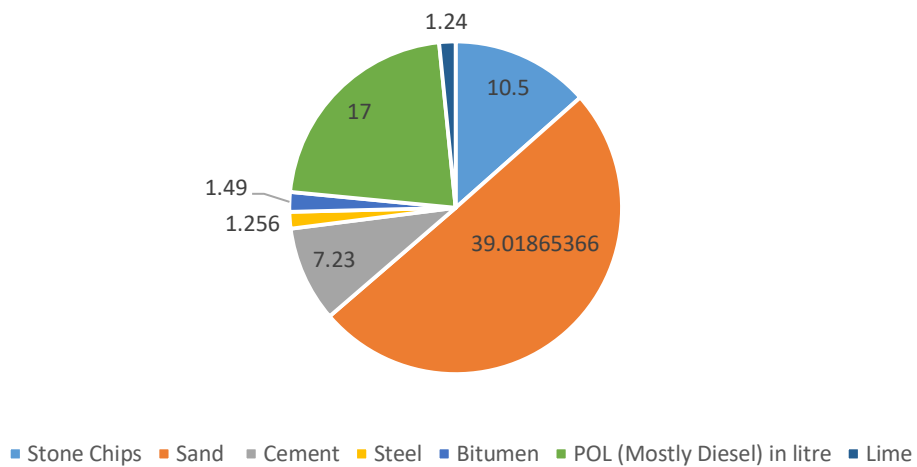


15) Response 15

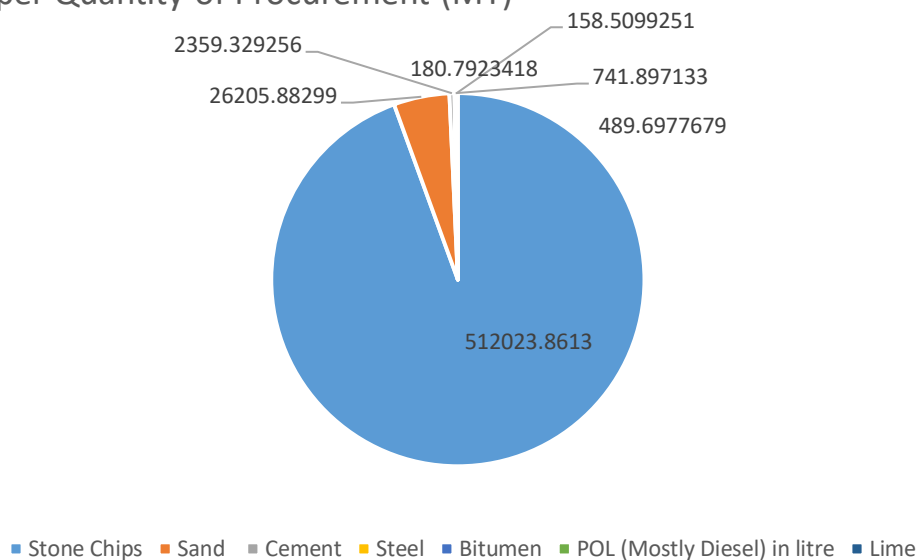


16) Response 16

As per Wastage percentage (%)

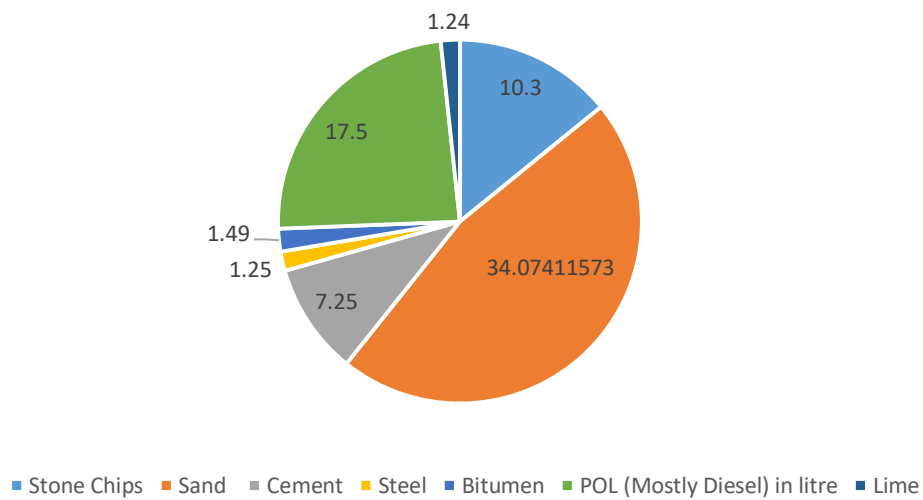


As per Quantity of Procurement (MT)

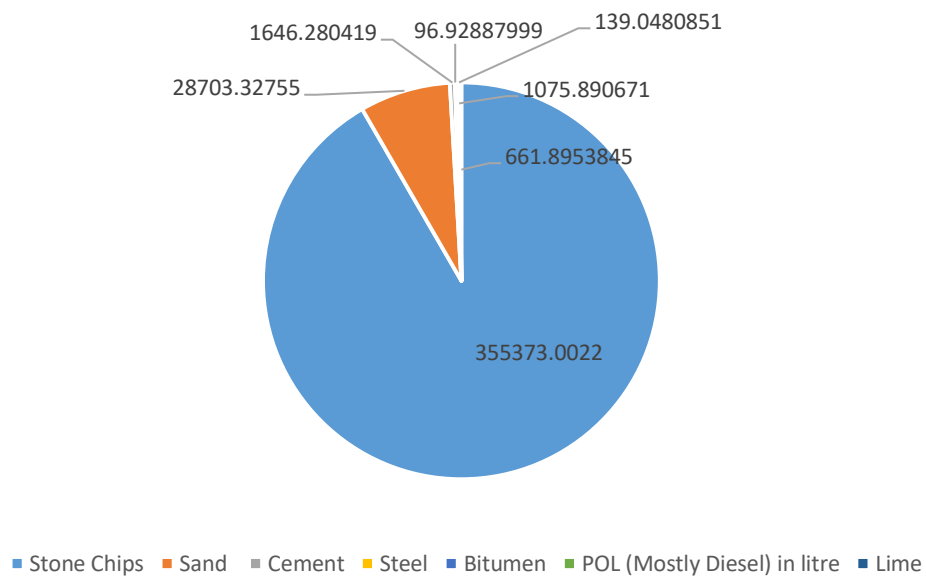


17)Response 17

As per Wastage percentage (%)

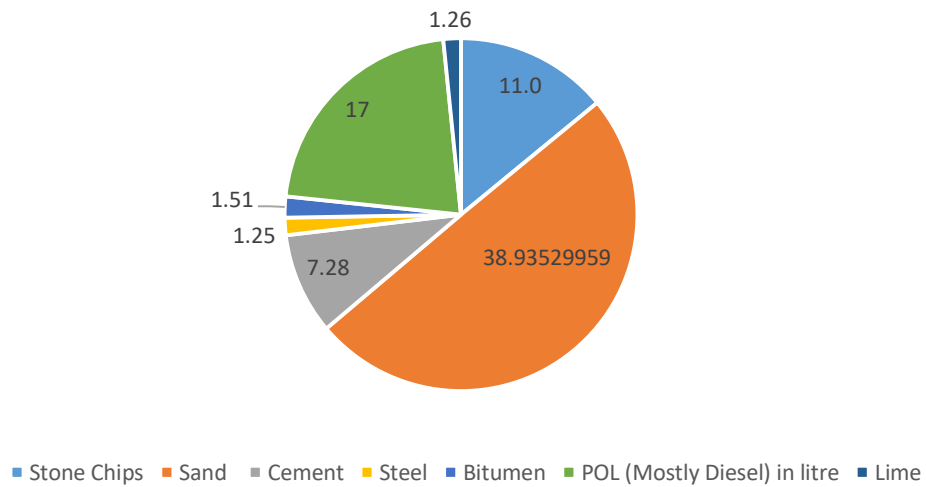


As per Quantity of Procurement (MT)

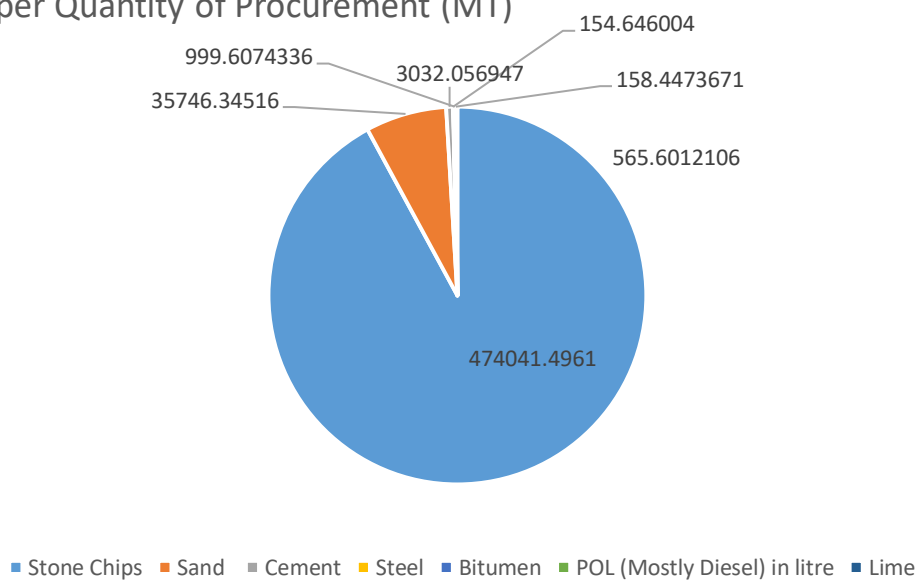


18) Response 18

As per Wastage percentage (%)

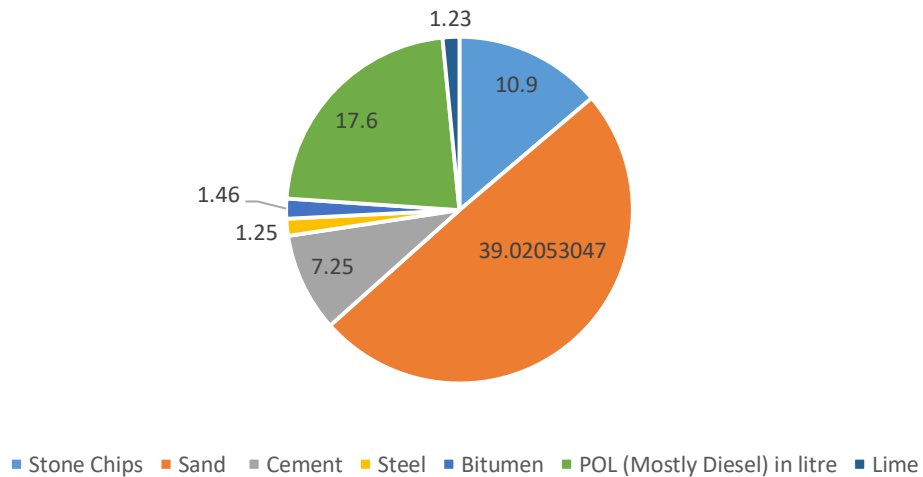


As per Quantity of Procurement (MT)

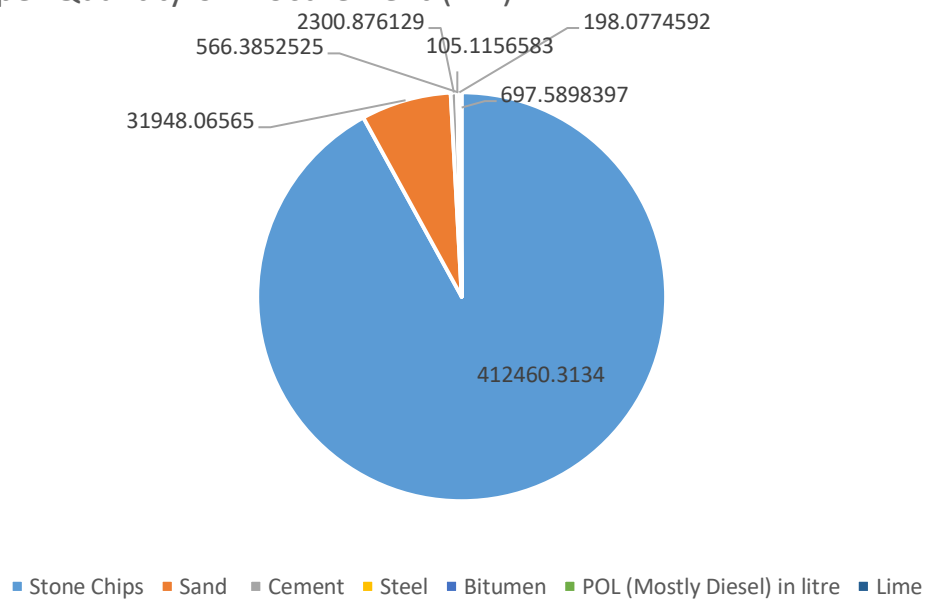


19)Response 19

As per Wastage percentage (%)

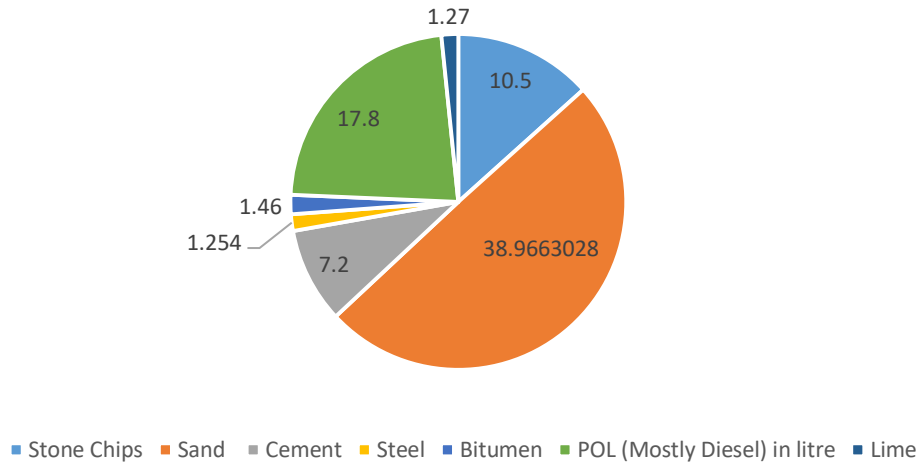


As per Quantity of Procurement (MT)

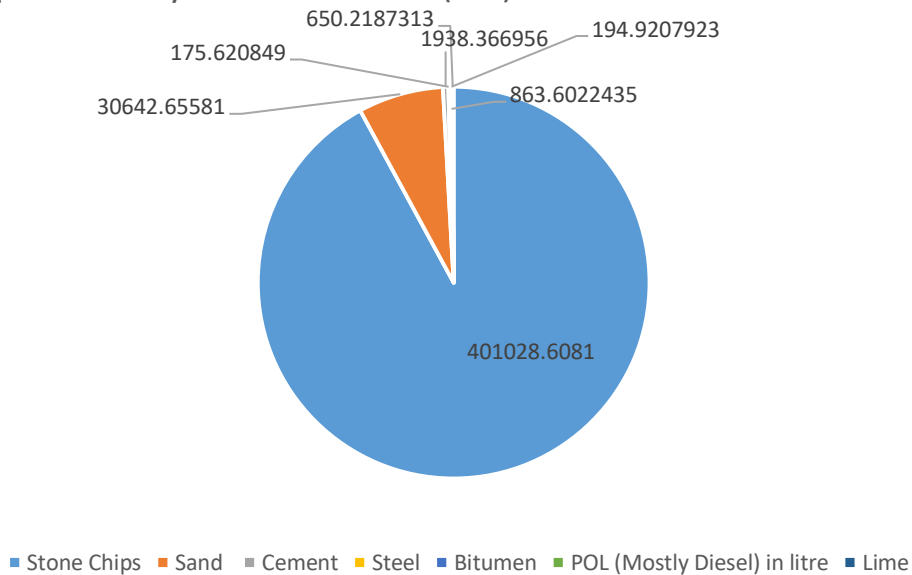


20)Response 20

As per Wastage percentage (%)

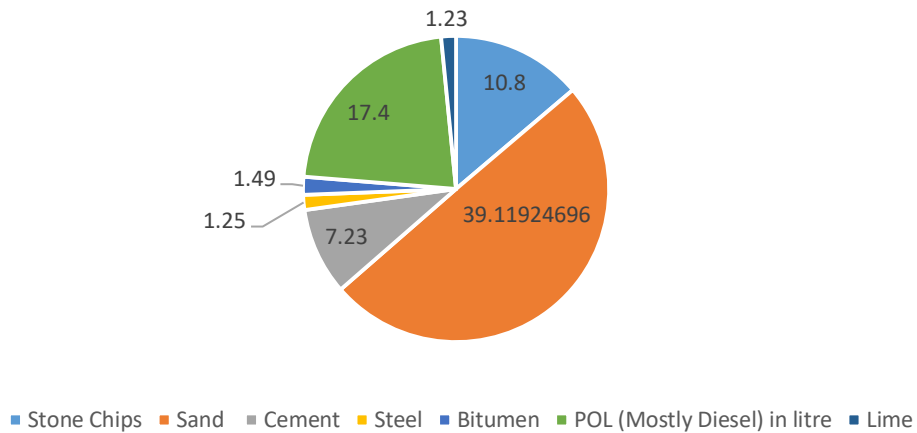


As per Quantity of Procurement (MT)

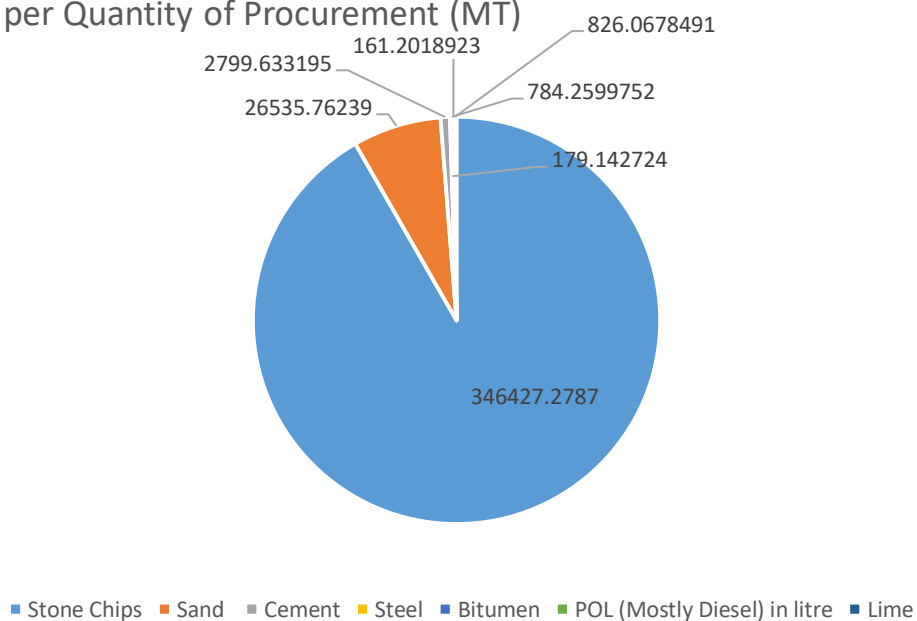


21)Response 21

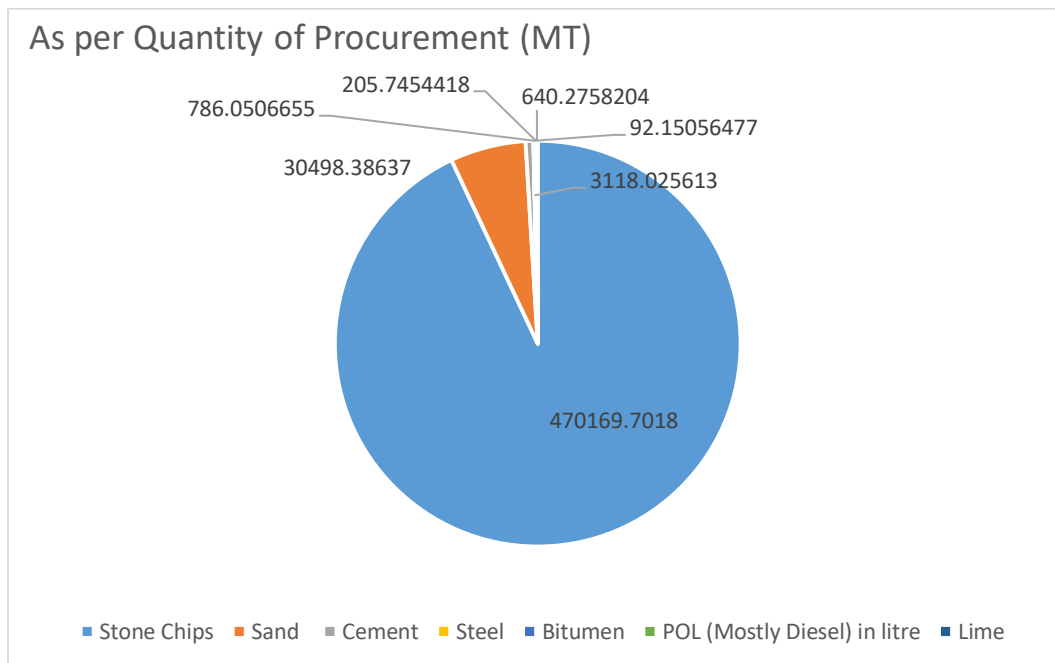
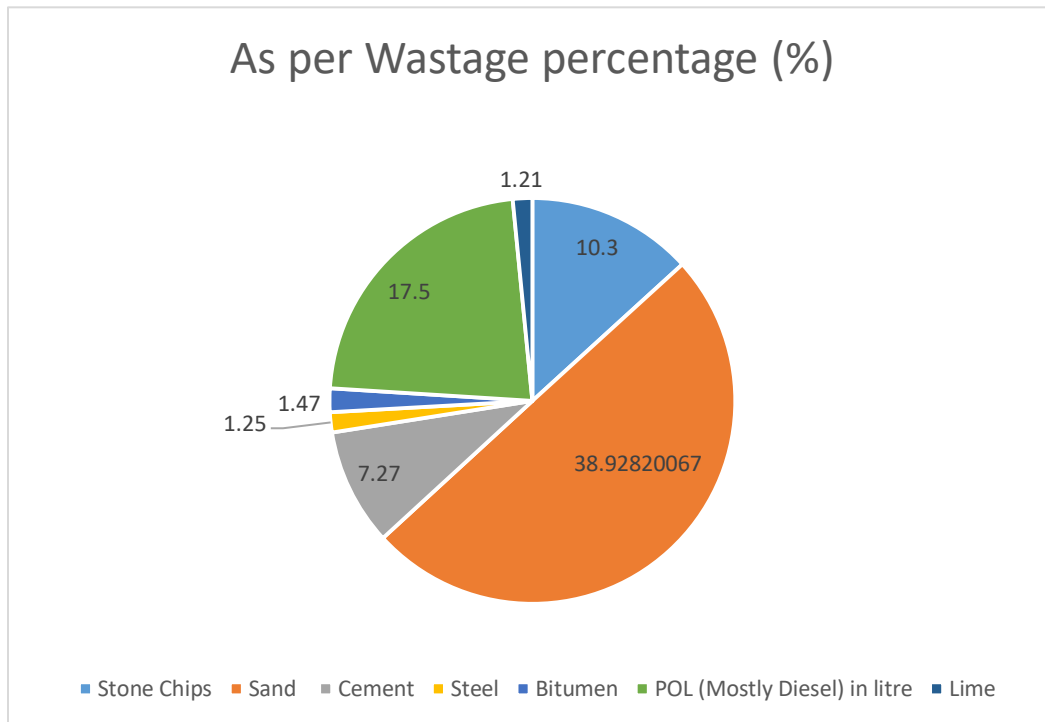
As per Wastage percentage (%)



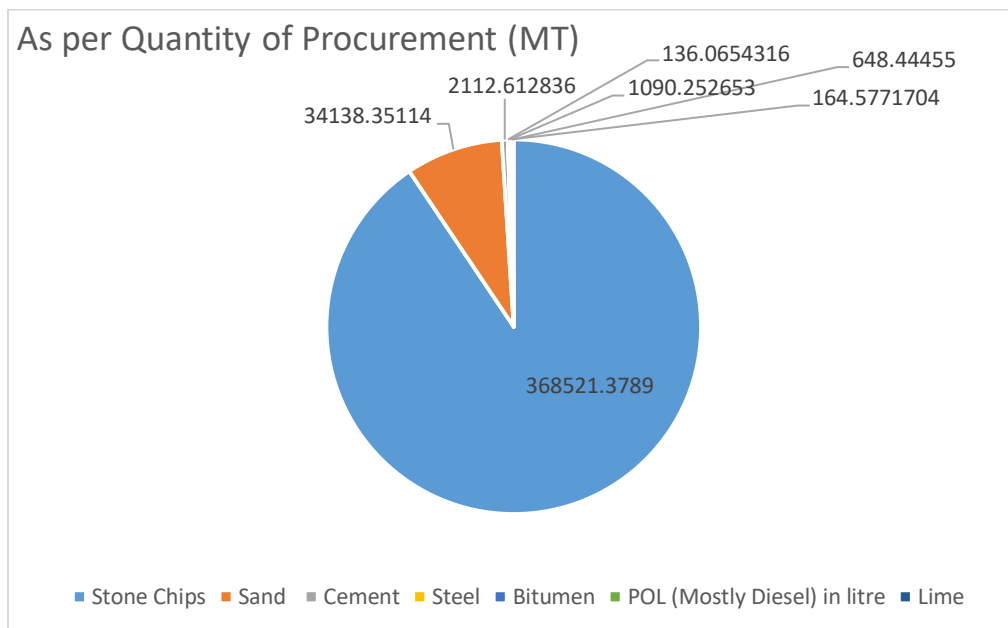
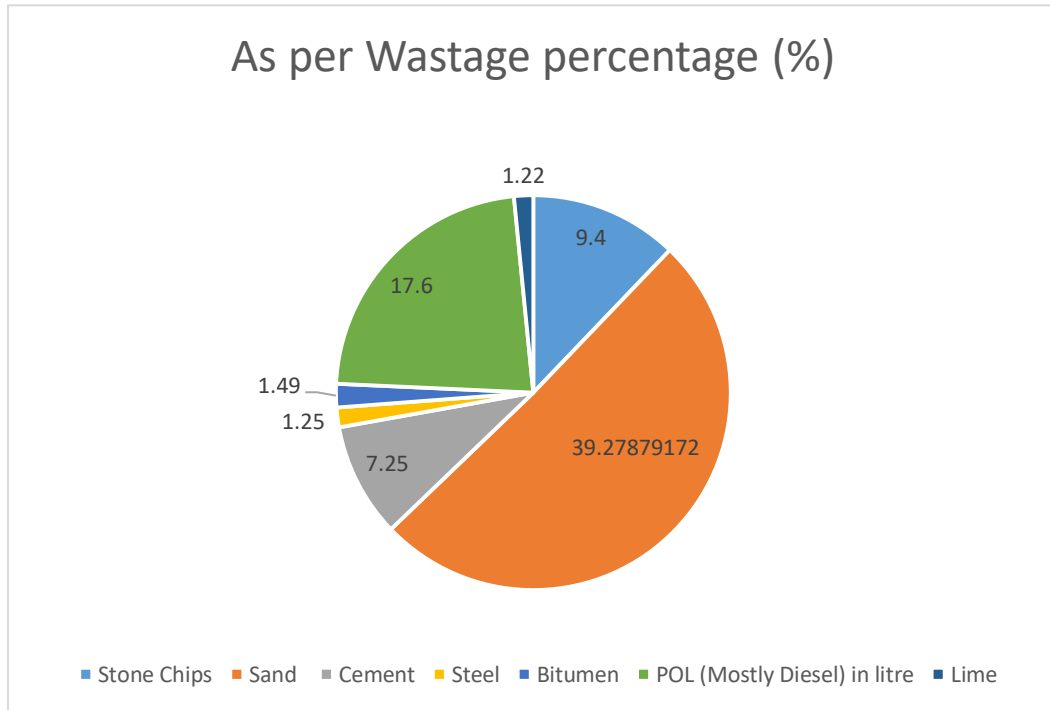
As per Quantity of Procurement (MT)



22)Response 22

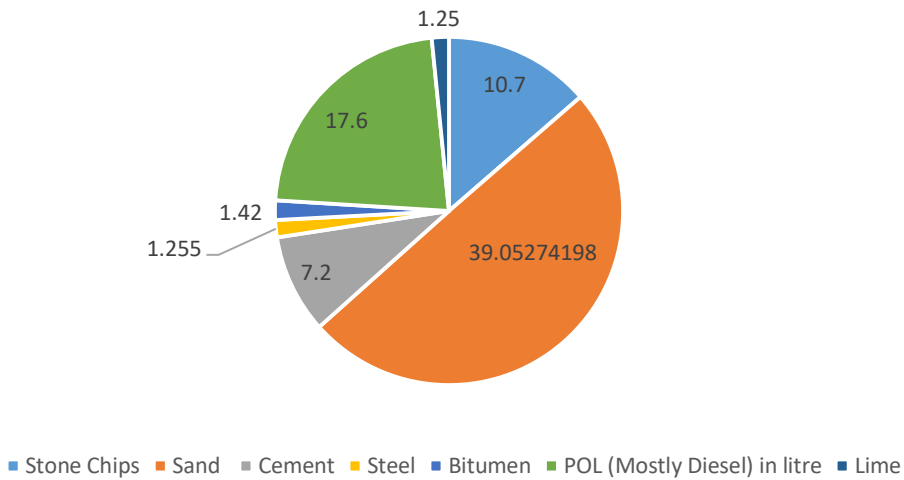


23) Response 23

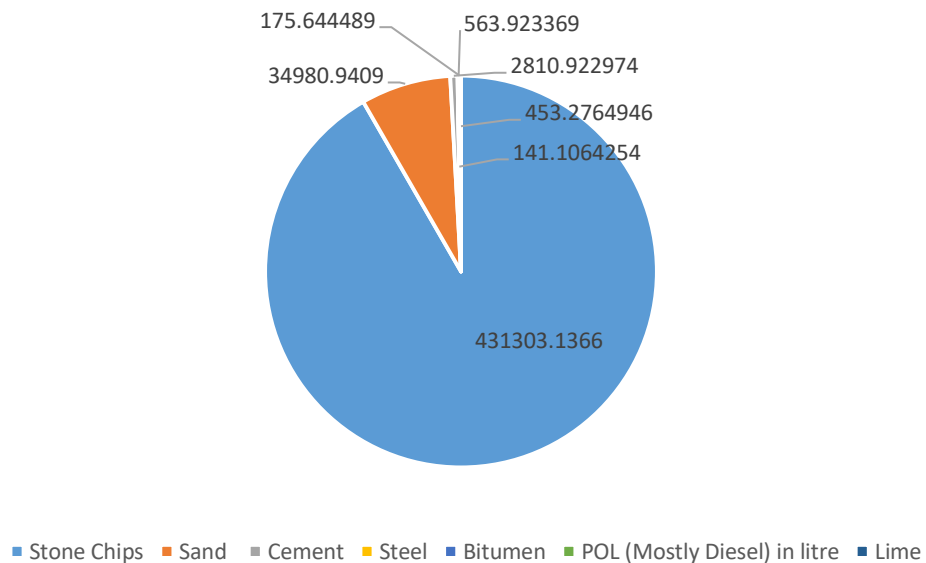


24) Response 24

As per Wastage percentage (%)

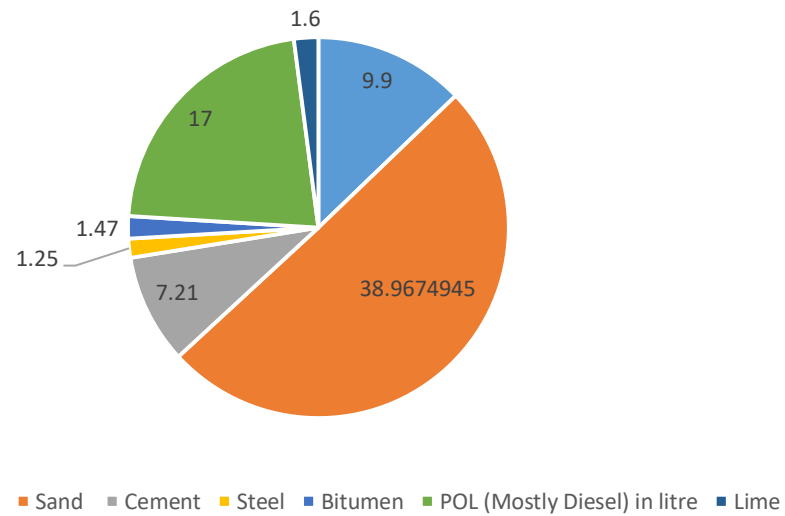


As per Quantity of Procurement (MT)

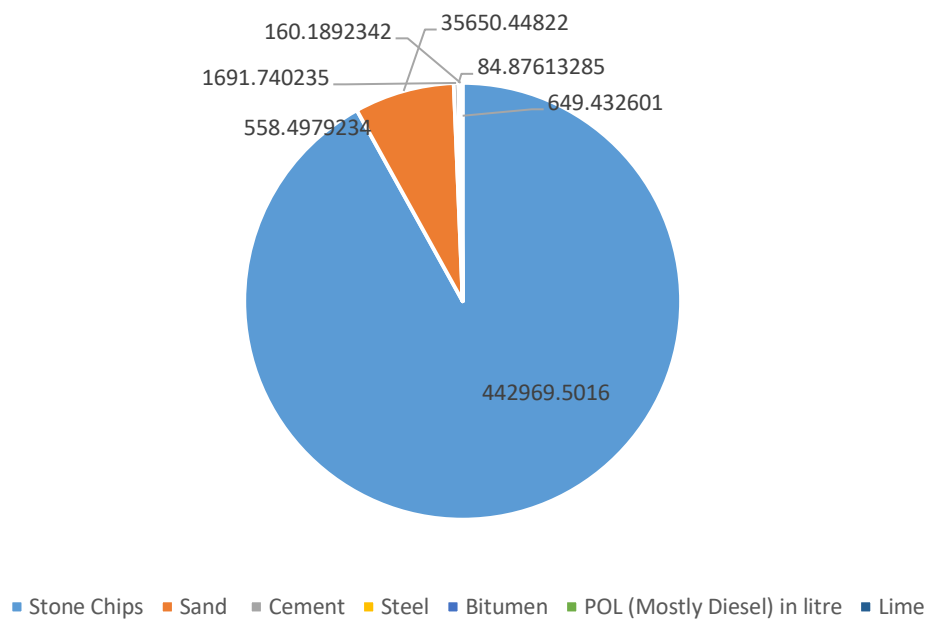


25)Response 25

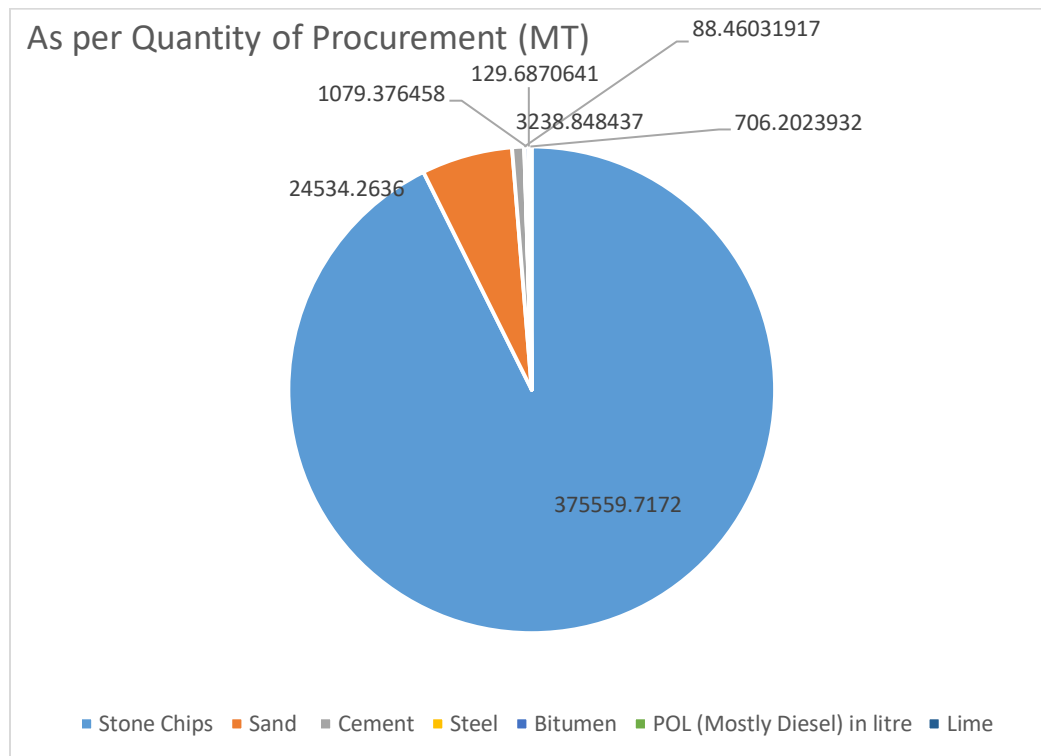
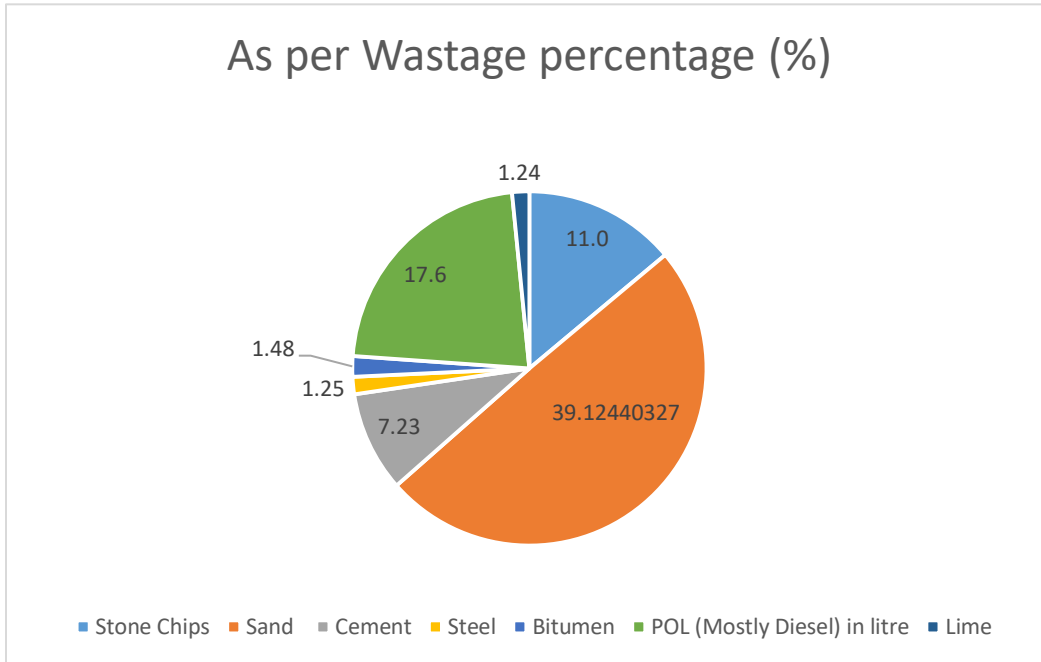
As per Wastage percentage (%)



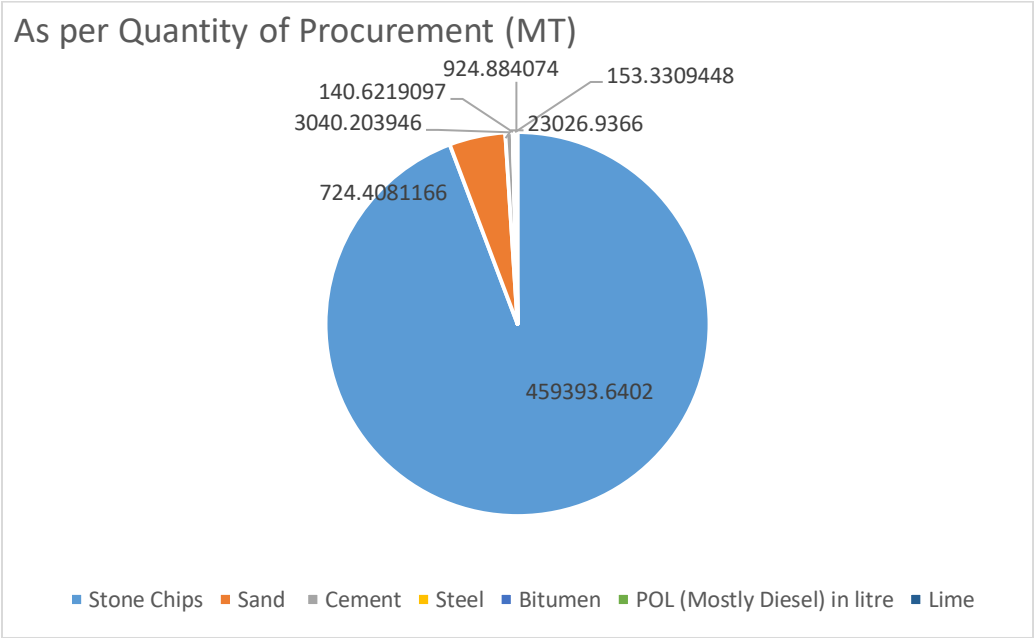
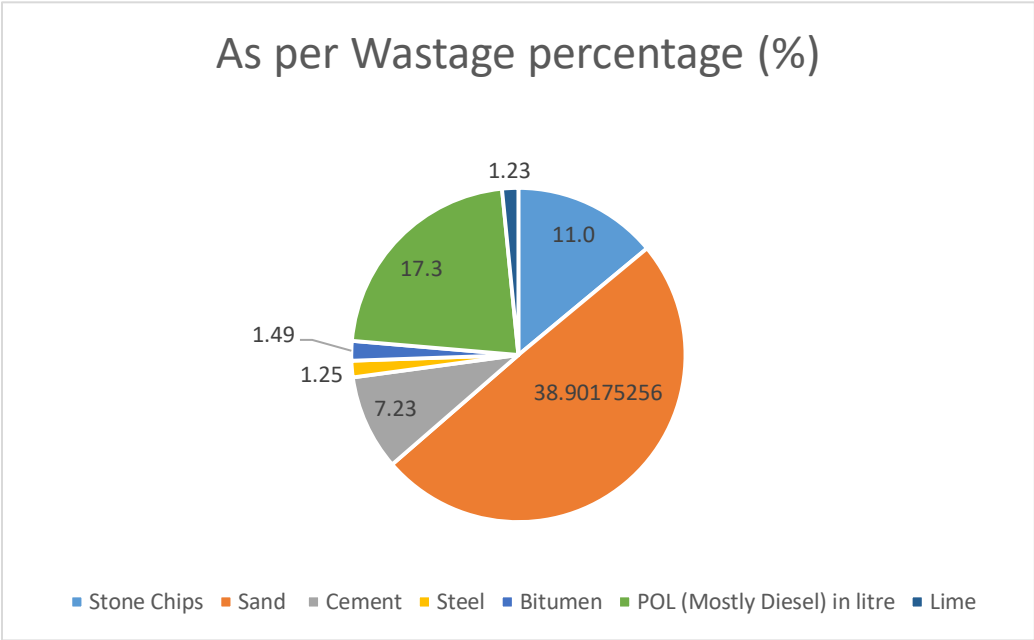
As per Quantity of Procurement (MT)



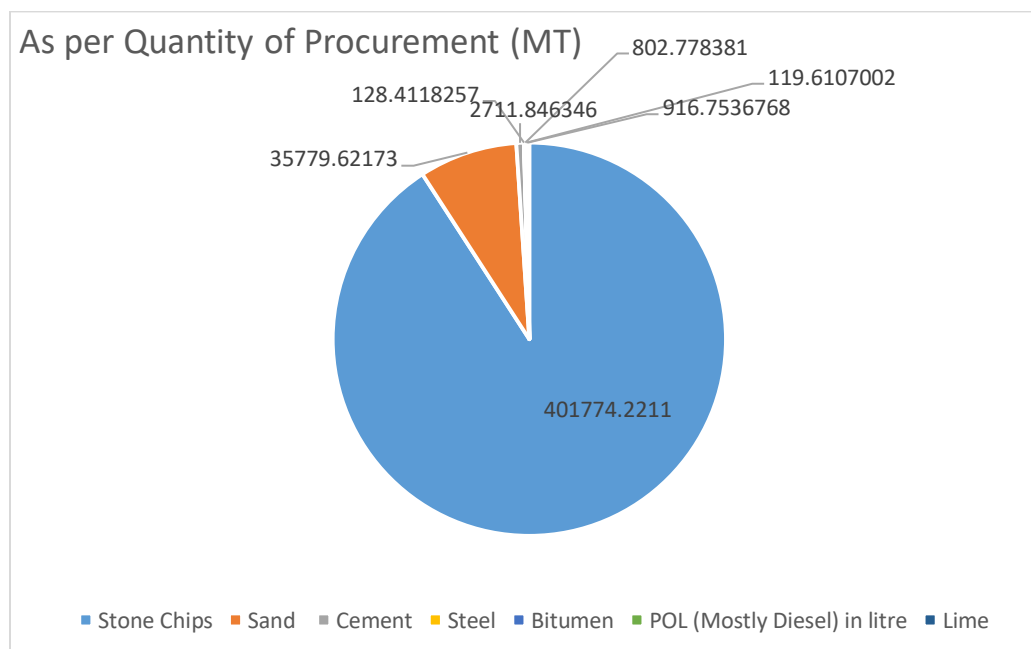
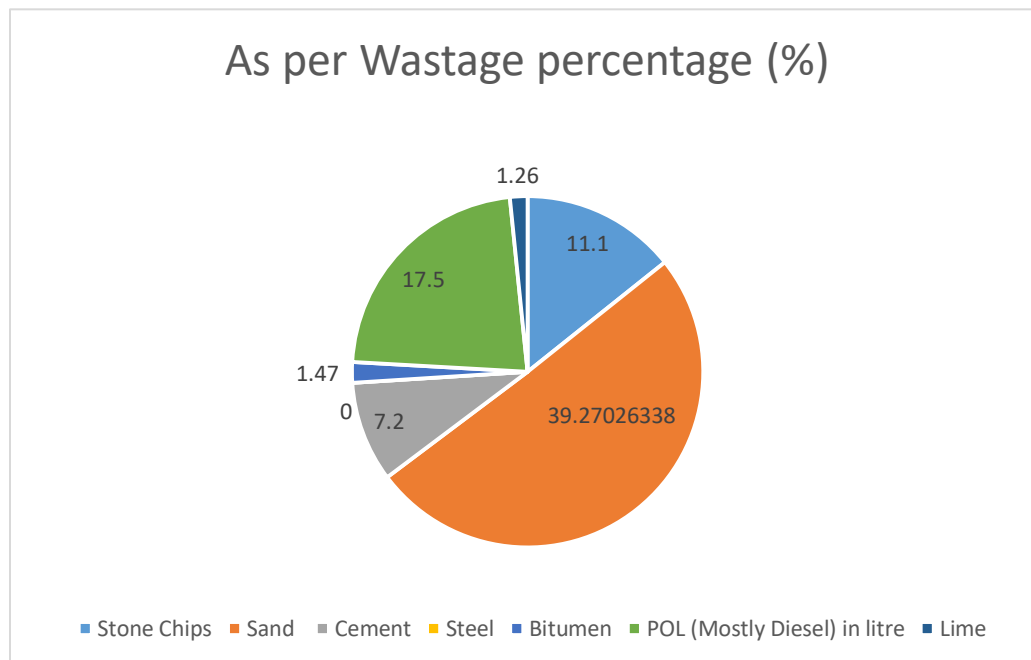
26)Response 26



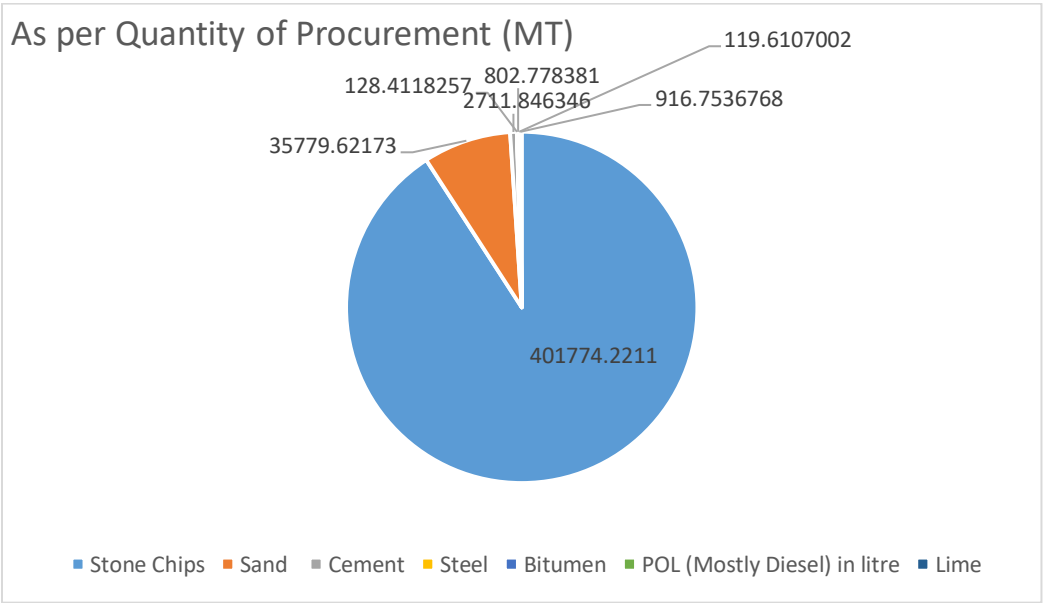
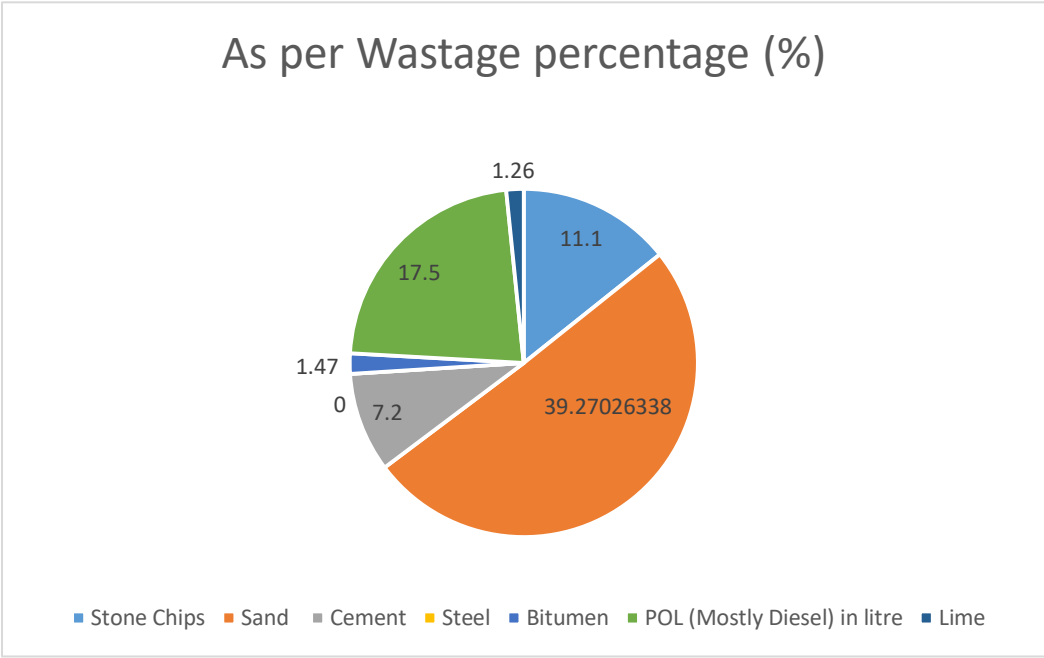
27) Response 27



28)Response 28

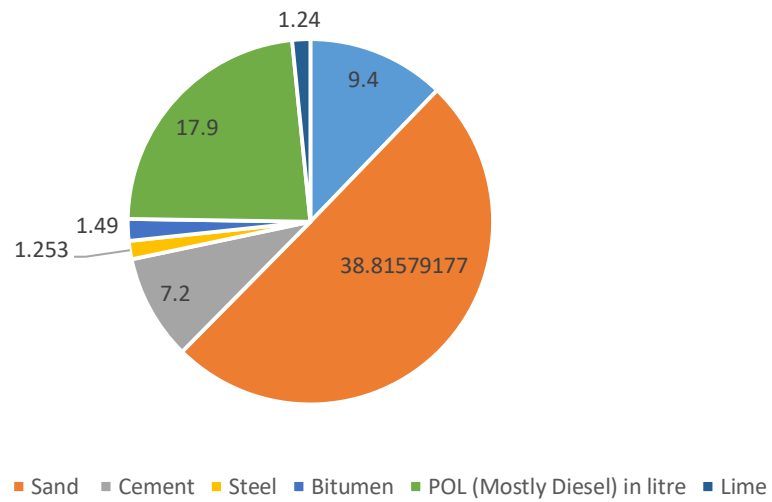


29)Response 29

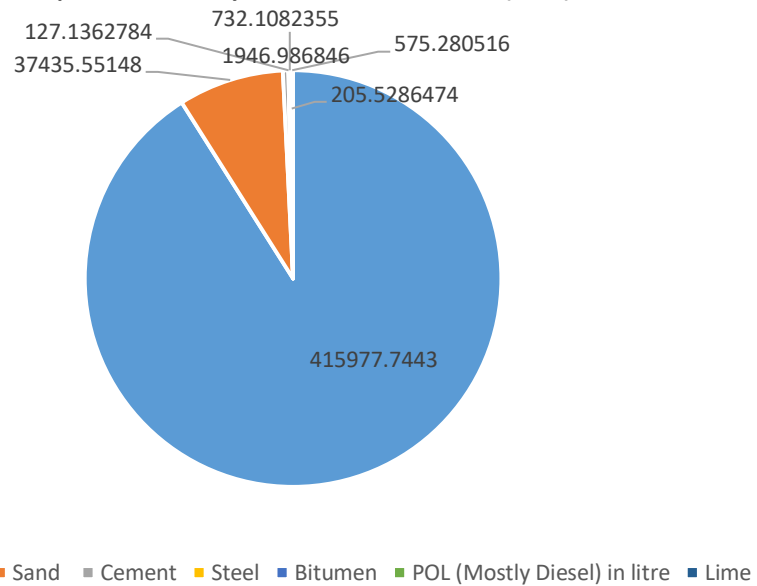


30) Response 30

As per Wastage percentage (%)

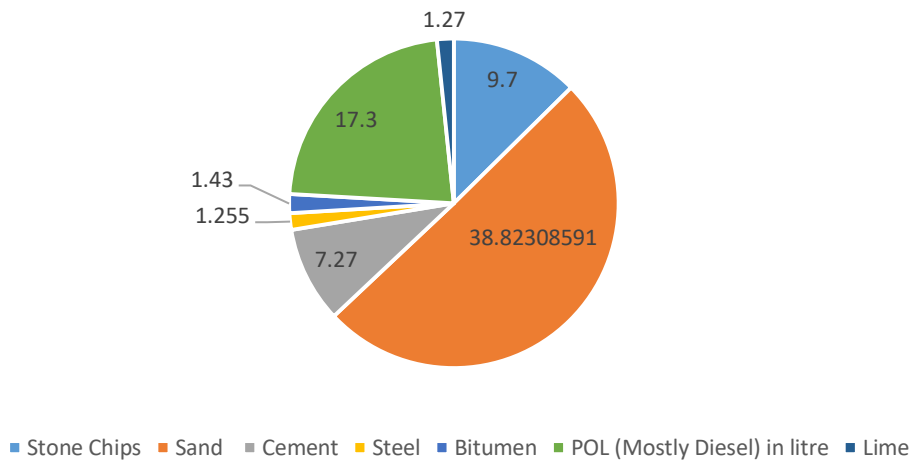


As per Quantity of Procurement (MT)

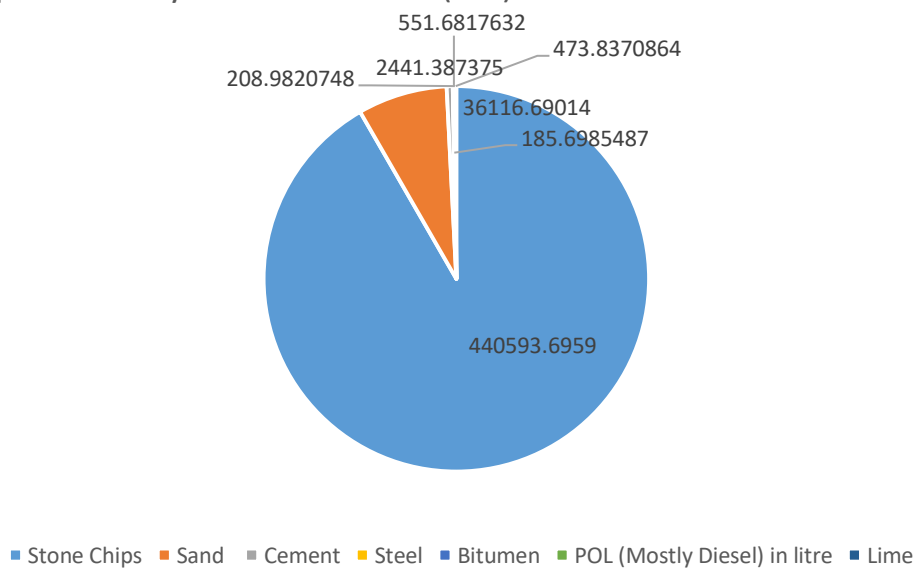


31)Response 31

As per Wastage percentage (%)

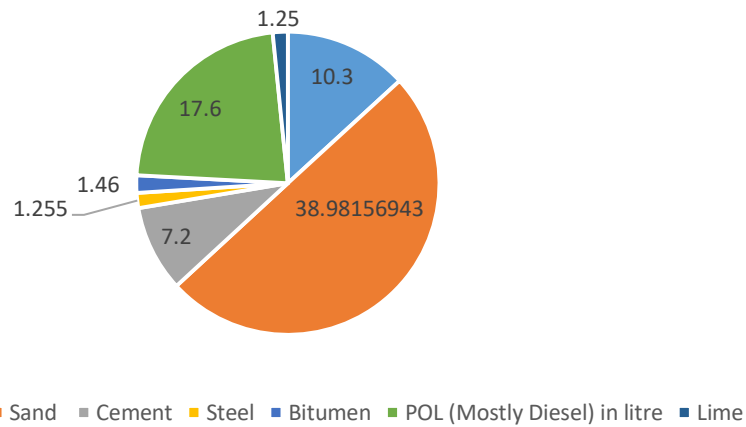


As per Quantity of Procurement (MT)

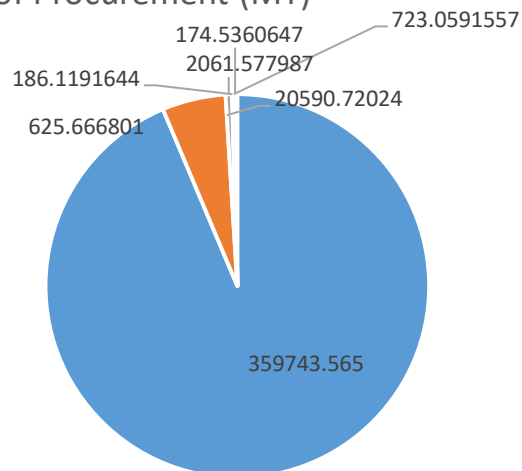


32)Response 32

As per Wastage percentage (%)

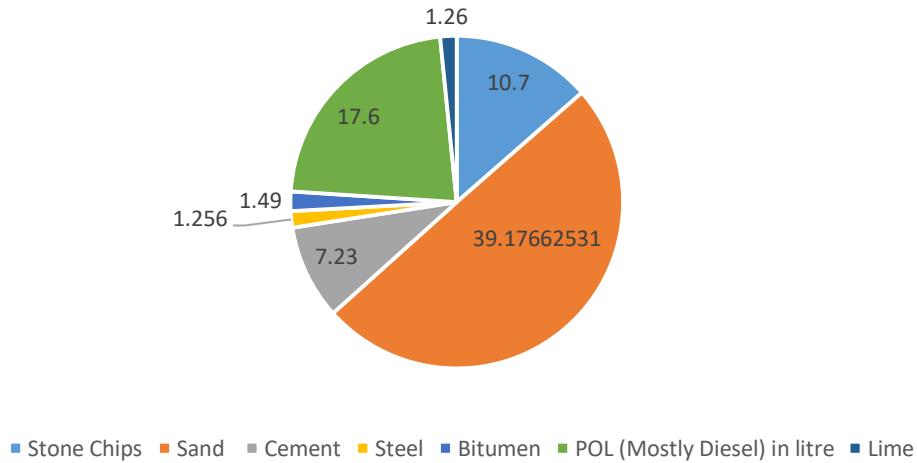


As per Quantity of Procurement (MT)

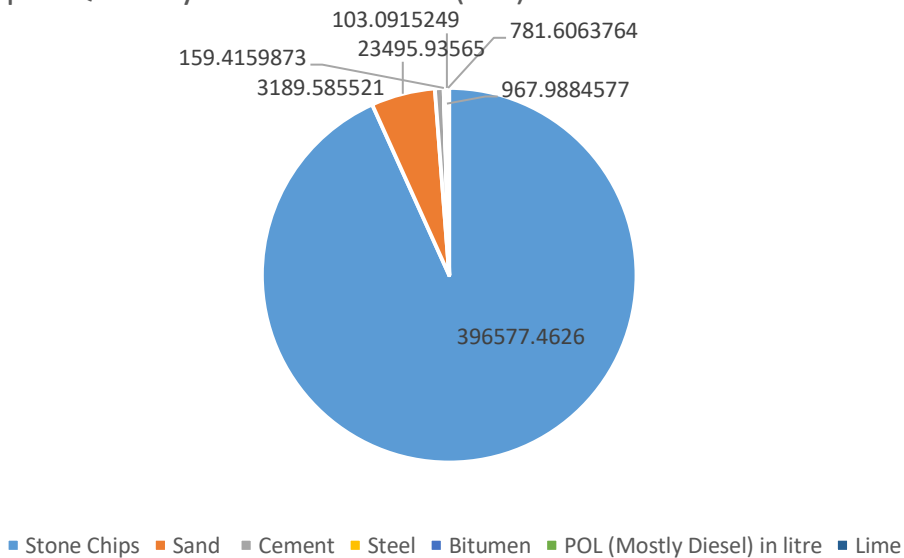


33)Response 33

As per Wastage percentage (%)

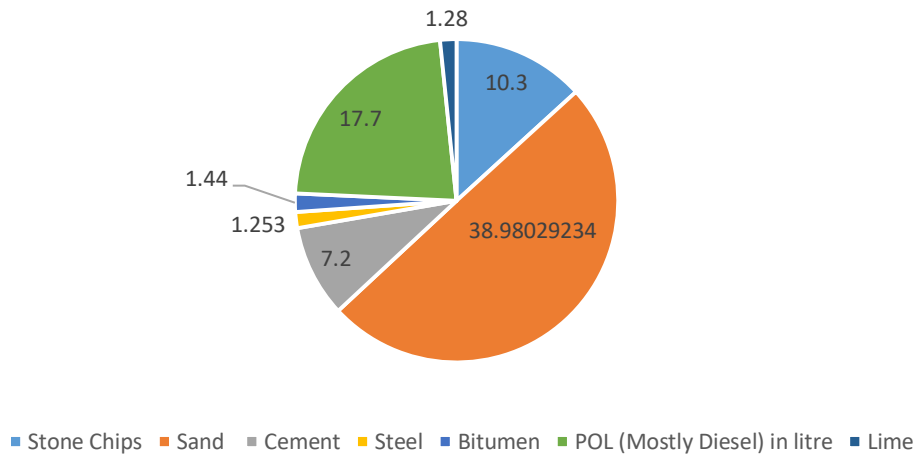


As per Quantity of Procurement (MT)

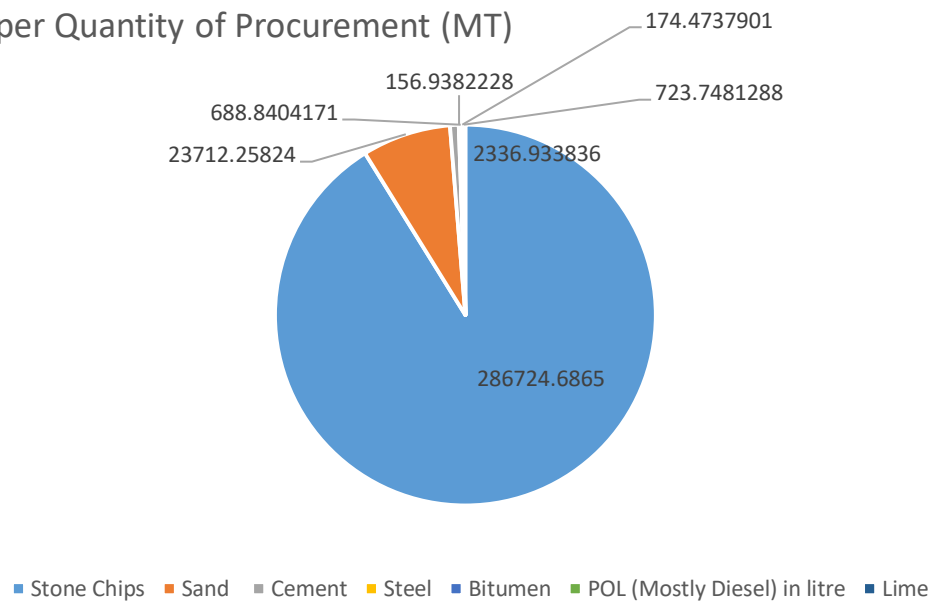


34)Response 34

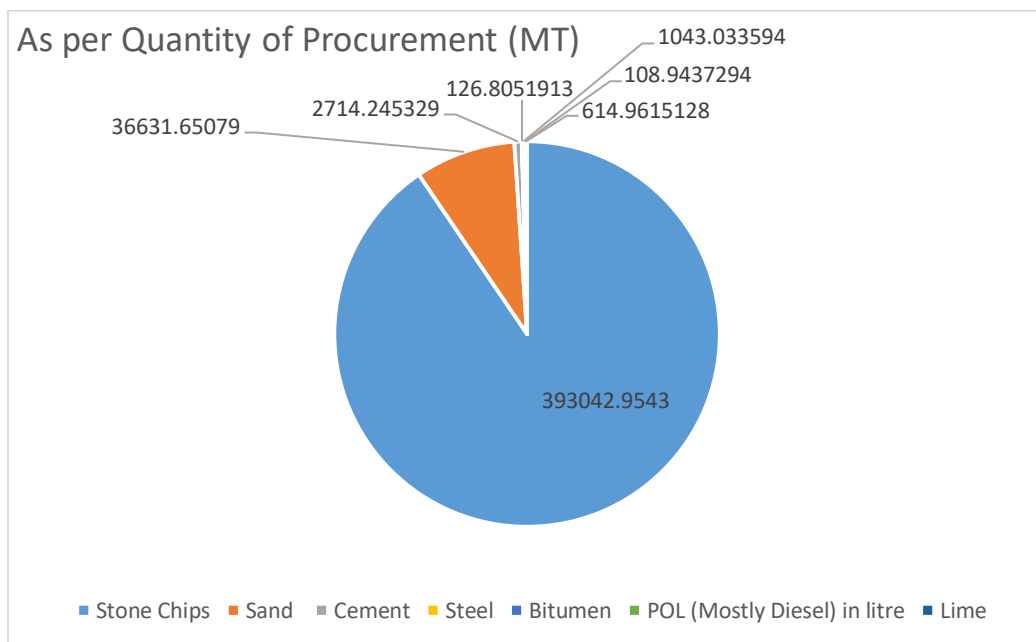
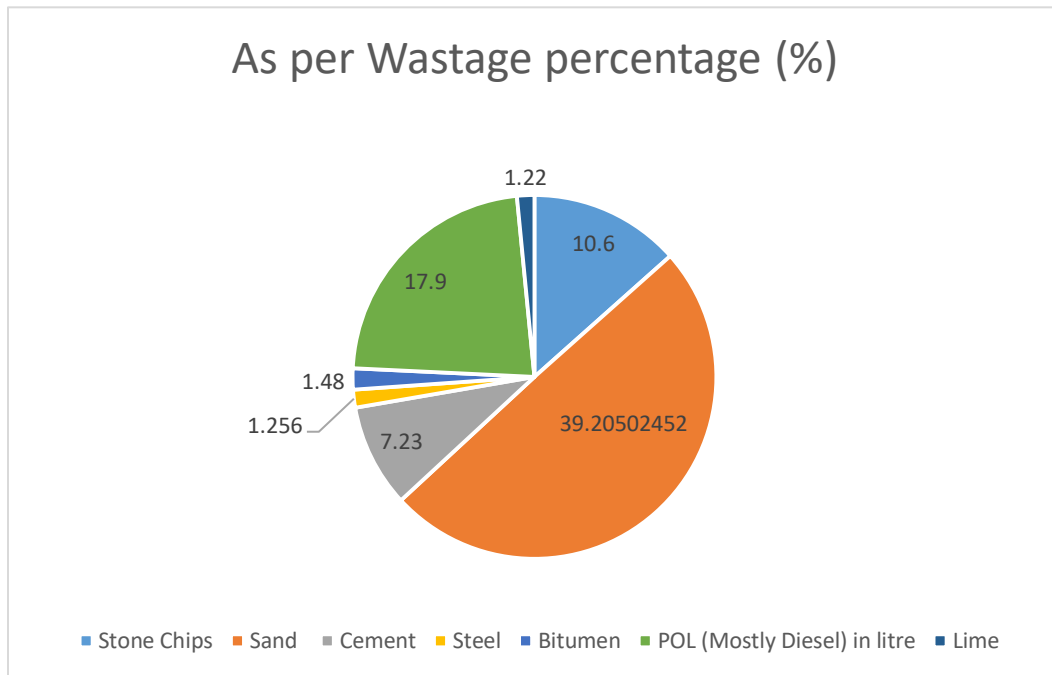
As per Wastage percentage (%)



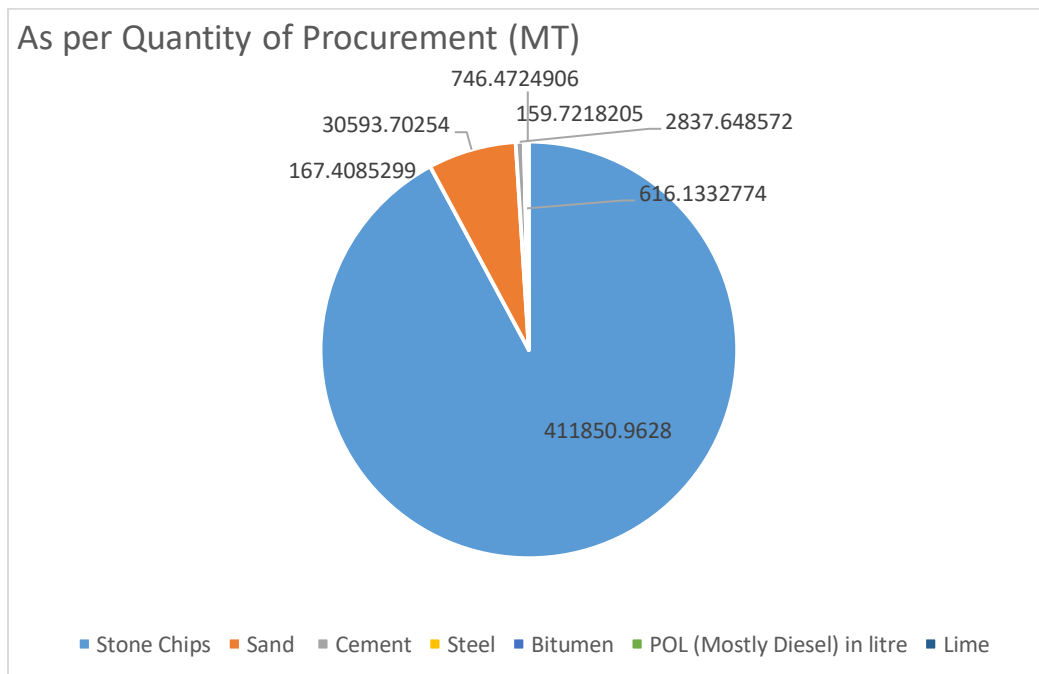
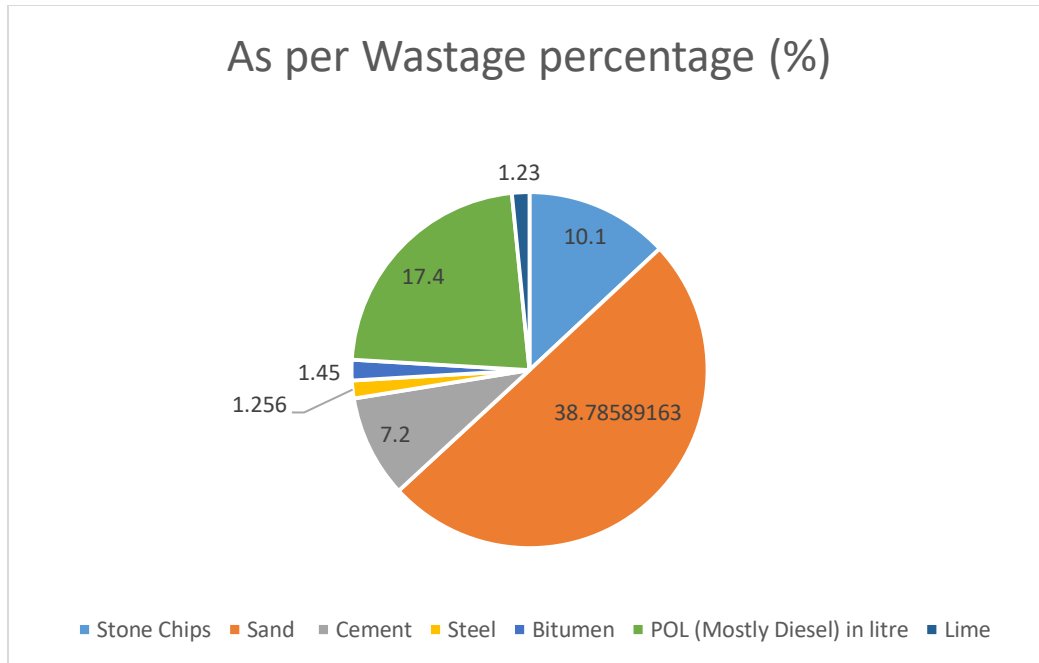
As per Quantity of Procurement (MT)



35)Response 35

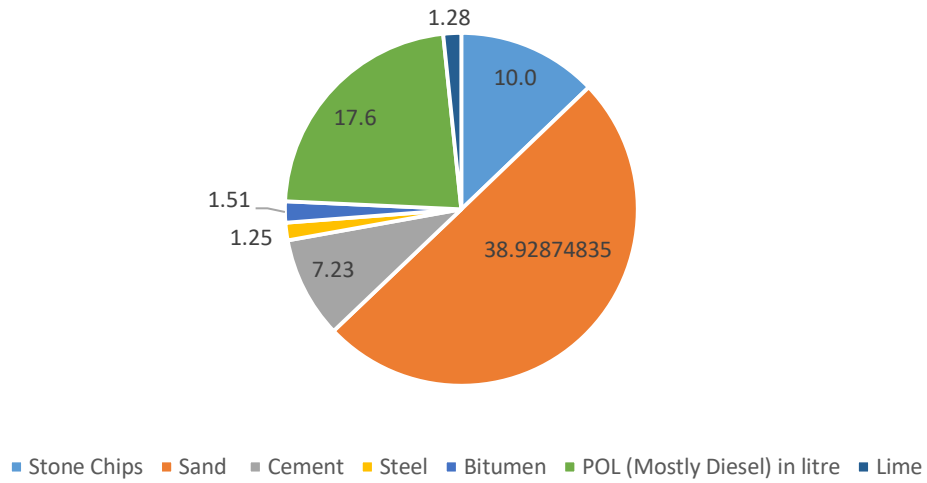


36)Response 36

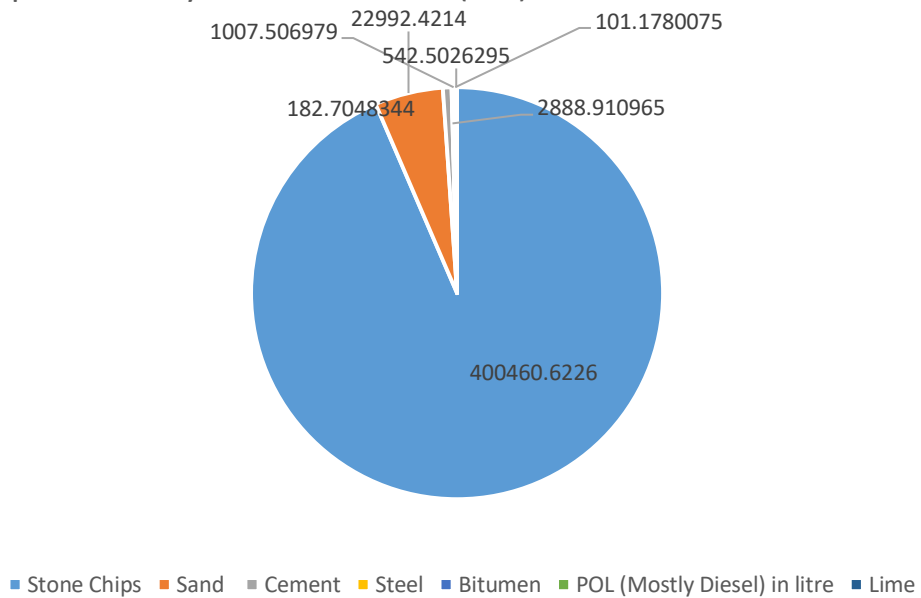


37)Response 37

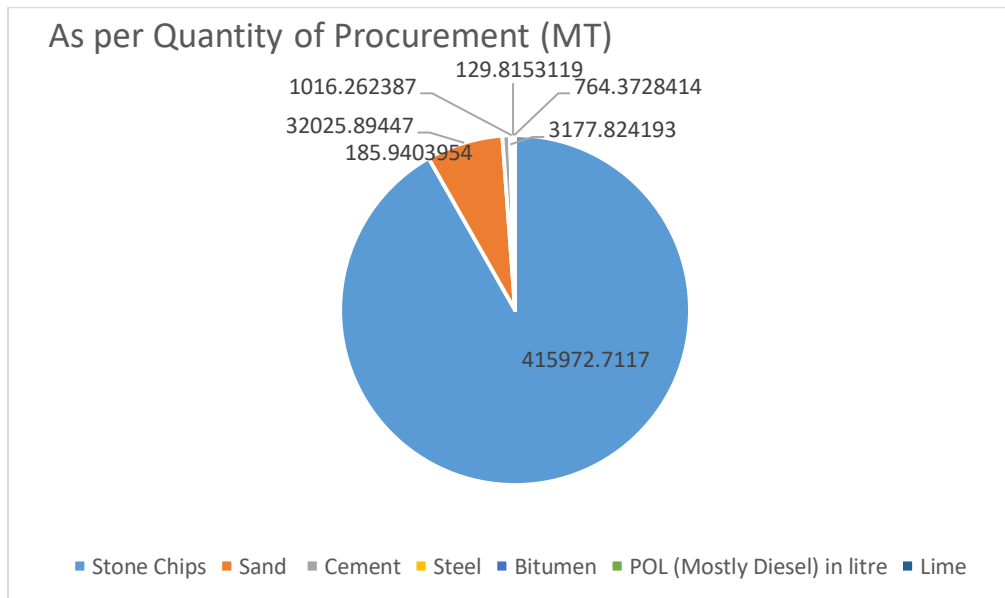
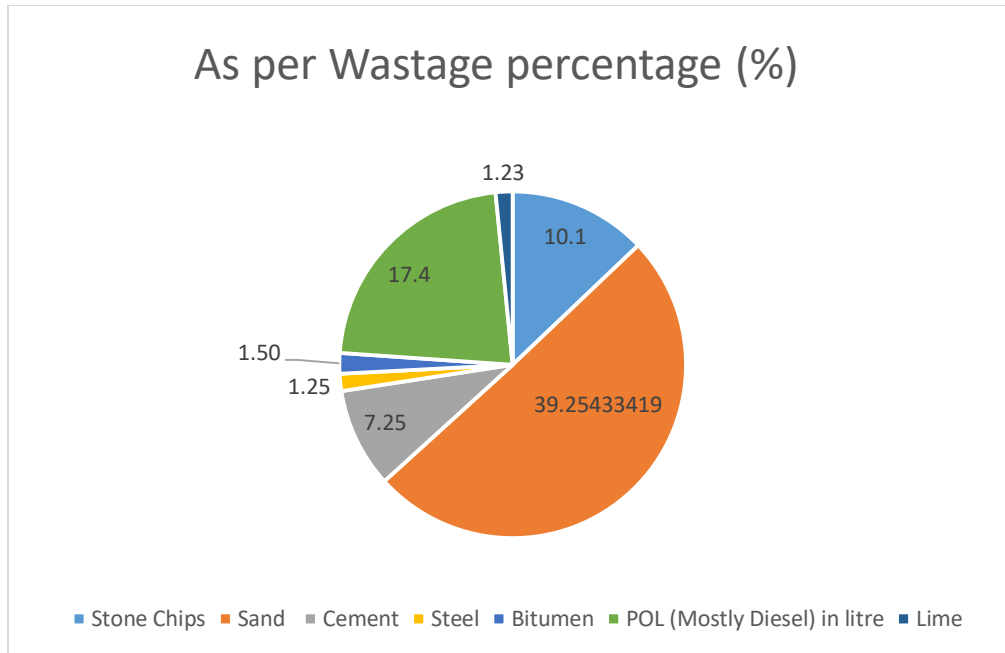
As per Wastage percentage (%)



As per Quantity of Procurement (MT)

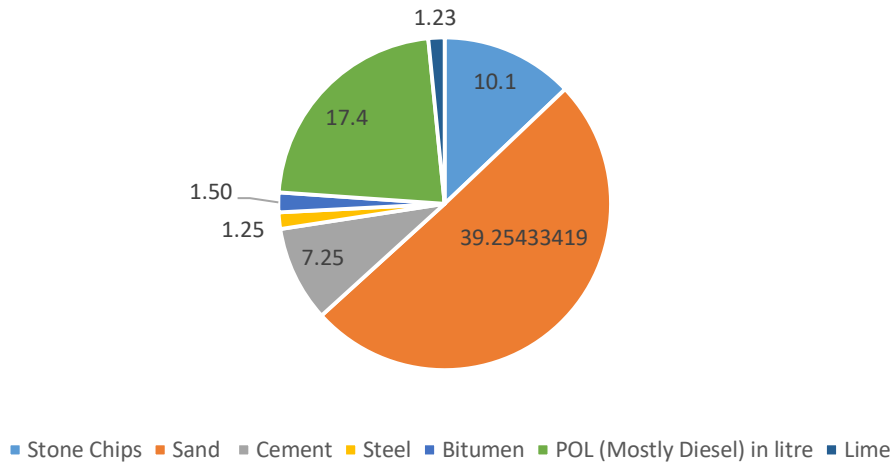


38)Response 38

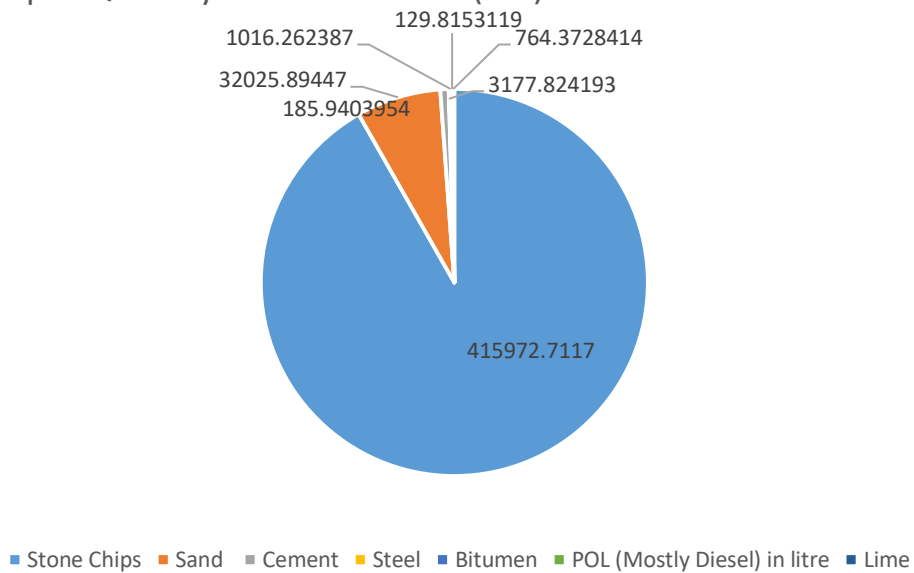


39)Response 39

As per Wastage percentage (%)

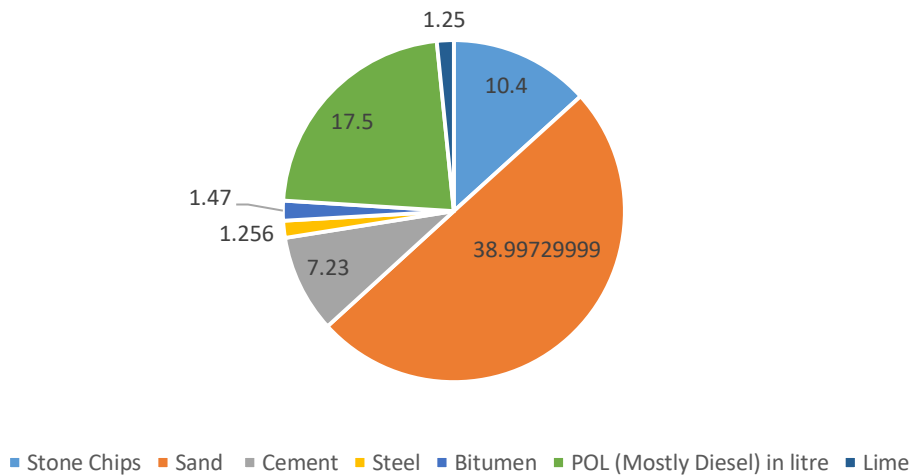


As per Quantity of Procurement (MT)

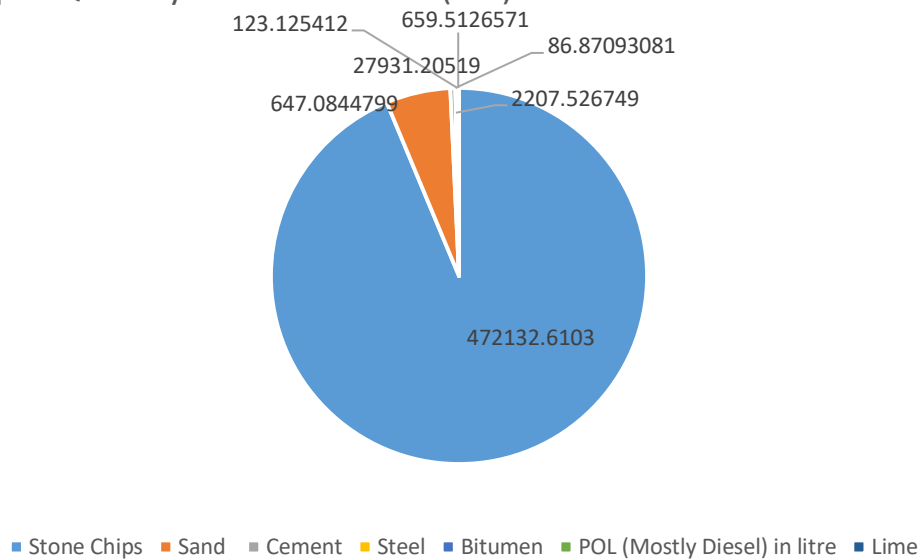


40)Response 40

As per Wastage percentage (%)



As per Quantity of Procurement (MT)



It is imperative to note from all the aforementioned charts that in all the cases it is specifically observed that sand, stonechips, POL and cement have been wasted across sites consistently above the 3 to maximum 5 percent limit that we need to maintain at all construction sites.

4.3 Conclusion

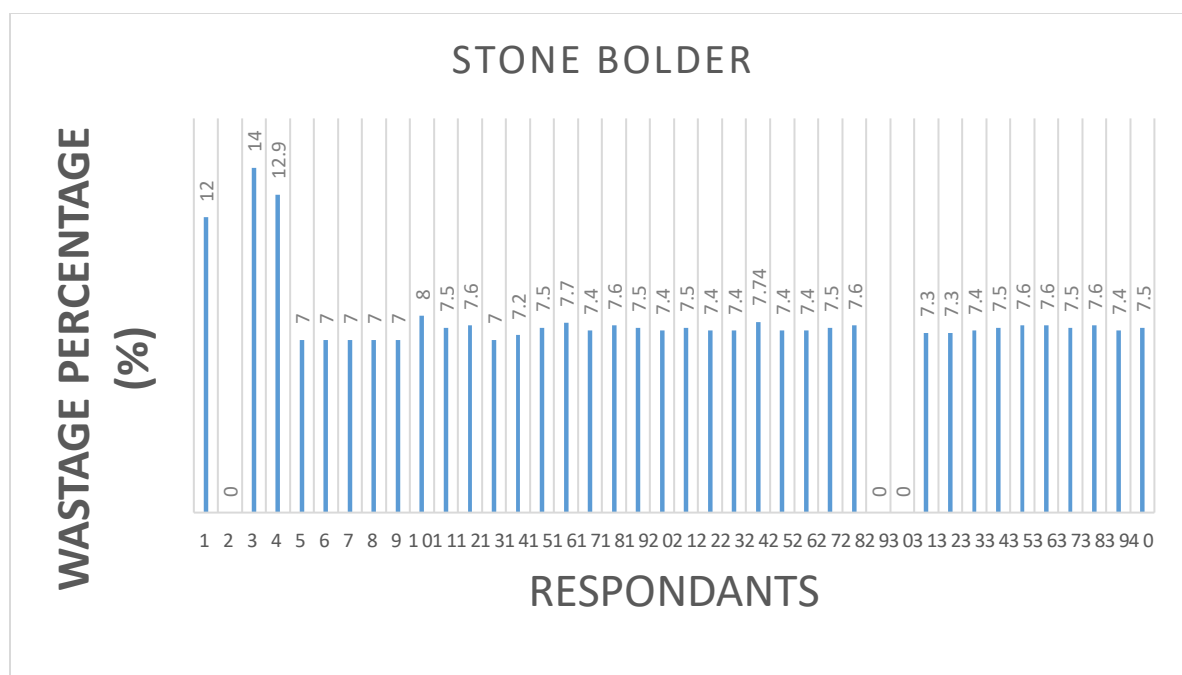
Such huge wastage specially in case of sand , cement, stonechips and POL clearly suggests negligence along with consistent pilferage across all sites as is recorded from the responses. Hence it becomes imperative to put an immediate stop to these and implement mathematical as well as vigilant measures at the same time across sites.

CHAPTER V: DISCUSSION

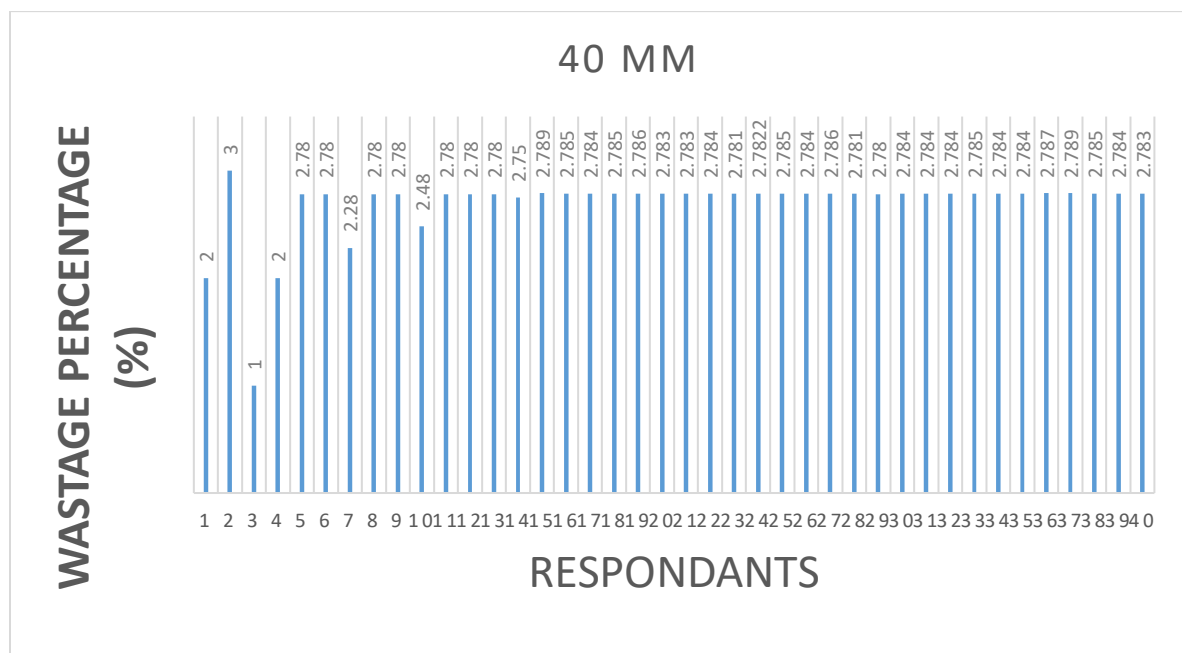
5.1 Discussion of Results

The aim of the research was always to put a stop to pilferage or negligent wastage that keeps on happening across infrastructure development sites. From the literature review it is imperative that various measures that include doing proper temporary boundary in the site, putting weigh bridge to weigh materials, installing close circuit recording devices and cameras as well as implementation of security measures have restricted pilferage and theft across sites to some extent but to completely eradicate the same and the idea amongst those at site store need typical engineering implementations like comparison with volume of materials at pre tender stage envisaged while bidding through a central procurement cell and assessing savings through reuse of raw materials wherever possible.

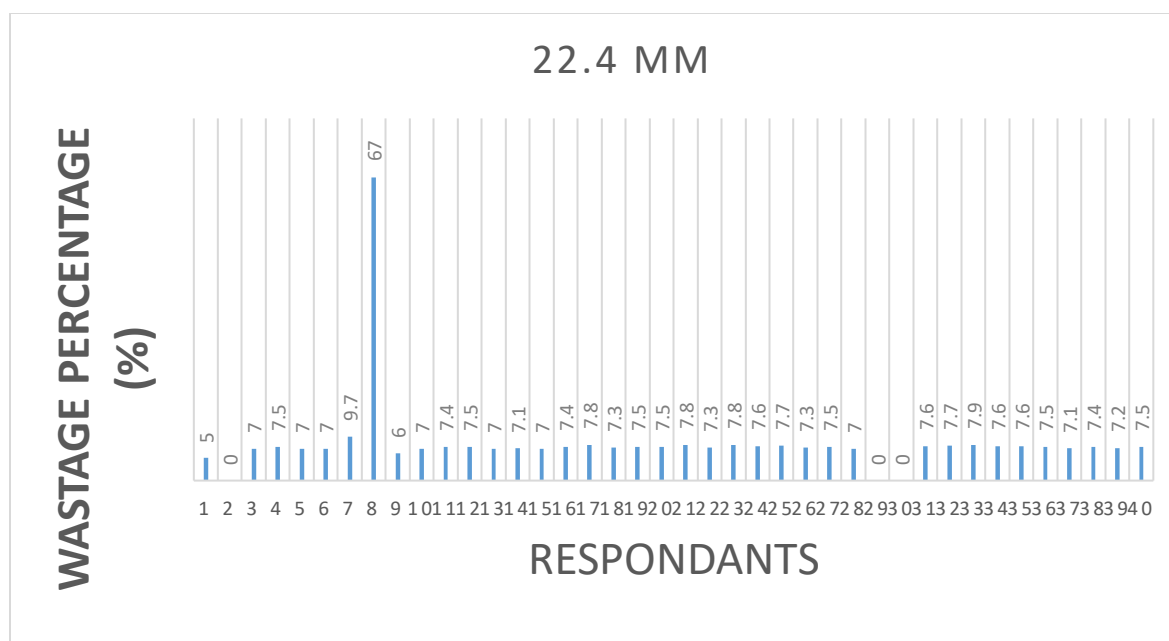
Among the results if we draw a chart, material wise across the questionnaire in which different raw materials have been used, it becomes crystal clear as to how the wastage in materials have varied across sites. Following are those given in tandem with the results given in the questionnaire which serve as primary data:



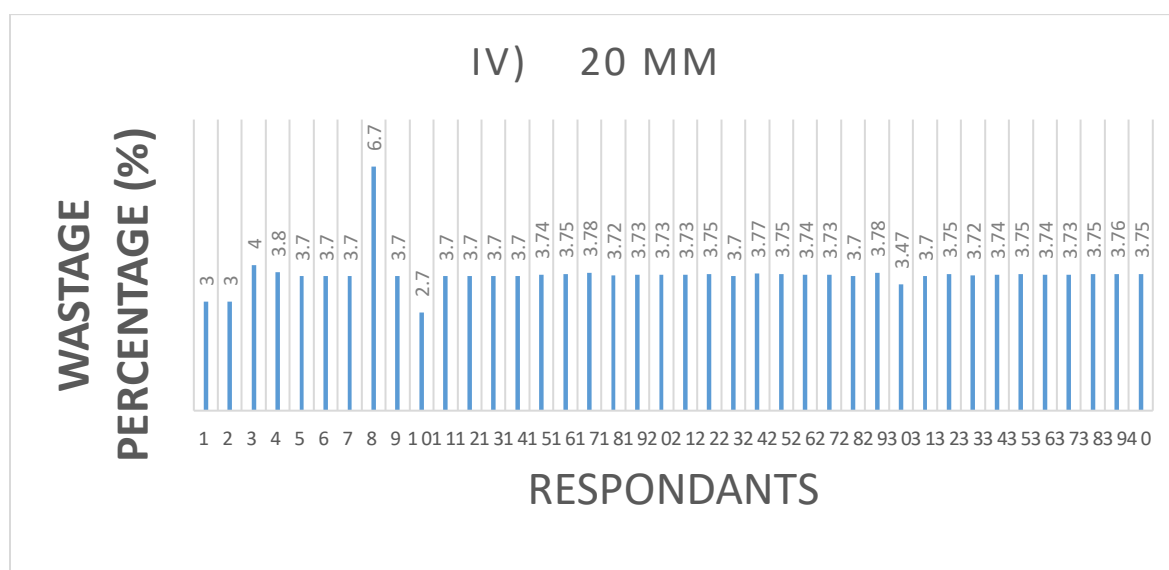
a) The above chart gives a complete picture of wastage or pilferage of Stone Boulder across responses received



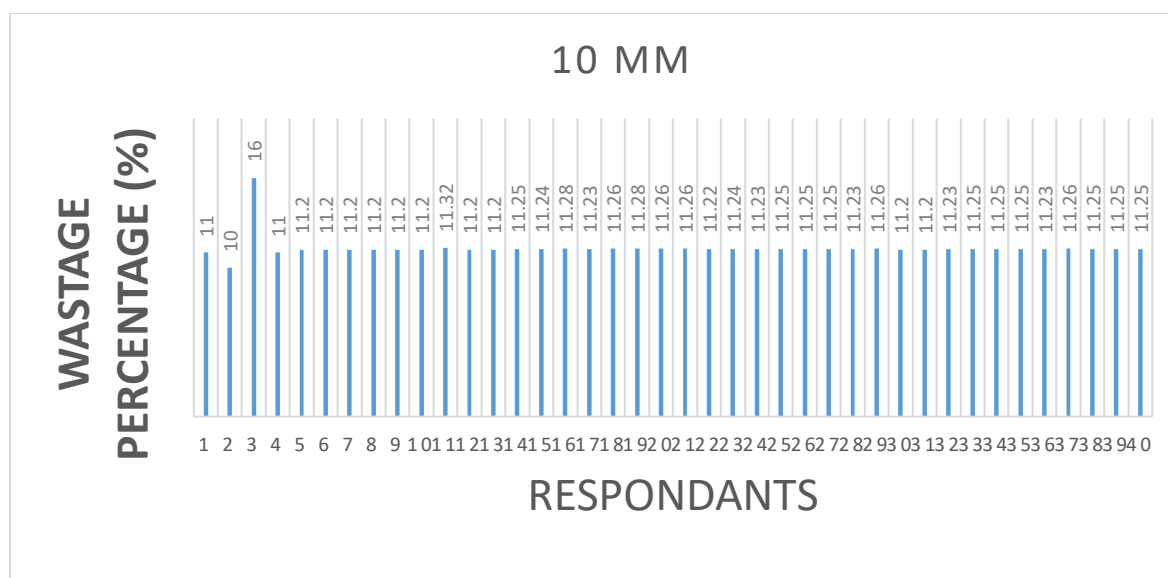
b) The above chart gives a complete picture of wastage or pilferage of 40mm stone chips across responses received



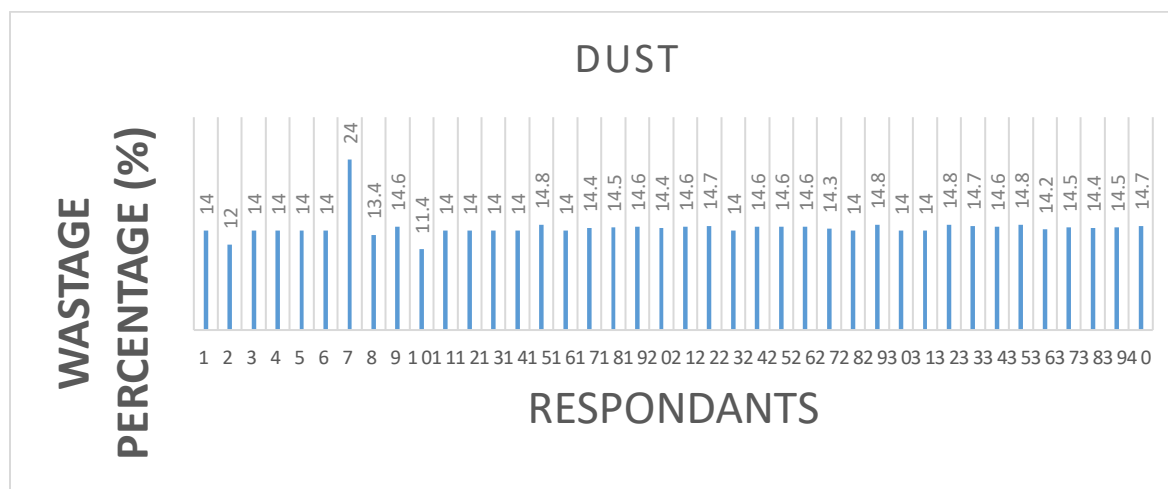
c) The above chart gives a complete picture of wastage or pilferage of 22.4mm stone chips across responses received



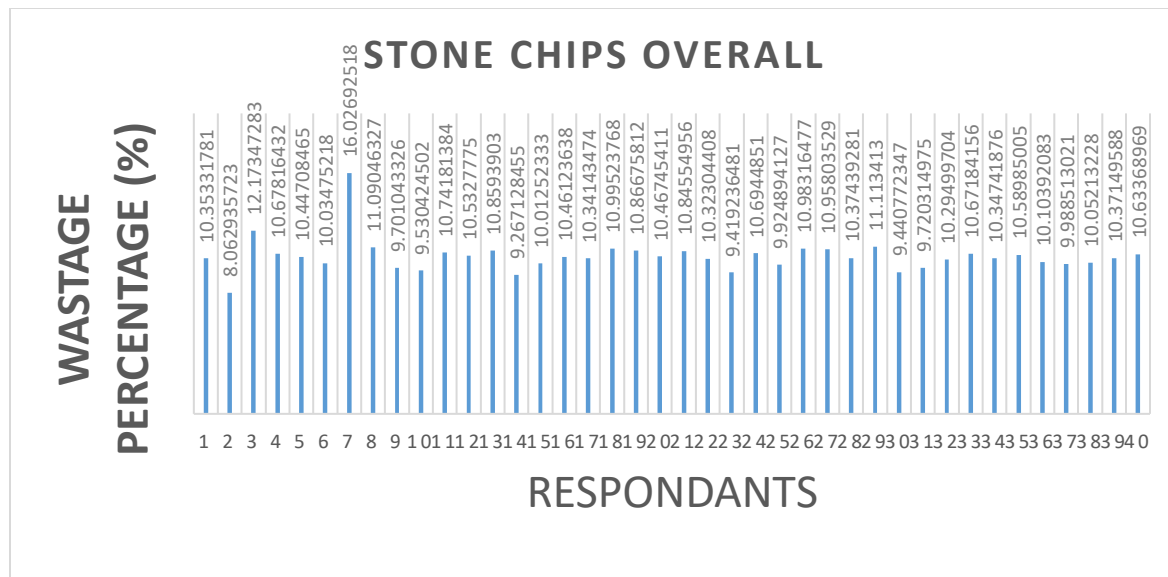
d)The above chart gives a complete picture of wastage or pilferage of 20mm stone chips across responses received



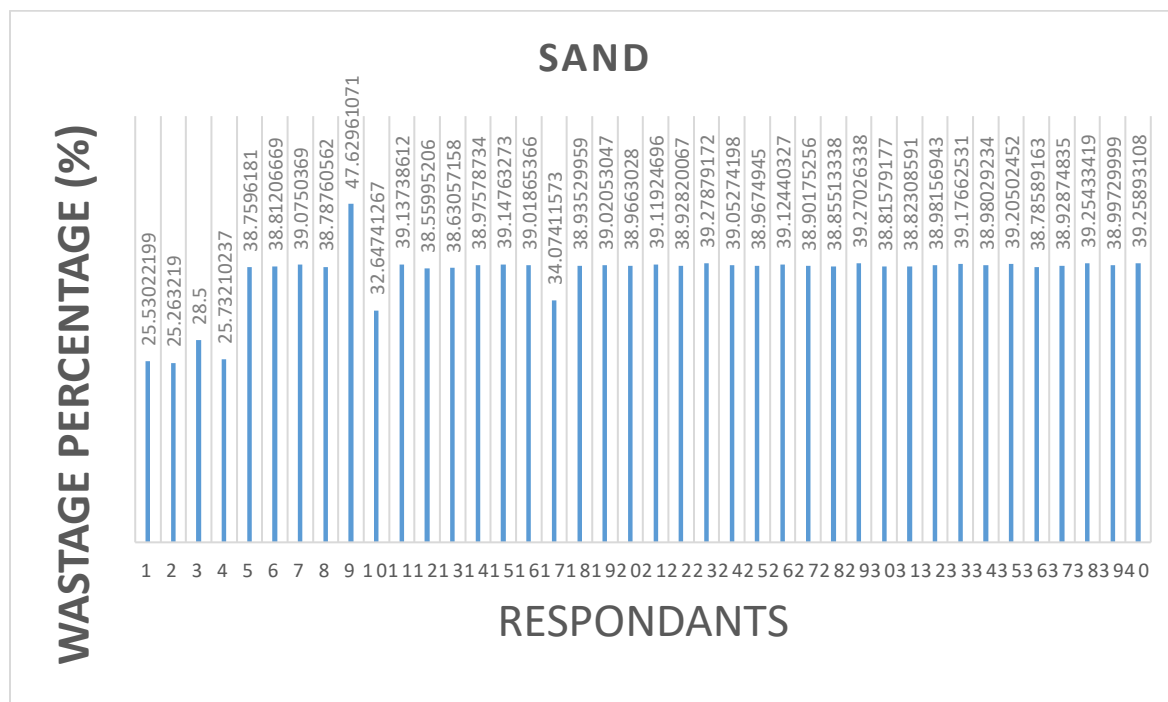
e)The above chart gives a complete picture of wastage or pilferage of 20mm stone chips across responses received



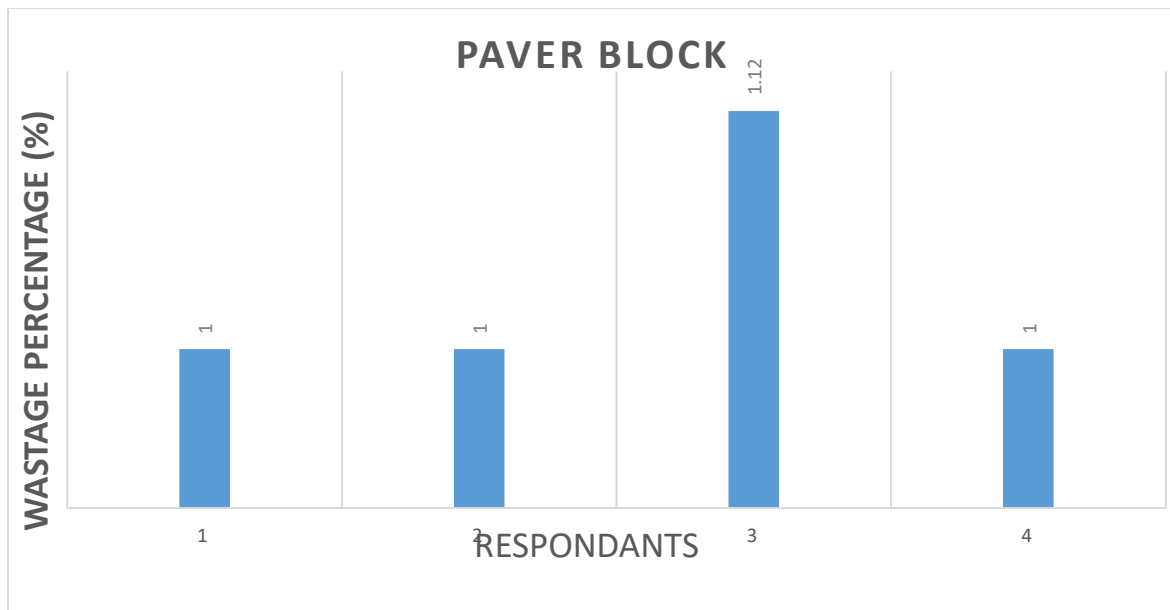
f) The above chart gives a complete picture of wastage or pilferage of stone dust across responses received



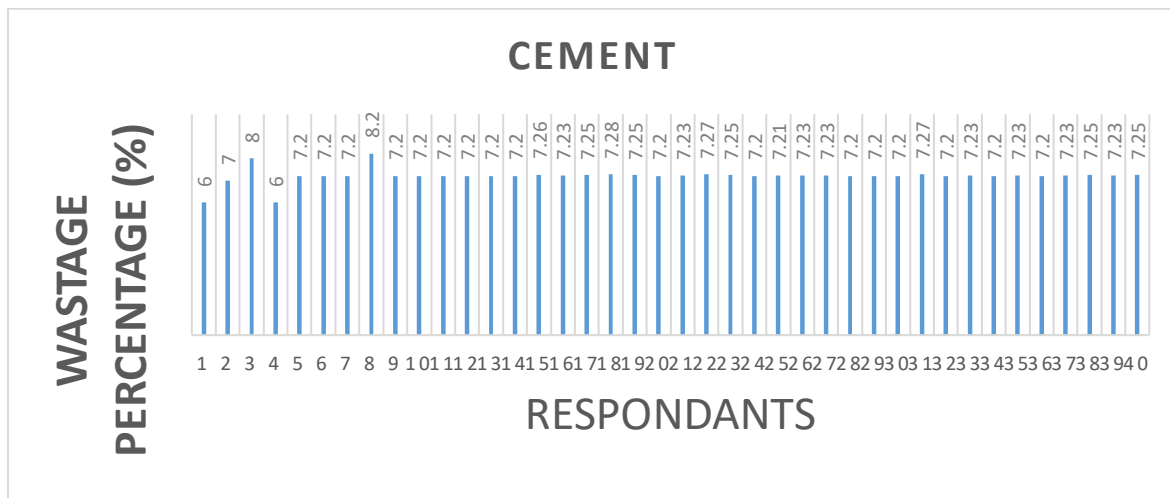
g) The above chart gives a complete picture of wastage or pilferage of overall stone chips across responses received



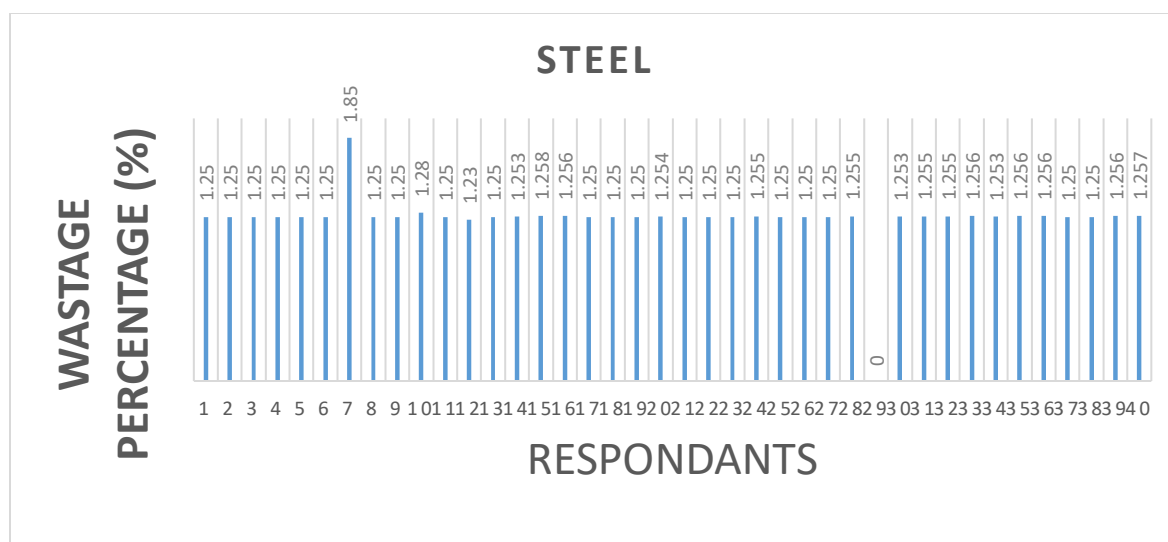
h) The above chart gives a complete picture of wastage or pilferage of sand across responses received



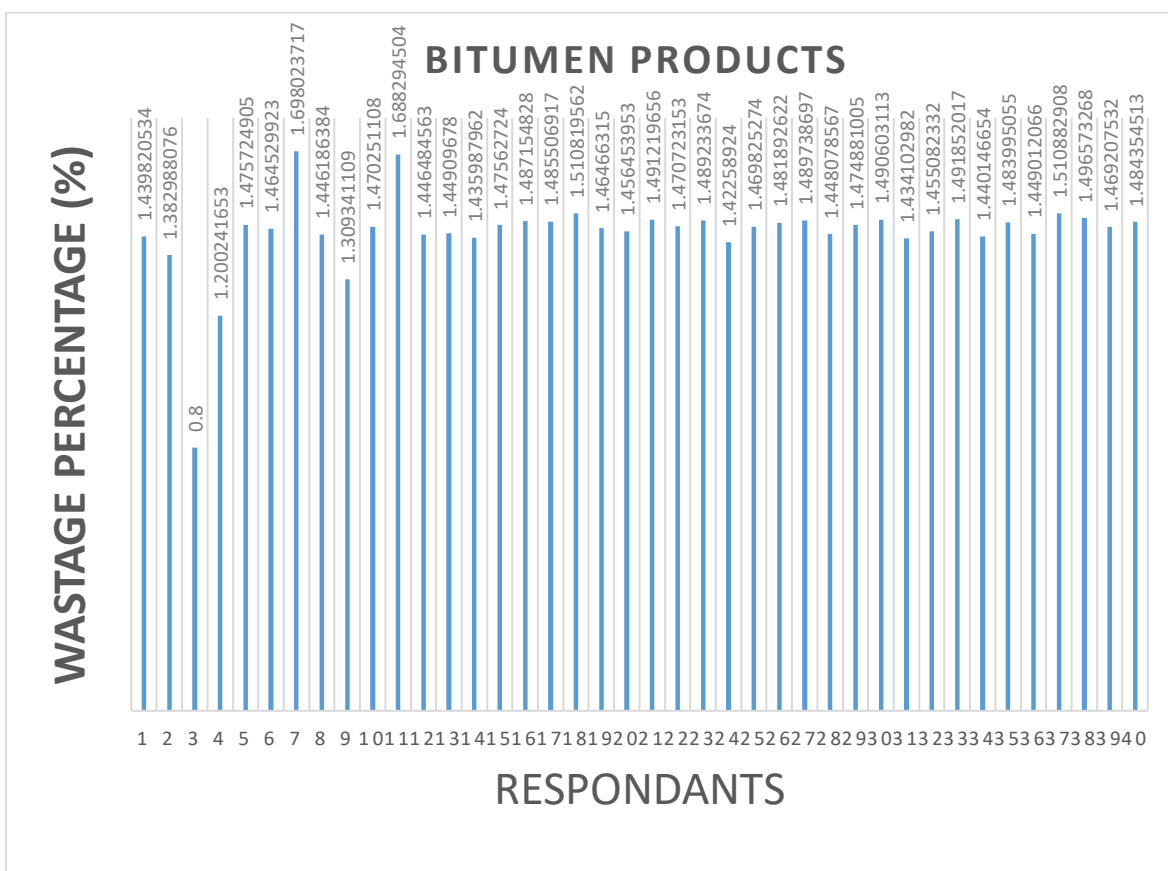
i)The above chart gives a complete picture of wastage or pilferage of paver block across responses received



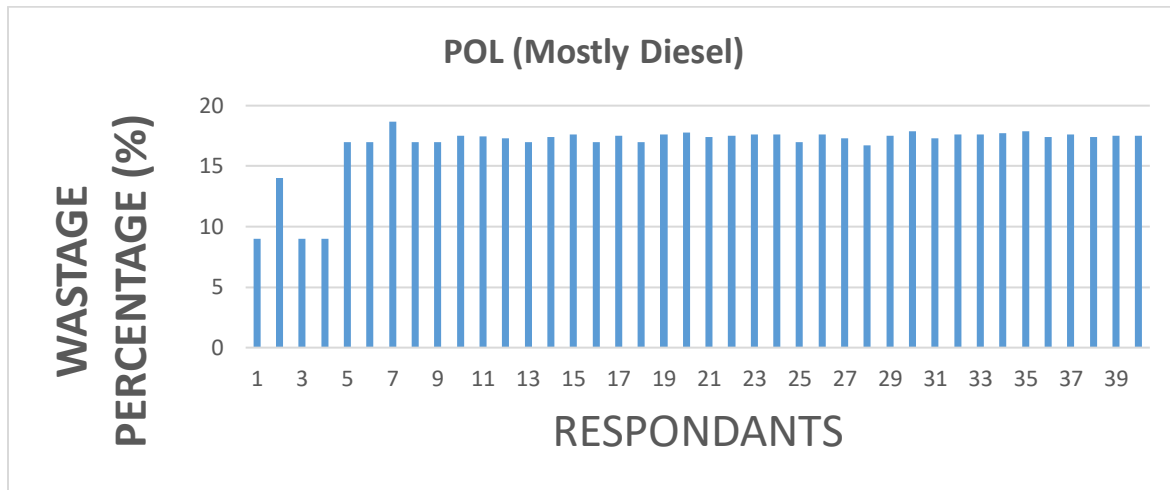
j)The above chart gives a complete picture of wastage or pilferage of cement across responses received



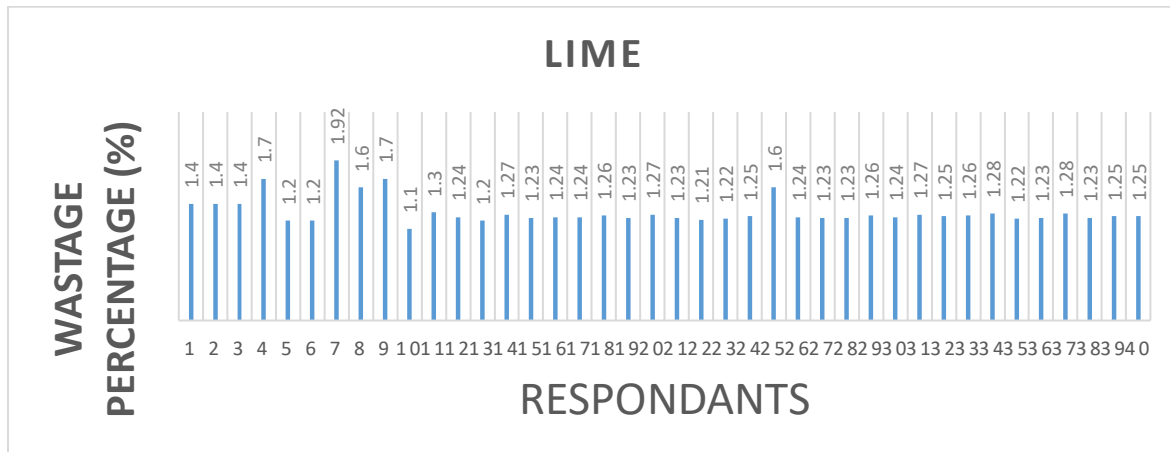
k) The above chart gives a complete picture of wastage or pilferage of steel reinforcement across responses received



l) The above chart gives a complete picture of wastage or pilferage of Bitumen products across responses received



m) The above chart gives a complete picture of wastage or pilferage of POL across responses received



n) The above chart gives a complete picture of wastage or pilferage of Lime powder across responses received

It is imperative to state that from the graphical representations that negligent wastage or pilferage is starkly high beyond the contemplations or industry standards for materials like stone dust, 10mm stone chips, sand and POL all of which are having aggregate wastage much above 10percent with sand having consistently the highest noted wastage of all.

On deeper understanding it becomes imperative that finer materials mined like stone dust and sand have the tendency of higher negligence and wastage which leads to higher wastage. Also the water content in finer materials ,precisely stone dust and sand, is always on the higher side which is often neglected while taking weighment of the consignments, this also accrues to a huge loss in finer materials. Of course vigil at site plays a role but without proper centralized procurement team with continuous reconciliation with envisaged requirement in the pretender stage, it becomes increasingly difficult to control the pilferage and negligent wastage across infrastructure development sites.

5.2 Recommendations for Future Research

From our work it would be clear as to how we should reconcile and get proper reports and results in a project such that the constant and previously irreversible change of pilferage and negligent wastage can be properly and sincerely addressed to get a formal outcome free of pilferage and negligent wastage.

Future studies can be based on graphical models on continuous and recurring expenditures in terms of change in rates of items from pretender stage till the time of completion of work and the impact that takes on the overall contemplated expenditure even after considering the excess payment accrued due to escalation of items within the tender clause. This work along with the instant work I have completed would pave the way for a robust system that would permanently end pilferage and or negligent wastage clubbed with

financial impact on a project site if not contemplated at the time of quoting of rates in a tender.

5.3 Conclusion

From the profound and elaborate works I have done by taking first hand data across industry experts it is sure to be precisely understood without any iota of doubt that the only way pilferage and wastage can be restricted to a huge extent is by comparing the data that was contemplated in the pre tender stage as to that when procurement is done during the work stage. Continuous reconciliation of items has to be done , comparing the individual items as to what it was thought of during the pretender stage. So beyond all electronic and mechanical surveillance, leave alone the physical surveillance across site by a team of personnel, it becomes essential and absolutely necessary without any other alternatives that procurement of items and reconciliation of items must be done centrally through a team of professional engineers. In case an item exceeds the requirement than that which was contemplated in the pretender stage, savings in other items must be found out so that the net volume doesn't go up in terms of quantity of similar items of work. This should be absolutely adhered to for getting a good result from a site of works. Ultimately profitability is the key to any business and in infrastructure construction material component makes up for majority of the bill, hence it is the single most important item driving a thriving company. Better the management, better are the results with due reconciliation of materials procured.

APPENDIX A

SURVEY COVER LETTER

This letter was sent to all potential participants along with details of survey.

The letter was sent through hand at different sites and their responses were recorded.

"I'm Soumik, a DBA scholar, and a Post Graduate Construction engineer having served in the field of infrastructure development for more than 15 years. I'm conducting research into restricting pilferage and negligent wastage at sites in West Bengal, India, as the state has all the different types of terrain that poses potential challenges while working. I am doing this as part of my doctoral thesis. As part of this research, I'm talking to several industry experts to gain insights. The research interview process is fairly simple, and won't take more than 15 to 20 minutes to complete. Would you be interested in participating?"

If after this introduction the prospective participant consented to participate in the study, the researcher would then send or hand over the following message.

Thank you for your willingness to engage in this research

My research is something that I know will help more than just participants, it will be something that the industry can benefit from.

[If you are comfortable answering these questions, please fill out the survey.]

Also attached is something for you to review.

· An information sheet

I ask that you read the full information sheet closely. This document explains what kind of research it is, what you can expect from the interview, and your options.

Once you have read the information sheet please fill in your name and sign and date the last page.

You are given choices about how the information you provide is managed in the interview consent form.

Once you've read the interview consent form, please choose the level of consent (for direct quotation) and enter your name/sign/date on the second page.

Please sign both documents and send a copy back to us. You can also keep a copy for your own records.

The information sheet and consent form also has contact information for my doctorate guide, who you can reach out to directly if you have any concerns or wish to have clarifications

Thank you, and I hope we get to speak soon

APPENDIX B

SCREENER SURVEY

Once the participant received the form, they were asked to complete the survey. The survey had to be approached in sections and one by one all sections were answered in order to proceed in the next section. Each section had to be completed in full before moving onto the next question.

SECTION 1 – General

S. No.	Type	Question
1	Checkbox	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.
2	Radio Button	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response? <ul style="list-style-type: none">• Yes• No

SECTION 2 – About the participant

S. No.	Type	Question
3	Text	Name
4	Text	Email / Contact
5	Radio Button	<p>How long have you been working in the industry?</p> <ul style="list-style-type: none"> • < 1 Year • 1 – 3 Years • 4 – 6 Years • 7 – 10 Years • 11 – 15 Years • 15+ Years
6	Multiple Choice	<p>Which of these roles do you perform? Please select all that apply</p> <ul style="list-style-type: none"> • Executive • Management • Project Management • Project Design • Project Implementation • Marketing/Procurement of materials • Commercial • Site implementation • Safety and Security • Labour management • Other (Please fill)

SECTION 3 – About the business

S. No.	Type	Question
7	Text	Which company do you represent?
8	Text	Your position/role at the company you represent
9	Radio Button	<p>How long have you been working with your current company?</p> <ul style="list-style-type: none"> • < 1 Year • 1 – 3 Years • 4– 6 Years • 7 – 10 Years • 11 – 15 Years • 15+ Years
10	Radio Button	<p>What is the approximate yearly revenue of the company you represent?</p> <ul style="list-style-type: none"> • <= INR 50,00,000 • INR 50,00,001 to 100,00,000 • INR 100,00,001 to 500,00,000 • INR 500,00,001 to 1000,00,000 • INR 1000,00,001 to 2500,00,000 • INR 2500,00,001 to 5000,00,000 • INR 5000,00,001 to 10000,00,000 • INR 10000,00,001 to 25000,00,000
11	Radio Button	<p>Is the company you represent profitable?</p> <ul style="list-style-type: none"> • Yes • No
12	Radio Button	Can you fill up the datasheet according to you site (attached)

		<ul style="list-style-type: none"> • Yes • No
13	Radio Button	<p>Do you reconcile as per site or as per pre tender works?</p> <ul style="list-style-type: none"> • As per site • As per pre tender
14	Radio Button	<p>What is the manpower strength of your company. Please only include full time employees and contractors.</p> <ul style="list-style-type: none"> • < 10 people • 10 - 50 people • 51 - 100 people • 101 - 250 people • 251 - 500 people • > 500 people
15	Multiple Choice	<p>Which of these job types are employed in the company you represent? Please select all that apply.</p> <ul style="list-style-type: none"> • Railway Jobs • Highway jobs • Bridge jobs • Jetty jobs • WTP • Private Clients • Others

APPENDIX C
SCREENER SURVEY RESULTS

Respondent 01

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email/ Contact	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Project Management, Commercial

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	500,00,001 to 1000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101 - 250 people
15	Which of these job types are employed in the company you represent? Please select all that apply.	Highway jobs , Bridge jobs

Respondent 02

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 - 15 Years
6	Which of these roles do you perform? Please select all that apply	Commercial/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Design
9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	INR 5000,00,001 to 10000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51 - 100 people
15	Which of these job types are employed in the company you represent? Please select all that apply.	Highway jobs

Respondent 03

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Safety and security

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Management
9	What is the duration of your employment with your current company?	1 – 3 Years
10	What is the approximate yearly revenue of the company you represent?	INR 5000,00,001 to 10000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51 - 100 people
15	Which of these revenue models are employed in the company you represent? Please select all that apply.	Highway jobs , Building jobs

Respondent 04

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Management, Commercial

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Management , Design
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	10 - 50 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway jobs

Respondent 05

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Commercial, Labour management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Management
9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	INR 5000,00,001 to 10000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway jobs ,Bridge jobs

Respondent 06

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Project Design, Project management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Management

9	What is the duration of your employment with your current company?	5 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 5000,00,001 to 10000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51 - 100 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway jobs

RESPONDENT 07

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes

2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes
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SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	4 – 6 Years
6	Which of these roles do you perform? Please select all that apply	Project Management, Safety and Security

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	1-3 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Highway jobs

Respondent 08

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	1 – 3 Years
6	Which of these roles do you perform? Please select all that apply	Labour Management, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	1 – 3 Years
10	What is the approximate yearly revenue of the company you represent?	INR 500,00,001 to 1000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per site

14	What is the manpower strength of your company? Please only include full time employees and contractors.	10 - 50 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Jetty jobs

Respondent 09

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Senior Manager
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000

11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Railway Jobs, Highway Jobs

Respondent 10

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Executive

9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51- 100 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Private Clients, Building Construction

Respondent 11

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Safety and Security, Labour Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500s people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Road Construction

Respondent 12

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Bridge construction

Respondent 13

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of	Yes

	quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	3 – 5 Years
6	Which of these roles do you perform? Please select all that apply	Management, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Manager
9	What is the duration of your employment with your current company?	1– 3 Years
10	What is the approximate yearly revenue of the company you represent?	INR 500,00,001 to 1000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51- 100 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Private Clients, Railway Jobs

Respondent 14

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Safety and Security, Labour Management, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	20 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes

13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge construction, Road construction

Respondent 15

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Executive

9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Highway Jobs

Respondent 16

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Safety and Security, Labour Management, Project Design

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Site Manager
9	What is the duration of your employment with your current company?	7 - 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Private Clients

Respondent 17

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN

4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Executive Director
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Highway jobs

Respondent 18

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes

2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes
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SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Management, Project Design, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Manager
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Private Clients

Respondent 19

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	4 – 6 Years
6	Which of these roles do you perform? Please select all that apply	Safety and Security, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Safety Officer
9	What is the duration of your employment with your current company?	1 – 3 Years
10	What is the approximate yearly revenue of the company you represent?	INR 500,00,001 to 1000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per pre tender

14	What is the manpower strength of your company? Please only include full time employees and contractors.	51- 100 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Railway Jobs, Private Clients

Respondent 20

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Vice President

9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs

Respondent 21

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Safety and Security, Labour Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Senior Manager
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Railway Jobs

Respondent 22

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN

5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Management, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Project Manager
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Government Tenders

Respondent 23

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Executive Director
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per pre tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Highway jobs

Respondent 24

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company.	Yes

	Fill the survey only if you agree, if you disagree please do not fill the survey.	
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Safety and Security, Labour Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Safety Manager
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Private Clients

Respondent 25

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	4 – 6 Years
6	Which of these roles do you perform? Please select all that apply	Management, Project Design

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Manager
9	What is the duration of your employment with your current company?	4 – 6 Years Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to you site (attached)	No
13	Do you reconcile as per site or as per pre tender works?	As per site

14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Railway Jobs, Government Tenders

Respondent 26

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Project Design

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Vice President
9	What is the duration of your employment with your current company?	10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes

12	Can you fill up the datasheet according to you site (attached)	Yes
13	Do you reconcile as per site or as per pre-tender works?	
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients

Respondent 27

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Management, Site implementation

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Operations Manager

9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	No
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Bridge construction

Respondent 28

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	4 – 6 Years
6	Which of these roles do you perform? Please select all that apply	Management, Labour Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Manager
9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	No
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	51- 100 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Railway Jobs, Government Tenders

Respondent 29

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Executive Director
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Highway Jobs

Respondent 30

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN

5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Management, Safety and Security

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Operations Manager
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	No
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Railway Jobs, Government Tenders

Respondent 31

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Executive, Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Managing Director
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Bridge jobs

Respondent 32

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting	Yes

	them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Chief Operating Officer
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 5000,00,001 to 10000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients

Respondent 33

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Management, Safety and Security

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Operations Manager
9	What is the duration of your employment with your current company?	4 – 6 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	No
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Highway Jobs

Respondent 34

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Executive, Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Director
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people

15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients
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Respondent 35

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Marketing/Procurement

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	General Manager
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)	

13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients

Respondent 36

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Operations

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Chief Executive Officer
9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 500,00,001 to 1000,00,000

11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	500+ people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients

Respondent 37

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Executive, Management

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Director of Operations
9	What is the duration of your employment with your current company?	15+ Years

10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Highway Jobs

Respondent 38

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	11 – 15 Years
6	Which of these roles do you perform? Please select all that apply	Management, Engineering

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Senior Project Manager

9	What is the duration of your employment with your current company?	11 – 15 Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Government Tenders, Private Clients

Respondent 39

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	7 – 10 Years
6	Which of these roles do you perform? Please select all that apply	Management, Administration

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Vice President
9	What is the duration of your employment with your current company?	7 – 10 Years
10	What is the approximate yearly revenue of the company you represent?	INR 1000,00,001 to 2500,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per pre-tender
14	What is the manpower strength of your company? Please only include full time employees and contractors.	101- 250 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Bridge jobs, Government Tenders

Respondent 40

SECTION 1 – General

S. No.	Question	Response
1	This survey is entirely optional. Your answers would be recorded by the researcher. Your answers would remain anonymous in case of quoting them. You can fill this survey only if you can represent your company. Fill the survey only if you agree, if you disagree please do not fill the survey.	Yes
2	The research analyst would want to conduct an interview with you lasting between 15 to 20 minutes to discuss your responses. Your response?	Yes

SECTION 2 – About the participant

S. No.	Question	Response
3	Name	HIDDEN
4	Email	HIDDEN
5	How long have you been working in the industry?	15+ Years
6	Which of these roles do you perform? Please select all that apply	Management, Safety and Security

SECTION 3 – About the business

S. No.	Question	Response
7	Which company do you represent?	HIDDEN
8	Your position/role at the company you represent	Safety Director
9	What is the duration of your employment with your current company?	15+ Years
10	What is the approximate yearly revenue of the company you represent?	INR 2500,00,001 to 5000,00,000
11	Is the company you represent profitable?	Yes
12	Can you fill up the datasheet according to your site (attached)?	Yes
13	Do you reconcile as per site or as per pre-tender works?	As per site
14	What is the manpower strength of your company? Please only include full time employees and contractors.	251- 500 people
15	Which of these job models are employed in the company you represent? Please select all that apply.	Highway Jobs, Government Tenders

APPENDIX D

INTERVIEW QUESTIONS

After potential participants completed the screener survey, the researcher relegated any participants who did not meet the requirements for the study.

These requirements were that the company be profitable, the participant was willing to speak about the business, and that the participant was able to represent the business. The researcher then scheduled a call that was convenient for both parties. During the call, the participant was told to fill up the data required as per site and the following questions were posed to the interviewee by the researcher.

1. Can you please describe what the key challenges you think exist to building a profitable work site in India?
2. What were the biggest challenges you faced as a site manager when growing?
3. What kind of challenges are faced as the work progresses?
4. How important was the role of government the project

Response 1

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Time management
2. What were the biggest challenges you faced as a site manager when growing?	Internal conflicts
3. What kind of challenges are faced as the work progresses?	Reconciliation of materials
4. How important was the role of government in the project?	Government funded

Response 2

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Material sourcing
2. What were the biggest challenges you faced as a site manager when growing?	Inclement weather in coastal regions restricting total worktime in projects
3. What kind of challenges are faced as the work progresses?	Local problems, proper material handling and reconciliation
4. How important was the role of government in the project?	Government funded project

Response 3

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Timely completion
2. What were the biggest challenges you faced as a site manager when growing?	Mobilization of continuous labour
3. What kind of challenges are faced as the work progresses?	Continuous feeding of materials and proper reconciliation with progress
4. How important was the role of government in the project?	Government funded

Response 4

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Terrain management and machinery mobilization
2. What were the biggest challenges you faced as a site manager when growing?	Labour and time management
3. What kind of challenges are faced as the work progresses?	In profitability and control on materials
4. How important was the role of government in the project?	Government funded

Response 5

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Pretender contemplation
2. What were the biggest challenges you faced as a site manager when growing, and how did you overcome them?	Local disturbances
3. What kind of challenges are faced as the work progresses?	Profit making ability, material management
4. How important was the role of government in the project?	Government funded

Response 6

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Sincerity since inception
2. What were the biggest challenges you faced as a site manager when growing?	Mining of raw materials
3. What kind of challenges are faced as the work progresses?	Environmental clearances, raw material usage properly
4. How important was the role of government in the project?	Government funded project

Response 7

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Dilly dally approach in the beginning
2. What were the biggest challenges you faced as a site manager when growing?	Site management , especially mobilization of manpower and machinery
3. What kind of challenges are faced as the work progresses?	Uncontemplated terrain and sourcing problems of raw materials
4. How important was the role of government in the project?	Government funded

Response 8

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Overconfidence
2. What were the biggest challenges you faced as a site manager when growing?	Material reconciliation and management
3. What kind of challenges are faced as the work progresses?	Further pilferage by local goons
4. How important was the role of government in the project?	Government funded

Response 9

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Building a team
2. What were the biggest challenges you faced as a site manager when growing?	Sourcing and proper utilizing of materials
3. What kind of challenges are faced as the work progresses?	Wastage and pilferage at site
4. How important was the role of government in the project?	Government funded

Response 10

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Immediate action on the field
2. What were the biggest challenges you faced as a site manager when growing?	Challenge within the company
3. What kind of challenges are faced as the work progresses?	Making people work as per schedule, sourcing of raw materials and reconciliation
4. How important was the role of government in the project?	Government funded

Response 11

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Proper assessment of materials
2. What were the biggest challenges you faced as a site manager when growing?	Daily reconciliation or weekly reconciliation of store items
3. What kind of challenges are faced as the work progresses?	Different types
4. How important was the role of government in the project?	Government funded

Response 12

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Team
2. What were the biggest challenges you faced as a site manager when growing?	Ego in site level
3. What kind of challenges are faced as the work progresses?	Machinery, manpower and material utilization as per plan
4. How important was the role of government in the project?	Government funded

Response 13

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Focus on profit
2. What were the biggest challenges you faced as a site manager when growing?	Responsiveness of site workers and store staff
3. What kind of challenges are faced as the work progresses?	As per terrain
4. How important was the role of government in the project?	Government funded

Response 14

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Regular profit assessment
2. What were the biggest challenges you faced as a site manager when growing?	Lack of responsibility
3. What kind of challenges are faced as the work progresses?	Time and cost overrun, increase in price of materials, wastage of materials with time
4. How important was the role of government in the project?	Government funded

Response 15

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Focus from day one
2. What were the biggest challenges you faced as a site manager when growing?	To build a responsible team
3. What kind of challenges are faced as the work progresses?	Weather and material availability along with stacking methodology
4. How important was the role of government in the project?	Government funded

Response 16

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Assessment
2. What were the biggest challenges you faced as a site manager when growing?	Material management
3. What kind of challenges are faced as the work progresses?	Reconciliation of materials
4. How important was the role of government in the project?	Government funded

Response 17

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Focus
2. What were the biggest challenges you faced as a site manager when growing?	Internal conflicts
3. What kind of challenges are faced as the work progresses?	Management of machines, material and manpower
4. How important was the role of government in the project?	Government funded

Response 18

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Time
2. What were the biggest challenges you faced as a site manager when growing?	Environmental clearances in mining
3. What kind of challenges are faced as the work progresses?	Stopping wastage
4. How important was the role of government in the project?	Government funded

Response 19

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Mobilization properly
2. What were the biggest challenges you faced as a site manager when growing?	Tackling local suppliers
3. What kind of challenges are faced as the work progresses?	Pilferage and theft across the site
4. How important was the role of government in the project?	Government funded

Response 20

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Understanding of profit
2. What were the biggest challenges you faced as a site manager when growing?	Doing the economics from day one
3. What kind of challenges are faced as the work progresses?	Proper reconciliation
4. How important was the role of government in the project?	Government funded

Response 21

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Mentality
2. What were the biggest challenges you faced as a site manager when growing?	Time management
3. What kind of challenges are faced as the work progresses?	Time and material management problems
4. How important was the role of government in the project?	Government funded

Response 22

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Time management
2. What were the biggest challenges you faced as a site manager when growing?	Doing profit
3. What kind of challenges are faced as the work progresses?	Unknown and unseen problems
4. How important was the role of government in the project?	Government funded

Response 23

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Material sourcing
2. What were the biggest challenges you faced as a site manager when growing?	Environmental clearances
3. What kind of challenges are faced as the work progresses?	Material procurement
4. How important was the role of government in the project?	Government funded

Response 24

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Skill of the site people
2. What were the biggest challenges you faced as a site manager when growing?	Unskilled labour and dearth of materials
3. What kind of challenges are faced as the work progresses?	Manpower and material
4. How important was the role of government in the project?	Government funded

Response 25

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Profit making ability
2. What were the biggest challenges you faced as a site manager when growing?	Sourcing of materials
3. What kind of challenges are faced as the work progresses?	Material management, machine management
4. How important was the role of government in the project?	Government funded

Response 26

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Focus
2. What were the biggest challenges you faced as a site manager when growing?	Stacking materials before monsoon
3. What kind of challenges are faced as the work progresses?	Milestone reaching within working season
4. How important was the role of government in the project?	Government funded

Response 27

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Time
2. What were the biggest challenges you faced as a site manager when growing?	Vindictive third party consultants
3. What kind of challenges are faced as the work progresses?	Material management
4. How important was the role of government in the project?	Government funded

Response 28

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Positive intent
2. What were the biggest challenges you faced as a site manager when growing?	Immediate action at every negative step
3. What kind of challenges are faced as the work progresses?	Several internal and external
4. How important was the role of government in the project?	Government funded

Response29

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Responsibility sharing
2. What were the biggest challenges you faced as a site manager when growing?	Local pilferage
3. What kind of challenges are faced as the work progresses?	Theft, dacoity and attack by local goons
4. How important was the role of government in the project?	Government funded

Response30

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Positive thinking
2. What were the biggest challenges you faced as a site manager when growing?	Material procurement
3. What kind of challenges are faced as the work progresses?	Material reconciliation and proper utilization
4. How important was the role of government in the project?	Government funded

Response31

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Immediate action
2. What were the biggest challenges you faced as a site manager when growing?	Payment issues for materials purchased from locals
3. What kind of challenges are faced as the work progresses?	Local problems
4. How important was the role of government in the project?	Government funded

Response32

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Straight thinking
2. What were the biggest challenges you faced as a site manager when growing?	Assessing a site with time
3. What kind of challenges are faced as the work progresses?	Reconciliation of raw materials and mobilization of machinery
4. How important was the role of government in the project?	Government funded

Response 33

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Simplifying the problems
2. What were the biggest challenges you faced as a site manager when growing?	Internal issues
3. What kind of challenges are faced as the work progresses?	Time and cost over run
4. How important was the role of government in the project?	Government funded

Response 34

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Positivity
2. What were the biggest challenges you faced as a site manager when growing?	Proper use of materials
3. What kind of challenges are faced as the work progresses?	Dearth of labour in remote areas
4. How important was the role of government in the project?	Government funded

Response 35

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Excuses
2. What were the biggest challenges you faced as a site manager when growing?	Slow progress
3. What kind of challenges are faced as the work progresses?	Missing milestones and losses
4. How important was the role of government in the project?	Government funded

Response36

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Several managerial issues
2. What were the biggest challenges you faced as a site manager when growing?	Material choosing
3. What kind of challenges are faced as the work progresses?	Proper utilization of materials
4. How important was the role of government in the project?	Government funded

Response 37

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Slow start
2. What were the biggest challenges you faced as a site manager when growing?	Low impact individuals
3. What kind of challenges are faced as the work progresses?	Loss of profit gaining ability
4. How important was the role of government in the project?	Government funded

Response38

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Inactive response
2. What were the biggest challenges you faced as a site manager when growing?	Defocussed staff
3. What kind of challenges are faced as the work progresses?	Time and cost over run
4. How important was the role of government in the project?	Government funded

Response39

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Time cost overrun
2. What were the biggest challenges you faced as a site manager when growing?	Inactive hands
3. What kind of challenges are faced as the work progresses?	Reconciliation of materials
4. How important was the role of government in the project?	Government funded

Response40

Interview Question	Participant's Response
1. Can you please describe what the key challenges you think exist to building a profitable work site in India?	Proper planning
2. What were the biggest challenges you faced as a site manager when growing?	Activity planning and material planning
3. What kind of challenges are faced as the work progresses?	Meeting milestones
4. How important was the role of government in the project?	Government funded

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