THE CONTEMPORARY PILGRIMAGE

The case of Elephanta Island

ABSTRACT
The research explores the impact of rapid infrastructural growth on Elephanta island and the informal economy that exists there. Located at the intersection of heritage, mass tourism, and sacred architecture.

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Explore Lab 39

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1-Abstract

The paper examines the development of Elephanta Island, a UNESCO World Heritage site located off the coast of Mumbai. The site faces significant challenges, including environmental fragility, a declining population, and seasonal isolation, contributing to socio-economic disparities. A proposed ropeway connecting Mumbai to the island aims to improve accessibility but raises concerns about equitable development and cultural preservation.

The research explores the role of architecture in balancing heritage conservation and mass tourism while supporting the existing informal economy. Previous studies have focused on the tension between heritage and tourism and large-scale infrastructure's impacts on 'sacred' landscapes. This study addresses these issues by proposing ephemeral and regional strategies for context-sensitive development at Elephanta Island.

Historical analysis and site studies form the foundation of the research, and case studies are utilised to create a programmatic framework for development. The findings underscore the importance of balancing 'formal' and 'informal' development while managing visitor influx. The framework derived from this research suggests a method of development that promotes the upliftment of local communities and sustainable tourism while safeguarding the site.

Figure 1- Image of the informal shops that line the heritage steps. (Author)

2-Introduction

The bustling metropolis of Mumbai, formerly Bombay, was originally a small grouping of 7 islands reclaimed under colonial rule and converted from "a tiny fishing village to a premier centre of trade and commerce." (Kamath, 2000)(Kamath, 2000). Located 10 km off the coast of the city is Elephanta Island (Gharapuri locally). An island defined by two gentle hills with an area of 2 square kilometres that fluctuates with the tide. The Island is home to the UNESCO World Heritage Site, the Elephanta Caves- a series of ancient Hindu rock-cut caves dating back to the 5th-8th centuries (Dhavalikar, 2007; Michell, 2002). The Island was an ancient port considered the capital of The Maurya Konkan kingdom. (Rao et al., 2001). A one-hour ferry ride from the coast of the financial capital of Mumbai is witnessing a rapid change in its built environment with a slew of proposed infrastructural/urban developments.

One such change is the opening of large land parcels of the Eastern port, which occupies prime waterfront land that is inaccessible primarily to the residents. (Paul et al., 2004). The Port is now witnessing a slowdown in cargo traffic due to several modern ports operating nearby. This decrease in traffic, accompanied by an increase in surrounding land prices, has pushed the Trust to pivot towards sea tourism. With the Mumbai Port Redevelopment Plan, the State aims to create a new financial centre and a dense mixed-use development employing a form-based code. The Ahmedabad-based HCP is designing the master plan and is also responsible for redeveloping Central Vista Avenue in Delhi. (HCP- Mumbai Port Complex Masterplan, 2020). Criticisms against the plan include the lack of socially equitable development as well as an over-emphasis on commercial development and reclamation. (Bhatia, 2016; Indorewala, 2020; Shaikh, 2023). The last iteration of the plan also demarcates a smaller area for public space in a city that already faces an acute shortage of open public space (Das, P.K, 2016).

A part of the development includes a ropeway connection from the Eastern coast to Elephanta Island, which will cut the current time of 1 hour by ferry to 15-20 minutes transporting an estimated 20,000 people per day (Hindustan Times, 2017; Onmanorama, 2020; Swarajaya, 2019). The small Island of Elephanta or Gharapuri is only accessible by ferry, making journeys during the monsoon untenable. Deemed a UNESCO World Heritage site in 1987, the caves are under the jurisdiction of the Archaeological Survey of India (ASI). A corporation adopted the caves under an ASI Scheme that seeks to create Public-Private Partnerships to assist in the upkeep of heritage sites. The scheme has received criticism for commodifying Indian heritage (Paul, 2024). The agreement permits the corporation to carry out 'semi-commercial' activities, although the ASI has claimed that any funds generated may only be used to keep the monument (Organiser Website, 2024). The ASI was also initially resistant to accepting the ropeway proposal and expanding the existing jetty. Despite concerns, work on the project is underway, and there are no recent updates on its completion date.

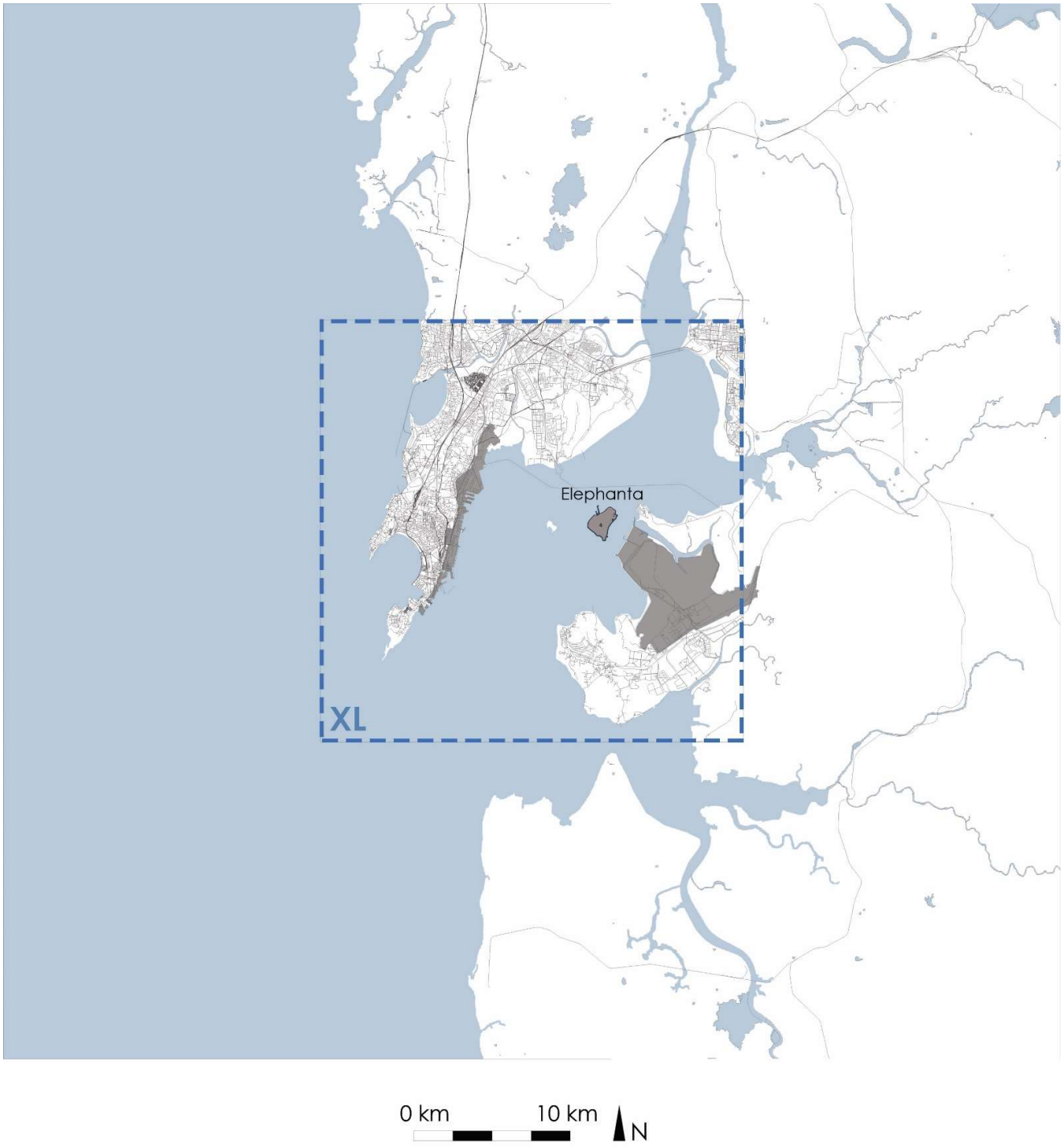


Figure 2- Map of Mumbai City and Elephanta Island in relation to it. The grey portions highlighted are the two ports MbPt and JNPT. (Author)

3-Problem statement

The establishment of JNPT (Jawaharlal Nehru Port Trust) has reduced cargo traffic towards the Mumbai Port. The Port Trust aims to repurpose portions of its land parcels, focusing on sea tourism and revitalising the docks that will now be closed. The proposed ropeway to Elephanta is one cog in the more extensive urban development of the new 'cultural district.' (MbPT, Special Planning Authority, 2018).

The Island of Elephanta has witnessed a different economic success than its metropolitan neighbour (Khergamker, 2017). The Island faces several challenges with a shrinking population of approximately 1200 people spread across three hamlets (Gadgil, 2018). Younger people migrate to the mainland for education and employment, while the remaining residents depend on the micro-economy tourists create. (Joshi S. , 2022). The residents require more water and medical facilities, while the monsoons make travel to the mainland problematic. Despite its proximity to Mumbai, the Island only received running electricity in 2018 (Financial Express, 2018; Parida, 2024).

The old 'pilgrimage' to Elephanta Island, a historic port, was always by boat. (Sastri, 1934). The ropeway will alter this form of travel permanently. This stream of tourism puts pressure on the delicate ecosystem of the tropical island. (Walters, 2004), which the project will only exacerbate. Despite these issues, the Caves' historical, cultural and religious significance attracts almost a million tourists annually. (Adimulam S. , 2023). The uniqueness of the caves is their position at the intersection of mass tourism, sacred architecture, and heritage while sustaining an informal economy. The world heritage status of the caves requires a complicated balance between managing tourism and preserving heritage, which often works against each other. (Buckley, 2018). This phenomenon occurs in several of these 'sacred landscapes' across India, which leads to an erosion of the spiritual character of the space. (Gahalot & Gupta, 2024; Shinde, 2007). Furthermore, the physical degradation of such sites is seen as secondary to their 'sacred' character, leading to disruptions of their delicate environments. (Shinde, 2011). The large footfalls witnessed by such locations support 'secular' socio-cultural and economic activities for pilgrims and tourists alike. (Singh & Rana, 2023). Experts suggest a blurring of lines between tourists and pilgrims travelling to sacred sites, leading them to be marketed as 'cultural' sites, further commodifying them. (Giovine & Garcia-Fuentes, 2016; Timothy & Olsen, 2006).

Alternative perspectives on developing heritage sites argue that change in historic environments is 'inevitable' (Lardinois, 2017). The argument is that heritage sites such as Elephanta Caves are important regional 'assets' that can catalyse development and aid local populations' socio-economic and cultural 'upliftment' (Ismagilova et al., 2015). Despite a polarisation between experts on the ways to intervene at heritage sites, they find common ground that there is a pressing need to balance 'environmental, economic and social' objectives (Landorf, 2009) with 'sustainable development strategies' that can manage visitors and the infrastructural growth that accompanies them (Shinde, K., 2017). In the case of Elephanta Island, the stimulus provided by the ropeway requires rapid adaptation and 'sustainable tourism practices' that can integrate the socio-economic needs of the residents (Chakravarty, 2001).

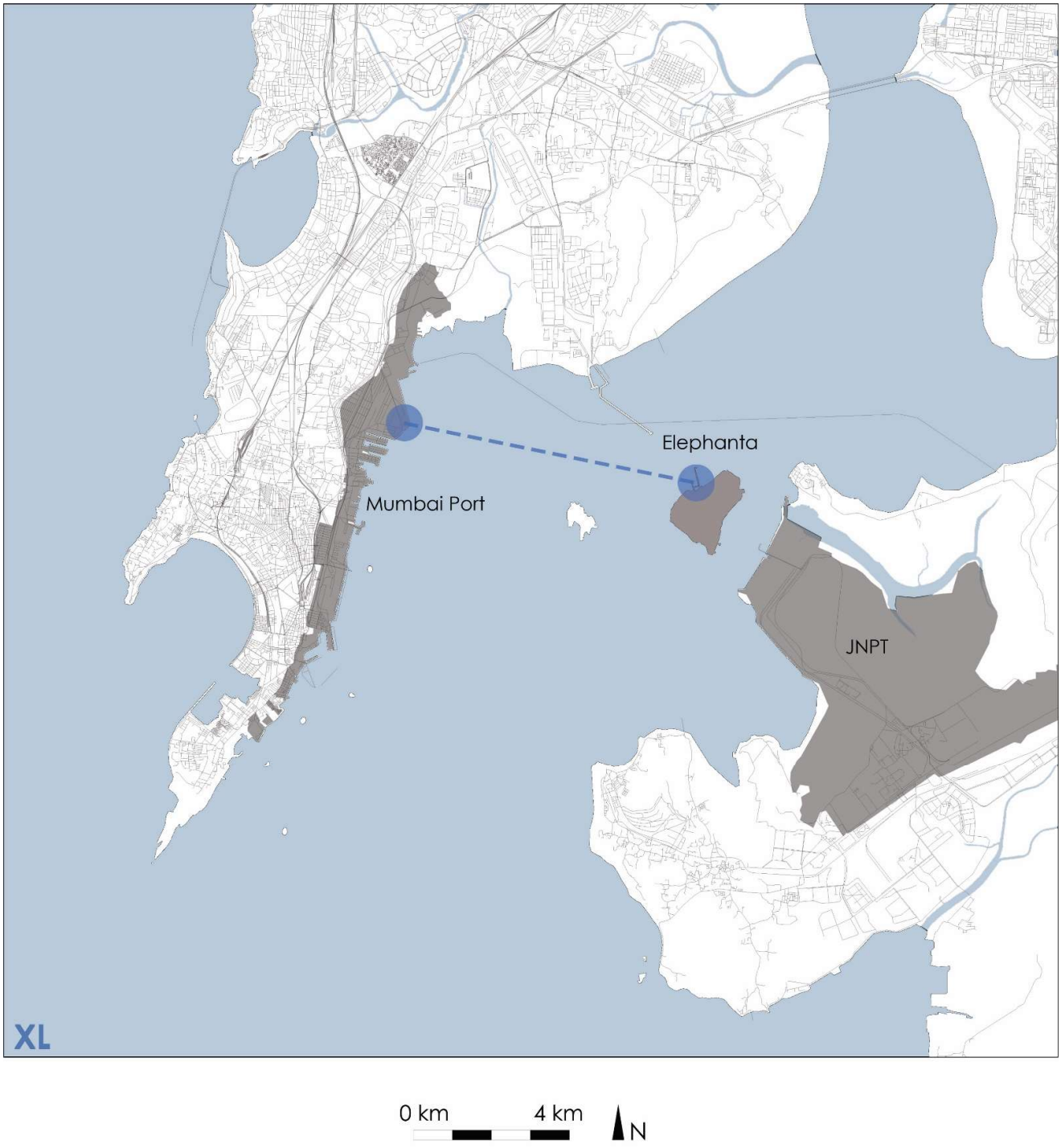


Figure 3- The proposed ropeway connecting Elephanta Island and Mumbai Port.. (Author)

4- Research question

How can architecture aid in developing Elephanta Island as a heritage, religious and tourist site while mediating between the informal economy and maintaining ecological integrity?

What is the role of architecture in sustainably managing tourism at Elephanta Island?

How can the new ropeway maintain the involvement of the informal economy that depends on tourists?

How can streams of visitors be managed while protecting the historical object and sacred site?

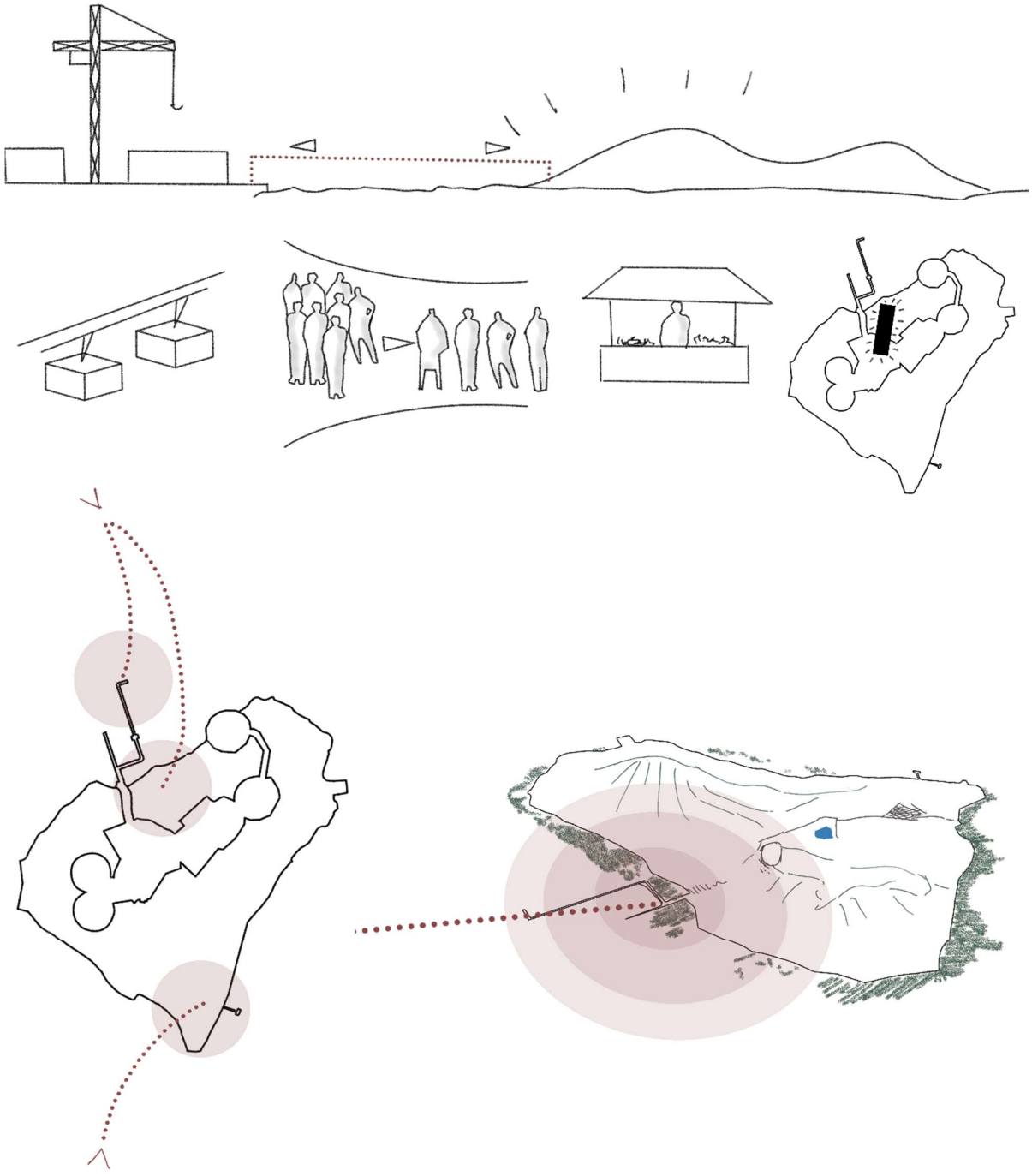


Figure 4- Sketches of the upcoming developments on Elephanta Island. (Author)

5- Historical framework and theoretical framework

The research's historical framework will include the growth stages of Mumbai, the Eastern Port, and Elephanta caves. The theoretical framework will include thematic literature on critical regionalism in India, its post-independence history, and contemporary texts on 'ephemeral' urban solutions in India.

It will include the history of the Elephanta caves in stages and the growth and development of the Eastern Port, which is, consequently, Mumbai. Mumbai is steeped in colonial history. (Dwivedi & Mehrotra, 1995), and Elephanta Island is no exception. The point of departure from the main is the Gateway of India, a symbol of the British Raj. As noted by Deepti Mulgund, the British used sites like the Elephanta Caves for picnics and portraits, framed as preservation efforts but justifying colonial rule. (Mulgund, 2024). Therefore, the theoretical framework of the research will be informed by relevant literature on critical regionalism in India. (Bahga & Raheja, 2018; Frampton, 1983; Shadar, 2010). Secondary literature to be aware of will include post-colonial theories in architecture. (Baydar, 2004; Egbers et al., 2024; Hernández, 2010; Nalbantoglu & Thai Wong, 1997).

In particular, the post-independence era created a series of modern Indian architects like Charles Correa, Raj Rewal and BV. Doshi blended traditional Indian architecture with the principles of avant-garde modernism. (Haddad & Rifkind, 2014). Srivastava and Scriver in Haddad, E., & Rifkind, D. (2014) A Critical History of Contemporary Architecture 1960-2010. (pp 379-401) detail the growth of modern Indian architecture in the Nehruvian era (1947-64) and how it was an essential cog in bridging the gap between India's 'craft-based past' and 'industrialised future' (Charles and Ray Eames seminal 1958 report). However, India's direction post-1964 differed from earlier anticipations. The subsequent technology boom and economic liberalisation of the 1990s provided what Rahul Mehrotra calls 'impatient capital', which sought to replicate the tall gleaming glass structures growing in other urban centres worldwide. India's climatic and cultural heterogeneity creates a unique architectural style with various local materials, forms, and techniques that provide a distinct identity to each region. In 2024, however, major urban centres are becoming increasingly uniform, losing any semblance of regional identity.

Supporting literature will include Rahul Mehrotra's writings on 'Kinetic cities' and 'ephemeral' urbanism as a viable form of sustainable development in the Global South (Vera & Mehrotra, 2015). Since the research focuses on the ropeway, contemporary literature on treating stations as 'multi-modal hubs' with integrated functions will also be studied (Triggianese et al., 2018). Apart from the above, contemporary literature on the tension between heritage and tourism globally, as well as specific to Indian Pilgrimage sites, will be examined (Lardinois, 2017; Shinde, 2011; Timothy & Olsen, 2006). Some of the critical literature will include…

Paul, A., Joshi, P., & Mehrotra, R. (2004). A Study of the Eastern Waterfront of Mumbai.

Dwivedi, S., & Mehrotra, R. (1995). Bombay- The Cities Within.

Correa, C. (1985). The New Landscape- Urbanisation in the Third World.

Eck, D. (2015). Kumbh Mela- Mapping the Ephemeral Megacity.

Mehrotra, R. (2021). The Kinetic City & Other Essays.

6- Methodology and positioning

The project will focus on the upcoming ropeway stations, the mainland site, and the landing at Elephanta Island. Additionally, the proposal will include some of the heritage steps leading to the caves, where an informal economy thrives. A 'model of growth' will be proposed for the informal shops that line the steps to the caves. The proposed program will delineate a 'maximum' extent of the building.

The main argument for connecting the residents of the Island to the mainland to better provide access, employment and services is sound. Due to the Island being inaccessible in the monsoons, more than improving and increasing ferries will be necessary. In this scenario, since the ropeway has become almost a necessity, the main aim would be to find means of integrating this new infrastructure in the most sensitive manner possible. The ropeway could potentially uplift the socio-economic status of the island residents, 57% of whom work in the tourism sector. (Chakravarty, 2001).

Research Methods

The research will include

Historical research-

Archival literature and maps

Empirical & analytical research-

Photographs, mapping, stakeholder analysis

Case study research-

The case studies will include two scales

Macro-scale: Heritage sites+islands

Intervention scale: Visitor centres, ropeway stations,

Ephemeral solutions for informal shops

7- Relevance

The research aims to provide a viable and practical outline for integrating sustainable tourism and the informal economy at Elephanta Caves. The outcome can inform a development model for Elephanta Island that can stimulate the socio-economic recovery of locals while managing large streams of tourism. The architectural approach towards the stations also provides a position towards other developments on the Island that are sensitive to the complex historical and socio-economic influences and their complex position in the urban fabric of Mumbai.

Diana Eck's book 'India: A Sacred Geography' refuted any British claim of creating 'India' by documenting the landscape of the subcontinent as an essential part of the Hindu faith and pilgrimage. A nation defined by pilgrims and the routes they traverse for devotion, there are sacred sites similar to the Elephanta caves spread across the length and breadth of the country. The project can also provide a contemporary Indian position on dealing with the Elephanta Caves and their heritage value.

Figure 5- A souvenir shop at Elephanta Caves. (Source- Raghu Rai/ Magnum Photos)

8- Ethical Issues

Ethical issues that may arise as a part of the research include the need for more involvement of Elephanta locals in the design or final product. Additionally, building the ropeway is an act of environmental disruption, and the residents of the Island have more pressing needs, such as regular water supply and medical facilities. More minor aspects of the design could also have consequential effects on the wages of locals who depend on the tourist economy. Adding accessibility features like electric star chairs can deprive locals who make money by lifting the elderly and disabled on makeshift 'thrones' up the stairs in return for compensation (A standard feature for pilgrimage sites across India). Notwithstanding the potential ethical issues in the research, the argument would be that the ropeway will provide access to and from the Island for the entire year and faster transportation of goods. The addition of such infrastructure, if managed well, can benefit all the stakeholders involved. The research would aim to provide a solution that creates the least environmental impact on the Island while prioritising the upliftment of the local population.

Figure 6- Photo by Gajanan Khergamker. Locals carrying pilgrims up the heritage steps. (Khergamker, 2017)

9-Historical research

9.1-Elephanta Island

Elephanta Island has a long, multilayered history. The small Island was approximately 8km East of the Bombay Archipelago and seemingly inhabited earlier than Mumbai. Approximately 2 square kilometres but varying with the tide, the Island was thickly forested and defined by two low hills rising 200 metres above the sea level. It had three entry points—Rajbunder, Morabunder (named after Mauryas), and Sethiabunder. Rajbunder was used by nobility, while Sethiabunder was for merchants and traders. (Dhavalikar, 2007; Sastri, 1934).

The natives called the Island Gharapuri a port that participated in transoceanic maritime trade from the 1st century BCE. (Rao et al., 2001). Buddhist stupas emerged on the Island between the 2nd and 3rd century BCE, while the renowned Elephanta Caves were built between the 5th and 8th centuries. The Konkan Mauryas, believed to have built the caves, also established the Island as their capital between the 6th and 7th centuries, referring to it as 'Puri' in their inscriptions. (Dhavalikar, 2007). The architecture of Elephanta caves is similar to that of Jogeshwari and Ajanta caves, which predate it. The cave series was carved at different times, depicting the artisans' growing proficiency in rock carving. The last and largest main cave is based on the ancient square mandala grid. Dedicated to Lord Shiva, one of the gods in the Hindu trinity, it has intricately carved columns and sculptures set in niches, each depicting a different story. The strict square geometry lays out 36 equally spaced bays of 5.5 metres aligning with the cardinal directions. The 'garbagriha' or sanctum santorum was placed off-centre and housed the 'linga' sculpture, while the main 'Trimurti' (three-headed sculpture0 was placed in the South. (Michell, 2002).

Between the 10th century and 1500 CE, the Island went through several hands, including the Chalukas, Yadavas, Muslims and later Marathas. The Portuguese began arriving in the region by the 1500s, facing stiff resistance from native rulers. They named the island 'Elephanta' because of the large stone elephant sculpture they saw at the jetty (Fergusson & Burgess, 1880). Considering the cave a pagan shrine, the sailors made attempts to disfigure carvings, even destroying the columns to collapse the caves and firing bullets at the sculptures. They also established a Christian chapel in the caves in 1588 (Mulgund, 2024). The Island was not a part of the 1668 marriage treaty between the Portuguese and the British when Mumbai was handed over to the latter. The Portuguese occupied the landmass until 1771 before finally ceding it to the British. Deepti Mulgulnd highlights the site's conditions and their significance to English. The caves continued being vandalised by European sailors, who attempted to damage the central Trimurti sculpture as late as 1865. The caves fell in and out of worship throughout these complicated stages. However, between 1870 and 1880, the flight of steps leading to the caves was constructed for 12000 rupees donated by a merchant from Bombay. This early sign of re-sacralisation of the site was marked by devotees from the mainland celebrating Mahashivratri (Lord Shivas main festival) on the Island, even hosting a fair. Public interest finally pushed the British to address the deteriorating conditions of the caves. Early attempts at conservation were merely attempts to legitimise the Empire, with the Island appearing as the background of royal portraits. The site became a stop for British nobility to display royal pageantry. The Prince of Wales even hosted a well-documented grand dinner within the caves in 1875, with images appearing across newspapers in London (Mulgund, 2024). The ongoing independence movement was finally successful in 1947 when the Island was finally a part of a newly formed nation. The PWD department of Bombay began severe conservation efforts in 1890; however, in 1909, the site came under the jurisdiction of the ASI (Archaeological Survey of India). The site was deemed a UNESCO World Heritage Site in 1987 (Michell, 2002).

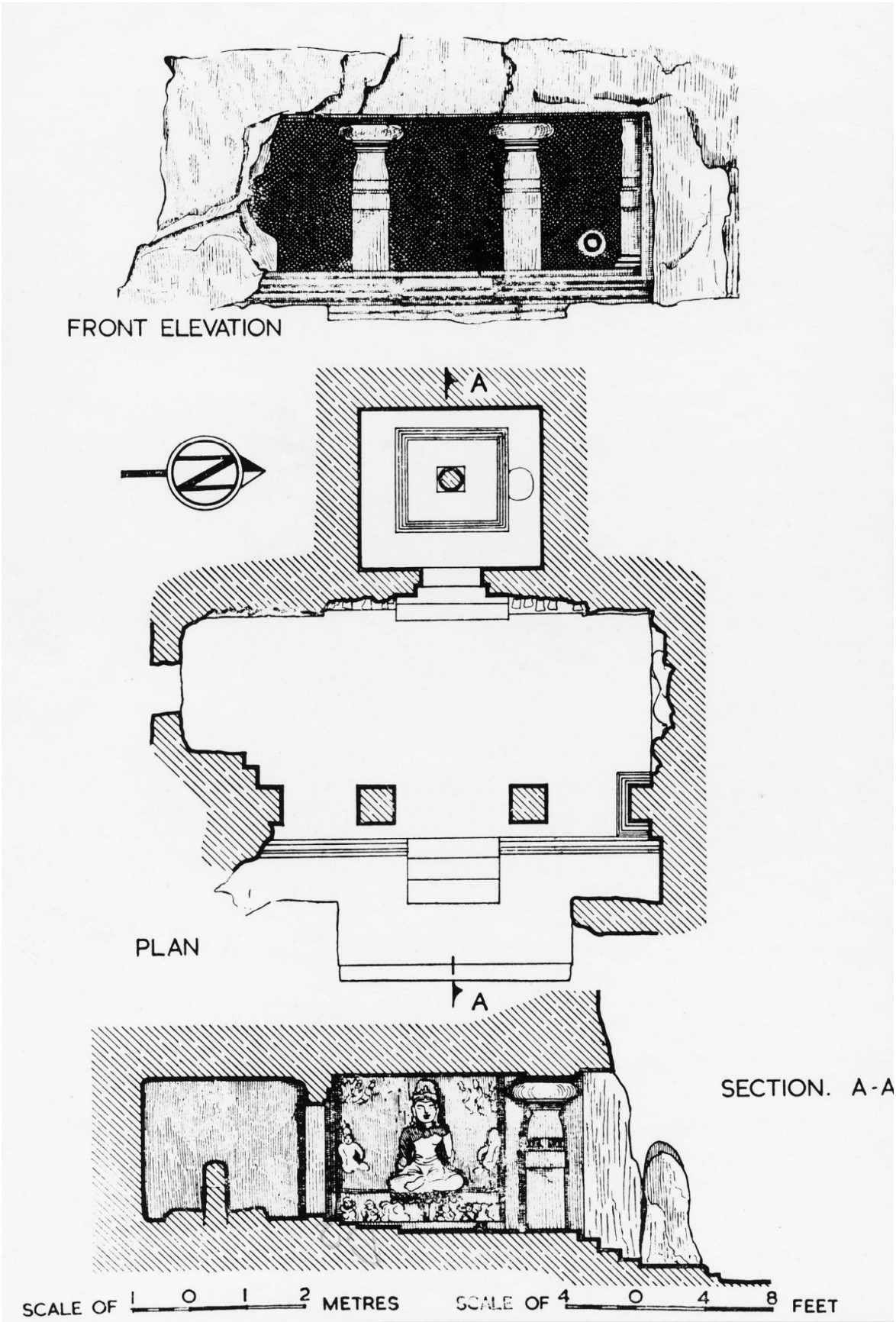


Figure 7- Drawings of the first cave of Elephanta (Source-. American Institute of Indian Studies, Varanasi)

9.2-Mumbai City

The metropolitan region called Mumbai (Formerly Bombay) today was once a small grouping of seven islands that, over time, was joined with the larger Salsette Island to its North. Initially inhabited by fishermen and farming communities, trade was conducted on the islands as far back as the 8th century BCE. The Portuguese began occupying territories in the region by the 1500s and transferred the Island to the English Crown as part of a marriage treaty in 1661 (Kamath, 2000). The Island was brought to the attention of the EIC (East India Company), which began building fortifications in 1668. The small Port's growth, supported by the opening of the Suez Canal in 1869, fuelled the city's growth. The Island had accumulated a population of 3 million in 1950, which grew to over 21 million in 2023 (Dwivedi & Mehrotra, 1995). The 2011 census data claims that 48.4% of the population lives in informal settlements or 'slums', which cover 24% of the city. The large migration of people from around India who came to Mumbai for employment, coupled with unplanned or delayed developments, has led to an affordable housing crisis and an erosion of public spaces such as parks, gardens, and coastline. The city offers an abysmally low 1.1-metre square of public space. (Tokyo is 3.96, London is 31.68 while New York is 26.4) (Das, P.K, 2016).

Figure 8- The seven Islands that make up Mumbai today and Elephanta to the East. (Author)

9.3-Mumbai Port

The original seven islands of Mumbai were named 'buon bhai' (good bay) by the Portuguese. The peninsular shape provided a natural breakwater, and the deep natural harbour protected vessels from the harsh southwest monsoons. The 70-square-mile harbour could dock merchant ships year-round. (MbPt, 2024). The likes of Shivaji and Tipu Sultan contested the colonial occupation fiercely and offered stiff resistance. Under the patronage of the Crown, the EIC set up a mole in 1673 that had grown into an elaborate dockyard with ship-building facilities by 1770 (Babu, 2021). The Port slowly became an essential part of the growing British Empire, which transferred the seat of governance from Surat to Bombay in 1686 (Dwivedi & Mehrotra, 1995). The islands were under the jurisdiction of the EIC for two centuries until 1858, when it was transferred back to the Crown. (Edwardes, 1902).

In the next few years, they permanently changed the fate of the Island. The breakout of the American Civil War in 1861 created a global shortage of cotton, and Mumbai was able to take advantage. Surplus cotton from other parts of the country catalysed the city's opening of Indigenous spinning and weaving mills (Jain, 2017). This growth was pushed even further by the revolutionary impact of the Suez Canal, which opened a few years later in 1869. The new shipping routes reduced the previous 24-day journey by 7-10 days, pushing the focus of the British from Calcutta to Mumbai. It became the principal 'Gateway to India' with import and export trade shifted to the East Coast. The British began investing heavily in the city and Port to' maximise economic benefits' (Dandekar & Mahajan, 2013) .

The islands were wholly transformed under colonial rule when EIC merged them through successive reclamations from 1860 onwards. The Port was formalised in 1873 by setting up a corporate body- the Bombay Port Trust, to manage it. (Kamath, 2000). The islands were terraformed through reclamation and the razing of the hills, transforming the Eastern coastline. (Babu, 2021). The building and enlargement of docks, warehouses and roads marked the expansion era between 1873 and 1914. This optimised the Empire's ability to move valuable commodities like opium, cotton, silk, sugar, and spices from the hinterland to the Port. The 'Mazagon-Sewree Reclamation' in 1912 was one of the most significant undertakings by the British, which added 583 acres to the Port. It included the lake tank and coal bunkers (piers). These piers had alternating steps and quay walls to dock smaller vessels moving goods manually. The industrialisation of the Port accelerated with the addition of rail lines, tramlines, and port facilities. (MbPt, 2024). The passenger 'Harbour Line' connected Mumbai to the suburbs, while the Port Trust Railway connected the docks, pier and storage depots. These railway lines became the firm threshold dividing the city and Port. The British set up the grain depot and Ryan Grain market in 1914 and the Cotton depot in 1923. The former spread across 127 acres, including 173 standardised ferro-cement warehouses, a fire brigade, dispensaries, and restaurants. It had additional depots for the growing demand for manganese ore, coal, and oil and land parcels dedicated to bricks, ship repairing, and drying fish. (Kamath, 2000; MbPt, 2024; Sharpe, 1900).

The expansion that began under the British also continued post-independence (1947). The Port was passed from British control to the Indian Central Government, which continued to upgrade it. The next major expansion took place in the 70s after the discovery of the offshore oil field 'Bombay High' in 1973 and the subsequent era of containerisation. The Port continued upgradation between 1984 and 97, adding a new jetty, warehouses and the Bulk Oil Depot. Between 1997 and 2008, the Port invested in modernisation and added oil/chemical terminals. Jawaharlal Nehru Port Trust (JNPT) was established in 1989 to assist Mumbai port with increasing cargo loads. (MbPt, 2024). After 2008, the more modern JNPT to the East of the city began overtaking Mumbai Port, which began seeing a gradual decline in traffic. The reduced load on the Port has led to sub-optimal land use. The north-south periphery road across its length is a perceived boundary separating the Port from the city. The Port has even attempted to disband coal transportation and shipbreaking recently. (Paul et al., 2004).

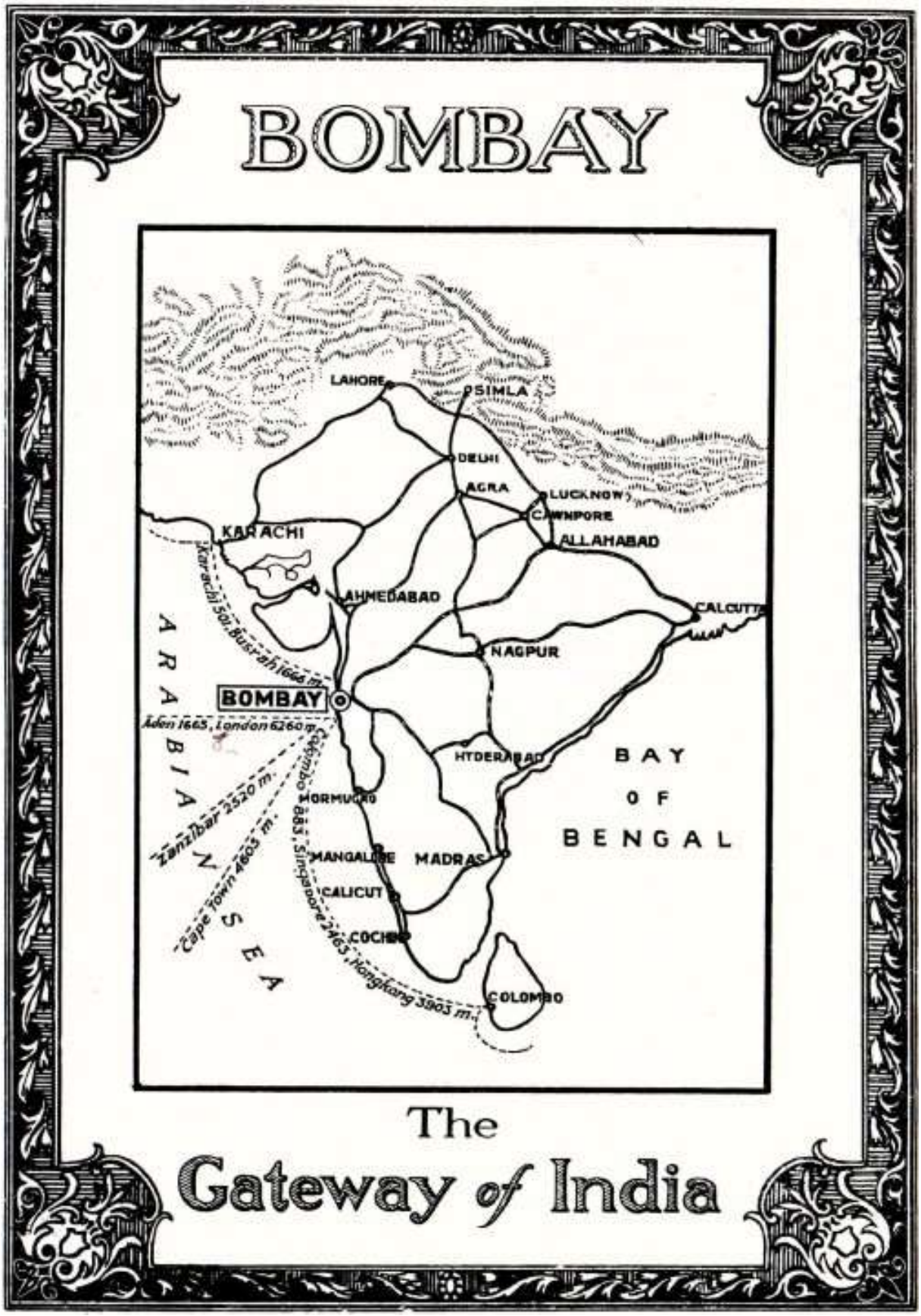


Figure 9- From the archives of the Mumbai Port Trust depicting the importance of then Bombay to the British Crown and the role it played as the 'Gateway' into the subcontinent (MbPt, 2024)

9.4- Original Inhabitants and settlements

Long before colonial rule transformed the islands of Mumbai, they were inhabited by locals who lived off the land and sea. These included the Koli (fishermen), Bhandari (liquor distillers), and Agris (Farmers). The Agris were further divided based on their production: the Bhat Agris grew batty, the Bhaji-pala Agris grew seasonal vegetables, and the Mitha Agris collected salt. (Babu, 2021). The largest group, the Kolis, used indigenous fishing methods and produced all their equipment within their settlements. The settlements were called Koliwadas, where the men would fish in groups while the women sorted and sold the catch. (Ulman, 2021). The Bhandari community produced a wine called 'tadi' by fermenting coconut water.

By 1534, the Portuguese had arrived in the region, and the islands were divided and distributed into land parcels. Industrialisation and port expansion attracted native workers in search of employment. This pushed many fishing communities away from the growing city, while the British also taxed the Kolis for conducting fishing activities in the water (Babu, 2021).

Figure 10- Images of the original inhabitants- Kolis (Source- Illustrations by M. V. Dhurandhar from the book By-Ways of Bombay – 1912)

The report by Pankaj Joshi of the area reveals small dispersed settlements before the arrival of the Portuguese and British. By 1812, the Island was buzzing with activity with parcels of coconut trees, fruit orchards and batty fields. The Koli houses stood out because of their long verandahs. Used to weave nets, it would act as the threshold before formally entering the hut. Timber, bamboo, thatch, and clay were typically used for construction, and the roofs were pitched (Joshi P. , 1995). The verandah typically spanned the length of a house and was partially covered by the roof. Particularly on the Island of Mazagaon, the evolution of these original settlements can still be seen in Matharpacady. Extensively documented for their architectural heritage value, the low-rise settlement forms an organic pattern with narrow alleys opening into pockets of open space. These narrow streets discourage vehicular traffic and are often used to congregate for festivals. Reminiscent of Koliwadas, the structures have raised verandahs and thick load-bearing walls. Typically made of burnt bricks or rubble, they were covered with mud or lime mortar. The pitched roofs had timber frames with Mangalore clay tiles above them. This, along with ingenious details like the railings and louvred windows, allowed the structure to 'breathe'. These structures were adept at managing ventilation, particularly in the hot tropical weather of Mumbai (Joshi P. , 1995). The Koli community and their proximity to the sea have led it to become a spiritual aspect in all areas of their lives. Prayer, celebration, and funerals within the community all have an aspect of the sea. The most important of these days is 'Narali Purnima', where coconuts are offered to the sea in exchange for calm waters (Mohanty, 2020; Sharma, 2023).

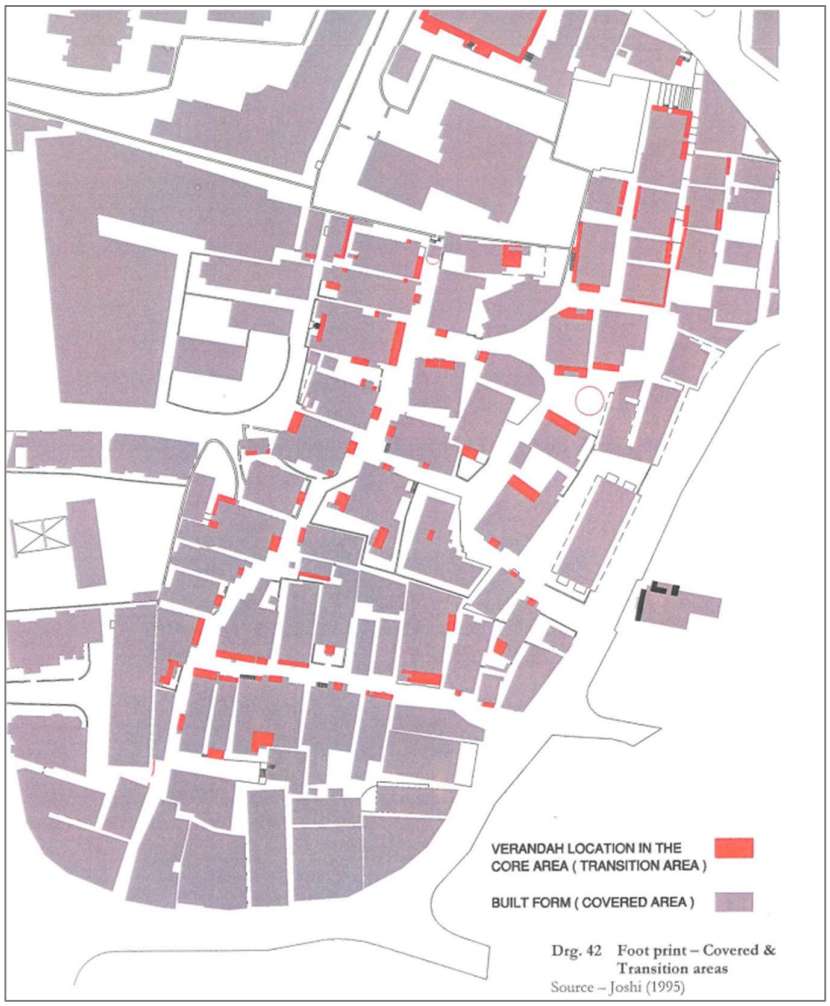


Figure 11- Plan of Matharpacady from the report depicting its narrow streets and dense settlement. (Joshi P. , 1995)

10- Analytical site study

The analytical site study will discuss the contemporary issues associated with Elephanta Island and Mumbai Port and zoom in further on the sites selected for the proposed ropeway. Furthermore, it will discuss the criticism against the Port master plan and the issues surrounding the ropeway connection between the mainland and the Island.

10.1- Elephanta Island

Elephanta Island today is in the middle of JNPT and Mumbai Port, one of the busiest water routes in the country. Despite the advanced metropolitan region growing in its periphery, life on the Island has not changed much. Under ASI jurisdiction, the sacred nature of the site has prohibited development (Walters, 2004). This, coupled with the fact that the Island cannot be visited during the monsoon months (July to September), effectively cuts off the Island from the mainland for nearly a third of the year. The small jetties on Elephanta accommodate six ferries at a time. The current journey begins at the Gateway of India on the mainland. Approximately 80 ferries ply the 1-hour journey daily, carrying groups of 60-65 people simultaneously (Adimulam S. , 2023). With the Island size varying based on the tide, almost 152 hectares of the 242-hectare Island is a protected forest with almost 30000 evergreen varieties. The Forest Ministry undertook this to provide green cover even during the hot summer. The remaining site is used for agriculture (22 hectares) and mudflats (57 hectares). Only a tiny portion of 2 hectares is built on, with 5 hectares of mangroves surrounding the edges of the Island (Chakravarty, 2001; Walters, 2004). Despite the mangroves, a concrete sea wall was built in 2020 to protect the edges from erosion (Naik Y. , 2015).

The three villages on the Island, namely Rajbunder, Shetbunder and Morabunder, house almost 1100 people today. The largest Rajbunder has 500 people, while Shetbunder and Morabunder have 300 and 250, respectively, totalling 205 houses accommodating 265 families. Additionally, 14 hotels and 165 smaller shops are on site (Parida, 2024). Overall, the Island has seen a population decline, with locals migrating to the mainland for employment and education. 57% of the 1100 locals are employed in the tourism sector, while the remaining 43% primarily engage in agriculture and fishing (Chakravarty, 2001). The tourism sector workers primarily operate small shops, restaurants, and transportation. The small hamlets face developmental issues, such as a lack of medical facilities, poor infrastructure and an unsteady education (Joshi S. , 2022; Khergamker, 2017). Limited public facilities and seasonal isolation during the monsoon present challenges for locals seeking treatment for minor medical issues like snakebites. They received a running electricity connection only in 2018 through an undersea cable (Financial Express, 2018). The large number of local and central government stakeholders and the sacred nature of the site have led to a 'contestation of resources' that is visible in similar sites in India (Gahalot & Gupta, 2024). Despite a small reservoir being built on the Island, it cannot manage the requirement of 100,000 litres per day for locals and tourists (Parida, 2024). The Island also faces more significant threats due to its location in the busy Mumbai harbour. Oil spills and bilge water threaten the mangroves on the edges, while its location on a fault line puts it at risk of natural calamity. The oil and chemical terminals on the periphery and the busy JNPT terminal to its East further threaten the site's ecological integrity (Mehta, 2002).

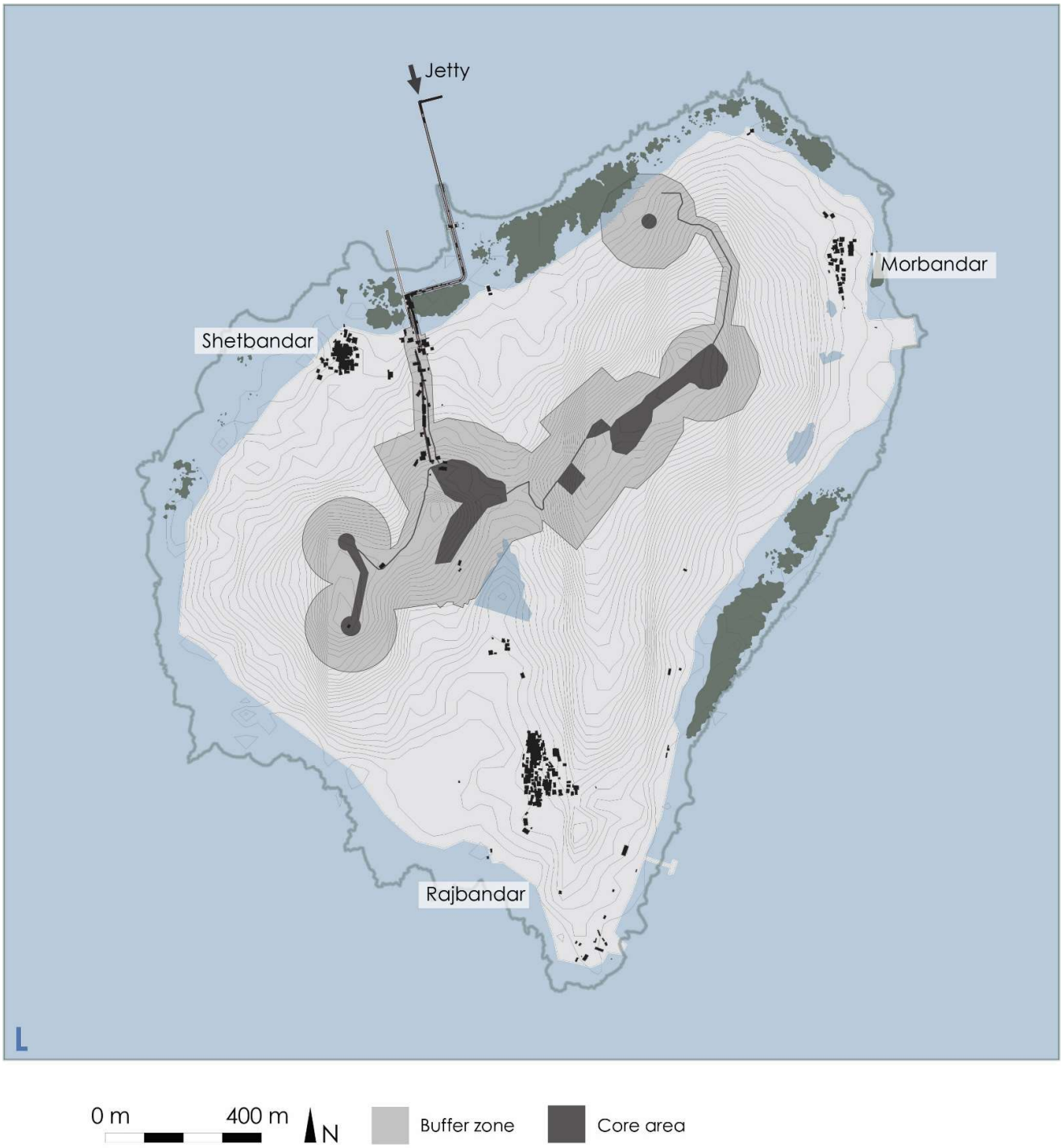


Figure 12- Map of Elephanta Island depicting heritage zones and settlements. (Author)

The Island is visited by almost a million tourists a year by ferry. (Adimulam S. , 2023). Elephanta caves saw a footfall of 4,77,796 people (ASI data) in 2022-23, most domestic tourists. The World Heritage status of the caves was a factor in the ASI adding them to the 'Adopt a Heritage 2.0' scheme, aimed at providing public-private partnerships to develop heritage sites in the country. This also permitted the company to conduct 'semi-commercial' activities on site, such as cafes, souvenir kiosks, and light and sound shows. (Organiser Website, 2024). This proposal has faced criticism for commodifying national heritage. Some argue that the vibrations from the light and sound show threaten the caves, while night-time tourism leads to excessive wear and tear of the monument. Furthermore, building on the site also prevents archaeologists from excavating further. However, The Additional Director of the ASI has argued that the government will regulate the prices for entering the caves, and any profit generated from carrying out 'semi-commercial activities' will be used for upkeep and maintenance. (Paul, 2024). The ASI had controversially used cement for recasting the bases of some broken columns and repair work. An earlier development plan for the Island proposed a marine bird sanctuary to regenerate mangroves and capture rainwater. Most 165 shops and 14 hotels on the Island are spread between the new pier and heritage steps, with a small diesel toy train ferrying passengers. (Mehta, 2002). While some of the structures are concrete, most of them employ simpler construction systems. It is assembled with bamboo, rolled metal roofing sheets and tarpaulin sheets. More 'formalised' shops use a mix of steel sections, concrete, and metal roof sheets but are mostly limited to the pier. The smaller shops run by locals use a mix of bamboo and tarpaulin sheets, and they even hang them from trees to provide shade along the heritage steps.

Figure 13- An image of the pier at Elephanta before reaching the steps. (Auhtor)

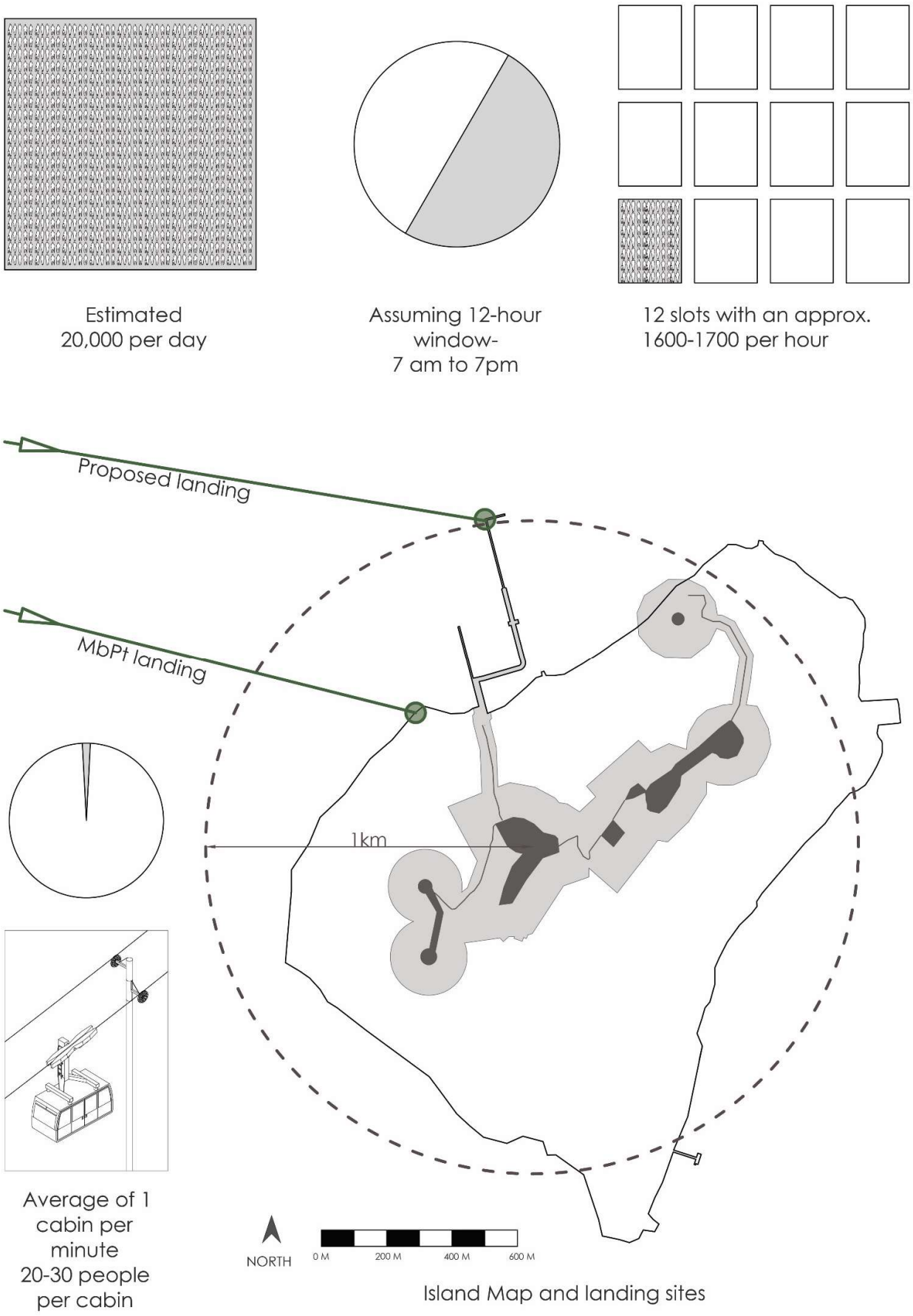


Figure 14- Depiction of visitor flows due to the proposed ropeway. (Author)

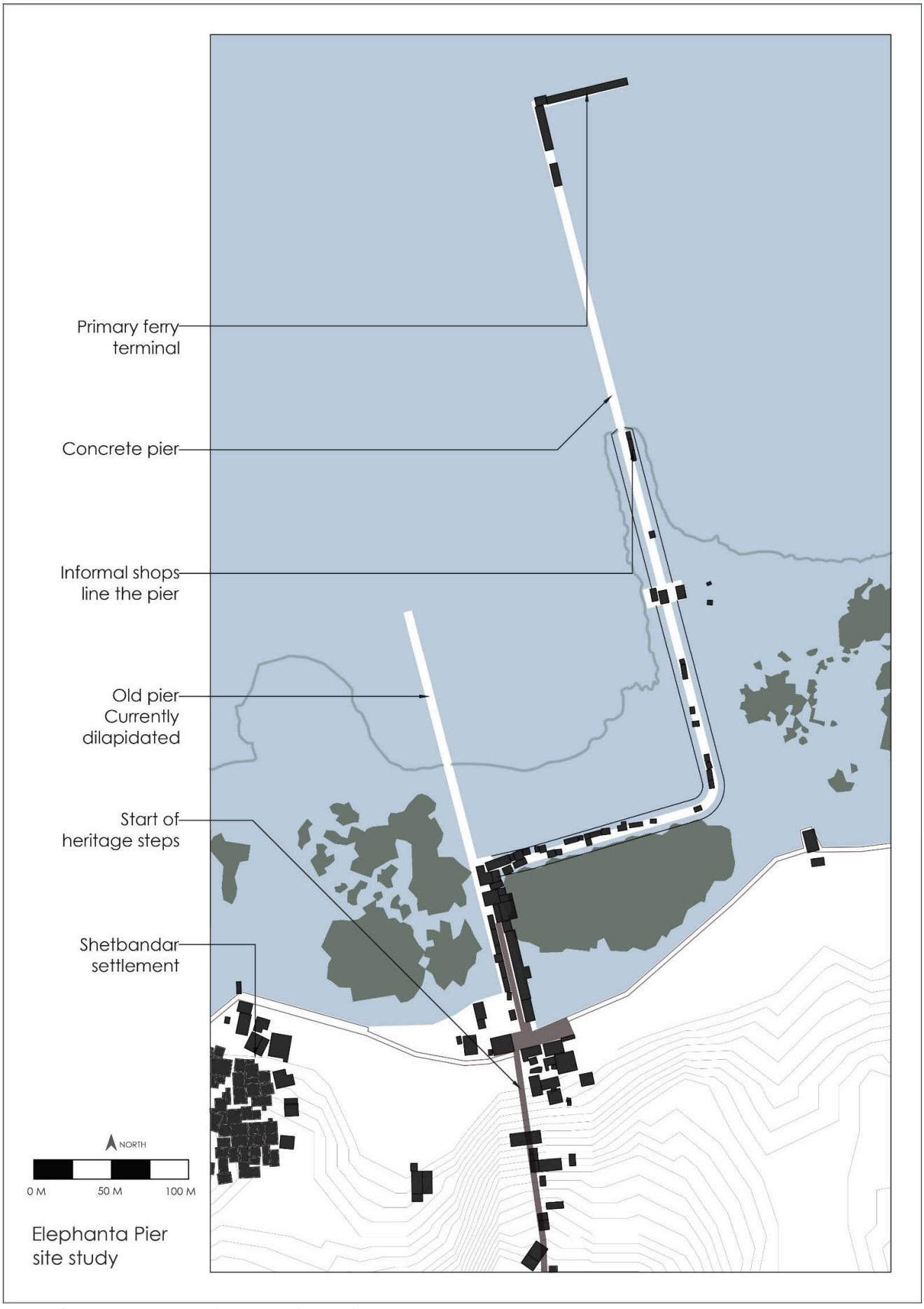


Figure 15- Detailed plan of the pier. (Author)

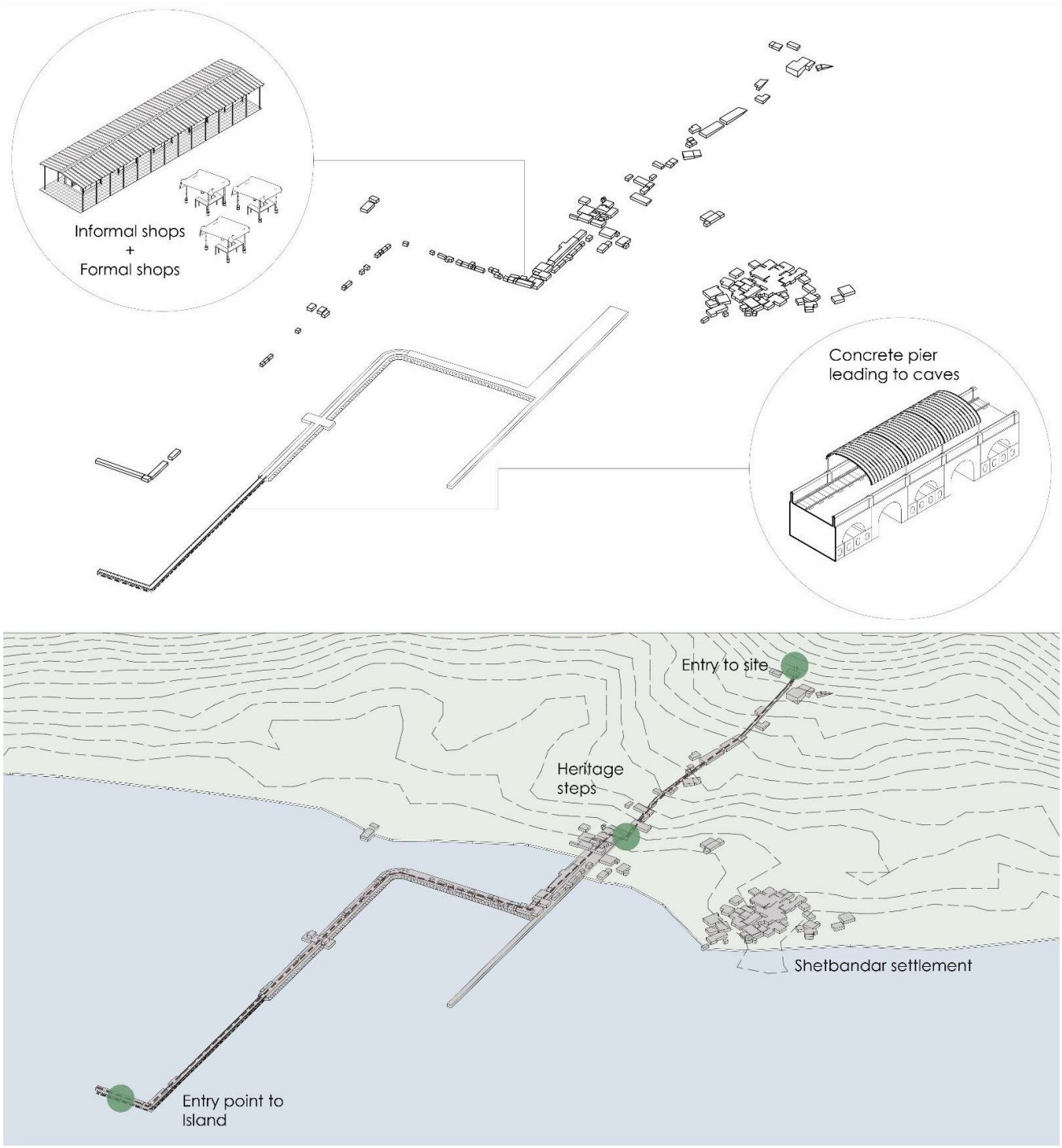


Figure 16- Exploded isometric of the Pier. (Author)

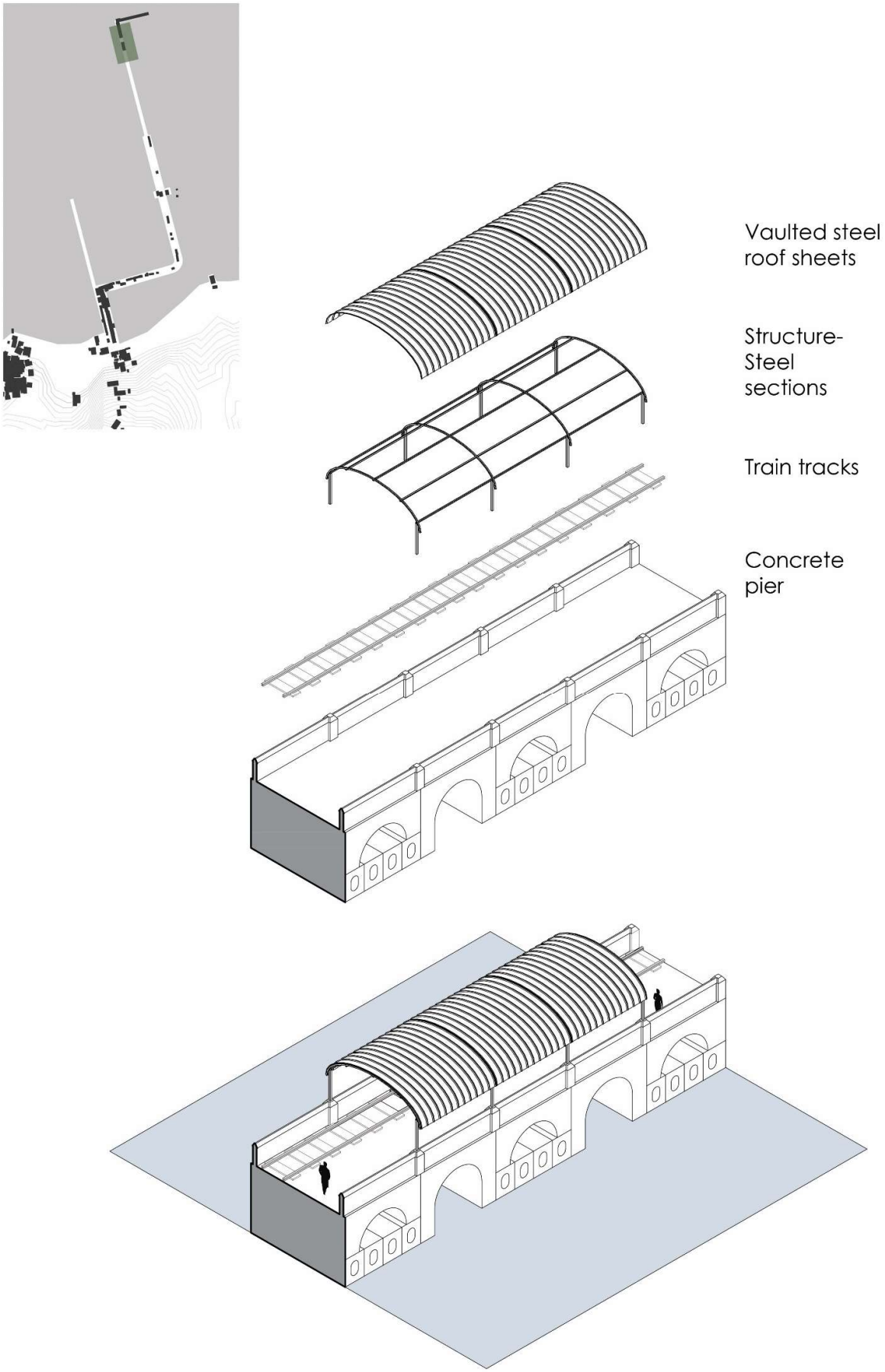


Figure 17- Isometric of the beginning of the pier. (Author)

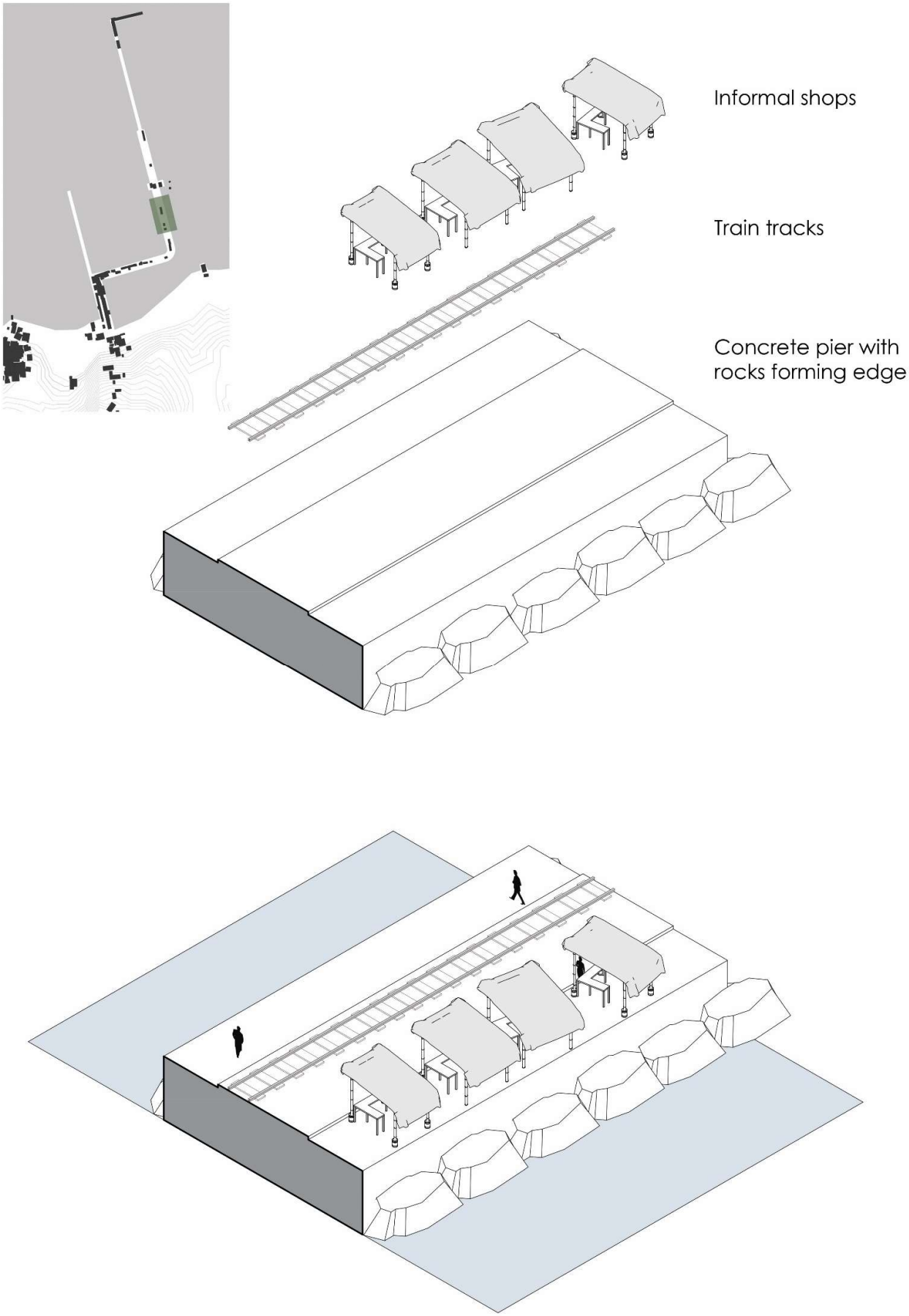


Figure 18- Isometric of the middle portion of the pier. (Author)

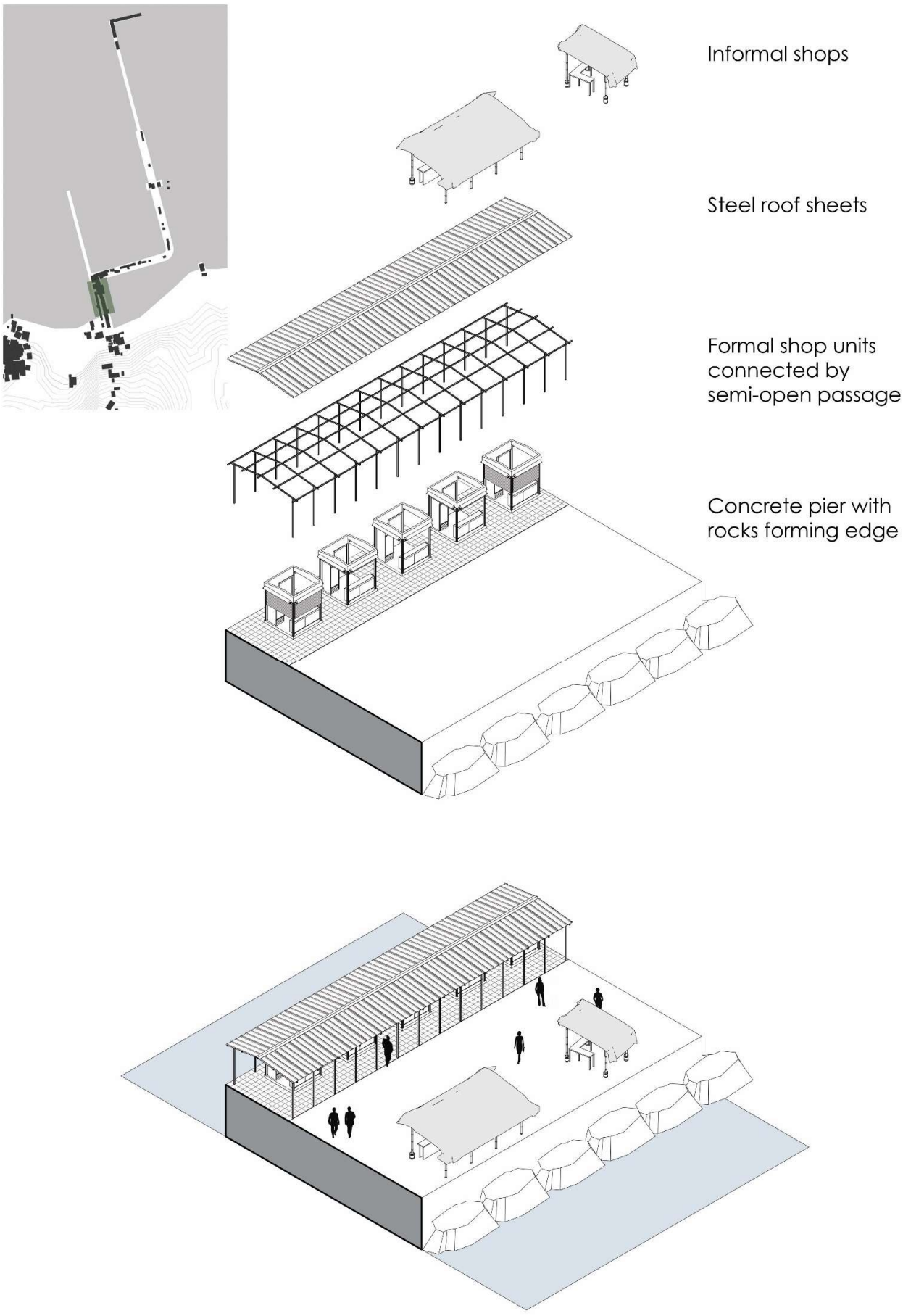


Figure 19- Isometric of the formal and informal shops towards the end of the pier. (Author)

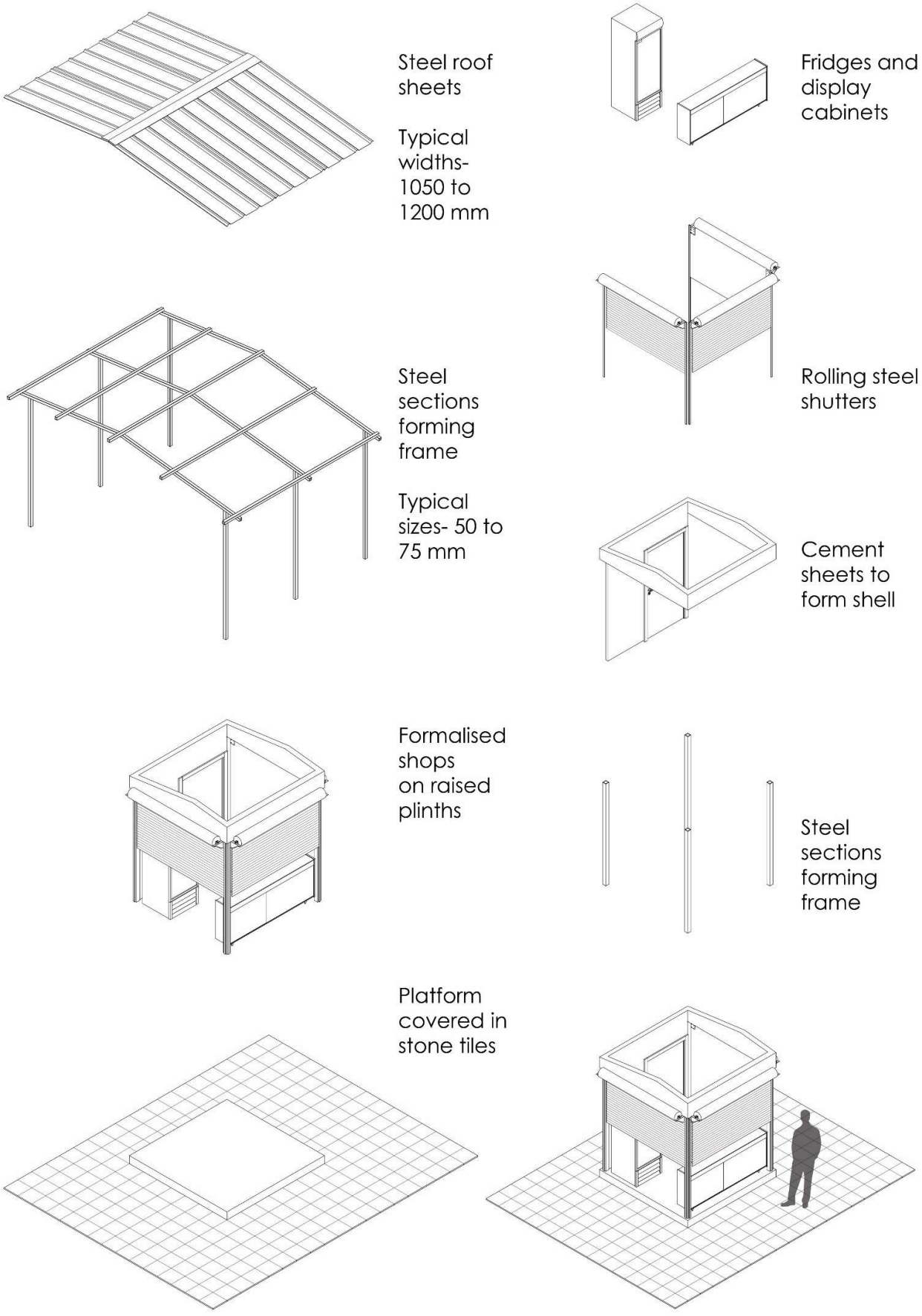


Figure 20- Exploded Isometric of the more formalized shops on the pier. (Author)

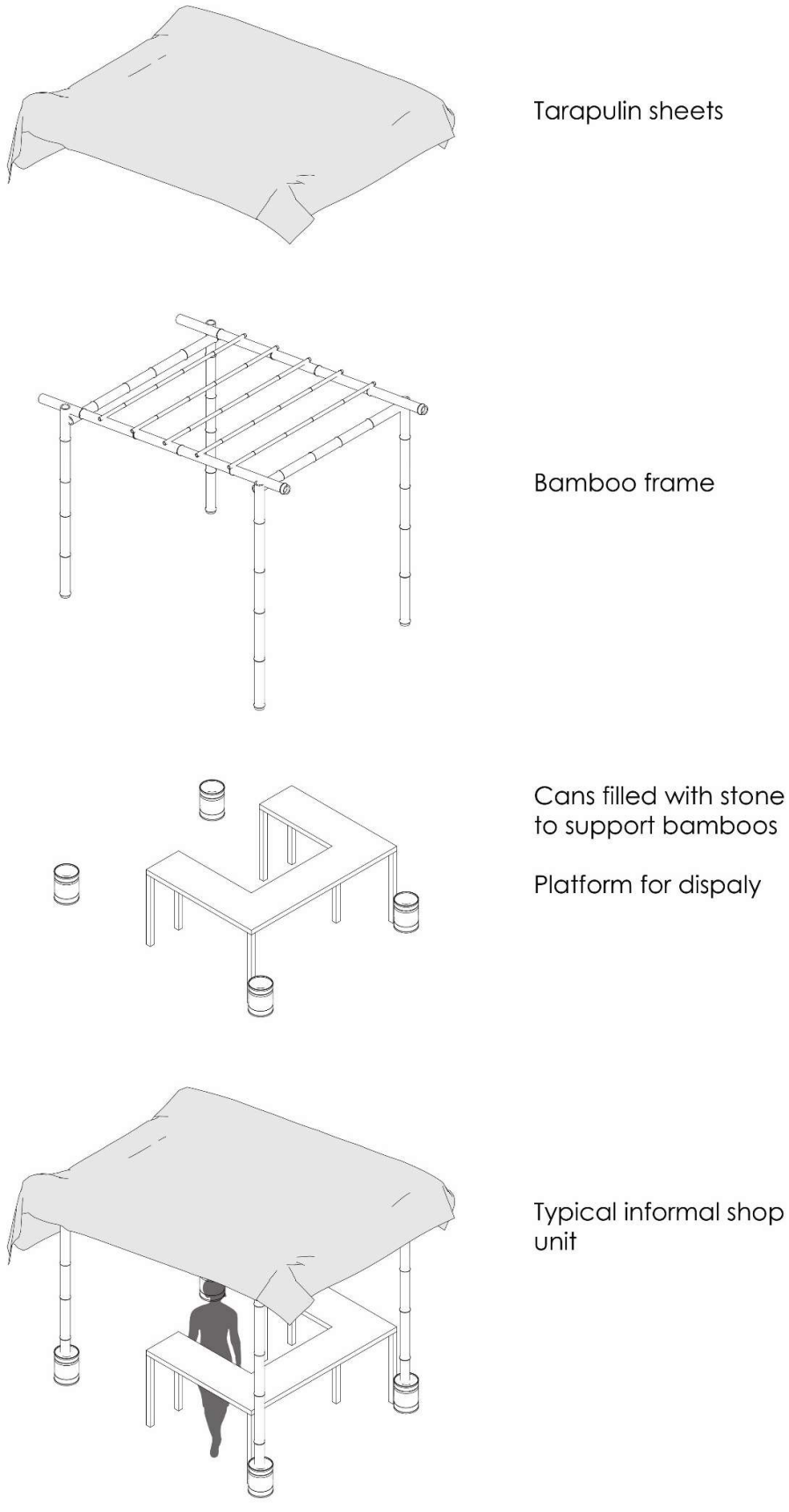


Figure 21-Exploded Isometric of the typical informal shops on the pier. (Author)

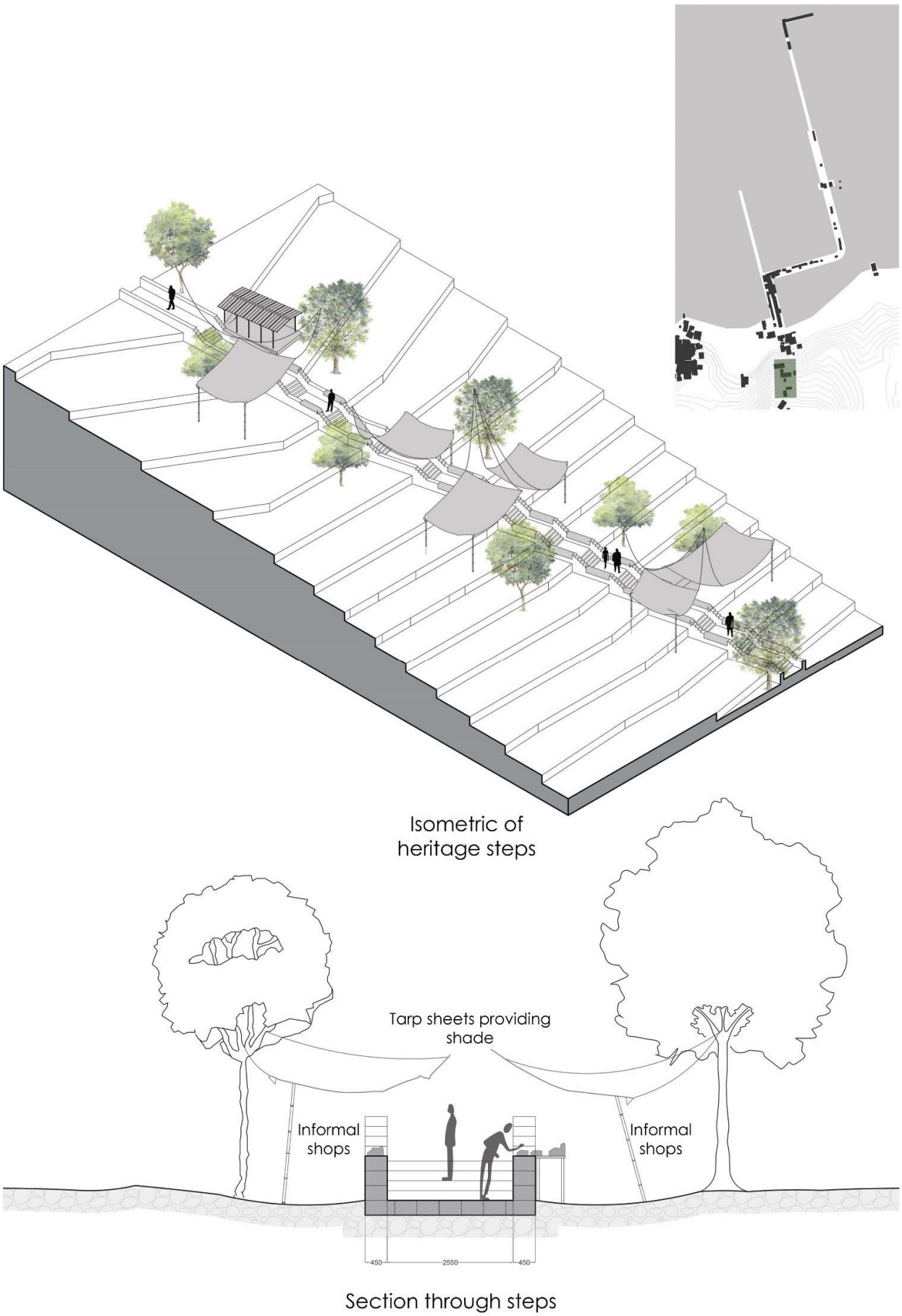
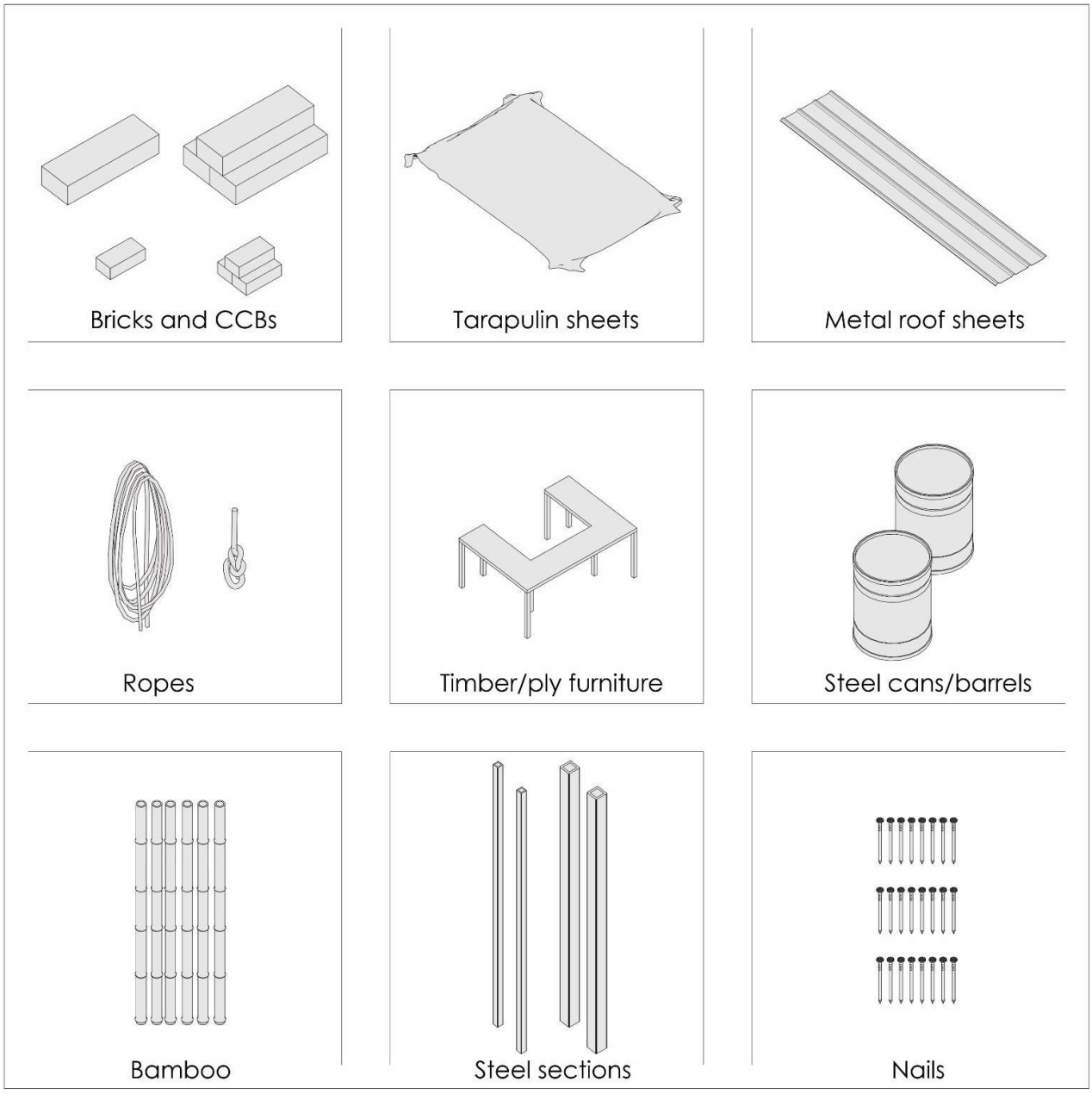
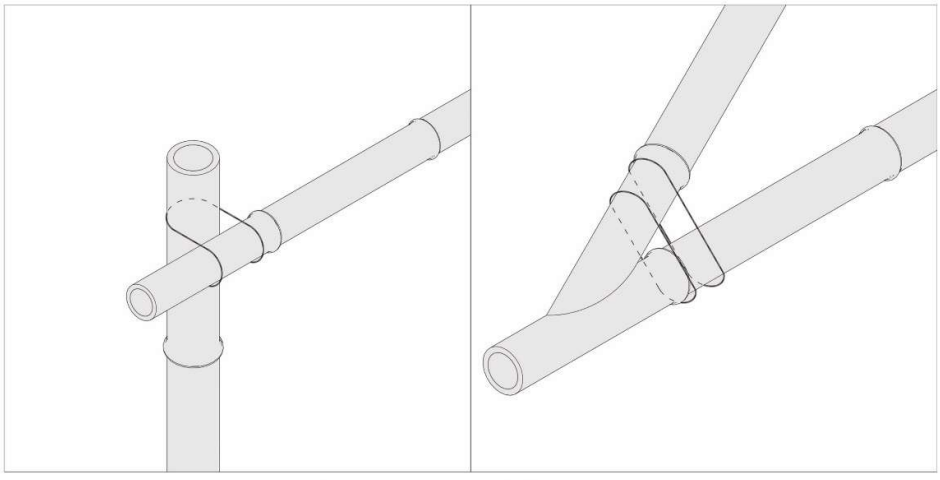


Figure 22- Isometric and section depicting the Heritage steps and the informal shops along it. (Author)





Typical bamboo joints observed

Figure 23- The typical toolkit of materials in use on the Island. Structures use one or more in combination. (Author)

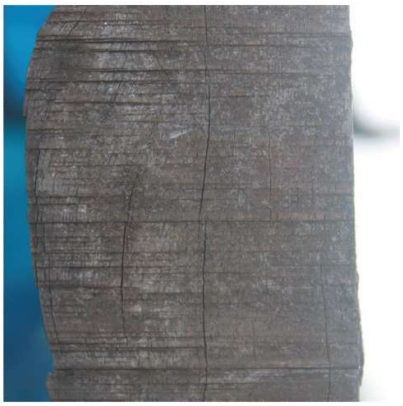
Material weathering on Elephanta Island

Edges of the pier

Flooring patterns

Textures of stone

Site images of Elephanta Island



Varying metal textures

Metal connections

Bamboo connections

Site images of Elephanta Island









Interactions between the formal and informal

10.2- Reclamation area in Mumbai Port

The second oldest Port of India, the Mumbai Port, was the nucleus of the city around which the city grew. At one point, the busiest Port of India still moves almost 62 million tonnes of cargo annually. (MbPT, Special Planning Authority, 2018). The area under the jurisdiction of the Port spans almost 966 hectares along the Eastern coast of the city and includes

Sassoon Dock, Colaba

Ballard Estate

Indira, Victoria and Prince's Dock

Elphinstone Estate

Mazagaon

Darukhana

Sewri- Cotton green area

Wadala

The site for the proposed ropeway is in the 'Mazagon-Sewree Reclamation' area, which was added during the colonial era. The extractive system set up by the British was focused on efficiently moving goods from the hinterlands to the Port. Displacing the inhabitants of the coastline, the infrastructure created effectively cut off the coastline from the city. The UDRI report on the Eastern waterfront highlighted the sub-optimal land use of the decaying industries. (Paul et al., 2004). The area referred to as 'Darukhana' has vast parcels of land dedicated to warehouses, some of which are dilapidated. A photo documentation of the area reveals the conditions of the coast as well as the structures. Primarily pitched roofs with RCC frames, warehouses, and empty lots dominate the area. Oil silos surrounded by tall boundary walls also create inaccessible pockets along the northern portion of the site. Companies like Hindustan Petroleum and Tata Oil primarily operate these. The old cotton, coal, and grain depots lie underutilised or dysfunctional. Some parcels are used for parking or vehicular repair (Paul et al., 2004).

Although the Port Trust officially disbanded ship-breaking activities, some still take place in pockets along the coast (Sheth, 2024). Shipbreaking and scrap markets are some informal industries that grew with the Port and still occur in the area (Naik Y. , 2015). An interview with a commercial tenant (Shah, 2024) revealed a majority of the warehouses are used by steel traders, primarily hiring 'migrants from other states' as manual labourers who come in groups from their villages. These labourers live in informal slums spread across the site and house service members, truckers, fishermen and cleaners. The UDRI report 2004 (Paul et al., 2004) revealed 12150 people living in these settlements, although there is no recent number after the decline in industrial activity. While pockets of greenery have emerged, enveloping many dilapidated buildings, the informal settlements lack basic facilities like toilets and electricity (Hanwate, 2024). These makeshift homes are built with brick, tarpaulin sheets and metal roofs resembling a similar material palette to the shops on Elephanta Island.

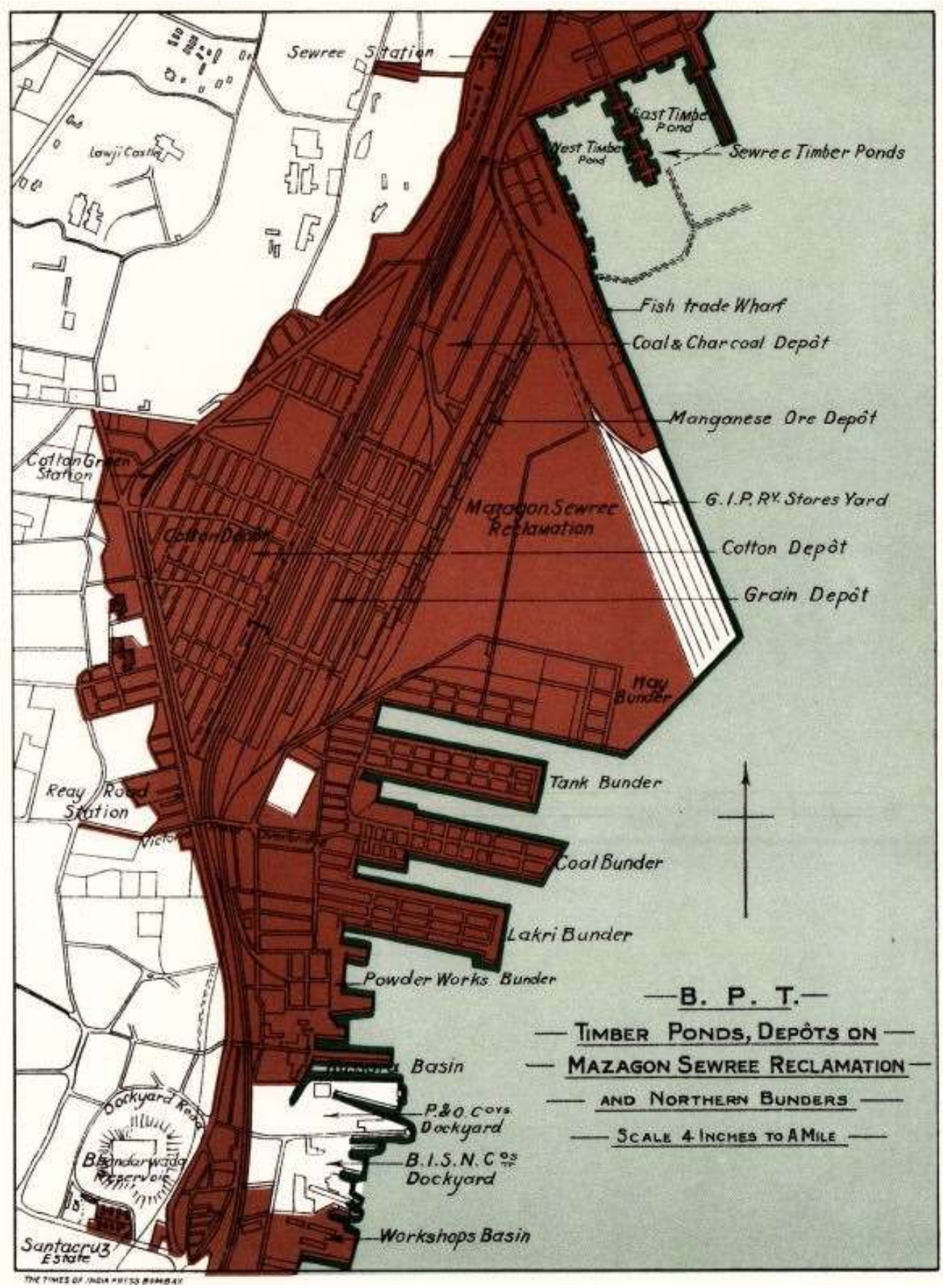


Figure 24- The plan of the 'Mazgon Sewree reclamation' where the proposed ropeway will begin from. (Mumbai Port Trust- The Port of Bombay)

10.3- Future Potential and Criticism

The establishment of JNPT in 1989 across the harbour aligns with the state government's push to expand the city of Mumbai towards the East. Charles Correa proposed Eastward expansion of the metropolitan region in 1964 with a larger group. He argues that the North-South linear expansion has caused an increase in land prices and shrinkage in public space. Having been instrumental in the planning process for the expansion of Navi Mumbai, his ideas have been fructified only some of these years later. In his diagram for the growing metropolitan region, Elephanta Island finds itself in the middle of these nodes, with Correa himself calling it an 'umbilical cord' taking you 'back a thousand years' (Correa, 1985). The gradual decline in container traffic to Mumbai Port and the increase at JNPT has led to slow deindustrialisation, with the 'workforce declining by 50% from 1990 to 2005' (Dandekar & Mahajan, 2013).

The Trust aims to repurpose most of the 966 hectares under its jurisdiction. Focusing on sea tourism and revitalisation of the docks, they found optimal land use would be from revenue generated by sea tourism and its allied activities. This plan has been termed the 'Port Redevelopment Master Plan' and is the most significant land redistribution in the city's history. The Port aims to become a hub for sea tourism and create new financial centres (MbPT, Special Planning Authority, 2018). The tender was won by Ahmedabad-based HCP, which claims- 'The draft master plan proposes to develop a new financial centre, a Government office, hotels, commercial as well as residential properties near the proposed metro line and the existing suburban railway stations' (HCP- Mumbai Port Complex Masterplan, 2020).

Figure 25-A visualization of the proposed redevelopment. (MbPT, 2018)

The draft plan for the proposal has been controversial, receiving almost 950 objections (Adimulam S. , 2022). Critics are sceptical of the plan because Mumbai has previously witnessed failed land distributions. After the gradual decline of the textile industry, large portions of mill land which had been leased out to facilitate the industry's growth were to be repurposed. The Charles Correa Committee Report 1991 proposed equal division among the stakeholders- The Mill Owners, MHADA and the Public. After an amendment in 2001, almost 86% of the land came under private control, with only 8% remaining for the Public (Adarkar et al., 2024). Critics argue that the plan for redevelopment lacks socially equitable development and over-emphasises commercial development (Bhatia, 2016; Indian Express, 2015; Shaikh, 2023). They argue that the government increased the buildable area between the 2018 and 2020 Draft Plan by shuffling complicated land use categories and reducing open space (Indorewala, 2020). The plans for reclamation to build green spaces and a marina have also faced criticism from environmentalists. At the same time, the government defended them by claiming they would provide free housing to the residents of the informal settlements (Adimulam S. , 2022)

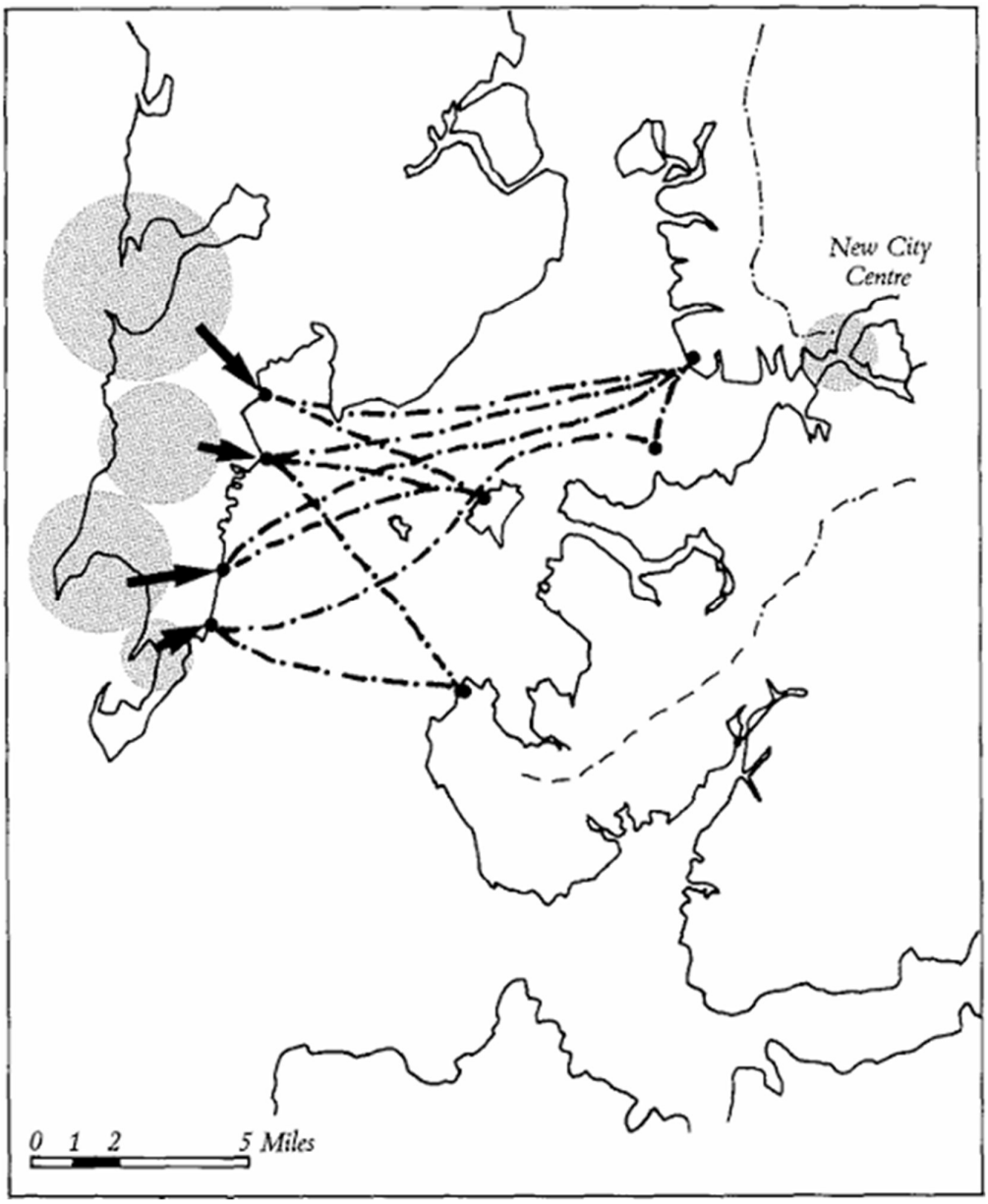


Figure 26- Charles Correa proposed eastward expansion of the city in the 1980s. (Correa, 1985)

10.4- Ropeway and Concerns Over Heritage

The proposed site for the ropeway is in the midst of the cultural district proposed in the plan. Adjacent to the large reclaimed park, the site will be close to the edge of the water north of the proposed Port Museum. The metro, railway, bus connections, and abundant open space will attract large footfalls to the region, further catalysed by tourist docking facilities (MbPT, Special Planning Authority, 2018). The site will also be close to the ferry terminal network. Aiming to provide year-round access to Elephanta Island for locals and tourists, the Port Trust put out a tender for an 8km ropeway. The proposed ropeway would begin from Mazagaon and take between 15-25 minutes one way, with 20-30 people per car and a capacity of 20,000 per day. These cars would be supported by 8-11 cable towers between 50-150 metres, cutting the ferry journey by half (Onmanorama, 2020; Swarajaya, 2019). While the city station was supposed to have a restaurant, viewing gallery and entertainment facilities, the ASI challenged the landing at Elephanta, stating it should be 1 kilometre from the caves (Hindustan Times, 2017; Shaikh, 2023).

The ropeway proposal finds itself in the debate on contemporary interventions at historical sites. The old pilgrimage route via ferry to the pier will change while the 'semi-commercial' activities threaten the informal shops. However, the path up the heritage steps to the caves through the crowded market will continue. The historic and sacred nature of the site makes it a tourist hotspot that is driving development. With requests for prayer in the caves emerging, the site is fluidly sacralised at multiple points in its history. Contemporary authors suggest blurring lines between pilgrims and tourists (Timothy & Olsen, 2006), sharing similar 'phenomenological and ontological' qualities (Giovine M. , 2008). Now, looking at tourists and pilgrims in the same light, the debate on additions to heritage sites continues to be divided. These fears are not unfounded, with threats of over-tourism visible in some Greek Islands and sites like Machu Pichu. For example, the construction of the Waldschlossen bridge in Dresden cost the site its UNESCO status a few years later (Lardinois, 2017). The ASI also found a ferris wheel catering to visitors set in the historic Naldurg Fort in Maharashtra, which had to be promptly brought down (Paul, 2024).

Simply put, a site's heritage or sacred nature is a magnet for tourists, which applies economic pressures on the landscape. These legal and financial complexities create tension between tourism and heritage (Buckley, 2018). Development triggered by tourism at such sites puts religious and commercial interests at odds, often leading to environmental degradation (Gahalot & Gupta, 2024). While locals on the economy created by tourists, development and conservation working against each other fracture the site's integrity, leading to gentrification and population loss (Leong et al., 2017).

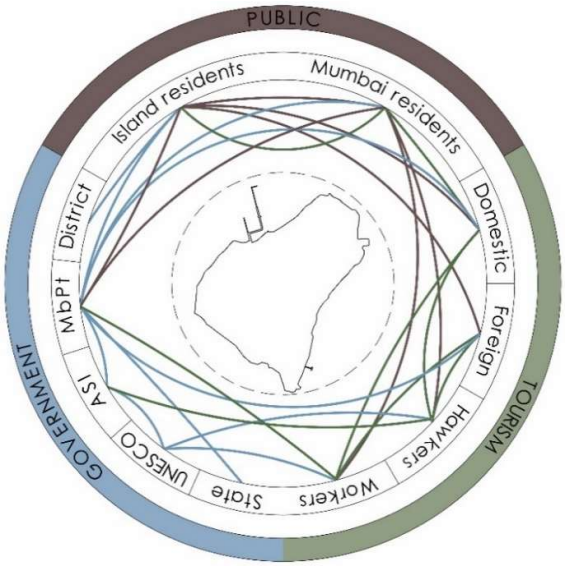


Figure 27- Stakeholder map depicting the complicated network of groups affected. (Author)

11- Case study research

11.1- Managing Heritage sites

While the previous chapters set the context for development on Elephanta Island, the global management of similar heritage sites has also highlighted principles that tie together such contested spaces. UNESCO's World Heritage Conservation branch has a comprehensive toolkit of case studies that implement a mixture of policy and infrastructure planning to manage sites sustainably. Using cases like Wadi Al-Hitan in Egypt, they emphasize the importance of visitor management at these sites (UNESCO- World Heritage Conservation, 2024). Others have also reiterated the need for infrastructure to respect the nature of fragile sites by determining the carrying capacity for the proposed additions (Pedersen, 2002). Particularly in deemed UNESCO sites, these additions must meet higher design, material, and workmanship standards (Shackley, 1998). A few of these operating principles include-

- Limiting access and segregating visitor groups- To prevent wear and tear at the site, there is a need to set a maximum number of visitors and plan backward on how they will be spatially separated through the site.

- Paths and movement-
  Determining set routes and activities to prevent bottlenecks and improve visitor movement through the site.

- Wayfinding and ticketing-
  Signage, advanced ticketing systems, and visitor data can assist in making strategic decisions while preventing overcrowding.

- Increasing dwell time to support local economies-
  Public spaces, markets, and even nature trails increase tourist activities at heritage sites. This increases dwell time in the buffer zones of such sites, benefitting local stakeholders.

- Developing a comprehensive master plan-
  Determining activities suitable for such sites' core zone, buffer zone, and access points allows for strategic infrastructure addition. This will also categorise activities that can and cannot take place.

- Balance between large and small businesses-
  Issues like ownership become crucial at heritage sites since they involve locals who rely on the tourist economy adjacent to such spaces. These affect decisions about adding infrastructure and programming to prevent competition with locals.

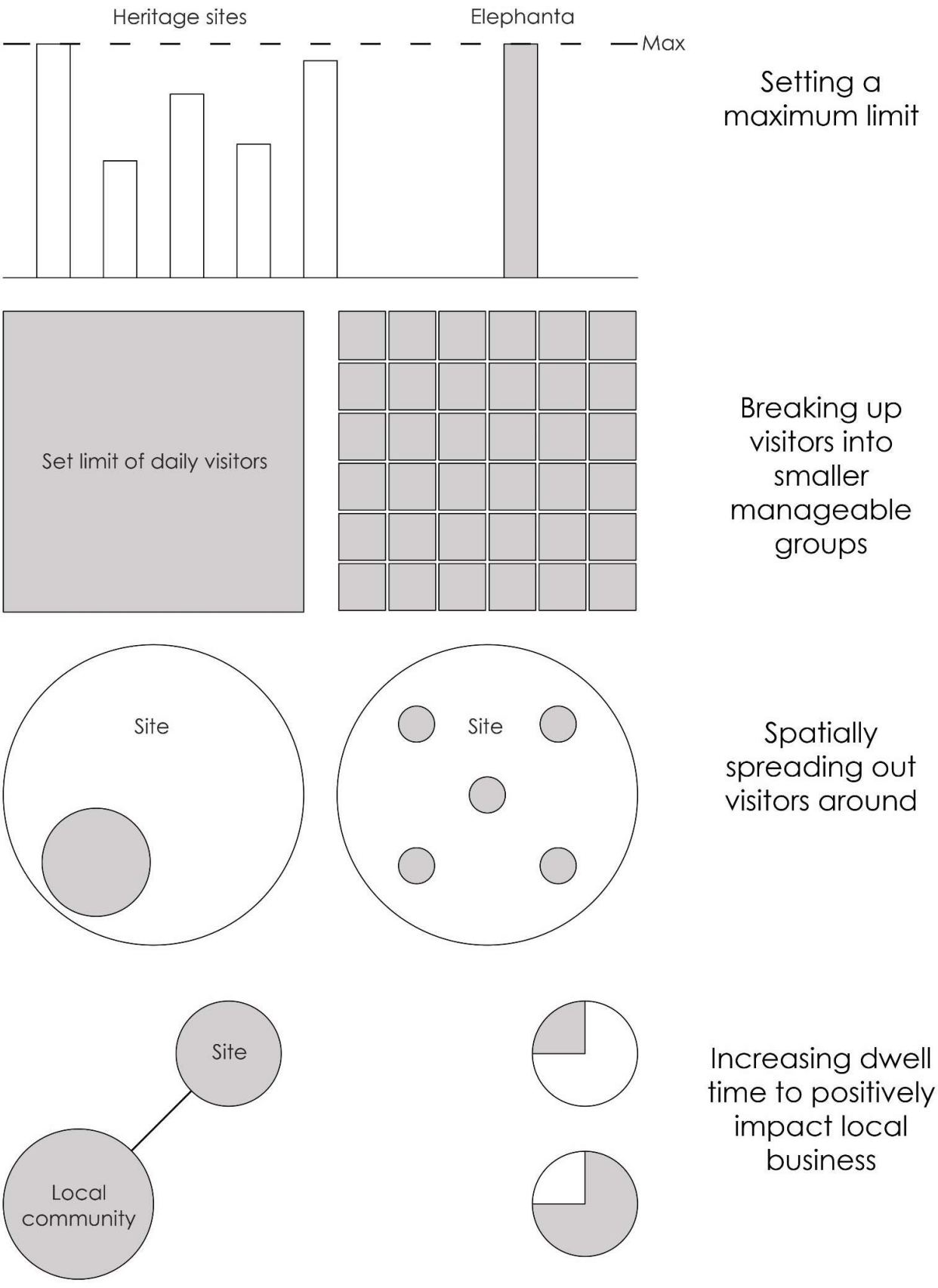


Figure 28- Visualisations of the key learnings for visitor management at Heritage Sites. (Author)

Similar heritage sites on Islands like Rapa Nui in Chile and Mont St Michel in France have faced developmental pressures. Rapa Nui has been unable to adapt to seasonal tourist demands, creating tension between locals and tourists. Increased traffic from cruise ships has led to the contestation of resources, with food being imported from the mainland to satisfy demand (Shackley, 1998).

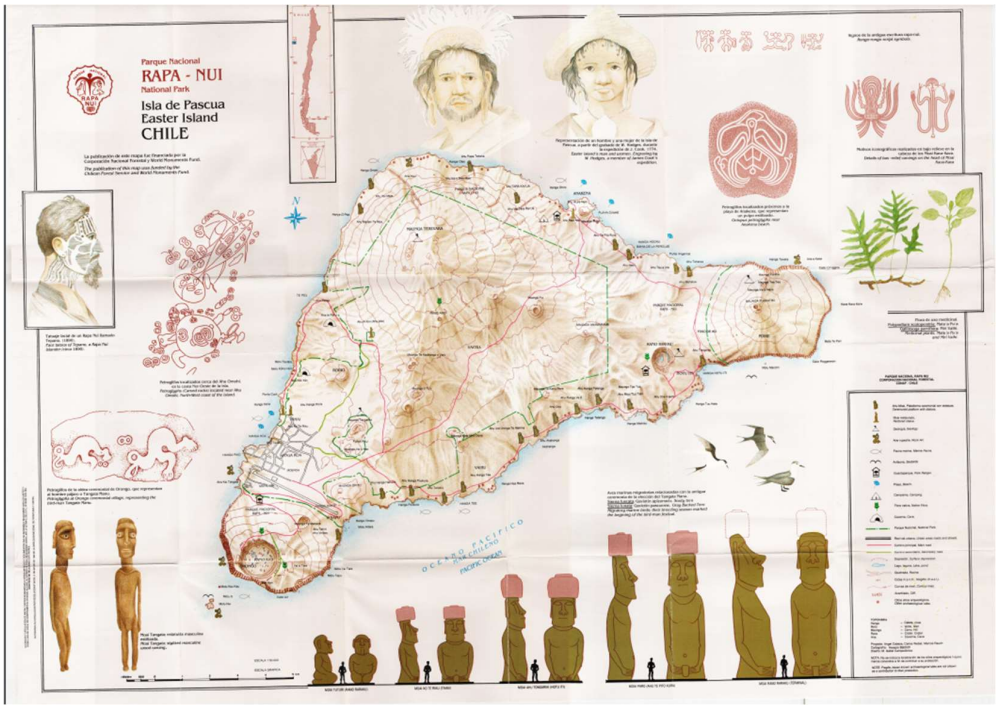


Figure 29- Plan of Rapa Nui Island (Baldrich, Horacio)

Mont St. Michel, another UNESCO World Heritage site, has been far more successful in managing visitors but has still experienced smaller developmental issues. The site is at risk to environmental and natural disasters, while increased tourist footfalls have led to issues of 'presentation of the property' (UNESCO Report) like parking and signage. A wind turbine project was also denied clearance due to its potential impact on the landscape.

Figure 30- Approach to Mont St. Michel (UNESCO)

11.2- Piers and public space potential

As documented in the site study above, the Elephanta pier receives the highest footfall, acting as a median between land and sea. The existing concrete pier also contains most of the formal and informal shops on the site and has the most potential for development. Taking the position that development on other parts of the island can be restricted by densifying and redeveloping the existing pier. The cases of piers below highlight their potential as vital public spaces connecting to the sea. In the case of Elephanta Island, the pier acts as a threshold or buffer that can mitigate excessive footfall on the historic caves. Re-programming the pier to provide spaces to settle and increase tourist dwell time becomes the primary objective.

The case studies below highlight the contemporary position towards infrastructure like piers. Moving forward from the romantic notion of British piers in the 1800s, today they are seen as important public spaces. The cases below have reimagined the position of the contemporary pier with the integration of public and semi-public functions, improving the sea-land connection.

Figure 31- Image of the existing pier. (Author)

Pier 22

Architects: Mostlikely Architecture

Area: 18000 m²

Year: 2024

Location- Vienna, Austria

Figure 32- Plans and images of the first phase of development in Vienna. (Archdaily, 2024)

Faaborg Harbor Bath

Architects: CREO ARKITEKTER A_S, JDS, URBAN AGENCY

Area: 20100 m²

Year: 2014

Location- Faaborg, Denmark

The public waterfront project, with a three-fingered plan, promotes outdoor activities and community engagement. Primarily built of timber, it features zones for resting, swimming, bathing, and interaction. Built with a flexible program in mind, the project has changing rooms, facilities for rowers, a diving platform, a water playground, and a sauna for winter bathers.

Figure 33- The three-pier extension into the sea at Faaborg provides virtual Public Space. (Archdaily, 2024)

11.3- Visitor centres in heritage sites

Considerations for interventions in historic environments-

1. **Character**
2. **Scale**
3. **Form**
4. **Placement on site**
5. **Materials, textures and colours**

CSMVS - Visitor Centre at the Prince of Wales Museum

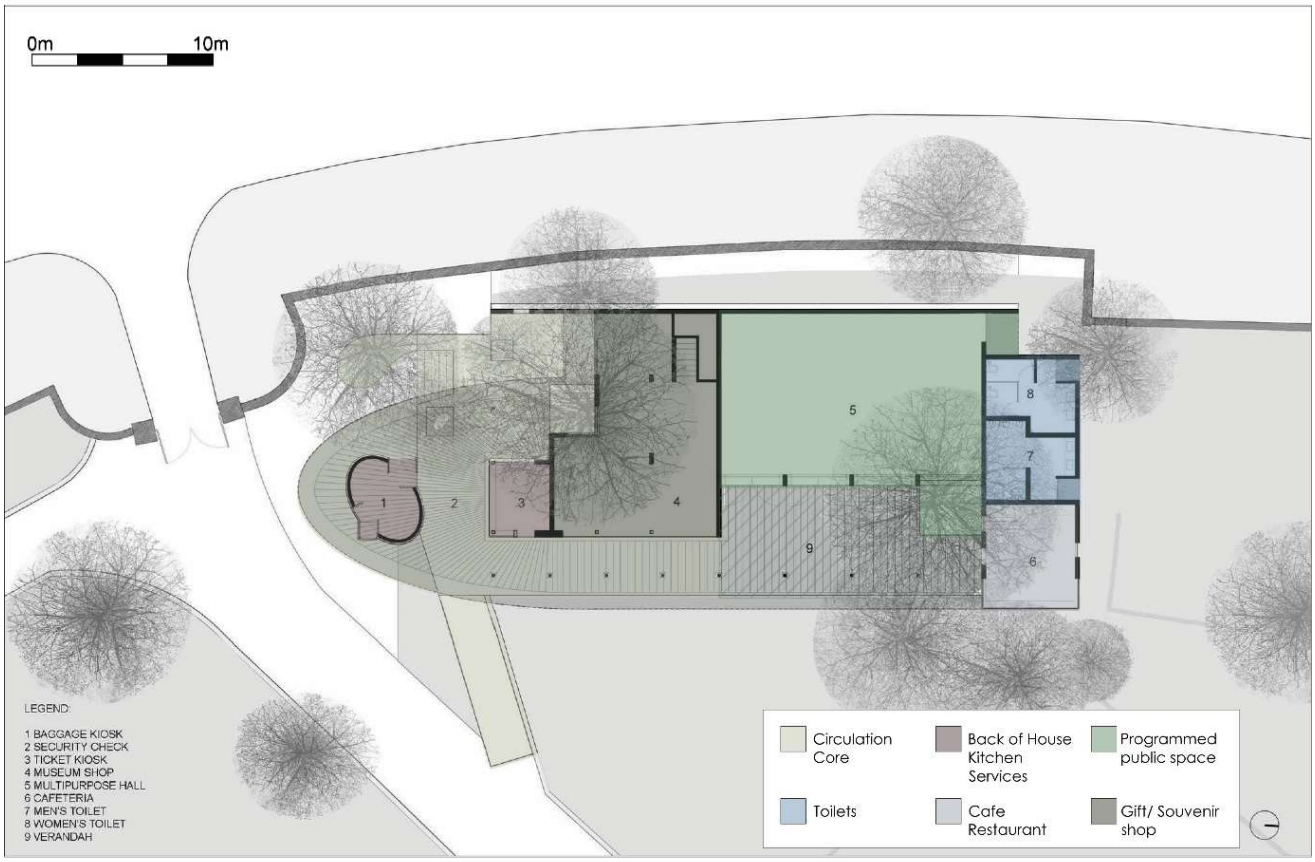
Architects- RMA Architects

Area- 652 m²

Year- 2011

Location- Mumbai, India

Figure 34- Entrance to the visitor centre (Source- Archdaily.)



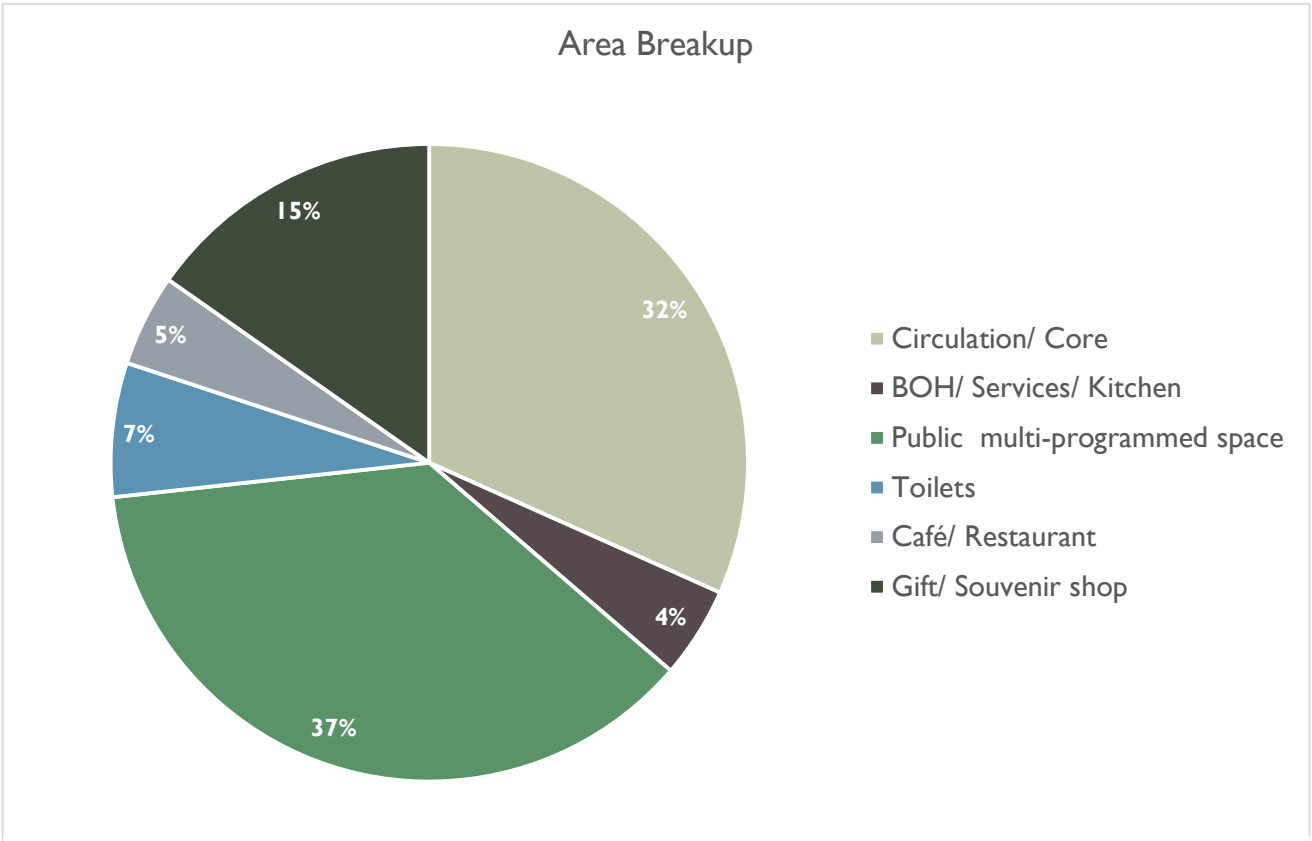


Figure 35- Plan and pie chart comparing 6 major programs and their area (Plan Source- Archdaily.).

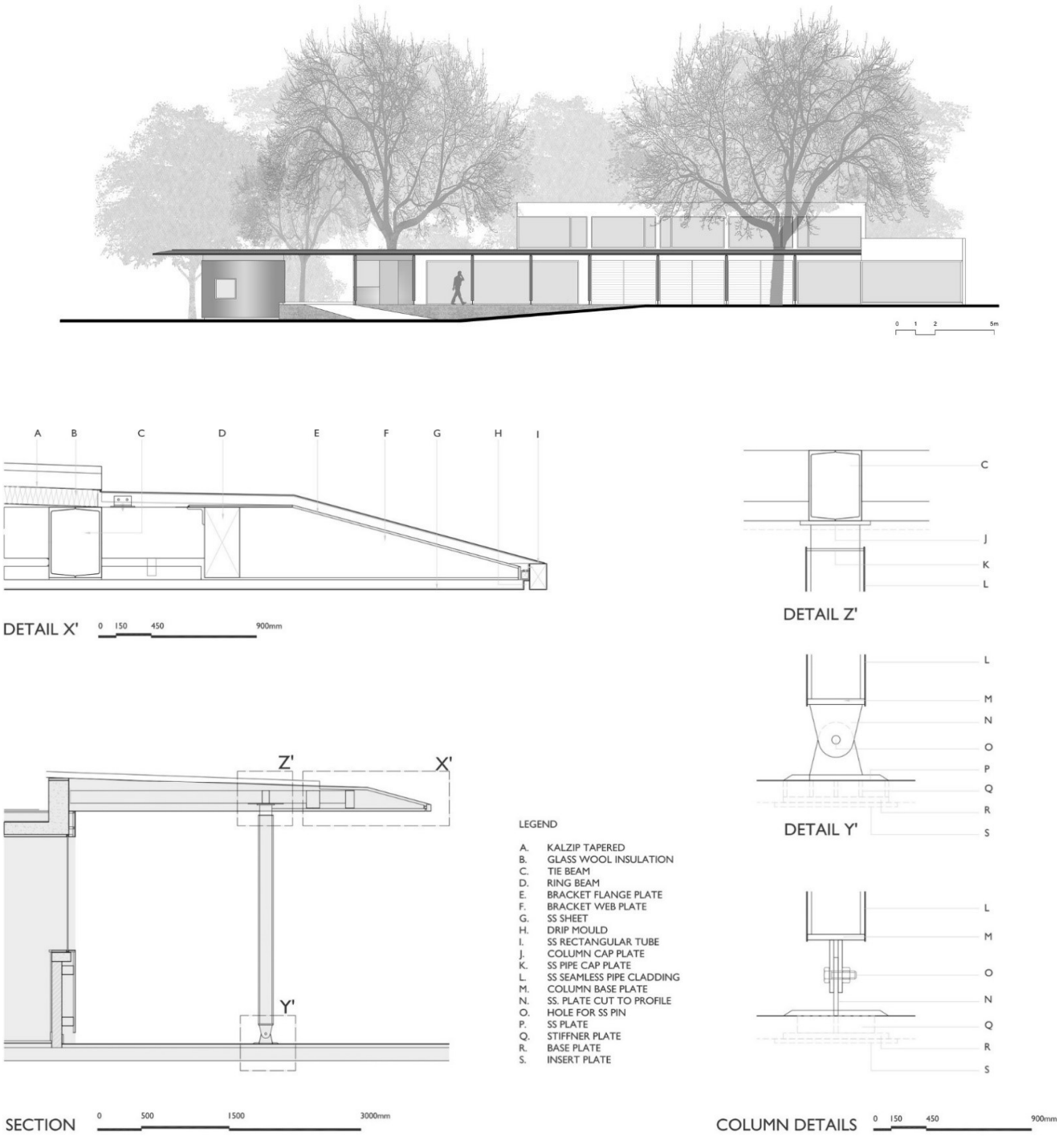


Figure 36- Section and details of the museum (Source- Archdaily).

Hammershus Visitor Centre

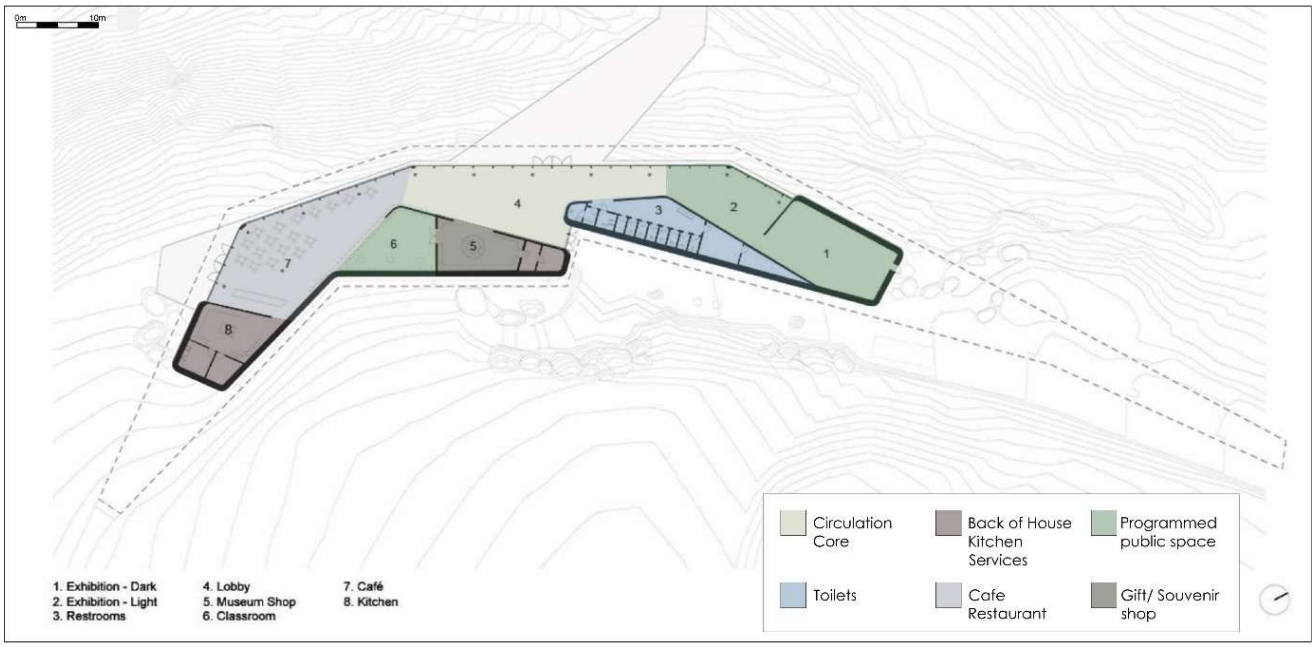
Architects- Arkitema, Christoffer Harlang

Area- 1000 m²

Year- 2018

Location- Hammershus, Denmark

Figure 37- Site images and elevation of the centre. (Source- Archdaily).



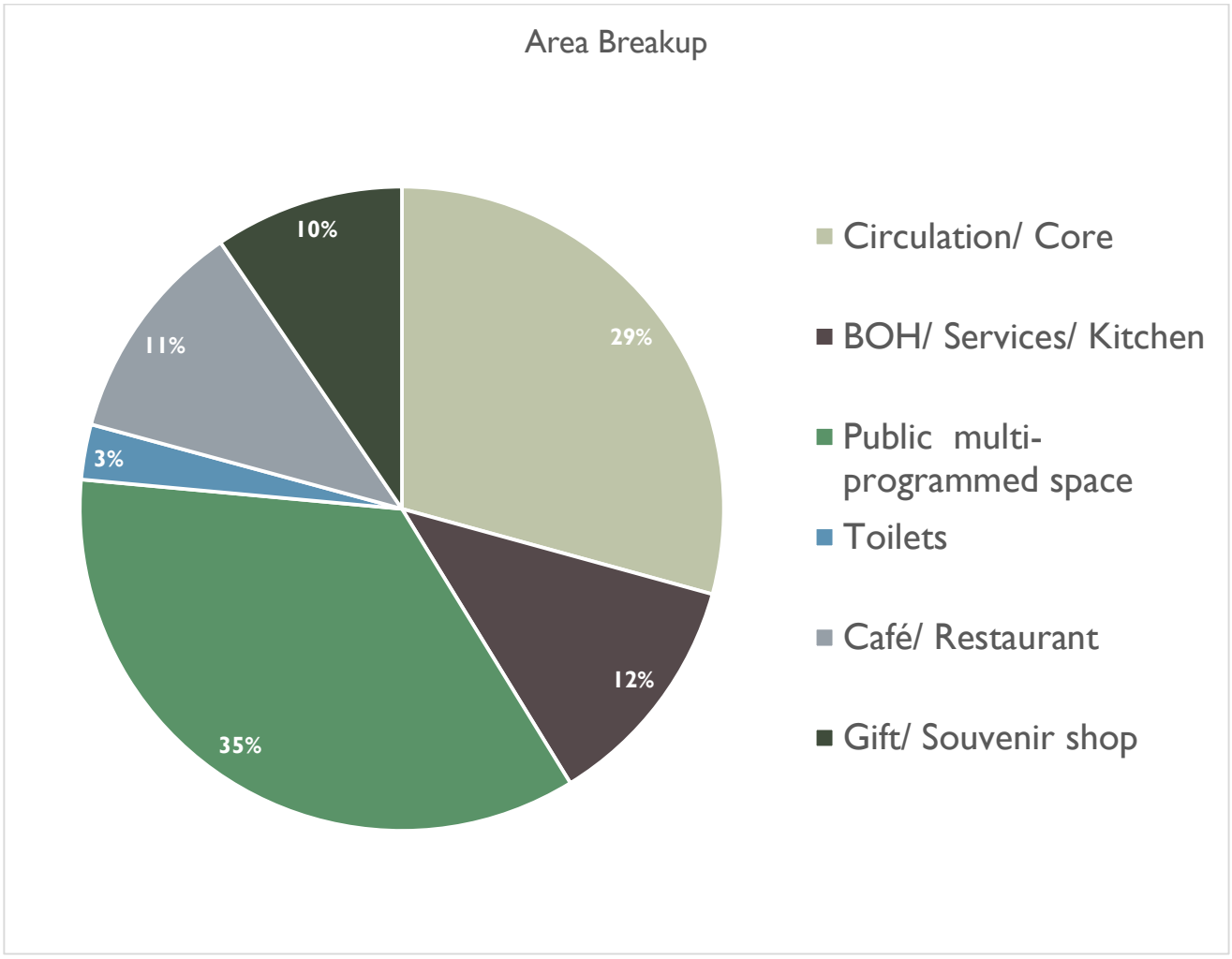


Figure 38- Plan and pie chart comparing 6 major programs and their area (Plan Source- Archdaily).

Visitor Center Unesco World Heritage Site Kinderdijk

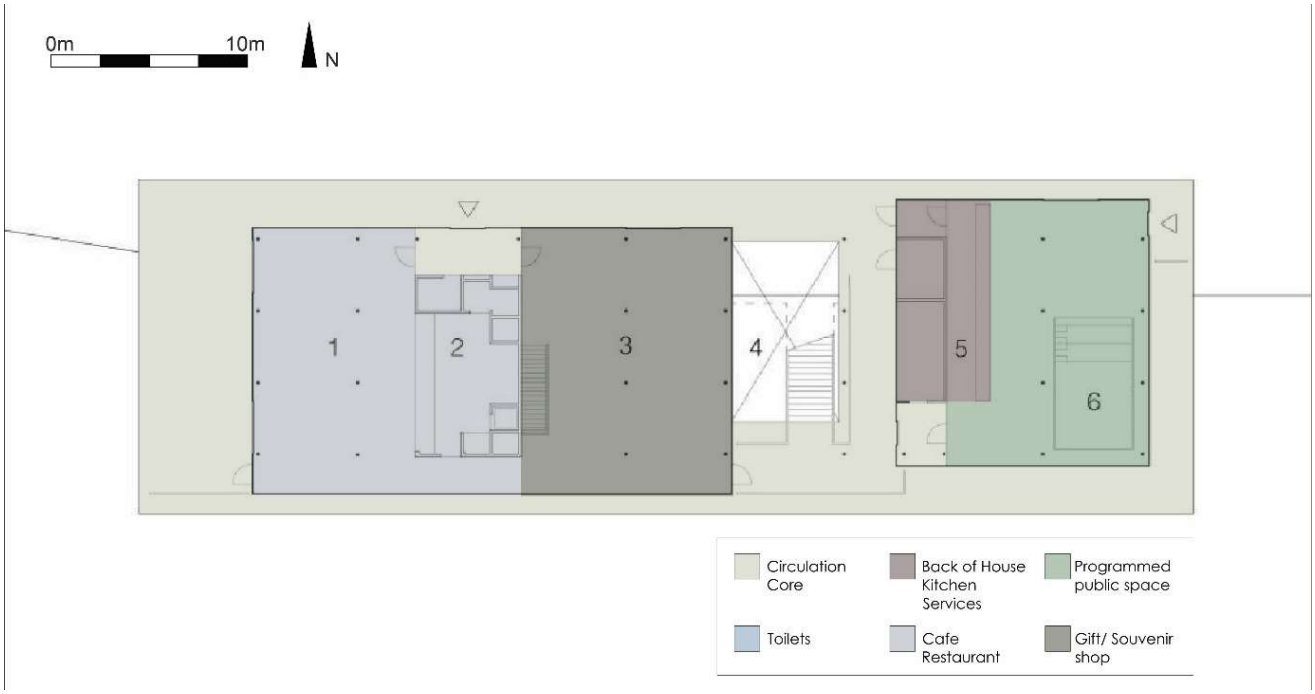
Architects- M& DB Architecten

Area- 1180 m²

Year- 2019

Location- Kinderdijk, The Netherlands

Figure 39- Aerial view of the visitor centre (Source- Archdaily).



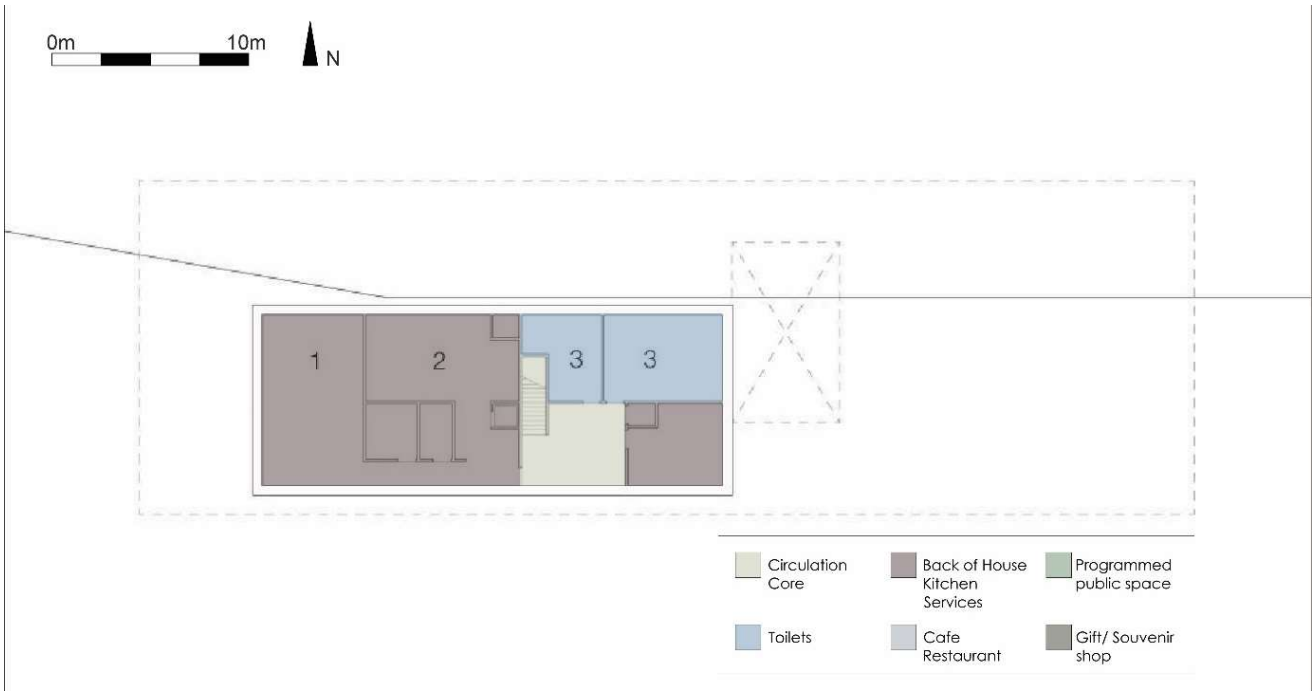
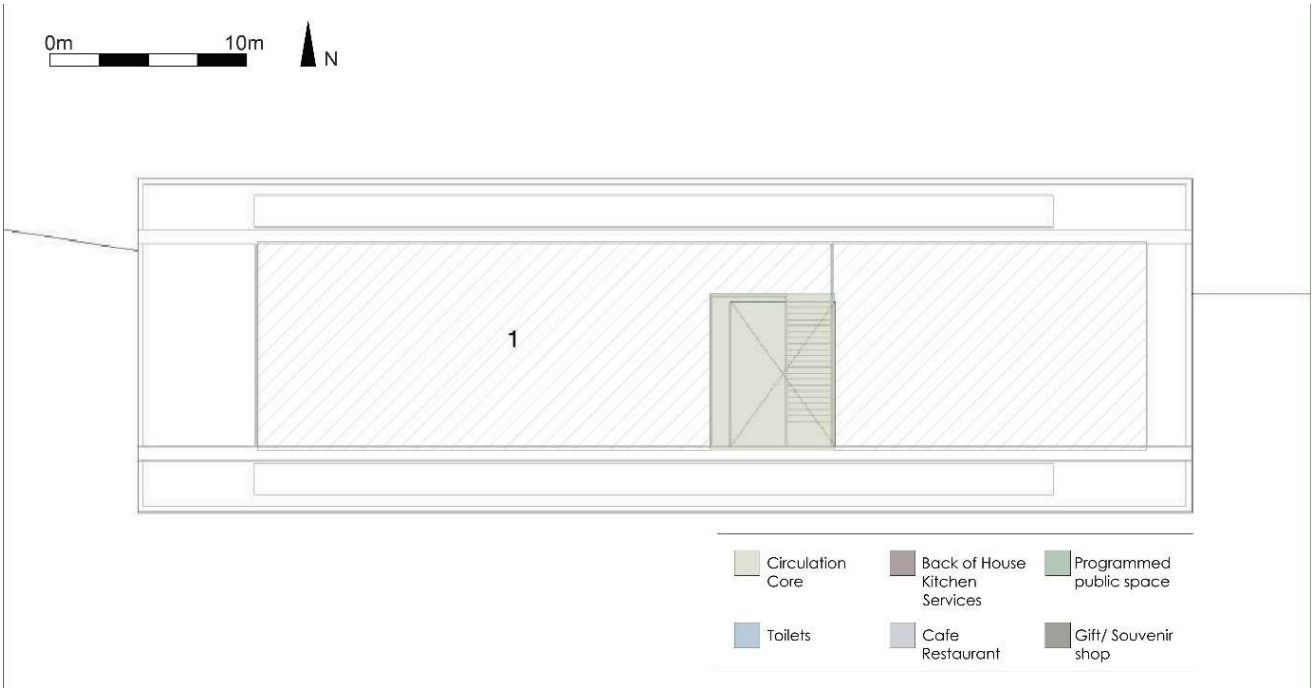


Figure 40- Plans comparing 6 major programs and their area (Plan Source- Archdaily)



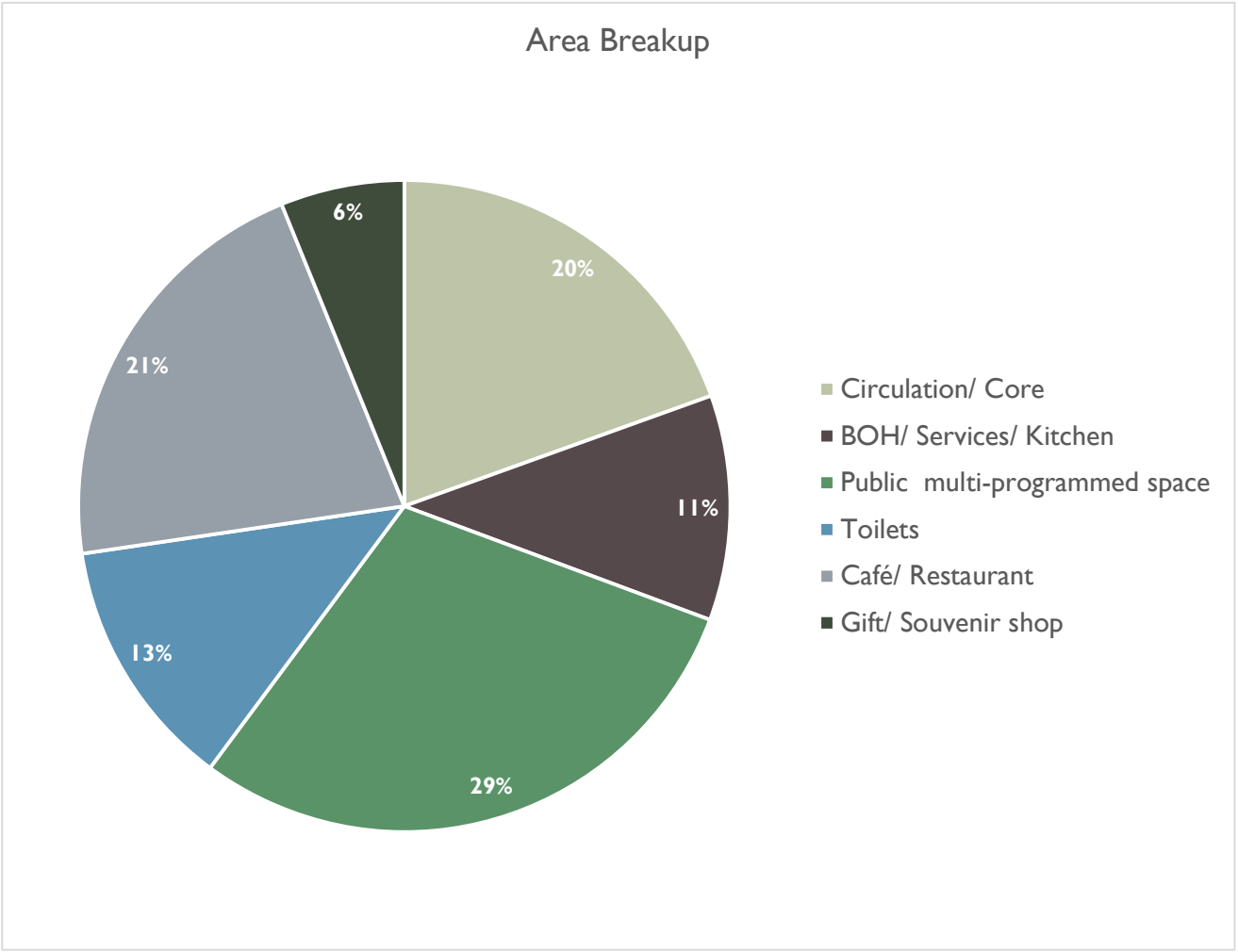


Figure 41-Figure 38- Plan and pie chart comparing 6 major programs and their area (Plan Source- Archdaily).

Area comparison

Breakup	Case 1	Case 2	Case 3	Average
Circulation/ Core	32	20	29	27%
Back of House/ Services/ Kitchen	4	11	12	9%
Public multi-program space	37	29	35	33.7%
Toilets	7	13	3	7.7%
Café/ Restaurant	5	21	11	12.3%
Gift/ Souvenir shop	15	10	6	10.3%

11.4-Crowd Control Elements

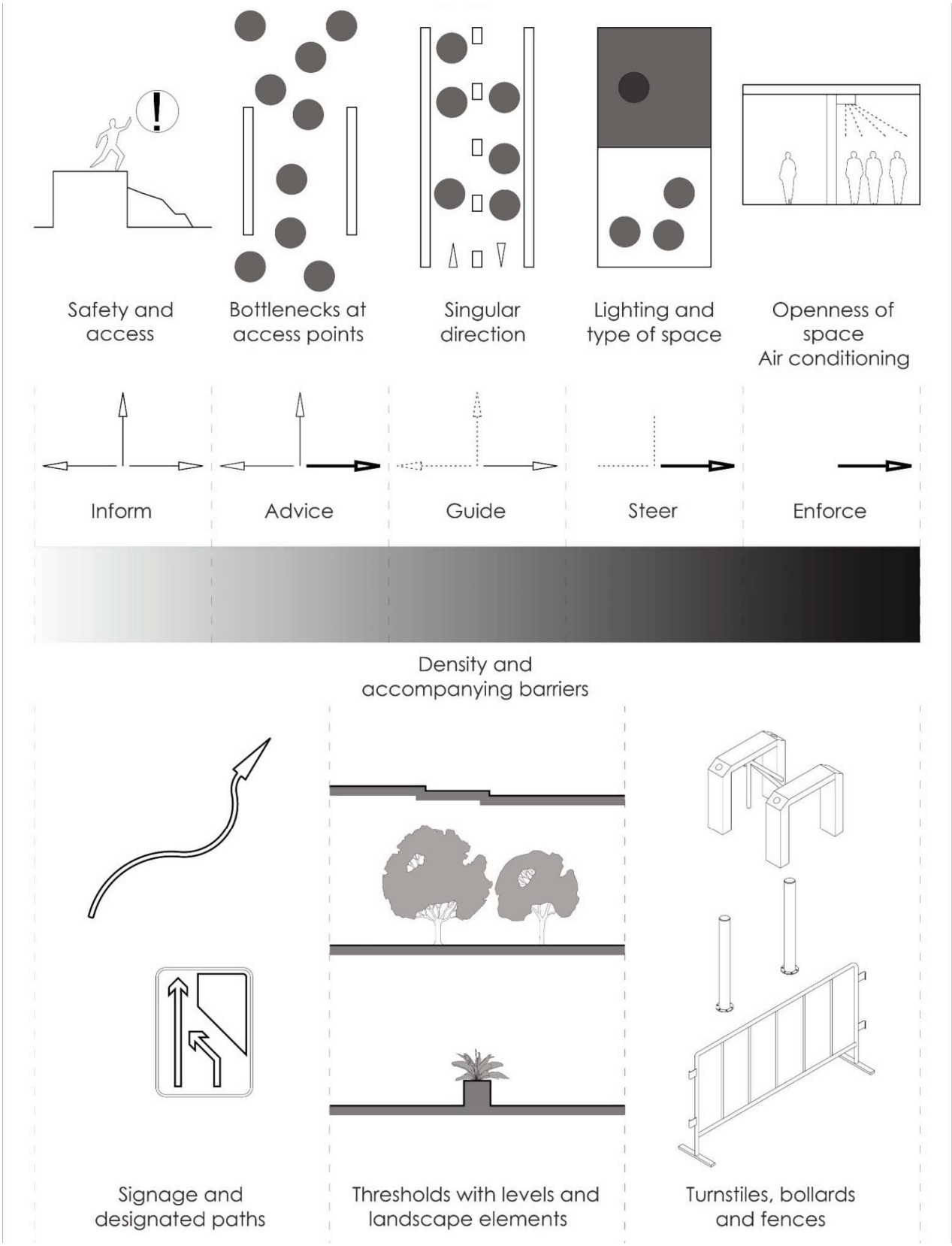


Figure 42- Basic crowd control elements derived fromFeliciani, C., Shimura, K., & Nishinari, K. (2021). Crowd Control Methods Established and Future Practices. In Introduction to Crowd Management (pp. 167–216).

12- Outcomes/ Conclusions

Based on the research in the paper, the key outcomes listed will provide a framework for intervention within the journey to the caves. The key guiding themes of Heritage, Tourism and the Informal economy require integration in order to benefit all the stakeholders involved.

12.1- Framework for intervention

The key conclusions based on the research area

1. Need for limits to the caves and spreading visitors around the island towards other historical sites.
2. Densification of the pier to increase dwell time of visitors.
3. Integrating formal and informal infrastructure and programs to support local residents as well as visitors.
4. Using the existing materials on the island while strategically adding contemporary materials and practices.
5. Proposing an increase in the ephemerality of structures closer to the core zones.

The conclusions listed above aim to tackle the immediate and future concerns of the Island, its residents as well sustainably manage the large inflow of visitors that come to the historic caves. The proposed ropeway threatens the already struggling Island that seeks to benefit through this infrastructure. The double-edged sword could catalyse the problem or address it. The focus of the research and eventually the design outcome involves the re-densification of the existing pier as the first steps in managing the influx of tourists.

12.2- Program overlay

The programmatic overlay for the intervention focuses on the pier and heritage steps leading to the caves. At the XL and L scale a proposal to spread visitors around the site may have negative impacts as well. The logic of focusing on the pier however remains strong even if the proposed ropeway does not take shape. The primary entry point by ferry for tourists on the Island, the pier was also the last addition to the Island built between 2005-07. The proposed program for the pier at the masterplan scale is aimed to increase the dwell time of tourists providing space for informal shops. Along the heritage steps, a terrace farming workshop that highlights the agricultural history of the Island is also proposed. At the building scale the conclusion to add a UNESCO visitor centre at the meeting point of the pier and steps acts as the perfect valve slowing visitors coming up or down the steps. The program for this structure is a mix of the needs of the residents as well as UNESCO centre requirements with a key difference. The souvenir shop and café in the cases studied are left out in order to prevent competition with the Island residents on depend on the tourist micro-economy. These programs as replaced additional toilets and water-taps as well a handicrafts workshops to strengthen the local economy.

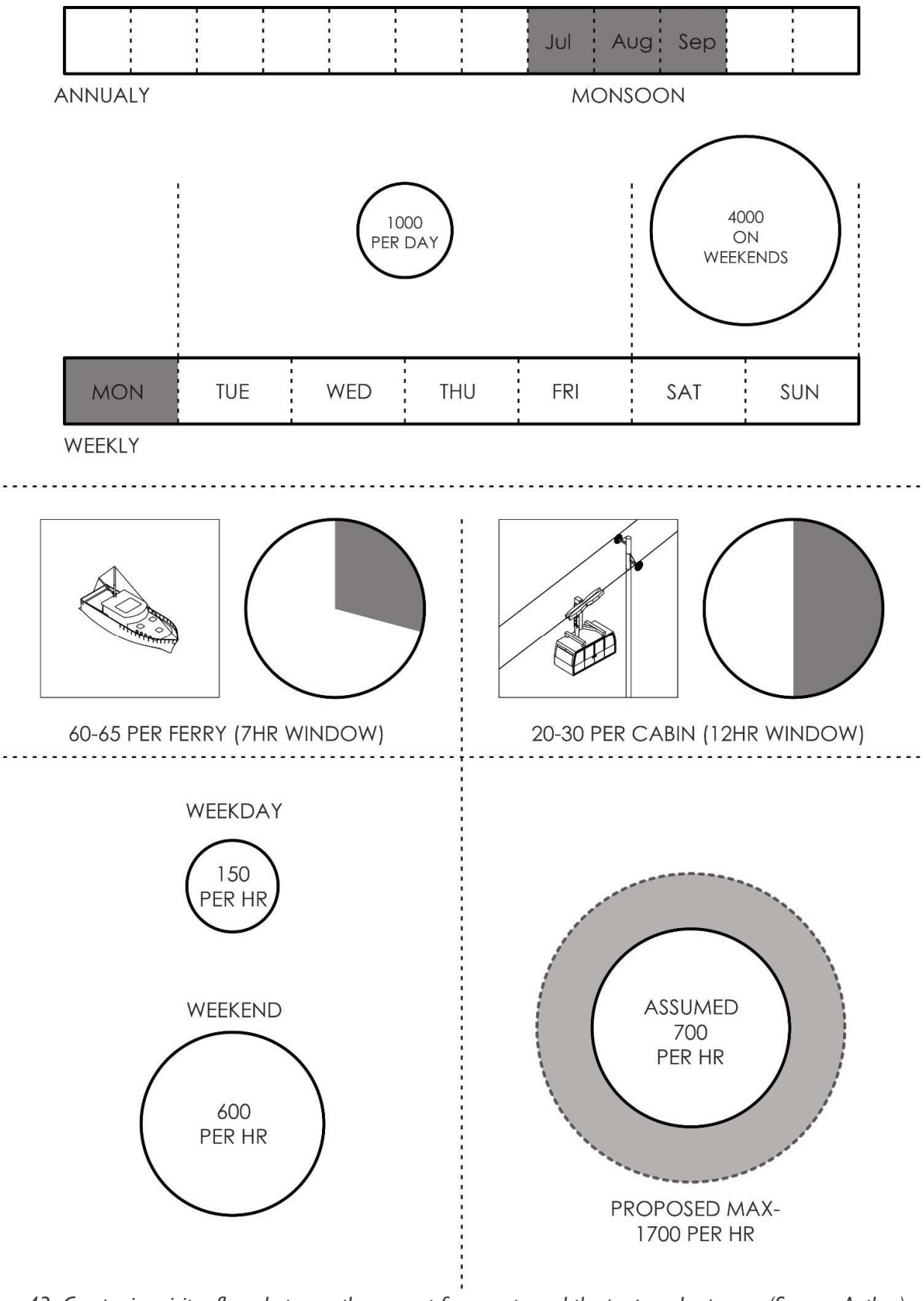


Figure 43- Comparing visitor flows between the current ferry route and the proposed ropeway (Source- Author)

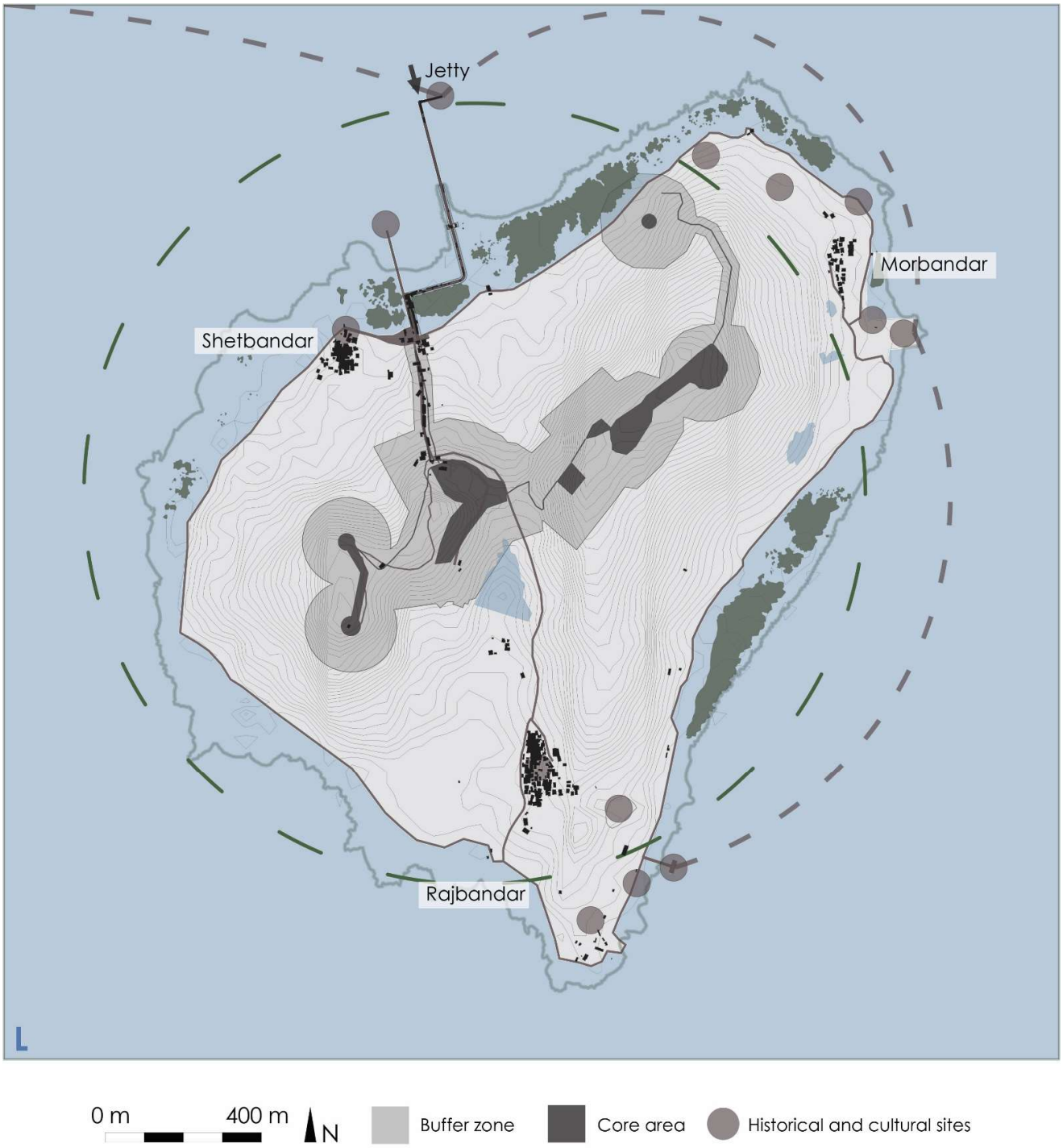


Figure 44- Proposals at the L scale for the island (Source- Author)

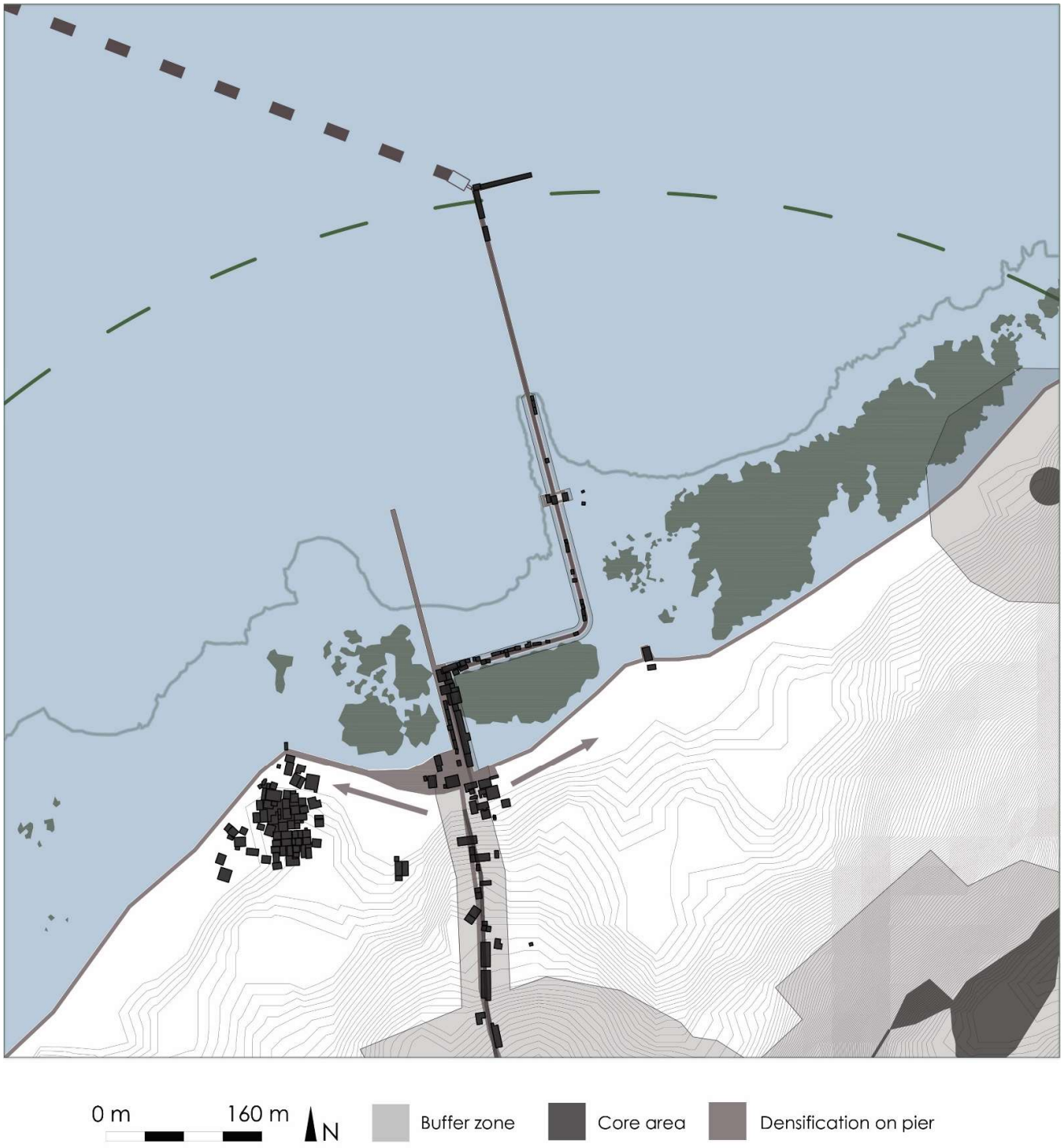


Figure 45- Proposing densifying the existing pier and strentheing routes to other historical sites on the Island (Source- Author).

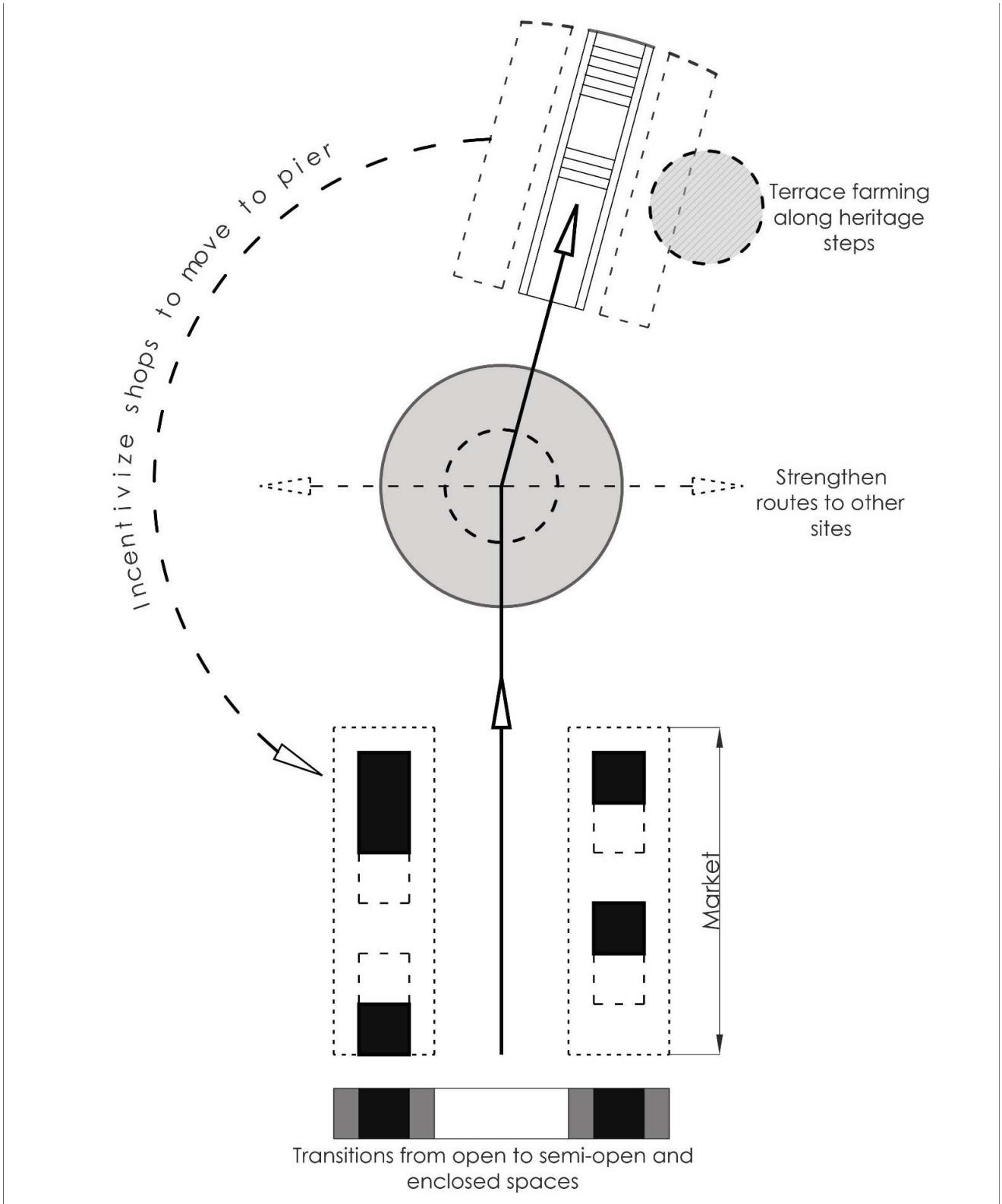


Figure 46- Diagram illustrating the key descisions to inform the design (Source- Author)

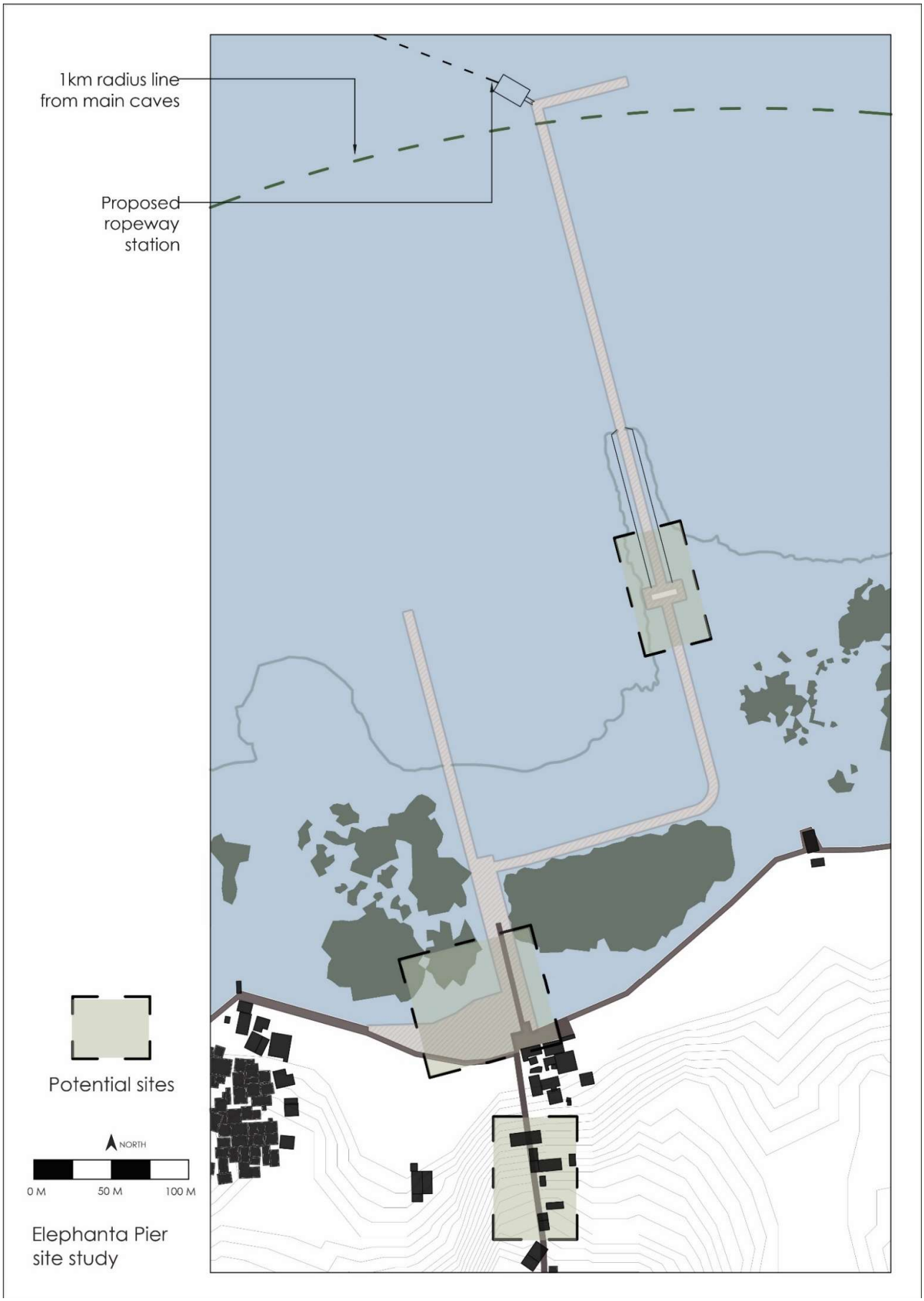


Figure 47- Identifying potential sites for intervening and placing tourist facilities (Source- Author).

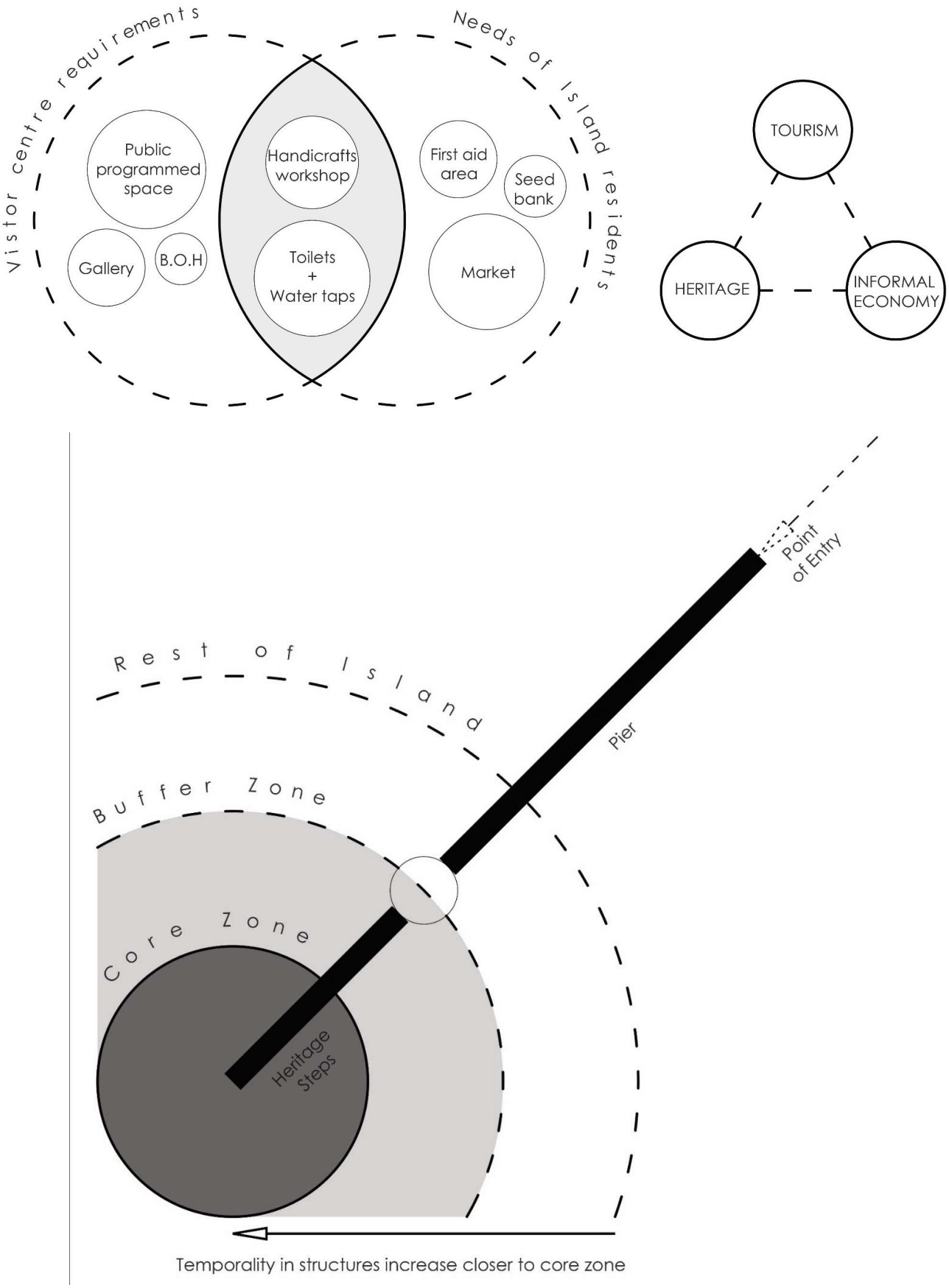


Figure 48- Determining the point of intervention within the journey to the caves. Programmatic overlay including needs of residents and visitor centre requirements (Source- Author).

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