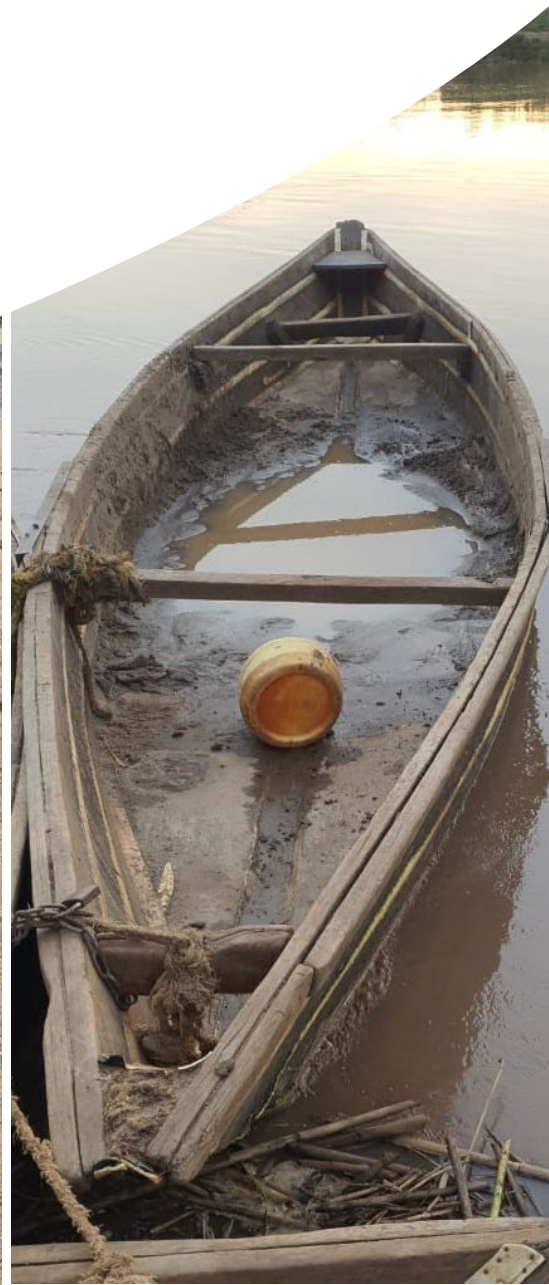


Assessing Labor Abuses in the Kenya Sand Supply Chain and Construction Sector

Report

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GLOSSARY

Admixtures	Chemical admixtures are ingredients in concrete, other than cement, water, and aggregate, that are added before or during mixing. Admixtures are added to lower costs, modify cement properties, and ensure quality control.
Aggregates	Granular materials such as sand, gravel or crushed stone. Crushed stone can be sourced from quarry rock, boulders, cobbles, large gravel, or recycled cement. Aggregates, along with water, cement, and admixtures, are used in the production of concrete. The type of aggregate impacts the concrete's quality, characteristics, and cost.
Batching plant	A facility that produces concrete by mixing cement, water, sand, admixtures, and aggregates.
Cement	A powdery substance made with calcined lime and clay, and other ingredients such as iron ore or fly ash. It is mixed with water to form mortar or mixed with sand, gravel, and water to make concrete. Cement can be stored in silos for bulk sale or bagged for retail sale.
Cement grinding mills	Facilities in which mechanical equipment is used to grind clinker into cement.
Cess taxes	Taxes imposed by county governments on the intra-county movement of goods. The tax is based on the carrying capacity of the vehicle and the weight of the products.
Clinker	A key ingredient in the production of cement. Clinker can be produced through a “wet” (with water) or “dry” (without water) process, in which limestone, clay, and other materials are mixed together at a high temperature. The solid clinker is then ground into a fine powder and blended with a small amount of gypsum, coal fly ash, furnace slag, silica fume, natural pozzolans, or aggregates before being used as a binder additive in the production of cement.
Concrete	A composite material produced with cement mix, water, and aggregate.
Cost including freight	A term referring to an international trade price valuation that includes the transaction value of goods plus the any costs (insurance, transport, etc.) incurred in transporting the goods to the port of origin as well as the costs of transporting the goods to the port of entry in the importing country. A cost including freight valuation does not include any costs after the goods arrive at the port of entry in the importing country, such as import duties, domestic transport costs, and other charges after arrival at the destination port.
Free on board	A term referring to an international trade price valuation that includes only the transaction value of goods and the transport costs up to loading at the port of export. A free on board valuation does not include any costs incurred after arriving at the port of origin.
Manufactured sand	Also known as “quarry dust.” (See definition below.)

Metric ton	Equivalent to 1,000 kilograms (2,204 pounds). Also referred to as “tonne.”
Murram	A type of red soil that is used in construction.
Natural sand	Sand that is harvested or mined from riverbeds, coastlines, or inland pits. For the purposes of this report, natural sand will be referred to as “sand,” whereas quarry dust (used as a substitute for sand) will be described as “quarry dust.”
Quarry dust	Also referred to as “manufactured sand,” “crushed sand,” or “dust,” quarry dust is produced by industrial mining and crushing larger rocks, quarry stones, or aggregates into smaller particles. Initially, quarry dust was a by-product of stone processing, but in recent years, it has also been produced as a primary product. For the purposes of this report, natural sand will be referred to as “sand,” whereas quarry dust (used as a substitute for sand) will be described as “quarry dust.”
Ready-mix concrete	Concrete that is batched from a central plant before being dispatched to a job site. Each batch formula is tailored to the specific requirements of a given project.
Shrink-mixed concrete	A type of ready-mix concrete. Concrete is partially mixed at the plant to reduce or shrink the volume of mixture, and mixing is completed in transit or at the job site.
Savings and Credit Cooperative (SACCO)	Offers financial services and affordable credit to its members. While benefits vary by region, in many cases, members of SACCOs in the sand extraction sector also benefit from SACCO-negotiated commercial advantages, including discounted road usage fees for transportation vehicles, preferential access to sand harvesting permits, and reduced rates for operational licenses. Through collective bargaining power, SACCOs can negotiate favorable terms with regulatory authorities and private landowners, creating cost efficiencies that individual operators could not achieve independently.
Slag	Ground granulated blast-furnace slag (“slag cement”) is a by-product of the steel industry. Slag cement is used in virtually all concrete applications.
Transit-mixed concrete	A type of ready-mix concrete. Also known as “truck mixed” or “cement mixer.” Materials are batched at a plant and partly mixed in transit (in cylindrical trucks with a rotating drum). Final mixing occurs on the job site.

ABBREVIATIONS

CBO	community-based organization
CSEC	commercial sexual exploitation of children
GDP	gross domestic product
HS	Harmonized System
ILO	International Labor Organization
KenGen	Kenya Electricity Generating Company
KENHA	Kenya National Highways Authority
KII	key informant interview
Mt	million metric tons
NEMA	National Environmental Management Authority
NGO	non-governmental organization
SACCO	Savings and Credit Cooperative

EXECUTIVE SUMMARY

PURPOSE OF STUDY

This qualitative study aimed to identify the potential presence of child labor in the supply chain of sand harvested in Kenya, particularly focusing on sand that is ultimately used in Kenya's construction sector. The study examined risk factors for child labor in sand production, the impact of power dynamics among supply chain actors on labor conditions, and stakeholder perceptions of industry monitoring to prevent labor exploitation. In addition, this study aimed to map the domestic supply chain of sand, including the degree to which it is possible to trace sand that was obtained using child labor through the downstream supply chains.

CONTEXT

Sand harvesting is a critical component of Kenya's construction sector, providing essential raw materials for building and infrastructure development. The industry operates largely informally, with extraction occurring primarily along riverbeds, coastal areas, and inland pits across multiple counties, including Machakos, Mombasa, Kakamega, Kajiado, Makueni, Nakuru, Isiolo, and Homa Bay. Many participants mentioned that artisanal sand harvesting employs the largest local workforce in their local area. The extraction process often involves manual labor using shovels, spades, and other hand tools, requiring minimal technical skills or physical strength to begin participating. This low barrier to entry, combined with economic pressures on families, inadequate enforcement of child labor laws, and the proximity of extraction sites to rural communities where educational and alternative employment opportunities are limited, creates conditions in which children are readily drawn into the workforce.

Sand has been listed on the U.S. Department of Labor's List of Goods Produced by Child Labor or Forced Labor since 2016 as a good produced with child labor in Kenya, and this study provides an update to these risks and risks in associated downstream products.

STUDY OBJECTIVES

The study pursued two main objectives: (1) to identify the current presence and characteristics of child labor in the sand harvesting from riverbeds supply chain, and (2) to trace the movement of sand potentially harvested using child labor through domestic supply chains, with particular attention to its use within the construction industry. The research also analyzed international trade data to understand the extent to which sand or sand-derived products from Kenya enter international markets.

METHODOLOGY AND DATA COLLECTION

Primary data collection took place across four counties in Kenya: Homa Bay, Embu, Kajiado, and Siaya. Adult workers provided information about the presence and working conditions of children as well as their own working conditions. Individual worker interviews, focus groups, and stakeholder key informant interviews were conducted. In addition to worker interviews with adult workers, the research team observed child laborers and conducted direct interviews with 28 children aged 13–17 who were actively engaged in sand harvesting activities, gathering first-hand accounts of their working conditions, recruitment pathways, and the impact of work on their education and well-being. Stakeholder interviews were conducted with government officials, non-governmental organization representatives, industry representatives, and other relevant experts. The findings are not representative of workers at the selected sites or the sector as a whole. The study also mapped the domestic supply chain, tracing the journey of the sand from harvesting to domestic consumption into various end uses. This mapping process involved triangulating information from multiple sources,

including worker and key informant interviews, site observations, and review of industry publications, government reports, and statistical data. Researchers documented the roles of various actors in the supply chain—including harvesters, loaders, brokers, transporters, and end users—and identified key transfer points where sand changes hands before reaching construction sites, cement manufacturing facilities, and other downstream applications. In addition, the research team reviewed publicly available trade data to understand international flows of sand and sand-derived products in Kenya, supplementing this quantitative analysis with qualitative insights from key informant interviews with industry representatives.

Although sand is primarily used domestically, the study also summarized sand, clinker, and cement imports and exports from Kenya with international trade data. Key informant interviews further supplemented the supply chain tracing.

KEY FINDINGS

The study found significant evidence of child labor in sand harvesting in Kenya, particularly in extraction and loading activities. Children as young as age 13 were found working at sand mining sites, with most between ages 15 to 17. Key findings include the following:

- Children in Kenya commonly engage in hazardous work, including manual digging, loading, and offloading sand, without proper safety equipment.
- Working hours are frequently long and irregular, with some children working late at night. These conditions are exacerbated by the seasonality of the industry.
- Payment is generally per task completed, with children sometimes earning less than adult workers.
- Most sand harvested in Kenya is consumed domestically, and the majority of domestic consumption of sand takes place in the country's construction industry, in the form of concrete.
- Research indicates that concrete produced in Kenya is used in a wide variety of downstream products and projects, including but not limited to, building construction, road development, culverts, water infrastructure, affordable housing projects, and the manufacturing of pre-cast products like poles, cabros (pavers), and other construction materials.
- Respondents indicated that cement production companies in Kenya are closely linked to sand supply, as cement is mixed with sand to produce concrete, mortar, plaster, or pre-cast cement products.
- It is likely that all river sand harvested with child labor in Kenya is at risk of having been co-mingled to some degree with other natural sand and manufactured sand. Thus, most, if not all, downstream products made from or containing sand in Kenya are at risk of containing sand harvested using child labor.
- Limited traceability mechanisms exist to track sand harvested using child labor once it enters the wider supply chain. Riverbed sand procured with child labor is often co-mingled with sand from other sources or manufactured sand to produce concrete, mortar, plaster, and pre-cast cement products. Therefore, while direct tracing of sand procured with child labor is infeasible in the current regulatory and market environment, it is documented that sand procured with child labor is traded into all concrete end uses—from individual retail sales to large government infrastructure projects. According to data collection findings, there is no industry monitoring system that could ensure that child labor was not used in the procurement of sand.

CONCLUSION AND RECOMMENDATIONS

This study found that child labor remains a significant concern in Kenya's sand harvesting sector, driven by a complex interplay of economic, social, and structural factors. The study identified numerous cases

of child labor across four different sand-harvesting regions of the country. Findings suggest that despite a high level of awareness of the illegality of employing children in sand harvesting in Kenya,¹ this practice is widespread and relatively socially normalized.

The study found that all interviewed child workers were exposed to worst forms of child labor under both international standards and Kenyan law. The child workers interviewed for this study reported regularly working long hours, working at night, and performing tasks that present significant risks to their health and safety. Many have either dropped out of school entirely or struggle to balance education with work demands. The economic pressures driving child labor are considerable, with many families depending on children's income to meet basic needs.

The sand harvesting supply chain in Kenya presents particular challenges for addressing child labor. Once sand enters the supply chain, the limited traceability mechanisms, widespread use of child labor, and co-mingling of sand supplies at various points in the supply chain make it nearly impossible to distinguish between sand harvested with child labor and sand harvested without it. The widespread domestic consumption of sand in construction means that products made with sand harvested using child labor likely permeate Kenya's construction industry.

Recommendations:

To the Government of Kenya:

- Enhance enforcement of child labor laws in the sand industry, including increasing labor inspections at mining sites.
- Expand access to quality education and social protection programs for families in sand mining communities to reduce economic pressures driving child labor. In particular, provide economic support to families struggling to pay school fees.
- Implement comprehensive occupational safety and health programs for sand harvesting workers.
- Conduct further research on the prevalence of child labor across different sand mining regions and manufactured sand production in Kenya to inform targeted interventions.

To Private Sector Actors:

Downstream sand consumers in Kenya—including construction companies, cement manufacturers, sand brokers, etc.—should implement robust supply chain due diligence and monitoring mechanisms to identify and address child labor risks, such as the following:

- Invest in community development and alternative livelihood programs.
- Improve working conditions through the provision of proper safety equipment and the adoption of safer labor practices that would reduce the risk of harm to all workers.

To Civil Society and Other Stakeholders:

- Support monitoring and reporting of child labor violations.
- Provide support services for affected children and families, including education and psychosocial support.

¹ Depending on the specific activities performed, employing children in sand extraction and transportation violates provisions of Kenya's Employment Act (2014), Children Act (2022), and the Occupational Health and Safety Act (2007), which prohibit children under 18 from engaging in hazardous work. Further, Kenya's list of "Activities Harmful to The Health, Safety and Morals of a Child" (Employment Act, Fourth Schedule) specifically lists sand harvesting, working with machinery, working at heights, lifting heavy loads, working with machinery, and shoveling sand.

- Assist in developing alternative income opportunities for families.
- Conduct further research on the prevalence and impacts of child labor across different regions.

Implementation of these recommendations requires coordinated effort from all stakeholders. Progress in eliminating child labor from Kenya's sand harvesting sector will require addressing both immediate labor violations and underlying socioeconomic factors while ensuring sustainable practices in the construction industry.

I. INTRODUCTION

Sand is regarded as the second most exploited natural resource after water and the most mined material in the world, with recent estimates suggesting that upwards of 50 billion tons of naturally produced sand² are extracted from riverbeds, lakes, and coastlines around the world each year (Hernandez et al., 2021; Lwanga et al., 2022; United Nations Environment Programme, 2019, 2022). Sand is used in a wide variety of downstream applications, including the manufacture of silicon-based electronic components, exfoliating cosmetics, and the production of glass (Da & Le Billon, 2022). By far, however, the largest downstream use of sand is in construction.

Sand is classified into several distinct grades based on particle size, shape, and composition. These different grades serve specific purposes in construction and industry. Fine sand is crucial for concrete finishing and plastering work, medium sand is commonly used in general concrete mixing and mortar production, and coarse sand is essential for heavy construction applications and as a base material in road building.

In Kenya, the sand industry is primarily focused on construction-grade sand extraction, with operations concentrated in riverbeds, coastal areas, and inland pits across counties in Kenya. Extraction methods range from mechanized dredging to basic manual digging using hand tools. Although comprehensive data on the sector's size are limited due to its largely informal nature, recent estimates suggest that Kenya's sand industry employs between 60,000 and 100,000 workers in Kenya across both formal and informal operations (Bachmann et al., 2024). In addition to these workers, there is a complex network of stakeholders that participate in and are impacted by sand extraction, including local community groups that organize extraction activities, transporters, brokers, and construction companies.

Sand is listed on the U.S. Department of Labor List of Goods Produced by Child Labor or Forced Labor as a good produced with child labor in Kenya (United States Department of Labor, 2024), and the presence of labor exploitation, including child labor, has been well documented in Kenya's sand extraction sector. The informal nature of this sector, the labor-intensive methods by which sand is extracted and transferred to trucks, and economic pressures on families in the mainly rural areas in which sand extraction takes place have all combined to create conditions conducive to the use of child labor.

This study had two primary objectives: (1) to identify the presence and working conditions of children involved in sand extraction in four sand-producing counties in Kenya (Homa Bay, Embu, Kajiado, and Siaya) and to map the domestic sand supply chain in this region; and (2) to assess the traceability of sand at risk of being harvested with child labor and to identify its uses in downstream products.

This study was undertaken by ICF, an international consulting firm headquartered in Reston, Virginia, and a local research partner in Kenya. The study applied a mixed-methods approach, which included an extensive review of secondary literature, interviews with child (n=28) and adult (n=2) workers engaged in sand harvesting, and key informant interviews (KIs) (n=40) with actors and stakeholders in Kenya's sand supply chain, including local industry representatives,³ government officials, and civil society representatives. Researchers also reviewed and analyzed publicly available trade and shipping data to support supply chain tracing activities. Researchers conducted a scoping trip to various sand harvesting areas of Kenya in March 2024 to inform research design. Data collection for the worker interviews took

² For the sake of brevity, naturally produced sand will be referred to hereinafter as "sand." Manufactured sand will be referred to as "quarry dust."

³ Supply chain actors and industry representatives interviewed for this study were all Kenyan.

place in four counties in Kenya (Homa Bay, Embu, Kajiado, and Siaya) in June 2024. KIs took place between June and November 2024.

2. BACKGROUND

2.1 ECONOMIC OVERVIEW

Kenya is a lower-middle-income country with a gross domestic product (GDP) of \$108.75 billion USD, in which nearly 36% of the population of 55.2 million lives in multidimensional poverty (UNDP, 2024; World Bank, 2024). The economy is centered around services (55.5% of the GDP), agriculture (21.2% of the GDP), and industry (17.7% of the GDP) (World Bank, 2024).

Sand extracted in Kenya is used as a key input in the construction industry, primarily due to its importance in the production of concrete. In 2023, the construction industry accounted for 6.6% of the GDP and employed 9.7 million people, or 7.5% of the population (Economic Survey 2024, 2024). The demand for cement in construction has been growing, driven by the growth in housing developments and government infrastructure projects (*Cement Production – Kenya Yearbook Editorial Board*, 2022). Thus, although the sand extraction industry in Kenya is largely informal and there are no government estimates on size of the sand sector workforce,⁴ given its importance to the construction industry, it directly or indirectly provides livelihoods for millions of Kenyans.

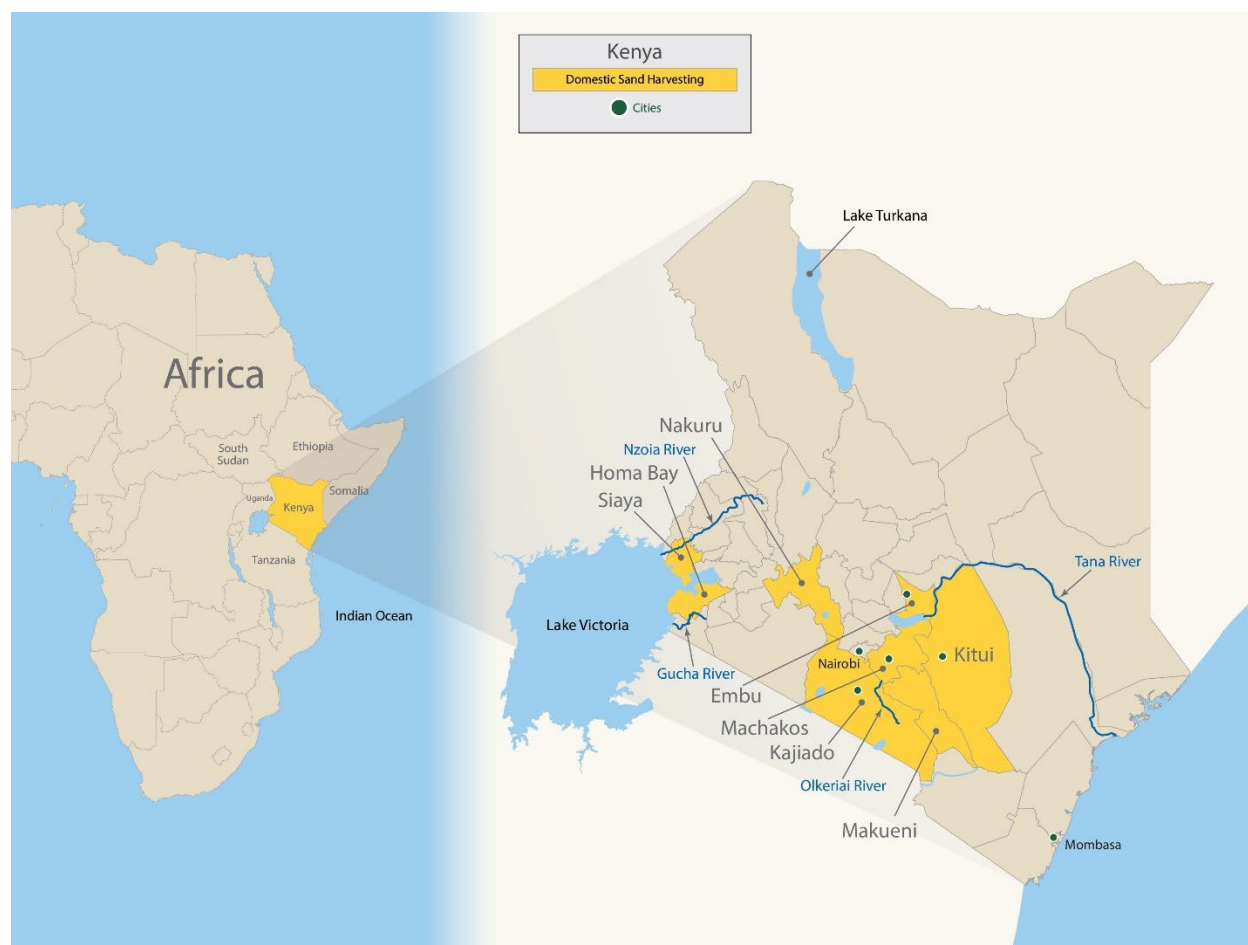
2.2 SAND EXTRACTION IN KENYA

Sand harvesting and mining in Kenya occurs primarily in three main contexts: riverbeds, pits on farmland, and coastal areas. The production of quarry dust, a substitute product for sand, is conducted mainly in industrial settings in which heavy machinery is used to crush stones and rocks, and aggregate them into a fine powder that is used as a substitute product for sand.

In this study, the data collection sites focused exclusively on sand from riverbeds in Kenya: Tana River in Embu County, Olkeriai River in Kajiado County, Kuja River in Homa Bay County, and Nzoia River in Siaya County.

⁴ A recent research study on the Kenyan sand industry estimated that 60,000–100,000 persons are employed in the sand industry (Bachmann et al., 2024).

Figure 1. Map of Kenya and sand extraction counties referenced in the report



Source: ICF

Major sand-extraction counties in Kenya include Machakos, Mombasa, Kakamega, Kajiado, Makueni, Nakuru, Isiolo, and Homa Bay. The extraction methods vary depending on the location, with river sand typically extracted using manual tools like shovels and spades, and coastal sand more likely extracted through the use of dredging machines and suction pumps (Hernandez et al., 2021; United Nations Environment Programme, 2019). In inland farmland-based sand extraction, sand is mined from pits, either through manual digging or by using excavators. Landowners may lease out portions of their land for sand extraction, generating income. However, this method often yields sand mixed with mud, requiring separation before sale.

In river sand extraction—the form of sand extraction primarily explored in this report—sand is often manually harvested from rivers, although excavators are employed in some areas. The flowing water naturally washes the sand, removing dirt and other impurities and resulting in cleaner sand. However, during rainy seasons, river levels rise, and access for both workers and machinery becomes challenging, sometimes halting extraction entirely. The location of the sand extraction also impacts the seasonality of work. In riverbed extraction, sand is harvested from both perennial and seasonal rivers. The seasonality of sand production is an important factor, with extraction activities often intensifying during dry seasons when river levels are low, and sand is more easily accessible. This seasonality can lead to periods of intense production followed by lulls, impacting the livelihoods of those involved in the sector.

Qualitative findings from data collection indicate that child labor is most commonly involved in manually loading sand from riverbeds onto trucks (6- to 40-ton capacity).

After extraction, sand undergoes very little processing before it is sold to downstream users. In some operations, extracted sand may be minimally cleaned to remove larger particles or debris; typically, this is done manually. Once harvested, the sand is loaded onto trucks and transported either to nearby storage sites or directly to manufacturing or construction sites.

Sand extraction is unregulated and tends to be characterized by small-scale operations, so there are no official government or private sector corporate reports quantifying annual sand extraction in Kenya. However, the Kenya National Bureau of Statistics publishes construction statistics, including domestic cement consumption (Table 1). Because both sand and cement are most commonly used in the production of concrete, the data on cement consumption can be used to roughly estimate domestic sand use in Kenya.

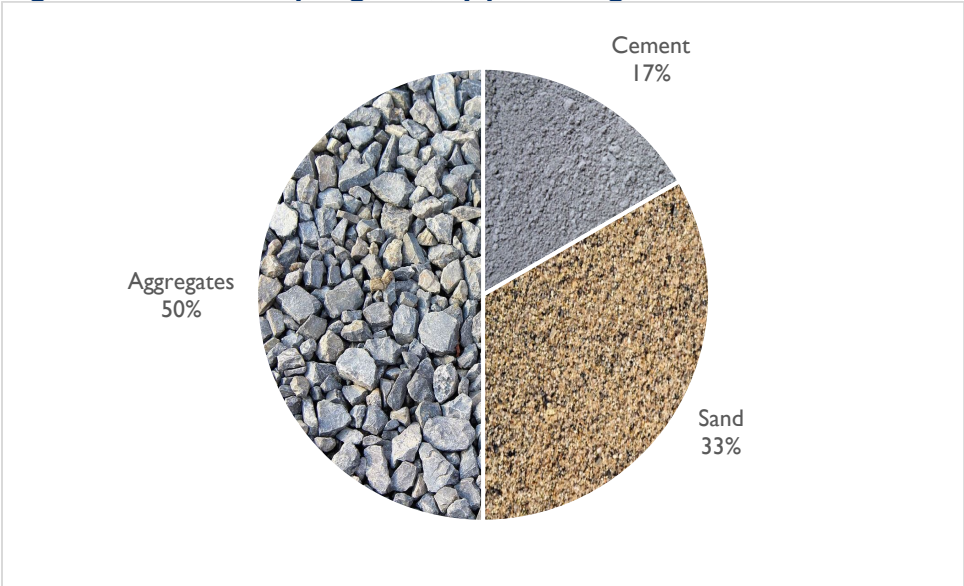
Table 1. Domestic consumption of cement in Kenya’s construction industry (millions of metric tons)

Product	2019	2020	2021	2022	2023
Cement	6.1	7.4	9.1	9.5	9.2

Source: Kenya National Bureau of Statistics Economic Survey, 2024

A standard concrete mix (Figure 2) has a ratio of one part cement, two parts sand, and three parts aggregate stone, although this can vary depending on project specifications, with some forms of concrete calling for as high as a 1:4:8 ratio of cement to sand to aggregate (Integrum, 2020; Okumu et al., 2017). To this concrete mix, water and admixtures are also added to meet project specifications.

Figure 2. Concrete input goods, by percentage



Source: ICF

Using the 1:2:3 ratio as a rough guide, cement consumption data suggest that up to 18.4 million metric tons (Mt) of sand or quarry dust were used in construction in Kenya in 2023 (ICF calculations). This method of estimation is imperfect and does not allow for the estimation of sand usage separate from quarry dust usage.

3. METHODOLOGY AND STUDY IMPLEMENTATION

3.1 STUDY OBJECTIVE AND RESEARCH QUESTIONS

The study pursued the following two main objectives:

- To identify the current presence and job characteristics of those who experience child labor in the sand supply chain
- To directly trace, within the sampled area, the supply chain of sand produced by child labor, with particular attention paid to its possible end use within the construction industry

The study also analyzed international trade data to identify imports and exports of sand and cement from Kenya, intending to link, to the extent possible, instances of child labor in the sample to both domestically used and exported sand and cement.

Study activities were guided by the following three research questions:

- In which phases of the sand supply chain in Kenya's construction industry is child labor present?
- Is there evidence that sand harvested with child labor is used in the construction industry in Kenya?
- Where and how does sand obtained using child labor or cement products produced with sand obtained using child labor in Kenya enter international markets, particularly in relation to regional exports within the Horn of Africa?

3.2 METHODOLOGY

This study employed a qualitative design to understand the problem of child labor in the sand industry and its supply chain in Kenya. The findings do not attempt to determine the extent of child labor in this industry, but rather the characteristics of child labor in the sand sector and at what stage in the production process this takes place. The overall research design and methodology were shaped by ICF's experience with similar studies and by a scoping exercise that ICF conducted in January 2024. ICF global research instruments informed the development of the data collection tools, and the scoping exercise was used to collect valuable contacts from sand and cement stakeholders and gather relevant information that helped shape the study design and methodology. Data were collected through primary and secondary sources through the following seven research activities:

- Collection of background research and materials
- Research instrument development
- Field pre-visits
- Training and data collection preparation
- Mining/harvesting site visits, surveys of supply chain actors, and interviews and observations
- KIs
- Supply chain tracing

3.2.1 Collection of Background Research and Materials

A review of secondary data and reports was guided by the thematic focus areas, including child labor, the natural sand supply chain, and working conditions. Reports and data available on child labor and the natural sand supply chain, many publicly available, were sourced from open-source research and relevant organizations.

3.2.2 Development of Research Instruments

Three research instruments were developed to guide primary data collection: the workers' interview guide, the child labor expert guide, and the supply chain actor KII guide. The instruments were adapted from the ICF global version of the research instruments. With input from local research partners, the instruments were adjusted to contextualize them to the Kenyan sand industry following the scoping exercise. All instruments were translated into Kiswahili to standardize the administration of questions. The instruments were piloted among workers and stakeholders who were not targeted for the study, and minimal adjustments were made based on the pilot experience.

3.2.2.1 *Defining Child Labor, Worst Forms of Child Labor, and Hazardous Child Labor*

Child Labor: Child labor is defined by International Labor Organization (ILO) Conventions 138 on the Minimum Age for Admission to Employment and 182 on the Worst forms of Child Labor. Broadly, child labor is “work that deprives children of their childhood, their potential, and their dignity, and that is harmful to physical and mental development” (ILO, n.d.). Child labor refers to work that is “mentally, physically, socially or morally dangerous and harmful to children; and/or interferes with their schooling by depriving them of the opportunity to attend school; obliging them to leave school prematurely; or requiring them to attempt to combine school attendance with excessively long and heavy work” (ILO, n.d.). The ILO Convention on Child Labor, 1973 (No. 138) aims to abolish child labor by requiring countries to establish a minimum age for work as well as employment (typically 14–15 years) of age while also allowing for light work for children under that age (ILO, 1973). The convention also requires nations to establish policies to eliminate child labor. In Article 3, the convention defines the “minimum age for admission to any type of employment or work which by its nature or the circumstances in which it is carried out is likely to jeopardize the health, safety or morals of a young person” to be 18 years old (ILO, 1973). This definition does not apply to work specifically authorized by national laws, including work done by children in schools for general, vocational, or technical education or in other training institutions, if such work is carried out in accordance with international standards under conditions prescribed by the competent authority, and does not prejudice children's attendance in school or their capacity to benefit from the instruction received (ILO, 1999b). More information on the legal framework governing child work and defining child labor in the Kenyan context can be found in Section 4.

Worst Forms of Child Labor: The worst forms of child labor encompass a broader category defined in ILO Convention No. 182, Article 3. This includes all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage, serfdom, and forced or compulsory labor, including forced recruitment of children for use in armed conflict. It also covers using, procuring, or offering a child for prostitution, production of pornography, or pornographic performances; using, procuring, or offering a child for illicit activities, particularly the production and trafficking of drugs; and work which, by its nature or circumstances, is likely to harm the health, safety, or morals of children (this last category overlaps with hazardous child labor).

Hazardous Child Labor: Hazardous child labor is defined by ILO Conventions 138 and 182 as “work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children.” This includes work that exposes children to physical, psychological, or sexual abuse; work underground, underwater, at dangerous heights, or in confined spaces; work with dangerous machinery, equipment, and tools; work that involves manually handling or transporting heavy loads; work in an unhealthy environment that exposes children to hazardous substances, temperatures, noise levels, or vibrations damaging to their health; and work under particularly difficult conditions such as long hours, night work, or work where the child is unreasonably confined to the employer's premises. Hazardous child labor is considered to be a subcategory of the worst forms of child labor as defined previously.

3.2.3 Child Labor Worker Interview and Key Informant Interview Guides

A workers' interview guide was developed in both English and Kiswahili to aid in collecting qualitative data from child and adult workers. Qualitative interviews with workers were used to gather information related to the existence of child labor in the sand industry, as well as to gather more detailed accounts regarding child labor practices throughout the sand supply chain (e.g., age, sex, path of recruitment or entry into work, manifestation of indicators of child labor, characteristics of the activities in which they are involved). The research prioritized interviewing older children (ages 13–17) working in the harvesting of sand.

Two KII guides were developed in both English and Kiswahili to facilitate discussions with local natural sand supply chain experts and child labor experts, including representatives from workers' unions, government officers, and civil society representatives, who were interviewed as key informants. The tools aimed at eliciting the knowledge, views, opinions, and perspectives of local experts in the sector.

3.2.4 Observational Tool

An observation checklist was developed to complement the collected data and contextualize them. The field research team used this tool to record observations in the sand mining or harvesting sites they visited. Observations included the site type, labor conditions, sand transportation methods, transportation networks, and trading activities.

3.2.5 Site Selection, Sampling and Recruitment, and Final Sample

A review of existing reports and data collected from the scoping exercise indicated that although sand mining occurs across the country, Nairobi, the surrounding areas, and major cities such as Kisumu and Mombasa had the highest demand for sand. Also, major government-initiated infrastructural projects are concentrated around these major cities. Scoping findings and the available data further revealed that river sand was the most used in construction, even though sand extraction was reported across the country, especially in western Kenya, along the Lake Victoria belt. Scoping findings further indicated that counties surrounding or near Nairobi accounted for the bulk of sand harvested in Kenya. These counties include Kajiado, Embu, Machakos, Kitui, Nakuru, and Makueni.

Two counties that were reported as the primary sources of river sand serving Nairobi and the major government projects were selected (Embu and Kajiado). In western Kenya, two counties that were reported to be the primary sources of sand for major projects were selected (Homa Bay and Siaya). In each county, one to two major rivers where large-scale sand harvesting was reported were selected as the research sites: Tana River in Embu County, Olkeriai River and Kasarani River in Kajiado County, Kuja River⁵ in Homa Bay County, and Nyadorera River in Siaya County. The research design entailed following the grain and sampling workers along the river and around the alluvial mining sites close to the target rivers. An initial pre-data collection visit of the target areas was done to assess the number of workers, especially child workers, and their characteristics. This visit informed researchers of the availability of the study population and the likely sample distribution across the study sites.

Worker interviews prioritized interviewing older children (ages 13–17) who were working in the harvesting of sand. If an adequate number of child workers was not accessible, adult workers were interviewed. Child expert interviews targeted organizations supporting child labor prevention interventions in the target areas and government officers whose mandate touches on the sand supply chain. This included Ministry of Labor and Social Protection officers, the National Environment Management Authority, and the Kenya National Highways Authority-Axle Load Enforcement

⁵ Kuja River is also known as Gucha River (Abiri Kenya, 2024).

Department. Finally, the supply chain guide targeted supply chain actors along the sand and cement supply chain, including sand owners, loaders, brokers/intermediaries, transporters, consumers, and cement manufacturers.

Mining/harvesting site leaders facilitated initial contact with workers. Organizations that work with older children involved in sand harvesting/mining were also used to link the study team with the target older children. Data collection began on July 13, 2024. Worker interviews in most sites were completed by the end of July 2024. However, the supply chain tracing interviews continued until October 2024.

The study team conducted interviews in various sand harvesting sites along five rivers and in two alluvial mining sites across the four target counties.

In total, 28 worker interviews were completed with child workers and 2 were completed with adult workers. Seven child labor experts were interviewed at the target sites and the national level. The research team also conducted interviews with 28 supply chain experts. The researchers conducted observations across the target sites, documenting what they saw at the harvesting/mining sites.



Researchers interview child workers at different sites

3.2.6 Data Analysis

Before qualitative analysis, worker interviews and KIs were transcribed and translated for interviews conducted in Kiswahili. Once translated, interview transcriptions were thematically coded using a codebook developed for the study. Codes were initially developed based on research questions, previous literature, and scoping findings. Additional codes were developed as they emerged during the analysis of transcripts. Qualitative coding used the latest version of NVivo 14 (23.14.4).

3.3 TRAINING AND PREPARATION

The data collectors' training began on June 18, 2024, and lasted five days. The first three days featured presentations, plenary discussions, role plays, and paired simulations. On the second day, the supply chain tracing research team moved to a breakout room, where they reviewed the supply chain specialists' data collection instrument. At the same time, the child workers' interviewers continued to train on the worker and child labor expert instruments. On the fourth day, all researchers piloted the research instruments in one non-target county, closely guided by the trainers and the quality control team. The fifth day was spent debriefing the experiences from the piloting exercise and making the necessary adjustments to the instruments and the overall approach.



Plenary instruction and role play training sessions and supply chain researchers conducting an interview

3.4 DATA COLLECTION

All research designs and instruments were reviewed by ICF's Institutional Review Board and the African International University Review Board in Kenya. Researchers were trained and required to strictly adhere to ethical guidelines, including informed consent, confidentiality, and data security. Research complied with 45 Code of Federal Regulations Part 46 on the Protection of Human Subjects. Mining site-level consent was sought from the site leader before engaging in any interviews. In addition, parental or caregiver consent was sought from the caregivers of all older children interviewed.

The child's assent was sought before any interviews. At the beginning of each interview, the researcher read the consent statement to the site leader/caregiver/parent and the assent form to the child participant in English or Kiswahili, depending on the language they were more comfortable with. Survey participants, caregivers/parents, or site leaders provided signed consent. A copy of the consent form was left with the participant, and the researcher retained the signed copy.

Researchers were instructed to end the interview if consent was not given. Participants had the option to consent or not to consent to audio recordings and to their organization's inclusion in the list of data sources. All personal identifying information of respondents was redacted from the data before analysis.

To ensure the collection of high-quality data, in-country researchers ensured that data collection adhered to the data collection plan by monitoring the teams in the field and providing feedback daily. In addition, data quality analyses were performed routinely for the submitted transcripts.

3.5 LIMITATIONS AND LESSONS LEARNED

3.5.1 Identification of Child Workers

Researchers found that awareness of the illegality of employing children in sand harvesting was relatively high among the stakeholders and workers interviewed for this study. For this reason, the first reaction in most of the sites was for the adult workers to deny the presence of child labor at the mining sites. However, with continued discussions, some workers relaxed and began to be more forthcoming, mentioning the presence of children working at the mining/harvesting site. The main lesson learned was that, although it was positive that community members were aware that child labor was outlawed, which may have resulted in the prevention of some children from working, researchers required more time at the mining sites to understand the actual characteristics and manifestation of child labor. Therefore, the research team employed various strategies, including prolonging data collection to three weeks, conducting interviews on school and non-school days, doing repeat visits by the team members and the quality control teams to the same sites, and creating rapport with adult workers first, who would link the teams with the child workers.

3.5.2 Multiple Intermediaries Along the Sand Supply Chain

The traceability of sand procured from riverbeds in this study was limited by the informality of sand harvesting, transportation, and sales. Intermediaries along the supply chain made direct tracing of a single load of sand infeasible. However, research findings point to the prevalence of co-mingling of sand procured with child labor throughout the supply chain, through multiple intermediaries. These intermediaries include the following:

- Transporters
- Point of sale (individual retail consumer, manufacturing business, warehouse depot) to a major infrastructure work site
- Informal and formal sales

Although sand can be sold directly to the end user, it is often sold through multiple intermediaries. Transporters interviewed for this study indicated that they did often know the end users of the sand they sold through their personal network, but there is no documentation of individual sales. Thus, while direct tracing was feasible, research documented through KIIs indicated that sand harvested with child labor was ultimately used in every aspect of the Kenyan construction industry.

3.5.3 Informality and Lack of Regulation in Sand Procurement

The informal and unregulated nature of sand procurement in Kenya presented methodological challenges for this study. The lack of formal registration systems, standardized documentation, or centralized oversight made it difficult to systematically map the supply chain of sand harvested from riverbeds, as there is no centralized documentation available on specific sand volumes harvested, worker conditions, and contractual business relationships between actors. The research team was able to document and analyze commercial and trading patterns in the first tier of the domestic supply chain through qualitative interviews, but direct tracing from sand from extraction sites to a specific end users was not realized.

3.5.4 Lack of Quantitative Data

A significant limitation of this study was the lack of reliable quantitative data on sand extraction and labor efforts in Kenya. The absence of systematic data collection by government agencies or industry associations meant that researchers could not establish basic parameters, such as total sand production volumes, number of active extraction sites, size of the workforce, or market values. This data gap constrained the research team's ability to contextualize qualitative findings and make evidence-based estimates about the scale of child labor in the sector. Although some government statistics exist for downstream industries like cement and concrete production, the predominantly informal nature of sand extraction means that comparable data are not available for the harvesting stage of the supply chain. The lack of quantitative benchmarks also made it challenging to assess how representative the study's findings might be of broader industry patterns. Future research would benefit from coordinated efforts among government agencies, industry stakeholders, and researchers to establish systematic data collection mechanisms that could provide a quantitative foundation for understanding labor conditions and supply chain dynamics in Kenya's sand sector.

In addition, the absence of quantitative data of the first tier of the supply chain limited analysts' ability to contextualize research findings within the regional or national sand harvesting sector.

3.6 POINTS TO FOLLOW UP IN FUTURE STUDIES

During the scoping trip for this study, the research team visited a stone quarry that produces manufactured sand. At this site, team members heard anecdotal accounts of commercial sexual exploitation of children (CSEC) occurring in quarry environments. While these concerning claims were noted, in consultation with the U.S. Department of Labor's Bureau of International Affairs, the ICF research team narrowed the focus of the final study design to include only child labor in riverbed sand extraction. No further research was performed into child labor in stone quarries. The research and data collection for this study did not reveal any evidence of CSEC in the sand harvesting sites visited. The potential issue of CSEC, worst forms of child labor, and child labor more generally in the context of Kenyan quarrying sites is thus outside the scope of the current study. That said, this topic warrants dedicated investigation in future research focused on child protection in extractive industries in Kenya.

4 SUPPLY CHAIN FINDINGS

The following sections present the findings of this study. Section 4.1 presents findings regarding the supply chain of sand harvested in Kenya, discussing the manner and context in which sand harvesting takes place, the downstream uses of sand harvested in Kenya, and the limited international import and export of downstream products containing sand. Section 4.2 presents findings related to labor conditions and child labor in the sector, starting with the demographics and job characteristics of all workers interviewed and finally discussing the indicators of child labor reported by interviewed workers and other industry stakeholders.

4.1 SUPPLY CHAIN OVERVIEW

4.1.1 Introduction

Globally, concrete is the largest consumed construction material (Logan, 2020). Sand (and its substitute product quarry dust) is indispensable in the construction sector, as sand constitutes approximately 33% of concrete. In Kenya, concrete and other essential building materials (such as plaster, mortar, etc.) are crucial for infrastructure development. This makes sand a vital resource for both rural and urban development.

"There's no building in Kenya that doesn't rely on sand. It's a primary material for any type of construction."
KII, site manager

"Every major construction project, whether roads or buildings, needs sand. Without it, we wouldn't have the infrastructure we see today."

KII, industry representative

This study focuses on the use of sand procured along riverbeds and highlights the role of child labor in harvesting sand.⁶ While sand extraction occurs year-round, peak riverbed sand extraction occurs after the rainy season ends. Research indicates some regional variations in the supply chain. Sand tends to be consumed close to extraction sites, and this study's research findings are centered around data collection sites at the Tana River in Embu County, Olkeriai River in Kajiado County, Kuja River in Homa Bay County, and Nzoia River in Siaya County.

⁶ See Appendix 2 for a more detailed description of stakeholders in the sand supply chain.

4.1.2 Sand

The artisanal or informal sector dominates the sand harvesting industry, especially in rural and underserved regions, where it provides a means of livelihood and a significant source of income for many communities. Many participants mentioned that artisanal sand harvesting employs the largest local workforce. Across all the regions, sand harvesting is largely informal, and harvesters, including children, often work in groups, using manual labor and basic tools such as shovels or spades to extract sand.

“We don’t have machines, so we work with our hands. This kind of work helps the youth here earn a living, especially those without formal education.”

—KII, transporter

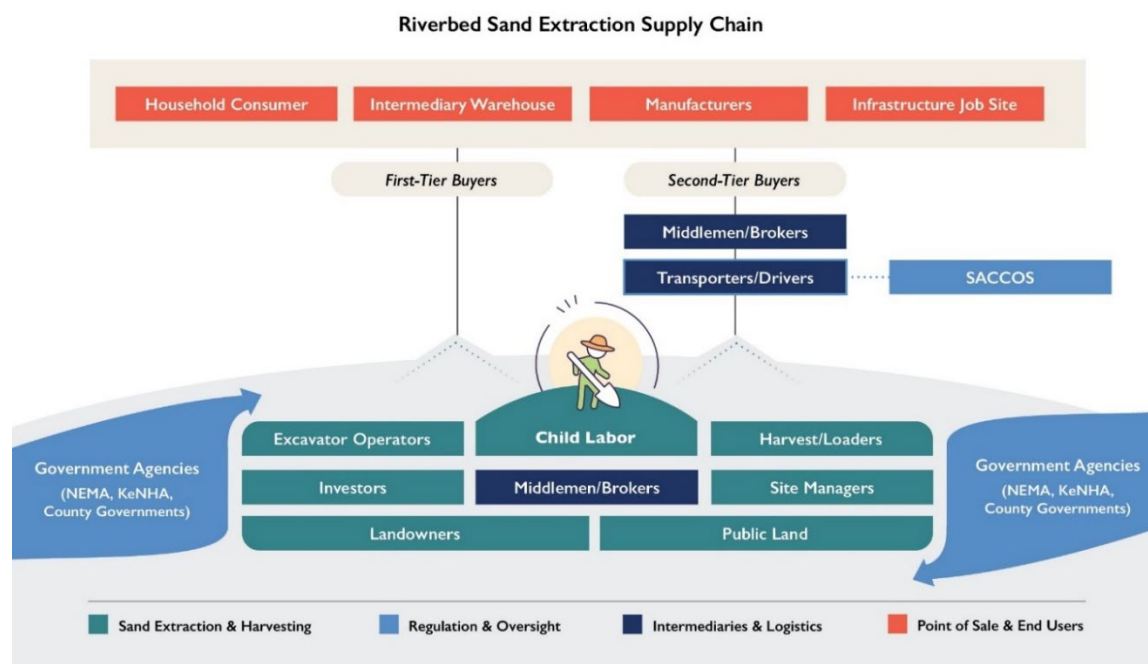
A landowner in Homa Bay explained that the income from sand harvesting allowed him to send his children to school and invest in other ventures. Small-scale miners rely on sand harvesting to sustain their families, especially in regions like Siaya.

“Sand harvesting has allowed me to send my children to school and invest in other businesses.”

—KII, landowner

For this study’s data collection, researchers only observed excavators loading sand in Homa Bay and Siaya Counties in western Kenya. However, qualitative interviews suggest that the use of mechanized equipment is more prevalent at certain sand sites, and thus, these findings are not necessarily indicative of the county-wide prevalence of mechanization.⁷

Figure 3. Labor and supply chain actors in sand extraction



KENHA: Kenya National Highways Authority, NEMA: National Environmental Management Authority, SACCO: Savings and Credit Cooperative

Source: ICF⁸

⁷ Some respondents also reported the use of heavier mechanized equipment to harvest sand from the lakebed of Lake Victoria.

⁸ For further discussion of the stakeholder groups depicted in this graphic, see Appendix 2.

The harvesting of river sand from extraction sites located along riverbanks is highly seasonal. During the rainy season, trucks and excavators cannot access most extraction sites, and even at sites that are accessible, the high water content of the sand complicates efforts to weigh and sell it. During the dry season, investors hire workers to harvest the sand deposited along the riverbanks during the previous rainy season. Extraction site managers interviewed for this study reported that because this work can only be conducted during the dry season, time is of the essence, and workers commonly put in long hours during those months—a situation that raises forced labor concerns, as the pressure to maximize production during limited seasonal windows may result in workers being coerced to work excessive hours with few alternatives for income during these critical periods. During the rainy season, sand prices rise as the available supply falls. Some sand extraction investors reportedly try to take advantage of these higher off-cycle prices by extracting sand during the dry season, storing it at storage sites that they rent or own, and then selling it during the rainy season.⁹ These sand consolidation or resale sites are generally located at sites in places like Sori and Dhiwa, close to roads that are sufficiently maintained and built up to be accessible even during the rainy season.¹⁰ Investors who do not own the land on which these extraction sites are located negotiate three- to four-month leases with landowners, under which the lessee investors are granted rights to access and harvest sand from the leased land.

Although there are many consistencies in river sand extraction across regions and over time, the industry has seen a variety of changes in recent years related to mechanization, communication technology, stricter environmental regulations, socio-political interference, and regulation and taxation issues.

The sand harvesting industry in Kenya is predominantly informal and harvested with manual labor, but there has been a noticeable shift toward mechanization in some areas, such as using excavators to scoop and load sand deposits from the riverbank onto sand transportation trucks. Several participants mentioned that introducing excavators and other machinery has significantly increased productivity, especially in regions with more sand deposits, such as the banks of major rivers, such as Kuja River in Homa Bay County.

“Before, we had to rely on manual labor, but now, with machines like excavators, we can extract more sand in less time, and it’s safer for the workers.”

—KII, industry representative

Mechanization has also led to shifts in the composition of the workforce at sites that use excavators. The use of excavators reduces the number of manual workers needed, leading to fewer people being employed on a site overall.

“If you use excavators, many people will lose their jobs.”

—KII, sand broker

According to some respondents, this reduction in demand for manual labor at mechanized sites has led to a shift in the composition of the remaining workforce. One respondent in Siaya County, for example, described this shift:

“The difference is that the actors involved, the numbers reduced largely. Because during the manual, we could find very different people from different [sexes], and different ages could participate but currently women are not allowed to line up for the sand task, only men and a specific group of over 18 men are qualified to do so.”

⁹ This paragraph derived from information given in HISC05.

¹⁰ This paragraph derived from information given in HISC05.

—KII, sand broker

Another respondent suggested that in areas in which excavators are used, the specific tasks performed by manual laborers (including children) has shifted: “Because sometimes the sand is at a higher level, and the trucks can’t climb up, so you have to bring it down and collect it together so the truck loaders can easily pick it up.” This suggests that when mechanization is present, manual labor is redirected to complementary roles rather than primary extraction.

Another significant change has been the use of technology to streamline operations. Transporters and brokers increasingly use mobile communication and Global Positioning System to manage logistics and check on sand supplies, ensuring timely delivery of sand. A transporter explained:

“With technology, we can now track where the trucks are and communicate better with clients, reducing delays.”

—KII, industry representative

Interviews with brokers and transporters in Siaya also noted that they would not drive their trucks to the river until they could confirm that adequate sand was available.

Stricter environmental regulations have also had a major impact on the sand industry. Multiple respondents mentioned that the National Environment Management Authority’s guidelines on sustainable sand harvesting practices have led to changes in how and where sand is extracted, slowed down extraction, and increased costs.

In addition to environmental regulations, stakeholders in the sand industry frequently cited taxation as a significant challenge, with multiple tax collection points adding to the cost of operations.¹¹ For instance, Kajiado transporters pay monthly and per-trip fees to move sand.¹²

“The introduction of weighbridge checks and cess collection points has made transportation more expensive and time-consuming.”

—KII, transporter, Savings and Credit Cooperative

The tax collected by county governments is intended to generate government revenue, to be used in local development projects.

“County governments collect taxes from transporters, and companies involved in sand extraction pay for licenses and other fees, adding to government revenue. These funds are often reinvested into community development projects.”

—KII, sand investor, producer, and broker

Other transportation respondents expressed their frustration that from their perspective, when the interests of the politicians (members of the county assembly in most cases) are not met, they tend to mobilize the community against the sand transporters, purporting to ban commercial sand harvesting.

In addition to changes within the sand industry over time, there are some differences in regional extraction practices that were documented during data collection. The following section highlights

¹¹ The impact of laws and regulations on the sand supply chain are presented in greater detail in Appendix 5.

¹² Interviews with transporters in Kajiado indicated that transporters paid a monthly cess levy of 60,000 Kenyan shillings (approximately \$463 USD). In the event of a vehicle breakdown within the month, no amount is refunded or carried over to the next month. The risk of vehicle damage is relatively high for transporters, as the final stretch of the road is often on unpaved dirt and muddy roads trafficked by high-weight vehicles.

various extraction methods and degrees of mechanization and operating differences in Kajiado, Embu, Siaya, and Homa Bay Counties.

4.1.2.1 Variations in Extraction Methods and Mechanization

The methods, timing, and labor dynamics of harvesting sand vary across sand extraction sites in Kenya, depending on the geographical and economic context of the local area. This study included data collection sites near the capitol of Nairobi, in Kajiado and Embu Counties, and in western Kenya in Siaya and Homa Bay Counties.

Sand harvesting in Kajiado, Embu, Siaya, and Homa Bay Counties is primarily manual, although excavators were observed by researchers in Siaya and Homa Bay Counties. In instances when excavators are used, some manual labor is still employed to clean debris from the sand.

In areas like Homa Bay County, the sand extraction process initially relied on manual labor, but introducing machines, such as excavators, has made the process more efficient.

“Initially, we used manual methods, but we realized that manual labor was strenuous for our workers. We then decided to acquire an excavator to ease the workload.”

—KII, landowner

However, the introduction of machinery sometimes led to initial conflicts between workers and machine operators, as described by another participant:

“In the past, there were conflicts because workers felt the machines were taking away their jobs. However, we later discovered that the machine helped us, as manual labor was very exhausting over time.”

—KII, landowner

The photos in Figure 4 show large deposits of sand along the Kuja River in Homa Bay County, excavators loading sand from the riverbanks, and young children working at the site to remove pieces of wood from the sand as it is being loaded into trucks.

Figure 4. Excavators loading sand near Kuja River in Homa Bay County



Source: Social Policy and Development Consulting

However, researchers observed sand harvesting conducted exclusively with manual labor in Kajiado and Embu Counties, with qualitative interviews indicating that the local communities had rejected the use of excavators, which community members feared would render them jobless. In Embu (along the Tana River), sand harvesting involved manually loading sand on trucks using shovels. A transporter who sources sand from Kajiado noted:

“For a 12-wheeled truck, about 12 loaders are required, 6 on either side of the truck.”

—KII, transporter

According to respondents, the work itself at all sites is very well organized. In Embu, for example, loaders are organized into groups and registered as community-based organizations (CBOs). Each CBO has its sand harvesting sites. The CBOs at each site often decide how best to apportion work among the present members. However, this was not a problem as long as enough trucks were awaiting loading. In Kajiado, the truck drivers pick loaders from specific points along the road to the river. From each point, 3 loaders are picked, and 12 loaders load a 12-wheeled truck at any time. This means that the loaders work on shifts. Figure 5 shows a loaded truck pulling another in Embu County.

Figure 5. Loaded sand trucks, Embu County



Source: Social Policy and Development Consulting

To prevent the trucks from getting stuck in the sand, wood logs (*ndaba*) are placed between the double wheels and below the wheels. Youths holding the logs are shown in Figure 6.

Figure 6. Sand truck being loaded



Source: Social Policy and Development Consulting

In Siaya, sand is manually mined in and near the Nzoia River. The process is not only manual but also risky. It involves two individuals, a boat, and a bucket. One person swims down to the riverbed with a bucket, scoops sand from the riverbed, and swims back up the river while someone else pulls the bucket up to the boat, where the scooped sand is emptied. This process is repeated approximately 70 times before the boat with the sand is pushed to the riverbank for offloading. Other workers, some confirmed through interviews to be ages 15–17, offload the sand to the river onto trucks. Figures 7 and 8 show the Nzoia River and the boats and buckets used to collect sand from the underwater sand deposits on the riverbeds.

Figure 7. Nzoia River, Siaya County



Source: Social Policy and Development Consulting

Figure 8. Boat and bucket used in riverbed sand harvesting, Siaya County



Source: Social Policy and Development Consulting

Most respondents reported that sand undergoes minimal processing after it is harvested, and the extent of processing is dependent on the purpose for which the sand is harvested. Typically, the sand is sold directly after being harvested, with only basic steps like removing sticks or sieving or washing away mud. One participant from Homa Bay explained that sand is sold directly after harvesting:

“No other processing stages. We sell the sand to customers immediately after digging.”

—Kll, site manager

When asked about the processing steps, another participant explained that sand is often just sieved to remove unwanted particles before use:

“So, you only know about the sand sieving. It’s the only process that you know that one does before being used.”

—KII, sand transporter

In some areas, the processing of sand involves separating mud and wood pieces from the sand, especially when they are mixed during harvesting.

“The only processing we can do is to separate the sand from the mud in case the two are mixed up.”

—KII, site manager

In other cases, a downstream buyer may do quality tests on the sand to ensure that it meets the downstream project’s specifications. One respondent emphasized that although there is limited processing of sand, companies sometimes send samples to laboratories for analysis, particularly for infrastructure projects like road construction.

“Some companies usually take sand samples to the laboratory for analysis before buying the sand.”

—KII, site manager

The collection of foreign materials, such as sticks and rocks, from the sand loaded onto a truck or before loading it onto a truck was observed by researchers in Homa Bay County, where excavators load sand. In this case, boys jump on the truck and pick out the foreign materials (mainly wood) from the trucks as the excavator loads the sand. This labor activity violates Kenyan labor laws¹³ and international standards on child labor by exposing children to dangerous working conditions around heavy machinery (excavators), requiring them to work at heights (climbing onto trucks), and involving them in hazardous activities where they risk injury from falling objects, moving equipment, or falls, all of which are classified among the worst forms of child labor under ILO Convention No. 182.

Also during loading, women and children collect pieces of discarded wood from the sand into small plastic bins. These are then used as firewood, either for their personal use or to be sold to neighboring residents.

During one research visit to Kuja River in Homa Bay County, women and young children were also seen collecting pieces of wood from the sand, before the excavator loaded it into the trucks. Figure 9 shows women and young children collecting pieces of wood into small basins, where an excavator loads sand. Researchers could not ascertain if there was any transactional relationship between the women, children, and excavator operators. Regardless, the collection of wood pieces represented minimal processing that improved the quality of sand loaded onto the trucks.

¹³ In particular, these activities violate provisions of Kenya’s Employment Act (2014), Children Act (2022), and the Occupational Health and Safety Act (2007) that prohibit children under 18 from engaging in hazardous work. Further, Kenya’s list of “Activities Harmful to The Health, Safety and Morals of a Child” (Employment Act, Fourth Schedule) specifically lists sand harvesting, working with machinery, working at heights, lifting heavy loads, and working with machinery, and shoveling sand.

Figure 9. Women and children collecting wood from sand, Homa Bay County



Source: Social Policy and Development Consulting

In Nairobi, downstream manufacturers that source sand from Kajiado and Embu Counties indicate that they process purchased sand by sieving to ensure high-quality sand. One participant from a manufacturing company stated:

“The cleaning process removes unwanted materials like silt. There is that sieving process that takes place there.”

—KII, manufacturer

Companies in Nairobi specializing in ready-mix concrete mentioned a more detailed quality control process. One participant explained how they check the quality of the sand before mixing it into concrete:

“We normally have ways to control and check if it’s the right quality. ... Sometimes you can get sand that has some big stones, so we sieve it to meet the specifications.”

—KII, industry representative, CRM Company

In addition to sieving, there are numerous other tests employed by cement and concrete manufacturers to ensure that the quality and characteristics of the sand meet the specifications of the construction project. These include testing for moisture, density, impurities, compressive strength, permeability, and soundness (resistance to volume changes) (Sand, 2023). The photos in Figure 10 show testing equipment used by a concrete manufacturer in Kenya.

Figure 10. Cement and concrete testing equipment



Source: ICF

4.1.3 Quarry Dust

The construction industry's rising demand for sand, combined with environmental, supply, and quality concerns, has led to the increasing use of quarry dust as a substitute product for harvested or mined sand over the last two decades.¹⁴ Quarry dust, also known as “manufactured sand,” is produced through industrial mining and crushing of stone, using uniform standards to ensure a more reliable and controlled product than natural sand. Previously, quarry dust was a less valuable by-product of mineral aggregate processing at crushing mills (Sundaralingam et al., 2022). Due to its use as a substitute for sand, it is now not only a natural by-product at crushing mills but is also produced as the final product (industry KIs). Multiple manufacturers and other stakeholders interviewed for this project reported that many construction companies and manufacturers of concrete goods have begun to use higher quantities of quarry dust as a cost-efficient replacement for sand in their concrete due to limited supply and quality issues with sand. According to a participant from Nairobi, the change occurred due to inconsistencies in the quality of natural sand:

“The consistency in quality of natural sand can no longer be guaranteed in the market anymore, so people switched to crushed sand because it meets the specifications and standards.”

KII, sand transporter

Some older engineers still recommend natural sand, but its diminishing quality and availability have made quarry dust the preferred choice in many projects.¹⁵ Interviews with transporters also indicated that some contractors mix quarry dust with sand to reduce costs. This co-mingling introduces another layer of complexity to any effort to assess the risk of child labor or forced child labor present in the sand sold and capital goods produced in the realization of Kenya's infrastructure projects.

Figure 11. Industrial testing of quarried stone to be processed into quarry dust



Source: ICF

¹⁴ In this report, the term “sand” is used to indicate “natural sand” harvested or mined from a riverbed, lakeshore, oceanside, or inland sand pit.

¹⁵ As a matter of engineering, literature is mixed on whether replacing natural sand with quarry dust improves compressive strength, durability, density, and workability (Sundaralingam et al., 2022; Turuallo et al., 2020).

Figure 12. Quarry dust and river sand at a construction site



Source: Social Policy and Development Consulting

4.2 SUPPLY CHAIN TRACING

4.2.1 Sand

Sand extracted in Kenya is overwhelmingly consumed domestically in the production of concrete for residential, commercial, or infrastructure construction projects. Many countries in Africa and Asia import sand because urbanization in Africa and Asia has fueled a construction boom, driving demand for the kinds of sand used in concrete production. In many of these countries, including Kenya, this demand consistently outstrips domestic production of concrete-grade sand, due both to limited supplies and the type of sand available.¹⁶ Globally, Europe and North America account for approximately 75% of \$2.2 billion USD of sand exported globally in 2023¹⁷ (UN Comtrade; (Coker, 2024).

In 2023, the largest sand exporters were the United States (38.4%), the Netherlands (12.5%), and Germany (7.6%) (UN Comtrade; Appendix 4). The import market for sand is less concentrated than the export market. Three-fifths of the sand exported originates from 3 countries, and three-fifths of the sand sold is imported by 10 countries. The largest 3 sand importers in 2023 were China (14.4%), Canada (11.1%), and Singapore (9.2%)¹⁸ (UN Comtrade).

¹⁶ As noted previously in the report, although some countries may have abundant sand resources, not all types of sand are appropriate for use in construction. Sand eroded by water, found in lakes, on seashores, and on riverbeds and banks is more angular in shape, and therefore valued for its use in concrete. Desert sand is eroded by wind, and its edges are too smooth to form stable concrete (*The World Is Running out of Sand* – DW – 03/15/2021, n.d.).

¹⁷ Trade statistics reflect official government customs data and therefore do not include sand that may be procured and traded illegally, outside of government channels (ENACT Africa, 2022a, 2022b; Hernandez et al., 2021; Lamb et al., 2019).

¹⁸ Sand value imports in 2023: China (\$254.8 million cost including freight), Canada (\$273.9 million free on board), and Singapore (\$226.1 million cost including freight).

Kenya, in contrast, consumes most of its sand domestically. In 2023, Kenya exported \$418,386 (3,868 Mt) worth of sand. The top 3 importers of Kenyan sand were Rwanda (66.7%), China (23.5%), and Uganda (4.6%) (UN Comtrade, Appendix 4). Kenya imported \$528,128 (1,799 Mt) worth of sand, primarily from India \$314,597 (1,561 Mt) and United Arab Emirates \$111,721 (176 Mt)¹⁹ (UN Comtrade).

Limited imports and exports of sand are consistent with respondents' understanding of the sand industry. Some respondents noted that sand might eventually find its way to international markets through intermediaries or special contracts, but—according both to trade data and supporting evidence that respondents had never heard of international export of sand from Kenya—direct exportation remains uncommon.

“...the sand harvested here is primarily for local use. There hasn't been any international export of sand from this site.”

—KII, transporter, Savings and Credit Cooperative

4.2.2 Sand in the Kenyan Cement Industry

Kenyan sand supports a robust and dynamic cement industry, which in recent years has witnessed numerous takeovers, expansions, and insolvencies. There are integrated cement plants, capable of both producing and grinding clinker into cement, as well as grinding plants, which purchase domestic or imported clinker to process into cement. (*International Cement Review - News, Events & Training*, n.d.).

Cement is primarily used in concrete. Concrete is a composite material made from several inputs: cement, aggregate, sand, and water. Cement is a powder substance made from carbonate rock (primarily limestone and clay).²⁰ After limestone is quarried, it is mixed with a silica source, such as slag or fly ash, and heated in a high-temperature kiln, resulting in clinker. Integrated cement plants or grinding facilities grind clinker into fine powder and mix in select additives, depending on end use, resulting in cement. That cement can be mixed with water to become cement paste. Adding sand to the cement paste produces mortar, and adding aggregates to the mortar produces concrete (industry KII).²¹

Major companies involved in cement and concrete production in Kenya that source sand from Kenya include Bamburi Cement Limited, Mombasa Cement, National Cement Company Ltd., Ndovu Cement, East Africa Portland Cement Company, and Savanah Cement (Bamburi Cement, n.d.; Cemnet, 2024a; Mombasa Cement, n.d.; National Cement, n.d.; Nduire, 2021). In 2021, the largest producers and their percentage of domestic sales of cement were Bamburi Cement (32.6%), National Cement (21%), Mombasa Cement (15.8%), and East Africa Portland Cement Company (15.1%) (Nduire, 2021).²²

¹⁹ One KII respondent indicated they import a specific “standard sand” from the Middle East through a company ELE International (www.ele.com) (see Figure 11). “Standard sand” is used internationally to conduction testing on sand and cement.

²⁰ There are 27 common types of cement, classified into 5 types and 3 strength classes. Type 1 is for general construction, Type 2 is used for concrete exposed to soil or water, Type 3 is used for projects like highways that require rapid hardening, Type 4 is used in locations with hot weather or dans that require uniform hardening, and Type 5 is used in projects in which there is a high exposure to sulfites. All of these five types are often referred to as ordinary Portland cement (cement industry KII; (P.E, 2020).

²¹ Note: Recycled cement can be used as an aggregate.

²² Although the construction industry has increased its consumption of cement in recent years, cement consumption has been relatively consistent between 2021 (9.1 million metric tons annually) to 2023 (9.2 million metric tons annually) (see Table 1).

Table 3. Leading cement companies in Kenya

Group name	Company name (retail name)	Facility location	County
Barak Asset Recovery	Savannah Cement	Athi River	Machakos
Rai Cement Limited (Kenya)	Rai Cement Ltd Kenya (Rai)	Kericho-Kisumu Road-Awasi	Kisumu
Ndovu Cement (Karsan Ramji & Sons Ltd)	Ndovu Cement (Ndovu)	Engashura	Nakuru
		Rai Cement	Kisumu
Devki Group of Companies	National Cement Co Ltd (Simba, Rhino)	Athi River	Machakos
		Athi River-Lukenya	Machakos
		Kaloleni	Killifi
		Merrueshi	Kajiado
		Pokot	West Pokot
		Salgaa	Nakuru
Tororo Cement Limited	Mombasa Cement (Nyumba)	Athi River	Machakos
	Bamburi Cement (Bamburi and Fundi)	Vipingo	Kilifi
		Athi River	Machakos
		Mombasa	Mombasa
Holcim Limited	East Africa Portland Cement (Blue Triangle)	Athi River	Machakos

Source: Social Policy and Development Consulting

4.2.3 Transporters: Connecting Sand Harvesters to Buyers

Transporters play a critical role in connecting sand harvesters with commercial buyers, whether an individual customer working on a home building project, a broker sand consolidator, cement manufacturers, or a government-funded infrastructure project. Due to the informality of the sector and evolving sand harvesting sites, transporters rely on their regional knowledge to identify where sand can be sourced. One transporter noted:

“You make yours from your contacts.”

—KII, transporter

Another respondent explained:

“Yes, I know all the sand harvesting sites along this beach... If you move from this village, you will go to the next village there called Ketuang. Then you will find two more excavators there, at different sites.”

—KII, industry representative

Transporters consistently mentioned that there was no formal centralized source to track all the sand harvesting or cement production sites. Instead, access to sand harvesting sites and selling sand relied on informal networks.

“We don’t have a formal list, but we know. If you say you’re in Kajiado, I will ask you which side of Kajiado. Then I know in Kajiado, you can find sand in this place, this place, this place. So long as the community agrees, you can collect the sand.”

—KII, transporter, Savings and Credit Cooperative member

Another participant highlighted the informal system of communications within the supply chain, explaining that a transporter may call a sand broker to confirm availability of sand:

“Before you start your trip, you have to do the confirmation. You can’t just start a trip without any confirmation.”

—KII, transporter

The lack of formal sand collection and delivery sites means that individuals rely heavily on personal relationships, industry knowledge, and local networks to navigate the sand supply chain. It was also noted that government authorities typically only collect levies from sand transporters and not sand harvesting sites.

In many cases, sand distributors or brokers are responsible for sourcing sand from different sites and coordinating its transportation to the end consumers. These intermediaries serve as critical linkages in the supply chain, possessing specialized knowledge about sand quality, availability, and consumer preferences that enables them to match supply with demand.

In many cases, sand distributors or brokers are responsible for sourcing sand from different sites and coordinating its transportation to the end consumers. These brokers serve as crucial intermediaries in the sand supply chain, connecting extraction sites with markets and consumers. Brokers maintain extensive knowledge of multiple extraction sites, different sand qualities, and the specific requirements of various construction projects.

"The role of a middleman is simply guiding the loading truck operators where they can get the sand of their specific choice."

—KII, broker

Participants described sand harvesting sites as varying widely in location and operation. One participant said:

"There are many sites. I can work at all the sand harvesting sites without any problem."

—KII, sand broker

Another mentioned that even within a county, different harvesting sites are known for different levels of sand quality:

"Nyadorera sand is one of the best in the Nyanza region. We also have sand from West Pokot and Machakos."

—KII, industry representative

Respondents observed that because of this variation, sand is sourced from different extraction sites, depending on its designated end uses and buyer specifications. They also observed, however, that market actors tend to avoid transporting sand from one county to another because doing so is more costly than selling within a given county due to transportation costs and levies by county governments.

Respondents reported that brokers actively participate in sand mixing practices to meet specific quality requirements. One excavator operator noted that when customers find sand quality unsatisfactory, "he comes looking for better quality and mixes it for the purposes of taking it to the customer." This mixing occurs at various consolidation points or "yards," where brokers stockpile sand from different sources. As one respondent explained, sometimes a broker "may have poor sand, or maybe the customer refused to accept the sand. ... He comes looking for better quality and mixes it for the purposes of taking it to the customer."

This practice of mixing sand from different sources has significant implications for traceability and quality control. Sand can be mixed at intermediate storage points before reaching consumers, so the original extraction site becomes difficult to determine. One excavator operator noted that "tracing it may be very difficult because, you know, they look alike. You will never know whether this sand has come from Kuja, or whether this sand has come from Kichan, or whether this sand has come from Siem."

Transportation of sand is primarily accomplished using trucks, with 6-wheeler and 10-wheeler lorries

being the most common. The choice of vehicle often depends on logistical and regulatory considerations. One transporter explained the benefits of using smaller trucks:

“We prefer the 6-wheelers because the weighbridge people usually disturb us when we use the 10-wheelers. With the six-wheelers, they know you haven’t exceeded the weight.”

—KII, transporter

In Homa Bay, a participant described the cost associated with transporting sand:

“For a 6-foot load, a small lorry charges about 1,500 shillings [\$11.54 USD]²³ ... for a 10-foot load, we charge 3,000 shillings [\$23.17 USD].”

—KII, landowner

However, findings show that transporters in Kajiado and Embu Counties prefer to use the 10-wheeler trucks, which, in addition to the load they carry, can also pull a trailer loaded with sand. This creates efficiency in sand transportation, in which trucks can maximize the load of sand they carry from the river.²⁴

Respondents mentioned that although there are often multiple operational sites, and many of these sites can be reached through informal networks, not all are equally accessible year-round. Accessibility of sand harvesting sites depends on several factors, including geographic location, weather conditions, and ownership. For example, during the rainy season, some sites become difficult to access due to poor roads, causing slowdowns in extraction and transportation. As one participant described:

“During the rainy season, in some areas, vehicles can’t access the roads because of the poor roads. When vehicles get stuck, it affects operations.”

—KII, landowner

In addition, some sand harvesting sites have been closed because of depletion, reducing access in certain areas:

“Maybe they closed when they could no longer find sand to harvest.”

—KII, sand broker

Multiple respondents noted that local authorities were increasingly outlawing commercial extraction of sand, which limited the areas from which they could harvest sand. This was, for example, the case in Makueni County, which was the primary source of sand during the construction of the Standard Gauge Railway and has since outlawed commercial sand harvesting.²⁵ Respondents reported that a similar dynamic was happening in parts of Machakos and Kitui Counties.

“The sources of sand are reducing as counties and communities ban commercial sand harvesting. We, for example, faced challenges when Makueni outlawed sand harvesting until Kajiado opened harvesting. Others, including Machakos and Kitui, have also outlawed harvesting in some areas.”

—KII, transporter

Among all transporter interviews, respondents consistently stressed the informal and dynamic and non-exclusive trading relationships, as well as a variety of consumers (from individuals to government

²³ Converted in this report at a rate of 1 Kenyan shilling to \$0.0077 USD, based on December 2024 exchange rates (Kenyan Shilling (KES) To US Dollar (USD) Exchange Rate History for December 31, 2024, 2024)

²⁴ Respondents noted that if the sand load is too heavy to pass government regulations and weight restrictions on paved roads, transporters may unload their sand before inspection points and return for it another day.

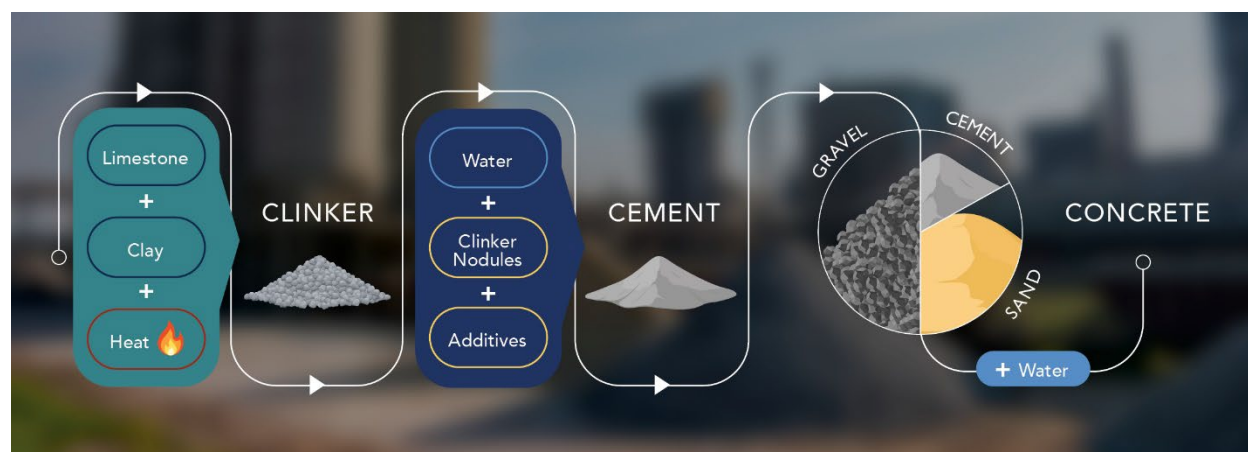
²⁵ The restrictions on sand harvesting adopted in Makueni County, as in other municipalities that have adopted such restrictions, have been driven in large part by concerns about over-extraction and environmental impact (Marindany, 2025).

infrastructure projects). Although some cement manufacturers noted that they repeatedly sourced sand from the same transporters, it was not an exclusive business arrangement, and transporters engaged in selling sand to a variety of buyers. The predominance of these informal broker networks also contributes to the sector's resistance to formalization efforts, as brokers operate through personal relationships rather than formal contracts. As one respondent stated, "If you tell them they won't deny ... they will not refuse," highlighting the reliance on trust and personal connections rather than formal business arrangements. Complex and fluid business relationships, in combination with co-mingling of sand from different sources, increase the likelihood that sand procured with child labor can enter the supply chain easily, and businesses that purchase sand from third party transporters may have difficulty verifying otherwise. One manufacturer indicated that there was no child labor involved in their sand procurement, because they used sufficiently large volumes of sand to make manual labor impossible. However, a transporter delivering sand to that same manufacturer, confirmed that it was in fact common practice for child laborers to assist in loading sand onto his trucks.

4.2.4 Sand to Concrete Supply Chain

The following sections explore in greater detail the supply chain of sand delivered by transporters to buyers in the domestic Kenyan concrete industry, including the production and international trade of clinker and cement.²⁶

Figure 13. Cement and concrete production



Source: ICF

4.2.4.1 Clinker

Clinker is the primary ingredient in cement and is produced by heating carbonate rock (primarily limestone and clay) and silica (such as slag or fly ash) in a high-temperature kiln to produce clinker nodules.²⁷ Clinker nodules are then ground into powder to be used as the primary ingredient in cement. Cement is then combined with sand, water, and aggregates to produce concrete.

²⁶ As noted in Figure 13 and in the text that follows, sand is not used in the production of clinker or cement, but is rather mixed with cement, water, and aggregate to make concrete.

²⁷ In the process diagram presented in Figure 13, clinker is the grey material depicted emerging from the rotating heater and being fed into the grinder.

Figure 14. Clinker nodules



Source: “Hot Clinker.” Wikimedia.org. Accessed May 23, 2025. https://commons.wikimedia.org/wiki/File:Hot_Clinker_2.jpg. Licensed under the Creative Commons CC0 1.0 Universal Public Domain Dedication license.

Clinker is a heavily traded commodity in global markets; in 2022, its global exports totaled \$4.7 billion (*Cement Clinkers (HS 252310)*, 2024). Cement plants that produce clinker need to ensure sufficient raw materials and fund costly, energy-intensive industrial kilns to produce clinker nodules. Clinker nodules are easily ground into cement powder using standard mineral handling equipment, and they can be stored for months without losing quality if kept in the right dry environment. Therefore, it is typical for local markets to support more clinker-grinding facilities than clinker-producing plants. In addition to producing their own clinker in house, cement firms that can produce clinker can also buy clinker from other producers and grind it into cement. Grinding facilities, which cannot produce clinker nodules, buy clinker from domestic or foreign producers and specialize in turning it into cement to either be sold in bulk, as ready-mix, or in retail bags. The co-mingling of clinker at this stage, in both grinding facilities and cement firms, introduces an additional aspect to the assessment of the risk of child labor or forced child labor present in the sand sold and capital goods produced in the realization of Kenya’s infrastructure projects.

In Kenya, there are two leading producers of clinker: National Cement (Devki Group) and Mobassa Cement (Tororo Group). Domestic production of clinker is insufficient to meet domestic demand, although numerous efforts are underway to increase domestic production of clinker.²⁸ The National Independent Clinker Verification Committee, established by the Kenyan Association of Manufacturers, reported in 2021 that even if all cement grinder and clinker production companies in Kenya operated at full capacity, the country would still need to rely on imports to meet domestic demand. The shortfall is exacerbated because some clinker from Kenya is exported (Anyanzwa, 2021).

²⁸ The East African Portland Cement Company has developed investment efforts in clinker facilities, but the company was shut down by the government in December 2024 due to unpaid debts (Nyeti, n.d.; week, 2022). In 2022, Savannah Cement contracted Chinese-based company Sinoma International Engineering to construct an integrated cement factory capable of producing clinker in Kitui County (*International Cement Review - News, Events & Training*, 2024; Onyango, 2023). Some sources anticipate new plants, and expansions are projected to grow the country’s clinker production capacity to 10.7 million Mt per year by 2025 (Cemnet, 2024b).

Even though Kenya needs to import clinker to meet a shortfall in domestic supply, the country also exports clinker.²⁹ Kenya reported exporting \$71,400,673 (965,133 Mt) of clinker in 2022, and \$112.4 million (1.94 million Mt) of clinker in 2023, almost exclusively to Uganda (98.9%) (UN Comtrade).³⁰

In 2022, according to UN Comtrade, Kenya imported \$61,980,796 (1.5 million Mt) of clinker and \$25,548,387 in 2023 (over 155,975 Mt, but some quantity data not available).³¹ A decline in clinker imports from 2022 to 2023 is attributed to a new import tariff. In July 2023, the Kenyan government introduced its Export and Investment Promotion Levy, which imposed a 17.5% fee on imported clinker. Cement producers that rely on imported clinker—including Rai Cement, Bamburi Cement, Savannah Cement, and Ndovu Cement—lobbied against the tariff. Domestic producers of clinker, including National Cement (Simba/Devki group) and Mobassa Cement, are likely to benefit from the tariff (Perilli, 2024) Kipkemoi, 2024). The impact of the new tariff has thus far reduced clinker imports, and the forecast for clinker imports in 2024 is still to be determined (Ambani, 2024).

4.2.4.2 Cement

Globally, the cement industry is capital-intensive,³² highly automated, and consumes large amounts of electricity.³³ Cement plants are usually located in close proximity to raw materials and buyers, due to a commercial incentive to keep transportation costs low.³⁴ Cement is primarily used in concrete production, although it can be used in other construction materials, such as mortar, plaster, and pre-cast concrete products. Cement can either be stored in silos for bulk delivery, in ready-mix concrete, or bagged into retail-size bags. One cement brand may sell multiple products, each of which varies, according to the ratio of ingredients and admixtures added to meet consumer end-use needs.

²⁹ In 2021, the supply of domestically produced clinker was just 3.8 million Mt per year against a demand for 5.3 million Mt (Anyanzwa, 2021).

³⁰ According to trade data provided by the governments of destination countries, in 2022, Kenya reported exports of \$75,740,622 (1.03 million Mt) in 2022 and \$113,630,659 (1.9 million Mt) in 2023. While the values reported by international governments and the Kenyan government are similar, international sources from the Ugandan government may overstate the quantity. Therefore, Kenyan trade statistics are deemed to be more accurate (UN Comtrade).

³¹ According to trade data provided by the Kenyan government, Kenya reported importing \$43,003,403 (656,401 Mt) of clinker in 2022, and \$8.0 million (n/a 147,900 Mt) in 2023 (UN Comtrade, Appendix 4) These quantities are inconsistent with research findings of total clinker consumption, and therefore trade data reported by international sources are deemed to be more accurate.

³² An international industry stakeholder indicated that, on average, the cost of a new cement plant is equivalent to three years of revenue, making the cement industry among one of the most capital-intensive industries.

³³ An international industry stakeholder indicated that each ton of cement produced requires 60–130 kilograms of fuel and requires a limited amount of skilled labor, and a modern plant is usually staffed by less than 150 people (cement.org).

³⁴ An international cement industry stakeholder indicated that typically it was not considered economically feasible to haul cement beyond 125–200 miles. However, bulk shipping has changed the calculation, to the point that it is typically less expensive to cross the Atlantic with 35,000 tons of cement cargo than to truck cement 190 miles. If not shipped internationally, in large countries, transportation costs usually result in cement markets clustering in regional areas (industry KII).

Figure 15. Read-mix concrete truck



Source: RawPixel.com. “Construction truck.” Digital Image. Accessed May 23, 2025. Licensed under the Creative Commons CC0 1.0 Universal Public Domain Dedication license.

Figure 16. Retail-size bags of concrete



Source: “Bamburi Cement.” ABDAS. Digital Image. Accessed May 23, 2025. <https://abdas.org/2020/02/27/kenya-bamburi-cement-packaging-changed-the-look-of-its-cement-bags-in-a-huge-makeover/>.

In recent years, Kenya has imported 60% of the clinker required for domestic cement production, but the majority of Kenya’s cement production is procured from domestically quarried limestone and shale³⁵ (Kipkemoi, 2024). Kenya exports some cement, with the largest destination being South Sudan, and imports a minimal amount of cement. In 2022, Kenya reported exporting \$54,202 (854 Mt) of Portland cement (Harmonized System [HS] 2523.29) and \$67,791 (518 Mt) in 2023.³⁶ In 2022, Kenya reported

³⁵ Based on cement production of 5.97 Mt and clinker imports of 1.81 Mt, clay and shale production for use in cement was estimated to be 800,000 tons in 2019 (according to Kenya National Bureau of Statistics, 2020; USGS 2019 minerals yearbook).

³⁶ It should be noted that Kenyan reported statistics differ from those reported by destination countries. Countries that reported exports of Portland cement (HS 2523.29) to Kenya recorded exports valued at \$64,004 (451 Mt) in 2022 and \$155,140 (2,217 Mt) in 2023. (UN Comtrade). Research was unable to account for the discrepancy.

importing \$33,587,137 (321,617 Mt) of Portland cement (HS 2523.29) and \$41,914,577 (447,982 Mt) in 2023³⁷ (UN Comtrade, Appendix 4).

Cement firms often manage their own quarries to extract raw materials like limestone, which is processed into clinker and later ground into cement. A respondent from the cement industry explained that the demand for cement has grown due to increased construction, and many firms are expanding their production capacities to meet this demand.

“We have quarries where we mine raw materials like limestone. This is processed into clinker and mixed with additives like pozzolana to produce cement.”

—KII, industry representative

In addition, there are a multitude of enterprises that sell “ready-mix concrete” but do not produce cement. Ready-mix concrete is produced by combining water, cement, admixture, and aggregates at a batch plant or in transit. Ready-mix concrete companies typically use fleets of mixer trucks to transport the ready-mix concrete to customers. Ready-mix concrete can be delivered through three primary means from a batch plant: (1) transit-mixed concrete, in which materials are batched at a central plant and then mixed in transit, thus avoiding problems such as premature hardening, especially when the construction site is far from the plant; (2) shrink-mixed concrete, in which the concrete is partially mixed at the plant to reduce shrinkage of volume, and mixing is completed either in transit or at the construction site, which maximizes the truckload capacity and can lower cost for buyers; and (3) concrete production in which cement powder is mixed with water to form a cement paste in preparation for various downstream uses (Industry KII).

In Kenya’s construction market, a growing number of ready-mix companies have emerged that specialize in producing and transporting ready-mix concrete to construction sites across urban areas. Ready-mix facilities are less capital intensive and have lower startup costs than cement processing facilities.³⁸

Respondents indicated that cement production companies in Kenya are important consumers in the sand supply chain, as cement is mixed with sand to produce concrete, and thus is essential for ready-mix concrete sales. Some transporters confirmed that they had supplied sand to cement-producing companies in and around the Athi River area in Machakos County.

“We supply sand to cement companies here in Athi River, which they use for the ready-mix.”

—Transporter

4.2.4.3 Concrete

Concrete is the world’s most consumed construction material (Wikimedia Commons, 2009). Cement is combined with sand, water, aggregate, and admixtures to produce concrete. The mixing of cement to make concrete can be done at a job site (with cement delivered in bulk or individual retail bags) or as ready-mix cement from a cement factory or “batching plants.”

³⁷ It should be noted Kenyan reported statistics differ from those reported by source countries. Countries that reported importing Portland cement (HS 2523.29) from Kenya recorded import values of \$21,501,643 (222,150 Mt) in 2022 and \$16,814,000 (186,283 Mt) in 2023 (UN Comtrade).

³⁸ Examples of ready-mix companies in Kenya include, but are not limited to Rhombus Concrete, Onda Concrete, Ready Mix Concrete Kenya, Sidai Concrete Limited Plant & Sales, Alliance Concrete Limited, Kisumu Concrete Products, Construction Revolution Market, Erdemann Concrete Ltd, Jopeed Limited, Silver Ready Mix, Citie Hills Enterprixe, DJ Mixing Kenya, Vishava Ready Mix, Mageta Enterprises Ltd, Warren Concrete Company, Bsp Two Rivers Plant, Tubemix, Gopinathji Readymix, Shiv Construction Company, Kenya Builders, Engineers Concrete, Greystone Industries Limited, and Flamingo Africa (Cemnet, 2024a; *Construction Kenya | News and Trends*, 2024).

Once on construction sites, whether mixed on-site or delivered as ready-mix cement, the concrete is poured per project specifications.

Figure 17. Pouring concrete



Source: "Cement Work." Digital image. Wikimedia Commons. Accessed May 23, 2025.

https://commons.wikimedia.org/wiki/File:Cement_Work.jpg. Licensed under the Creative Commons Attribution-Share Alike 4.0 International license.

4.2.5 Downstream Use of Sand

Interview respondents indicated that sand harvested with child labor was delivered to various downstream consumers, including major governmental infrastructure projects such as the Standard Gauge Railway; Thiba Dam; Talanta Stadium;³⁹ housing projects; private sector building projects; and manufacturers of cement, ready-mix cement, and pre-cast concrete products. Government infrastructure projects are a material driver in the demand for concrete, thus increasing the demand for sand. In fiscal year 2023/2024, anticipated Kenyan government expenditures on road construction (23,024 km) totaled 179.5 billion Kenyan shillings (\$1.39 billion USD), and expenditures on public housing totaled 92.5 billion Kenyan shillings (\$710 million USD). In 2023, the government completed 3,521 public residential buildings (Economic Survey 2024, 2024).

³⁹ Although, as addressed previously, the vast majority of the sand harvested in Kenya is consumed domestically, that is not to say that all these downstream uses are without international importance and international involvement. Each of these major infrastructure projects was built with the assistance of significant international financing and involvement by foreign companies. The Standard Gauge Railway was financed through loans related China's Belt and Road Initiative, and much of the construction was performed by the China Road and Bridge Corporation. Thiba Dam is also an international project, drawing on financing provided by Japan's International Cooperation Agency and constructed by Strabag International, a German construction company. In addition, Talanta Stadium is also being built by China Road and Bridge Corporation under supervision of the Kenya Defense Forces and the Ministry of Sports. Of note, Bamburi Cement PLC, is a major subcontractor in the Talanta Stadium project.

Stakeholders through the supply chain emphasized the importance of government infrastructure projects in sand consumption, for major infrastructure projects as well as government buildings.

“We used to supply [sand] for government projects, including the Standard Gauge Railway and expressway projects, but recently, there hasn’t been much demand.”

—KII, industry representative

The sand near the Tana River supported large-scale projects like the Thiba Dam. One industry stakeholder who purchased sand indicated:

“The Thiba Dam ... consumed a sizable amount of concrete.”

—KII, industry representative

“... the sand is used for government projects like the construction of police stations and [...] hospitals.”

—KII, sand investor and broker

In addition to government projects, sand is also widely used for general construction purposes, such as housing structures, culverts, and other building materials. In Nairobi, manufacturers interviewed for this study indicated that they produce high-quality construction materials, such as concrete pipes, concrete blocks, road channels, colored roofing tiles, and other pre-cast products. Transporters and brokers were familiar with the variety of end uses for which their customers use sand:

“It’s used for culverts, housing, and tank flooring.”

—KII, sand broker

“... individuals, institutions like hospitals, schools, and road construction companies.”

—KII, transporter

Figure 18. Photos of culverts, roofing tiles, decorative tiles, and paving blocks manufactured with sand





Source: ICF

The production of concrete drives the demand for sand, but sand is also used as a key ingredient in other construction products, such as mortar for bricklaying, plaster for walls and flooring, a standalone

product a base material for paving roads, and in asphalt mixing or building foundations. Less commonly, sand in Kenya can also be used as an additive to plant soil to grow seedlings or chicken feed.

“Sand is good because it does not have natural micro-organisms, so you can easily control what you want in the soil that you grow seedlings on.”

—KII, Government of Kenya, sand end user

Although all downstream products that use sand are at risk of being produced with sand procured from child labor, interview respondents stressed that it becomes challenging to track sand after it leaves the harvesting site, especially after it passes through brokers:

“It’s difficult to trace where the sand goes after it’s loaded onto trucks and delivered to brokers.”

—KII, sand broker

Mixing sand from different sources is a common practice, which further complicates traceability. This often happens either on construction sites or at sand consolidation centers, at which sand sellers pile their stocks of sand and from which they supply the consumers. When sand is piled in these consolidation centers, it becomes difficult to trace the specific source from which it was harvested, although the general area is likely known. In addition, quarry dust, a common substitute for sand, is often co-mingled with sand, further diluting the supply chain.

“Sand is often mixed with other types to meet specific client requirements.”

—KII, sand broker

It is likely that all sand harvested in Kenya is at risk of having been comingled to some degree with sand harvested with child labor. Thus, most if not all downstream products made from or containing sand harvested in Kenya are at risk of containing sand harvested using child labor.

5 LABOR FINDINGS

5.1 ON-SITE LABOR DYNAMICS FOR SAND HARVESTING/EXTRACTION

The labor force in Kenya’s sand harvesting sector is largely informal, with workers often lacking formal contracts or consistent employment. This informality contributes to the risk of exploitation of children.

Sand harvesting in Kenya is generally conducted by sand harvesting teams, either made up of workers who have some familial or community connection or formed on an ad hoc basis. These teams can be organized by local leaders or by intermediaries who act as liaisons between the workers and sand buyers. The composition of these teams can be fluid, with members joining or leaving based on their economic needs and the availability of work. The membership of these teams can include a mix of adults and children.

The roles within sand harvesting teams are often divided based on age, sex, and physical capability. Adults, particularly men or older boys, are usually responsible for the more physically demanding tasks, such as digging and heavy lifting. Younger or smaller boys are usually responsible for tasks like cleaning plants or other impurities out of harvested sand or moving sand from one staging place to another.

According to interviews and observations conducted for this study, sand extraction and transport in Kenya is primarily performed by men and boys. Although the research team observed a number of young girls, mostly accompanied by their mothers or caregivers, at a number of extraction sites, these girls and older women were not generally participating in the sand extraction process itself. Instead, they were collecting pieces of wood that could be used as firewood, either to be sold or used at home.

Although the research team was instructed to note any children, male or female, who appeared to be providing support services (food vending, etc.) to the workers on sand extraction sites, the team did not observe any.

The payment structure in sand harvesting is predominantly based on output rather than fixed wages. Workers are typically paid per truck loaded. This piece-rate system can incentivize longer working hours and the involvement of children, as families seek to maximize their earnings.

The labor dynamics are further complicated by the seasonal nature of sand harvesting. During dry seasons, when river levels are low, sand harvesting activities often intensify. This seasonality can lead to periods of intense work followed by times of unemployment, creating economic instability for workers and their families.

5.1.1 Awareness of Child Labor Laws and Regulations

Interviews with both child workers and other stakeholders in the sand supply chain in Kenya reflect a relatively high understanding among most respondents about the illegality of children working in sand extraction and loading. Among child workers themselves, there is often direct acknowledgment of such regulations, with one child worker explicitly stating, “As sand harvesters, we said a child under 18 years should not work in sand harvesting as it constitutes child labor.” Child workers also demonstrated knowledge of enforcement consequences, with one explaining that when the sub-chief finds children working, “the owner of the pit is taken into custody.” Several mentioned site-based restrictions, noting that children under 18 are officially prohibited from accessing some sites, although the enforcement of such prohibitions varied widely.

Industry stakeholders exhibited awareness primarily through community standards and local enforcement mechanisms. A landowner cited that “the certificate issued after registration of the laborers’ SACCO [Savings and Credit Cooperative] doesn’t allow them to work at these sites” and “the area chief cannot allow employment of anyone below the age of 18 years.” Corporate entities like Strabag implement formal requirements, with one representative stating, “Strictly you have to be employed when you are bringing your ID, your KRA pin. ... It is not possible that we can employ someone who is underage.” Multiple sites reportedly use identity card verification to screen out minors.

No worker or stakeholder interviewed for this study made reference to specific child labor laws by name or statute. This may indicate that awareness stems primarily from practical enforcement and community norms rather than formal legal education or training.

5.1.2 Normalization of Child Labor in Sand Extraction Despite Regulations

Several consistent factors contribute to the continued involvement of children in sand harvesting despite known prohibitions. Economic necessity appears as the primary driver, with multiple child workers explicitly mentioning working to pay for their education and family support obligations. One transporter explained that children sometimes work “to get money for essentials like soap, etc.” The lack of alternative income sources in many communities makes sand harvesting an attractive option, with one broker noting that parental acceptance is common as long as children “are not involved in chewing *miraa*, they are not smoking.”

Flexible definitions and inconsistent enforcement further normalize child labor. Many sites distinguish between school days and holidays, with one respondent clarifying, “During school days you cannot find any child working here,” while acknowledging that holiday work is permitted. Some communities prioritize education completion over age, with one stating, “Someone who is already done with form 4 is an adult,” even if technically under age 18. Weekend and night work provide opportunities for

children to participate without facing enforcement, as one respondent mentioned: “At weekends kids enter and dig sand,” and several child workers reported working at night.

Labor market dynamics also appear to play a significant role in normalizing child labor. Children often fill gaps when adult workers are unavailable, particularly during evenings or peak demand periods. Community acceptance makes prohibition difficult to enforce, as one transporter explained: “When us drivers don’t allow it but people from the community where you carry sand from allow children to come and load the sand, it gets difficult for us to stop the issue.” The immediate financial reward proves attractive, with one landowner describing how children are drawn to quick income: “When they taste the money that comes from loading sand they don’t want to go back to school.”

5.1.3 Enforcement Challenges

Interviews with both child workers and other stakeholders in the sand supply chain in Kenya reveal significant gaps in enforcement of child labor prohibitions. Government oversight appears limited across most sand harvesting sites, with one landowner stating when asked if labor inspectors visit, “I haven’t seen them.” Another respondent bluntly noted: “The government does not have a job here. It has left us.” This lack of official presence creates an environment in which violations can occur with minimal risk of consequences.

Diffusion of responsibility among various stakeholders further complicates enforcement. Many industry participants distance themselves from responsibility for labor practices at extraction sites, with one site manager stating, “For us, we have little involvement when it comes to extraction, what concerns us is the delivery.” This compartmentalization allows each link in the supply chain to avoid accountability for child labor violations occurring at other points.

Enforcement, when it does occur, appears selective and inconsistent. It tends to be stronger at formal sites with corporate involvement, versus informal extraction areas, and focuses more on school attendance than age verification. This creates spaces in which child labor can flourish in certain contexts while being prohibited in others, sending mixed messages about the seriousness of the prohibition.

5.1.4 Impact of Informality and Awareness of Illegality on Reporting

Although the connection between illegality and underreporting of injuries was not explicitly stated in the interviews, several patterns suggest serious implications for the well-being of child workers. As discussed in detail in Section 5.2.4, child workers reported various injuries, including cuts from spades, being hit by sand, and leg injuries, but they described these as routine occupational hazards rather than reportable incidents. This normalization of harm is reinforced by inadequate safety measures, with one respondent acknowledging that workers “load sand barefoot” and lack basic safety equipment like gloves and helmets. The response to injuries appears frequently insufficient, as illustrated by one troubling account: “I was taking porridge there when I saw someone injured. When I get there he is laid down while they touch his back.”

The informal nature of the industry has led to community-based support systems that may inadvertently reduce official oversight. One child worker mentioned a contribution system in which workers collectively help injured colleagues with medical expenses, suggesting a self-contained system that avoids official reporting channels. These informal arrangements may also include potential for exploitation, with another child worker describing a punishment system in which workers who refuse to pay fines “cannot work again until they pay.” Several children mentioned having to work at night and sometimes sleeping at work sites to meet earnings targets, suggesting potential coercive elements in these informal labor arrangements.

5.2 CHARACTERISTICS OF RESPONDENTS AND THEIR WORK

The study interviewed 28 child workers and 2 adult workers⁴⁰ who were engaged in sand harvesting across the 4 target counties: Homa Bay, Embu, Kajiado, and Siaya. Child workers interviewed for this study ranged from age 13 to age 17, with a majority being 17 years of age. Some workers, however, reported that they commonly work alongside children as young as age 12.⁴¹

Child workers interviewed for this study included a mix of children still in school and those who no longer attend school, with several having completed primary education but not continuing to secondary. Older interviewees (17-year-olds) were more likely to have dropped out of school, compared to younger ones. There was some regional variation in school attendance patterns among interviewed child workers. Child workers interviewed in Homa Bay County tended to be younger and still enrolled in school, whereas those interviewed at the other three data collection sites tended to be older and to report having left school.

Table 3. Respondent background characteristics by district*

	Homa Bay		Tana River		Kajiado		Siaya		Total	
	n	%	N	%	n	%	n	%	n	%
Age (years)										
12–14	2	22%	0	0%	0	0%	0	0%	2	7%
15–17	7	78%	9	100%	7	100%	3	100%	26	93%
Sex										
Male	9	100	9	100%	7	100%	3	100%	28	100%
Education										
Work only	1	11%	7	78%	7	100%	1	33%	16	57%
Combines work and school	8	89%	2	22%	0	0%	2	66%	12	43%

*Percentages may not sum to 100 due to rounding.

5.2.1 Working Conditions/Activities

The involvement of children in sand harvesting in Kenya is characterized by a range of activities, working conditions, and impacts on their well-being and development. According to interviews conducted for this study, children involved in sand harvesting perform a number of activities at sand harvesting sites, intermediary sand storage sites, and downstream construction sites. These tasks include loading sand into lorries/trucks; manually harvesting sand from pits on dry land or riverbanks using shovels, sand hoes (*fork jembe*), or other hand tools; diving and manually harvesting sand from riverbeds using buckets; removing plant matter or other debris from sand by hand; using spades or shovels to spread and level sand in truck beds; and lifting and placing logs under lorry wheels to provide traction and support.

Interviewees reported that employment arrangements for loaders at sand work sites are relatively informal, with children and adult workers able to come and go as they choose. That said, there are

⁴⁰ The 2 adult workers (male, between 20 to 40 years of age) were interviewed in areas where the in-country research team had either been met with resistance or where they had received contradictory reports about the presence of children working. The research team conducted these interviews to learn more about the site and to build trust among local workers to facilitate further research activities at the site.

⁴¹ Of note, one worker in Siaya County reported working alongside 10-year-olds, and another in Homa Bay County mentioned that children as young as age 6 work at extraction sites (“Some are 6 years, 9 years, some are 7 years”). These two reports were outliers compared to the other interviews, which generally reported ages 15 and above for child workers. The discrepancy could be due to differences in observation, interpretation of the question, or variations between different sand harvesting sites.

established norms around payment rates and work assignments, but they vary from site to site and are not established in any formal documentation or agreements.

5.2.2 Indicators of Child Labor

Sand harvesting—including gathering of sand (whether from riverbeds or surface depressions or pits), working underwater, and lifting of heavy loads—is included on the Government of Kenya’s list of Activities Harmful to the Health, Safety, and Morals of a Child (The Employment (General) Rules, 2014, Section Fourth Schedule), and is thereby classified as an activity that constitutes a “worst form of child labor” and prohibited under Kenya’s Employment Act of 2007 (Employment Act, 2007, Section 53).

5.2.3 Working Hours

One determinant of child labor according to ILO guidelines is whether children work above a set number of hours based on their age range. Under ILO guidelines, children aged 15–17 meet the threshold of child labor if they engage in paid economic activity for 43 hours or more per week. For children aged 12–14 and children aged 11 and younger, thresholds are 14 or more hours per week and 1 or more hours per week, respectively (International Labour Organisation & UNICEF, 2021).

Kenyan labor law does not include a specific limit on the number of hours children can be employed per week, but it does prohibit the employment of children younger than age 17 to perform any work during nighttime hours (between the hours of 6:30 p.m. to 6:30 a.m.) (Employment Act, 2007, Section 59(1)), and it prohibits the employment of children under age 17 to perform any economic work that, due to the nature of the tasks involved or duration of work, is likely to be harmful to the child’s health or development, impacting the child’s attendance at school or other educational opportunities (Employment Act, 2007, Section 56).

Worker interviews revealed that although many children who engage in sand harvesting do so for relatively short periods at a time (as little as one to two hours), others work long and irregular hours that often significantly exceed both domestic and international standards for acceptable work durations and schedules for minors.

Some older workers reported commonly working 11- or 12-hour days at sand extraction sites. One 17-year-old worker in Homa Bay County, for example, reported that he commonly worked loading sand into lorries from 6:30 a.m. to 7 p.m. Another, a 17-year-old in Siaya County, reported that he commonly worked from 8 a.m. to 7 p.m.

Although relatively few children described working for such long periods of time during any given day, many children reported that the prevalence of payment based on output (per truck loaded or unloaded) often led them to work, or seek to work, for longer hours and on more days per week in an attempt to maximize earnings. To this end, a number of children reported arriving at extraction sites before dawn and leaving long after dark, waiting for the chance to work.

“At 6 a.m. and I went to the river. Since we [workers] are so many and only few lorries, we [workers] have to organize ourselves so that everyone gets a share of the work. I stayed up to 6 p.m. with no work waiting for my turn.”

—Child worker, Kajiado County

“In some places, we can work for 24 hours, while in others, the work is completed in 30 minutes.”

—Child worker, Kajiado County

“I load sand into the lorry ... every day. There is no resting day. Even Sunday.”

—Child worker, Embu County

Others reported working six or more days per week.

“[I work] six days. Only Sunday is the day we don’t come here.”

—Child worker, Siaya County

In addition to these reports of children working for long days and on many consecutive days on sand extraction sites or loading or unloading trucks at sand storage sites or downstream construction sites, worker interviews also revealed that children are commonly employed to perform tasks related to sand harvesting (loading, cleaning, unloading) late into the night and early morning.

“... I got one lorry at 9 p.m. It took two hours to get to the river and another two to three hours for loading it and another two hours to go back. I came back at 9 a.m.”

—Child worker, Kajiado County

“I went there at 5 p.m. in the evening, I loaded the sand until 10:30 p.m. then we came back. By 2 a.m. the lorry left.”

—Child worker, Siaya County

“We come here around 9 p.m. and go back home at 1 a.m.”

—Child worker, Homa Bay County

One worker, a 17-year-old working at a sand extraction site on the Tana River in Embu County, reported that he commonly works from 6 p.m. to 9 p.m., walks home (a 2-hour walk) to take a “nap” from 11 p.m. to 2 a.m., and then walks back to the extraction site to start work again by 5 a.m.

These kinds of reports of long and nighttime working hours were more common among older children and children who reported that they no longer attend school, but a number of children who were still attending school reported working on days when school was not in session or in the evenings.

“We come here around 9 p.m. and go back home at 1 a.m. ... I still attend school. ... During the evening after school, I come here.”

—Child worker, Homa Bay County

“I used to come at night and go to school. ... How many times a week? Let’s say seven days. I did it for the seven days. At night and during daytime I went to school and went to work in the evening again. So I went to work the whole week.”

—Child worker, Kajiado County

The long working hours and nighttime work hours described by children working in sand extraction interviewed for this project are directly contrary to both ILO guidelines on working hours and Kenyan labor laws.

The extensive working hours observed have significant implications for children’s physical health, mental well-being, and educational opportunities. The fatigue resulting from such long work periods increases the risk of accidents and injuries, while also compromising children’s ability to attend and concentrate in school.

5.2.4 Exposure to Hazards

Exposure to hazards is another determinant of child labor. Exposure to one hazard is sufficient to constitute a state of child labor by international standards. In addition to listing employment in sand

harvesting as one of the “worst forms of child labor,” Kenyan law prohibits the employment of children younger than age 17 to perform any tasks that require “attend[ing] to machinery” or to perform any work in an open-pit, surface, or underground mining sites (Employment Act, 2007, Section 58 (1-2)). Kenyan law also prohibits, as a category of “worst forms of child labor,” employing children younger than age 17 in any “work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of the child” (Employment Act, 2007, Sections 2, 52).

Children involved in sand harvesting are exposed to numerous hazards that pose serious risks to their health, safety, and overall well-being. These hazards include using sharp tools like hand shovels, spades, and *fork jembes*; carrying heavy loads; working near or on heavy machinery; doing the same task over and over again at a fast pace for long hours; working in an environment in which dust, sand, smoke or fumes make it hard to breathe or see clearly; and working long hours in the hot sun without a break or working at night or very early in the morning. Interviewees reported suffering cuts, bruises, and even more severe injuries caused by shovels, spades, and other digging tools.

“You have to be very careful because you can cut yourself with a spade. There was a day I cut myself with one, so you need to be cautious while working.”

—Child worker, Homa Bay County

Interviewees also reported lasting soreness and discomfort resulting from the repetitive and strenuous work of loading multiple tons of sand into tall trucks using manual tools.

“The work is so painful. My hand hurts. Even [if] you [are] alone, you will come back when you are completely tired. You can’t do anything else when you are from the river.”

—Child worker, Kajiado County

“That sand is heavy, so loading it makes you feel that it’s a bit hard.”

—Child worker, Siaya County

“That work is always bad because when you go to school you have a backache.”

—Child worker, Embu County

“When you go to the site a day to going to school, the work makes you too tired and with a painful body.”

—Child worker, Embu County

Others described injuries suffered when standing inside truck beds, caused either by being struck by falling objects or being crushed by the sand itself.

“The sand buried me [to] my waist. ... Yes, I was rescued.”

—Child worker, Homa Bay County

“In 2018... I was loading and a piece of glass fall on my head causing a cut on my leg. I was taken to the hospital. When I was healed, I went back to work.”

—Child worker, Kajiado County

“The lorry might slide and pour the sand on you, so that is what you need to be careful again. That is the most dangerous thing, it is a very bad incident to be buried in the sand. Or there could be mines. ... Mines as in when the sand is being harvested, there is always some mud that comes with it, that is what we call mines. ... Yes, they have fallen on many people and cause them serious injuries. ... Like around 2021–2022, two people died and one was badly injured on the legs.”

—Child worker, Kajiado County

Finally, multiple children reported having suffered or having seen other children suffer severe cuts, contusions, and even broken bones after being struck by the logs placed under lorry wheels, having objects fall on them, or being swept away or drowned by rising or fast-moving water.

“When you're setting it [a log], if you throw it badly and it lands on the edge of a lorry wheel, it can bounce back and hit your leg, breaking it.”

—Child worker, Kajiado County

“The lorry so that it may not step on me. There are at times we cut logs and put them on the tires to prevent it [the truck] from getting stuck. So I have to be careful since if the log comes out it can hit you or the lorry can roll and hit you.”

—Child worker, Embu County

“Yes, I got hurt. ... I got hit by the logs on my fingers and I went to the hospital.”

—Child worker, Kajiado County

The injuries resulting from these work-related accidents varied, ranging from minor bumps and bruises to serious injuries requiring hospitalization and, in some cases, death.

“A lorry lost its brakes while descending a slope, leading to an accident. Some individuals broke their legs.”

—Child worker, Kajiado County

“There was one where people were loading a lorry and when they were done when alighting the lorry the driver started the lorry and left when one was still on. ... The guy had to jump off the lorry but after jumping the lorry stepped on his leg and he had to be amputated.”

—Child worker, Kajiado County

“There have been a few injuries, around five, and three people have died. Just last week, someone was seriously injured.”

—Child worker, Homa Bay County

“Yes, some died, not just injured. ... They were about 16 years old. ... They were digging sand, and the sand collapsed on them.”

—Child worker, Homa Bay County

In addition to these physical hazards, children involved in sand harvesting are also commonly subjected to various environmental, biological, and ergonomic hazards. Working long hours at sand harvesting sites, temporary sand holding sites, and downstream construction sites in the dry season sun can lead to dehydration, exhaustion, and, in severe cases, heat stroke. Prolonged exposure to sand dust can cause respiratory issues and eye irritation. For those children working in dry sand pits or in deeper excavation sites on riverbanks, the risk of sand pit collapses or cave-ins pose a significant threat to their safety. Given the remote and rural nature of most sand extraction sites, children working at these sites can lack access to adequate sanitation facilities and clean water, and children working near rivers or standing water are at risk of contracting diseases like schistosomiasis. Finally, the kinds of repetitive and strenuous motions, often made while in awkward postures, can lead to acute and chronic musculoskeletal injuries.

Worker interviews and research team observations revealed a severe lack of the kinds of safety equipment and measures that would be necessary to mitigate these workplace hazards. Only three of the workers interviewed mentioned having access to any form of protective gear, and in one case this gear was limited to “wearing gumboots.” Although most of the children interviewed were aware of safety hazards associated with their work in sand harvesting, none mentioned having been given any

safety training, and many mentioned being asked to perform tasks that posed immediate and obvious risks to their physical safety. In interviewees' descriptions of instances in which they or another worker had been seriously injured, some mentioned workers having to be taken to a nearby hospital, but no mention was made of on-site first-aid or medical care.

These direct reports of the hazardous working conditions to which children working in sand harvesting are subjected were echoed by representatives of local non-governmental organizations (NGOs) and CBOs.

"We have talked about waterborne diseases. And you know when they are harvesting, they harvest up to beneath the water level. So waterborne diseases are very common in those areas."

—Kenyan CBO representative

"There are thorns in the sand ... that can pinch these children. ... The dust can also affect them especially if one has a problem has a health problem. ... They can be infected by diseases ... that come with the dirty water because that water is not clean."

—Local NGO representative

"If you go to the rivers, they don't even wear shoes. No. They go without shoes."

—Local NGO representative

"The risk of death, because eventually, if this lorry is not well controlled and it defies this child, they would die due to lorries being driven over them ... their health is also at risk because this child is doing manual work that they do not consume to their age."

—Kenyan CBO representative

The extensive exposure to these various hazards not only poses immediate risks to children's health and safety but also threatens their long-term physical and psychological development. The lack of proper safety measures and protective equipment further compounds these risks, creating a dangerous working environment for young workers.

5.2.5 School Attendance

Worker interviews revealed that working in sand harvesting significantly impacts children's ability to attend school, with many child workers either missing school regularly or dropping out entirely. Of the 28 child workers interviewed, 16 (57%) reported that they were no longer attending school, and 12 (43%) combined schooling with work.

That said, interviews with child workers and KIIs with sector stakeholders and experts suggest that the relationship between working in sand harvesting and school attendance is complex.

On the one hand, working in sand harvesting, even on days or during hours in which school is not in session, impacts child workers' ability to complete schoolwork and focus during school hours.

Those who tried to maintain school attendance reported frequent absences due to work demands, with many describing how the physical exhaustion from sand harvesting affected their ability to concentrate in class. As one 17-year-old worker from Kajiado County explained: "That work is always bad because when you go to school you have a backache." Further, the lure of ready income reportedly draws some children's attention away from schoolwork, as highlighted by one CBO representative: "This causes a lot of problems because when a young person gets used to coming and loading sand, they are unable to concentrate on their studies. When they taste the money that comes from loading sand, they don't want to go back to school."

On the other hand, none of the child workers who reported no longer attending school reported that they had left school by choice to start working in sand harvesting. Instead, they generally reported that they had stopped attending school because their families could no longer afford to pay their school fees. Indeed, many of those children who reported that they are still attending school also indicated that they had been sent home multiple times for failure to pay school fees. Many of the children who reported still attending school said that at least a portion of their pay from working in sand harvesting was used to assist in paying their school fees, and a number of children reported that they were engaged in sand harvesting at least in part to earn money that would be used to pay for school fees. Of the children not attending school, some reported that they wished to return to school but were unsure of how they could do so without the income from working in sand harvesting. One 17-year-old worker from Kajiado County, for example, explained that the reason he had started working in sand harvesting was to cover his school fees, saying “The main reason was so that I can go back to school.” Some respondents mentioned not just their own education but helping siblings. For example, one mentioned “supporting my sisters with little school fees to go to school.” It is clear that the physically demanding and time-consuming nature of working in sand harvesting does negatively impact children’s ability to attend and perform in school. And reports from some sector stakeholders suggest that the lure of immediate income does draw some children’s attention away from schoolwork. But interviews suggest that most children begin working in sand harvesting due at least in part to the economic pressures imposed by insufficient economic opportunities for caretakers or family members and the requirement to pay school fees.

6 CONCLUSION AND RECOMMENDATIONS

This study’s findings suggest that child labor remains a pervasive issue in Kenya’s sand harvesting sector, with significant implications for both the affected children and the broader construction industry.

This study identified dozens of cases of child labor in sand harvesting across the counties of Homa Bay, Embu, Kajiado, and Siaya. Although most of the child workers interviewed for this study were ages 16 or 17, the youngest of those interviewed was just age 13, and interviewees reported working alongside children younger than age 10. All interviewed child workers were exposed to conditions that constitute child labor under both international standards and Kenyan law, facing risks ranging from physical injuries to long-term health impacts. The prevalence of piece-rate payment systems and economic pressures on families has created conditions in which child labor has become normalized in many communities.

An investigation into the supply chain of sand harvested in Kenya revealed that all sand-containing downstream products exported from Kenya are at risk of being produced with child labor. Although sand extraction occurs primarily along riverbeds in rural areas, the harvested sand flows through a complex network of transporters, brokers, and buyers before reaching end users in construction projects, cement manufacturing, and other applications. In the course of this supply chain, sand from various sources is commonly mixed together during transport or storage.

The persistence of child labor in sand harvesting reflects broader socioeconomic challenges in Kenya. Poverty, limited access to quality education, and the lack of alternative economic opportunities drive many families to rely on children’s income from sand harvesting. The seasonal nature of the work, combined with the informal payment systems and limited oversight, creates conditions in which children can easily become engaged in hazardous labor. Some children attempt to balance education with work, but the physical demands and irregular hours of sand harvesting often lead to school absences or complete dropout, perpetuating cycles of poverty and limited economic opportunity.

Addressing child labor in Kenya’s sand harvesting sector requires a coordinated response from government agencies, private sector actors, and civil society organizations. Key priorities include

strengthening enforcement of existing labor laws, implementing robust supply chain monitoring systems, expanding social protection programs for families, and improving access to quality education in affected communities. Although the challenges are significant, the findings from this study provide a foundation for developing targeted interventions that can help protect children's rights while ensuring that the construction industry operates sustainably. Success will require sustained commitment from all stakeholders and a holistic approach that addresses both immediate labor violations and underlying socioeconomic factors.

Recommendations:

To the Government of Kenya:

- Enhance enforcement of child labor laws in the sand industry, including increasing labor inspections at mining sites.
- Expand access to quality education and social protection programs for families in sand mining communities to reduce economic pressures driving child labor.
- Implement comprehensive occupational safety and health programs for sand harvesting workers.
- Promote alternative livelihoods and skills training programs for youth and families in mining communities.
- Conduct further research on the prevalence of child labor across different sand mining regions of Kenya to inform targeted interventions.

To Private Sector Actors:

- Implement robust supply chain due diligence and monitoring mechanisms to identify and address child labor risks.
- Invest in community development and alternative livelihood programs.
- Improve working conditions through proper safety equipment and fair labor practices.
- Support skills training programs for youth and adults.
- Develop traceability systems to monitor sand sourcing.

To Civil Society and Other Stakeholders:

- Support monitoring and reporting of child labor violations.
- Provide support services for affected children and families, including education and psychosocial support.
- Assist in developing alternative income opportunities for families.
- Conduct further research on the prevalence and impacts of child labor across different regions.

Implementation of these recommendations requires coordinated effort from all stakeholders. Progress in eliminating child labor from Kenya's sand harvesting sector will require addressing both immediate labor violations and underlying socioeconomic factors while ensuring sustainable practices in the construction industry.

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APPENDIX 2: STAKEHOLDERS IN THE SAND SUPPLY CHAIN

This appendix provides a more detailed explanation of the stakeholders in the sand supply chain.

Engineer

Engineers, often working on construction sites, such as those working on the Thiba Dam project, focus on ensuring structural integrity and managing materials, including sand. They offer direction on the quality and quantity of sand needed. Engineers would be found mainly in large construction sites and government projects. One participant noted:

“I oversee the quality of sand used in our projects, ensuring it meets the required standards. Sand plays a vital role in our concrete work, especially in dam construction.”

—Sand end consumer, Government of Kenya dam, Tana River

Excavator Operator

Excavator operators are directly involved in the mechanized loading of sand from the riverbank. Sometimes, excavators load sand and scoop it from the river bed. These were encountered in Homa Bay along the Kuja River in Sori. They were noted to increase efficiency and speed in the loading of sand. Sand loaders in Kajiado and Tana River Counties reported rejecting mechanized loading because it would have driven them from work. Their work is crucial for maintaining the quality and availability of sand for transporters. A participant explained:

“We scoop and load the sand on to the trucks, ensuring that we meet the quality needed for the projects we supply. Sometimes we also test the sand before it's taken to the client.”

—Excavator, Homa Bay

Investor

Investors often fund sand harvesting operations. Investors are key in providing financial backing for equipment and labor in the sand industry. One participant from Siaya shared:

“I employ youth to harvest sand while I manage the business side. I focus on logistics and negotiating sales with transporters.”

—Nyadorera sand investor, producer, and broker, Siaya

Landowner

In many cases, sand extraction occurs on private land. Landowners play a crucial role by granting access to their land and negotiating lease agreements with investors or companies involved in sand harvesting. Landowners often rent their land for sand harvesting. They play a crucial role by providing access to land, often used for sand consolidation and access routes to the river where sand is harvested. In Homa Bay, one landowner stated:

“I rent out my land to sand harvesters, and we negotiate terms depending on the amount of sand extracted.”

—Landowner, Homa Bay

Middleman/Broker

Brokers are the intermediaries. Along the supply chain, brokers operate at two levels. They are either (1) between the sand harvesters and the drivers (who buy sand from the harvesters) or (2) between the driver and the final sand consumer. Brokers who link the drivers to the sand harvesters are mainly

located in the sand harvesting sites, and those who link the drivers to the markets or final buyers are situated closer to the markets. For the Nairobi market, for example, these would be stationed at Kapa Oil premises along Mombasa road, Mlolongo, and Chumvi-Machakos for sand harvested from Kajiado. For sand harvested from the Tana River, brokers are situated in Thika, Juja, and Ruiru. They handle the logistics of connecting transporters with the harvesting teams and buyers. A broker from Kajiado described his role:

“I organize transporters and ensure that buyers receive the right sand. We deal with multiple clients, ensuring that each gets what they need according to their specifications.”

—Broker, Tana River

Site Managers

Site managers oversee the day-to-day operations at sand harvesting sites. They are responsible for maintaining workflow efficiency and loading the quality of sand the buyers need. In Homa Bay, a respondent explained:

“I supervise the workers and manage the financials for the site. My job is to ensure everything runs smoothly from harvesting to transport.”

—Site manager, Homa Bay

Customers

Customers are often the most significant influencers in the sand industry. A customer could be an individual working on a home building project, a sand consolidation warehouse/broker, a cement manufacturer, or a buyer for a government infrastructure project. A respondent explained:

“The customer is the main influencer followed by transporters and brokers who manage the logistics ... because the demand for sand doesn’t always match the supply, the customer dictates the terms.”

—Transporters Savings and Credit Cooperative, Nairobi

Manufacturers

Cement and construction product manufacturers rely heavily on sand. These include pre-cast concrete manufacturing facilities, stand-alone ready-mix facilities, and concrete/cement manufacturers. One manufacturer described their operations:

“We produce concrete blocks and other materials. Sand is one of the primary raw materials we use, and we source it from trusted suppliers.”

Manufacturer, Kajiado

Government Agencies

The National Environment Management Authority, the Kenya National Highways Authority, and county governments are critical in regulating the industry. The Kenya National Highways Authority is concerned with the axle load regulations, and the county governments are concerned with cess for natural resources mined from their territories.

Savings and Credit Cooperatives (SACCOs)

SACCOs offer financial services and affordable credit to their members. Although benefits vary by region, in many cases, members of SACCOs in the sand extraction sector also benefit from SACCO-negotiated advantages, including discounted road usage fees for transportation vehicles, preferential access to sand harvesting permits, and reduced rates for operational licenses. Through collective bargaining power, SACCOs can negotiate favorable terms with regulatory authorities and private landowners, creating cost efficiencies that individual operators could not achieve independently.

Transporter/Driver

Transporters manage the delivery of sand from one point to another. Transporters are essential in ensuring the movement of sand within the supply chain. A majority of the transporters also double up as drivers. In other instances, a transporter may have many trucks, employing many drivers. Most transporters would also be members of transport associations. One transporter from Tana River explained:

“We pick up sand from the rivers and transport it to various counties. I coordinate with local loaders and brokers to ensure everything goes as planned.”

—Transporter, Tana River

Independent Driver

Drivers play a crucial role in the logistics and transport of sand from harvesting sites to construction locations. Drivers are an important link between the sand harvesting sites and the market. They are the primary buyers of sand from harvesters and loaders. Truck owners might have markets/buyers for sand, but drivers often are the ones who source for markets. They buy sand from harvesters and sell it to the users. Drivers also assist in checking the quality of sand before transportation. They know where to get the quality of sand clients need. One driver, who operates in Siaya, explained:

“I have been transporting construction materials for 20 years, primarily sand. My job is to ensure the sand reaches the construction site in good condition.”

—Driver, Siaya

APPENDIX 3: HS CODES

HS Code Glossary

Product	HS Code	HS Definition
Sand	2505.00	Natural sands of all kinds, whether or not colored, other than metalbearing sands
Cement	2523.21	Portland cement: White cement, whether or not artificially colored
	2523.29	Portland cement: other than white cement
	2523.30	Aluminous cement
	2523.90	Other hydraulic cements
Clinker	2523.10	Cement clinkers
Bricks	6810.11	Articles of cement, of concrete or artificial stone, whether or not reinforced. Tiles, flagstones, bricks and similar articles: building blocks and bricks.
Tiles	6810.19	Articles of cement, of concrete or artificial stone, whether or not reinforced. Tiles, flagstones, bricks and similar articles: other than building blocks and bricks.
Precast components	6810.91	Articles of cement, of concrete or artificial stone, whether or not reinforced. Prefabricated structural components for building and civil engineering.
Other articles	6810.99	Articles of cement, of concrete or artificial stone, whether or not reinforced. Other articles, other than Prefabricated structural components for building and civil engineering

Note on HS mapping: Sand (HS 2505.00) uniquely defines natural sand and does not include quarry dust. Cement (HS 2523.21, 2523.29, 2523.30, 2523.90) uniquely defines cement categories, but cement does not include sand. Clinker (HS 2523.10) is procured from limestone and not sand, but it is a critical input to concrete. Bricks (HS 6810.11) is a broad category that potentially includes bricks produced without sand. Tiles (HS 6810.19) is a broad category that potentially includes tiles produced without sand. Precast components (HS 6810.91) is a broad category that potentially includes products produced without sand. Other articles (HS 6810.99) is a broad category that potentially includes products produced without sand.

APPENDIX 4: EXPORT VALUES

Top 5 Destination Markets for Sand Exported from Kenya, 2023

Destination country	Importing country percent of market share, by value
Rwanda	66.7%
China	23.5%
Uganda	4.6%
Zambia	2.4%
Tanzania	0.9%

Source: UN Comtrade, 2024

Top Global Exporters of Sand, 2023

Country	Export value (FOB) (percentage of global exports)
United States	\$761,094,805 (34.8%)
Netherlands	\$272,856,220 (12.5%)
Germany	\$165,602,480 (7.6%)
Belgium	\$99,801,289 (4.6%)
Cambodia	\$97,090,240 (4.4%)
Malaysia	\$89,253,261 (4.1%)
Mozambique	\$81,844,000 (3.7%)
France	\$60,857,706 (2.8%)
Indonesia	\$58,608,834 (2.7%)
Egypt	\$45,025,361 (2.1%)

Source: UN Comtrade, 2024

Exports from Kenya, by HS Code, Value (FOB),⁴² 2019–2023

Good	HS code	2019	2020	2021	2022	2023	Top destination market for 2023 (percentage)
Sand	2505.00	\$147,252	\$219,930	\$204,499	\$1,081,453	\$418,386	Rwanda (66.7%)
Cement	2523.21	\$1,362,943	\$615,484	\$153,924	\$196,963	\$68,854	South Soudan (81.4%)
	2523.29	\$5,079,884	\$9,621,339	\$14,325,636	\$34,659,469	\$41,914,577	South Soudan (43.7%)
	2523.30	\$156	n/a	n/a	n/a	\$249	Rwanda (100%)
	2523.90	\$20,357	\$7,697	\$15,325	\$162,417		South Soudan (100%)
Clinker	2523.10	5,581,744	15,502,087	91,519,935	71,400,674	\$112,405,477	Uganda (98.9%)
Bricks	6810.11	\$15,129	\$1,517	\$4,729	\$1,744	\$2,640	Tanzania (67.5%)
Tiles	6810.19	\$93,172	\$118,636	\$24,902	\$3,130	\$9,008	Rwanda (93.4%)
Precast components	6810.91	\$394,063	n/a	\$24,902	\$3,130	\$154,165	Sudan (86.6%)
Other articles	6810.99	\$831,914	\$18,908	\$3,444	\$31,813	\$5,747	Rwanda (43.7%)

Source: UN Comtrade, 2024; ICF calculations (USD FOB)

⁴² Note, values in this table are FOB per export statistics reported by Kenya and may differ from CIF values reported by importers of Kenyan goods.

APPENDIX 5: KENYA SAND CONSUMPTION STATISTICS

Government infrastructure projects are a material driver in the demand for concrete, thus increasing the demand for sand. In fiscal year 2023/2024, anticipated Kenyan government expenditures on road construction (23,024 km) totaled 179.5 billion Kenyan shillings (\$1.39 billion USD), and expenditures on public housing totaled 92.5 billion Kenyan shillings (\$710 million USD). In 2023, the government completed 3,521 public residential buildings (Economic Survey 2024, 2024).

APPENDIX 6: LAWS AND REGULATIONS IMPACTING SAND HARVESTING OR CEMENT INDUSTRY

There are numerous laws and regulations relating to sand harvesting and the cement industry, which are outlined in this appendix. Despite multiple regulations, some workers indicated they were unaware of specific laws governing their work. For example:

“No one knows the rules; it’s self-employment, so people work how they want.”

—Excavator operator, Homa Bay

Others mentioned that they had not encountered any laws affecting their operations:

“We don’t have any laws. Ours is just to collect sand.”

—Driver, Homa Bay

Given irregular enforcement patterns, the summary of laws and regulations includes quotes from KIIs to give greater context how these laws impact stakeholder in the sand supply chain.

County Laws or Regulations

County governments are a leading player in the supply chain. They issue transportation permits following the payment of a levy (cess). Many participants acknowledged paying cess to their respective county governments, although some expressed dissatisfaction due to the lack of corresponding infrastructure improvements.

“We pay cess to the county; you’re good to go once you pay. They don’t care where the sand is harvested.”

—Driver, Homa Bay

Another participant explained how taxes are collected:

“The county government came here, and we agreed with them on taxation. They erected cess collection points on the highway.”

—Nyadorera sand investor, producer, and broker, Siaya

Despite paying taxes, many workers feel the county government isn’t effectively using the funds:

“It will only be fair if they construct the roads since (we incur losses as a result of) maybe you’ve paid the one thousand for the broken spring or still get stuck on the roads.”

—Transporter, Homa Bay

Government or Governmental Agencies Laws

Several other government agencies regulate the sand harvesting industry, including the National Environmental Management Authority (NEMA), Kenya National Highways Authority (KENHA), and the Kenya Electricity Generating Company (KenGen).

KenGen Regulations

KenGen, responsible for hydroelectric power generation, has some regulations concerning sand harvesting along the Tana River that serves power generation dams. A participant mentioned how KenGen is involved:

“KenGen wasn’t happy about the logs used to prevent the free flow of sand along the river. This caused clogging. They prefer lorries to transport sand away, to reduce the silt that flows into the dam.”

—Transporter, Tana River

Kenya National Highways Authority Regulations

KENHA is mainly concerned with axle load laws, specifically the weight limits for trucks transporting sand. Overloading can lead to hefty fines:

“We interact with KENHA at the weighbridge; if you’ve overloaded, you’ll get fined before you can proceed.”

—Transporter, Tana River

“Regarding laws and regulations, we have two main legal regimes applicable in Kenya. One is the East Africa Community Load Control Act 2016, and the second is the Traffic Act.”

—Government of Kenya Axle Load Regulator

National Environmental Management Authority Regulations

NEMA is the most significant governmental body overseeing environmental regulations, including those related to sand harvesting. Many participants acknowledged the role of NEMA in setting depth limits and inspecting harvesting sites:

“NEMA inspects the pits where sand is being dug, checking the depth of the pits.”(Harvesting site manager.”

—Homa Bay

Participants reported adherence to these environmental rules:

“NEMA does not allow us to harvest sand at the riverbanks because it interferes with the environment.”

—Nyadorera sand investor, producer, and broker, Siaya

Police Involvement

Police play a role in enforcing transport laws, especially regarding overloading and ensuring proper documentation. However, there were several mentions of corruption and bribery:

“The police don’t care whether your lorry is in good or bad condition as long as you pay them.”

—Transporter, Kajiado

Taxes and Weighbridge Regulations

Taxes and cess payments to local authorities are crucial parts of the regulatory framework, often imposed by county governments. Participants reported paying these taxes based on the size of their trucks:

“Per lorry, the tax is 1,000. For 6 six-wheeler, it’s 500.”

—Transporter, Homa Bay

The weighbridge ensures that trucks comply with weight limits, with fines imposed for violations:

“At the weighbridge, if you’re found overloaded, you’ll be in trouble. So you must carry the required capacity.”

—Driver, Homa Bay

KENHA manages weighbridges.

Operational Guidelines

Operational guidelines vary, depending on the location and the scale of operations. Some areas have informal operational guidelines agreed upon by landowners:

“We, as landowners, agreed to maintain boundaries during harvesting to ensure peace between neighbors.”
—Landowner, Homa Bay

Other participants noted that they had to follow guidelines set by local leaders, such as area chiefs:

“The area chief gives instructions and laws for operations.”
Sand spreaders CBO member, Homa Bay

Private Laws and Savings and Credit Cooperatives

Savings and Credit Cooperatives (SACCOs) are industry institutions in the sand harvesting industry, particularly for workers and transporters. Membership in these organizations is often required for those working in the sector:

“If you are a laborer here, you must join the SACCO for the site laborers.”
—Harvesting site manager, Homa Bay

SACCOs also offer certain benefits, such as exemptions to carry extra weight:

“When you’re in a SACCO, you’re allowed to carry an extra one to two tons above the standard limit.”
—Transporters SACCO, Nairobi

Standards

Standards are crucial in maintaining the quality of materials used in construction, particularly concrete mix and cement manufacturing. Participants noted that they adhered to both local and international standards, depending on client requirements:

“We work with Kenyan standards, but sometimes clients bring in American or British standards. The difference is just in the procedure, but the result is the same.”
—Concrete ready-mix company, Nairobi

APPENDIX 7: FINAL RESEARCH INSTRUMENTS

CHILD WORKER QUALITATIVE RESEARCH INSTRUMENT

Interviewer:

Date:

Location of interview:

Interview Code Number:

[Sex] of Respondent:

Parental Contact Information:

Time Interview Started:

Time Interview Ended:

Interviewer instructions:

Foster a dynamic conducive to gathering good data. The interview should have the relaxed feel of a conversation. Set the tone by using a slow pace in your speech.

Ask one question at a time. Give the respondent ample time to reflect and fully respond before moving to the next. Try not to interrupt, and do not answer on their behalf.

If the respondent agrees to be recorded, give them your full attention. Make note of any follow-up questions you want to remember to ask, but otherwise focus on the respondent rather than your paper.

Probe for more depth, particularly when responses are brief. Use phrases such as, “Tell me more about that” and “Can you give me an example?” Aim to get specific instances, in considerable detail, whenever possible.

You do not have to ask each question verbatim, but at least broach all the topics covered that are relevant to the worker by the guide. If a respondent makes clear they have no knowledge of that topic, move on to the next. Adapt the flow and questions to make them relevant to the respondent.

For each item, ask the general question first, and then probe the sub-items that have not been addressed spontaneously.

After gaining consent and assent, including to record, start the recording and then state the interview code number.

1. Can you tell me a little about yourself?
 - a. How old you are?
 - b. Do you go to school? (NOTE FOR INTERVIEWER: YOU WILL COME BACK TO THIS TOPIC. THIS IS TO GET THE CONVERSATION STARTED)
2. What kind of work / help do you do at the lake/river?
 - a. How often do you go to the lake/river? How do you get there and how long does it take you to get there?
 - b. For how long have you been working/helping at the lake or river?
3. Do you see any other children working / helping?
 - a. If so, how many and how old are they?
 - b. What kind of work do they do?
4. How did you become involved in your work at the lake/river?

5. What is the main reason you work / help?
6. Think about the last time you worked/helped on the lake/river. I would like to hear about your whole day.
 - a. What time did you go to the lake/river? Whom did you go with?
 - b. What did you do when you got there? And then? [INTERVIEWER: CONTINUE TO PROMPT UNTIL RESPONDENT RECOUNTS FULL DAY]
 - c. When did you go home? How did you know it was time to go home?
 - d. Was that a pretty normal day? IF NO: Why not?
7. Are the tasks you do hard? Which ones? What makes them hard?
8. What do you need to be careful about at work? Do you do anything to protect yourself?
 - a. Have you ever gotten hurt or sick because of your work? Tell me more about that.
 - b. Have you ever seen anyone else at your worksite get hurt or sick? Tell me what happened. Does this happen a lot?
9. Who tells you what to do when you're there? Anyone else? [INTERVIEWER: ESTABLISH WHETHER PEOPLE REFERENCED ARE FAMILY MEMBERS]
10. Does this person / do these people ever do anything to make you work harder or faster? Tell me more about that.
11. What happens if you make a mistake?
12. Are you paid for your work? How much do you earn?
13. After the sand leaves the lake/river, do you know where it goes? / Who buys it?
 - i. (PROBE AS NEEDED INTO THE SUPPLY CHAIN IF THE RESPONDENT APPEARS TO BE KNOWLEDGEABLE. IF THE RESPONDENT IS NOT KNOWLEDGEABLE, ASK WHO AT THE SITE MIGHT KNOW THIS INFORMATION.)
14. I'd like to hear more about your life outside of (site type).
 - a. IF DOES GO TO SCHOOL: Do you like school? Does your work make it hard to go to school or do schoolwork? Please explain.
 - b. IF DOES NOT GO TO SCHOOL: You mentioned you don't go to school. Tell me more about that.

NOTE TO INTERVIEWER: ASK ONE OR BOTH OF THESE QUESTIONS TO END THE INTERVIEW ON A POSITIVE NOTE

15. What do you like to do for fun? Tell me more about that.
16. What kind of job would you like to have in the future?

ADULT WORKER QUALITATIVE RESEARCH INSTRUMENT PROTOCOL

Interviewer:

Date:

Location of interview:

Interview Code Number:

[Sex] of Respondent:

Profession / Position:

Site Type / Employer:

Contact Information:

Time Interview Started:

Time Interview Ended:

Interviewer instructions:

Foster a dynamic conducive to gathering good data. The interview should have the relaxed feel of a conversation. Set the tone by using a slow pace in your speech.

Ask one question at a time. Give the respondent ample time to reflect and fully respond before moving to the next. Try not to interrupt, and do not answer on their behalf.

If the respondent agrees to be recorded, give them your full attention. Make note of any follow-up questions you want to remember to ask, but otherwise focus on the respondent rather than your paper.

Probe for more depth, particularly when responses are brief. Use phrases such as, “Tell me more about that” and “Can you give me an example?” Aim to get specific instances, in considerable detail, whenever possible. For each item, ask the general question first, and then probe the sub-items that have not been addressed spontaneously.

You do not have to ask each question verbatim, but at least broach all the topics covered that are relevant to the worker by the guide. If a respondent makes clear they have no knowledge of that topic, move on to the next. Adapt the flow and questions to make them relevant to the respondent.

Introduction/ Supply Chain:

- I. Could you please tell me about your work?
 - a. How long have you been doing it?
 - b. (IF PERSON DOES NOT LIST WORK AS SAND HARVESTING): Do you also engage in sand harvesting? Please explain why and when you became involved in sand harvesting
 - c. (IF PERSON LISTS WORK AS SAND HARVESTING): Do you do any work in addition to sand harvesting? Please explain why
2. How has sand harvesting impacted your community (PROBE FOR POSITIVES AND NEGATIVES)?
3. Do you know where sand goes after it leaves the lake/river?
 - a. PROBE FOR:
 - i. How is it sold?
 - ii. How is it transported before / after sale?
 - iii. Who buys it?

4. What products in your village/town/city contain harvested sand / cement?
 - a. Is there any way to know if it contains sand from your workplace?
5. Do you have any children and if so, how old are they?
6. (IF RESPONDENT HAS CHILDREN, IF NOT SKIP) Do your children help/work in **sand** harvesting Why or why not?
 - a. If so, what tasks do they perform?
 - i. Are they assisting you or performing other tasks?
 - b. If so, how often do they accompany you at the worksite?

(NOTE FOR INTERVIEWER: BASED ON INTERVIEWEE RESPONSE TO “QUESTION 5”: CHILD STATUS AND “QUESTION 6”: CHILD WORK STATUS PLEASE USE THE APPROPRIATE SECTION OF QUESTION. FOR RESPONDENTS WITH A CHILD WHO IS WORKING IN THE INDUSTRY USE THE “**FOR RESPONDENTS WITH CHILDREN IN INDUSTRY**” SET. FOR RESPONDENTS EITHER WITHOUT A CHILD OR WITH A CHILD WHO IS NOT WORKING IN THE INDUSTRY USE THE “**FOR RESPONDENTS WITHOUT CHILDREN WORKING IN INDUSTRY**” SET)

For respondents with children in industry:

1. How much is your child typically paid for their help/work?
 - a. Are they paid directly, if not how are they paid?
2. How many hours a day does your child help/work?
 - a. What hours do they help/work?
 - b. Is this the same each week?
 - c. Are there certain times of the year they work more or less?
3. In addition to your own children, have you observed other children helping/working in sand harvesting?
 - a. If so, what tasks do they perform / are they similar or different to your own children?
 - b. Do you notice any differences in activities based on the [sex] of the child?
4. Are there certain tasks that your children do that adult workers do not?
 - a. Please explain
 - b. What activities are more suited to younger children? What about adolescents?
5. At what age did your children start helping/working in **sand harvesting**?
6. Who decided that your child would help/work?
 - a. What led to this decision?
 - b. Has your child ever refused to help/work? If so, how did you respond?
 - c. What would happen if your child wanted to stop helping/working?
7. What changes would need to happen in your household or community for your child to stop helping/working in **sand harvesting** activities?
8. Have your children experienced any challenges accessing schooling in your community? If yes, please explain. Does your child attend school currently?
 - a. Do any challenges relate to your children’s participation in **sand harvesting** activities?
 - b. If your child helps/works and attends school, do you think this affects their schooling?
 - i. If yes how does helping/working affect their schooling?
9. Do you consider any of the help/work your child does/ has done **at sand harvesting sites** to be dangerous?
 - a. Is yes what specific work/activity do you consider dangerous and why?
 - b. Why do you think the help/work your child does is not dangerous?
 - c. Have you seen your child(ren) being injured?
 - i. If so, please explain

- d. Have you seen any children being mistreated?
 - i. If so, by whom? Please explain
 - ii. If so, did you feel that you could speak up about what you witnessed? Please explain.
 - 10. Are your children performing activities on the lake/river/site treated the same as adults such as yourself? If not, what is the difference?
 - a. Who treats them differently?
 - 11. In your perspective how does your child feel about their participation in sand harvesting? Please explain.
 - 12. In your opinion, at what age should people start helping/working in **sand harvesting**?
 - a. (IF PEOPLE BEGIN WORKING EARLIER THAN THE RESPONDENT THINKS THEY SHOULD) Why do you think people begin helping/working sooner/earlier? Any other reason?
 - 13. How do people in your community feel about children helping/working in **sand harvesting**?
 - 14. Is there anything else you'd like to add?
- (INTERVIEWER: THANK THE RESPONDENT FOR THEIR PARTICIPATION AND END INTERVIEW)

For respondents without children working in industry:

- 1. In your work within the good industry how often have you witnessed/observed any children at the lake/river/site?
 - a. What tasks have you seen them perform?
 - b. Are you aware if they are accompanied by an adult/parent or are they alone?
- 2. Are there certain tasks that only children do (instead of adults)? Please explain
- 3. At what age do people typically start helping/working in **sand harvesting**?
- 4. In your opinion, at what age should people start helping/working in **sand harvesting**?
 - a. (IF PEOPLE BEGIN WORKING EARLIER THAN THE RESPONDENT THINKS THEY SHOULD) Why do you think people begin helping/working sooner/earlier? Any other reason?
- 5. How do people in your community feel about children helping/working in **sand harvesting**?
- 6. What types of **sand harvesting** activities do people under 18 typically do?
 - a. What activities are more suited to younger children, which to adolescents?
 - b. Girls versus boys?
- 7. Which groups of children are more likely to help/ work in **sand harvesting**?
 - a. PROBE: Local children [or children from elsewhere]? Girls or Boys? Ages? Etc.
- 8. Who decides that a child will help/work?
 - a. What happens if that child refuses?
 - b. Can a child choose to stop helping/working? Do you feel that children are forced to help/work – please explain?
- 9. What changes would need to happen in your community to prevent people under 18 from helping/working in **sand harvesting** activities?
- 10. How much are children typically paid for their help/work?
 - a. How are they paid? How does this differ from adult workers?
- 11. How many hours in a day do children typically help/work?
 - a. Do the hours children help/work differ from those worked by adults?
 - b. Do the hours children help/work change in relation to the time of year / season?
- 12. Are there any challenges to accessing schooling in your community? If yes, please explain.
 - a. Does this relate to children's participation in **sand harvesting** activities?

- b. Do children who do **sand harvesting** activities tend to also attend school? If yes how does helping/working affect their schooling?
- 13. Do you consider the work children do at **lake/river/site harvesting sand** to be dangerous?
 - a. Why or why not?
 - b. Have you seen any children being injured or mistreated?
- 14. Are children performing **sand harvesting** activities at the **lake/river** /site treated the same as adults? If not, what is the difference?
- 15. In your perspective, how do children feel about their participation in the industry? Please explain.
- 16. Is there anything else you'd like to add?

(INTERVIEWER: THANK THE RESPONDENT FOR THEIR PARTICIPATION AND END THE INTERVIEW)

LABOR RIGHTS/LABOR CONDITIONS KEY INFORMANT INTERVIEW PROTOCOL

Interviewer:	Date (DD/MM/YY)
Location of interview:	
KII Code:	Sex:
Profession (if applicable):	
Position (if applicable):	
Employer/Affiliated Institution/Organization (if applicable):	
Contact information (office address, phone number, email):	
Time interview started:	
Time interview ended:	

Interviewer instructions:

Foster a dynamic conducive to gathering good data. The interview should have the relaxed feel of a conversation. Set the tone by using a slow pace in your speech.

Ask one question at a time. Give the respondent ample time to reflect and fully respond before moving to the next. Try not to interrupt, and don't answer on their behalf.

If the respondent agrees to be recorded, give them your full attention. Make note of any follow-up questions you want to remember to ask, but otherwise focus on the respondent rather than your paper.

Probe for more depth, particularly when responses are brief. Use phrases such as, "Tell me more about that" and "Can you give me an example?" Aim to get specific instances, in considerable detail, whenever possible.

You do not have to ask each question verbatim, but at least broach all the topics covered that are relevant to the key informant. If a respondent makes clear they have no knowledge of that topic, move on to the next. Adapt the flow and questions to make them relevant to the respondent.

For each item, ask the general question first, and then probe the sub-items that have not been addressed spontaneously.

Introduction Questions (KIIs):

- I. Could you please tell me your role and what you focus on?
 - a. Is there other experience you have in relation to the **sand** industry?
 - b. Can you describe your organization's work directly related to children working in the **sand** industry?
 - i. What age groups do you work with?
 - ii. Do you do any additional work with families of working children or other stakeholders such as industry groups, government bodies, or CSOs?

Child Labor Questions General:

2. Are you aware of the presence of children working or helping their parents in (target area. E.g., in Kajiado, Machakos, Kitui, Western Kenya Nairobi, etc) in the **sand** industry, including sand harvesting?
 - a. Has this changed in recent years, if so please explain?
 - b. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
 - c. In your opinion / expertise, does the work those children do amount to child labor (INTERVIEWER READ ILO DEFINITION OF CHILD LABOR). Please explain.
3. (PROVIDE VERBAL AND WRITTEN DEFINITION OF ILO DEFINITION OF CHILD LABOR FOR THE RESPONDENT) Based on this definition we have provided, how prevalent is child labor in the sand industry, including sand harvesting?
 - a. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
 - b. Where is child labor most prevalent? – PROBE FOR SPECIFICS (REGION, SITE/EMPLOYER TYPE, ETC) PROBE SPECIFICALLY FOR (**SAMPLE AREA**)
 - c. What types of children are most at risk for child labor (race, [sex], ethnicity, migratory status, etc)?
4. In your opinion, what are the main drivers of child labor in the **sand** industry?
 - a. (PROBE FOR INDUSTRY SPECIFIC ANSWERS) What might incentivize an employer to engage in child labor practices? Does this change based on the age of the child?
5. At what stages of production / of the supply chain of **sand** is child labor present?
 - a. Are certain stages more likely to use children than others – please explain.
 - b. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
6. Are you aware of any risks related to child labor at artisanal, smallholder, or informal sites, if so please explain?
 - a. Are these artisanal sites a part of the supply chain of corporate employers/producers? Tell me about these sites.
 - i. If yes, are you aware of which large scale producers purchase from artisanal sites?
 - ii. Why do large scale producers purchase from artisanal sites? What motivates an artisanal site to be a part of the supply chain of a large-scale producer?

Recruitment and Working Hours:

7. Could you tell me how children become involved in labor activities in the sand industry? Are there any differences between child laborers and legally-permitted working children?
 - a. Are the jobs arranged? If so, by whom? (PROBE FOR FAMILY INVOLVEMENT)
 - i. Is a recruiter involved? - IF SO, REQUEST DETAILS AND PROBE ABOUT FEES
 - b. Have you heard of children being sold or taken by force to work in the sand industry, including sand harvesting?
 - i. What about being forced to work or otherwise working against their will?
8. When are children typically engaged in labor activities?
 - a. PROBE ALL FREQUENCIES: HOURS PER DAY/WEEK, NUMBER OF DAYS PER WEEK, TIME OF DAY? SEASONAL OR YEAR-ROUND?
 - b. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
 - c. PROBE FOR DIFFERENCE BETWEEN LEGALLY-PERMITTED WORKING CHILDREN AND CHILD LABORERS
9. Are children who work or help in the sand industry, including harvesting sand, able to attend school regularly? Please explain?

- a. What about those that qualify as cases of child labor that we have been discussing?
 - b. If able, how often? / If unable, why? (PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER)
 - c. In your opinion / expertise at what age do children stop attending school to work in the **-sand** industry?
10. Are children paid for their work? If so, are they paid directly or is someone else paid for their work? Please explain.
- a. If so, in what form? (Daily rate, Hourly, or piece-rate, cash, or another means)
 - b. Are you aware of situations when working children have their wages deducted? Please explain?
 - c. **PROBE FOR DIFFERENCE BETWEEN LEGALLY-PERMITTED WORKING CHILDREN AND CHILD LABORERS**

Working Conditions:

11. Are there any tasks that are seen as more suitable for children to perform by families/employers? Why?
- a. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
 - b. Are there certain tasks of these that you mentioned that can be considered hazardous or dangerous? Please explain.
12. What kinds of dangers/risks are children in the **sand** industry exposed to? (Exposure to chemicals, sharp hand tools, etc.)
- a. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
 - b. Are children provided with protective gear? What kind?
 - c. Are you aware of any reports of children being injured while working? - please explain.
 - d. Are these dangers present on all lakes/**rivers/sites** or only certain types of **lakes/rivers/sites** in **(sample area)**
13. How are children treated by their employers / family members when working?
- a. Have you heard of children feeling threatened at work? – please explain?
 - b. Have you heard of children working in the **sand** industry/sector being mistreated in any way? - please explain?
 - c. Are you aware of situations where children cannot leave their job if they chose to? Please explain?

Community Attitudes and Efforts:

14. What is the local attitude towards the use of child labor in the sand industry?
- a. PROBE FOR SPECIFICS ON: CHILDREN 15-17, CHILDREN 12-14, AND CHILDREN 11 AND YOUNGER
15. Are you aware of any efforts by government or non-government entities to prevent child labor or remove children from working in the **sand** industry? Please explain the one you are most familiar with.
- a. Where are these efforts occurring (nationally, regionally, etc.)?
16. What about worker associations or employers / site owners or wider industry initiatives? What do they do to prevent child labor or remove children from working in the **sand** industry?
- a. Where are these efforts occurring (nationally, regionally, etc.)?
 - b. (PROBE FOR SPECIFICS ON MONITORING POLICES)
17. What are the relevant laws used to safeguard against child labor in the (target good) industry?
- a. How are these laws enforced? PROBE: What about inspections?
 - b. In your opinion, how effective are these laws at preventing/addressing child labor?

Supply Chain Specific Questions:

18. Who are the main stakeholders (e.g., companies) in the **sand/construction** industry of **Kenya** involved in the sale and processing of **sand** from sites that use child labor?
19. At what point is **sand** produced at sites at risk for using child labor mixed with **sand** that is produced without child labor?
20. How is **sand** obtained with child labor used in **Kenya**?
 - a. Are you aware of any specific products?

Conclusion:

21. What changes would need to happen to prevent people under the age of 18 from working in **sand** activities that are hazardous/dangerous or otherwise age inappropriate? / What changes would need to happen to prevent child labor in the **sand** industry?
22. Could you suggest any organizations or individuals that are well informed about the **sand** industry/sector supply chain or child labor in the industry that we could interview?
 - a. (IF APPLICABLE BASED ON RESPONDENT TYPE: PROBE IF THE INDIVIDUAL HAS ANY ADDITIONAL REPORTS OR DATA THEY ARE ABLE TO SHARE)
23. Is there anything else you'd like to add?

SUPPLY CHAIN KEY INFORMANT INTERVIEW PROTOCOL

Interviewer:	Date (DD/MM/YY)
Location of interview:	
KII Code:	Sex:
Profession (if applicable):	
Position (if applicable):	
Employer/Affiliated Institution/Organization (if applicable):	
Contact information (office address, phone number, email):	
Time interview started:	
Time interview ended:	

Interviewer instructions:

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You do not have to ask each question verbatim, but at least broach all the topics covered that are relevant to the key informant. If a respondent makes clear they have no knowledge of that topic, move on to the next. Adapt the flow and questions to make them relevant to the respondent.

For each item, ask the general question first, and then probe the sub-items that have not been addressed spontaneously.

Introduction Questions (KIIs):

1. Could you please tell me your role and what you focus on?
 - a. Is there other experience you have in the **sand harvesting/cement** industry?
2. Can you describe your organization's work directly in the **sand/cement** industry?
 - a. PROBE FOR WHAT KIND OF ACTIVITIES IN THIS AREA DO YOU AND YOUR ORGANIZATION UNDERTAKE? F

Supply Chain Theme General:

3. Could you please tell us how the **sand harvesting/cement industry** works in Kenya?
 - a. What laws and regulations are central to operations in the **sand harvesting/cement** industry?

4. How important is the sand harvesting industry to Kenya? How about **to (sample area)**? How about to the construction industry?
 - a. How important is the artisanal / informal sector compared to the formal sector?
 - b. What has/have been the most significant change(s) to the industry in the last few years? Please explain.
5. Have there been any recent socio-political events that have impacted the supply chain? Please explain.
 - a. How have they impacted your company?
6. Who are the major stakeholders and influencers in the **sand harvesting/cement industry**?

Production:

7. Could you please describe the production process of **sand/cement** from the beginning to the end? Where does your company become involved in that process?
 - a. How is **sand/cement** transported from one location to the next? How does your company transport / receive **sand/cement**?
8. After **sand harvesting**, what processing occurs in Kenya?
 - a. What about specifically in **(sample area)**? Where are the main processing areas (PROBE FOR GEOGRAPHY)?
 - b. What goods (including bi-products and downstream goods) are produced in-country? What about in **(sample area)**?
 - c. Of these, which are the most common (or produced) by your company?
 - d. Are these consumed domestically or for export? Please explain.
9. Is there a list of sand harvesting or cement production sites in Kenya? How would we be able to access it?
 - a. Probe if participant is willing to share the information of who to contact to get access.
 - b. (IF PROCESSOR ASK) Do you have a list of sand harvesting sites or sand distributors that are a part of your supply chain? Tell me more about how that list is updated / maintained.
 - c. (IF TRADER ASK) Do you have a list of cement processing facilities that you sell to? Tell me more about how that list is updated / maintained.
 - i. Do you have a list of sand harvesting sites that you purchase from?
 - ii. What rivers / lakes does your sand originate from?

Tracing and Due Diligence:

10. What types of products does **sand/cement** from **Kenya** end up in? (PROBE FOR BOTH INTERMEDIARY GOODS AND FINISHED/END GOODS)? (IF APPLICABLE: Which of those goods does your company make?)
11. How might one track **sand / cement** harvested/made at a particular site through the domestic supply chain?
 - a. Could you walk us through how your company does this? Are you aware of which regions, rivers, or lakes your sand comes from? Please explain.
 - b. Is there a point in the supply chain where you anticipate tracking would no longer be possible? (probe for specifics on what stakeholder the traceability ends with, ex: intermediary buyer, exporter, etc.)
 - i. (SPECIFIC PROBE) When does the mixing of (target good) from different sites occur, how does mixing occur?
12. What oversight is being conducted by the government when it comes to labor standards within the **sand /cement** industry and its supply chain. How does this impact your company?

- a. PROBE FOR SPECIFICS ON WHAT THE INITIATIVES ARE AND WHO IS PROMOTING THEM (E.G. GOVERNMENT (National and County), INTERNATIONAL CORPORATIONS, DOMESTIC COMPANIES))
 - b. What about any supply chain traceability initiatives specifically? Please explain the stakeholders involved, including your own company.
 - c. What are the different certifications available for companies in the supply chain and how common are they?
 - i. How are these certifications monitored / approved and is your company a part of any of them? If so, please explain how you got approved and how you are monitored for compliance.
13. What due diligence initiatives does your company participate in to monitor labor conditions on the sand harvesting sites you source from?
- a. (IF NOT ANSWERED IN PREVIOUS QUESTION) What supply chain or industry certifications does your company current have? Can you please explain the process involved in obtaining the certification(s) and how you are monitored for compliance?
 - i. Are you actively working to obtain any additional certifications in the near future? Please tell me more about that.

Sourcing Questions for buyers (middlemen, traders, and processors)

14. Where do you source your sand from?
- a. PROBE (geographical region, names of sites, etc) PROBE SPECIFICALLY FOR SAMPLE AREA
 - b. Please explain your sourcing process (buying method, transportation process, etc)
 - c. Do you keep the sand you buy from each source separate and at what point do you combine sand from multiple sources? Please explain.
15. How often do you source sand from these places within (SAMPLE AREA)? (PROBE FOR PARTICULAR LAKES AND RIVERS)
- a. Are there times of the year when this changes? Please explain.
 - b. How do you determine how much you buy from a source?
16. (IF NOT COVERED PREVIOUSLY) Who are your primary buyers domestic and/or international of **sand/cement**?
- a. PROBE (regions, companies, countries, specific industry)

Post Export Questions

17. How would you describe the role of **sand and cement** exports from Kenya in the global trade of **sand and cement**? (PROBE FOR RELATIVE IMPORTANCE BETWEEN SAND AND CEMENT, IS ONE MORE COMMONLY EXPORTED, ETC)
- a. What are some international markets? (PROBE FOR SPECIFICS WITHIN THE HORN OF AFRICA)
 - i. Are there any recent changes (emerging/declining) in these markets? (PROBE FOR COUNTRIES AND/OR COMPANIES)
18. Who are the major players / stakeholders in (**import country of focus**) that import **sand or cement** from Kenya? Please explain.
- a. Who are the major exporters and importers involved in this? Can you describe in what product form the good is exported to (**import country of focus**)?
 - b. Are you aware of situations where the importing company in (**import country of focus**) is formally connected to the exporter in Kenya? (PROBE FOR CONTRACTS, OWNERSHIP, PART OF SAME LARGER COMPANY, ETC)

19. Does **(import country of focus)** produce **sand or cement** domestically?
 - a. How have changes in domestic production impacted/changed imports of **sand/cement**?
 - b. At what stage do **sand/cement** imports become mixed with domestically produced **sand/cement**?
20. Does the downstream use of **sand/cement** imported from Kenya differ from the downstream use of domestically produced **sand/cement**?

Labor Questions

21. What is your overall impression of working conditions in the sand industry?
 - a. What are the main issues you are aware of? (PROBE FOR CHILD LABOR IF NOT STATED)
22. What can you tell us about labor standards in the sand industry, especially when it comes to harvest/extraction sites?
 - a. What are the primary concerns across the industry when it comes to labor standards?
 - b. How are labor standards enforced at your workplace and who enforces them?
23. During which stages of the sand supply chain are risks for child labor most prevalent?
 - a. What are the risk factors at each stage?
 - b. PROBE FOR ANY RISKS RELATED TO CEMENT PRODUCTION

Conclusion:

24. Could you suggest any organizations or individuals that are well informed about the **sand / cement** supply chain or the construction industry that we could interview?
 - a. (IF APPLICABLE BASED ON RESPONDENT TYPE: PROBE IF THE INDIVIDUAL HAS ANY ADDITIONAL REPORTS OR DATA THEY ARE ABLE TO SHARE SUCH AS ANY LISTS MENTIONED IN QUESTION 9)
25. Is there anything else you'd like to add?