Beyond resorts

The interplay of nature and culture of touristic industry on the island of Zanzibar

Natalia Lialinova

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Beyond resorts. The interplay of nature and culture of the touristic industry on the island of Zanzibar

Tutor:
prof. Daniele Campobenedetto

Co-tutor:
prof. Filippo de Dominicis

Candidate:
Natalia Lialinova

P.225

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Acknowledgment

Dedicated to

my dear Erfan,
my phenomenal brother Ivan,
my sisters Marusia and Sonia,
my mom and dad,
the city of St. Petersburg, where I was born and worked on this thesis,

with the wish of love, peace and sustainability.

Gratitude to my tutors Daniele and Filippo who made me a better architect.

Abstract [IT]

Il settore turistico rappresenta un'importante opportunità di crescita economica nella regione dell'Africa orientale. Tuttavia, la costruzione di resort tropicali sta diventando una sfida, che rappresenta una minaccia per le risorse naturali e culturali locali.

La tesi è un progetto sperimentale di design-ricerca che pone domande ed espone problemi attraverso il design per affrontare il problema della crescita nel caso di Zanzibar in Tanzania. Si ipotizzano scenari utopici estremi per rispondere alla domanda di ricerca: se l'industria del turismo a Zanzibar possa essere armonizzata con il suo contesto ambientale e culturale. Lo strumento che proponiamo di utilizzare è la strategia Lo-TEK che migliora sia la qualità dei servizi turistici per i clienti degli hotel sia la qualità dell'ambiente, del paesaggio naturale e dell'habitat naturale per i numerosi esseri viventi dell'isola, nonché il benessere della popolazione locale.

Questo obiettivo viene raggiunto attraverso un'analisi approfondita che creerà un corpo di conoscenze sugli aspetti economici, naturali, sociali e architettonici di Zanzibar. L'analisi mira a identificare e definire le sfide e le potenzialità della regione nell'ambito dell'industria turistica.

Le industrie del turismo e dell'agricoltura rappresentano più della metà dell'economia di Zanzibar. Proponiamo di integrare le varie attività identificate nel settore agricolo con il turismo in modo da ottenere una serie di vantaggi. Gli obiettivi principali includono l'aumento della resilienza economica e delle pari opportunità, la ridefinizione del turismo come industria multidimensionale che ha il potenziale per integrare le attività locali e l'ecologia in modo sostenibile con le nuove attività turistiche.

Questa visione del settore nella regione tropicale dell'isola di Zanzibar aumenterà la consapevolezza delle risorse naturali e culturali di Zanzibar e trasformerà le infrastrutture turistiche per sostenere una serie di attività che vanno dall'agricoltura e dall'allevamento all'artigianato locale e alle attività culturali.

Il turismo esperienziale è proposto come mezzo per questa integrazione. Nel documento osserviamo come e perché questo fenomeno abbia grandi potenzialità e opportunità di proteggere, conservare e sviluppare l'ecologia e la biodiversità uniche di Zanzibar, aumentando al contempo l'equità nell'accesso alle risorse economiche e naturali e garantendo la sostenibilità ambientale.

Si analizzano dapprima 19 casi di studio di resort, 4 dei quali vengono esaminati in modo più approfondito per valutarne le caratteristiche ambientali e architettoniche. Infine, nell'ultimo capitolo "Progettazione", si selezionano due casi da sottoporre a esperimenti di progettazione. La tesi utilizza disegni assonometrici e sezioni trasversali come strumenti di progettazione per presentare sia una sintesi delle informazioni derivate dall'analisi sia suggerimenti basati sulle conclusioni tratte dal corpus di conoscenze.

Il risultato finale, che incorpora progetti a grande e piccola scala, intende fornire una visione di un futuro in cui l'integrazione tra natura e cultura, popolazione locale e straniera, privato e pubblico, turismo e attività locali garantisce la sostenibilità economica e ambientale. Il modello proposto è in equilibrio tra crescita e conservazione, migliorando la qualità dell'industria turistica e preservando al contempo il patrimonio naturale e culturale unico dell'isola di Zanzibar.

Abstract [EN]

The tourism sector represents a major opportunity for economic growth in the East African region. However, the construction of tropical resorts is becoming a challenge, posing a threat to local natural and cultural resources.

The thesis is an experimental design-research project that asks questions and exposes problems through design to adress the problem of growth in the case of Zanzibar in Tanzania. We speculate on utopian extreme scenarios to answer the research question: whether the tourism industry in Zanzibar can be harmonized with its environmental and cultural context. The tool we propose to use is Lo-TEK strategy that improve both the quality of tourism services for hotel customers and the quality of the environment, natural landscape and natural habitat for the island's numerous living creatures, wellbeing of the locals.

This objective is achieved through a thorough analysis that will create a body of knowledge on the economic, natural, social and architectural aspects of Zanzibar. This analysis is intended to identify and define the challenges and potential of the region within the tourism industry.

The tourism and agriculture industries account for more than half of the economy of Zanzibar. We propose to integrate the various activities identified in the agricultural sector with tourism in a manner that will provide a number of benefits. Key objectives include increasing economic resilience and equal opportunities, redefining tourism as a multi-dimensional industry that has the potential to integrate local activities and ecology in a sustainable manner with new tourism activities.

Such view of the industry in the tropical region of Zanzibar island will raise awareness of Zanzibar's natural and cultural resources, and transform tourism infrastructure to support a variety of activities ranging from agriculture and livestock to local handicrafts and cultural activities.

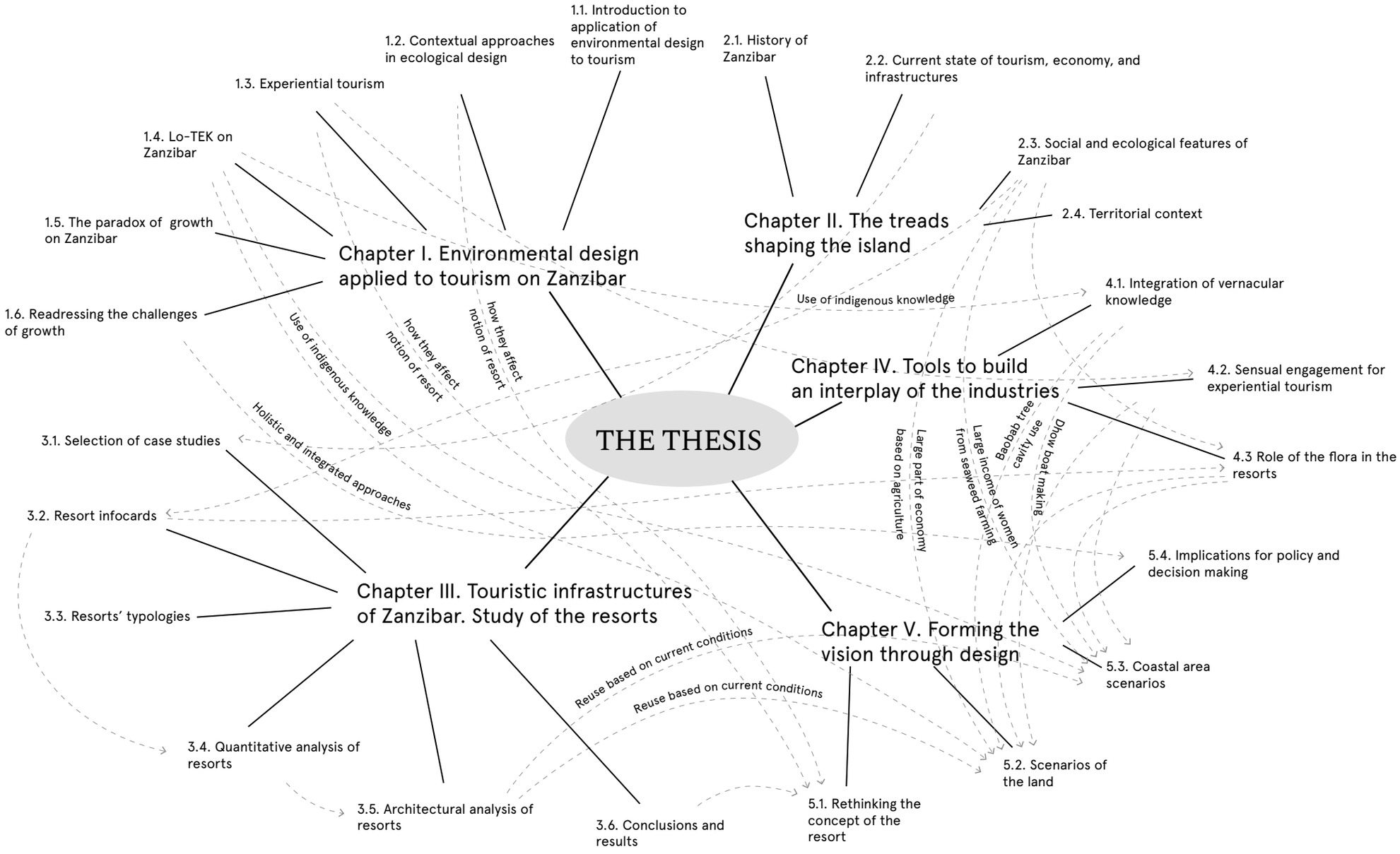
Experiential tourism is proposed as a means for this integration. In the paper we observe how and why this phenomenon has great potential and opportunity to protect, conserve and develop Zanzibar's unique ecology and biodiversity, while increasing equity in access to economic and natural resources, ensuring environmental sustainability.

We first analyze 19 resort case studies, 4 of which are examined in more depth to assess their environmental and architectural features. Finally, in the last chapter "Design", two cases are selected for design experiments. The thesis uses axonometric drawings and cross-sections as design tools to present both a synthesis of information derived from analysis and suggestions based on conclusions drawn from the body of knowledge.

The final result, incorporating both large-scale and small-scale designs, is intended to provide a vision of a future in which the integration of nature and culture, local and foreign populations, private and public, tourism and local activities provides both economic and environmental sustainability. The proposed model strikes a balance between growth and conservation, enhancing the quality of the tourism industry while at the same time preserving the unique natural and cultural heritage of the island of Zanzibar.

Index


Tanzania. Zanzibar
Indian Ocean


THE THESIS
Chapter I. Environmental design applied to tourism on Zanzibar
1.1. Introduction to application of environmental design to tourism
1.2. Contextual approaches in ecological design
1.3. Experiential tourism
1.4. Lo-TEK on Zanzibar
1.5. The paradox of growth on Zanzibar
1.6. Readressing the challenges of growth
Chapter II. The treads shaping the island
2.1. History of Zanzibar
2.2. Current state of tourism, economy, and infrastructures
2.3. Social and ecological features of Zanzibar
2.4. Territorial context
Chapter III. Touristic infrastructures of Zanzibar. Study of the resorts
3.1. Selection of case studies
3.2. Resort infocards
3.3. Resorts' typologies
3.4. Quantitative analysis of resorts
3.5. Architectural analysis of resorts
3.6. Conclusions and results
Chapter IV. Tools to build an interplay of the industries
4.1. Integration of vernacular knowledge
4.2. Sensual engagement for experiential tourism
4.3 Role of the flora in the resorts
Chapter V. Forming the vision through design
5.1. Rethinking the concept of the resort
5.2. Scenarios of the land
5.3. Coastal area scenarios
5.4. Implications for policy and decision making
Use of indigenous knowledge
how they affect notion of resort
how they affect notion of resort
Use of indigenous knowledge
Holistic and integrated approaches
Large part of economy based on agriculture
Large income of women from seaweed farming
Baobab tree cavity use
Dhow boat making
Reuse based on current conditions
Reuse based on current conditions

Chapter I.

Environmental design applied to tourism on Zanzibar

1.1. Introduction to application of environmental design to tourism

The aim of the research is to study the cultural and natural implications of the tourism sector on tropical island in the so-called "developing country", with a focus on the case of Zanzibar island, Tanzania. The thesis seeks to redefine the concept of the resort, the architectural embodiment of the entire tourism industry. What is a resort of capitalism? How the tourism boom and humanity's capacity for transcontinental hours-long flights are shaping the beautiful corners of the Earth? We are aiming to integrate the effects of tourism with the enhancement of the natural and cultural aspects of the context.

Zanzibar is washed by the waters of the Indian Ocean to the east. Historically, it has been a center of trade in the Indian Ocean, connecting Africa to the east making it a multi-ethnic and multicultural island with a unique cultural identity. Nicknamed the "Spice Island", it has been a major producer of spices throughout history. However, during and after the twentieth century, changes in the global economy have challenged Zanzibar's existence and weakened its historical potential. Furthermore, the changes occurring at the end of the 20th century during which Zanzibar became an autonomous region within the state of Tanzania has had drastical effects on the society and economy of Zanzibar. In recent years, the island has turned to tourism as a major industry of strengthening its economy. Tourism has now become one of the pillars of the economy, accounting for about one-third of the market.

The high rate of the growth of tourism is changing the social, cultural and environmental dynamics of the island. Zanzibar is becoming a hotspot for travel to Africa creating certain challenges, such as growing disparities in wealth distribution, displacement of the local population, changing traditions and lifestyles to suit touristic needs, overexploitation of natural resources, intrusion to spaces used by locals for economic activities, and disturbance of the island's unique ecosystem including erosion of coasts, damage to coral reefs, deforestation, and inappropriate waste disposal. It is to address this issue that the thesis aims to redefine tourism through a reinterpretation of the touristic resort as a beneficial solution for both ecological, economic and cultural conservation and development in a sustainable way, while improving the very quality of the customer experience which is done through the introduction of the concept of experiential tourism.

Therefore, the thesis takes a theoretical framework grounded in Critical Regionalism, ecological design, and the practical design principles of the Lo-TEK movement.

Firstly, it is proposed to redefine tourism from an activity focused solely on recreation to one that becomes a means of interpreting and communicating contextual knowledge and understanding. This change of attitude can occur through fundamental changes in tourism infrastructures. In this case, the focus is on tourist resorts, which are reimagined as centers of interpretation of local nature and culture. Through this rethinking, tourism can become a catalyst for the integration of the different sectors of Zanzibar's economy. This approach changes the notion of development from growth in numbers to growth in linkages. Tourism, with its multifaceted dimension, is thus defined as a hub that weaves the different sectors together, redefining resorts as open public spaces where industrial and agricultural activities thrive, contributing to the local economy and providing tourists with a multi-sensory experiential type of tourism.

Secondly, we consider the means by which the objective is achieved. Given the research question and purpose, utilizing ecological design principles with a focus on the context brings us closer to the main objectives of the thesis as they provide the opportunity for a deeper connection between the local economy and culture and the experiential aspect of tourism.

Such approaches limit the influence of biases that can affect design from the designer's perspective. Furthermore, they promote the integration of nature and society by promoting an approach that seeks to overcome the current separation between nature and culture.

Based on these considerations, the principles of environmental design become the theoretical framework of the thesis. The core idea of the Critical Regionalism has been to mitigate the effects of universal design practices and contextual specifications which aligns with the aim of integrating the universality of tourism and its demands with the characteristics of the local context of Zanzibar. The Lo-TEK movement which has been the recent practical outcome of the Critical Regionalism movement integrates traditional indigenous knowledge of the ecology with the necessities of new designs which aligns with the focus of the thesis to observe the causal relationships and spontaneous emergence of local natural and artificial (man-made) ecosystems.

To arrive at such a vision, the thesis draws on the creation of an extensive body of knowledge, analyzing different aspects of the context, both in terms of its economy and ecology and the current state of tourism and specifically of the resorts.

The socio-economic analysis emphasizes the continuous growth of tourism in the future, while showing that the majority of investments in the tourism sector are coming from abroad. Thus, although tourism forms a significant part of Zanzibar's economy, it is largely managed by non-locals and much of the profits do not circulate within the local economy. Meanwhile, the analysis also shows that a large proportion of the population is predominantly engaged in activities related to agriculture and rural lifestyle.
The analysis of the area reveals a spatial conflict between localized ecosystems, local activities and the spaces that tourism captures. This literally might be interpreted as literally a struggle for territory between industries. Resorts are often located on the periphery of the island and in close proximity to the most important ecological treasures of the land and sea. Their location and the flow of tourism intersect with the flow of economic activities of the local population, mainly related to the use of the coastline and the sea. Overall, the analysis points to the inevitable interconnection of tourism, ecology and local activities. This emphasizes the need for the main concept of the thesis that this inevitable interconnection should be seen as a design challenge.

Finally, the analysis of existing resorts is intended to provide a framework for design. Various aspects of 19 resorts located across the island are examined to identify their potentials, strengths and weaknesses. Four cases are selected for more in-depth analysis at an enlarged close up scale using cross sections and construction details. Finally, two cases, which will be the subject of Chapter V, are further speculated using axonometric drawings.

The results of the analysis show that the resorts with the most balanced approach to tourist comfort and local context are also those that integrate environmentally friendly practices such as the use of renewable energy, waste management, management of rainwater harvesting and distribution, use of local farms and products for food consumption. In some cases, resorts are also acting as local community and environmental enhancers through programs initiated by the resorts themselves.

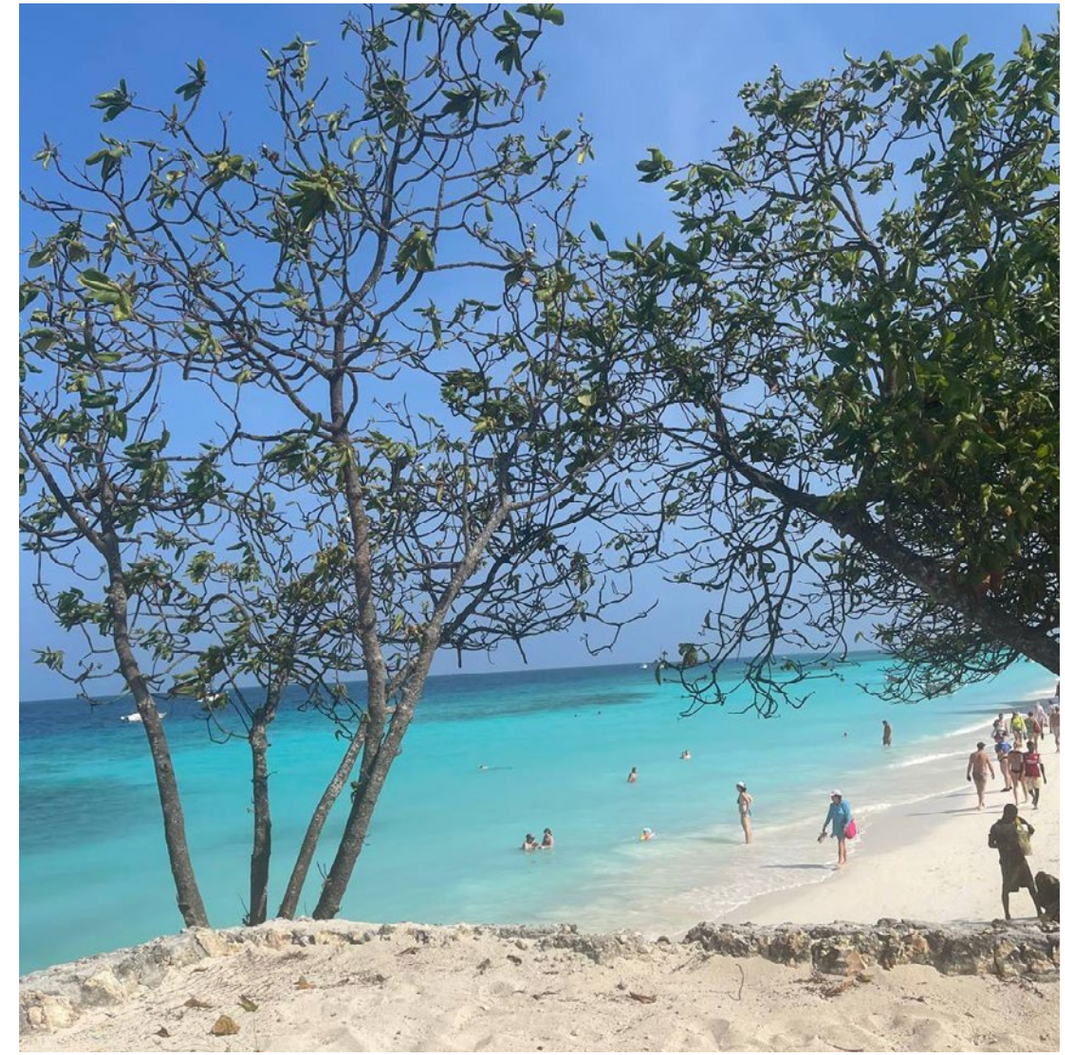
The extraction of contextual characteristics and the identification of potentials according to the current state of the economy, society, ecology, and touristic infrastructures, makes it possible to construct a new model for tourism and resorts which creates a new type of social relationship between the tourist and the site, replacing exploitation with preservation and care through architectural tools. Through the research we imagine

1.1. Introduction to application of environmental design to tourism

utopian scenarios that might appear in the touristic resorts of the tropical islands.

The vision that is offered as a reflection on the research question of the thesis is determined by the influence of the local context and represents a utopian view of the relationship between culture and nature, specifically, that of touristic resorts and their context. The rejection of different types of barriers (tangible and intangible) between the habitats of tourists (resorts) and wild fauna (natural ecosystems) and the activities of the local population (social ecosystems) transforms resorts from isolated islands of comfort and relaxation to centers of economic development, ecosystem enhancement, and preservation of local culture and natural life on the island integrated with the context of space.

The vision draws on local traditional knowledge and designs structures and spaces that offer tourists a multi-sensory experience of the place, engaging all their senses. Thus, the final idea links tourism with ecology, society, the various sectors of the economy, and local culture by defining the activities of tourists through architectural and environmental means. This links tourism to the natural context at a deeper level, which has two implications. First, it promotes the conservation of the natural context in all its dimensions, whether it is the smell of a flower, the sound of a bird, the feel of clean sand and water, or the contemplation of the sunset. Second, it conveys the spirit of the island so that the tourist not only sees the island from the window, but also experiences it in all its manifestation. This would be successful outcome of the thesis to envision integrated, multi layered, experiential, adaptive, inclusive, and symbiotic approaches to resort design over extractive and damaging approaches that currently are being observed in the touristic sector of the tropical islands.



Picture 1.1.
View of the Nungwi coast (photo by author, february 2021)

Touristic resorts have become an important part of the economy of Zanzibar. Historically the island has relied on its strategic location as a trade hub, also, the high price if spices which it produced for its economic prosperity. However, after the reduction of spice prices and the change in the global trade networks, Zanzibar turned towards tourism. The modern notion of the touristic resort has entered into the island and the rate of resort construction is on the rise in recent years. However, the modern touristic resort has clashed with many of the contextual attributes of the island. Although, the tourism sector is providing economic growth and opportunities for a lot of the industries in Zanzibar, at the same time it is threatening the resources of the island in various manners. Below is a summary of the threats that the touristic resorts and industry poses to the island.

I. Environmental and ecosystem degradation:

If we consider the data from the previous chapter regarding the share of each sector in the economy of Zanzibar, we can conclude that tourism and the agriculture and forestry, aquaculture and fishing sectors make up close to 75 percent of the economy of Zanzibar combined. All these activities rely, directly or indirectly, on the wellbeing of the natural ecosystem.

Hence, we can say that the unique ecosystem of Zanzibar constitutes the economic backbone of the island. However, both the increase in population and tourism is contributing furthermore to its degradation, specifically in the coastal areas which are a keychain in the whole natural network. The constant construction of resorts and tourism infrastructures leads to changes in the natural coastal areas and in some cases causes coastal erosions. Additionally, the increased touristic activities in coastal areas cause coral reef degradation and bleaching due to activities such as snorkeling, diving, and boat activities. These also affect the mangrove forests which are an essential part of the ecosystem protecting the shoreline and marine wildlife.

All in all, the increase of use of coastal areas due to the increase in population along with the extensive intrusion by touristic activities leads to the habitat loss of both marine and terrestrial species and the loss of biodiversity. It is important to note that all these effects are the result of the growth of the economy and so they cannot be ceased. It is, therefore, essential to devise actions and solutions which would allow the economy to grow while not only preserving but enhancing the ecosystem which the economy is heavily dependent on.

II. Overexploitation of the natural resources

We saw in the previous chapter that currently there is a 20% water deficiency because of the lack of adequate freshwater resources in the island. With the growth of the population and tourism flow to the island, this important resource will be pressured furthermore. Also, the tourism industry is excessively increasing the use of land and the restriction of access to other valuable resources to the local economy such as coral reefs, seaweed farms, and mangrove forests. On the other hand, the growing economy is overusing the trees which are traditionally used for construction, putting important flora species of the island in the risk of extinction.

This overexploitation could not only pressure the local economy in terms of sustenance and negatively effect the tourism sector, it will, also, have a negative effect on the ecosystem and biodiversity of the island.

For these reasons, it is crucial to take actions which would not only assure a sustainable use of these natural resources by the tourism industry but would also provide solutions for solving the current shortcomings such as

water deficiency.

III. Habitat and biodiversity loss

In addition to the effects that the previous points would have on the loss of biodiversity, the growing trend in resort and tourism infrastructure also contributes to the loss of habitat when the local ecosystems and greenery are removed for construction and in most cases, later are replaced by different and sometimes newly introduced species. However, this negative effect is not constrained to the construction phase of the resorts, it also continues with the activities of the resorts which cause habitat displacement due to disturbances from actions that create noise, water pollution, and physical disturbance.
Apart from the negative effects of the loss of biodiversity on the whole ecosystem, it would affect, also, the various means of income for the locals which rely on marine or terrestrial species for sustenance such as fishery and beekeeping.
Considering that most of the touristic infrastructures are made in the vicinity of the habitat of keystone species, they play a major role in the preservation or degradation of habitat and biodiversity. With the increasing number of excursions from touristic resorts to the hearts of the natural habitat of many species such as natural preserved islands and forests, it is ever more important to devise plans for the organization of activities and growth patterns of resorts which would eliminate the elements responsible for habitat displacement and pollution while integrating with the natural context in a way to further enhance the habitat of all the species in Zanzibar.

IV. Socioeconomic displacement and inequality

In addition to the displacement of natural elements, resorts could also be responsible for the displacement of local communities, especially those reliant on coastal areas for fishing and aquaculture. The constant grow of tourism and the creation of new resorts marginalizes and privatizes the beaches, thus, cutting access to coastal resources for the local people such as areas for seaweed farms and fishery. This causes a change in the circulation of local communities in the island which are sometimes forced to move to other regions still with free beaches. This matter demands more attention when we highlight several points.

First, as we have seen in the previous chapter, more than half the population of Zanzibar live in rural areas. Since the rural population relies more on economic activities which are dependent on access to coastal areas, this privatization of the beaches affects a large portion of the population. Second, as we have seen, more than half the population of Zanzibar consists of females. In recent years, seaweed farming has grown rapidly, becoming an important part of the aquaculture activities of the island and most of it is conducted through the female population which contribute to the household economy. Therefore, access to areas which are suitable for the faring of seaweed is crucial to guarantee equal economic possibilities for the female portion of the population. The final point concerns the fact that most of the benefits from tourism tends to flow to foreign investors since as we have seen the portion of foreign companies owning touristic resorts in Zanzibar is considerably high. This leaves the residents with only a small share of the benefits of the tourism industry through minor jobs in the resorts.

It is for these reasons that touristic resorts need to integrate, along with the natural context they are created in, the local community into their domain both physically and economically. The integration of local communities would guarantee access to valuable resources while also providing possibilities for the tourists to interact with the local population. It would also decrease inequality by providing the means for economic activities

even in the premise of the resorts themselves, consequently DISTRIBUTING THE wealth and increasing the share of the locals of both the natural and the tourism economic potential of the island. Finally, this could open up more sustainable means for the safekeeping of the ecosystems of the resorts through the local population themselves.

V. Cultural and economic vulnerability

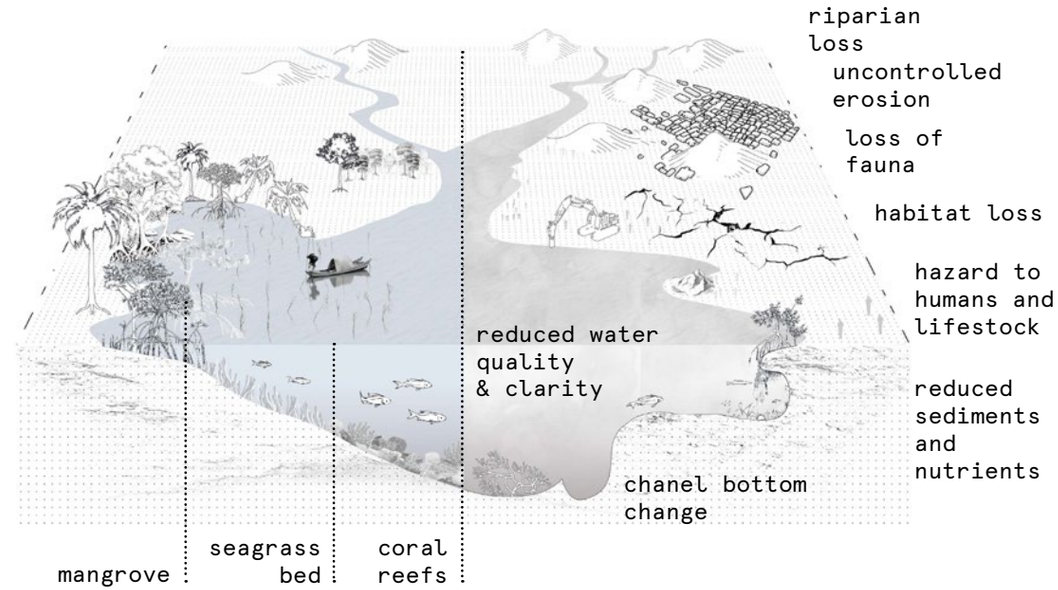
During the pandemic, the tourism industry in Zanzibar was dramatically affected. Considering that this sector has a direct effect on one fourth of the economy of Zanzibar, any threat which could affect in a similar manner the flow of tourism could have drastic consequences. Furthermore, tourism, in its current form, is inevitably a seasonal industry. In Zanzibar, in the best year, tourism flow experiences a decrease of more than fifty percent in the low season. This means that most locals are not able to rely all year round on the income from tourism. Furthermore, the portion of the population which are directly working with the resorts are the most vulnerable in this case since they do not have the flexibility to leave their jobs to focus on other channels of income.

On the other hand, the growth of tourism and the change of the shape of the economy from the traditional form to a modern structure, forces the population to switch from traditional roles in society which are linked to cultural practices to ones which are better adapted to the current situation. This implies the degradation and disappearance of most of the intangible aspects of the traditional culture. The local culture is, therefore, threatened with being consumed by the growing new industries and their demands.

The two discussed vulnerabilities shed light on the importance of increasing the resilience of the population and the economy towards these aspects.

On one side, touristic resorts need to go beyond their traditional role as only places to accommodate foreign tourists and become multi-purpose areas which provide economic support from a variety of activities and resources they could have in hand that are not dependent on the tourism flow. This would increase the resilience of the tourism industry and provide year round income, especially for the local employees of the resorts. This could also be done through the integration of the local traditional cultures into the activities of the resorts, whether as merely for the observation of the tourists or for providing them with the opportunities of taking part in activities which have roots in the cultural context of the island.

Industrial effects present on Zanzibar:



Picture 1.2.
Sunset on the west coast of Zanzibar (photo by author, february 2021)

20th century

In the second half of the 20th century there was a move in various humanistic sciences to confront the problem of biased and ethnocentric attitudes of analysis towards the study of social contexts outside the direct reach of the worldview of the analyst. This was reflected in various fields such as anthropology and archaeology which gave way to movements in these fields which were more context conscious. This tendency also expressed itself in the topics of ecological design initially with the "Critical Regionalism" of Kenneth Frampton (Kallipoliti, 2018). According to Frampton, `the fundamental strategy of Critical Regionalism is to mediate the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place.' (Frampton, 1983). Critical Regionalism aimed on shedding light on the dangers that exist in an ethnocentric and biased approach to design regarding a specific context, especially one which is not the same as the universal urban environment of modern societies.

However, this movement differed from the formal historical revival of post modernism. It cautioned against the `simple-minded attempts to revive the hypothetical forms of a lost vernacular.' (Frampton, 1983) which would lead to a non-authentic mere mimicry of vernacular forms.

In this manner the contextual movements which developed in this period of the history of ecological design gave rise to a consciousness towards the a priori effects of the subjective point of view of the designer towards the interpretation and consequently design of the context and promoted the broadening of the domain of agency from only the subject designer to encompass all the objects of design and the context itself. The context was no longer seen as a preset static stage which is already laid out in all its properties for the designer to approach. As Gandy has outlined regarding the approach to nature: `Rather than a predetermined stage set, nature presents a field of possibilities that are revealed through multiple types of cultural and historical interactions.' (Gandy, 2022)

21st century

This effort for confronting problems of ethnocentric biases in ecological design led to contextual approaches in which, `design involves capitalizing on local places and resources to create magnetic, ecologically conscious architectures.' (Kallipoliti, 2018). This approach has continued well into the 21st century in various literature. One example is the approach of Gandy in his analysis and description of urban nature in which he highlights the necessity of a change of perspective towards what is defined as nature in the traditional European point of view. His argument for the preservation and manner of management and design for areas within the urban fabric which for any reason have given way to a spontaneous growth of an ecology stems from this change of attitude towards nature and its connection with the human subject. As he describes:

'Spaces of spontaneous nature are more than just unusual biotopes; they serve as portals into alternative conceptualizations of agency, identity, and modernity.' (Gandy, 2022).

Furthermore, in several parts of his text, Gandy draws attention to the psychological benefits of these spaces within the urban context and their sensory attributes, highlighting that the approach to an unbiased understanding of a context is inevitably grounded, also, in the understanding of the sensory experiences attributed with it.

1.3. Study of contextual approaches in ecological design

The view resonates also in the works of recent social anthropologists such as Latour who exposes how modern society tends to a priori set the scene of the connection between society and nature by distinguishing, as given, the nature-society distinction. 'The dualisms between Nature and Society/Culture, which constitute one way in which we define ourselves as moderns, hinder our understanding of the world.' (Yaneva, 2022). Latour argues that since the enlightenment, modern societies have moved towards what he calls the act of purification in which nature and society are divided into two separate realms. 'In other words, while premodern societies still confuse nature and society, moderns have managed to 'escape' from that by introducing a partition between Nature and Society' (Yaneva, 2022).

We can again see here the tendency to shift the center of agency from the subject to encompass all that is involved within the activity of design. 'The subject–object distinction is irrelevant according to Latour. Instead, he suggested the use of the term nonhuman in order to replace that of object and to widen its scope'(Yaneva, 2022). This contribution from social anthropology is especially relevant for the ecological designer since it reveals the fundamental bias inherit within the modern approach to nature, thus, revealing the necessity to approach the design of natural contexts from a fundamental point of departure.

The introduced concepts highlight the necessity for the integration of universal industries with local characteristics. In the case of Zanzibar this framework aligns with the need to merge the universality of the tourism industry with the unique natural, social, and cultural aspects. The thesis takes the use of the mentioned theories of ecological design to approach the research question. In this regard, the Lo-TEK movement provides practical methodologies for the integration of contextual attributes into architecture.

Lo-TEK

There have been other more practical approaches to the implementation of non-biased and ethno-tolerant manners of studies of ecological design. One example is that of the Lo-TEK movement. As defined by Julia Watson in her book, 'Lo-TEK is a movement that investigates lesser-known local technologies, and traditional ecological knowledge (TEK)' (Watson, 2020) It is a 'design movement to rebuild an understanding of indigenous philosophy and vernacular architecture that generates sustainable, climate-resilient infrastructures.' (Watson, 2020) The movement is based on the idea that local and indigenous societies bear a body of knowledge embedded in their adaptive methods of interaction with the environment and their myths and folklore which bring them into a symbiosis with their environment. In this regards Lo-TEK brings the attribution of anthropological studies of a society into the contextual approaches to design. The movement is therefore a utilization of Critical Regionalism which aims at offering design solutions which are based not merely on the tangible but also on the anthropological, spiritual, and intangible aspects of a local society. The initial step in the approach towards designing for a context, in the framework of this movement is the creation of a body of knowledge using graphical tools which document the intangible aspects of construction of a society which give way to the tangible objects. This approach brings into focus the social aspects which are inherit in the manner of construction and adaptation to the environment of an indigenous society.

The question that the thesis aims to address is how contextual approaches to ecological design can be implemented in the design of touristic resorts in a twofold manner. First to adapt the design to the context in terms of its tangible aspects (self-reliance and resilience), and second, to extend the possibilities that the contextual approaches provide to offer expressions of the context to the tourists in a multisensory manner promoting high quality *experiential tourism*, hence, transforming the typical resort into an interpretation center for the region. The reflection of some key notions of the proposed approach is following.

Seaside hotel resorts

Seaside hotel resorts are associated with the birth of mass tourism in Europe which further expanded to other regions of the world with the advent of airplanes and facilitation of long-distance transportation. They are establishments which offer accommodation along with other facilities for dining and recreational activities in an autonomous manner situated in the vicinity of an attractive natural setting, satisfying all the needs of the tourists within themselves. They evolve from natural contexts but with greater size they lose their natural setting qualities and become urbanized (Smith, 1991). At the same time they provide economic opportunities for government, businesses, and local communities.

Touristic resorts stand in an intermediary position in relation to their context. From the point of view of the context, they bring in foreign elements whether it be foreign forms of buildings or foreign temporary societies that dwell in them. From the point of view of the tourists they act as a portal to an exotic place framed within the range of activities that the touristic resort offers. Thus, they can be interpreted as *connection hubs* between two different worldviews.

Experiential Tourism

Experiential tourism provides the means for the mitigation of the negative effects of tourism from the touristic side. It paves the way for a new definition of tourism which distances itself from the universal modern notion of mass tourism and moves closer to more contextual and ecofriendly types of touristic activities. But what is experiential tourism?

The phrase experiential tourism started to appear in the tourism literature from the 1990's and into the new millennium (Smith W.L., 2006). The phrase points to a manner of growing tourism demand which, in contrast to mass tourism focuses on the creation of experiences which bring the tourist in close contact with a certain context. A 2023 study on the behavior and preferences of tourists has revealed that experiential activities are taking over conventional travel motivations. (Mabrian, 2023). It is a sensory type of tourism which includes all the five senses and *brings the tourist in contact with the spirit of the place* (Smith W.L., 2006) and includes activities related to wellness, active and lifestyle, nature and food and cuisine. (Mabrian, 2023).

An example of typologies of touristic infrastructures providing for this type of tourism are *interpretation centers*. 'Visitor centres are not destinations but serve as portals to a site that assists people in their quest for self-renewal and personal growth. Visitor centres are facilities that prepare travelers physically, mentally and spiritually to *experience a special place*.' (Smith W.L., 2006). In this regard, as an example, centers which are utilized for highlighting a natural setting should be `land-based, serve the local community and *foster sustainable relationships between people and the earth*' (Gross and Zimmerman, 2002)

A set of standards which are derived from the literature review concerning

1.4. Rethinking the industry: experiential tourism

experiential tourism and which are of relevance to the topic of the current research are determined below (Haugen et al., 2004; Hedin et al., 2005):

- People create meaning through direct experience.
- Experiential tourism draws people into local nature, culture and history.
- Experiential tourism is low impact, low volume and high yield.
- The desired outcome of experiential tourism is to achieve a complete participatory experience that provides new knowledge and authentic experiences.
- Cultural elements are shared in an atmosphere of traditional ways of life.
- Experiential tourism shows rather than describes.
- *Experiential tourism engages all five senses.*
- Experiential tourism includes `the story of the place.

It is noteworthy to mention that the context awareness inherit in the characteristics of experiential tourism is the common point where the thesis aims to connect ecological design with the tourism market.

Picture 1.3.
Dining in the Breezes Beach Resort (photo by author, february 2021)

To implement the principles of experiential tourism according to the research question the Lo-TEK approach will be the link between the necessary aims of the thesis, the body of knowledge, and the architectural means forming the final vision.

Lo-TEK aims at turning the focus in environmental design from high-tech modern solutions towards softer and indigenous methods and techniques of construction. In contrast to the idea that indigenous innovation is unsophisticated, uncomplicated, and primitive, `Lo—TEK aligns to today's sustainable values of low-energy, low-impact and lowcost, while producing complex nature-based innovations that are inherently sustainable' (Watson et. al. 2021). Lo-TEK is thus, considered as a source for innovative solutions which adhere to the environmental context.

The difference between vernacular approaches and Lo-TEK comes down to the fact that within the Lo-TEK movement, unlike vernacular approaches which imitate the architectural language along with the traditional methods and techniques, the aim is to integrate indigenous solutions with the modern design, therefore providing innovation inspired by tradition. As Watson continuously hints at in her book indigenous technologies give "clues", "inspiration", and "models" for a built environment with soft systems that collaborate with nature (Watson, 2020). Thus, the aim of Lo-TEK is the scaling up of indigenous technologies in order to come up with innovative solutions for the problems that are raised by current environmental and social threats.

Some case studies of the practical use of Lo-TEK are the floating schools in Bangladesh by the architect Mohammad Rezwan and the rice terraces on top of Thammasat University in Thailand by LANDPROCESS studio.

Picture 1.4. Local workers assembling temporary structures using coconut palm leaves. East coast. Terrirory of Breezes Beach Resort (photo by author, february 2021)

1.5. Concept of Lo-TEK applied to the environmental and urban challenges

Pictures 1.5 . Solar-powered floating school out on the water. (Image source: Desigboom. Accessed November 24, 2024)

Picture 1.6. Solar-powered floating school docked with students aboard. (Image source: Desigboom. Accessed November 24, 2024)

Floating schools of Bangladesh

Mohammad Rezwan is an architect from Bangladesh who in 2002 initiated the organization named Shidhulai Swanirvar Sangstha to provide a solution for the problem of annual flooding in Bangladesh and how it poses a problem for children who lose access to their schools due to flooding. His proposal was the creation of floating boats so that if the students could not go to school, the school would go to them. His idea, as he describes in one of his interviews was inspired by his culture of living with nature and its coping capacity (Runge, 2023).

The boats are made using local boat making methods along with the local weaving techniques for making thatched walls. The boats which started of as only places for teaching have developed to include various facilities including libraries, health clinics, playgrounds, and floating training centers with wireless internet access which according to the website of the organization serve close to 150000 people in flood prone areas.

The boats which were designed by Rezwan himself are innovative in the way that they integrate local boat making and wall weaving methods to create a new type of boat which serves a new type of institution that offers a solution for an environmental problem. In this regard, it is a successful example of the use of the Lo-TEK approach to design connecting traditional methods with contemporary needs.

Rice terraces on top of Thammasat University

The LANDPROCESS studio, to revive the land on which the Thammasat University stands, has created a rice terrace on the roof of the university building. This decision was made on the basis that rapid unregulated

urbanization on rice producing regions has transformed the once fertile marshlands, acting as an important sources of food, into concrete developments.

The design was inspired by the traditional agricultural practices on mountain terrains across south east Asia. The roof integrates the concept of terraced rice fields with modern green roof technologies to create a roof which on one hand slows down runoff up to 20 times more efficiently than a conventional concrete rooftop. On the other hand it is a productive organic rooftop farm (Asia's largest) offering sources of food for the region. (Landprocess studio, 2019).

This is another example of the Lo-TEK approach in which a traditional manner of coping with the environment for agricultural gains is infused with modern technology to provide a solution for the urbanization process which has been eliminating the rice fields of the region.

These two cases are intended to demonstrate how local technology can be used as the means for new design which would address social or environmental issues. In the case of Zanzibar, the integration of the aformentioned technologies and practices with the tourism industry acknowledges the problems posed in the beginning of the chapter. By connecting the various industries and craftsmen with tourism, they weave the economy together thus increasing the resilience of the community and promoting equality.

This is in line with the research question of the thesis related to harmonizeing the tourism industry in Zanzibar with its ecological and cultural context so as to boost the economy while mitigating the negarive effects of tourism on the island.

Picture 1.7. Thammasat University rooftop inspired by traditional rice cultivation. (Image source: LANDPROCESS. Accessed November 24, 2024)

Picture 1.8. Thammasat University rooftop rice terraces. (Image source: LANDPROCESS. Accessed November 24, 2024)

1.6. Readressing the challenge of growth. Interplay of industries

The methodology of the thesis is based on an extensive study of the context in various scales and themes to create a multi-dimensional body of knowledge on which to base the design upon. The aim is to draw out main attributes of the context both in terms of tangible and intangible features to identify as the grounds and requirements of the design. The body of knowledge is based on three modes of analysis.

First, an analysis of the territorial level consisting of the various ecological, social, and economical aspects of the island. This part is conducted using data driven from demographical and economical sources combined with GIS tools to map the various data in a spatial manner and arrive at a holistic picture of the connection between the various data and their correlation with space.

Second, following the methodology of the Lo-TEK approach, a study of the vernacular construction methods is examined both regarding its tangible and intangible aspects and is synthesized and documented using graphical tools. This part draws insights into the local use of materials, vernacular construction methods, various activities taking part around the process of construction, and the various architectonic features of the local architecture.

Third, an extensive case study of the current touristic resorts in Zanzibar is conducted to provide insights into the features of the current state of tourism infrastructures and give a holistic image of the strengths and weaknesses, possibilities, and opportunities that could be further implemented in the design of a touristic resort. This is done by the creation of info cards for each case chosen from around the island providing data regarding their orientation in the island, their context, morphology, used materials, and sustainable attributes.

This phase is concluded with the attribution of qualitative indices to the cases to arrive at an evaluation of the cases and be able to understand, in a comparative manner, the approaches to resort design which are better adapted to the context of Zanzibar.

Fourth, a list of sensory experiences is analyzed using the opinions of tourists to Zanzibar coupled with the sensory experiences attributed to the local population to highlight the main attributes which are regarded as the main points of strength in Zanzibar for an experiential tourist.

Finally, the various data from the body of knowledge are integrated in a comparative analysis to arrive at conclusions and requirements for the design of the touristic resort.

The second part after the design of the body of knowledge includes the chose of five case studies and the proposal for their design and modification in a way which would increase their self-reliance and adaptation to the context while *transforming them into portals of expression of the local context* both regarding its tangible and intangible aspects.

Ranging from mere philosophical stances to the more practical approaches, what all the described literature have in common can be summarized in two main points:

- Since architecture is inevitably entangled with social attributes, like all social sciences it has to be aware of the biases that from the onset the designer or planner could impose on the design process. Because of architecture's tangible and direct affect on societies and contexts this awareness becomes ever more urgent.
- In the case of designing for a specific context, whether it be natural or cultural, the designer should start from a more fundamental step of allowing the context to express itself by initiating the creation of a body of knowledge which grounds itself on the common ground between the tangible and intangible aspects of a context and culture.

This is the theoretical ground on which the current thesis bases itself upon. The aim is to investigate the implementation of the current contextual approaches to ecological design in the framework of a design topic. The object of investigation is chosen as the design of a touristic seaside resort in the coastal areas of Zanzibar. The logic for this choice comes from various sources. First, Zanzibar has a rich and unique culture consisting, also, of specific construction methods in symbiosis with the environment.

Second, Zanzibar is a developing region moving towards integrating aspects of universal modernization into the fabric of its society. This is while tourism plays a key role in the economy of Zanzibar and has become a backbone for development. Third, while the growth of tourism has brought higher rates of employment and development, the rapid increase of the number of touristic resorts in the island threatens to abolish the main source of the islands touristic potential which is its natural and untouched areas. Therefore, the main problem which was highlighted in the movement of Critical Regionalism becomes relevant in the context of Zanzibar. Consequently, there is a need for an extensive contextual approach regarding touristic infrastructures in order to guarantee a sustainable future for the economy of Zanzibar.

Picture 1.9.
Locals on the east coast. Terrirory of Breezes Beach Resort (photo by author, february 2021)

Chapter II.

The threads shaping the island

The aim of this part is to extract the main attributes of the island regarding its culture, economy, resources, social aspects, and ecology. Following the research aim which is to redefine tourism as an environment-friendly activity this chapter makes an important part of the study phase. We start from a timeline of the history of Zanzibar to make a clear picture of the cultural and historical potentials and challenges of the island after which we move to statistical and demographical analysis related to the economy and the society.

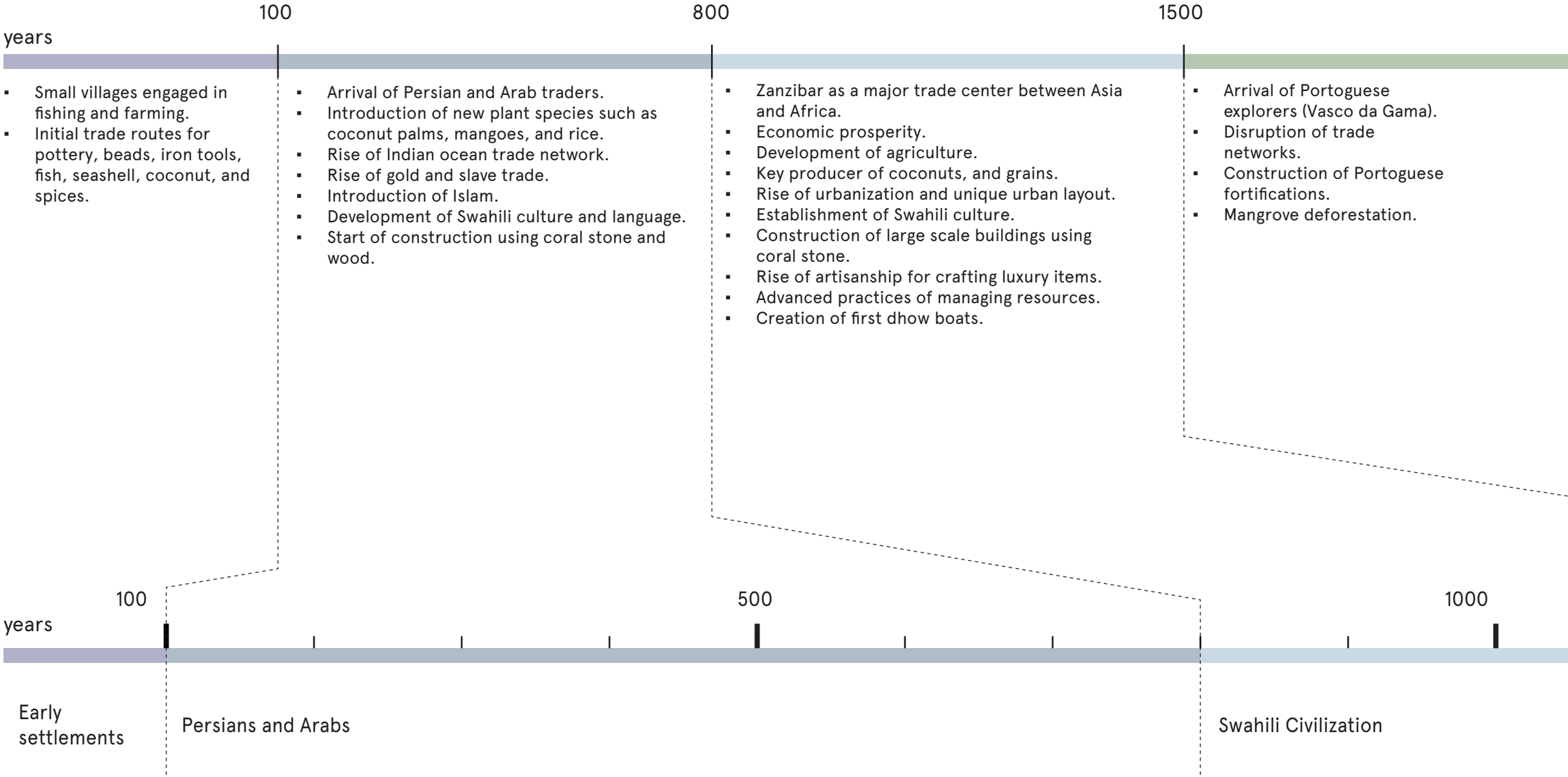
After describing the statistical data of the study area, we provide a holistic view of the spatial data of the island regarding its settlement pattern, accessibility and environmental features on a large scale. In addition, 18 examples of resorts in different locations across the island were selected and synthesized into the maps presented. These examples are analyzed in detail in Chapter 3, but their introduction in this part is intended to provide insight into their geographic characterization at the larger scale of the area. Data from a variety of sources, both local and international databases, were synthesized using GIS tools to create the thematic maps presented in this chapter.

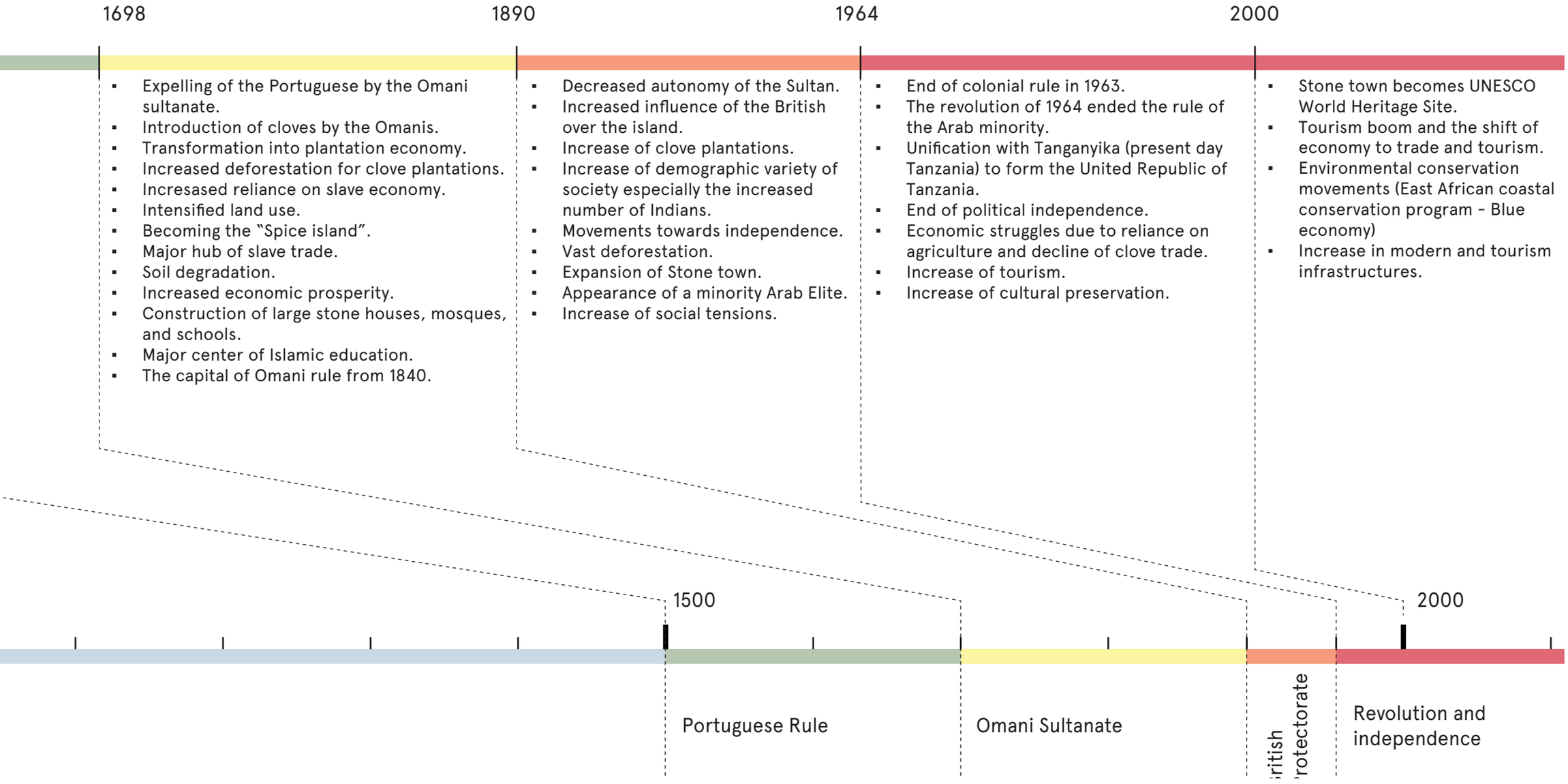
It should be noted that the maps are then used for two types of interpretations: the analytical aspects of the island (quantitative characteristics), the different sensory qualities present on the island according to the different ecologies and anthropological activities (qualitative characteristics). Relating these qualities to the location of the resorts will help to understand the unique potential of each resort, which will be used in Chapter 5 to form the design vision for the selected cases.

The thematic maps begin by analyzing the accessibility and distribution of population centers on the island. In addition, the various ecological systems of the islands and their key species are presented. These include various species of marine life. Some of them are essential sources of economic activity for the local population, while others were used in the past for the construction of local traditional buildings. In addition to marine life, mainland inhabitants have been identified and localized, including various animals and vegetation that exist on the island. Some of the species are in protected areas of national importance. Famous spice farms, of both economic and tourist importance to the island, are distributed throughout the island. These maps show the biodiversity of the island. They also show that some of the resorts studied are close to areas of high biodiversity to assess if and how they meet this potential. The elevation map gives an indication of the topography of the island. As the map shows, the landscape of the island is relatively flat, covered by low hills. The highest points of the island are in the northern part of the island. In addition, the combination of the island's soils, on the one hand, shows the physical characteristics of the soil and, on the other hand, can be used to describe another important factor of sensory experience in the different contexts of the island, related to the feeling of the soil.

Finally, maps illustrating the anthropological characteristics of the island, such as the network of activities and land use, show the network of human activities taking place on the island. They provide a clear indication that there is a spatial distinction between the natural and agricultural landscape of the island. In general, the unspoiled natural landscape is located in the east, where most of the resorts are also located, while the urban landscape is located in the west. These two landscapes are spatially linked by agricultural land, which contains coconut plantations and spice farms. The overall picture presented here is that most resorts are preferably set in an unspoiled natural context and offer excursions to urban and agricultural areas.

2.1. History of Zanzibar, a legacy of challenges




1698
1890
1964
2000
Expelling of the Portuguese by the Omani sultanate.
Introduction of cloves by the Omanis.
Transformation into plantation economy.
Increased deforestation for clove plantations.
Incresased reliance on slave economy.
Intensified land use.
Becoming the "Spice island".
Major hub of slave trade.
Soil degradation.
Increased economic prosperity.
Construction of large stone houses, mosques, and schools.
Major center of Islamic education.
The capital of Omani rule from 1840.
Decreased autonomy of the Sultan.
Increased influence of the British over the island.
Increase of clove plantations.
Increase of demographic variety of society especially the increased number of Indians.
Movements towards independence.
Vast deforestation.
Expansion of Stone town.
Appearance of a minority Arab Elite.
Increase of social tensions.
End of colonial rule in 1963.
The revolution of 1964 ended the rule of the Arab minority.
Unification with Tanganyika (present day Tanzania) to form the United Republic of Tanzania.
End of political independence.
Economic struggles due to reliance on agriculture and decline of clove trade.
Increase of tourism.
Increase of cultural preservation.
Stone town becomes UNESCO World Heritage Site.
Tourism boom and the shift of economy to trade and tourism.
Environmental conservation movements (East African coastal conservation program - Blue economy)
Increase in modern and tourism infrastructures.
1500
2000
Portuguese Rule
Omani Sultanate
ritish
rotectorate
Revolution and independence

2.2. The current state of tourism, economy and infrastructures

Although the tourism sector makes up a large part of the economy of Zanzibar and provides jobs for a large part of the population, the investment in tourism infrastructures and activities has been sourced largely from foreign countries rather than local investing. The top contributors in the whole tourism industry are the United Kingdom, Italy, and Kenya targeting the accommodation and food services sector. According to the recent statistics, the foreign private investment has been increasing in the tourism sector (Zanzibar Investment Promotion Authority, 2023). Other than the mentioned countries the government of Zanzibar has been attracting investors from the Gulf region countries, specifically the UAE and Oman. (Giza, 2021). What has to be outlined here is that Zanzibar has been providing investment packages for foreigners through which they can own 100 percent of their business.

This, coupled with the low power of competing with foreign capital for the locals has put the various sectors of tourism and their decision making mostly in the hand of foreign investors and although the local government is encouraging the investors to hire from the local population and the youth, in the end the final decision for the extent of integration rests in the hand of foreigners (Ndilwa, 2021)

Categories of the context analysis:

- Society
- Marine ecosystem
- Land / soils
- Economics

Tourism constitutes a large part of the economy of Zanzibar; However the influence of tourism on the island goes beyond just its economical aspect as it is one of the industries which is affecting the island is various manners both socially and ecologically.

Annual tourism in Zanzibar has experienced an increasing trend and although in 2019 the industry was affected by the Covid-19 pandemic it has since returned to the pre-Covid numbers and as of 2023 has surpassed them in growth reaching 638498 visitors annualy.

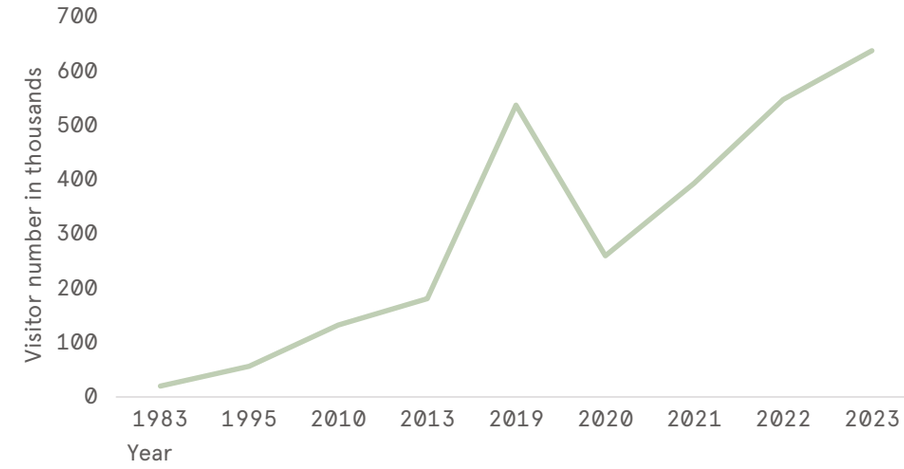


Fig. 2.1. Tourism growth (Office of the Chief Government Statistician Zanzibar, Tourism statistical release, 2023)

The most attractive season for the tourists is during the winter months while in the months of April and May the island receives the least amount of visitors.

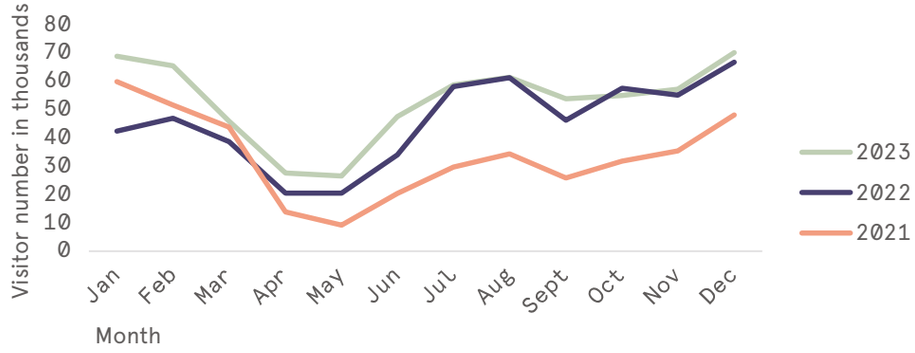


Fig. 2.2. Monthly tourism flow (Office of the Chief Government Statistician Zanzibar, Tourism statistical release, 2023)

The largest group of tourists spend one week of holidays in the island and the most preffered duration of stay is between 3 days and 2 weeks.

Fig. 2.3. Stay duration preference of tourists (Office of the Chief Government Statistician Zanzibar, Tourism statistical release, 2023)

The countries with the highest share of the tourism industry in Zanzibar mostly consist of European states. France provides the largest share of tourists visiting Zanzibar annualy while Poland, Germany, and Italy are the other large consumers of the tourism services in the island.

Fig. 2.4. Top tourist market countries (Office of the Chief Government Statistician Zanzibar, Tourism statistical release, 2023)

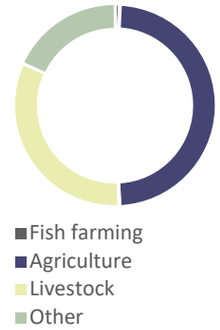
2.2. The current state of tourism, economy and infrastructures

A large part of the household in Zanzibar is made up of rural populations. Therefore, the understanding of the various aspects of the rural society becomes crucial.

Considering the acivities which are the focus of the household population agriculture has a large share while livestock and fish farming constitute the second and third most important activities for household population. This demonstrates the importance of the local ecology to the economy of the Zanzibar households.

Household type

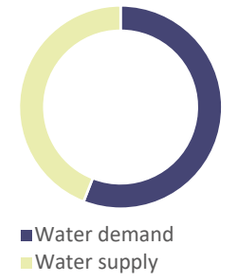
Household activities



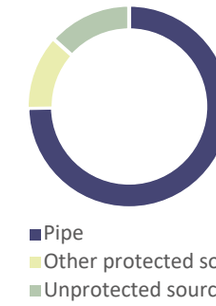
Waste disposal is a major issue in the island. It is estimated that a close to 200000 kg of waste is dumped into the environment of Zanzibar every day. In recent years there have been attempts at sustainable diposal of waste. Examples include companies such as Zanrec which provides waste management services to both private and commercial/industrial clients and mostly works with hotels in the island. Another attempt has been the newly established decentralised waste management system which employs the local population to manage waste disposal.

In terms of resources water is considered as a valuabe resource since the islands lack an abundant source of freshwater and therefore there is a water deficiency of 20%. A large amount of the water is provided through pipes to the households and services.
Electricity and Kerosene are the main sources of energy in the islands. Zanzibar receives its supply of electricity from the main land power grid connected to the island through and underwater submarine cable system. Due to the large number of blackouts in the past years due to problems with the previous powre transmission system kerosene is still widely used as an important resource for lighting.

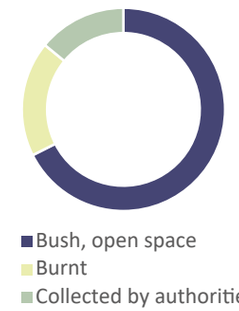
Water deficiency (20%)



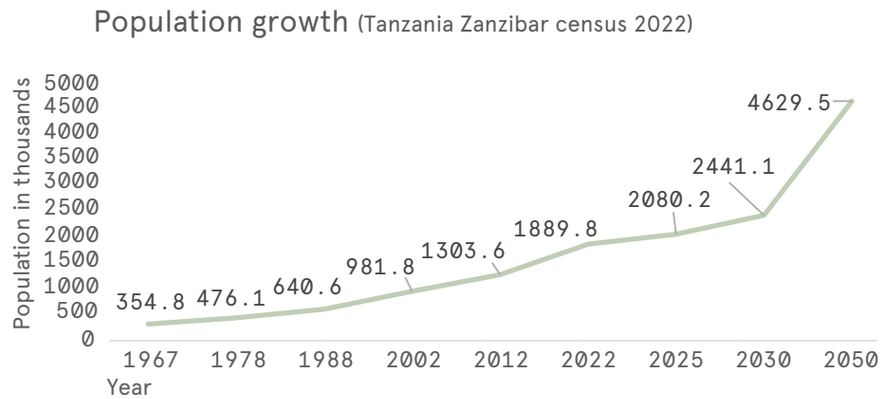
Sources of drinking water



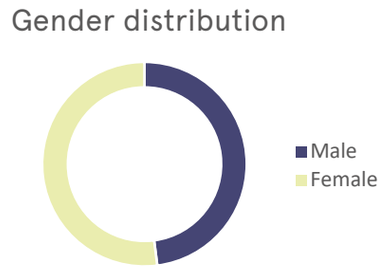
Waste disposal



As of 2022 Zanzibar had a population of 1,889,900 according to the recent census conducted by the local authorities of Zanzibar in 2022. The projections of the same census predict that the growing trend of the population will increase and the number will reach 4.6 million by 2050.



The gender structure of the society is divided rather equally between male and female with the female and male population making up 52% and 48% of the population repectively.



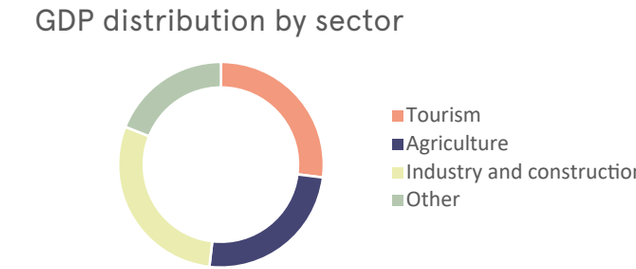
The society of Zanzibar consists of five ethnic groups namely Swahili, Arabs, Hadimu, Shirazi, and Tumbatu.

The island of Zanzibar consists of three administrative regions. The Kaskazini Unguja region in the north, the Kusini Unguja region in the east and the Mjini Magharibi region to the west. A large part of the population is located on the west and in the Mjini Magharibi region which has a density of 3883 persons per square kilometer. The largest town of Zanzibar named stone town is located in this region.

Economy

The economy of Zanzibar can be structured into three main categories namely that of agriculture and forestry, industry and construction, and services. Being a center for spice trade throughout history, agricultural and forestry activities make up a considerable part of the economy. From the services sector, tourism acts as a major backbone of the economy. In this regard, as of 2022 tourism made up 27% of the total GDP of Zanzibar.

To understand the contribution of the tourism sector to the economy of Zanzibar it is sufficinet to observe that the the share of the agricultural sector of the total GDP was 24.8% as of 2022. Furthermore, the construction and industry sector made up 29.2% of the total GDP.



2.3. The social and ecological features of Zanzibar

The Ecological system

The island of Zanzibar consists of various ecological habitats which house the species making up the ecosystem of the island. The habitat include:

- Mangrove forests
- Coral reefs
- Beachs and reefs
- Inland forests

The ecosytem of the island provides the necessary means for agricultural and forestry activities in the island as well as resources for construction and energy production.

Some of the most important assets of the ecosystem which make up an important part of the economy of the local households consist of:

- Mangrove forests
- Coconut plantations
- Clove trees
- Rice plant
- Sugar cane plant
- Vegetation
- Seagrass
- Sand and clay soils.
- Coralline soils

Ecology and Society

The ecology of the island constitutes the backbone of the economy and sustenance of the society in the island. It directly affects the agriculture and tourism industry wich as mentioned earlier make up half the GDP of the economy.

The ecosystem provides the necessity for the tourism industry to function through the natural beaches, the forests, the diving areas and many various points of attraction for tourists.

On the other hand the ecosystem provides the means for the sustenace, both biologcally and economically of a large portion of the society. An example of this are the seaweed farms which are planted in the marginal locations between land and beach and which are one of the main agricultural activities of the women of the island which make up more than half the population. On the other hand the mangrove forests and the coral reefs make an important part of the ecosystem for the fish which are necessary for the fishing indusrty and economy in the island.

Because of the dependancy of a large part of the society on the ecosystem there is a danger of over expolitation of it because of the rapid growing trend both in the population and the growth of the tourism industry.

Picture 2.6.
Swings in the sea. Terrirory of Breezes Beach Resort (photo by author, february 2021)

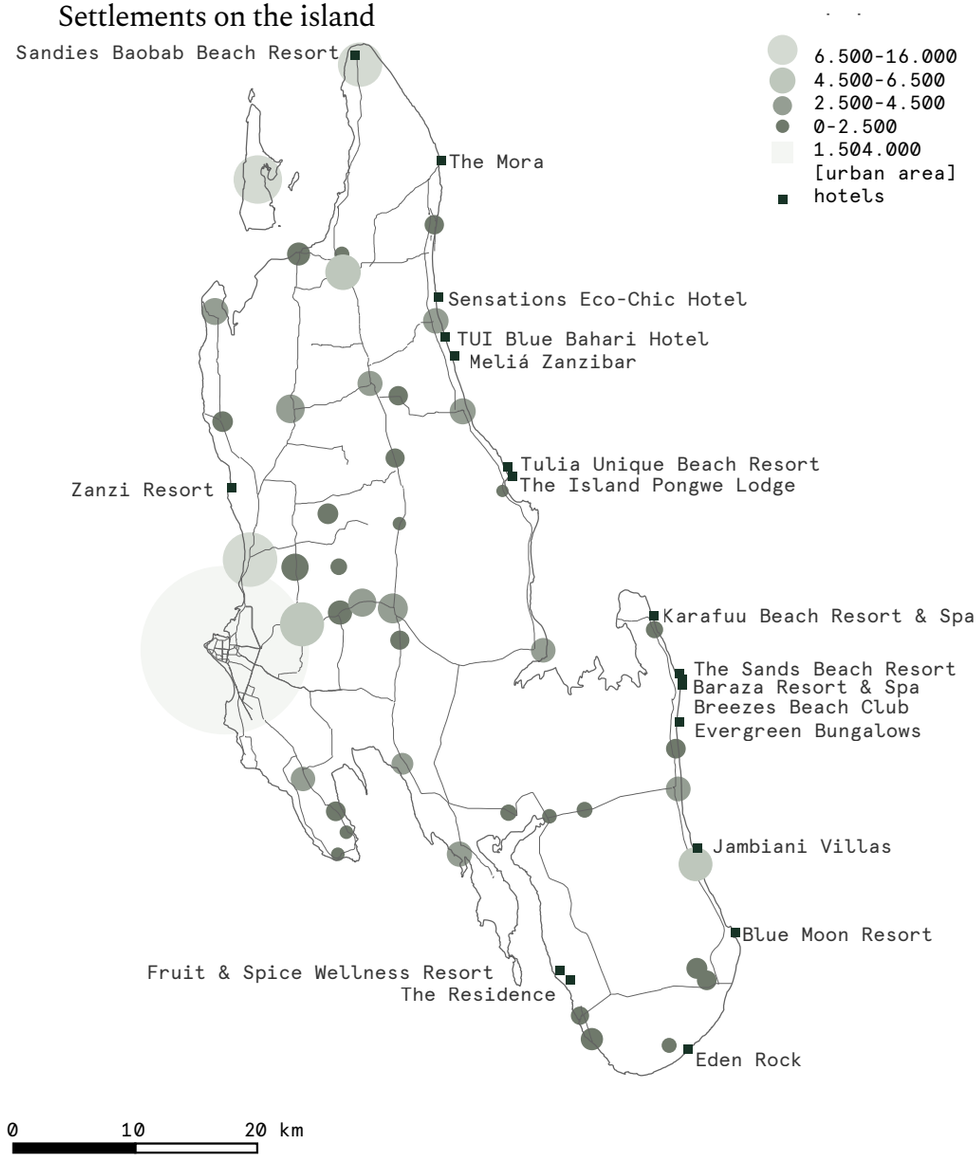
Some of these threats could be highlighted as mentioned below:

- Excessive deforestation for the creation of agricultural land.
- Excessive mining.
- Excessive expoitation of mangrove trees.
- Threathening of the beach ecosystems with the increasing number of seaside resorts made on the beach.
- Degradation of the soil due to deforestation and the modification of the soil and sand with excessive construction both for private and commercial means.
- Lowering of water tables
- Excessive and non-sustainable waste disposal.
- Habitual loss leading to the distruption in other chains of the ecosystem.

In order to understand the root of these threats it is beneficial to understand the elements of the ecosystem which they affect. In this manner they can be categorised as:

- Geology and soil
- Hydrology
- Meteorology
- Water quality
- Air quality

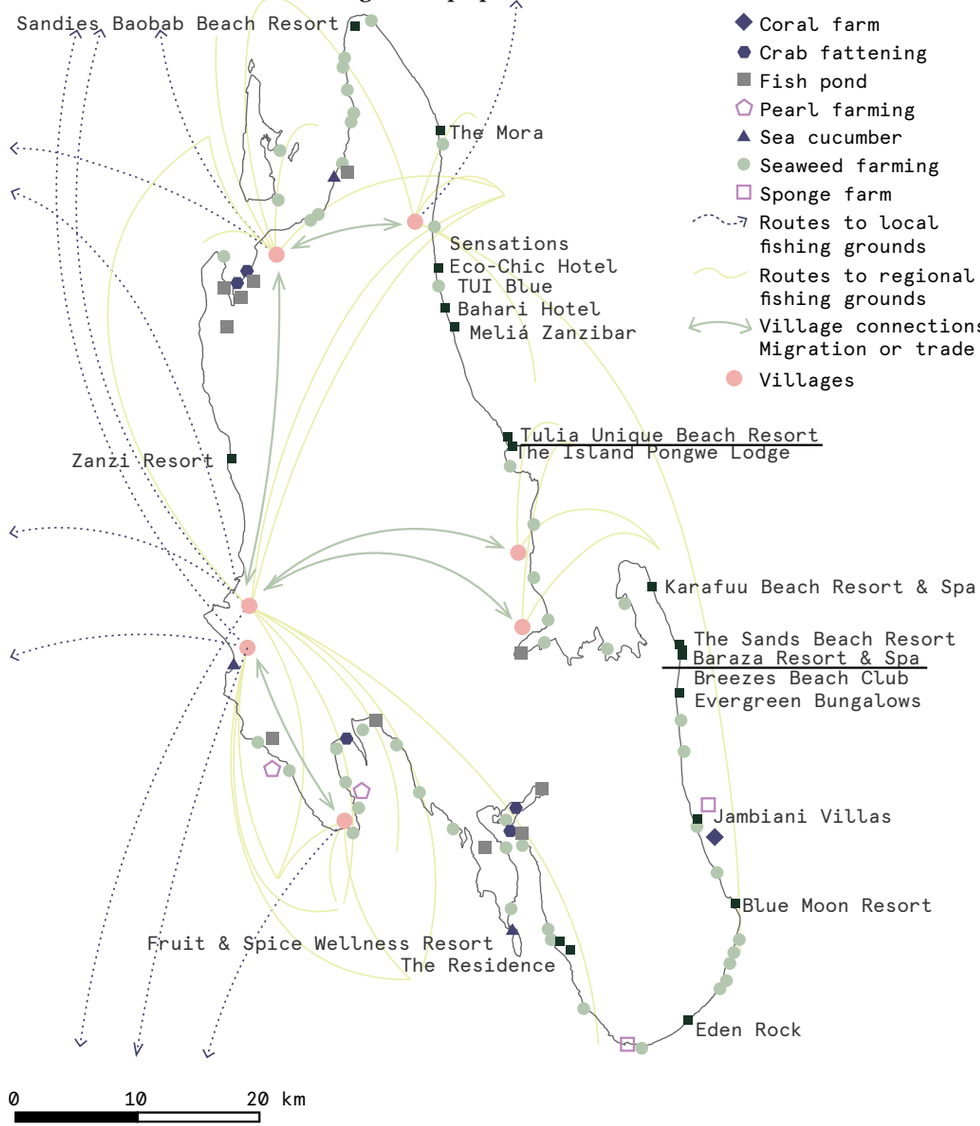
2.4. Territorial context



It was relevant regarding the subject of research to pick the hotels with significant amount of capital involved and at the same time intensions towards sustainable management of the hospitality items. Various locations and variety of ecologies around was also accounted. List of the case studies evaluated as follow:

1. Sandies Baobab Beach Zanzibar
2. The Mora Zanzibar
3. Sensations Eco-Chic Hotel
4. TUI Blue Bahari Hotel
5. Melia Zanzibar
6. Tulia Unique beach resort
7. The Island Pongwe Lodge
8. Karafuu beach Resort & Spa
9. The Sands Beach Resort
10. Baraza Resort & Spa Zanzibar
11. Breezes Beach Club & Spa
12. Evergreen Bungalows
13. Jambiani Villas
14. Blue Moon Resort
15. Eden Rock
16. The Residence Zanzibar
17. Fruit & Spice Wellness Resort
18. Zanzi Resort

Coastal activities among local population on Zanzibar



Although the majority of the coastline is in close proximity to coral reefs, coral farms are not common on the coast of Zanzibar. We see only one coral farm in the southeast of the island.

Crab breeding is practiced in bays and lagoons in contact with freshwater. All of them are not located in direct proximity to hotels. It is possible to trade crabs between villages and direct deliveries to hotel kitchens. By offering a greater variety of fresh seafood, hotels can improve customer service. In addition, investing in crab farms and fattening them can serve as a method of caring for the island's nature.

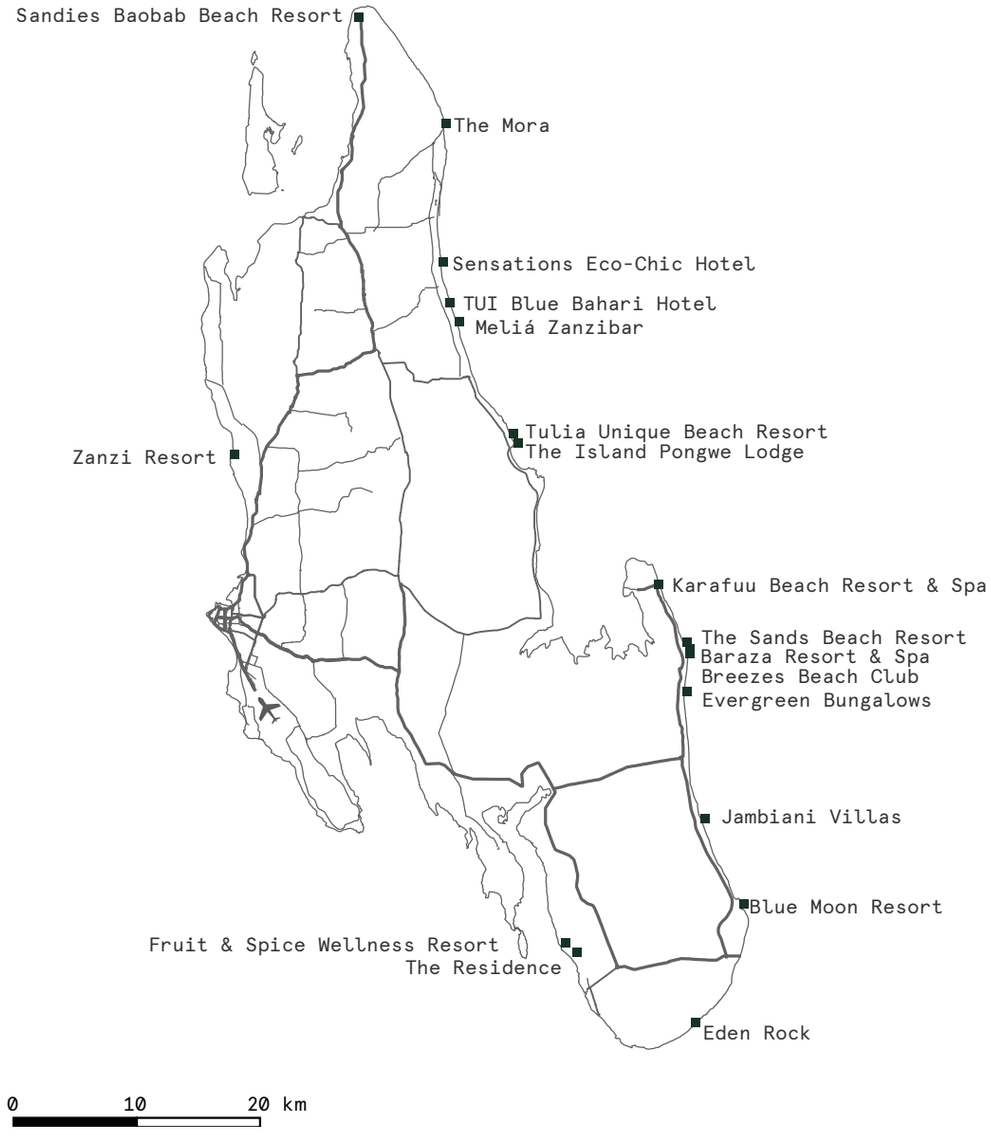
Pearls are harvested from the southwest pier of the island at Menai Bay Protected Area.

Fishing is widespread along the entire coast of the island. Fish trading between villages is also popular, so fresh fish dishes may be available at any hotel.

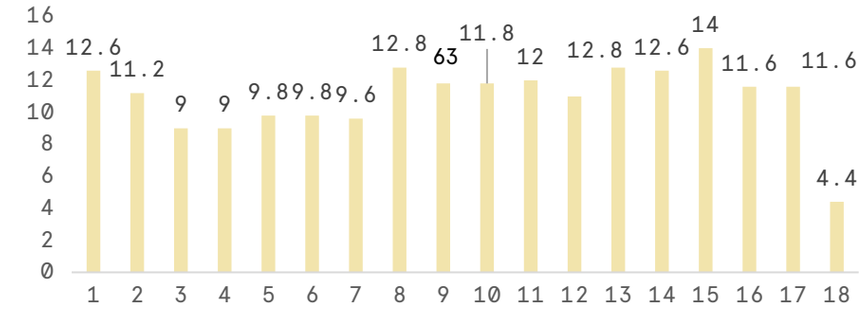
Seaweed farms have unrealized development potential. There may be interaction between wild seagrass and hotel spas or kitchens. The spread of seaweed farms can also attract labor from local women, for whom the activity is a key part of the coastal industry.

2.4. Territorial context

Transport availability



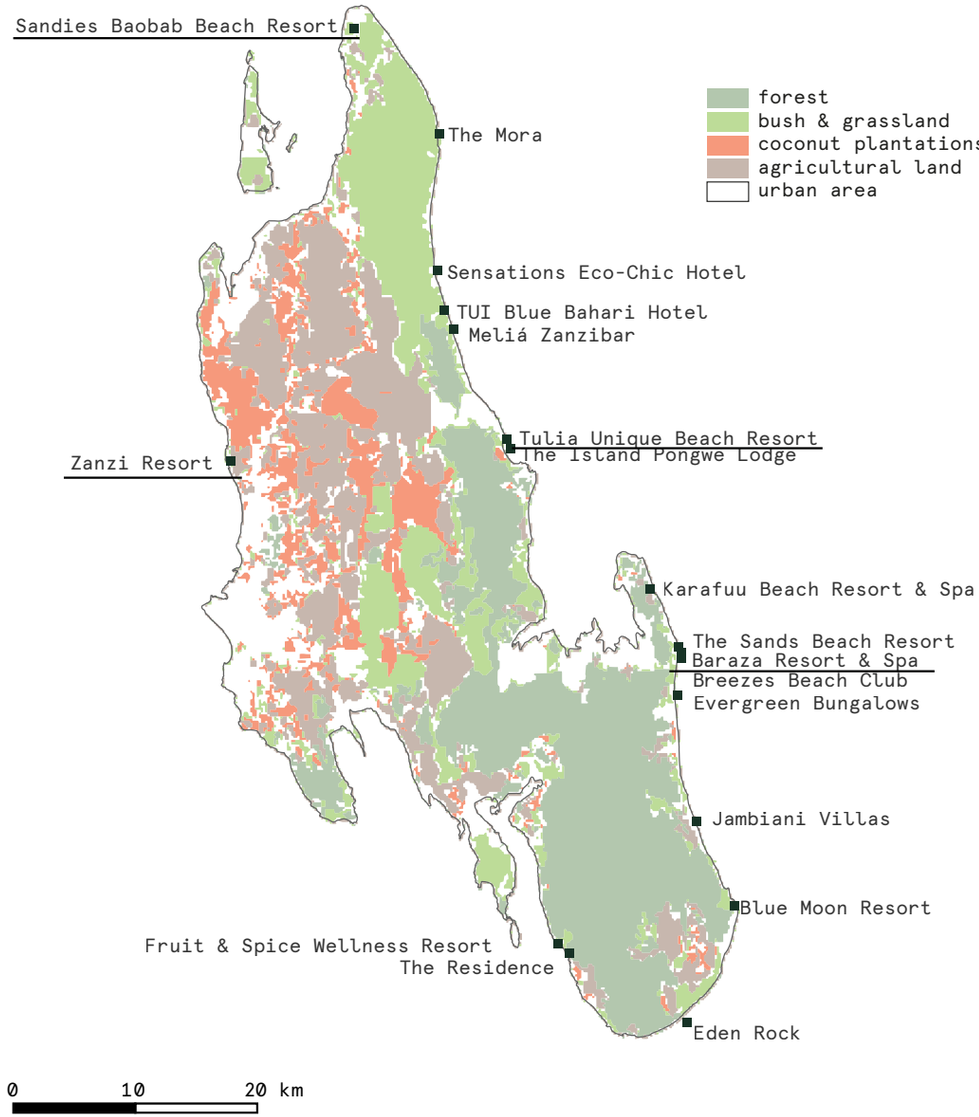
Transportation from the hotel to the airport



For transportation availability we consider the transportation of group of tourists by car that is correlated to the class of hotels considered (that is high). For approximation we consider the petrol/diesel/hybrid car with medium level of emissions that is 200 gr of CO2 per kilometer.

For one way for group of tourists it is not very diverse amount of eminitions for transportation that is aproximately 12 kg of CO2. The hotel with the furthest location is the Eden Rock, that is located on the south of the island. The closest one to the airport is Zanzi resort emissions for which is only 4.4 kg for one way by car.

Landuse



The main part of the island is occupied by forests and grasslands. Densely populated areas are located in the west of the island (Stone Town) and in the Chwaka Bay area, where the population density is significantly higher than the rest of the island.

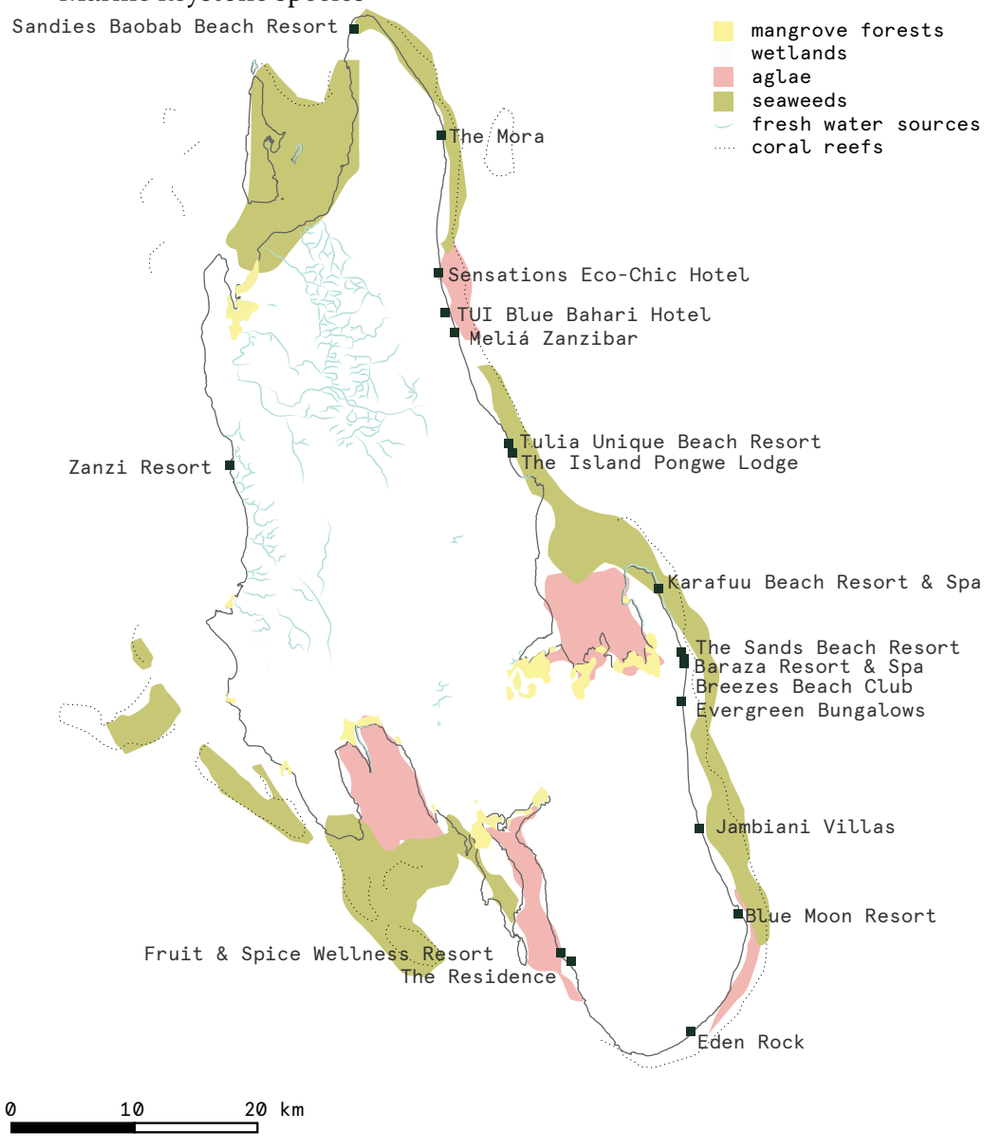
Agricultural land is mainly located in the alluvia, selinates & latosols soil region in the northwest of the island.

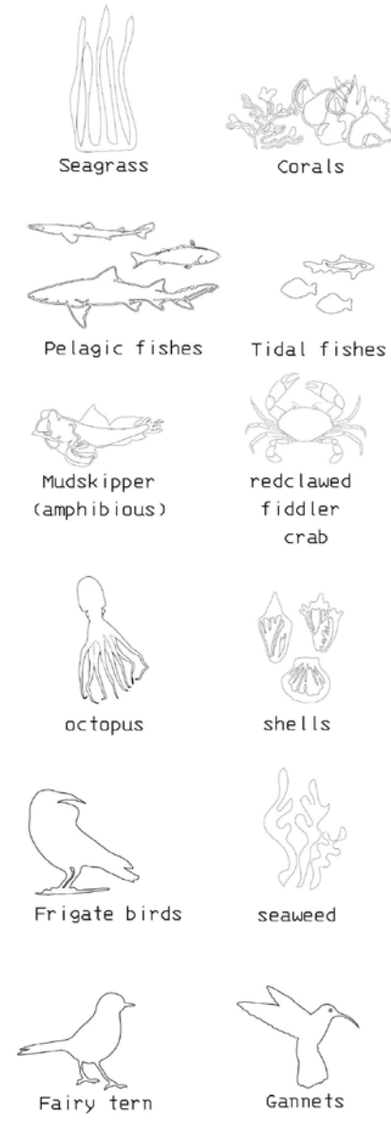
Dense forests predominate on the southern cape of the island and partly on the east coast.

Coconut plantations are intermingled with agro-cultural lands and provide a large number of valuable nutritional and economic resources: coconuts, coconut oil (for nutrition and cometology), coconut milk, coconut pulp, wood and coconut shell. All these plantations are located on fertile soils of alluvia, selinates and latosols.

2.4. Territorial context

Marine keystone species

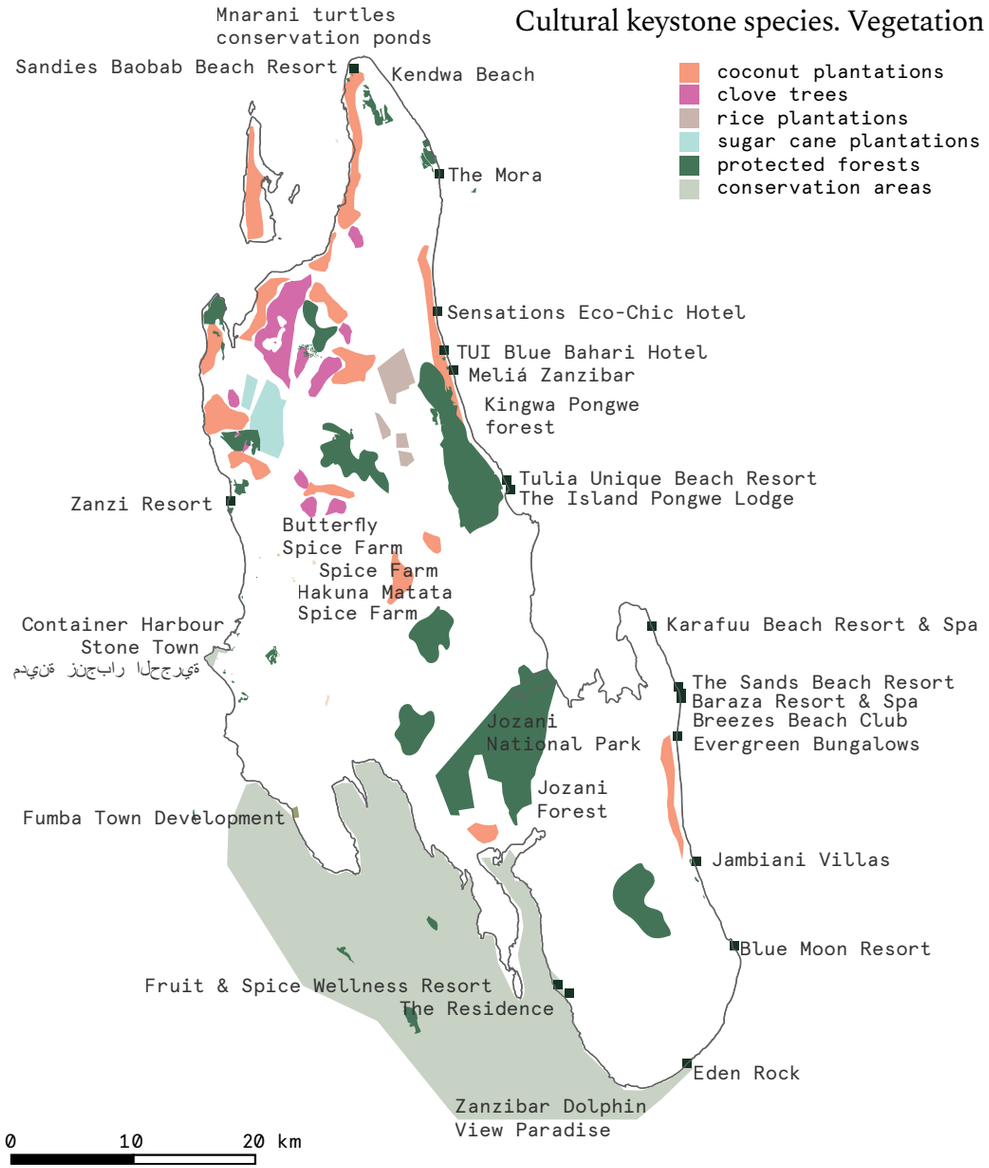


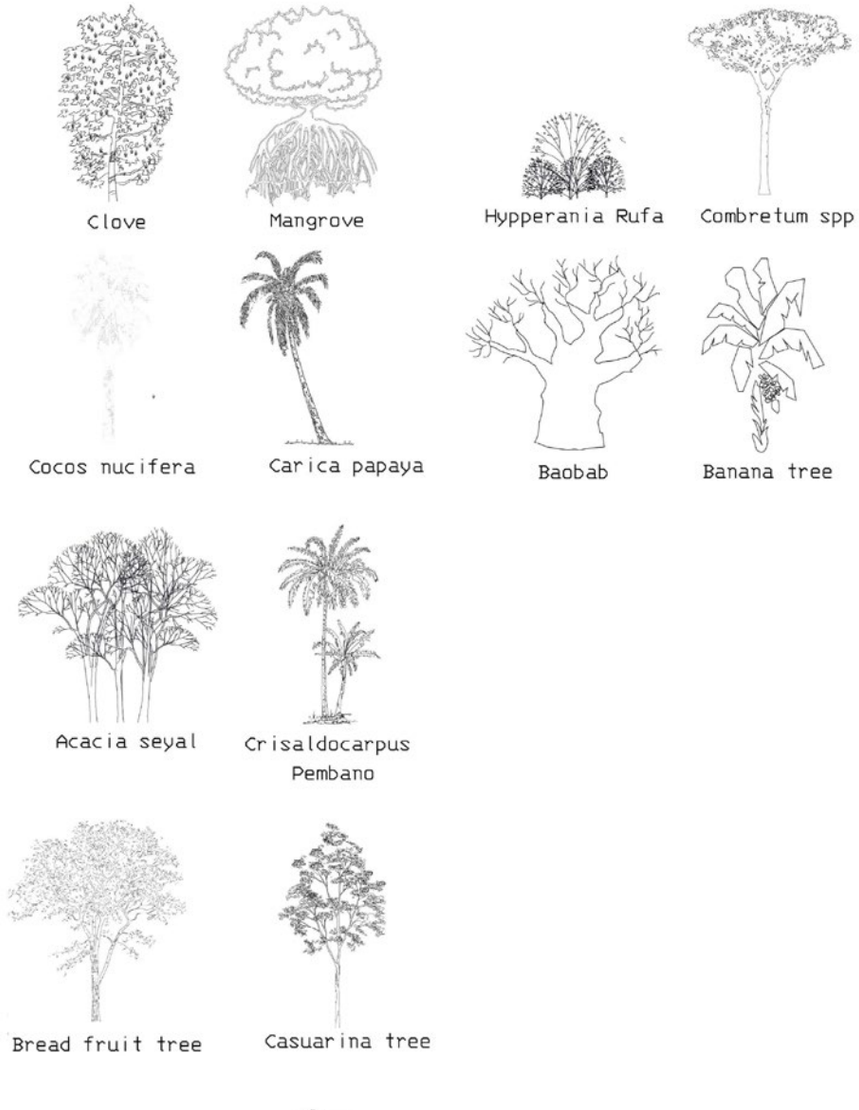


For most of the hotels we observe the possibility of interaction with marine keystone spicies, which may further serve as a promising factor for sustainable resort development.

Mangroves are mostly found in freshwater backwaters and are most often protected at the national level, so there is minimal, if any, overlap between resorts and their impact on mangroves. In most cases, the proximity of hotels to coral reefs encourages hotel management to engage solely in consumer interaction with coral reef inhabitants. While this factor has a promising direction for sustainable hotel management and design. It is possible to offer conscious diving, education and lectures on underwater life to hotel customers and introduce tourists to the care of marine life.

Cultural keystone species. Vegetation





2.4. Territorial context

Relief. Map of elevations

Relief

Most of the island is at sea level. In general, the relief of the island can be called flat. The highest elevation is in the middle of the island, where alluvia soils prevail. The minimum elevation is -4 meters above sea level, at the highest point the elevation reaches 129 meters. The difference is 134 meters between the highest and lowest point of the relief.

Soils

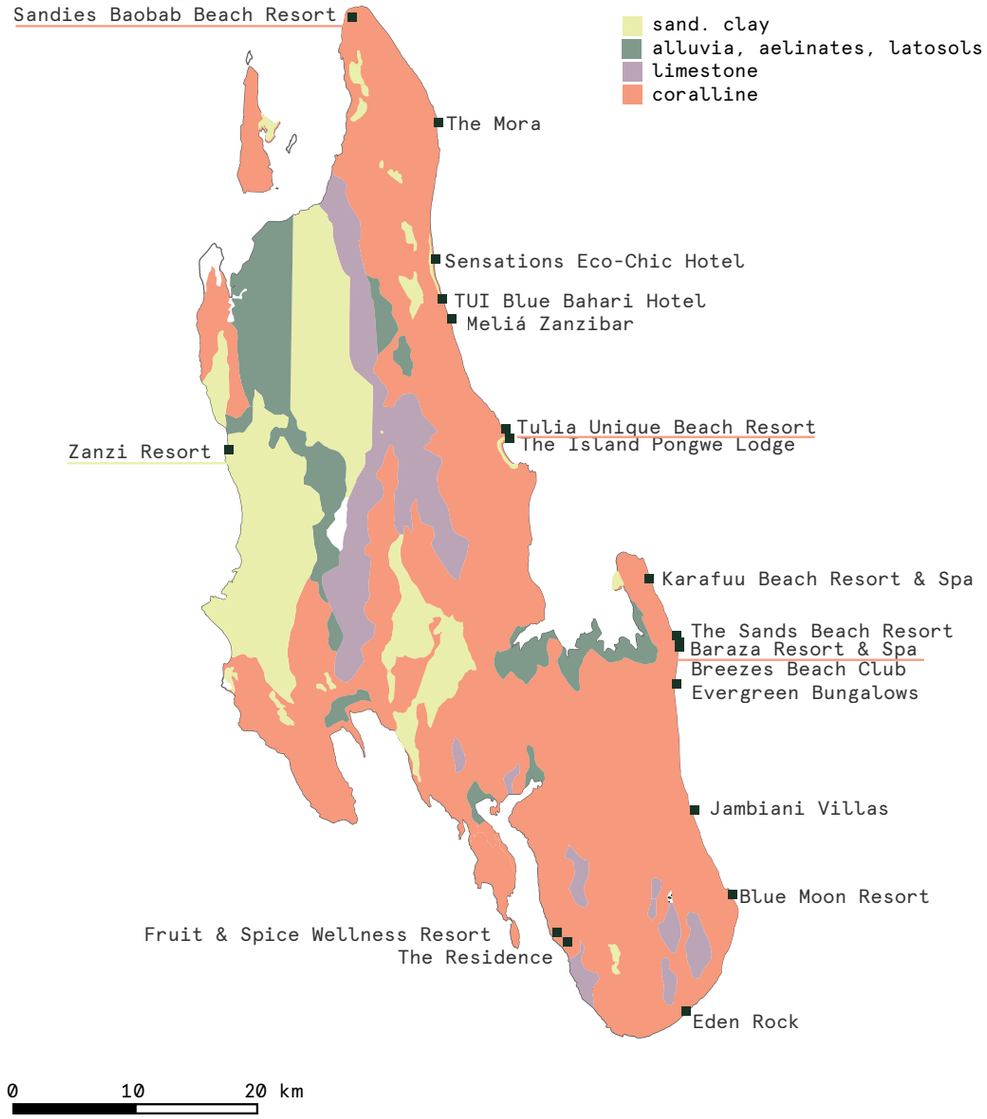
Alluvium is loose clay, silt, sand, or gravel that has been deposited by running water in a stream bed, on a floodplain, in an alluvial fan or beach. Selinate - mineral gypsum. Latosols known as tropical red earth. It is soil found under tropical rainforests which have a relatively high content of iron and aluminium oxides. Coralline is a porous stony soil that forms rocks but is also easily eroded.

Much of the island is covered with coralline soil, which makes construction in this region very specific and often difficult. Also from the east, the island is much more prone to erosion and soil depletion, leaching by sea water.

The soils of alluvia, selinates & latosols are more suitable for agricultural use. This is evidenced by the location of a large amount of agro-cultural land, pastures and farms in these regions. The position of hotels on these regions facilitates the transportation and the local planting of the products.

Sand and clay located mostly on the west coast of the island are the most suitable lands for new construction. The abundance of coarse sand also makes this region popular for mining materials for construction, making the soils vulnerable to sand depletion and excavation. These soils need to be protected and restored to their natural potential.

Soils' map

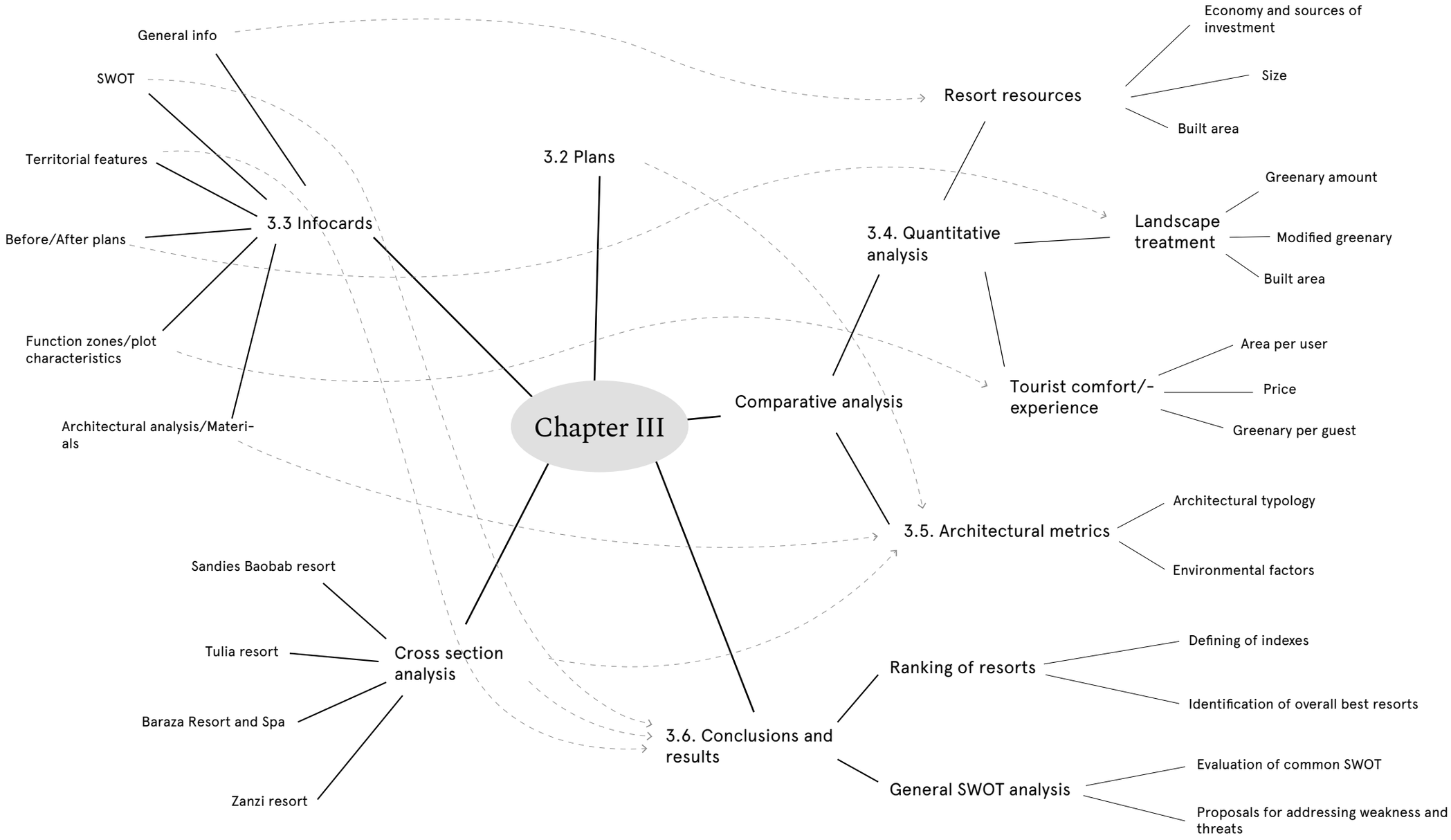


Conclusion

The current data reveals various points related to the research question and aim of the thesis all supporting the problems highlighted in the previous chapter. The increase of tourism flow and the population at the same time highlights the inevitable necessity for the integration of the ecology with the tourism activities in order to prevent the depletion of the resources of the island and provide a prosperous future for future generations. The seasonality of the tourism flow shows how the large part of the economy is vulnerable to changes and how the tourism industry is in need of activities which would increase its diversity in terms of income sources. Furthermore, the analysis of the spatial features of the island reveals the potentials the island has for economic gain from its resources, specifically related to its coast, while highlighting, also, the fragility of these ecological resources. The location of most of the current resorts and their distance from the airport points to the need to enhance the local regions so as to decrease the need for transportation.

The proximity of most resorts to seawater resources such as coral reefs, seaweed plantations and fish and crab breeding regions exposes the spatial conflict that the resorts could have with the activities of the local population. The resorts occupy the space which is a necessary need for the local population.

In general, the extracted data becomes beneficial from two points. First, as it provides in this point the necessary knowledge needed to back up the vision which will be provided in the final chapter. Second, it highlights the urgency of the research question and aim of the thesis not only as a complimentary design but as a necessity for the preservation of the sustainable future Zanzibar.


Chapter III
3.2 Plans
3.3 Infocards
General info
SWOT
Territorial features
Before/After plans
Function zones/plot characteristics
Architectural analysis/Materi-als
Resort resources
Economy and sources of investment
Size
Built area
3.4. Quantitative analysis
Landscape treatment
Greenary amount
Modified greenary
Built area
Tourist comfort/-experience
Area per user
Price
Greenary per guest
Comparative analysis
3.5. Architectural metrics
Architectural typology
Environmental factors
Cross section analysis
Sandies Baobab resort
Tulia resort
Baraza Resort and Spa
Zanzi resort
3.6. Conclusions and results
Ranking of resorts
Defining of indexes
Identification of overall best resorts
General SWOT analysis
Evaluation of common SWOT
Proposals for addressing weakness and threats

Chapter III.

Touristic infrastructure of Zanzibar. Study of the resorts

3.1. Selection of the case studies

This chapter includes an extensive study of 18 case studies of tourist resorts around the island of Zanzibar that are currently operating. The cases are analyzed on various topics ranging from general information about their properties, their current context, their environmental impact, the relationship between their functional areas, morphological and architectural features, and climatic properties.

The analysis aims to address the questions which were highlighted in the previous chapters. We illustrate how the current resorts are dealing with the use of resources around them, how they are interacting with their ecological context, and how they are providing or blocking the benefits to the local populations. Furthermore, it is aimed at showcasing the dominant architectural features of the resorts to understand if the current construction trends and market is in favor of the use of local materials or not and which plan typologies or architectural features are mostly used and whether they can be considered as weaknesses or strengths. This SWOT analysis at the final part is intended to synthesize this information.

From among these cases, 4 cases are chosen for a more in depth investigation shown on cross sections which perform their connection to the context, detailed architectural structures. From among these, two cases will be chosen in the final chapter for the proposal of their reuse and speculation in order to address the questions which arise from the body of knowledge and the weakness and potentials that exist within the touristic infrastructure.

In this chapter the information is organized into information maps for each case that synthesize all the data obtained. The contribution of this analysis to the objectives of the thesis can be described in the following aspects. First, the analysis provides the possibility of comparison between cases, which allows the creation of qualitative indices. These indices, which will be demonstrated in paragraph 3.4, highlight the main concerns in the design of resorts in Zanzibar and also demonstrate the types of resorts that are better adapted to the environment in terms of the evaluation factors in this thesis. Secondly, the information maps allow for further comparison between existing resorts and local vernacular architecture to understand how much the inclusion of local built assets may or may not improve the quality of the resort in terms of its self-sufficiency and expression of context.

Overall, the aim is to translate the resorts into tangible data that can be used for the research objectives of the thesis.

Due to the research topic, it was appropriate to select hotels with a significant amount of capital involved and at the same time with intentions for sustainable management of hospitality facilities. The different location and the diversity of the surrounding ecology were also taken into account.

The infocard for each of the 18 hotels is a quintessence of information that has been obtained from public sources as well as by GIS means. First of all, it is basic information provided on the hotel's website about the number of rooms, the year of establishment of the hotel, the ownership of the country or company, economic indicators such as prices per night and the class of the hotel. Also when available, some hotels have a section such as sustainable actions. Some hotel owners especially emphasize some principles that they follow in running the hotel. Also an important factor is the distance from the airport and some nearby ecologically valuable natural resources - fields, forests, rivers, farms. The proposed set of activities that the tourist can take advantage of, the different functional areas are given. Also the location in relation to the island, the soils on which the hotel is located, the availability of marine, water resources and vegetation values, threats for each of the cases, thus considering the hotel from a multilateral analysis perspective.

Then we move on to analyze the site itself, its quantitative characteristics. The area of the site, the building area, the amount of greenery on the site as a percentage and numerically. We also determine the percentage of development on the entire plot.

The relationship of the functional zones of the hotels to each other is assessed. The most common functional areas are residential areas, lobbies, bars, restaurants, sports complexes, spas, swimming pools and auxiliary service areas. The last part in the infocard is the analysis of the typology and bioclimatic design for residential buildings in the resort. The materials, type of organization of the residential cells and their structures are evaluated.

This section concludes with a comparative analysis of all the factors studied above.

The list of case studies is as follows:

1. Sandies Baobab Beach Zanzibar
2. The Mora Zanzibar
3. Sensations Eco-Chic Hotel
4. TUI Blue Bahari Hotel
5. Melia Zanzibar
6. Tulia Unique beach resort
7. The Island Pongwe Lodge
8. Karafuu beach Resort & Spa
9. The Sands Beach Resort
10. Baraza Resort & Spa Zanzibar
11. Breezes Beach Club & Spa
12. Evergreen Bungalows
13. Jambiani Villas
14. Blue Moon Resort
15. Eden Rock
16. The Residence Zanzibar
17. Fruit & Spice Wellness Resort
18. Zanzi Resort

3.2. Case study No 1. Sandies Baobab Beach

Size	105 rooms/suites
Founded in	2002
Ownership	PLANHOTEL HOSPITALITY GROUP (Switzerland)
Price per night (EUR)	€ 264
Hotel class	4
Sustainable actions	Promotion the scientific research // Beach cleaning // Coral conservation protection // Electro-cars recharge // Marine biologist involved in coral reef diving // Rooms designed in Swahili style
Distance to the airport	63 km. [1 h. 20 mins.]
Relevant ecology	Beach (White beach) Baobab trees
Entertaining services	Spa // Pool bar // Restaurant Long stay offer // Gymnastic Beach volley // Beach soccer
Location	Nungwi Road, Nungwi 73107 Tanzania Open in Google Maps
Link	Link to website of the hotel

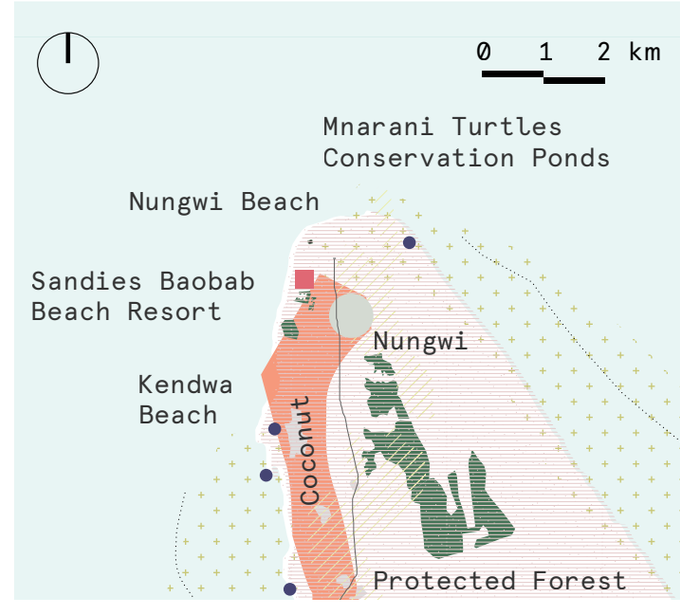
Picture 3.1. Bird eye view of Sandies Baobab beach resort beach and structures. (Image source: Sandies Baobab Beach resort website. Accessed November 24, 2024)

STRENGTHS:
- Use of thatched Makuti roofs for majority of the buildings.
- Implementation of a project to help the water sourcing and sanitation of a local school using donations from guests.
- Separation of beach front dining areas and activities from the natural beach using a higher platform.

WEAKNESSES:
- Located far away from the airport (60 km) and other touristic hotspots.
- High density resort.
- No indication of waste management.
- Lack of passive energy sources.
- Lack of strategies for providing contextual experiences for the tourists.

OPPORTUNITIES:
- Possibility of further integration with the local society of the town and providing economical support to the local population.
- Integration of passive energy sources.
- Integration of farms for providing zero-kilometer meals.

THREATS:
- Low accessibility from airport and to touristic
- Beach erosion and rising sea levels.



LEGEND

Settlements with population of:
- 6.500-16.000
- 4.500-6.500
- 2.500-4.500
- 0-2.500
- hotels

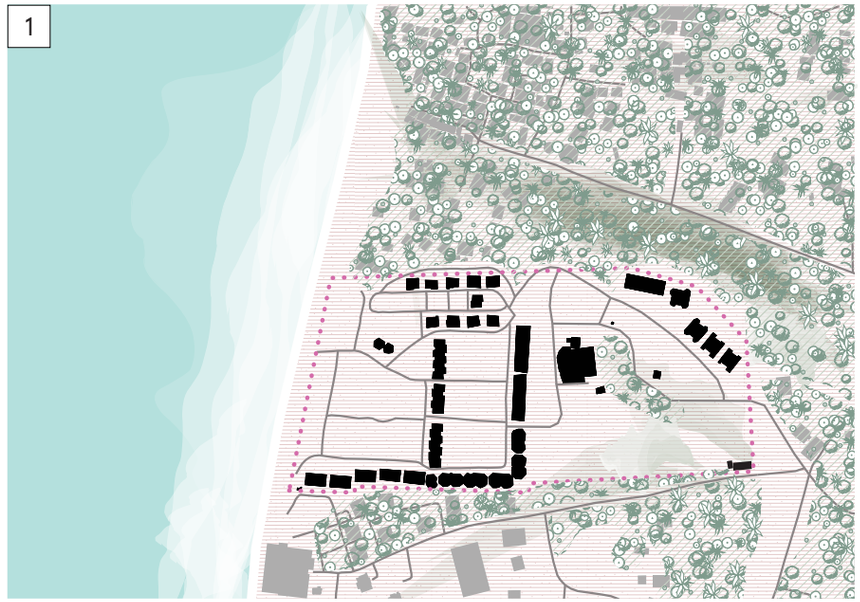
Vegetation keystone species:
- coconut plantations
- clove trees
- rice plantations
- protected forests

Marine keystone species:
- mangrove forests
- wetlands
- algae
- seaweeds
- fresh water sources
- coral reefs
- seaweed farms

Soils:
- sand. clay
- alluvia, aelinates, latosols
- limestone
- coraline
- sea / ocean surface

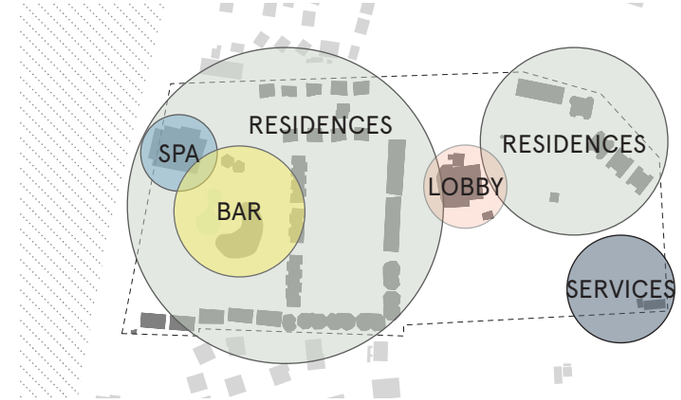
Before 2000

After 2024



0 50 100 m

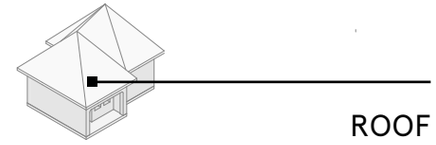
Functional zoning of the territory



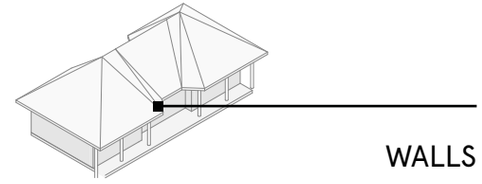
Plot characteristics:

Property land area:	60 486 sq.m.
Built area:	8 100 sq.m.
Built area in the sea:	-
Green area:	2 230 sq.m.
Green area in the borders of the property before 2000:	28 041 sq.m.
Persentage of green area on the plot area:	3.69 %
Removed greenary on the plot area:	43 %
Ratio of greenary (sq.m.) to the built area (sq.m.):	28 %
Percentage of built area:	13.39 %

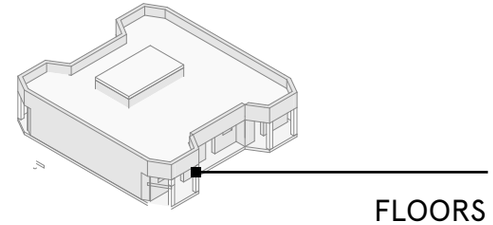
Plan type:	LINEAR / REGULAR
Size:	LARGE
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	GROUPED
Terraces:	YES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



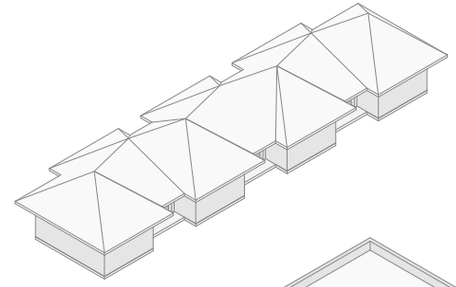
ROOF

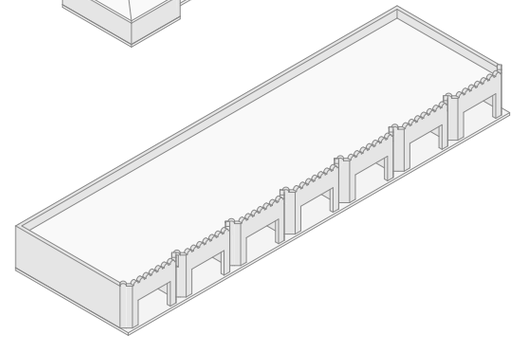


WALLS

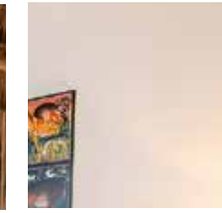


FLOORS



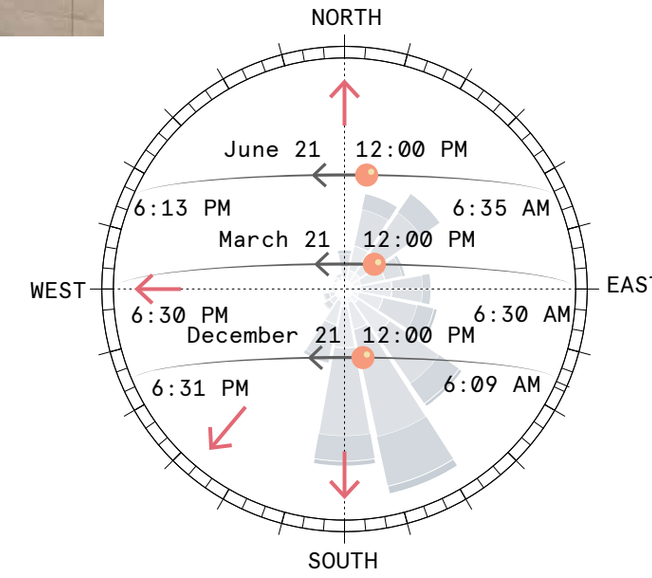


Metal tiles
Dried leaves / straw
Shed: dry banana leaves



Plaster

Porcelain tiles



3.2. Case study No 2. The Mora

Size	250 suites
Founded in	2024
Ownership	TUI Group (Germany)
Price per night (EUR)	€ 338
Hotel class	5
Sustainable actions	Local sourcing of food and drinks // Supply of materials and signature fragrances from local trades // Water recycling
Distance to the airport	56 km. [1 h. 9 mins.]
Relevant ecology	Beach (Muyuni beach)
Entertaining services	Wellness center // Gym // Water sports: snorkeling // Motorised watersports // Scuba diving // Jet ski // Windsurf // Spa // Pools // Bars and restaurants // Childcare service // Children play area
Location	Muyuni Beach, Matemwe Tanzania
Link	Open on Google Maps Link to website of the hotel

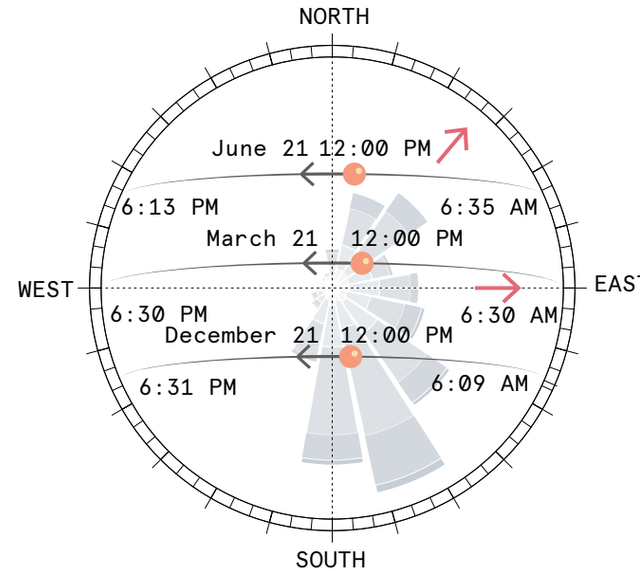
Picture 3.2.
Bird eye view of The Mora Zanzibar residential buildings. (Image source: agoda website. Accessed November 24, 2024)

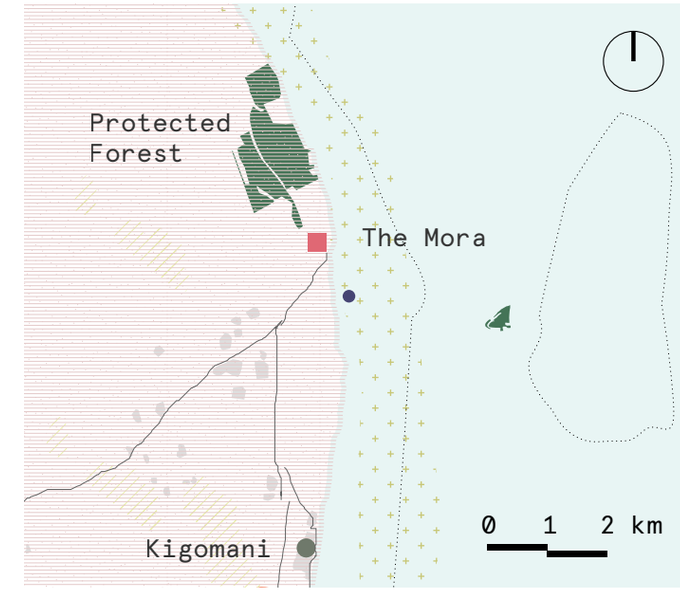
STRENGTHS:
- Use of locally sourced food and drink products.
- Recycling of waste such as paper, plastic, glass, and compost organic waste.
- Use of recycled and locally sourced materials in construction.
- Use of water-saving fixtures and greywater recycling system.
- Use of biodegradable materials for packaging.
- Investment in solar panels for energy sources.
- Located near a less populated beach.

WEAKNESSES:
- Located far away from the airport (60 km) and other touristic hotspots.
- High density resort.
- Use of large-scale building masses.
- Huge intervention on the original environment.
- Lack of implementation of vernacular passive environment control methods.
- Lack of strategies for providing contextual experiences for the tourists.
- Use of active environment control systems.

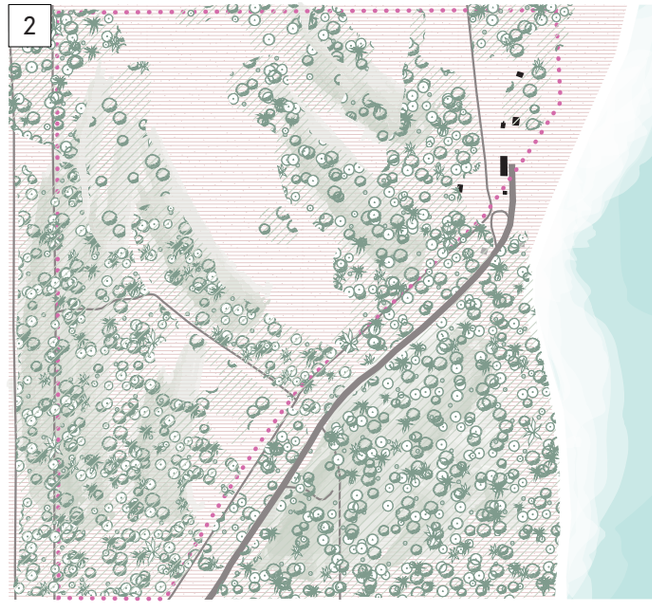
OPPORTUNITIES:
- Planned and controlled use of the remote and natural location for increasing quality of user experience.
- Integration of farms around the property for providing zero-kilometer meals.
- Use of sustainable waste management systems.

THREATS:
- Low accessibility from airport and to touristic hotspots.
- Beach erosion and rising sea levels.
- Increasing number of hotels currently under construction in the same area and increase of competition.

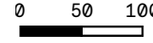




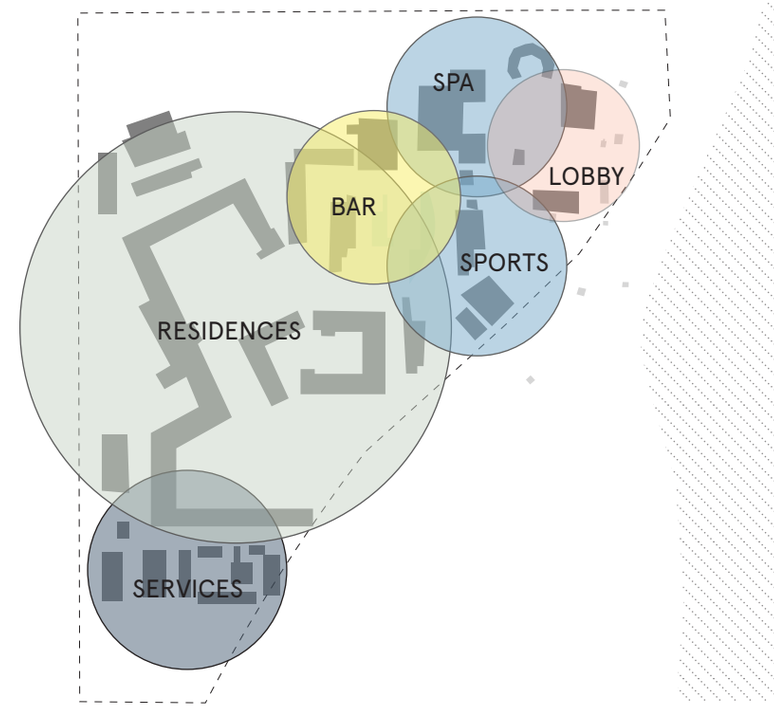
Before
2016



After
2024



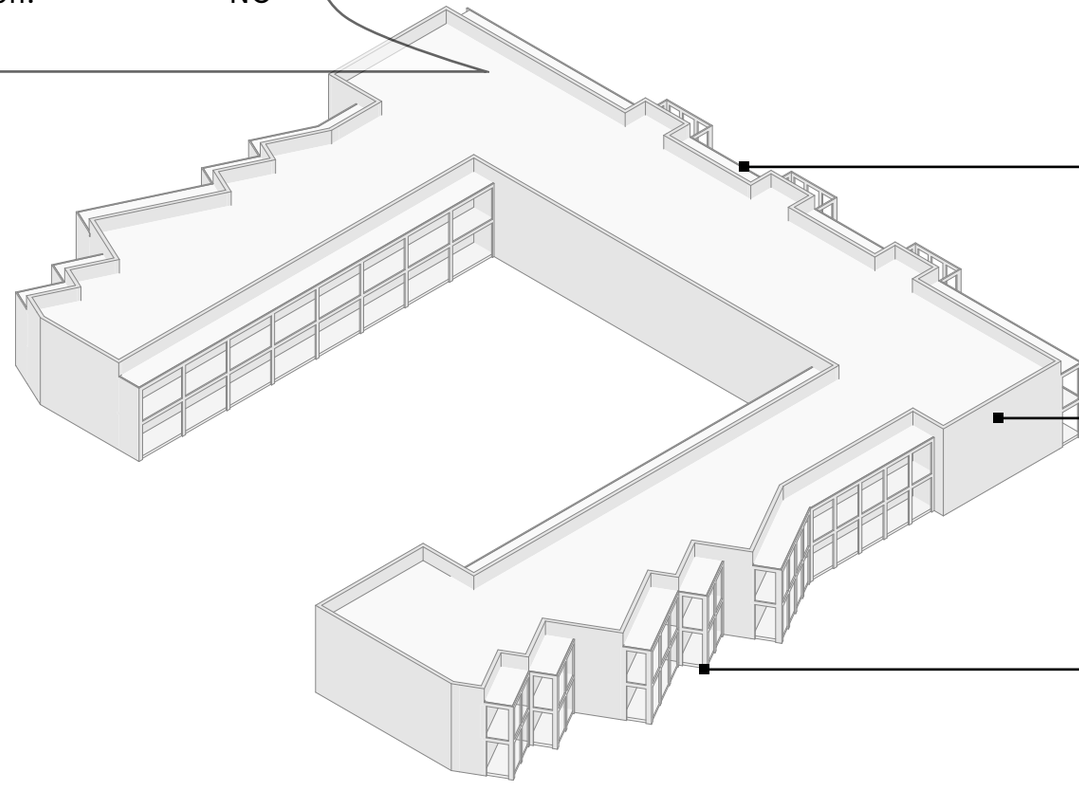
Functional zoning of the territory



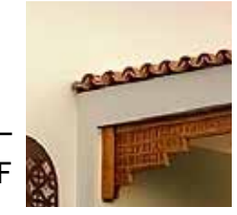
Plot characteristics:

Property land area:	130 000 sq.m.
Built area:	25 528 sq.m.
Built area in the sea:	-
Green area:	1 261 sq.m.
Green area before 2000:	85 650 sq.m.
Persentage of green area on the plot area:	0.97 %
Removed greenary on the plot area:	65 %
Ratio of greenary (sq.m.) to the built area (sq.m.):	5 %
Percentage of built area:	19.64 %

Plan type:	LINEAR / П-SHAPED
Size:	LARGE
Type of the roof:	FLAT
Entrance:	COMMON
Organisation of units:	GROUPED
Terraces:	YES
Floors:	2
Shading devices:	HORIZONTAL
Natural ventilation:	NO

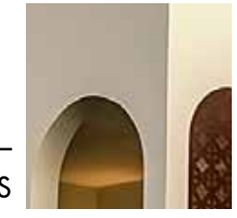


ROOF



Ceramic tiles

WALLS



Plaster

FLOORS

Parquet / laminate

3.2. Case study No 3. Sensations Eco-Chic Hotel

Size	20 suites
Founded in	2023
Ownership	MERILEN HOLIDAYS by MR GROUP (Italy)
Price per night (EUR)	€ 494
Hotel class	5
Sustainable actions	Furniture of natural materials // Water recycling // Solar power // Wind power // Locally sourced products and services // Hotel built with zero impact approach on the environment // Training and employment of local staff // Plastic free
Distance to the airport	45 km. [1 h. 3 mins.]
Relevant ecology	Beach (Pwani beach)
Entertaining services	Bar and restaurants // Spa & Yoga // Dolphin tour // White island tour // Stonetown tour- Prison island tour // Spice farm tour // Jozani forest tour
Location	20, Pwani Mchangani Tanzania Open on Google Maps
Link	Link to website of the hotel

Picture 3.3. Top view of the Sensations Eco Chic Hotel resort. (Image source: Sensations Eco Chic Hotel website. Accessed November 24, 2024)

STRENGTHS:

- Use of local natural materials for making the furniture.
- Plastic free hotel.
- Water recycling.
- Use of passive energy sources such as solar panels and wind turbines.
- Use of locally sourced products and services.
- Training programs and employment as staff for the local population.
- Use of thatched roofs.
- 100 percent use of natural materials for construction.
- Medium intervention on the original environment with the preservation of existing trees.
- Low density resort.
- Barefoot hotel.

WEAKNESSES:

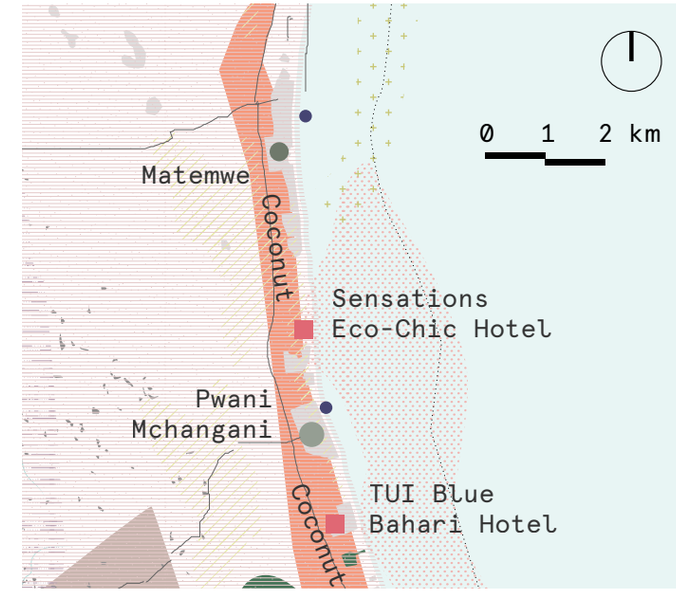
- Located far away from the airport (50 km) and other touristic hotspots.
- High price per night.
- Use of active environment control systems.

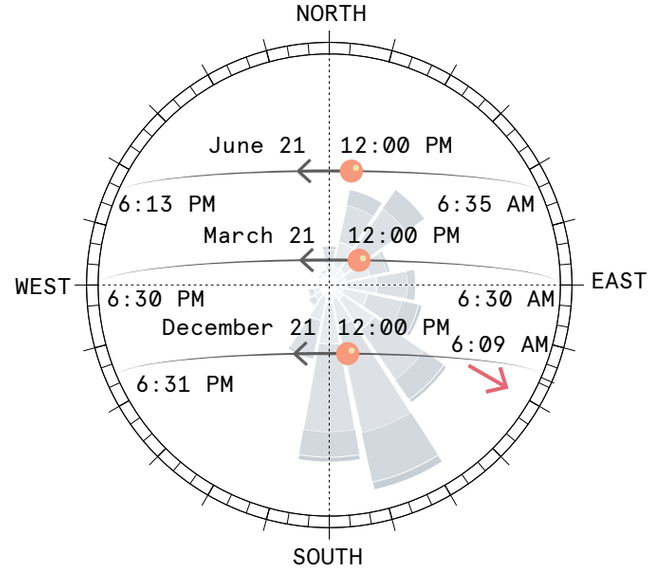
OPPORTUNITIES:

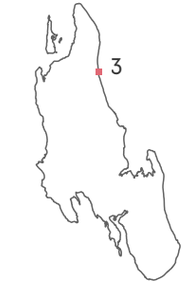
- Planned and controlled use of the remote and natural location for increasing quality of user experience.
- Integration of farms around the property for providing zero-kilometer meals.

THREATS:

- Low accessibility from airport and to touristic hotspots.
- Beach erosion and rising sea levels.

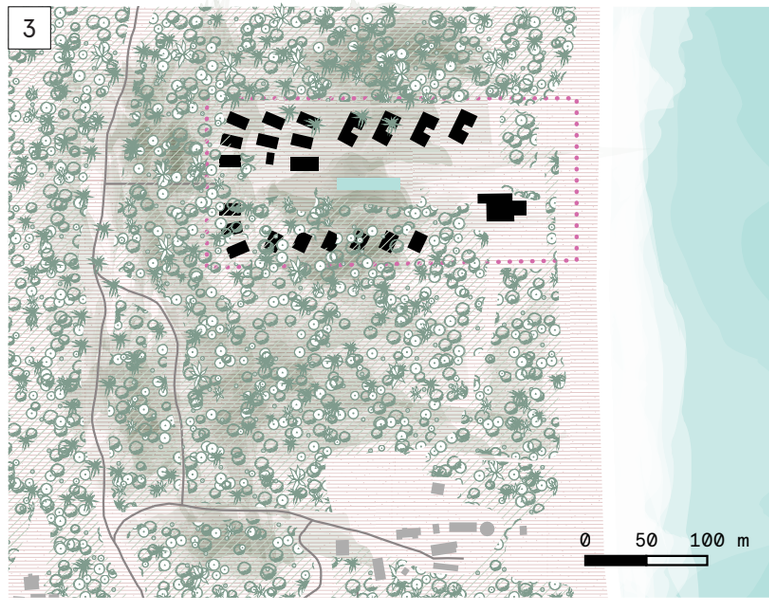




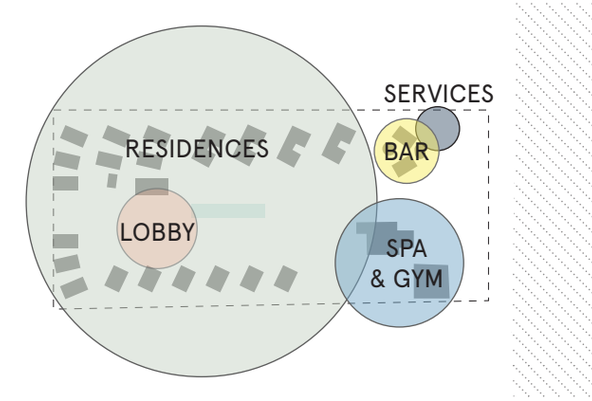


Before
2017

After
2024



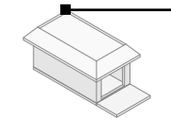
Functional zoning of the territory

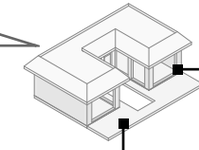


Plot characteristics:

Property land area:	41 204 sq.m.
Built area:	5 110 sq.m.
Built area in the sea:	-
Green area:	14 137 sq.m.
Green area in the borders of the property before 2000:	34 353 sq.m.
Persentage of green area on the plot area:	34.31 %
Removed greenary on the plot area:	49 %
Ratio of greenary to the built area:	277 %
Percentage of built area:	12.40 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	BOTH
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE





ROOF

Straw / dried leaves
Wooden rafters

WALLS

Plaster

FLOORS

Natural stone / porcelain tiles

3.2. Case study No 4. TUI BLUE Bahari Zanzibar

Size	207 rooms
Founded in	2007
Ownership	TUI Group (Germany)
Price per night (EUR)	€ 256
Hotel class	5
Sustainable actions	Locally sourced supplies // Sustainability certification (based on Global Sustainable Tourism Council (GSTC) Criteria) // Circular business model // Reduce emissions aligned with the Paris Agreement // Renewable energy
Distance to the airport	45 km. [1 h.]
Relevant ecology	Beach (Kiwengwa)
Entertaining services	Bar and Restaurant // Fishing // Diving // Sailing // Catamaran sailing // Kitesurfing // Tennis // Wellness area // Beauty center // Massage // Children playground // Pool // Garden // Gym // Yoga
Location	Pwani Mchangani Tanzania
	Open on Google Maps
Link	Link to website of the hotel

Picture 3.4.
Bird eye view of the TUI Blue Bahari Zanzibar. (Image source: Secretescapes website. Accessed November 24, 2024)

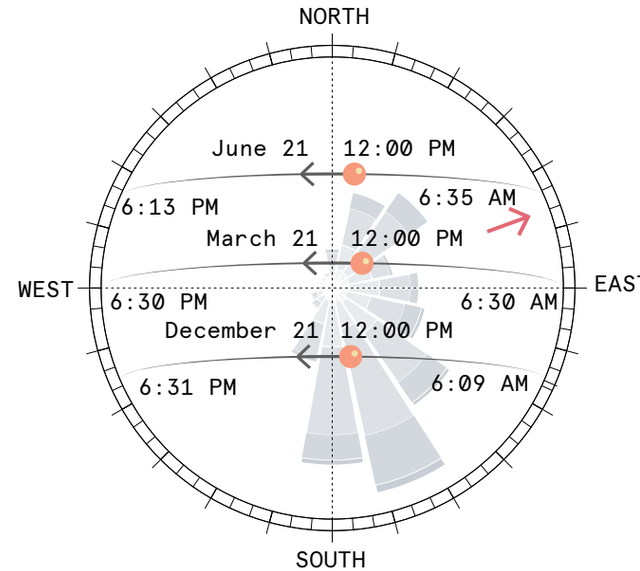
SWOT analysis

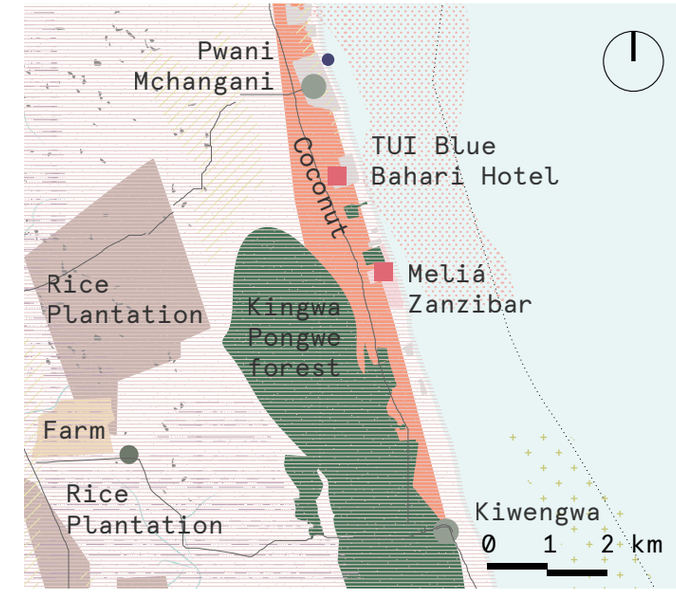
STRENGTHS:
- Use of locally sourced supplies.
- Acquired sustainability certification based on circular business model.
- Use of passive energy sources.
- Distribution of units in several buildings instead of using large buildings masses.
- Separation of the natural beach from the resort using higher platform
- Use of thatched roofs.
- Providing local craft teaching with the local craftsman for tourists.

WEAKNESSES:
- Located far away from the airport (50 km) and other touristic hotspots.
- High price per night.
- No indication of waste management system.
- No indication of economical connection with the social context.
- Use of active environment control systems.

OPPORTUNITIES:
- Planned and controlled use of the remote and natural location for increasing quality of user experience.
- Integration of farms due to the existence of free space around the property for providing zero-kilometer meals.
- Further integration of local population with various activities introducing the local culture.

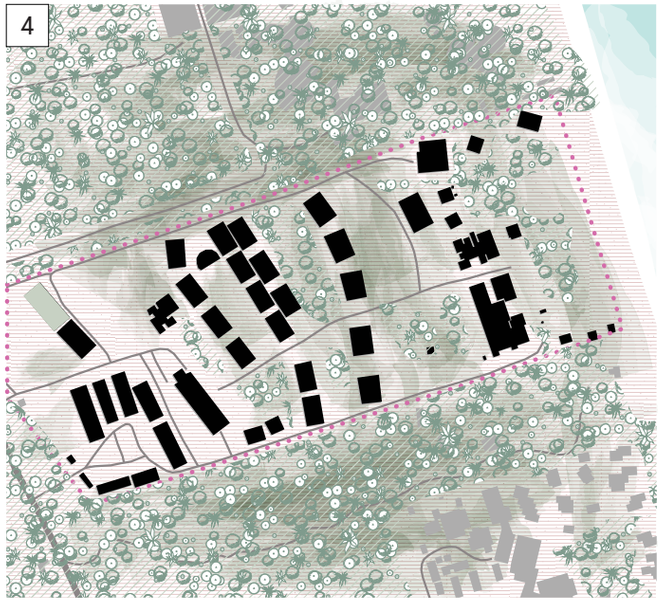
THREATS:
- Low accessibility from airport and to touristic hotspots.
- Beach erosion and rising sea levels.

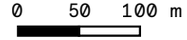




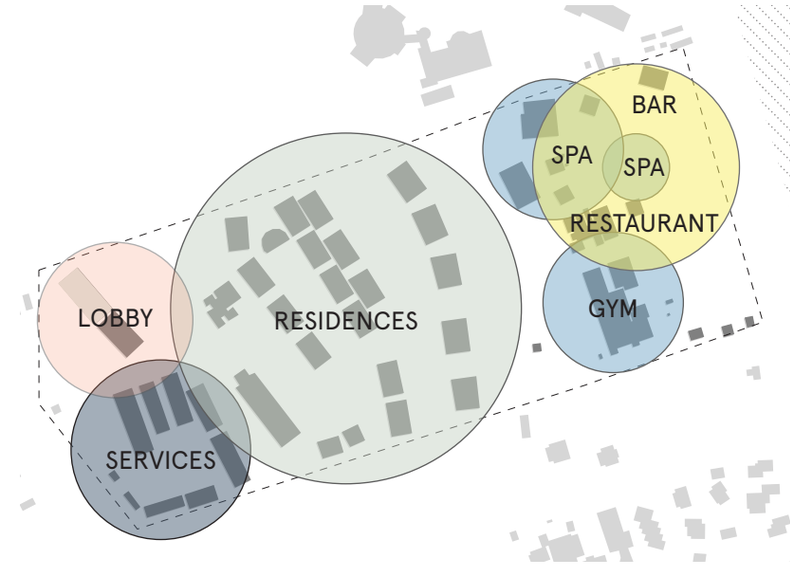
Before
2007

After
2024





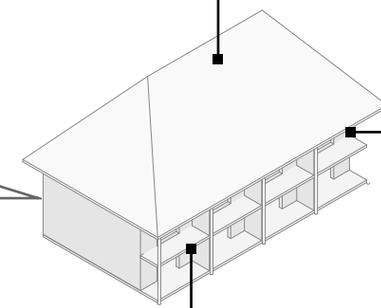
Functional zoning of the territory



Plot characteristics:

Property land area:	97 419 sq.m.
Built area:	14 902 sq.m.
Built area in the sea:	-
Green area:	13 442 sq.m.
Green area in the borders of the property before 2000:	24 394 sq.m.
Persentage of green area on the plot area:	13.80 %
Removed greenary on the plot area:	11 %
Ratio of greenary (sq.m.) to the built area (sq.m.):	90 %
Percentage of built area:	15.30 %

Plan type:	REGULAR
Size:	LARGE
Type of the roof:	SLOPED
Entrance:	BOTH TYPES
Organisation of units:	GROUPED
Terraces:	YES
Floors:	2
Shading devices:	HORIZONTAL
Natural ventilation:	NO



ROOF

Straw/dry leaves
Wooden rafters

WALLS

Plaster

FLOORS

Porcelain tiles

3.2. Case study No 5. Melia Zanzibar

Size	156 rooms
Founded in	2005
Ownership	Melia Group (Spain)
Price per night (EUR)	€ 442
Hotel class	5
Distance to the airport	49 km. [1 h.]
Relevant ecology	Beach (Kiwengwa) Natural Coral reef
Entertaining services	Bars and Restaurants // Spa // Kids club // Pool // Meeting rooms and outdoor amphitheater // Gym
Location	Kiwengwa 00200 Tanzania
Link	Open on Google Maps Link to website of the hotel

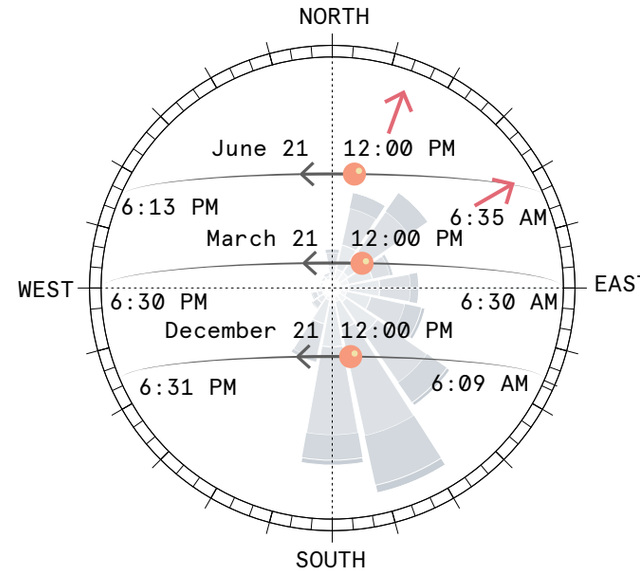
Picture 3.5.
Residential blocks of Melia Zanzibar. (Image source: Melia Hotels and Resorts website. Accessed November 24, 2024)

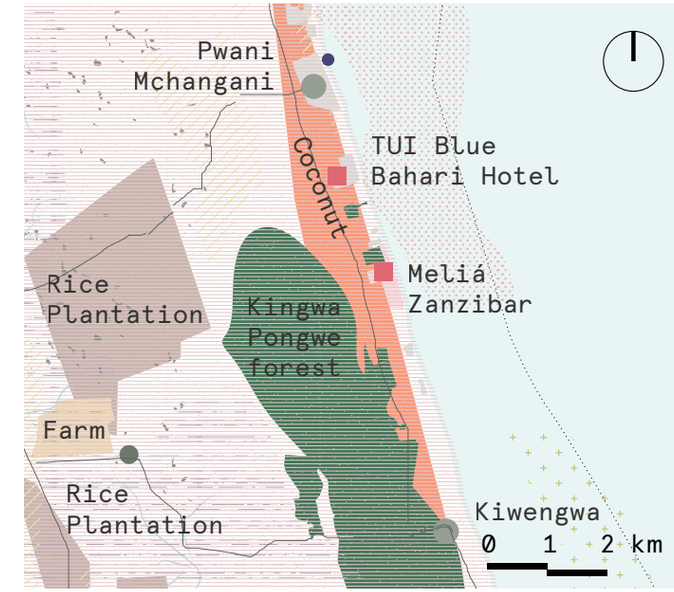
STRENGTHS:
- Use of passive energy sources.
- Distribution of units in several buildings instead of using large buildings masses.
- Separation of the natural beach from the resort using higher platform
- Designed based on the natural slope of the land.
- Using the Makuti thatched roof in some units.
- Use of pilotis for construction of buildings near the cliff.
- Providing various facilities such as spaces for congress and social events.
- Located on a cliff thus eliminating the threat of sea level rise.
- Use of jetty to provide an extended experience among the sea to visitors.
- Farms around the property for providing zero-kilometer meals.

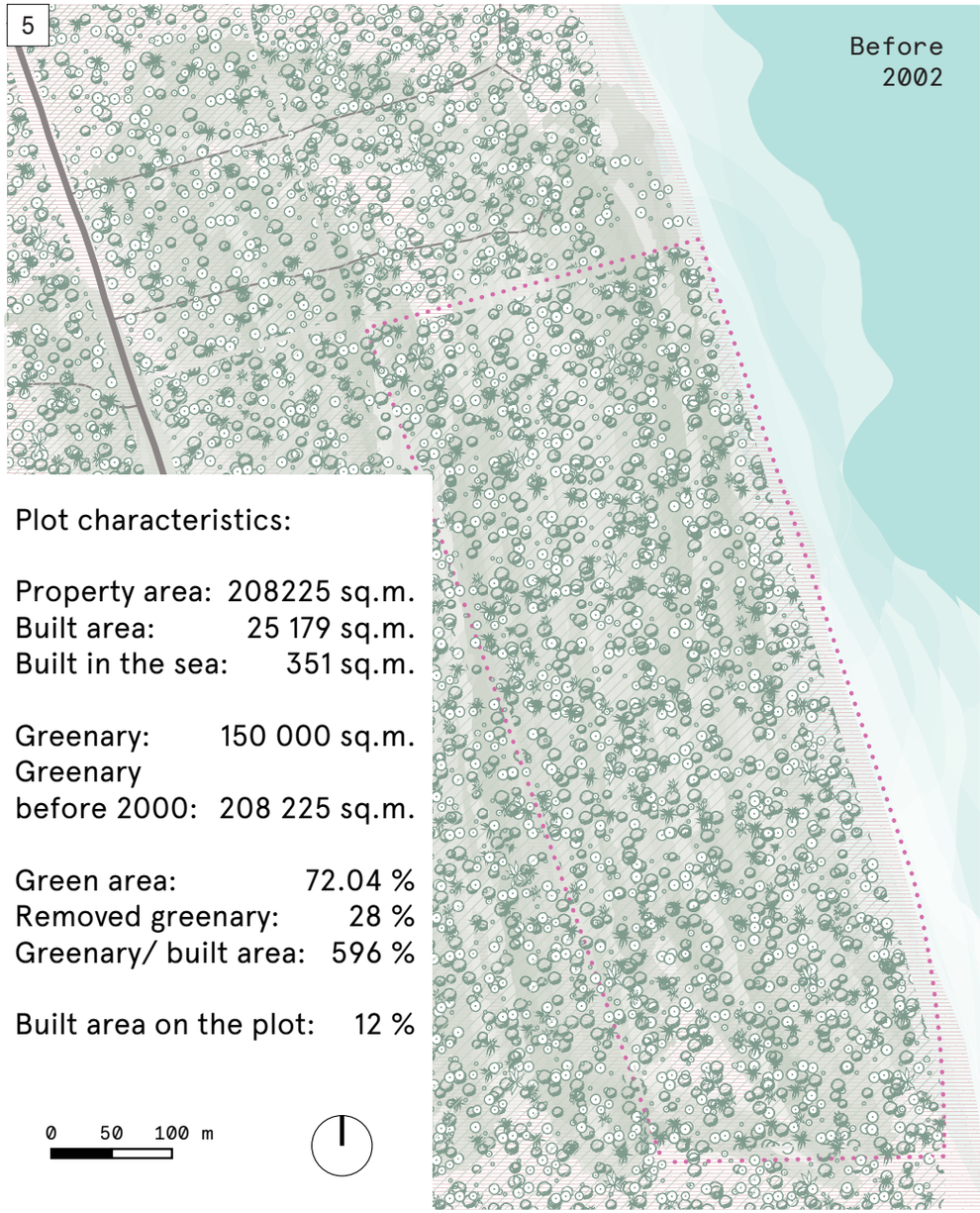
WEAKNESSES:
- Located far away from the airport (50 km).
- High price per night.
- No indication of waste management system.
- No indication of engagement with the social context.
- No beach.
- Use of active environment control systems.

OPPORTUNITIES:
- Planned and controlled use of the remote and natural location for increasing quality of user experience.
- Involvement of the local population from nearby towns in the activities of the resort.

THREATS:
- Low accessibility from airport and to touristic hotspots.







Plot characteristics:

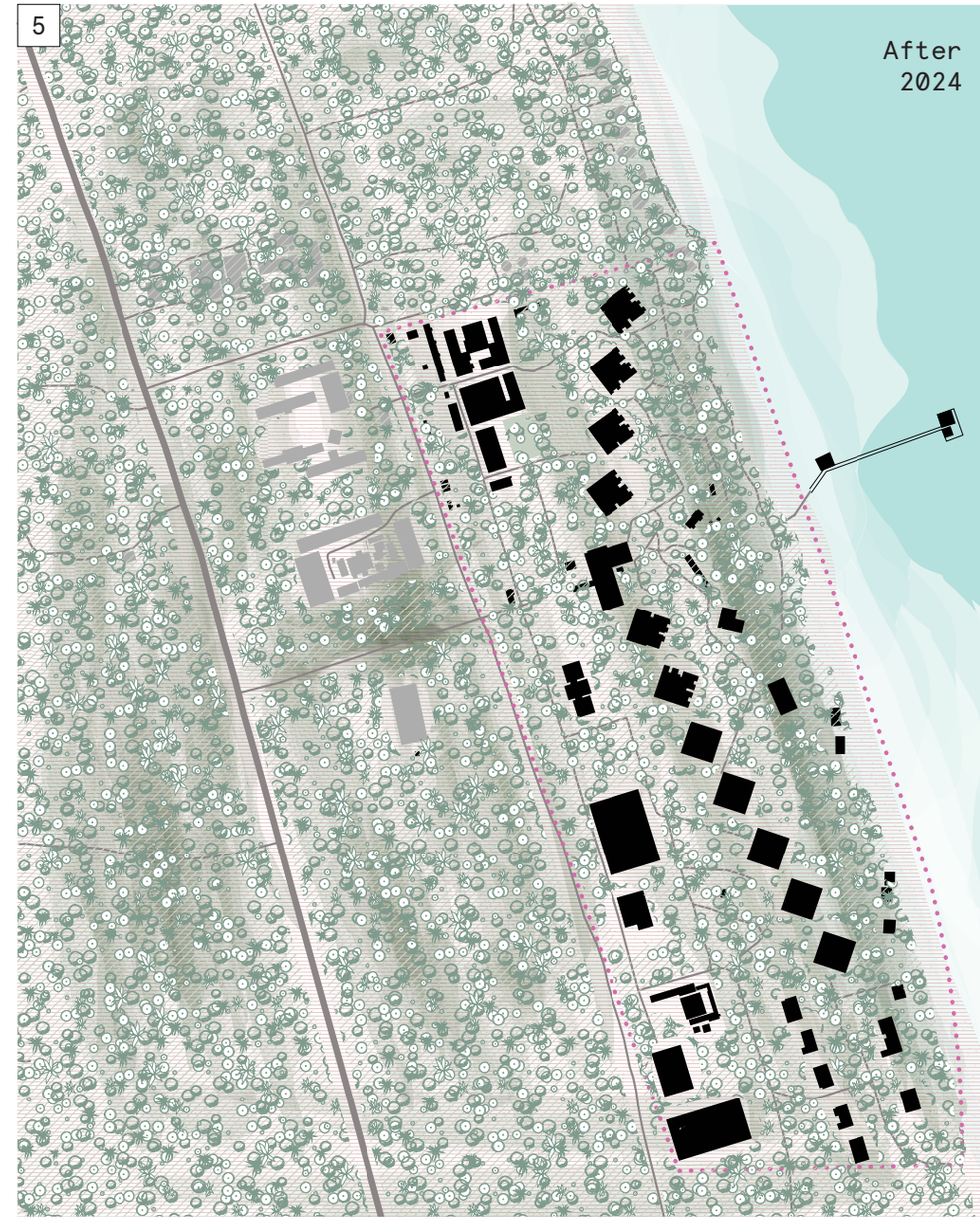
Property area: 208225 sq.m.
Built area: 25 179 sq.m.
Built in the sea: 351 sq.m.

Greenary: 150 000 sq.m.
Greenary
before 2000: 208 225 sq.m.

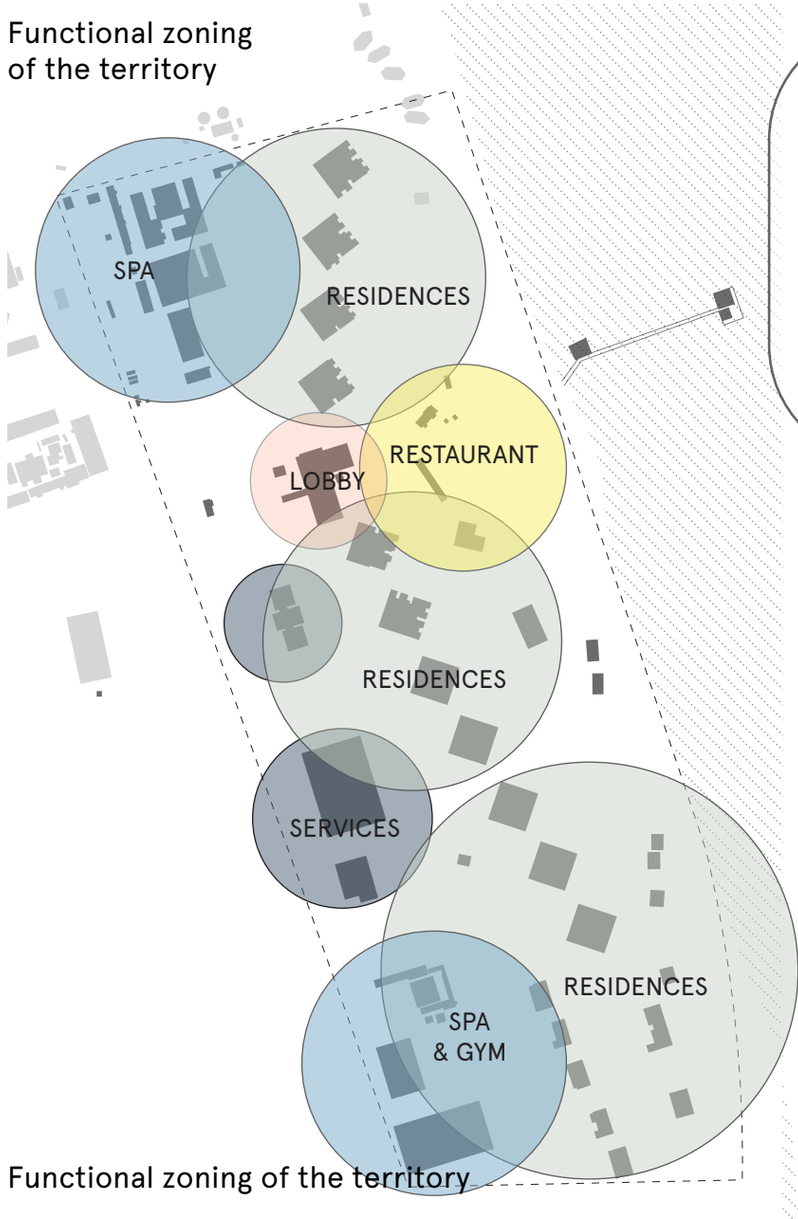
Green area: 72.04 %
Removed greenary: 28 %
Greenary/ built area: 596 %

Built area on the plot: 12 %

0 50 100 m

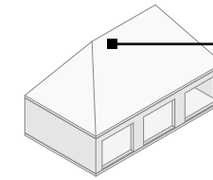


Functional zoning
of the territory



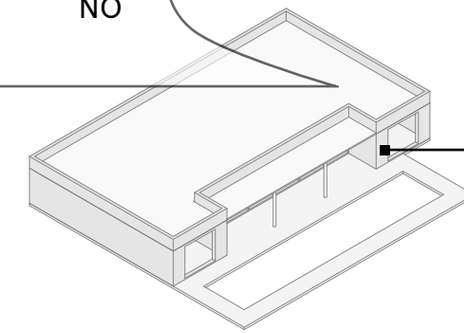
Functional zoning of the territory

Plan type:	REGULAR
Size:	LARGE
Type of the roof:	SLOPED / FLAT
Entrance:	BOTH TYPES
Organisation of units:	BOTH
Terraces:	BALCONIES
Floors:	2
Shading devices:	ON THE EAST
Natural ventilation:	NO



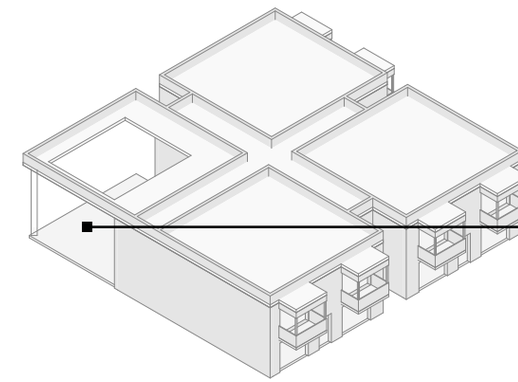
ROOF

Dry grass
Wooden beams



WALLS

Plaster
Wooden structures
Shell rock / limestone /
porous stone



FLOORS
Porcelain tiles

3.2. Case study No 6. Tulia Unique Beach Resort

Size	16 villas
Founded in	2015
Ownership	TLHG
Price per night (EUR)	€ 543
Hotel class	5
Sustainable actions	Waste recycling to use for soil for organic farm to grow vegetables and local herbs and fruits // Hiring of local chefs // Education and hiring of local community
Distance to the airport	49 km. [1 h. 1 mins.]
Relevant ecology	Kiwengwa/Pongwe Forest Reserve Beach (Pongwe)
Entertaining services	Semi Submarine cruise // Jozani forest tour // Swimming with turtles // Bar and Restaurants // Water sports (paddle boards and kayaks) // Yoga // Spa // Beach sports // Electric scooters // Farm tour // Gym // Tulia boat // Bicycle
Location	Pongwe Tanzania Open on Google Maps
Link	Link to website of the hotel

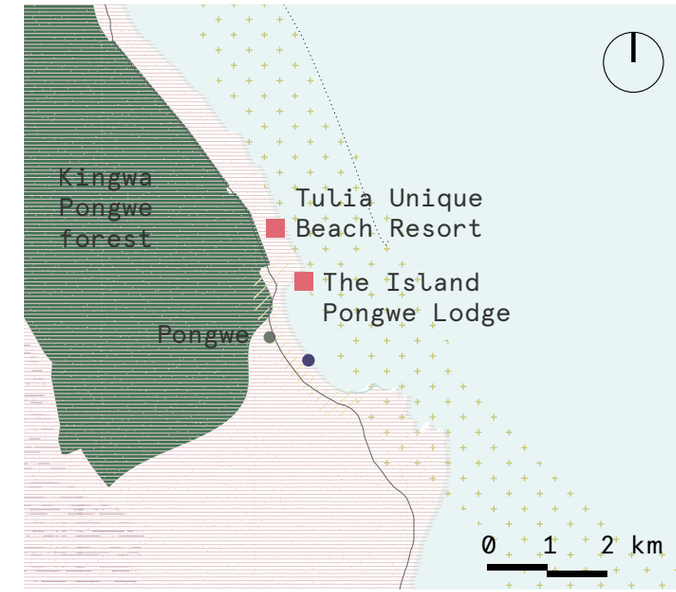
Picture 3.6.
Bird eye view of the Tulia Unique Beach Resort. (Image source: Tulia Unique Beach Resort website. Accessed November 24, 2024)

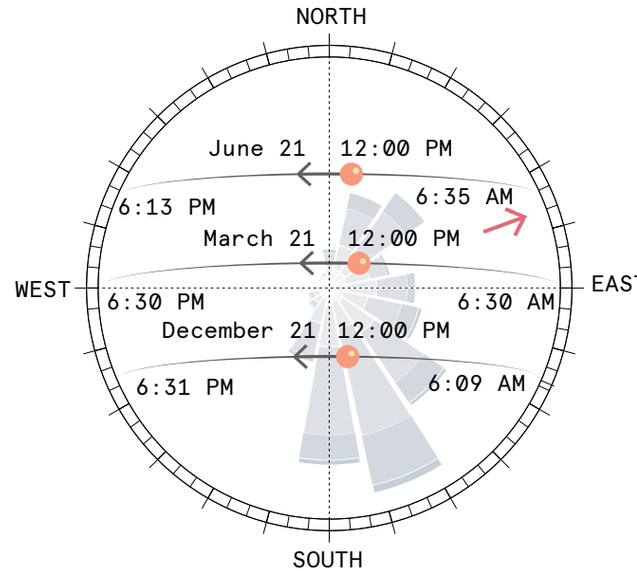
STRENGTHS:
- Use of passive energy sources.
- Low density hotel.
- Separation of the natural beach from the resort using higher platform
- Use of Makuti thatched roof.
- Located on a high platform thus eliminating the threat of sea level rise.
- Organic farm providing zero-kilometer meals.
- Waste recycling to be used in the property farm.
- Hiring of local chefs.
- Providing education courses and employment of the local population.
- Support for local population through educational programs and the support of local schools.

WEAKNESSES:
- Located far away from the airport (50 km).
- High price per night.
- Use of active environment control systems.

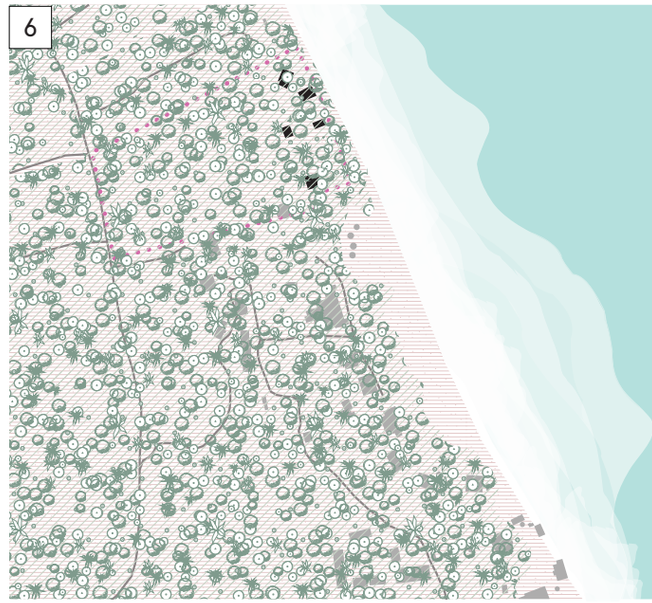
OPPORTUNITIES:
- Close vicinity to the Kichwele forest reserve.
- Making of a low impact jetty to provide elevated access to the sea from atop the platform.

THREATS:
- Low accessibility from airport.





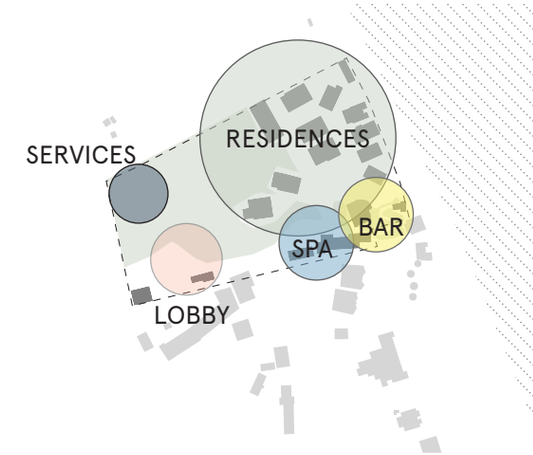
Before
2012



After
2024

0 50 100 m

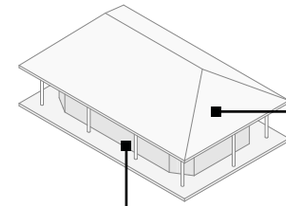
Functional zoning of the territory



Plot characteristics:

Property land area:	21 430 sq.m.
Built area:	3 359 sq.m.
Built area in the sea:	-
Green area:	12 714 sq.m.
Green area in the borders of the property before 2000:	21 430 sq.m.
Persentage of green area on the plot area:	59.33 %
Removed greenary on the plot area:	41 %
Ratio of greenary to the built area:	379 %
Percentage of built area:	15.67 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	SEPARATED
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	NO

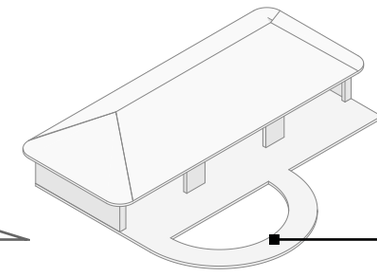


ROOF

Straw

WALLS

Facade stone



FLOORS

Parquet / laminate

3.2. Case study No 7. The Island Pongwe Lodge

Size	6 villas
Founded in	2013
Ownership	The Coccon collection (Italy)
Price per night (EUR)	€ 350
Hotel class	3
Distance to the airport	48 km. [1 h.]
Relevant ecology	Island (Pongwe)
Entertaining services	Dining and bar // Sailing and snorkeling // Spear fishing // Line fishing // Private boat // Bike ride
Location	Pongwe Tanzania
Link	Open on Google Maps Link to website of the hotel

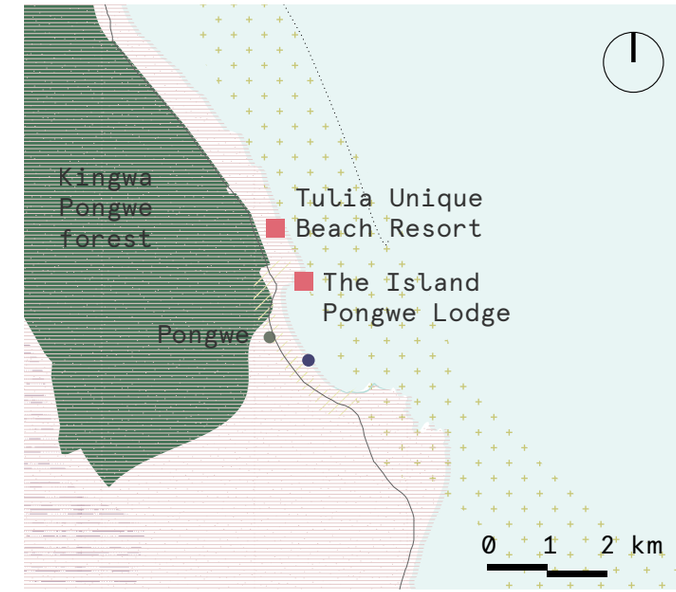
Picture 3.7.
Bird eye view of the Pongwe island. (Image source: The Island Pongwe website. Accessed November 24, 2024)

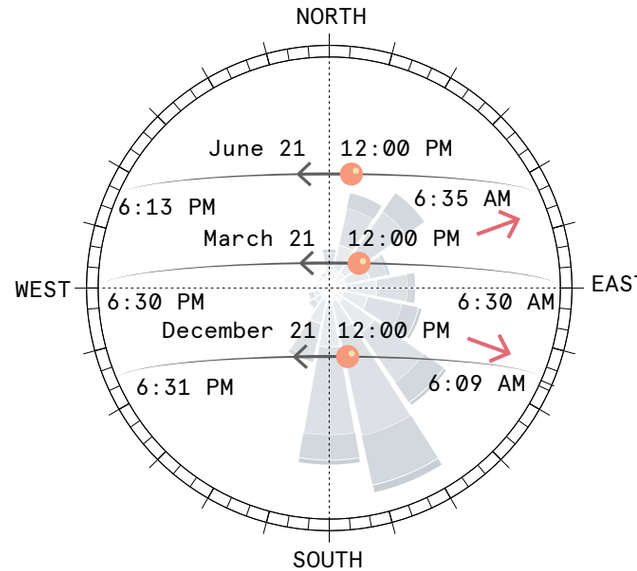
STRENGTHS:
- Low density hotel.
- Located on an isolated and quite island.
- Using the local Makuti roof in construction.
- Use of thatched roof.
- Hiring of local population.
- Holding local culture events.
- Adult only hotel.
- Use of only local passive cooling methods for environmental condition regulation. (No A/C)
- No TV and music from electronic devices.
- Low intervention with the existing environment.

WEAKNESSES:
- Located far away from the airport (50 km).
- Limited facilities.

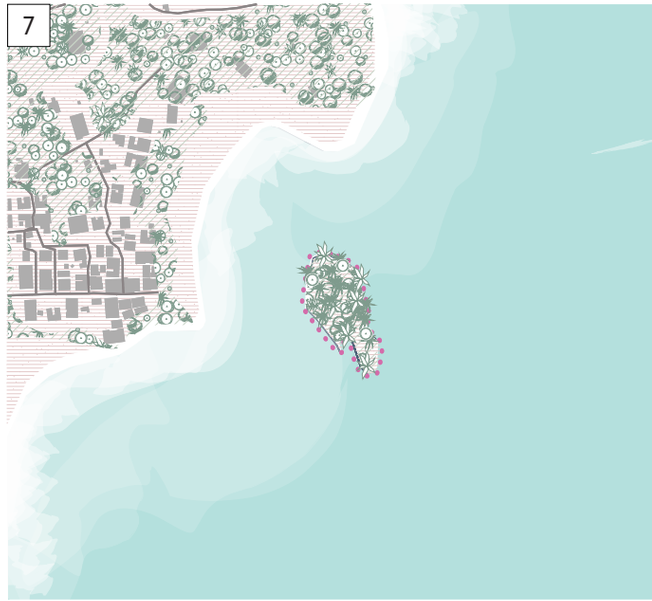
OPPORTUNITIES:
- Integration of the activities in the close vicinity seasonal seaweed farms.
- Providing further plans for supporting the seaweed farms.
- Possible extension of the facilities with floating structures.

THREATS:
- Low accessibility from airport.
- Increasing sea level rise.

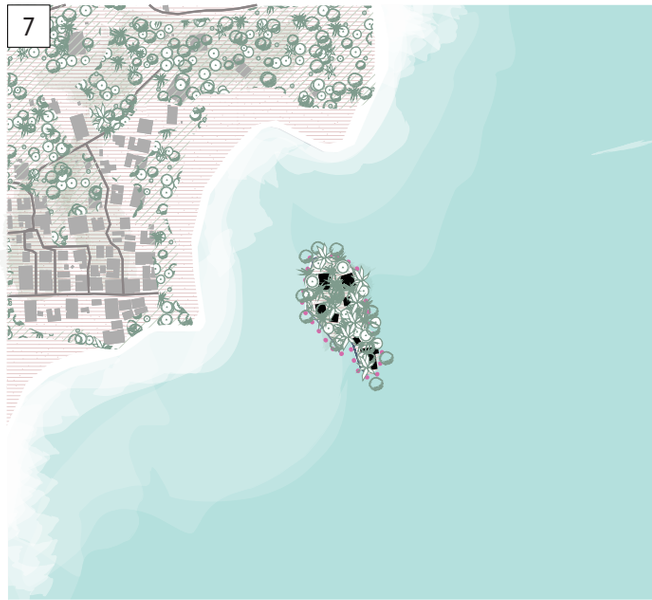




Before
2006

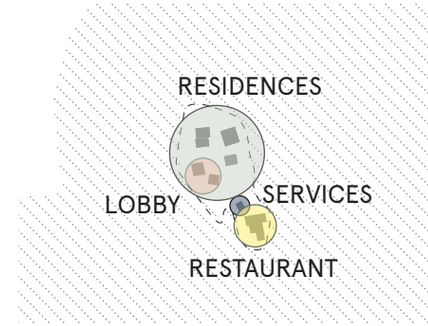


After
2024



0 50 100 m

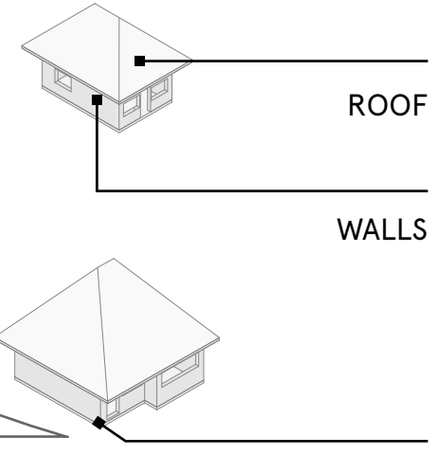
Functional zoning of the territory



Plot characteristics:

Property land area:	3 700 sq.m.
Built area:	641 sq.m.
Built area in the sea:	-
Green area:	2 143 sq.m.
Green area in the borders of the property before 2000:	3 700 sq.m.
Persentage of green area on the plot area:	57.92 %
Removed greenary on the plot area:	42 %
Ratio of greenary to the built area:	334 %
Percentage of built area:	17.32 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	SEPARATED
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



ROOF

WALLS

FLOORS

Dried wood
Branches and wooden beams

Plaster

Wood (boards)
Natural stone

3.2. Case study No 8. Karafuu Beach Resort & Spa

Size	138 rooms
Founded in	1995
Ownership	Carmelo Reitano (Italy)
Price per night (EUR)	€ 230
Hotel class	5
Sustainable actions	One hectare vegetable garden for products // Use of glass bottles and dismissal of plastic bottles for water // seawater desalination // solar panels
Distance to the airport	64 km. [1 h. 17 mins.]
Relevant ecology	Beach (Pingwe)
Entertaining services	Bar & pool bar // Restaurant // Spa // Pool // Snorkelling // Spice farm tour // Jozani forest tour // Diving // Boutique with locally crafted product // Gym // Tennis court // Beach volleyball // Table sports
Location	Uroa Tanzania Open on Google Maps
Link	Link to website of the hotel

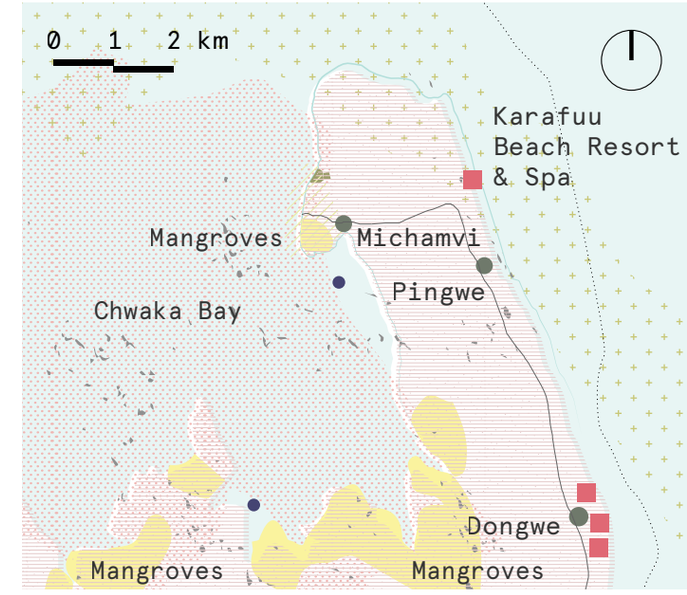
Picture 3.8. Single villa of the Karafuu Beach Resort & Spa.
(Image source: Karafuu Beach Resort & Spa website. Accessed November 24, 2024)

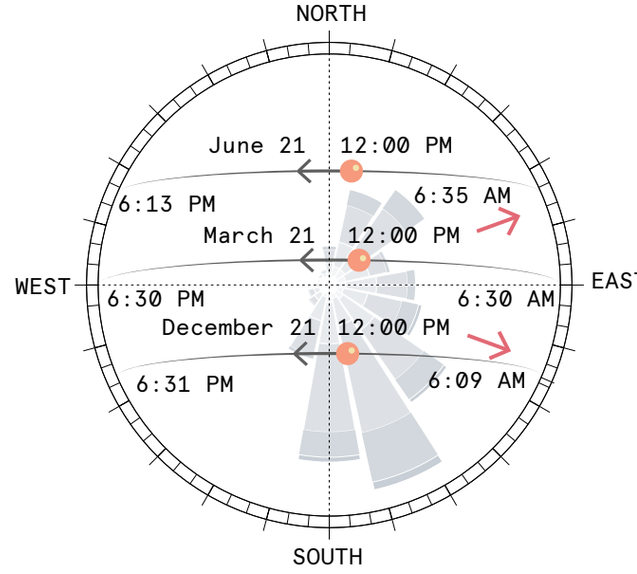
STRENGTHS:
- Distribution of units in several buildings instead of using large buildings masses.
- Using the local Makuti roof in construction.
- Use of thatched roof.
- Separation of the natural beach from the resort with the use of wooden dams and higher platforms.
- Organic garden providing zero-kilometer meals.
- Support of a local schools.
- Providing support for poor families and agricultural development.
- Plastic free.
- Providing various facilities such as spaces for congress and social events.
- Holding local culture events.

WEAKNESSES:
- Located far away from the airport (68 km).
- No indication of use of passive energy sources.
- No indication of waste management system.
- No indication of used water source.
- Use of electric carts for the transportation of tourists around the resort.
- Use of active environment control systems.

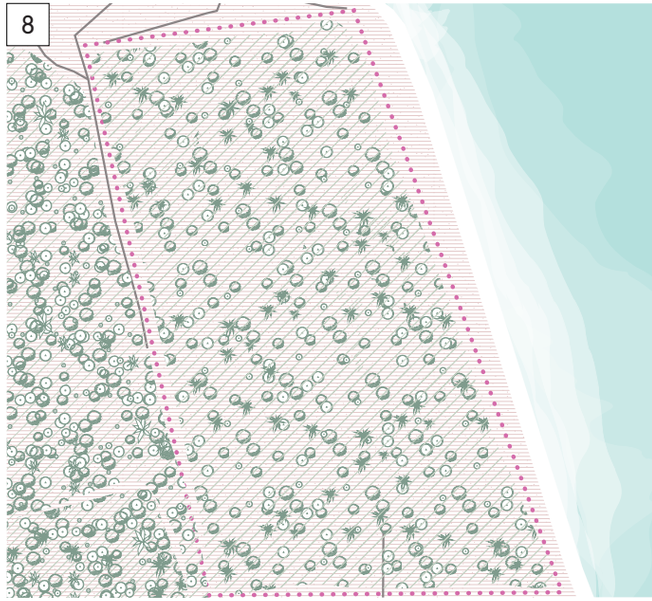
OPPORTUNITIES:
- Integration of passive energy sources
- Use of electric cars not for use within the resort compound but for transportation to the airport.

THREATS:
- Low accessibility from airport.
- Increasing sea level rise and beach erosion.
- Degradation of the soil of the organic farm.





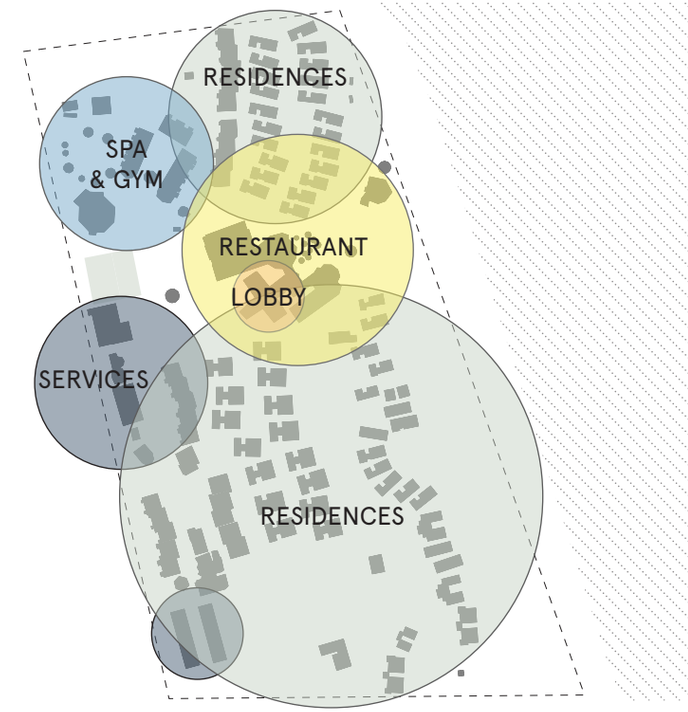
Before
1993



After
2024

0 50 100 m

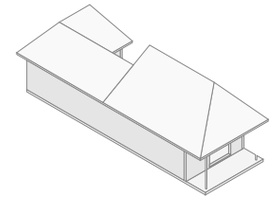
Functional zoning of the territory

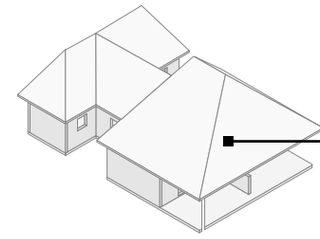


Plot characteristics:

Property land area:	120 537 sq.m.
Built area:	23 055 sq.m.
Built area in the sea:	-
Green area:	30 366 sq.m.
Green area before 2000:	120 537 sq.m.
Persentage of green area on the plot area:	25.19 %
Removed greenary on the plot area:	75 %
Ratio of greenary to the built area:	132 %
Percentage of built area:	19.13 %

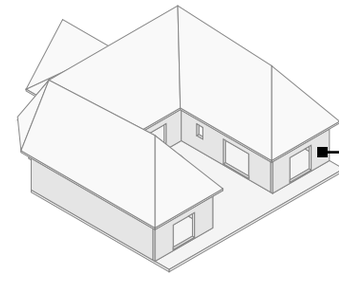
Plan type:	LINEAR / REGULAR
Size:	LARGE
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	BOTH
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	NO





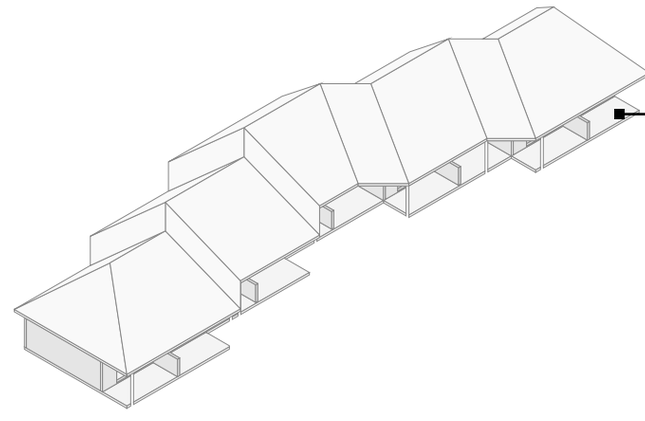
ROOF

Roofing: straw

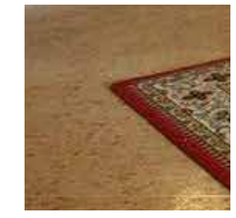


WALLS

Walls: facade plaster



FLOORS



Floors: forcelain tiles

3.2. Case study No 9. The Sands Beach Resort

Size	20 rooms
Founded in	2015
Ownership	Tanzania
Price per night (EUR)	€ 187
Hotel class	4
Distance to the airport	59 km. [1 h. 16 mins.]
Relevant ecology	Beach (Dongwe)
Entertaining services	Restaurant and beach bar // Pool // Surf school and trips // Snorkeling at blue lagoon // Jozani forest tour // Snorkeling at Kizimkazi // Prison island tour // Sailing in traditional Dhow boats // Spice farm tour
Location	Pingwe Village Rd, Dongwe 791 Tanzania Open on Google Maps
Link	Link to website of the hotel

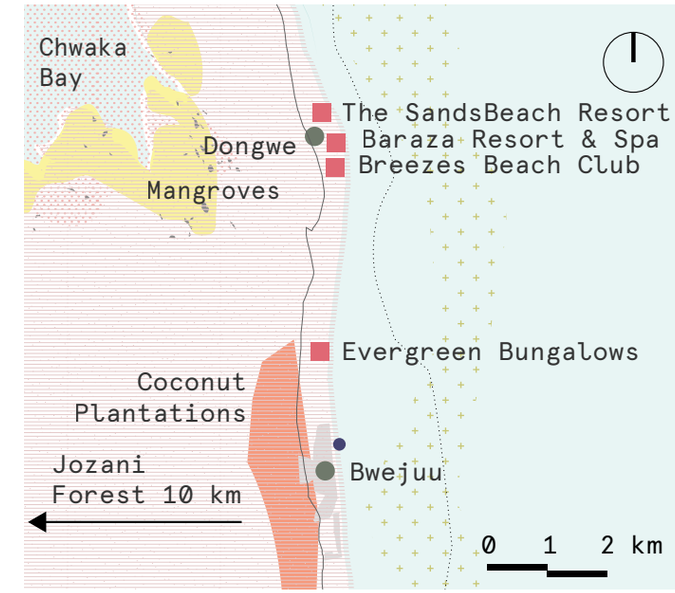
Picture 3.9. Standard bungalow unit of The Sands Beach Resort Zanzibar.
(Image source: The Sands Beach Resort Zanzibar website. Accessed November 24, 2024)

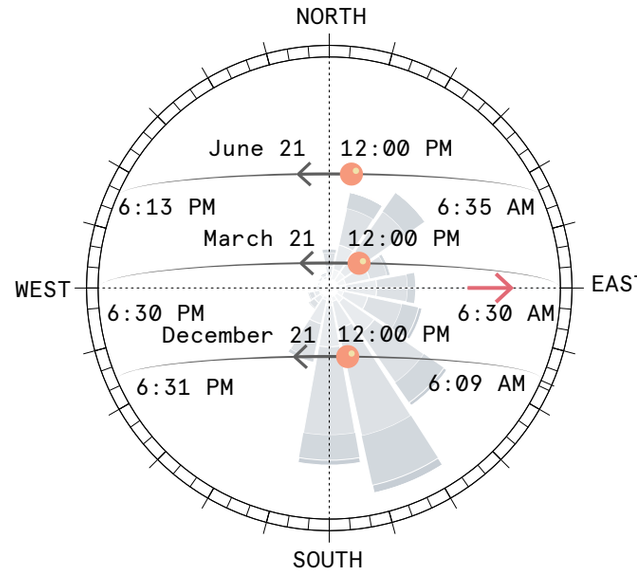
TRENGTHS:
- Low density hotel.
- Separation of the main hotel spaces from the natural beach with wooden dams.

WEAKNESSES:
- Located far away from the airport (60 km).
- No indication of use of passive energy sources.
- No indication of waste management system.
- No indication of used water source.
- Use of thatched roof only for the restaurant.
- Large intervention in the existing environment.
- Use of active environment control systems.

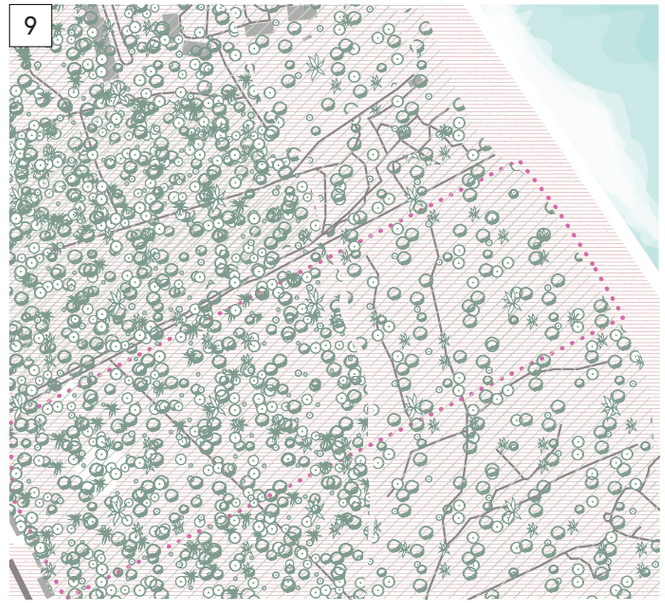
OPPORTUNITIES:
- Integration of passive energy sources
- Further integration of the local population in the hotel activities.
- Planned and controlled use of the remote and natural location for increasing quality of user experience.
- Nearby Jozani forest.
- Integration of farms for providing zero-kilometer meals.

THREATS:
- Low accessibility from airport.
- Increasing sea level rise and beach erosion.
- High number of competing resorts nearby.

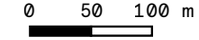




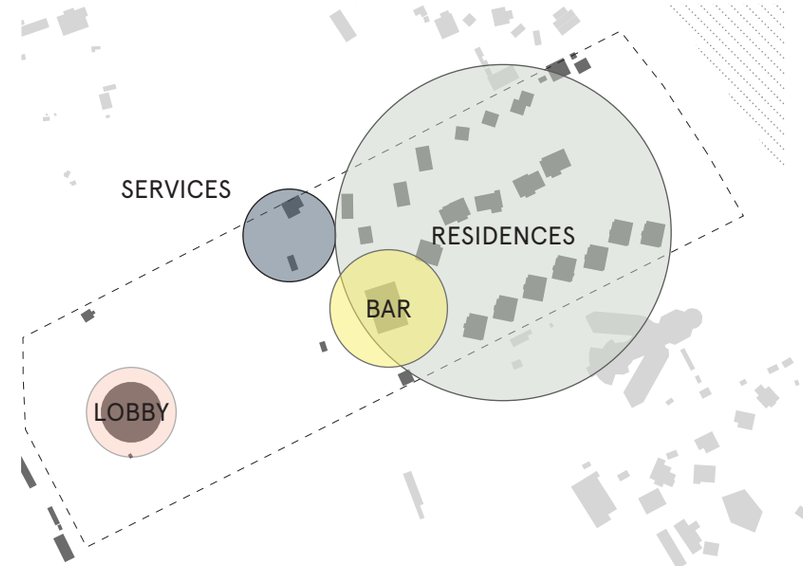
Before
2010



After
2024



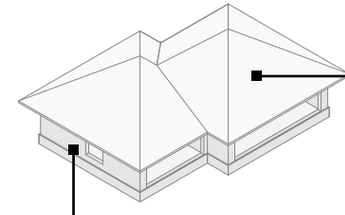
Functional zoning of the territory



Plot characteristics:

Property land area:	77 471 sq.m.
Built area:	6 895 sq.m.
Built area in the sea:	-
Green area:	30 419 sq.m.
Green area in the borders of the property before 2000:	77 471 sq.m.
Persentage of green area on the plot area:	39.27 %
Removed greenary on the plot area:	61 %
Ratio of greenary to the built area:	441 %
Percentage of built area:	8.90 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	BOTH
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	NO

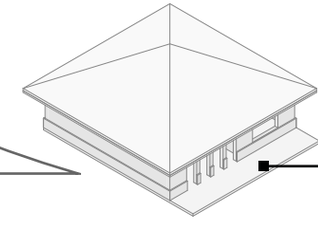


ROOF

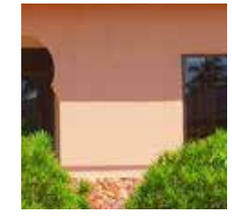
Cement-sand tiles
Straw
Timber
wooden beams and rafters

WALLS

Plaster



FLOORS



Porcelain tiles / natural stone

3.2. Case study No 10. Baraza Resort & Spa

Size	30 villas
Founded in	2009
Ownership	Raguz Family (USA)
Price per night	€ 963
Hotel class	5
Sustainable actions	Hospitality education program (training and employing local) // Use of local products // Furniture created by local artisans // Sustainable fishing methods for guest tours // Payments to the visit of nearby villages going to charity for the improvement of villages // Turtle rescue program // Use of local products // Solar power // Recycling of used plastic // Waste recycling for irrigation // Water recycling // Consultation of marine biologist for the protection of the barrier reef // Classes in local crafts
Distance to the airport	59 km. [1 h. 15 mins.] Beach (Pongwe)
Relevant ecology	Spa // Diving // Snorkeling // Visit to Jozani forest // Kayaking // Sailing
Entertaining services	// Kite surfing // Spice farm tour // Coral reef exploration // Local food cooking classes // Bar and restaurants
Location	Bwejuu Beach Road, Bwejuu Tanzania Open on Google Maps
Link	Link to website of the hotel

Picture 3.10. Royal beach two bedroom villa of the Baraza Resort & Spa.
(Image source: Baraza Resort & Spa website. Accessed November 24, 2024)

STRENGTHS:

- Low density hotel.
- Separation of the main hotel spaces from the natural beach with wooden dams.
- Training programs for and employment from the local population.
- Support of local economy by purchase of supplies from local fisherman and farmers.
- Use of local craftsman for the interior design objects.
- Use of passive energy sources such as solar panels.
- Organic garden.
- Water recycling for use in farm.
- Providing excess electricity to the local settlements.
- Plastic free.
- Protection of the nearby barrier reef with the help of experts

WEAKNESSES:

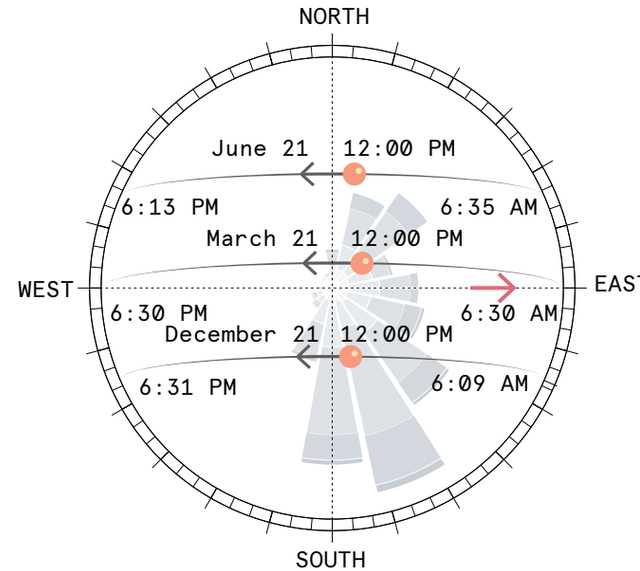
- Located far away from the airport (60 km).
- Use of active environment control systems.

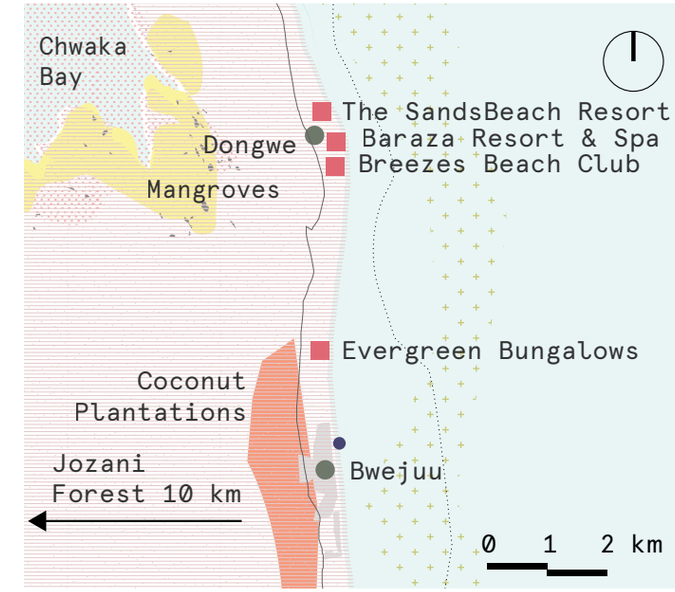
OPPORTUNITIES:

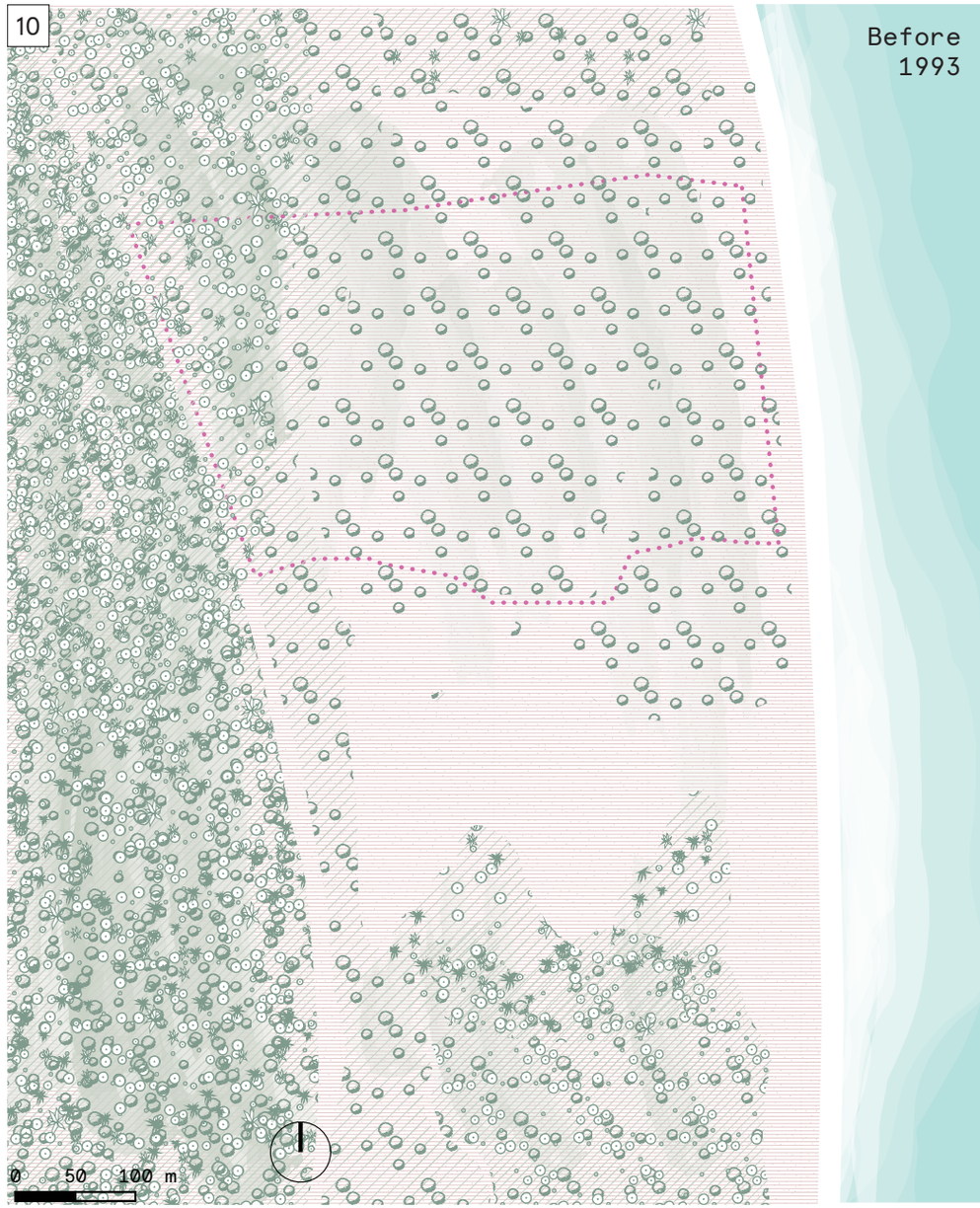
- Extension of the variety of facilities.
- Nearby Jozani forest.

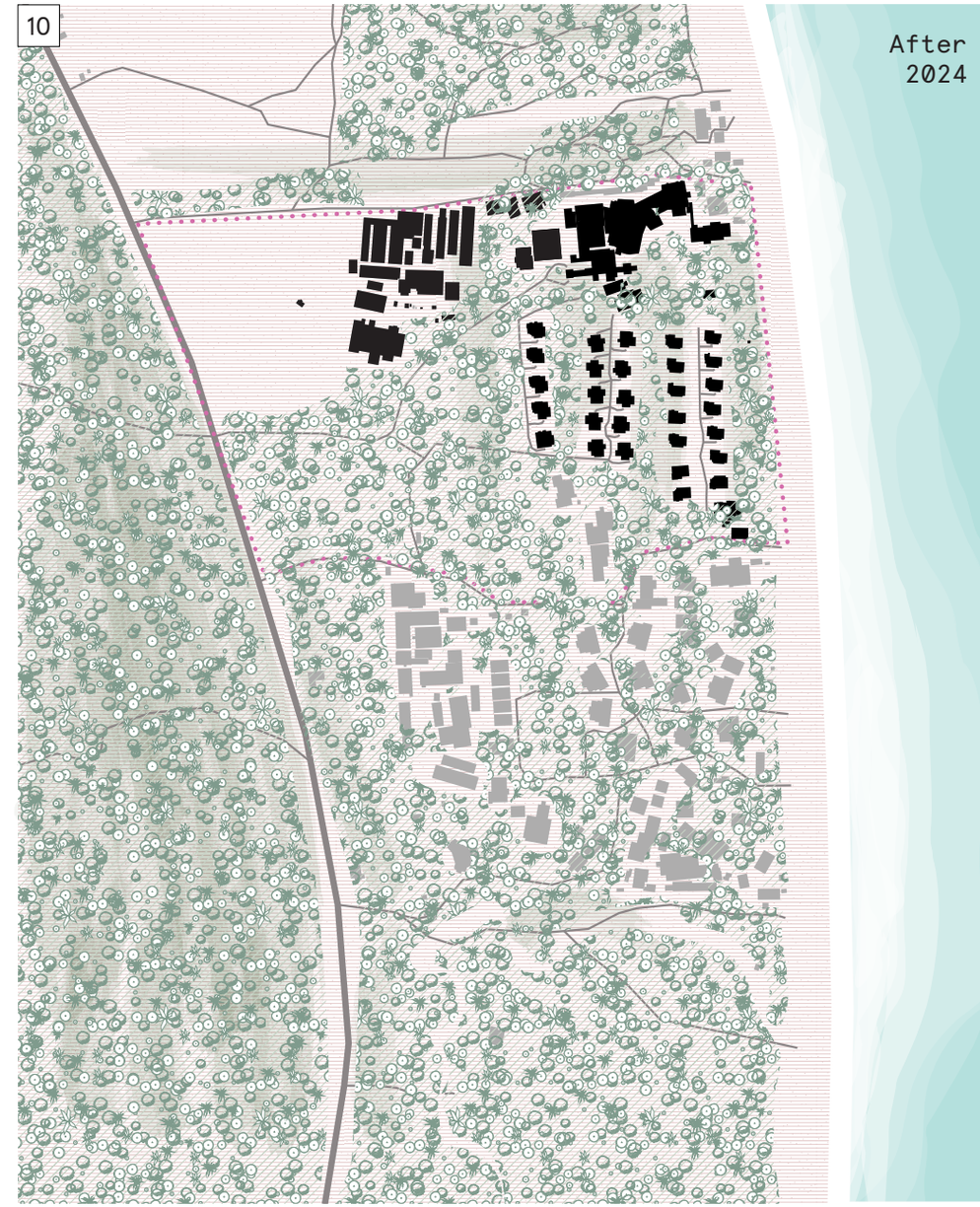
THREATS:

- Low accessibility from airport.
- Increasing sea level rise and beach erosion.

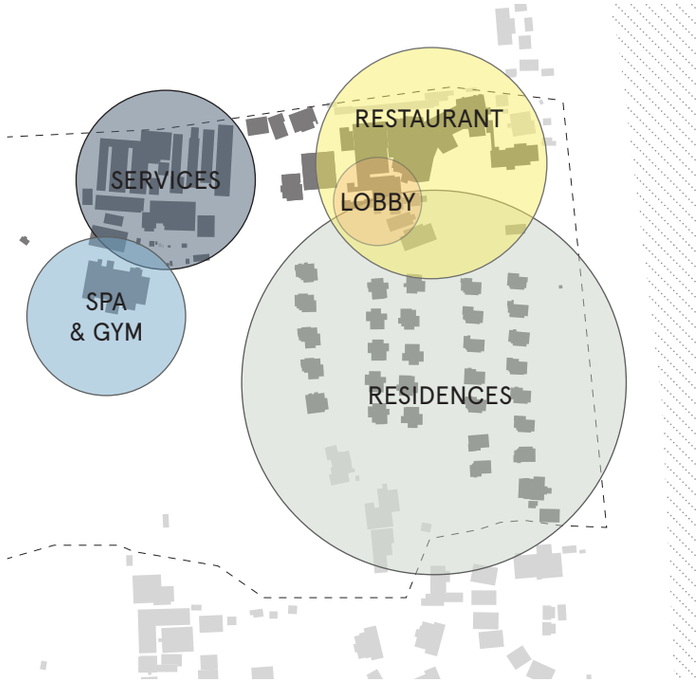





10
Before
1993
0 50 100 m


10
After
2024

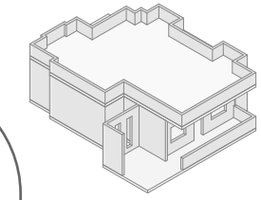
Functional zoning of the territory

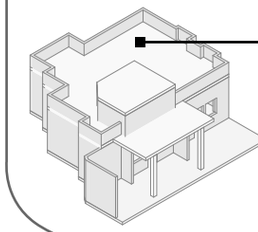


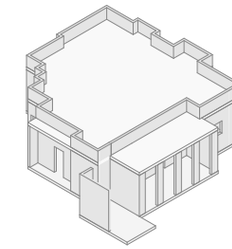
Plot characteristics:

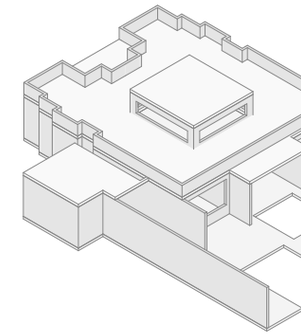
Property area:	146 841 sq.m.
Built area:	18 093 sq.m.
Built area in the sea:	-
Greenary:	80 181 sq.m.
Greenary before 2000:	146 841 sq.m.
Green area:	54.60 %
Removed greenary:	45 %
Greenary/ built area:	443 %
Built area on the plot:	12 %

Plan type:	REGULAR
Size:	MEDIUM
Type of the roof:	FLAT
Entrance:	INDIVIDUAL
Organisation of units:	SEPARATED
Terraces:	YES
Floors:	1
Shading devices:	ON THE EAST
Natural ventilation:	NO









ROOF

Flat non-exploitable roofing with internal drainage

WALLS

Facade white plaster on walls made of reinforced concrete

FLOORS

Porcelain tiles

3.2. Case study No 11. Breezes Beach Club & Spa

Size	70 rooms/suites
Founded in	1996
Ownership	Raguz Family (USA)
Price per night	€ 294
Hotel class	5
Sustainable actions	Hospitality education program (training and employing local) // Use of local products // Furniture created by local artisans // Sustainable fishing methods for guest tours // Payments to the visit of nearby villages going to charity for the improvement of villages // Turtle rescue program // Use of local products // Solar power // Recycling of used plastic // Waste recycling for irrigation // Water recycling // Consultation of marine biologist for the protection of the barrier reef // Classes in local crafts
Distance to the airport	60 km. [1 h. 16 mins.] Beach (Pongwe)
Entertaining services	Bar and restaurant // Diving // Coral reef exploration // Kite surfing // Sailing // Kayaking // Snorkelling // Classes for local culture and craft // Spice farm tour // Dhow boat tour // Jozani forest tour
Location	Bwejuu Beach, Bwejuu 72111 Tanzania Open on Google Maps
Link	Link to website of the hotel

Picture 3.11.
Top view of Breezes Beach Club & Spa. (Image source: Breezes Beach Club & Spa website. Accessed November 24, 2024)

STRENGTHS:

- Distribution of units in several buildings instead of using large buildings masses.
- Separation of the main hotel spaces from the natural beach with wooden dams.
- Training programs for and employment from the local population.
- Support of local economy by purchase of supplies from local fisherman and farmers.
- Use of local craftsman for the interior design objects.
- Use of passive energy sources such as solar panels.
- Organic garden.
- Water recycling for use in farm.
- Providing excess electricity to the local settlements.
- Plastic free.
- Protection of the nearby barrier reef with the help of experts
- Use of traditional boats instead of oats with anchor for tourist's tours in the sea.
- Turtle rescue project for preserving the ecology of the beaches.
- Use of Makuti thatched roof.

WEAKNESSES:

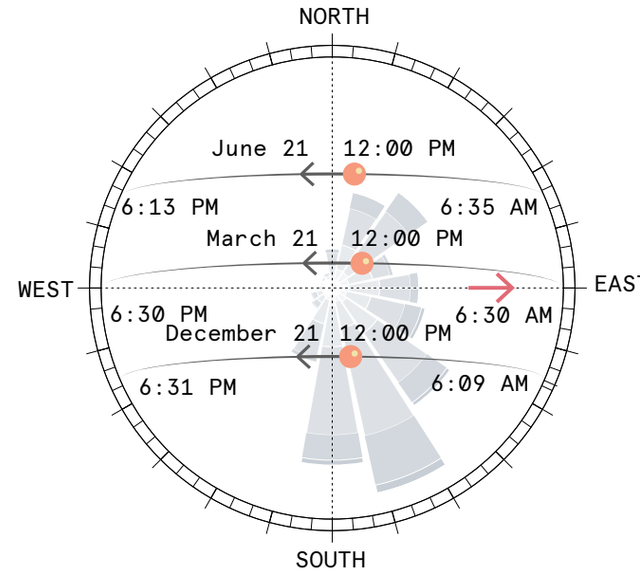
- Located far away from the airport (60 km).
- Use of active environment control systems.

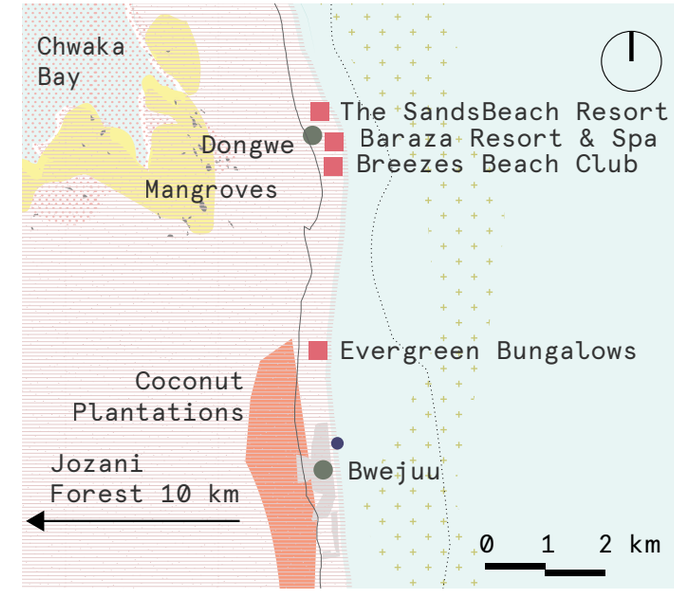
OPPORTUNITIES:

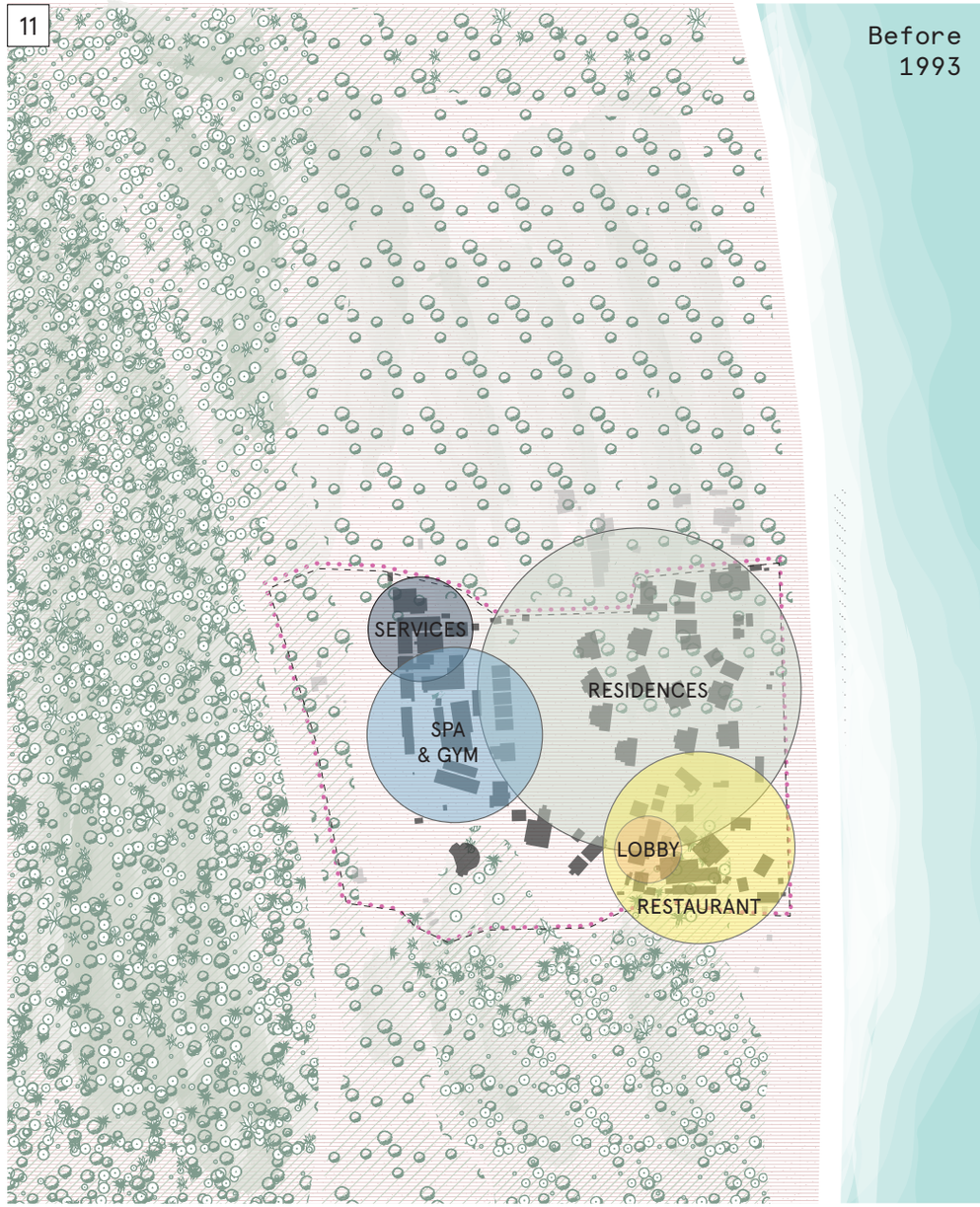
- Extension of the variety of facilities.
- Nearby Jozani forest.

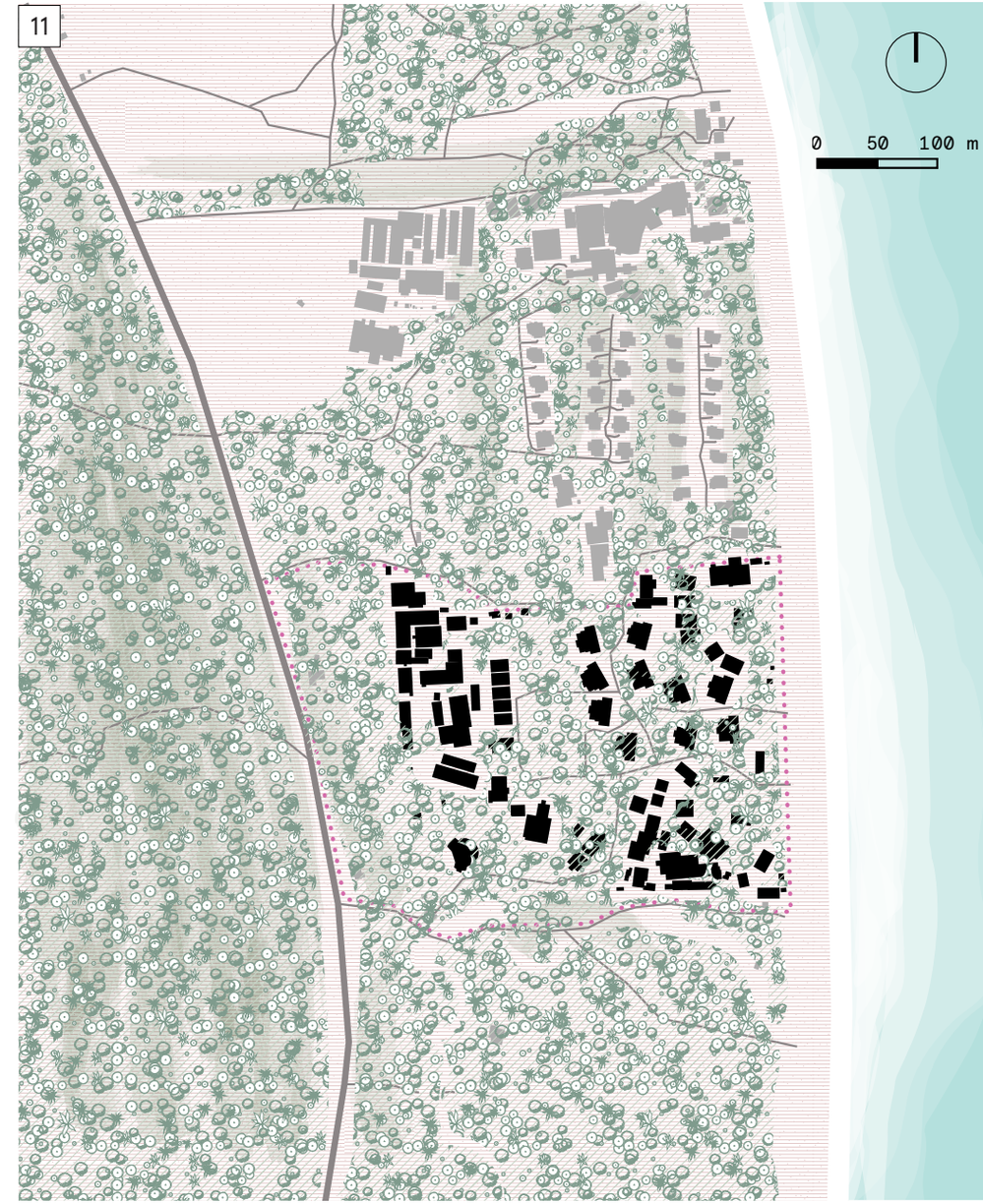
THREATS:

- Low accessibility from airport.
- Increasing sea level rise and beach erosion.

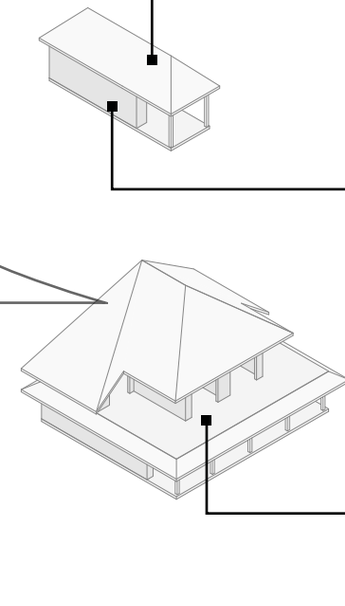





11
Before
1993
SERVICES
RESIDENCES
SPA
& GYM
LOBBY
RESTAURANT


11
0 50 100 m

Plan type:	REGULAR
Size:	MEDIUM
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	BOTH
Terraces:	YES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



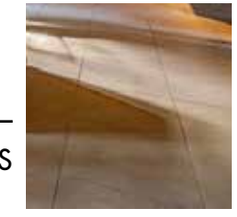
ROOF

Ceramic tiles
Straw
Wooden branches and beams
from local wood species

WALLS

Plaster on stone walls

FLOORS



Porcelain tiles

3.2. Case study No 12. Evergreen Bungalows

Size	23 rooms / bungalows
Founded in	2004
Ownership	Family owned (Tanzania)
Price per night (EUR)	€ 50
Hotel class	3
Distance to the airport	55 km. [1 h. 11 mins.]
Relevant ecology	Beach (Bwejuu)
Entertaining services	Restaurant
Location	Evergreen Zanzibar, Bwejuu 483 Tanzania
Link	Open on Google Maps Link to website of the hotel

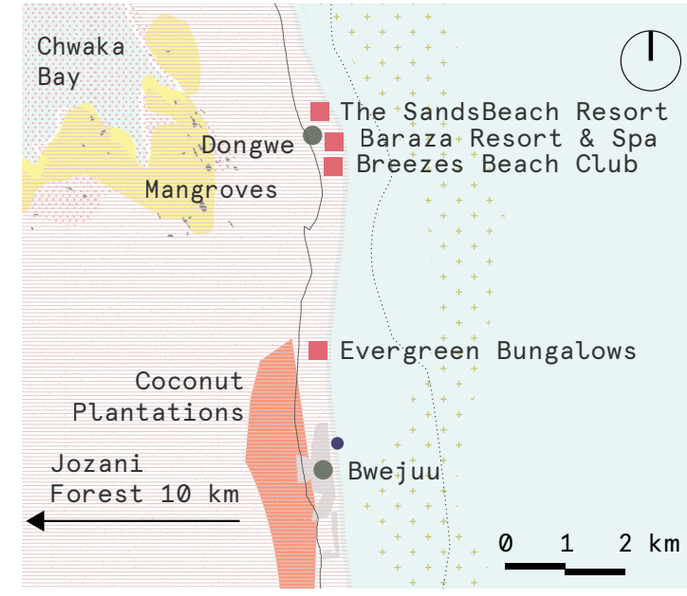
Picture 3.12. Two story double residential units of the Evergreen Bungalows resort.
(Image source: Evergreen Bungalows website. Accessed November 24, 2024)

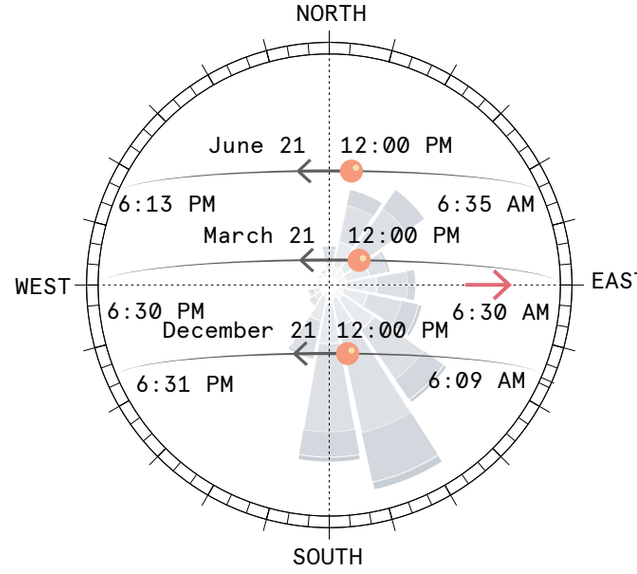
STRENGTHS:
- Low density hotel.
- Use of Makuti thatched roof.
- Use of vernacular construction methods and materials.
- Low intervention on the existing environment.
- Cheap price per night
- Offering more contextual based experience of accommodation.

WEAKNESSES:
- Located far away from the airport (55 km).
- No use of passive energy sources.
- No waste management programs.
- No indication of engagement with local community.
- Use of active cooling systems (fans)

OPPORTUNITIES:
- Intervention in the current buildings to provide better vernacular environment control methods.
- Use of local population in the hotel activities and services.
- Branding to promote the possibility of an authentic experience of Zanzibarian accommodation which the hotel provides.

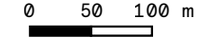
THREATS:
- Low accessibility from airport.
- Increasing sea level rise and beach erosion.
- Losing to competitive hotels with higher levels of comfort due to lack of good branding.



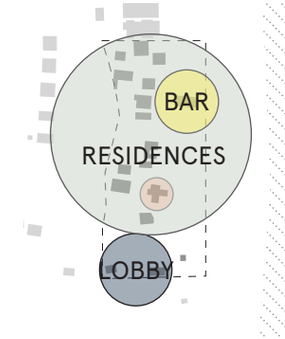


Before
2002

After
2024



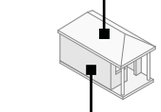
Functional zoning of the territory



Plot characteristics:

Property land area:	11 106 sq.m.
Built area:	1 218 sq.m.
Built area in the sea:	-
Green area:	4 765 sq.m.
Green area in the borders of the property before 2000:	8 000 sq.m.
Persentage of green area on the plot area:	42.90 %
Removed greenary on the plot area:	29 %
Ratio of greenary to the built area:	391 %
Percentage of built area:	10.97 %

Plan type:	REGULAR
Size:	MEDIUM
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	GROUPED
Terraces:	YES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE

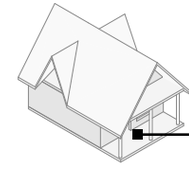


ROOF

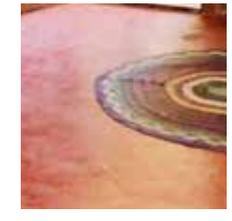
Wooden beams and rafters
Straw and dry leaves

WALLS

Plaste



FLOORS



Self-leveling

3.2. Case study No 13. Jambiani Villas

Size	8 villas
Founded in	2007
Ownership	Poland
Price per night	€ 178
Hotel class	4
Sustainable actions	Villas of local materials (muninga and coconut wood) // Furniture hand made by local artisans // Villas partially powered by solar power // Growing of local herbs, fruits and vegetables and sourcing of fish from local fishermen // Recycle of waste with ZANREC // All profits of village tour go to community projects of village // Supporting of local projects of the village (Jambiabi): water, food supply, production of seaweed soap with Jambiani women collective, kids football tournament organization, fixing of roads
Distance to the airport	64 km. [1 h. 20 mins.] Beach (Jambiani)
Relevant ecology	Restaurants and bars // Kayaking // Dolphin tours // Ocean retreat tours
Entertaining services	// Maalum cave tours // Blue Lagoon // Snorkelling // Kuza cave tour // Jambiani snorkelling // Jozani forest tour // Sunset boat cruise in Michamvi // Spice farm tour // Swahili cooking class // Village tour
Location	Jambiani Tanzania Open on Google Maps
Link	Link to website of the hotel

Picture 3.13. View of two story single residential units of the Jambiani Villas.
(Image source: Jambiani Villas website. Accessed November 24, 2024)

STRENGTHS:

- Low density hotel.
- Use of Makuti thatched roof.
- Buildings built using local materials such as muninga and coconut wood.
- Located in the vicinity of a rural area.
- Cheap price per night
- All furniture made by local artisans.
- Partial use of solar power.
- Organic garden.
- Supply of fishes from local fisherman.
- Recycling of waste with the innovative ZANREC company for responsible waste management.
- Water supply for the nearby village.
- Supply of the unused food for the local village.
- Production and selling of seaweed soap through the local female population.
- Engaging in local population through organizing events such as football tournaments for the young population.

WEAKNESSES:

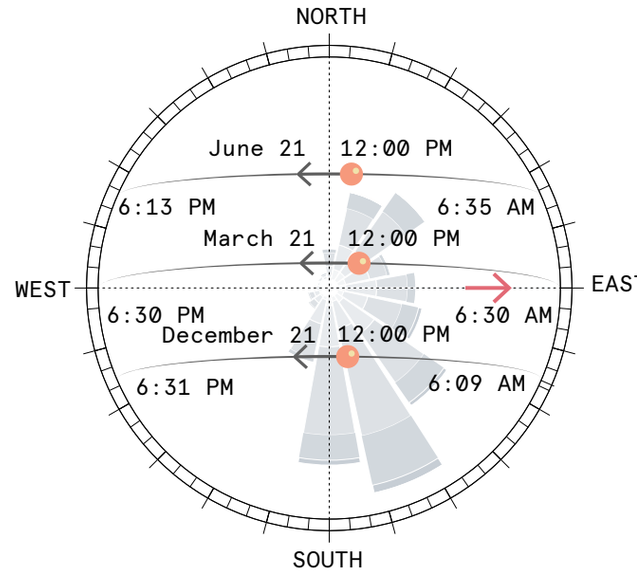
- Located far away from the airport (55 km).
- Buildings very close to the beach line which could be affected by rising sea levels.
- Lack of various facilities.
- Use of active environment control systems.

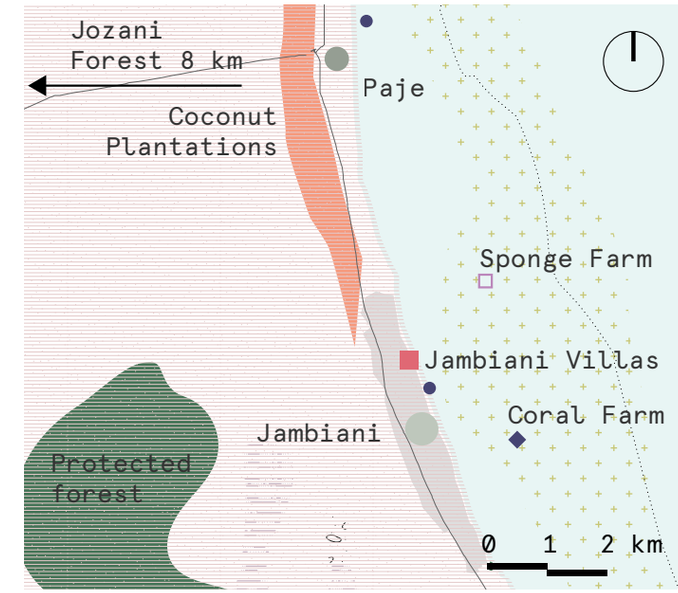
OPPORTUNITIES:

- Further integration of the local population in the hotel activities.
- Providing visitors with the specific experience of living in a village through various events and tours.

THREATS:

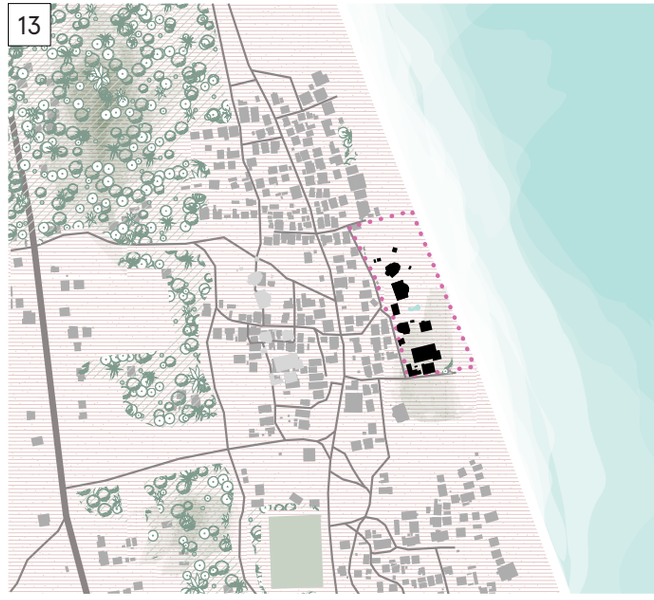
- Low accessibility from airport.
- Increasing sea level rise and beach erosion.
- Being surrounded by existing buildings

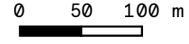




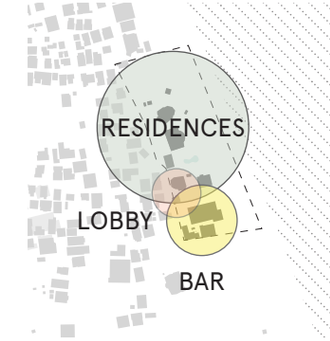
Before
2004

After
2024





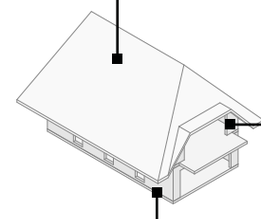
Functional zoning of the territory



Plot characteristics:

Property land area:	6 727 sq.m.
Built area:	977 sq.m.
Built area in the sea:	-
Green area:	0 sq.m.
Green area in the borders of the property before 2000:	0 sq.m.
Persentage of green area on the plot area:	0 %
Removed greenary on the plot area:	0 %
Ratio of greenary (sq.m.) to the built area (sq.m.):	0 %
Percentage of built area:	14.52 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	BOTH TYPES
Organisation of units:	BOTH
Terraces:	BALCONIES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



ROOF

Straw
Wooden beams and rafters

WALLS

Plaster

FLOORS

Parquet / laminate

3.2. Case study No 14. Blue Moon Resort

Size	11 rooms/villas
Founded in	2018
Ownership	Merilen holidays (Italy)
Price per night (EUR)	€ 248
Hotel class	4
Distance to the airport	63 km. [1 h. 20 mins.]
Relevant ecology	
Entertaining services	
Location	Shungi, Jambiani Tanzania
Link	Open on Google Maps Link to website of the hotel

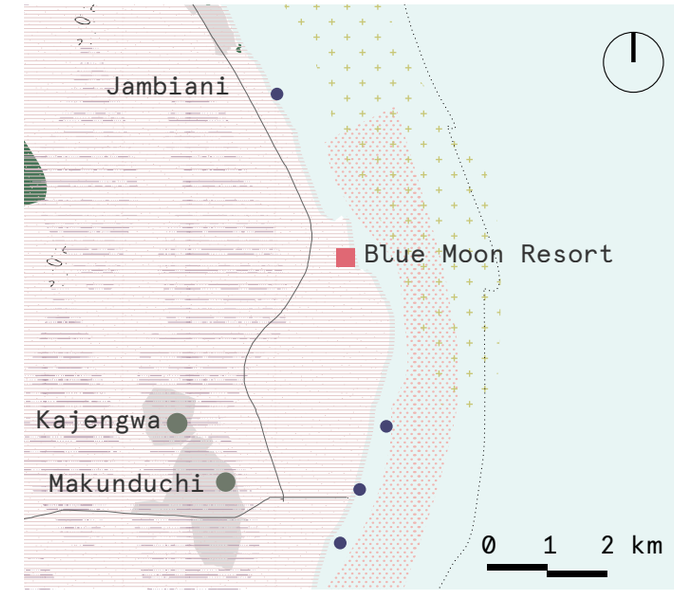
Picture 3.14.
Superior King room of the Blue Moon Resort. (Image source: Blue Moon Resort website. Accessed November 24, 2024)

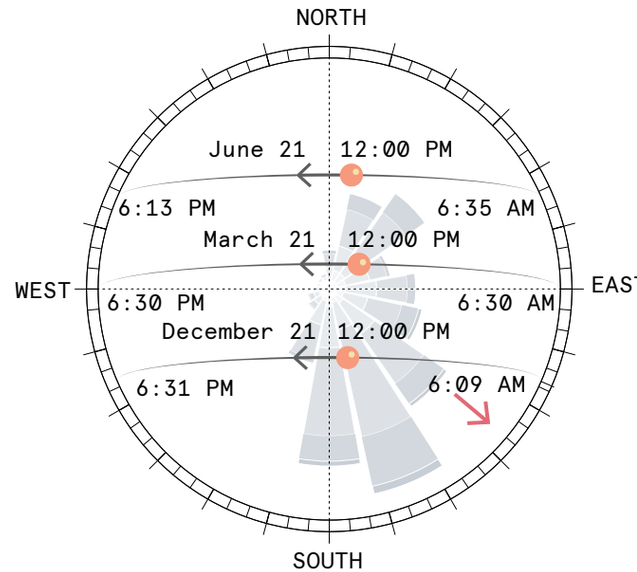
STRENGTHS:
- Low density hotel.
- Use of Makuti thatched roof.
- Buildings built using local wood.
- Remote location.
- Jetty providing access to the sea.

WEAKNESSES:
- Located far away from the airport (63 km).
- No indication of using passive energy sources.
- No indication of waste management.
- Lack of various facilities.
- Isolated from other settlements and sightseeing locations.
- Use of active environment control systems.

OPPORTUNITIES:
- Eco friendly strategies of providing unique experiences for the visitors in the nearby forests.
- Use of solar panels and waste management systems.
- Integration of the seaweed farm activities and side products with the activities of the hotel.
- Integration of farms for providing zero-kilometer meals.

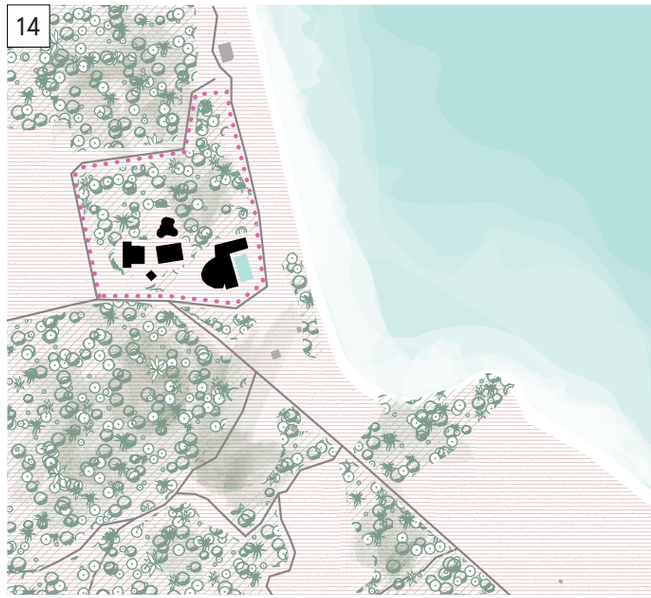
THREATS:
- Low accessibility from airport.
- Increasing sea level rise and beach erosion.
- Very remote location





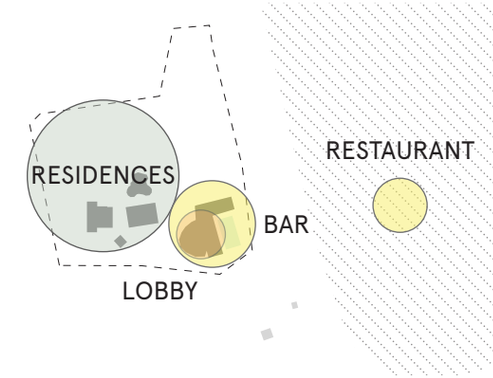
Before
2014

After
2024



0 50 100 m

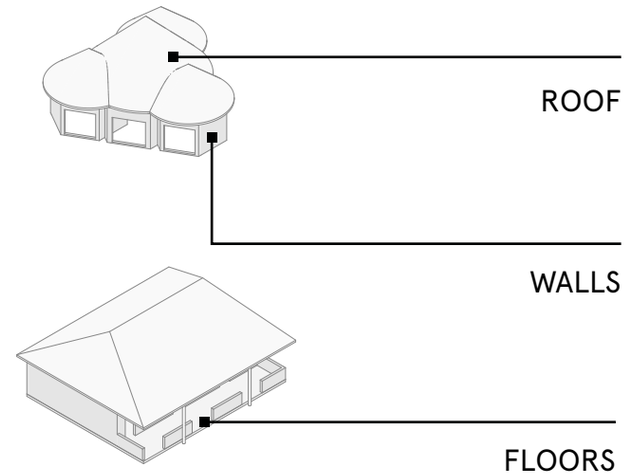
Functional zoning of the territory



Plot characteristics:

Property land area:	17 629 sq.m.
Built area:	1 735 sq.m.
Built area in the sea:	-
Green area:	9 740 sq.m.
Green area in the borders of the property before 2000:	12 803 sq.m.
Persentage of green area on the plot area:	55.25 %
Removed greenary on the plot area:	17 %
Ratio of greenary to the built area:	568 %
Percentage of built area:	9.84 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	GROUPED
Terraces:	NO
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



Straw
Timber

Plaster

Porcelain tiles

3.2. Case study No 15.Eden Rock Zanzibar

Size	6 rooms
Founded in	2022
Ownership	Private (Tanzania)
Price per night (EUR)	€ 100
Hotel class	1
Distance to the airport	70 km. [1 h. 26 mins.]
Relevant ecology	
Entertaining services	Bar and restaurant
Location	Mtende South Zanzibar Mtende Village Sea front, Mtende, Tanzania
Link	Open on Google Maps Link to website of the hotel

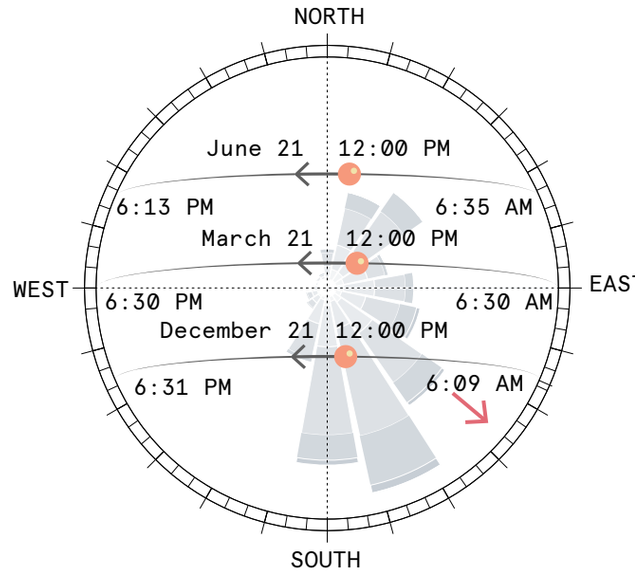
Picture 3.15.
Single unit of the Eden Rock resort. (Photo by Hei Li K on Tripadvisor, 2022)

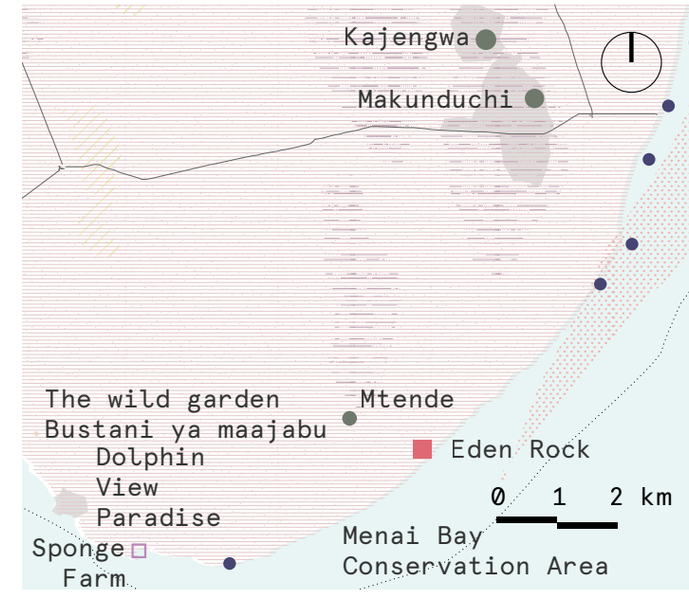
STRENGTHS:
- Low density hotel.
- Use of Makuti thatched roof.
- Buildings built using local materials.
- Remote location.
- Jetty providing access to the sea.
- Cheap price per night
- Offering more contextual based experience of accommodation.
- Located atop a natural cliff

WEAKNESSES:
- Located far away from the airport (70 km).
- No indication of using passive energy sources.
- No indication of waste management.
- Lack of various facilities.
- Isolated from other settlements and sightseeing locations.
- No indication of engagement with local community.

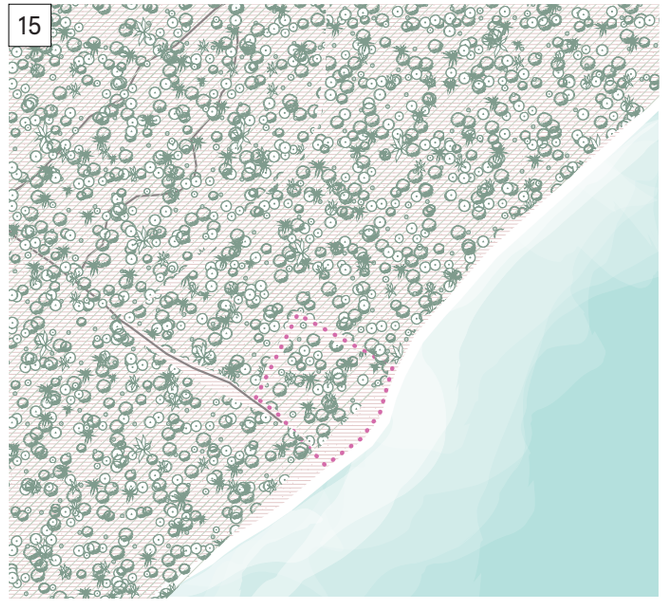
OPPORTUNITIES:
- Strong natural setting for providing visitors with a unique experience.
- Branding to promote the possibility of an authentic experience of Zanzibarian accommodation which the hotel provides.
- Use of passive energy sources.

THREATS:
- Low accessibility from airport.
- Isolated location from other places.

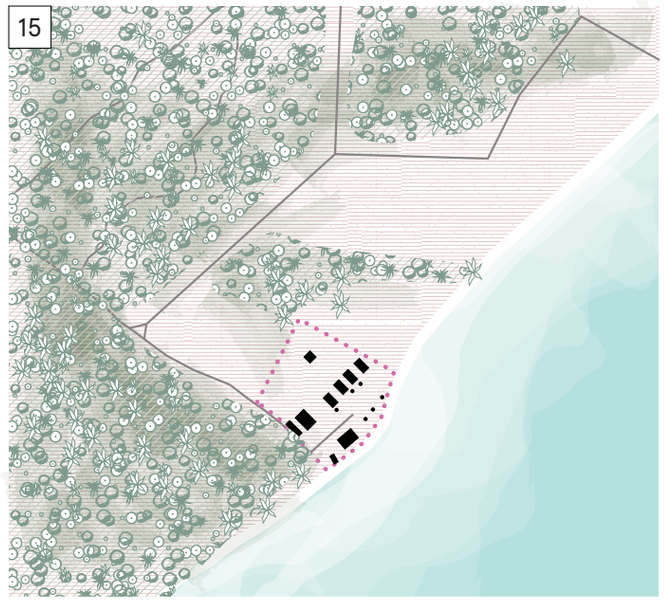


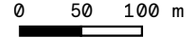


Before
2019

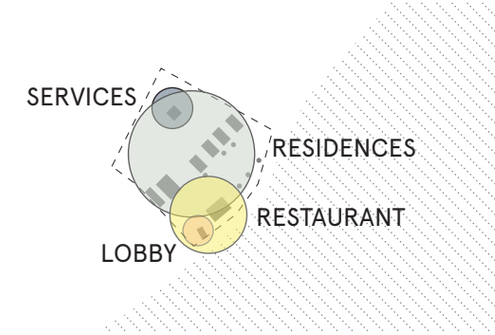


After
2024





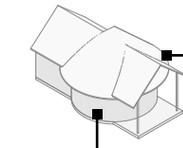
Functional zoning of the territory



Plot characteristics:

Property land area:	7 882 sq.m.
Built area:	883 sq.m.
Built area in the sea:	-
Green area:	0 sq.m.
Green area in the borders of the property before 2000:	7 882 sq.m.
Persentage of green area on the plot area:	0 %
Removed greenary on the plot area:	100 %
Ratio of greenary (sq.m.) to the built area (sq.m.):	0 %
Percentage of built area:	11.2 %

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	BOTH TYPES
Organisation of units:	BOTH
Terraces:	YES
Floors:	1-2
Shading devices:	ON THE EAST
Natural ventilation:	POSSIBLE

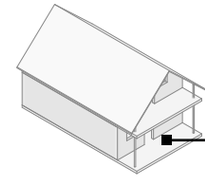


ROOF

Dry leaves

WALLS

Plaster



FLOORS

Self-leveling

3.2. Case study No 16.The Residence

Size	66 villas
Founded in	2011
Ownership	Cenizaro Hotels & Resorts (Singapore)
Price per night (EUR)	€ 415
Hotel class	5
Distance to the airport	58 km. [1 h. 7 mins.]
Relevant ecology	Beach // Forest // Menai bay conservation area
Entertaining services	Bar and Restaurant // Spa and wellness center // Jozani forest tour // Spice farms tour // Dhow boat ocean safari tour // Seaweed farming tour // Local foods cooking class
Location	Mchangamle, Kizimkazi Dimbani Tanzania Open on Google Maps
Link	Link to website of the hotel

Picture 3.16. The Residence Zanzibar restaurant building.
(Image source: The Residence Zanzibar website. Accessed November 24, 2024)

STRENGTHS:

- Distribution of units in several buildings instead of using large buildings masses.
- Jetty providing access to the sea.
- Separation of the natural beach using a platform and wooden dams.
- Offering a variety of facilities.
- Low intervention on the existing environment.
- Various typologies of residences.
- Located within a natural reserve area.
- Located near a natural marine biodiversity area.

WEAKNESSES:

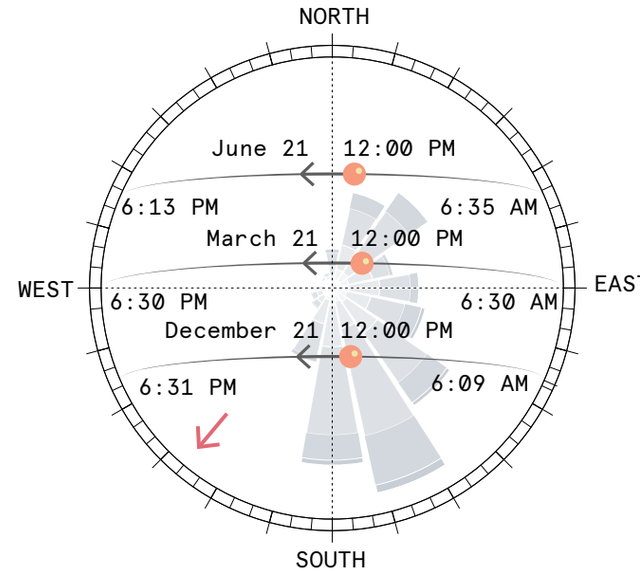
- Located far away from the airport (60 km).
- No indication of using passive energy sources.
- No indication of waste management.
- No indication of engagement with local community.
- Use of active environment control systems.

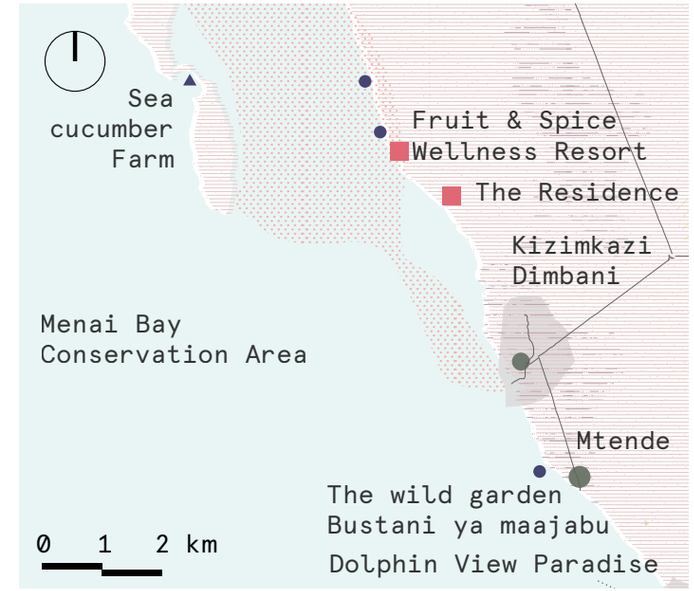
OPPORTUNITIES:

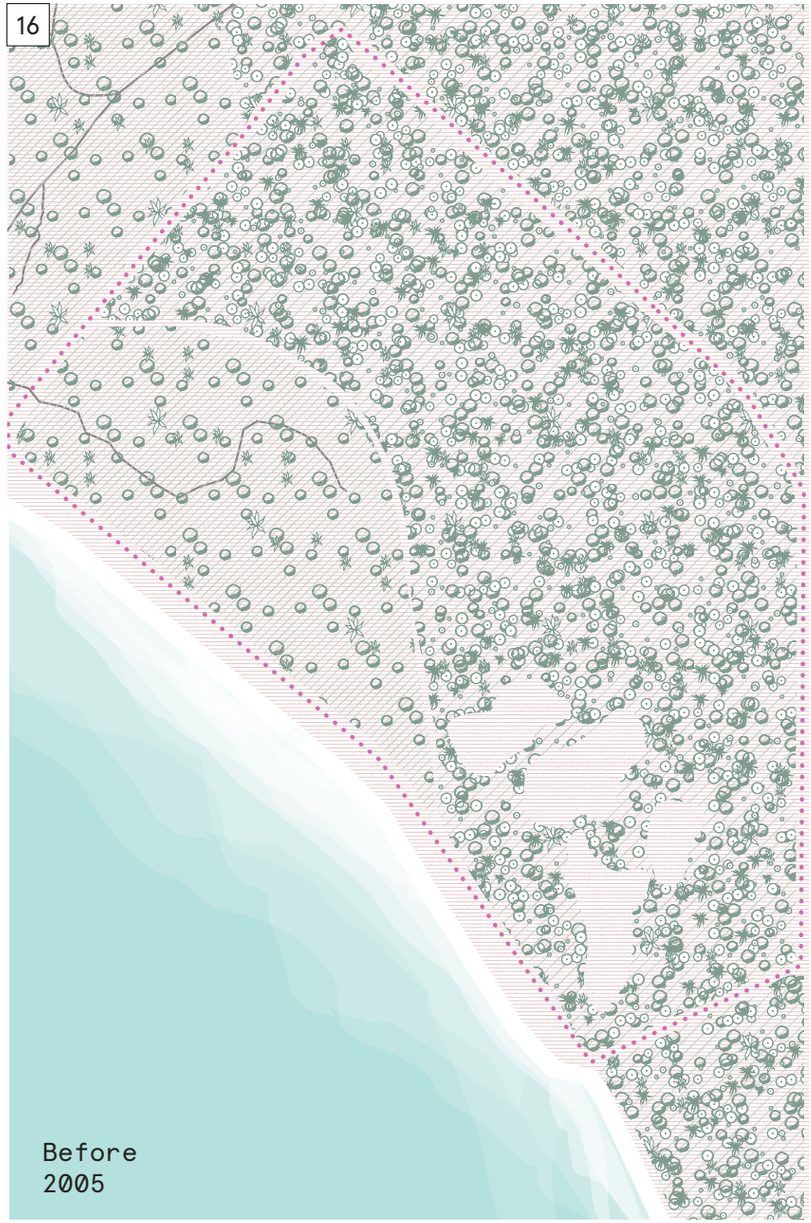
- Engagement with the local community of the nearby village.
- Integration of passive energy sources.
- Private beach.
- Low competitive pressure within the area.
- Projects for the safeguarding of the natural reserve areas in the vicinity of the hotel.
- Integration of farms for providing zero-kilometer meals.

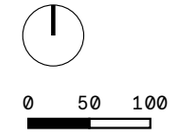
THREATS:

- Low accessibility from airport.
- Rising sea level and beach erosion.
- Wildfire danger due to climate change and the vicinity of large forest area.





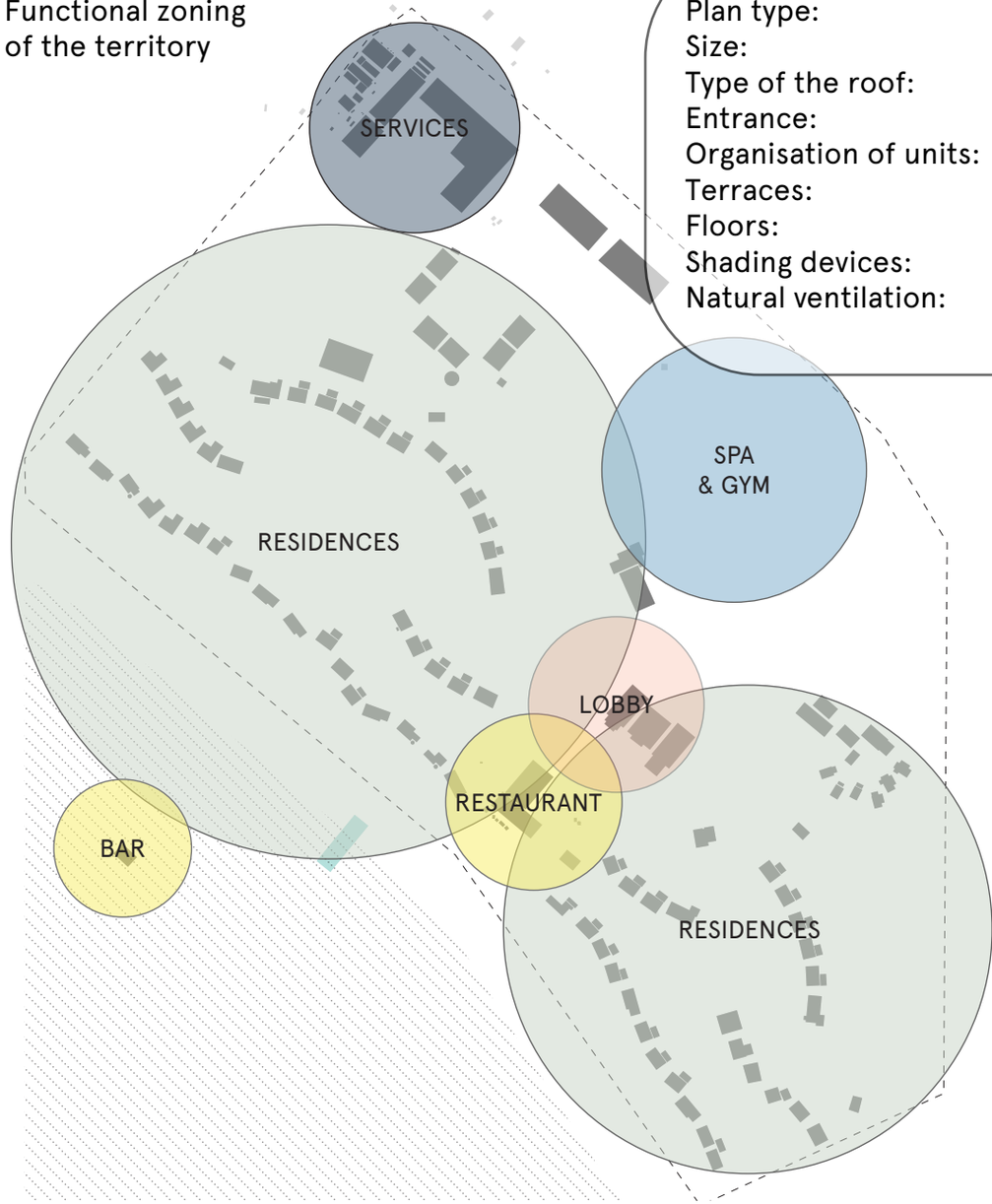




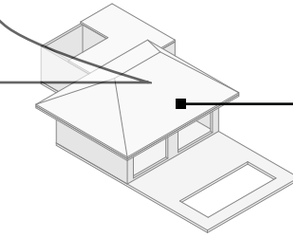
Plot characteristics:

Property area:	302986 sq.m.
Built area:	24 573 sq.m.
Built area in the sea:	-
Greenary:	254 000 sq.m.
Greenary before 2000:	264 000 sq.m.
Green area:	83.83 %
Removed greenary:	3 %
Greenary/ built area:	103 %
Built area on the plot:	8.11 %

Functional zoning
of the territory

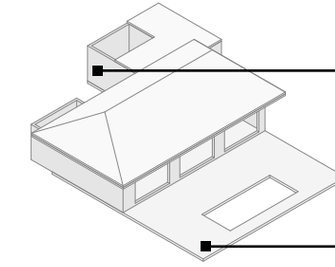


Plan type:	REGULAR
Size:	MEDIUM
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	SEPARATED
Terraces:	YES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	NO



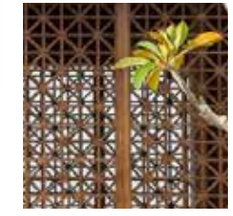
ROOF

Cement-sand / ceramic tiles
Wooden beams and rafters



WALLS

Plaster
Decorative wooden elements



FLOORS

Porcelain tiles / natural stone

3.2. Case study No 17. Fruit & Spice Welness resort

Size	51 rooms
Founded in	2013
Ownership	Merilen holidays (Italy)
Price per night (EUR)	€ 200
Hotel class	5
Sustainable actions	Turtle saving programs
Distance to the airport	58 km. [1 h. 10 mins.]
Relevant ecology	Beach // Forest // Menai bay conservation area
Entertaining services	Beach club // Dining and bar // Spa // Fitness studio // Diving // Safari // Day trips
Location	Mchangamble Beach, Kizimkazi Dimbani 4893 Tanzania
Link	Open on Google Maps Link to website of the hotel

Picture 3.17. Bird eye view of the Fruit and Spice Wellness Resort Zanzibar.
(Image source: Fruit and Spice Wellness Resort Zanzibar website. Accessed November 24, 2024)

STRENGTHS:

- Distribution of units in several buildings instead of using large buildings masses.
- Jetty providing access to the sea.
- Located atop a natural cliff
- Offering a variety of facilities.
- Low intervention on the existing environment.
- Various typologies of residences.
- Located within a natural reserve area.
- Located near a natural marine biodiversity area.
- Turtle saving projects for the safeguarding of turtles in the vicinity of the hotel and increasing awareness of tourists of the
- Use of Makuti thatched roof.
- Buildings built using local materials.
- Offering the possibility of planned visits to the nearby village.

WEAKNESSES:

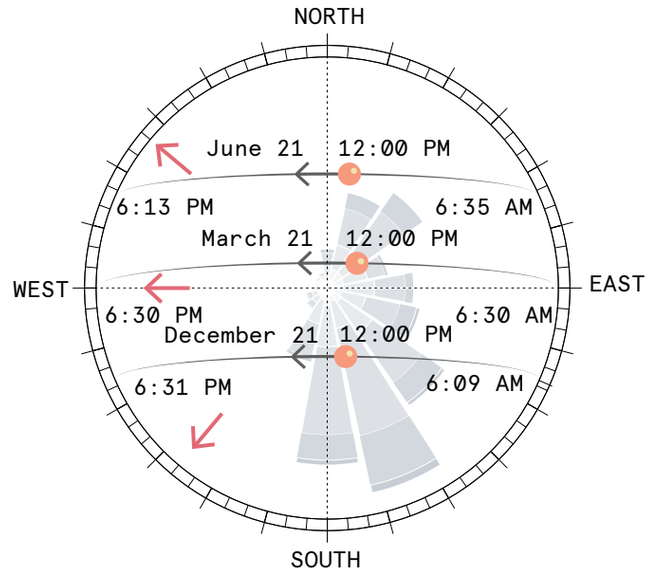
- Located far away from the airport (60 km).
- No indication of using passive energy sources, waste management and engagement with local community.
- Offering touristic activities on the sea with vehicles such as jet skis which could be harmful for the nearby ecology.
- Lack of beach.
- Use of active environment control systems.

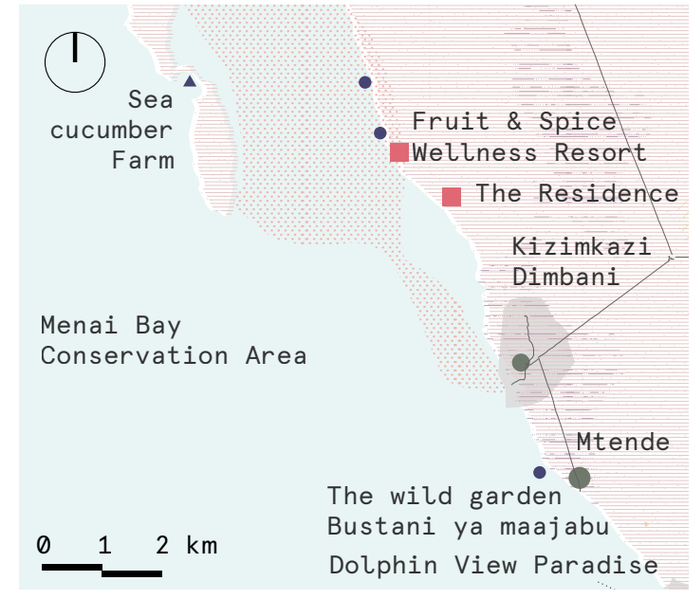
OPPORTUNITIES:

- Integration of passive energy sources.
- Low competitive pressure within the area.
- Projects for the safeguarding of the natural reserve areas in the vicinity of the hotel.
- Eco friendly strategies of providing unique experiences for the visitors in the nearby forests.
- Integration of farms for providing zero-kilometer meals.

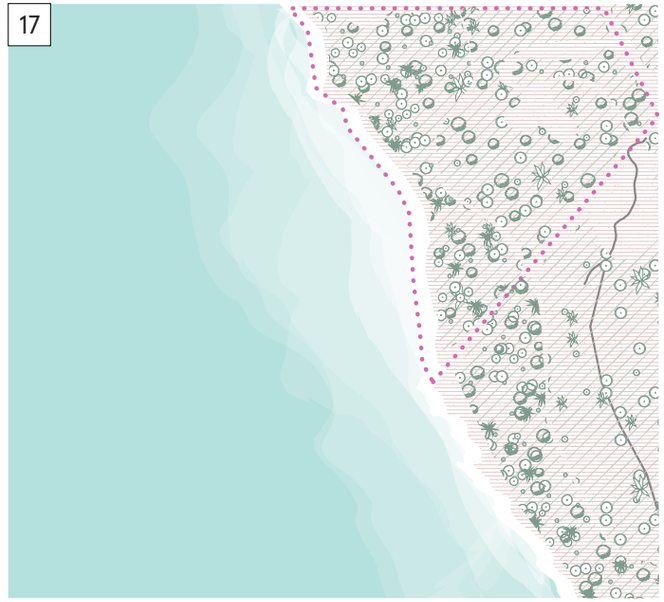
THREATS:

- Low accessibility from airport.
- Wildfire danger due to climate change and the vicinity of large forest area.

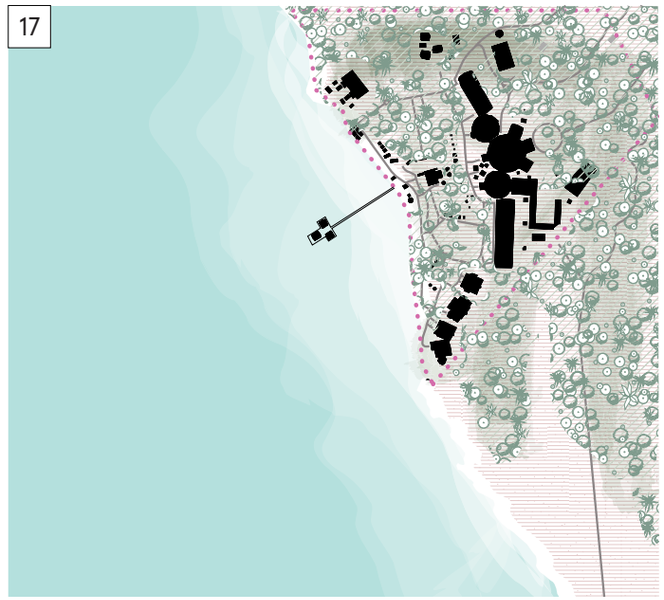


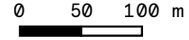


Before
2009

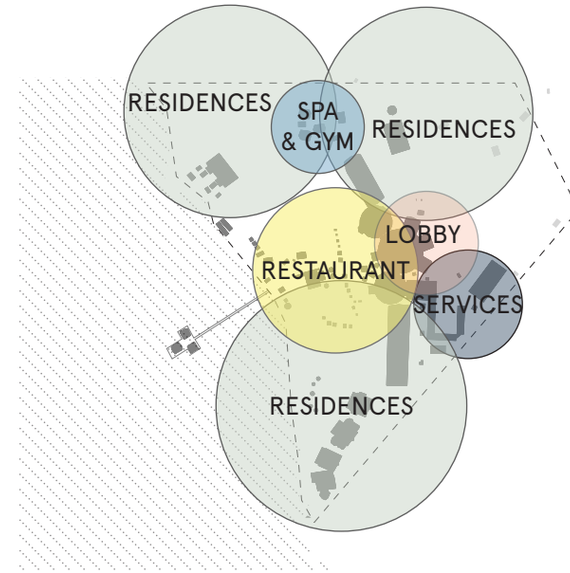


After
2024



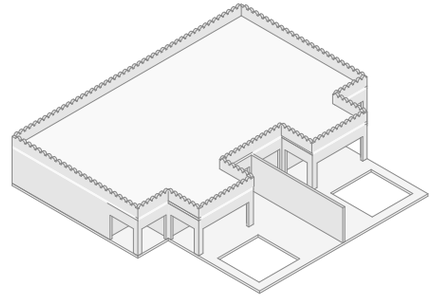


Functional zoning of the territory

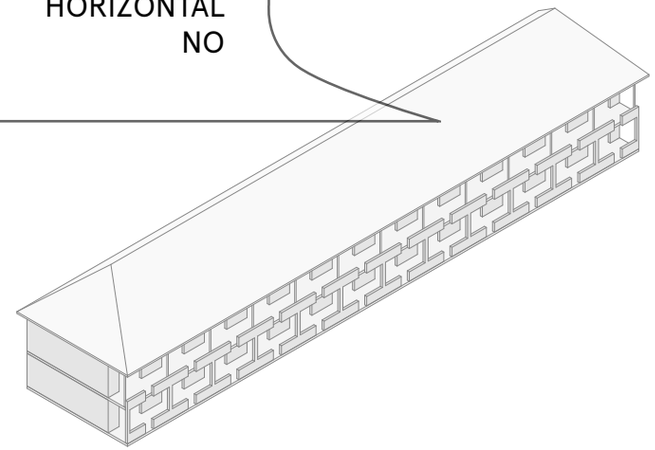


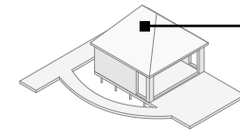
Plot characteristics:

Property land area:	48 551 sq.m.
Built area:	6 830 sq.m.
Built area in the sea:	120 sq.m.
Green area:	31 935 sq.m.
Green area in the borders of the property before 2000:	37 325 sq.m.
Persentage of green area on the plot area:	65.78 %
Removed greenary on the plot area:	11 %
Ratio of greenary to the built area:	468 %
Percentage of built area:	14.07 %



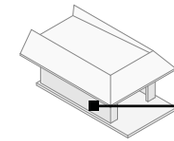
Plan type:	LINEAR / REGULAR
Size:	MEDIUM
Type of the roof:	SLOPED / FLAT
Entrance:	BOTH TYPES
Organisation of units:	BOTH
Terraces:	YES
Floors:	1-2
Shading devices:	HORIZONTAL
Natural ventilation:	NO





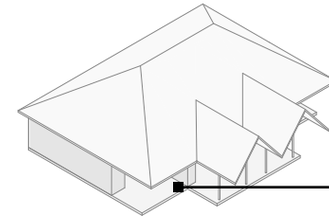
ROOF

Straw
Timbe



WALLS

Plaster
Limestone
Shell rock



FLOORS

Porcelain tiles

3.2. Case study No 18. Zanzi resort

Size	13 villas
Founded in	2009
Ownership	Zanzi Resort (Tanzania)
Price per night (EUR)	€ 618
Hotel class	5
Distance to the airport	22 km. [38 mins.]
Relevant ecology	Beach // Forest
Entertaining services	Restaurant and bar // Spice farm tour // Prison island tour // Sunset cruise in Dhow boat // Jozani Chwaka bay tour // Diving and snorkelling // Menai bay Dhow boat safari tour // Kayak and SUP in Mangrove forest // Golf // Tennis // Spa // Local food cooking class Kama Tanzania
Location Link	Open on Google Maps Link to website of the hotel

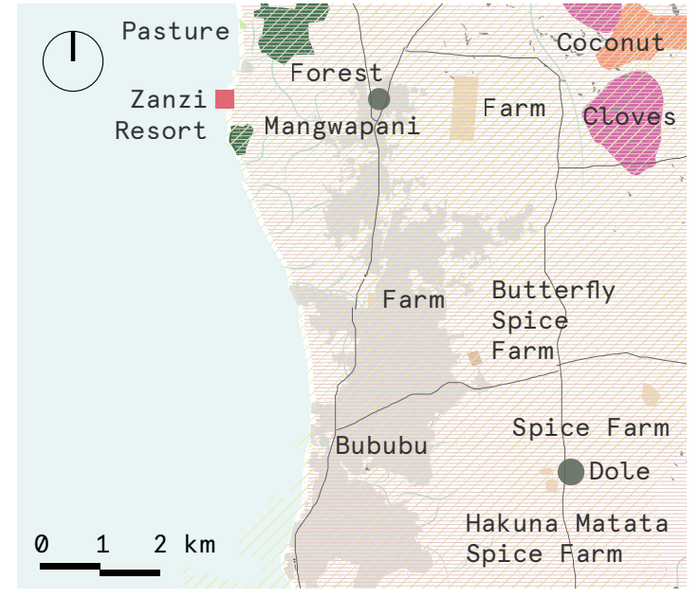
Picture 3.18.
Bird eye view of the Zanzi Resort. (Image source: Zanzi Resort website. Accessed November 24, 2024)

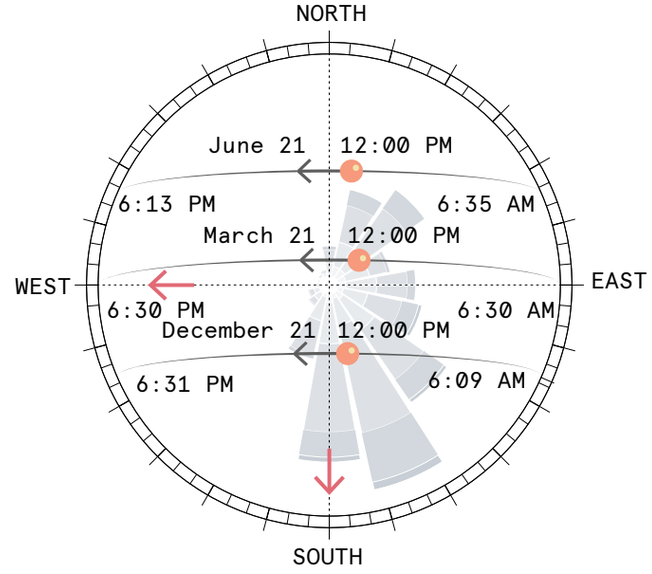
STRENGTHS:
- Low density hotel.
- Jetty providing access to the sea.
- Located atop a natural cliff
- Low intervention on the existing environment.
- Use of Makuti thatched roof.
- Private beach area.
- Located close to the airport (22 km)
- Close to Stone Town (16km)
- Close to Kichwele forest reserve.

WEAKNESSES:
- No indication of using passive energy sources.
- No indication of waste management.
- No indication of engagement with local community.
- Use of active environmental control systems.

OPPORTUNITIES:
- Integration of passive energy sources.
- Possibility of engaging with the local community of the nearby town.
- Harnessing the potential of being close to major touristic hotspots.
- Integration of farms for providing zero-kilometer meals.

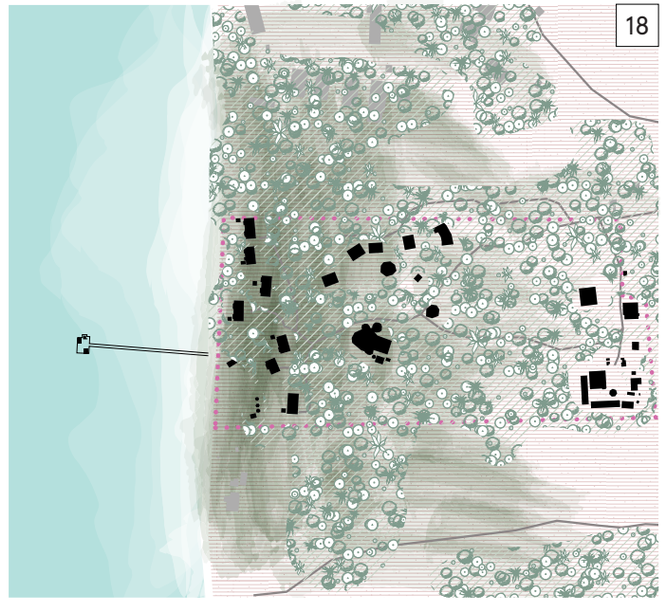
THREATS:
- Sea level rise and beach erosion.

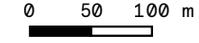




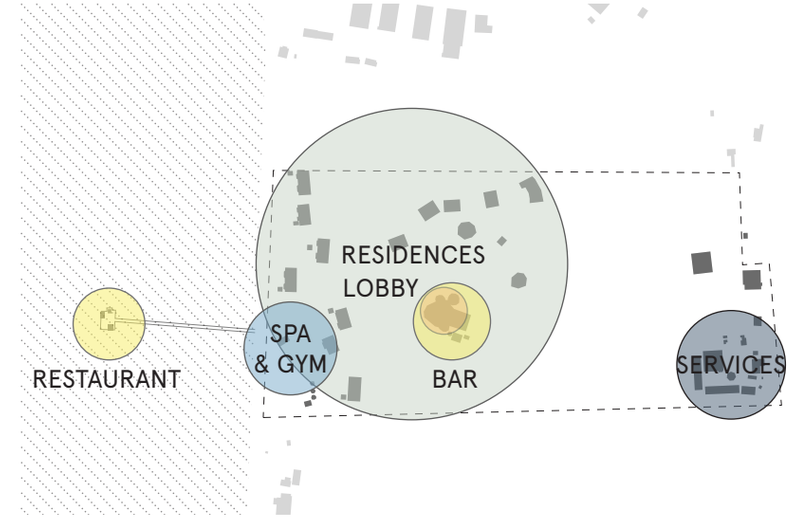
Before
2006

After
2024





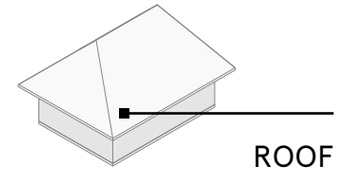
Functional zoning of the territory



Plot characteristics:

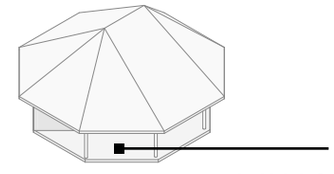
Property land area:	54 574 sq.m.
Built area:	3 626 sq.m.
Built area in the sea:	37 sq.m.
Green area:	45 800 sq.m.
Green area in the borders of the property before 2000:	32 844 sq.m.
Persentage of green area on the plot area:	83.92%
Removed greenary on the plot area:	-24%
Ratio of greenary to the built area:	1263%
Percentage of built area:	6.64%

Plan type:	REGULAR
Size:	SMALL
Type of the roof:	SLOPED
Entrance:	INDIVIDUAL
Organisation of units:	SEPARATED
Terraces:	YES
Floors:	1
Shading devices:	HORIZONTAL
Natural ventilation:	POSSIBLE



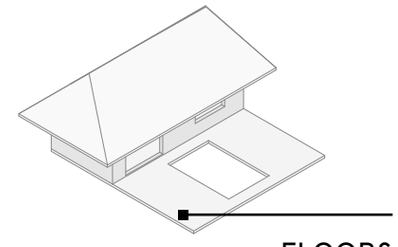
ROOF

Straw
Light timber structures

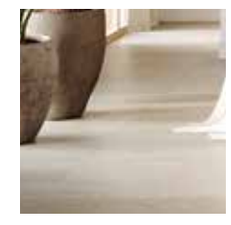


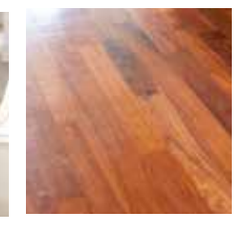
WALLS

Facade stone
Plaster
Reinforced concrete



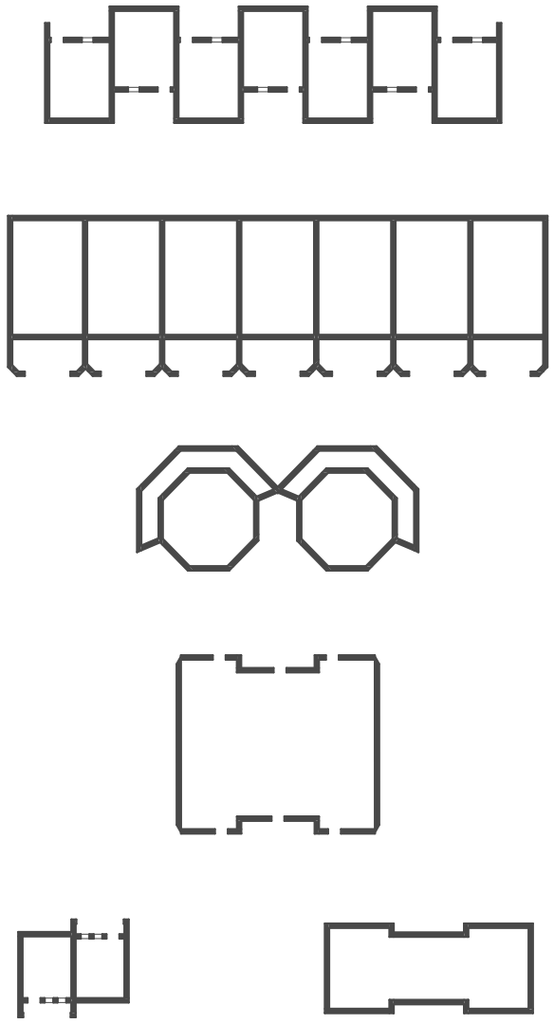
FLOORS



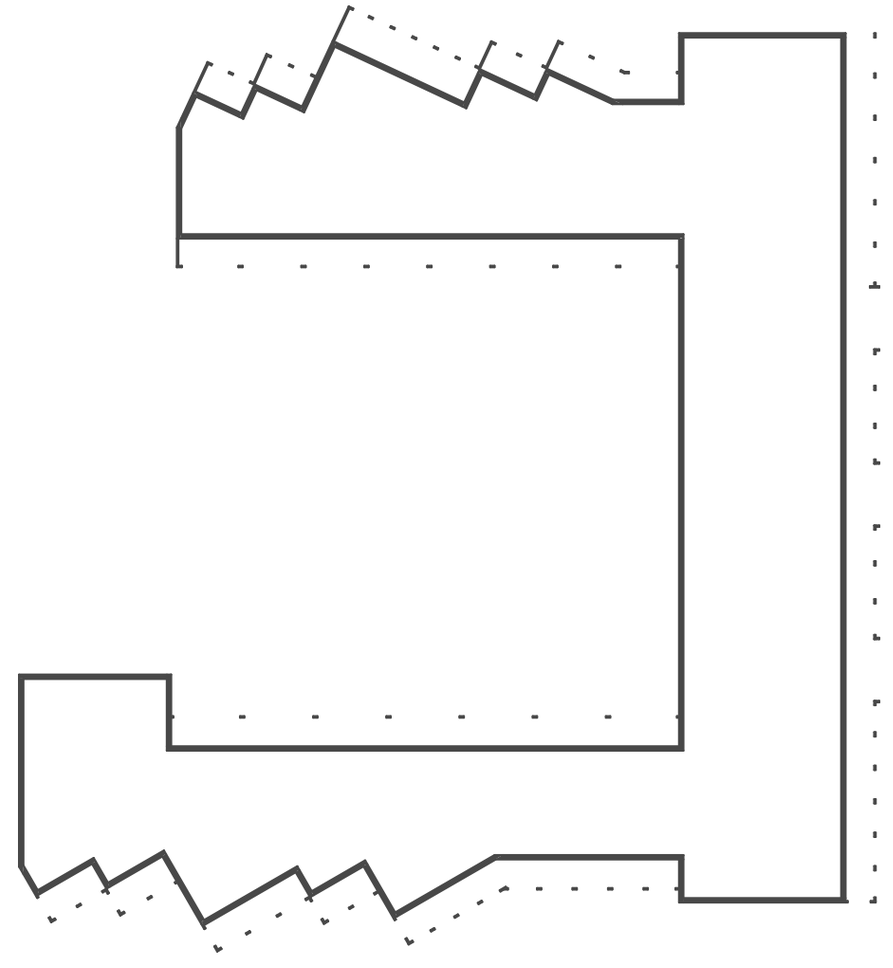


Parquet / laminate
Natural stone / porcelain stoneware

3.3. Resorts' typologies



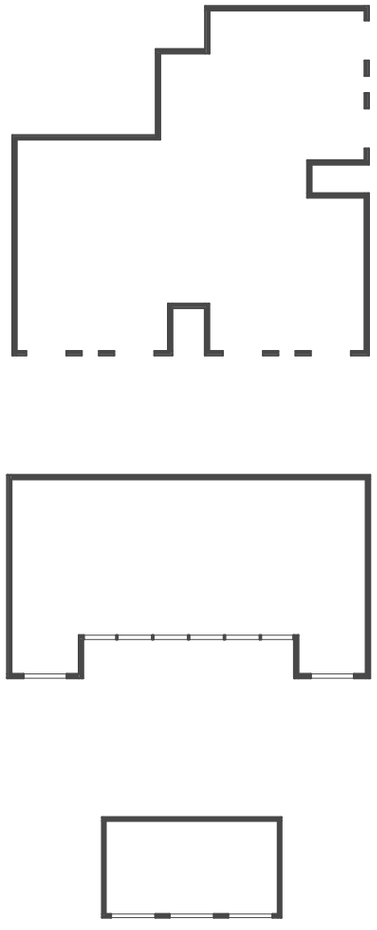
1. Sandies Baobab Beach Zanzibar



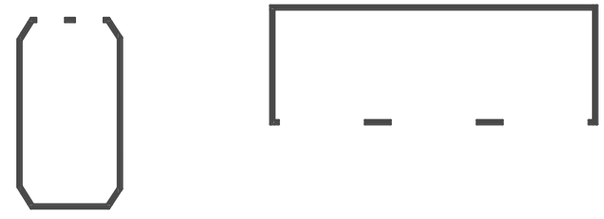
2. The Mora Zanzibar

3. Sensations Eco-Chic Hotel

4. TUI Blue Bahari Hotel

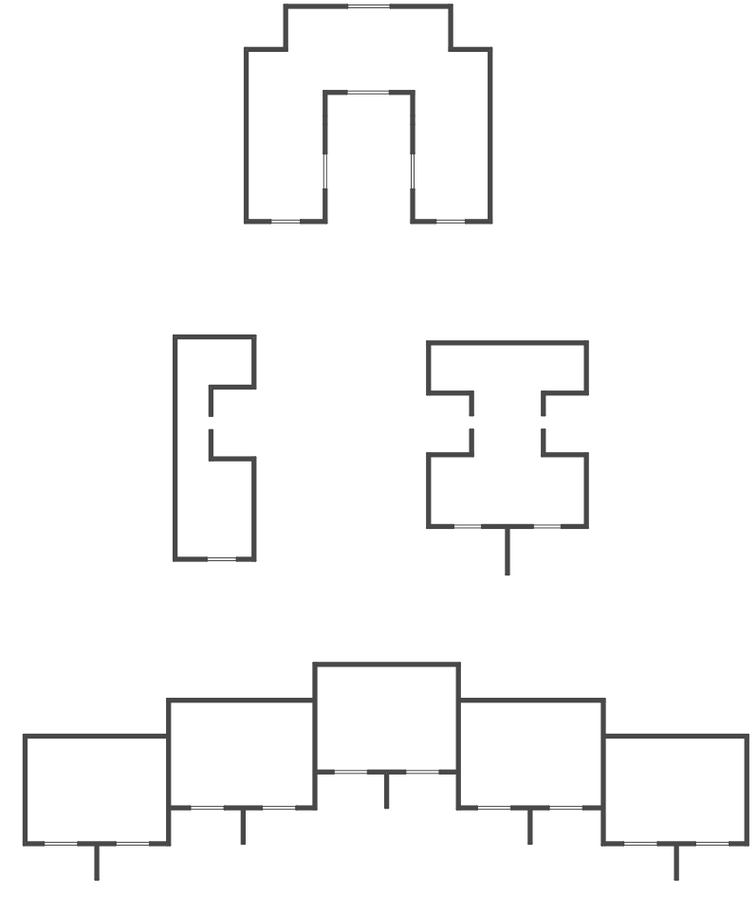


5. Melia Zanzibar



6. Tulia Unique beach resort

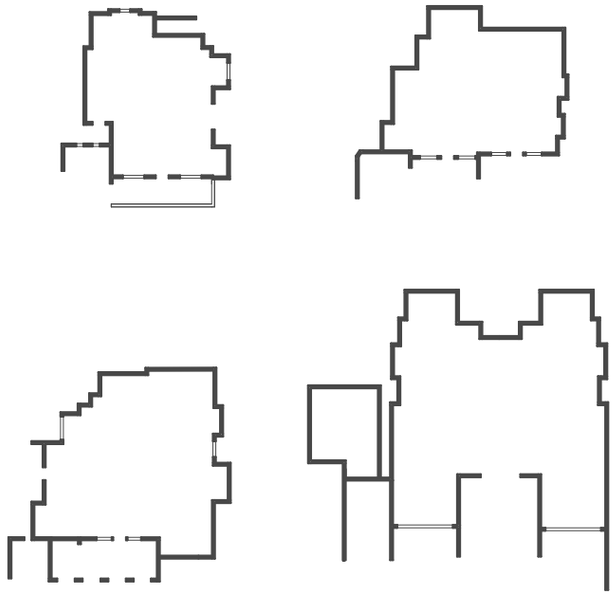
7. The Island Pongwe Lodge



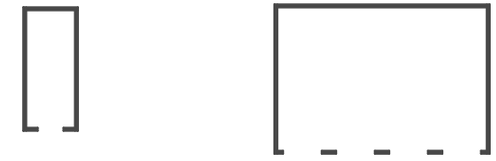
8. Karafuu beach Resort & Spa

3.3. Resorts' typologies

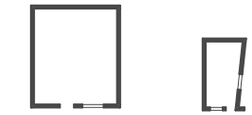
9. The Sands Beach Resort



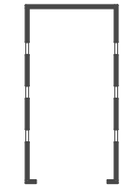
10. Baraza Resort & Spa Zanzibar



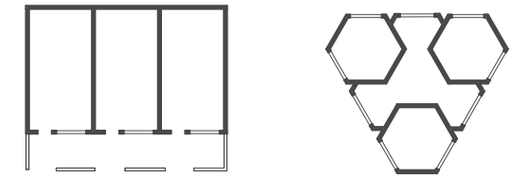
11. Breezes Beach Club & Spa



12. Evergreen Bungalows

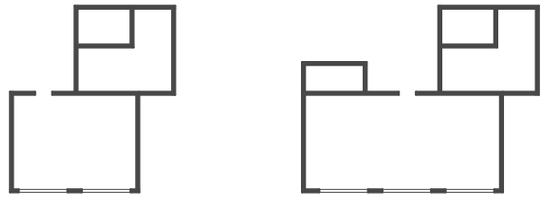


13. Jambiani Villas



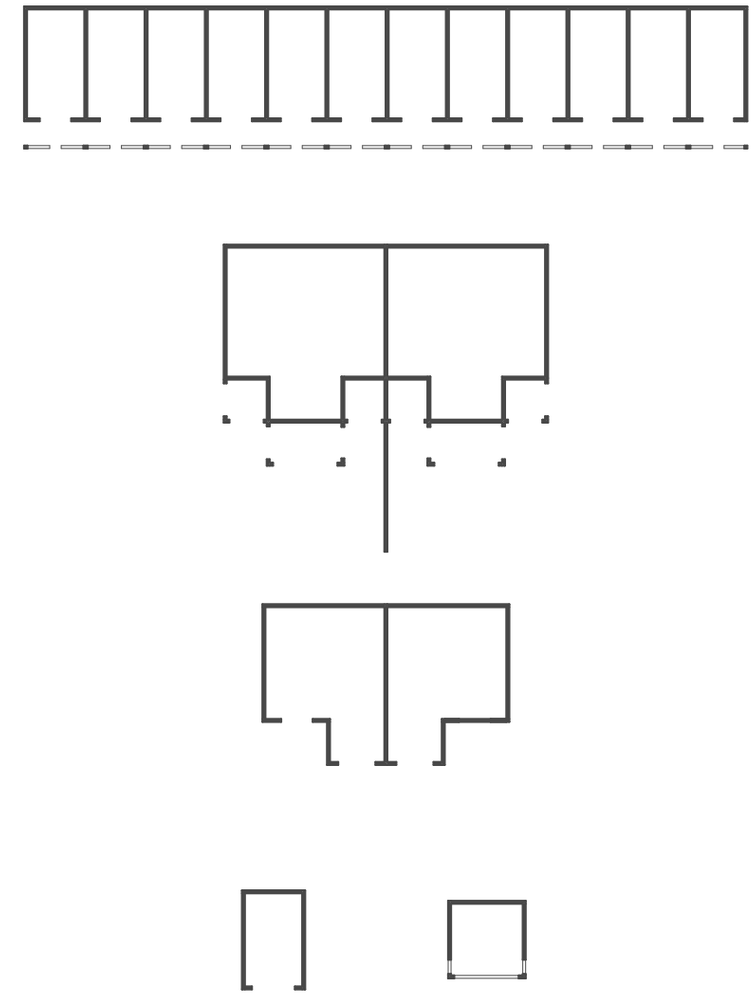
14. Blue Moon Resort

15. Eden Rock



16. The Residence Zanzibar

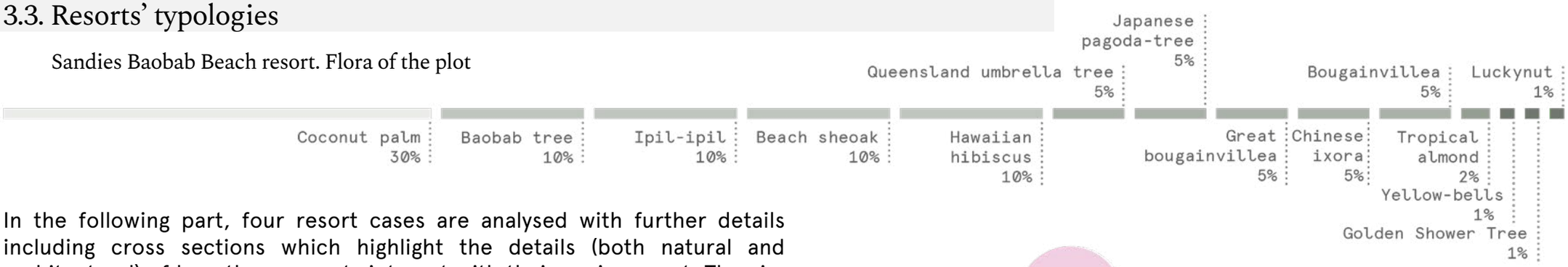
18. Zanzi Resort



17. Fruit & Spice Wellness Resort

3.3. Resorts' typologies

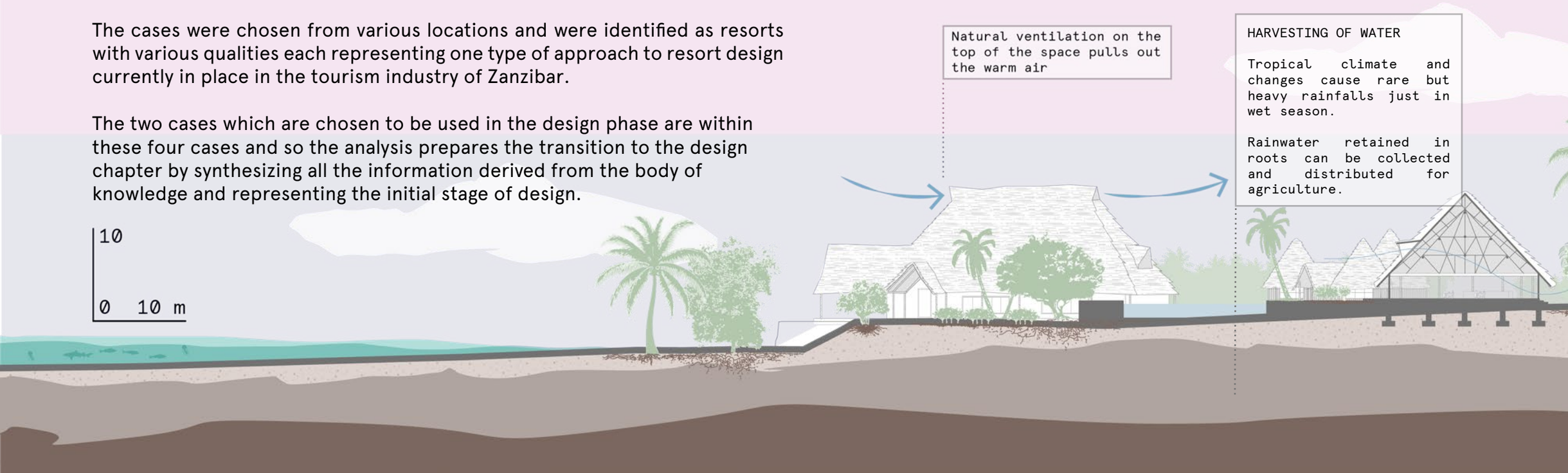
Sandies Baobab Beach resort. Flora of the plot



In the following part, four resort cases are analysed with further details including cross sections which highlight the details (both natural and architectural) of how these resorts interact with their environment. The aim of this level of analysis is to move to a closer scale of the resorts and study them in the architectural level. This lays the ground to move from the body of knowledge to the design phase by bridging the approach and information of the infocards and synthesizing the architectural features within architectural presentation tools. The analysis provides an insight into the spatial feature of the resorts and the island itself in the coastal regions.

The cases were chosen from various locations and were identified as resorts with various qualities each representing one type of approach to resort design currently in place in the tourism industry of Zanzibar.

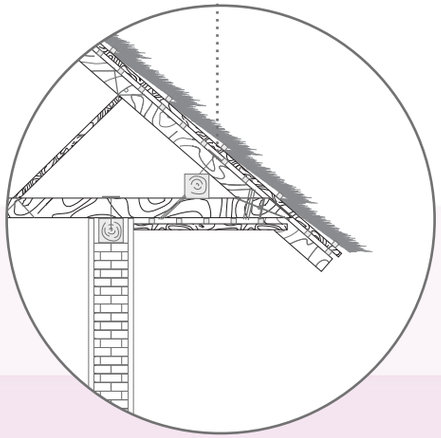
The two cases which are chosen to be used in the design phase are within these four cases and so the analysis prepares the transition to the design chapter by synthesizing all the information derived from the body of knowledge and representing the initial stage of design.

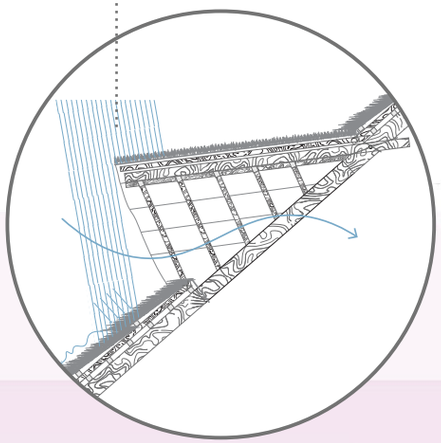


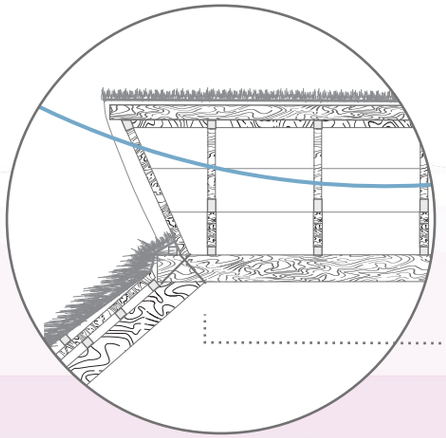
Sandies Baobab Beach resort.
Longitudinal section

DRY GRASS COVERING slowing down the water runoff of rainwater

RAINWATER absorbed into the dry grass and evaporated under solar radiation, contributing to the cooling of the roof







LOCAL ROOF MAKING
Tying the connections using traditional knots

Thatched roof providing shade for the flat roof of the units

Flat roof covered with sloped metal sheet for rainwater runoff

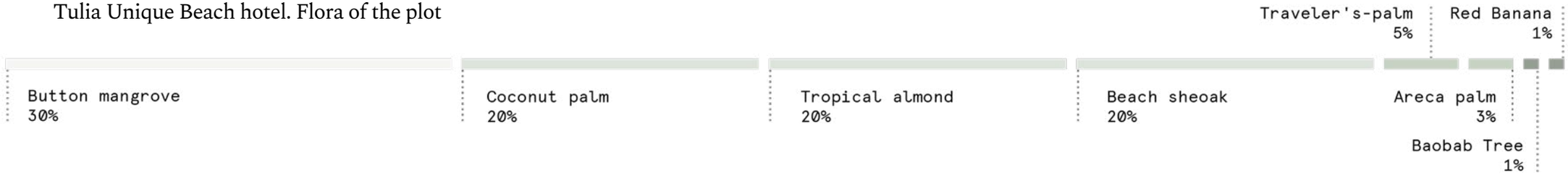
RECYCLED WOOD is used to build a permeable border with temporary frames to be used as a frame for vegetation to grow, in those spaces in which the flow of nature has been altered.

SOILS

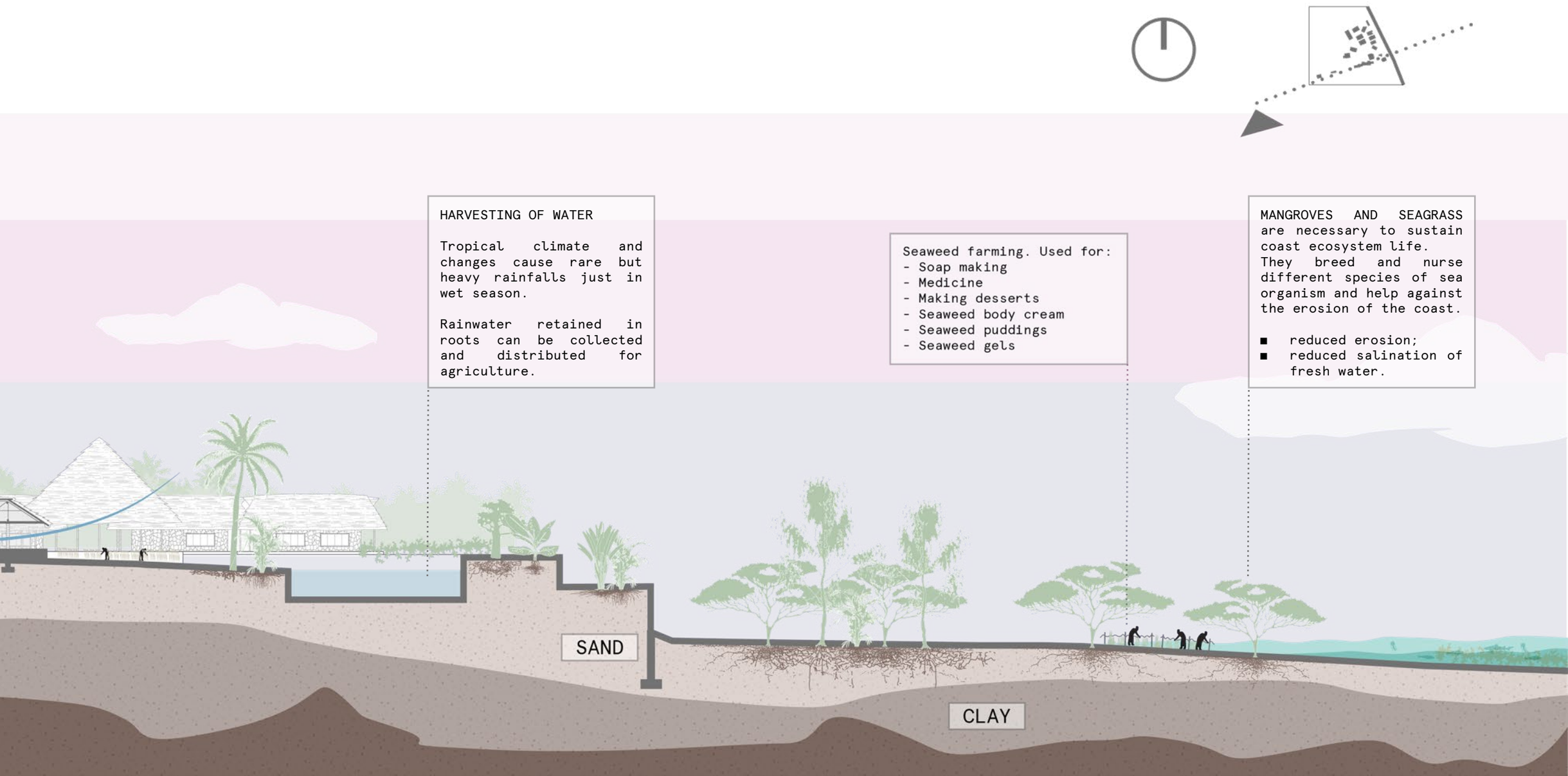
CORALLINE

3.3. Resorts' typologies

Tulia Unique Beach hotel. Flora of the plot

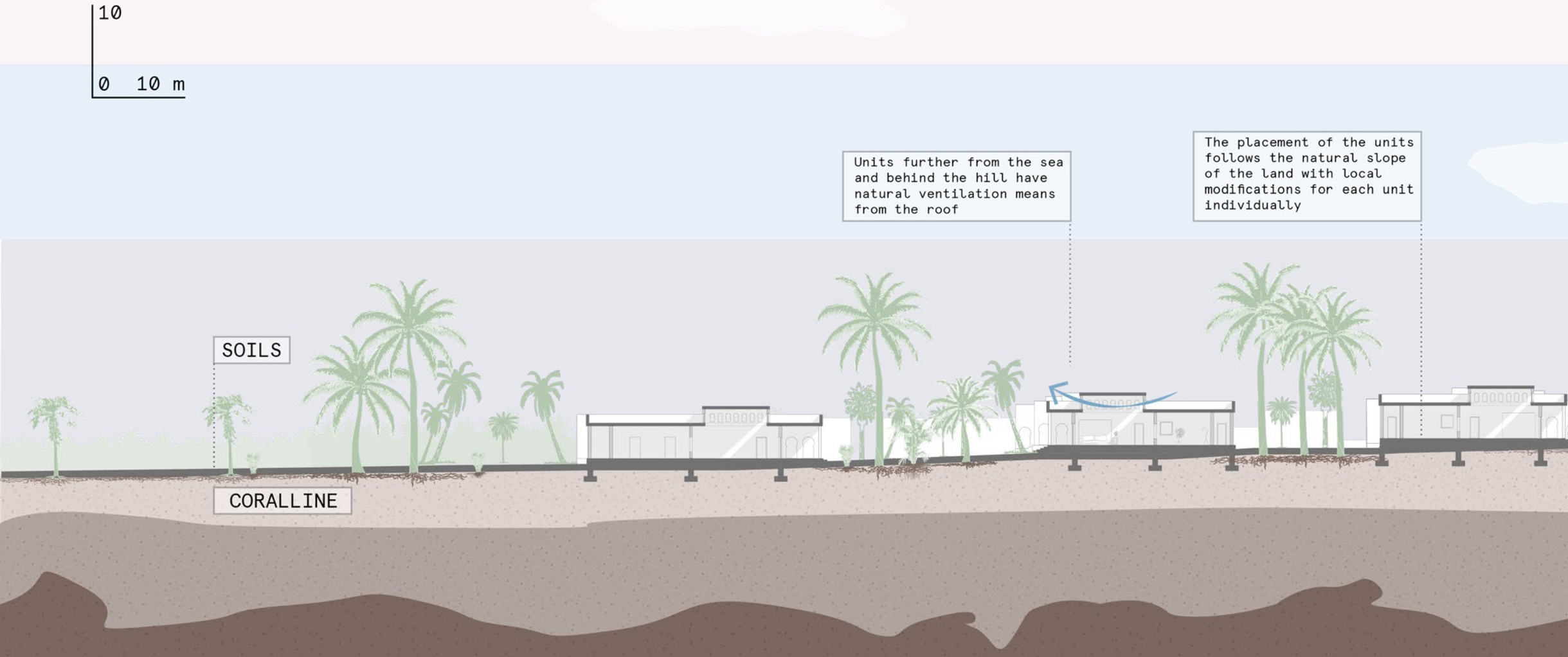


Tulia Unique Beach hotel. Longitudinal section

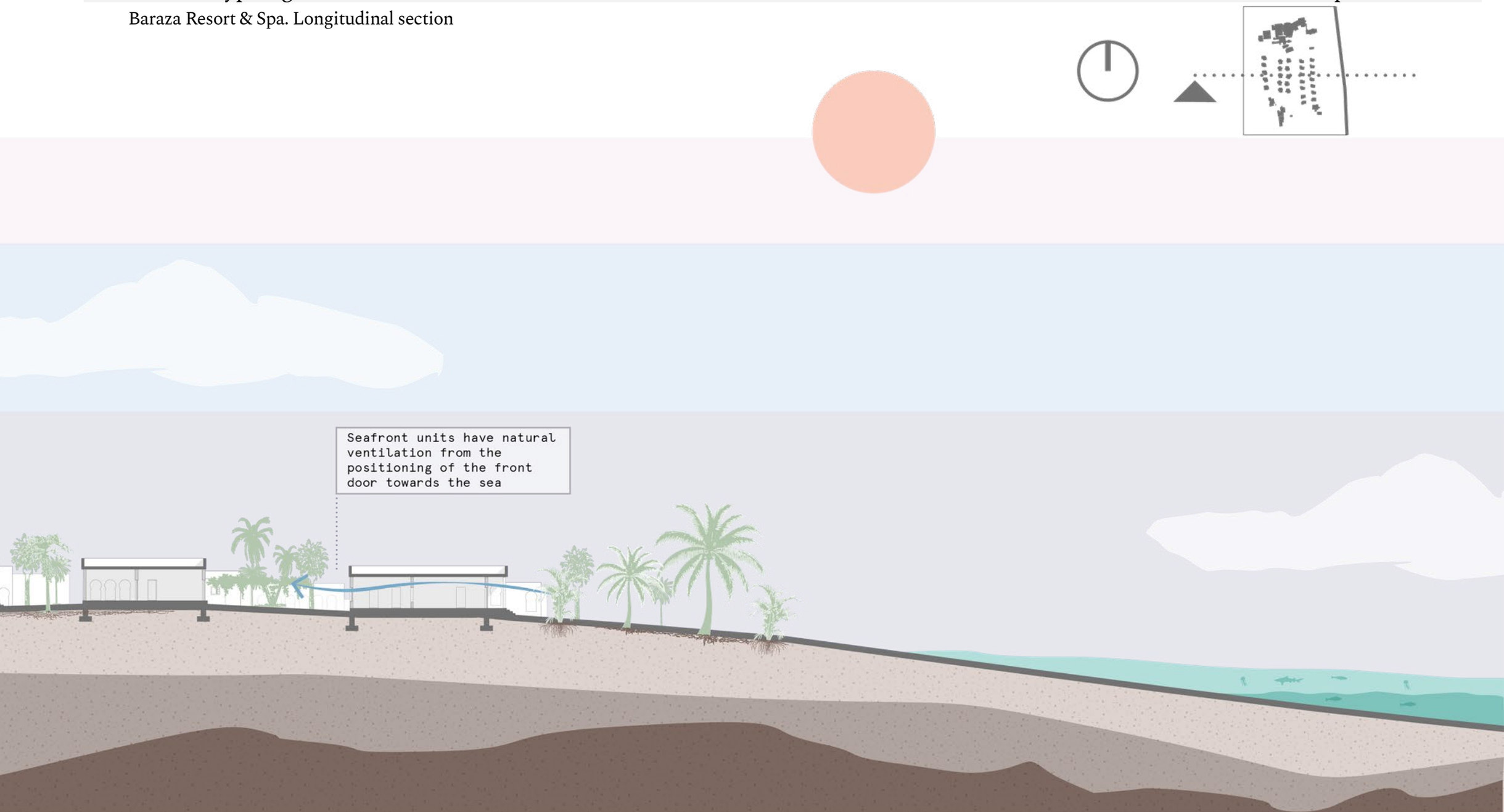


3.3. Resorts' typologies

Baraza Resort & Spa. Flora of the plot

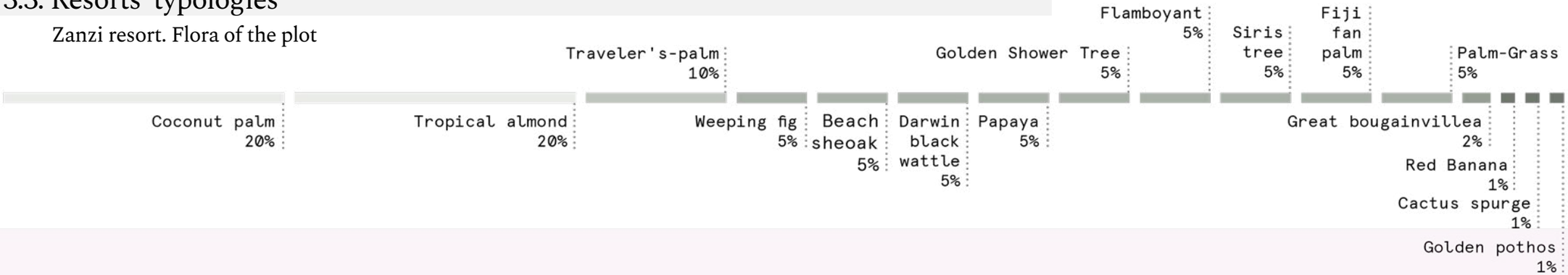


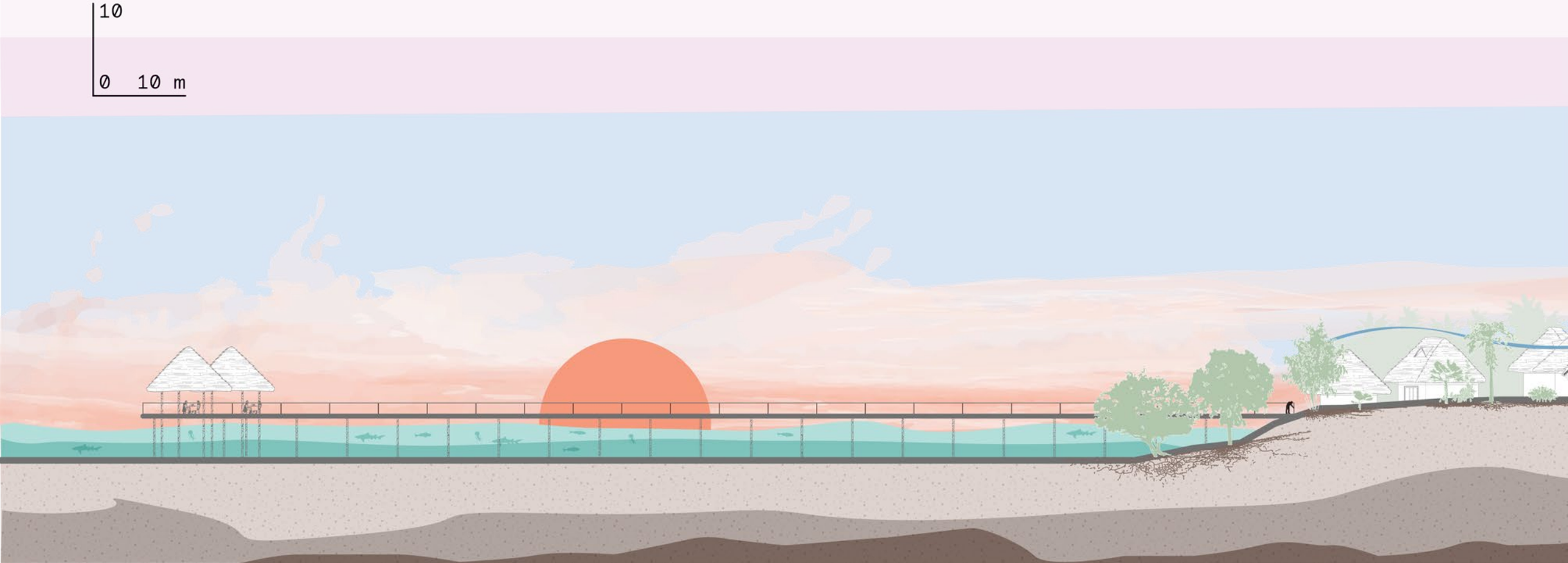
Baraza Resort & Spa. Longitudinal section



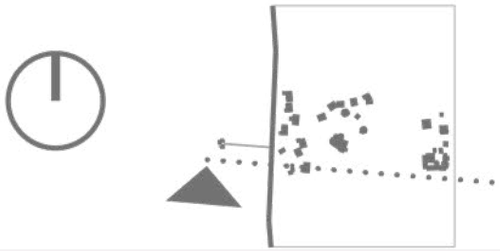
3.3. Resorts' typologies

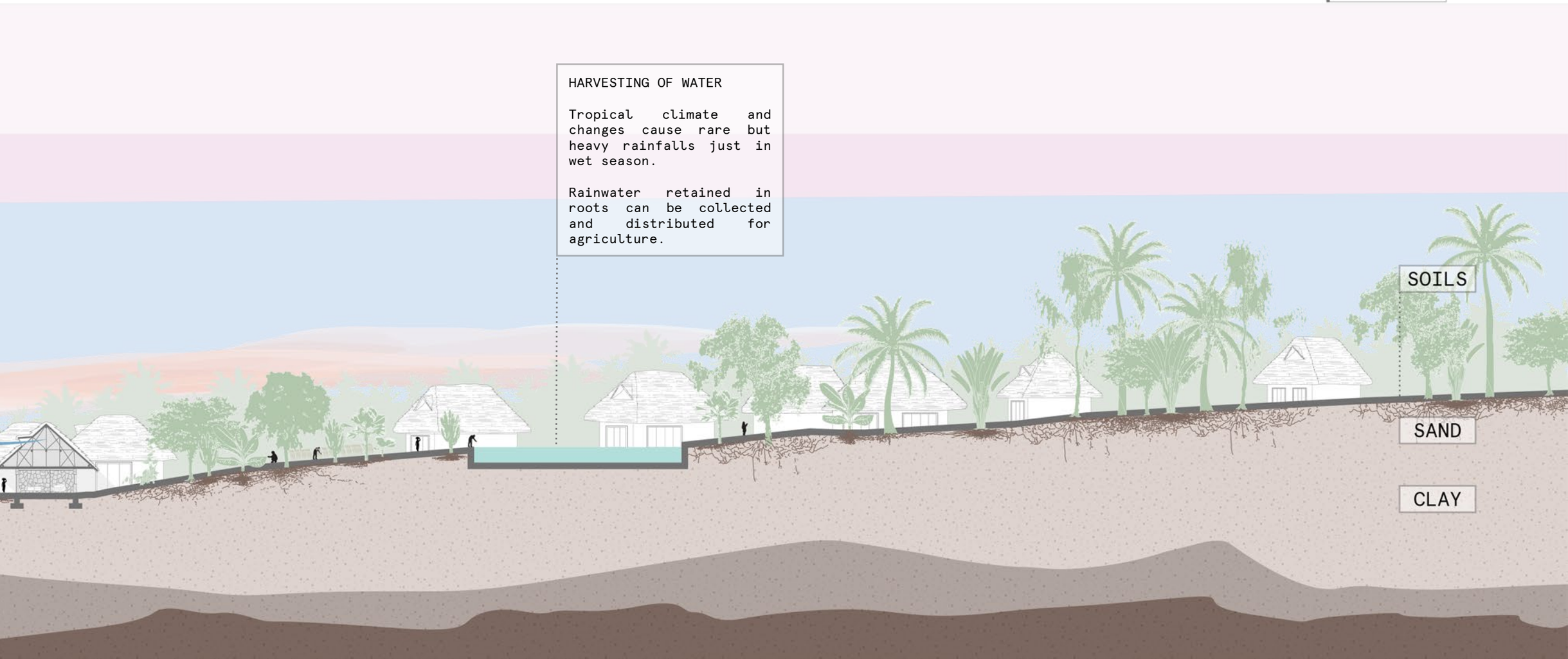
Zanzi resort. Flora of the plot





Zanzi resort. Longitudinal section





3.4. Comparative analysis of the resorts. Quantitative factors

The analysis of the case studies points to certain conclusions regarding their features and also SWOT analysis. In general, it can be stated that the cases can be grouped into three main categories. First, the large-scale resorts with all the amenities of a modern hotel with dramatic influence on their environment. This group of resorts tend to utilize large scale buildings and integrate modern methods for environmental control. The extent to which these resorts conform to vernacular characteristics comes down mostly to only a formal imitation of the local buildings.

The second group of resorts are medium-sized resorts usually with separate units distributed throughout the environment. Their impact on the environment is less than the previous group while in most cases providing the same level of amenities as the large-scale resorts. Furthermore, the resorts of this group integrate more elements of the vernacular context in their construction methods and spatial organization going beyond the mere formal imitation. Even though in most cases they also provide environmental control strategies based on modern techniques they have the potential of integrating vernacular passive methods of cooling due to their integration of vernacular architecture features. In one case of the Pongwe island this is exactly the case in which high-quality accommodation integrated with vernacular modes of life is offered for the experiential tourist.

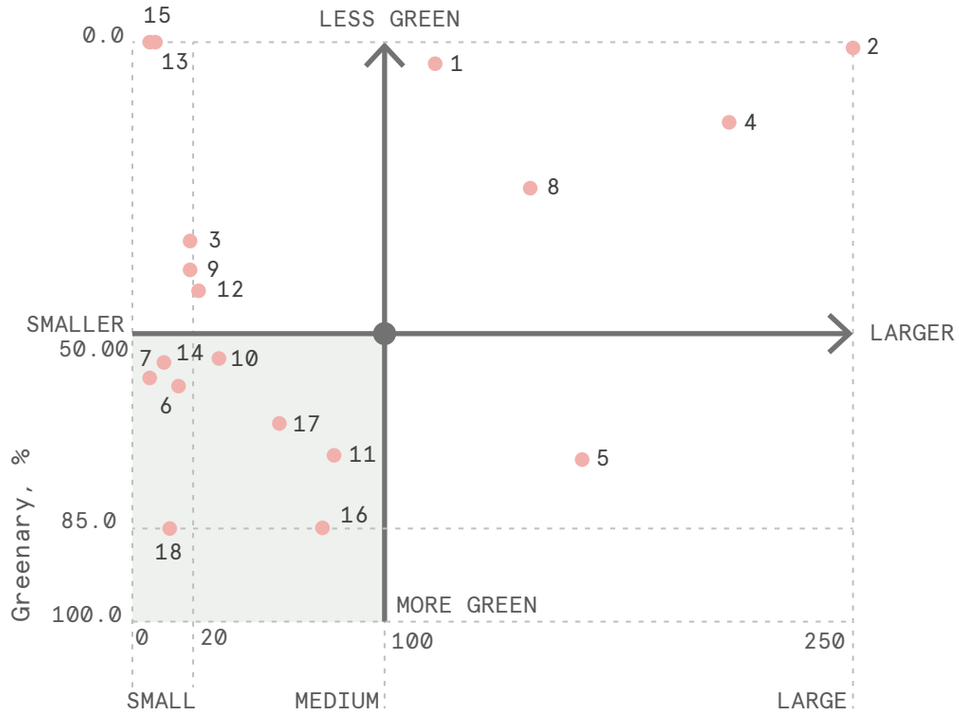
The third group are small scale resorts built entirely based on local manners of construction. They have a minimal effect on their environment and offer the closest experience of local life. However, the amenities they provide are limited and the level of comfort they offer is low. In most cases they also lack environmentally friendly methods of providing energy or disposing of waste. Therefore, although their effect initially on the environment is low, their negative effect on the environment in the long run could surpass the cases from the other groups.

The distance from main urban centers and the airport is a common weakness in most cases. The threat of sea level rise is also one of the main dangers in most cases due to the vicinity to the sea. In this case the resorts which are located on natural or man-made cliffs are exempt from this threat. Furthermore, the real factors which bring the main difference between the resorts is their ability in being self-reliant. Use of renewable energy sources, use of farms inside the resort for zero-kilometer food, ecologically responsible methods of waste disposal, and certain programs for the protection and enhancement of the natural and social context are some examples of what sets the best resorts apart from the average cases.

The only one large and green hotel among the case studies is No. 5. Melia Zanzibar. Hotels No. 3. Sensations Eco-Chic Hotel, No. 9. Melia Zanzibar, No. 12. Evergreen Bungalows, No. 13. Jambiani Villas and No. 15. Eden Rock are small sized and with lack of greenery (<50%).

Large hotels, such as No. 1 Sandies Baobab Beach Zanzibar, No. 2 The Mora Zanzibar, No. 4. TUI Blue Bahari Hoteland No. 8. Karafuu beach Resort & Spa have significant lack of greenery on the plot (<25%).

Majority of the hotels are small and medium and green (<100 residential units and greenery >50% on the plot) - 8 case studies.

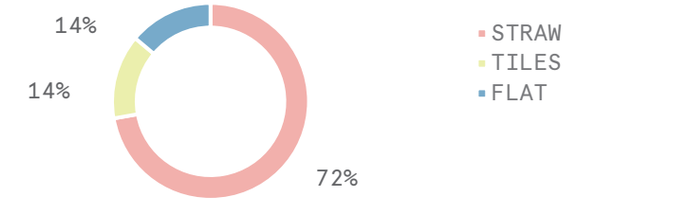


SIZE of the hotel
by number of residential units

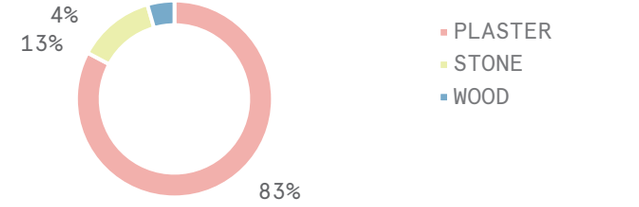
The prevalent materials used in the buildings of the residential units of the resorts are:

straw for the roof;
plaster for walls;
porcelian tiles for the floor.

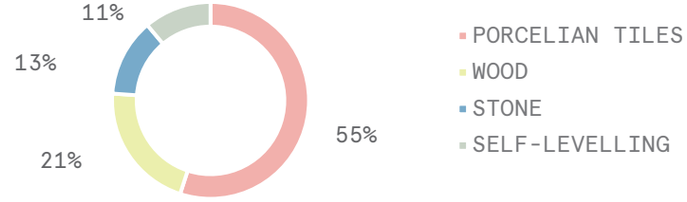
ROOF MATERIALS



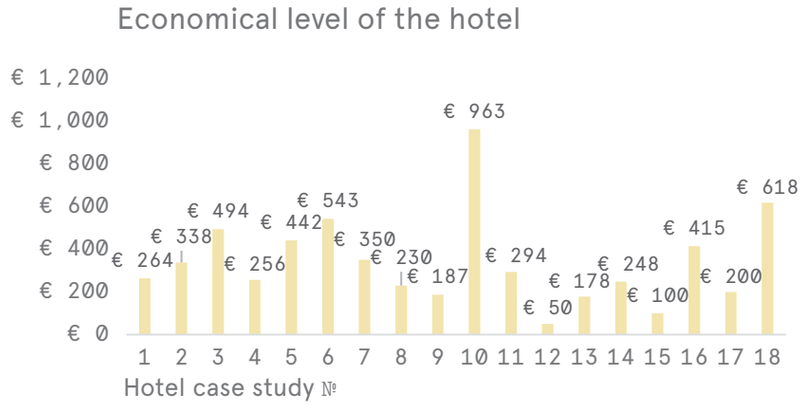
WALLS MATERIALS

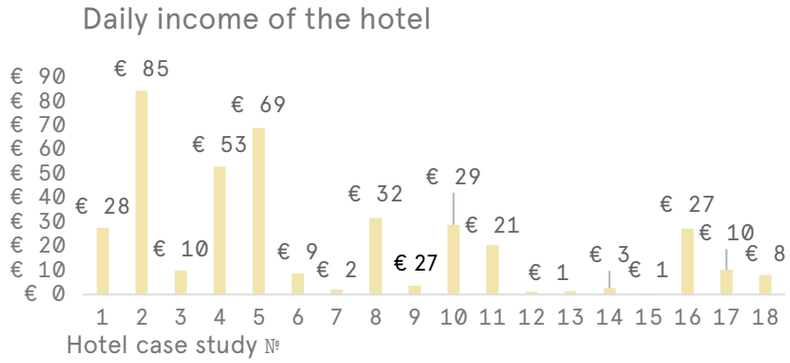


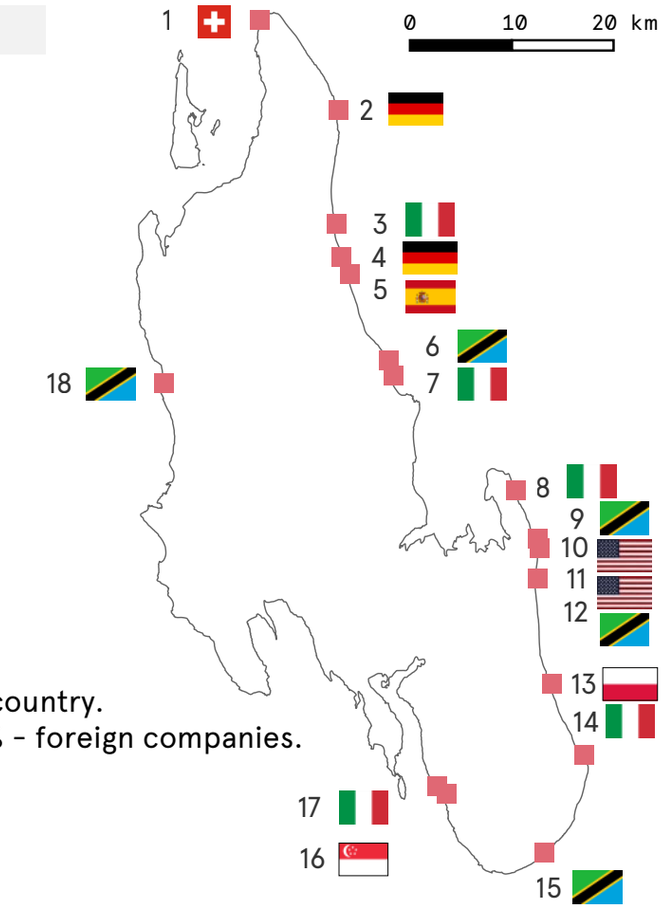
FLOOR MATERIALS



3.4. Comparative analysis of the resorts. Quantitative factors





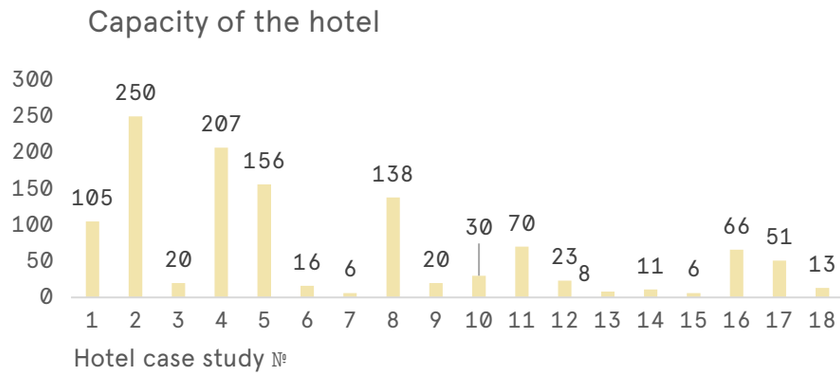


Ownership of the hotel by country.
28% - local (Tanzania), 72 % - foreign companies.

On the first graph we evaluate hotels depending on the price for one residential unit (room, suite or villa) per one night stay. The top 3 most expensive hotel are: Baraza Resort & Spa, Zanzi Resort, Tulia Unique beach resort.

The bottom 3 cheapest hotels are: The Sands Beach resort, Evergreen Bungalows, Eden Rock.

On the second graph hotels are evaluated by the market capitalization. Value is obtained by multiplying the capacity of the hotel (amount of residential units of the hotel) on the price of one residential unit per night.
The hotels with the largest market capitalization are: The Mora, Melia Zanzibar, Baraza Resort & Spa.
The bottom-3 are: The Island Pongwe Lodge, Evergreen Bungalows, Eden Rock.



1. Sandies Baobab Beach Zanzibar
2. The Mora Zanzibar
the largest by market capitalization, by capacity and price per night.

3. Sensations Eco-Chic Hotel
4. TUI Blue Bahari Hotel
5. Melia Zanzibar
6. Tulia Unique beach resort
7. The Island Pongwe Lodge - the smallest by capacity.

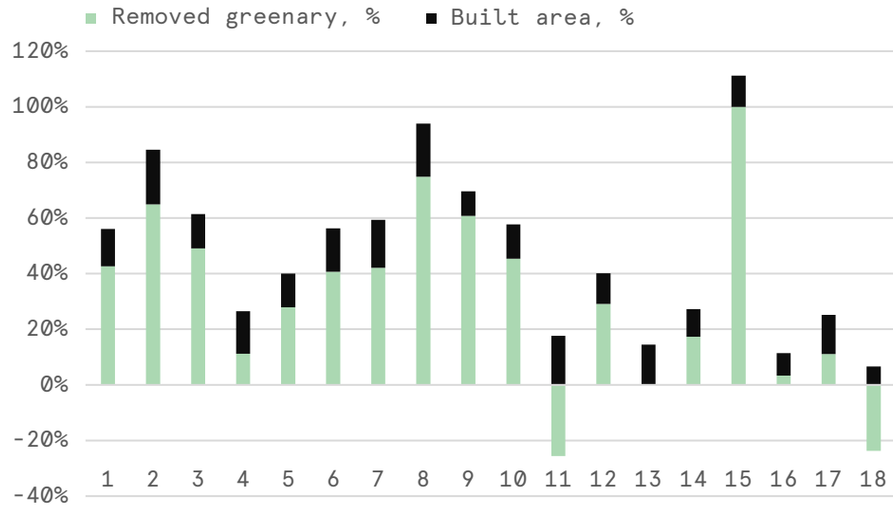
8. Karafuu beach Resort & Spa
9. The Sands Beach Resort
10. Baraza Resort & Spa Zanzibar - the most expensive by price per night.

11. Breezes Beach Club & Spa
12. Evergreen Bungalows - the chepest one by price per night.

13. Jambiani Villas
14. Blue Moon Resort
15. Eden Rock - the smallest by capacity, the furtherst from the airport.

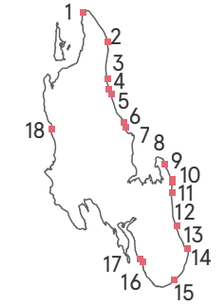
16. The Residence Zanzibar
17. Fruit & Spice Wellness Resort
18. Zanzi Resort - the most various by surrounding ecologies.

3.4. Comparative analysis of the resorts. Quantitative factors



HOTEL CASE STUDIES:

1. Sandies Baobab Beach Zanzibar
2. The Mora Zanzibar
3. Sensations Eco-Chic Hotel
4. TUI Blue Bahari Hotel
5. Melia Zanzibar
6. Tulia Unique beach resort
7. The Island Pongwe Lodge
8. Karafuu beach Resort & Spa
9. The Sands Beach Resort
10. Baraza Resort & Spa Zanzibar
11. Breezes Beach Club & Spa
12. Evergreen Bungalows
13. Jambiani Villas
14. Blue Moon Resort
15. Eden Rock
16. The Residence Zanzibar
17. Fruit & Spice Wellness Resort
18. Zanzi Resort



As a result of the quantitative and graphic analysis, 12 main indicators (factors) were identified that characterize the hotel's interaction with the landscape, customers and the economic share of the tourism sector:

1. Property area, sq.m.
2. Residential units
3. Covered built area, sq.m.
4. Daily income, EUR*10e3
5. Price per night, EUR
6. Ratio of built area to number of residential units, sq.m.
7. Built area, % of the plot area
8. Ratio of property area to number of residential units, sq.m.
9. Greenery on the plot, %
10. Removed greenery, %
11. Ratio of greenery (sq.m.) to covered area (sq.m.)
12. Ratio of greenery to number of residential units, sq.m.

This criterias can be devided onto 3 groups: resort resources, landscape treatment and users' comfort.

These indicators are chosen based on the research question of the thesis. The indicators related to the resort resources highlight how much resources the resort has consumed to be built, the amount of tourism flow it creates and the capital circulation it is based on. These quantitative indicators highlight the spatial and economic occupancy of the resorts. The indicators related to the landscape show how each resort is dealing with the natural context and how it is integrating the ecological system into its spaces. This group of indicators respond to the aspect of the research question related to how good touristic resorts can harmonize with the natural and ecological setting and how the current situation acknowledges this question. The indicators related to user comfort compromise the other side of the research question related to tourism to demonstrate how, within the current resort groups, each resort is able to comply with a high quality touristic experience.

Resort resources

- Property area, sq.m.
- Share of built area on the plot, %
- Built area, sq.m.
- Daily income, EUR
- Quantity of the residential units

Landscape treatment

- Ratio of greenary to the built area, %
- Green area on the plot, %
- Removed greenary on the plot, %
- Green area per one residential unit, sq.m.

Users' comfort

- Area of the plot per one residential unit, sq.m.
- Price per night, EUR
- Built area per one residential unit, sq.m.

3.4. Comparative analysis of the resorts. Quantitative factors

FACTOR VALUES SORTED ACCORDING THE RANK (FACTORS 1-3)

FACTOR 1.
Property area, sq.m.

№	Name of the hotel	FACTOR VALUE
16	The Residence Zanzibar	302986
5	Melia Zanzibar	208225
10	Baraza Resort & Spa Zanzibar	146841
2	The Mora Zanzibar	130000
8	Karafuu beach Resort & Spa	120537
11	Breezes Beach Club & Spa	110439
4	TUI Blue Bahari Hotel	97419
9	The Sands Beach Resort	77471
1	Sandies Baobab Beach Zanzibar	60486
18	Zanzi Resort	54574
17	Fruit & Spice Wellness Resort	48551
3	Sensations Eco-Chic Hotel	41204
6	Tulia Unique beach resort	21430
14	Blue Moon Resort	17629
12	Evergreen Bungalows	11106
15	Eden Rock	7882
13	Jambiani Villas	6727
7	The Island Pongwe Lodge	3700

FACTOR 2.
Number of residential units

№	Name of the hotel	FACTOR VALUE
2	The Mora Zanzibar	250
4	TUI Blue Bahari Hotel	207
5	Melia Zanzibar	156
8	Karafuu beach Resort & Spa	138
1	Sandies Baobab Beach Zanzibar	105
11	Breezes Beach Club & Spa	70
16	The Residence Zanzibar	66
17	Fruit & Spice Wellness Resort	51
10	Baraza Resort & Spa Zanzibar	30
12	Evergreen Bungalows	23
3	Sensations Eco-Chic Hotel	20
9	The Sands Beach Resort	20
6	Tulia Unique beach resort	16
18	Zanzi Resort	13
14	Blue Moon Resort	11
13	Jambiani Villas	8
7	The Island Pongwe Lodge	6
15	Eden Rock	6

FACTOR 3.
Covered built area, sq.m.

№	Name of the hotel	FACTOR VALUE
2	The Mora Zanzibar	25528
5	Melia Zanzibar	25179
16	The Residence Zanzibar	24573
8	Karafuu beach Resort & Spa	23055
11	Breezes Beach Club & Spa	19496
10	Baraza Resort & Spa Zanzibar	18093
4	TUI Blue Bahari Hotel	14902
1	Sandies Baobab Beach Zanzibar	8100
9	The Sands Beach Resort	6895
17	Fruit & Spice Wellness Resort	6830
3	Sensations Eco-Chic Hotel	5110
18	Zanzi Resort	3626
6	Tulia Unique beach resort	3359
14	Blue Moon Resort	1735
12	Evergreen Bungalows	1218
13	Jambiani Villas	977
15	Eden Rock	883
7	The Island Pongwe Lodge	641

FACTOR VALUES SORTED ACCORDING THE RANK (FACTORS 4-6)

FACTOR 4. Daily income, EUR x 10e3

№	Name of the hotel	FACTOR VALUE
2	The Mora Zanzibar	€ 85
5	Melia Zanzibar	€ 69
4	TUI Blue Bahari Hotel	€ 53
8	Karafuu beach Resort & Spa	€ 32
10	Baraza Resort & Spa Zanzibar	€ 29
1	Sandies Baobab Beach Zanzibar	€ 28
16	The Residence Zanzibar	€ 27
11	Breezes Beach Club & Spa	€ 21
17	Fruit & Spice Wellness Resort	€ 10
3	Sensations Eco-Chic Hotel	€ 10
6	Tulia Unique beach resort	€ 9
18	Zanzi Resort	€ 8
9	The Sands Beach Resort	€ 4
14	Blue Moon Resort	€ 3
7	The Island Pongwe Lodge	€ 2
13	Jambiani Villas	€ 1
12	Evergreen Bungalows	€ 1
15	Eden Rock	€ 1

FACTOR 5. Price per night, EUR

№	Name of the hotel	FACTOR VALUE
10	Baraza Resort & Spa Zanzibar	€ 963
18	Zanzi Resort	€ 618
6	Tulia Unique beach resort	€ 543
3	Sensations Eco-Chic Hotel	€ 494
5	Melia Zanzibar	€ 442
16	The Residence Zanzibar	€ 415
7	The Island Pongwe Lodge	€ 350
2	The Mora Zanzibar	€ 338
11	Breezes Beach Club & Spa	€ 294
1	Sandies Baobab Beach Zanzibar	€ 264
4	TUI Blue Bahari Hotel	€ 256
14	Blue Moon Resort	€ 248
8	Karafuu beach Resort & Spa	€ 230
17	Fruit & Spice Wellness Resort	€ 200
9	The Sands Beach Resort	€ 187
13	Jambiani Villas	€ 178
15	Eden Rock	€ 100
12	Evergreen Bungalows	€ 50

FACTOR 6. Ratio of built area to the number of residential units, sq.m.

№	Name of the hotel	FACTOR VALUE
10	Baraza Resort & Spa Zanzibar	603
16	The Residence Zanzibar	372
9	The Sands Beach Resort	345
18	Zanzi Resort	279
11	Breezes Beach Club & Spa	279
3	Sensations Eco-Chic Hotel	256
6	Tulia Unique beach resort	210
8	Karafuu beach Resort & Spa	167
5	Melia Zanzibar	161
14	Blue Moon Resort	158
15	Eden Rock	147
17	Fruit & Spice Wellness Resort	134
13	Jambiani Villas	122
7	The Island Pongwe Lodge	107
2	The Mora Zanzibar	102
1	Sandies Baobab Beach Zanzibar	77
4	TUI Blue Bahari Hotel	72
12	Evergreen Bungalows	53

3.4. Comparative analysis of the resorts. Quantitative factors

FACTOR VALUES SORTED ACCORDING THE RANK (FACTORS 7-9)

FACTOR 7.
Built area, % of the plot area

№	Name of the hotel	FACTOR VALUE
2	The Mora Zanzibar	19.64%
8	Karafuu beach Resort & Spa	19.13%
11	Breezes Beach Club & Spa	17.65%
7	The Island Pongwe Lodge	17.32%
6	Tulia Unique beach resort	15.67%
4	TUI Blue Bahari Hotel	15.30%
13	Jambiani Villas	14.52%
17	Fruit & Spice Wellness Resort	14.07%
1	Sandies Baobab Beach Zanzibar	13.39%
3	Sensations Eco-Chic Hotel	12.40%
10	Baraza Resort & Spa Zanzibar	12.32%
5	Melia Zanzibar	12.09%
15	Eden Rock	11.20%
12	Evergreen Bungalows	10.97%
14	Blue Moon Resort	9.84%
9	The Sands Beach Resort	8.90%
16	The Residence Zanzibar	8.11%
18	Zanzi Resort	6.64%

FACTOR 8.
Ratio of property area to the number of residential units, sq.m.

№	Name of the hotel	FACTOR VALUE
4	TUI Blue Bahari Hotel	471
12	Evergreen Bungalows	483
2	The Mora Zanzibar	520
1	Sandies Baobab Beach Zanzibar	576
7	The Island Pongwe Lodge	617
13	Jambiani Villas	841
8	Karafuu beach Resort & Spa	873
17	Fruit & Spice Wellness Resort	952
15	Eden Rock	1314
5	Melia Zanzibar	1335
6	Tulia Unique beach resort	1339
11	Breezes Beach Club & Spa	1578
14	Blue Moon Resort	1603
3	Sensations Eco-Chic Hotel	2060
9	The Sands Beach Resort	3874
18	Zanzi Resort	4198
16	The Residence Zanzibar	4591
10	Baraza Resort & Spa Zanzibar	4895

FACTOR 9.
Greenery on the plot, %

№	Name of the hotel	FACTOR VALUE
13	Jambiani Villas	0.00%
15	Eden Rock	0.00%
2	The Mora Zanzibar	0.97%
1	Sandies Baobab Beach Zanzibar	3.69%
4	TUI Blue Bahari Hotel	13.80%
8	Karafuu beach Resort & Spa	25.19%
3	Sensations Eco-Chic Hotel	34.31%
9	The Sands Beach Resort	39.27%
12	Evergreen Bungalows	42.90%
10	Baraza Resort & Spa Zanzibar	54.60%
14	Blue Moon Resort	55.25%
7	The Island Pongwe Lodge	57.92%
6	Tulia Unique beach resort	59.33%
17	Fruit & Spice Wellness Resort	65.78%
11	Breezes Beach Club & Spa	71.28%
5	Melia Zanzibar	72.04%
16	The Residence Zanzibar	83.83%
18	Zanzi Resort	83.92%

FACTOR VALUES SORTED ACCORDING THE RANK (FACTORS 10-12)

FACTOR 10. Removed greenery, %

№	Name of the hotel	FACTOR VALUE
15	Eden Rock	100%
8	Karafuu beach Resort & Spa	75%
2	The Mora Zanzibar	65%
9	The Sands Beach Resort	61%
3	Sensations Eco-Chic Hotel	49%
10	Baraza Resort & Spa Zanzibar	45%
1	Sandies Baobab Beach Zanzibar	43%
7	The Island Pongwe Lodge	42%
6	Tulia Unique beach resort	41%
12	Evergreen Bungalows	29%
5	Melia Zanzibar	28%
14	Blue Moon Resort	17%
4	TUI Blue Bahari Hotel	11%
17	Fruit & Spice Wellness Resort	11%
16	The Residence Zanzibar	3%
13	Jambiani Villas	0%
18	Zanzi Resort	-24%
11	Breezes Beach Club & Spa	-26%

FACTOR 11. Ratio of greenery (sq.m.) to covered area (sq.m.)

№	Name of the hotel	FACTOR VALUE
15	Eden Rock	0.00
13	Jambiani Villas	0.00
2	The Mora Zanzibar	0.05
1	Sandies Baobab Beach Zanzibar	0.28
4	TUI Blue Bahari Hotel	0.90
8	Karafuu beach Resort & Spa	1.32
3	Sensations Eco-Chic Hotel	2.77
7	The Island Pongwe Lodge	3.34
6	Tulia Unique beach resort	3.79
12	Evergreen Bungalows	3.91
11	Breezes Beach Club & Spa	4.04
9	The Sands Beach Resort	4.41
10	Baraza Resort & Spa Zanzibar	4.43
17	Fruit & Spice Wellness Resort	4.68
14	Blue Moon Resort	5.61
5	Melia Zanzibar	5.96
16	The Residence Zanzibar	10.34
18	Zanzi Resort	12.63

FACTOR 12. Ratio of greenery to the number of residential units, sq.m.

№	Name of the hotel	FACTOR VALUE
13	Jambiani Villas	0
15	Eden Rock	0
2	The Mora Zanzibar	5
1	Sandies Baobab Beach Zanzibar	21
4	TUI Blue Bahari Hotel	65
12	Evergreen Bungalows	207
8	Karafuu beach Resort & Spa	220
7	The Island Pongwe Lodge	357
17	Fruit & Spice Wellness Resort	626
3	Sensations Eco-Chic Hotel	707
6	Tulia Unique beach resort	795
14	Blue Moon Resort	885
5	Melia Zanzibar	962
11	Breezes Beach Club & Spa	1125
9	The Sands Beach Resort	1521
10	Baraza Resort & Spa Zanzibar	2673
18	Zanzi Resort	3523
16	The Residence Zanzibar	3848

3.4. Comparative analysis of the resorts. Quantitative factors

To assess the influence of each factor on the final hotel sustainability index, we will use the method of mathematical statistics, which allows us to assess the significance of each factor.

Correlation or dependence is any statistical relationship, whether causal or not, between two random variables or bivariate data. In statistics it usually refers to the degree to which a pair of variables are linearly related.

The case study characteristics provided are qualitative, not quantitative. That is why for the evaluation method from business analytics with rank correlation coefficient will be used. The Spearman coefficient is used to detect and describe statistical dependence between features, as well as to test hypotheses about the presence of this dependence. It was proposed by the English statistician and psychologist Charles Spearman in 1904.

If the sampling factors correlate with another factor (correlation coefficient), then it will be considered significant. A significant factor is one that makes a significant and unique contribution to the final index of each hotel.

For ranking, the case studies were arranged in ascending order depending on the value of the factor in each category. Each hotel was assigned a rank depending on its location in the list (from 1 to 18). In this case, 1 place in the list corresponds to the most favorable value of the factor, 18 - the least favorable.

The Excel add-in «Data Analysis» was used, with the help of which a matrix of correlation coefficients was obtained:

factor №	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	0.80	1										
3	0.96	0.89	1									
4	0.86	0.91	0.92	1								
5	0.42	0.15	0.34	0.45	1							
6	0.43	-0.13	0.28	0.08	0.52	1						
7	0.01	0.36	0.20	0.38	0.00	-0.36	1					
8	-0.30	0.28	-0.12	0.06	-0.51	-0.95	0.55	1				
9	-0.28	-0.01	-0.17	-0.08	-0.52	-0.51	0.34	0.54	1			
10	-0.01	0.02	0.03	0.07	-0.12	-0.07	0.17	0.13	0.56	1		
11	-0.11	0.31	0.07	0.24	-0.14	-0.51	0.71	0.63	0.63	0.18	1	
12	-0.47	0.00	-0.30	-0.14	-0.59	-0.83	0.50	0.84	0.83	0.34	0.61	1

At Spearman correlation coefficient values > 0 ... 0.7, a strong linear relationship between these factors is observed.

At correlation coefficient values < -0.7... 0 - A strong inverse linear relationship between these factors is observed.

Values in the range of -0.5 ... 0.5 indicate a statistically insignificant relationship between the factors and these factors can be considered independent.

Without testing the hypothesis of significance, factors in the range of 0.5 ... 0.7 and -0.7 ... -0.5 were accepted as independent.

The dependent factors are:

- with a proportional relationship.

1 & 2. Property area (sq.m.) & number of residential units
1 & 3. Property area (sq.m.) & covered built area (sq.m.)
1 & 4. Property area (sq.m.) & daily income (EURx103)
2 & 3. Number of residential units & covered built area (sq.m.)
2 & 4. Number of residential units & daily income (EURx103)
3 & 4. Covered built area (sq.m.) & daily income (EURx103)
7 & 11. Built area (%) & ratio of greenery to covered area
8 & 12. Ratio of property area to number of residential units (sq.m.) & ratio of greenery to number of residential units (sq.m.)
9 & 12. Greenery on the plot (%) & ratio of greenery to number of residential units (sq.m.)

- with an inversely proportional relationship

6 & 8. Ratio of built area to number of residential units (sq.m.) & ratio of property area to number of residential units (sq.m.)
6 & 12. Ratio of built area to number of residential units (sq.m.) & ratio of greenery to number of residential units (sq.m.).

As a result of this study, factors relevant for the assessment were identified. Only these factors will be taken into account in the final assessment:

1. Property area, sq.m.
5. Price per night, EUR
6. Ratio of built area to number of residential units, sq.m.
7. Built area, % of the plot area
9. Greenery on the plot, %
10. Removed greenery, %

3.4. Comparative analysis of the resorts. Quantitative factors

For the final evaluation by this criterias two approach will be considered. We will use rank No.1 and rank No.2.

The sum of the ordinal numbers corresponding to the place in the list of the case studies for each factor, when ranking them in ascending order by the indicator value (ranking No.1). The second rank is distinguished by the fact that it is not the sum of the ranks that is taken into account, but the sum of the index values for each factor, and then the hotels are ranked depending on the value obtained (from smaller to larger) - ranking No.2.

Final rank No.2 is the sum of the factor values converted into indices. The transition from a quantitative indicator to an indeces (measure of change in a representative group of individual data points) was carried out using the formula:

$$INDEX = \frac{x_i - x_{min}}{x_{max} - x_{min}}$$

where x_i - value of the processed factor;

x_{max} - the value of the highest indicator of a given factor in a sample of 18 case studies;

x_{min} - the value of the lowest indicator of a given factor in a sample of 18 case studies.

All indices lie in the interval from 0 to 1. An index equal to zero means the absence of the considered indicator in a given case study.

№	Name of the hotel	Property area, sq.m.	Price per night, EUR	Ratio of built area to amount of residential units, sq.m.	Built area, % of the plot area	Greenary on the plot, %	Removed greenary, %	Σ of factors' values	Score of sustainability. Ranking № 1
1	Sandies Baobab Beach Zanzibar	0.20	0.27	0.13	0.68	0.96	1.00	3.25	16
2	The Mora Zanzibar	0.43	0.35	0.17	1.00	0.99	0.80	3.74	17
3	Sensations Eco-Chic Hotel	0.14	0.51	0.42	0.63	0.66	0.72	3.08	14
4	TUI Blue Bahari Hotel	0.32	0.27	0.12	0.78	0.86	0.69	3.04	13
5	Melia Zanzibar	0.69	0.46	0.27	0.62	0.28	0.59	2.90	12
6	Tulia Unique beach resort	0.07	0.56	0.35	0.80	0.41	0.57	2.75	10
7	The Island Pongwe Lodge	0.01	0.36	0.18	0.88	0.42	0.54	2.40	6
8	Karafuu beach Resort & Spa	0.40	0.24	0.28	0.97	0.75	0.54	3.17	15
9	The Sands Beach Resort	0.26	0.19	0.57	0.45	0.61	0.53	2.61	8
10	Baraza Resort & Spa Zanzibar	0.48	1.00	1.00	0.63	0.45	0.44	4.00	18
11	Breezes Beach Club & Spa	0.36	0.31	0.46	0.90	0.29	0.43	2.74	9
12	Evergreen Bungalows	0.04	0.05	0.09	0.56	0.57	0.34	1.65	1
13	Jambiani Villas	0.02	0.18	0.20	0.74	1.00	0.29	2.44	7
14	Blue Moon Resort	0.06	0.26	0.26	0.50	0.45	0.29	1.82	4
15	Eden Rock	0.03	0.10	0.24	0.57	1.00	0.23	2.17	5
16	The Residence Zanzibar	1.00	0.43	0.62	0.41	0.16	0.20	2.83	11
17	Fruit & Spice Wellness Resort	0.16	0.21	0.22	0.72	0.34	0.01	1.66	2
18	Zanzi Resort	0.18	0.64	0.46	0.34	0.16	0.00	1.78	3
		0.27	0.36	0.34	0.68	0.58	0.46	2.67	

Table represents numbers of the indicators by each factor for 18 case studies. Result of investigation is represented by sum of facors' values (last two columns). The last column indicates the rank number assigned to a particular hotel in ascending order (depending on the resulting sum of indices for all 6 factors).

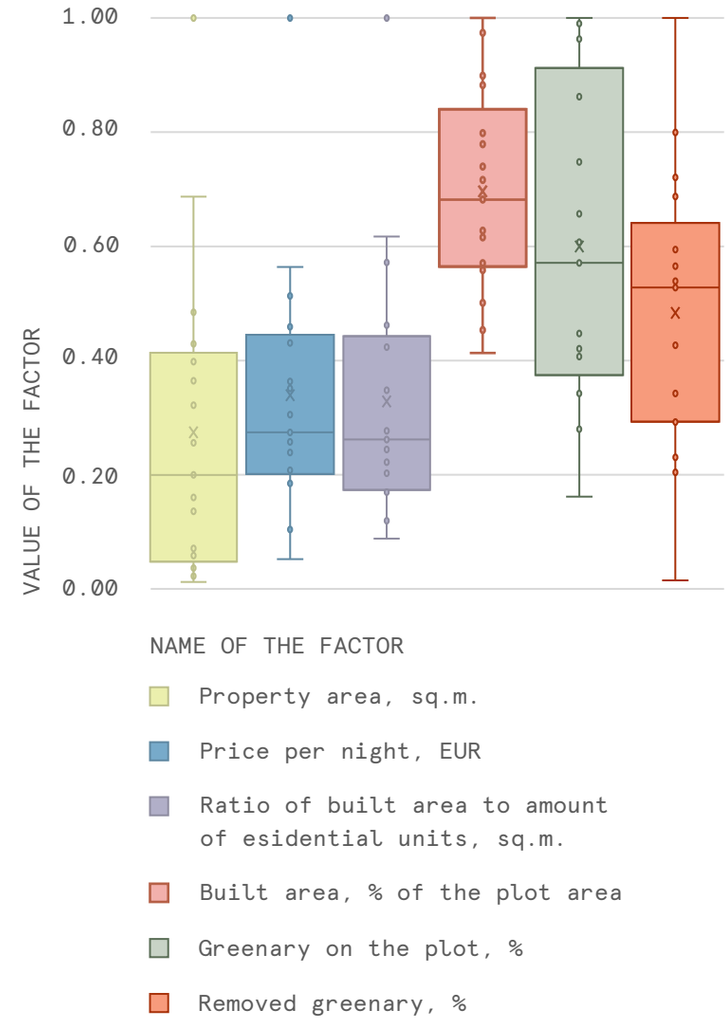
Boxplot diagram is demonstrating graphically the locality, spread and skewness groups of numerical data through their quartiles. In addition there are lines extending from the box indicating variability outside the upper and lower quartiles.

We observe the distribution of hotels by 6 independent factors. For factors 1 (property area), 2 (price per night) and 3 (ratio of built area to the number of residential units), there are abnormally high values for hotels The Residence (factor 1), Baraza resort (factor 2 and 3). It represents that this resort is very different from most other hotels in the sample, which makes it unique by the corresponding indicator.

Thus, the Residence Zanzibar has an outstanding large property area that is 302 986 sq. m. Baraza resort is the most expensive hotel (963 euro per night) with the largest and outstanding ratio of built area to the amount of residential units, that charactarises rooms and villas in a resort as spacious ones.

For factors 5 and 6, there are abnormally low values for three hotels. Largest amount of greenary on the plot obtained for the resort Zanzi, the Residence and Melia (that is also correlated to the fine size of property area). The least amount of remomved greenary have resorts Zanzi, Jambiani and Breezes. Thus, we can concludde that Zanzi resort can be considered as the most delicate and caring regarding the aspect of the treatment of the greenery on the plot.

BOXPLOT DIAGRAM OF DISTRIBUTION OF THE FACTORS



3.5 . Comparative analysis of the resorts. Architectural metrics

RESORT NAME	Sandies Baobab Beach	The Mora	Sensations Eco-Chic Hotel	TUI BLUE Bahari Zanzibar	Melia Zanzibar	Tulia Unique Beach Resort	The Island Pongwe Lodge	Karafuu Beach Resort & Spa	The Sands Beach Resort
No.	1	2	3	4	5	6	7	8	9
PLAN TYPE	LINEAR / REGULAR	LINEAR / П-SHAPED	REGULAR	REGULAR	REGULAR	REGULAR	REGULAR	REGULAR / LINEAR / П-SHAPED	REGULAR
SIZE	LARGE	LARGE	SMALL	LARGE	LARGE	SMALL	SMALL	LARGE	SMALL
TYPE OF ROOF	SLOPED	FLAT	SLOPED	SLOPED	BOTH	SLOPED	SLOPED	SLOPED	SLOPED
ENTRANCE	INDIVIDUAL	COMMON	INDIVIDUAL	BOTH	BOTH	INDIVIDUAL	INDIVIDUAL	INDIVIDUAL	INDIVIDUAL
ORGANIZATION OF UNITS	GROUPED	GROUPED	BOTH	GROUPED	BOTH	SEPARATED	SEPERATED	BOTH	BOTH
TERRACES	YES	YES	YES	YES	BALCONIES	YES	YES	YES	YES
FLOORS	1-2	2	1	2	2	1	1	1	1
ORIENTATION	1.9	4	2	3	2	3	3	2.5	1.5
SHADED AREAS ON THE EAST	0.1	1	1	1	1	1	1	1	0.5
SHADED AREAS ON THE WEST	0.8	1	0	1	0	1	1	0.5	0
VERTICAL SHADING SYSTEMS	0	1	0	0	1	0	0	0	0
HORIZONTAL SHADING SYSTEMS	1	1	1	1	0	1	1	1	1
DIRECTION OF MAIN OPENINGS	S/S-W/W/N	N-E / E	S-E	N-E	N-E	N-E	N-E / W	N-E / S-E	S-E
ANGLE BETWEEN PREVALANT WIND AND OPENINGS	20/60/110/160	120 / 70	40	90	90 / 130	90	90 / 110	90 / 50	50
POSSIBILITY OF NATURAL VENTIALTION	0.6	0.5	1	0.3	0.3	0.3	1	0.5	0.3
TYPE OF FUNCTIONAL ZONING	INCLUSIVE	LINEAR	LINEAR	LINEAR	LINEAR	INCLUSIVE	LINEAR	INCLUSIVE	LINEAR

Baraza Resort & Spa	Breezes Beach Club & Spa	Evergreen Bungalows	Jambiani Villas	Blue Moon Resort	Eden Rock Zanzibar	The Residence	Fruit & Spice Welness resort	Zanzi Resort
10	11	12	13	14	15	16	17	18
REGULAR	REGULAR	REGULAR	REGULAR	REGULAR	REGULAR	REGULAR	REGULAR / LINEAR	REGULAR
MEDIUM	MEDIUM	MEDIUM	SMALL	SMALL	SMALL	MEDIUM	MEDIUM	SMALL
FLAT	SLOPED	SLOPED	SLOPED	SLOPED	SLOPED	SLOPED	BOTH	SLOPED
INDIVIDUAL	INDIVIDUAL	INDIVIDUAL	BOTH	INDIVIDUAL	BOTH	INDIVIDUAL	BOTH	INDIVIDUAL
SEPERATED	BOTH	GROUPED	BOTH	GROUPED	BOTH	SEPARATED	BOTH	SEPARATED
YES	YES	YES	BALCONY	NO	YES	NO	YES	YES
1	1-2	1-2	1-2	1	1-2	1	1-2	1
1.5	2	2	2	1	1.5	3	2	1.5
1	1	1	1	0	1	0.5	0	0
0	0	0	0	0	0	1	0.8	0.5
0.5	0	0	0	0	0	0.5	0.2	0
0	1	1	1	1	0.5	1	1	1
E	E	E	N-E	E	S-E	S-W	S-W/W/N-W	S / W
70	70	70	90	70	30	60	50/110/150	20 / 110
0.4	0.8	0.5	1	1	1	0.2	0.1	0.7
LINEAR	INCLUSIVE	LINEAR	INCLUSIVE	INCLUSIVE	LINEAR	LINEAR	INCLUSIVE	INCLUSIVE

After a study and evaluation of the quantitative values related to the resorts in this part we will focus on the study of architectural and environmental features in order to transform these qualities into quantitative values to be able to apply to the categorization of resorts.

The features are chosen as the basic architectural features more common among resorts and which are of relevance to the current study.

These highlight how well each resort is responding to the environment or the necessary needs of users and comfort levels to be able to link the architectural features with the other studied aspects.

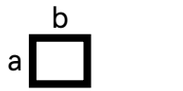
3.5. Comparative analysis of the resorts. Architectural metrics

The aim of this part is to be able to assign quantitative values to the mentioned indicators of each resort in order to be able to arrive at a numerical assessment. This will allow us to understand which resort with which qualities has a better approach overall regarding the research questions of the thesis to the design of touristic resorts.

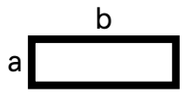
Here is the transition from qualitative characteristics to quantitative ones. According to the following rules, we will translate the indicators from the previous table into digital indicators.

1. Plan type. Value of the indices:

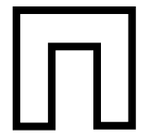
- If the plan shape is regular = 1
- If the plan shape is partially regular, partially complex = 0.6
- If the plan is prevalent linear & complex = 0.3
- If the plan shape is linear / complex only = 0



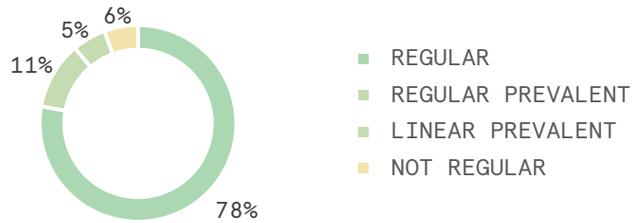
Regular shape
a/b < 1/5

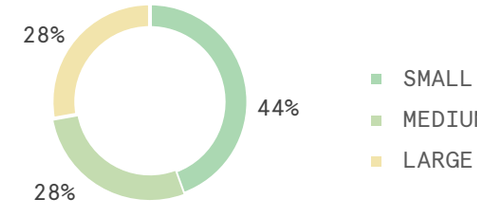


Linear shape
a/b > 1/5



Complex plan:
П-shaped,
L-shaped





2. Size

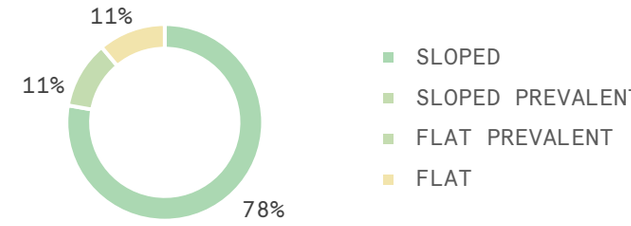
Classification by size was done regarding the number of residential units in the resort.

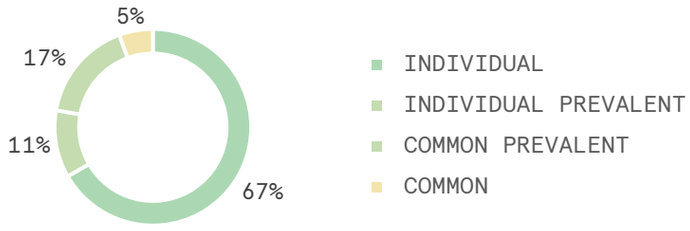
- Small size - 1-20 r.u.
- Medium size - 21-100 r.u.
- Large size - 101-300 r.u.

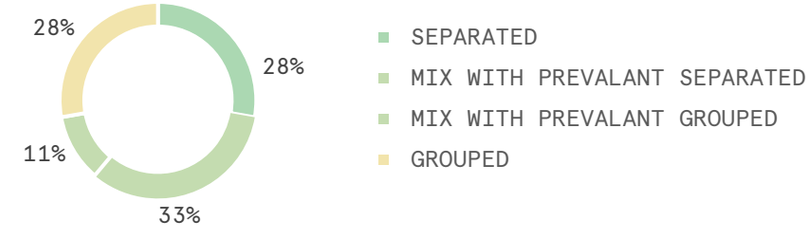
indices values: if small = 1; if medium = 0.5; if large = 0

3. Type of the roof. Value of the indices:

- if sloped = 1
- if sloped prevalent = 0.6
- if flat prevalent = 0.3
- if flat = 0







4. Entrance
- If the entrance is individual from the street for each unit = 1
- if the individual entrances' type is prevalent = 0.6
- If common entrance is prevalent = 0.3
- If for each unit entrance is common = 0

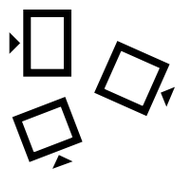
5. Organisation of the units
- If residential unites are separated from each other = 1
- if morphology is mixed with separated unites prevalent = 0.6
- if morphology is mixed with groupedd unites prevalent = 0.3
- If residential unites are grouped = 0

6. Terraces

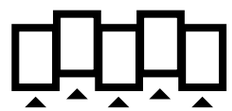
- If terraces are present = 1
- If balconies are present instead of terraces = 0.5
- If property doesn't have terraces = 0

7. Number of floors

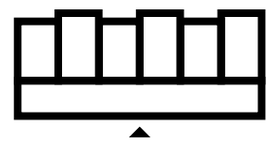
- 1-floor buildings = 1
- Combined 1 and 2 floors buildings = 0.5
- Only 2 floor buildings = 0



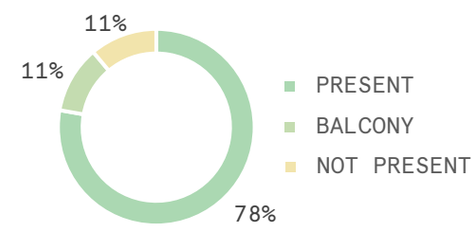
Separated unites with individual entrance

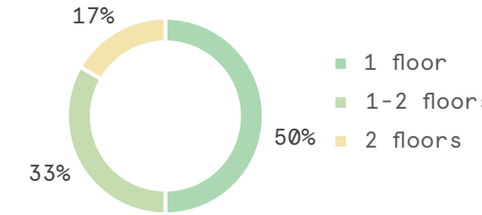


Grouped unites with individual entrances



Grouped unites with common entrance





3.5. Comparative analysis of the resorts. Architectural metrics

8. Orientation: sum of following. Range of values = {0 ... 4}:

- Shaded areas on the east

if no shading on the east, value = 0;
if complete shading on the east is present, value = 1;

- Shaded areas on the west:

if no shading on the east, value = 0;
if complete shading on the east is present, value = 1;

- Vertical shading systems:

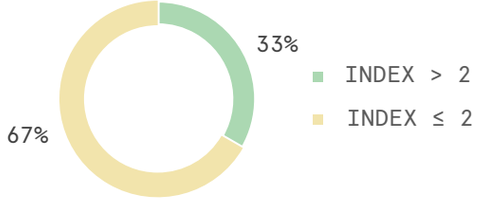
if no shading on the east, value = 0;
if complete shading on the east is present, value = 1;

- Horizontal shading systems:

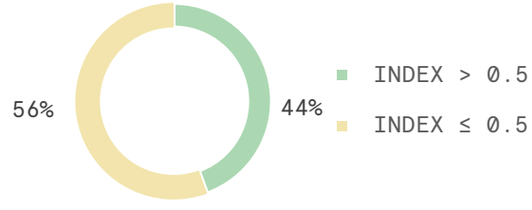
if no shading on the east, value = 0;
if complete shading on the east is present, value = 1;

If sum of values > 2, then index = 1
If sum of values ≤ 2, then index = 0.

ORIENTATION



POSSIBILITY
OF NATURAL VENTILATION



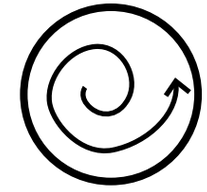
9.1. Direction of main openings: south / east / north / west. It is defined graphically taking into account the resort plan.

9.2. Angle between prevalent wind direction and openings: value in degrees. It is defined graphically by overlapping the resort plan and the wind rose.

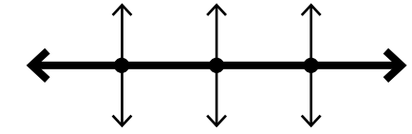
9.3. Possibility of natural ventilation
If probability of wind in the prevalent direction of openings > 0.5, then = 1
If probability of wind in the prevalent direction of openings ≤ 0.5 =0

10. Type of functional zoning

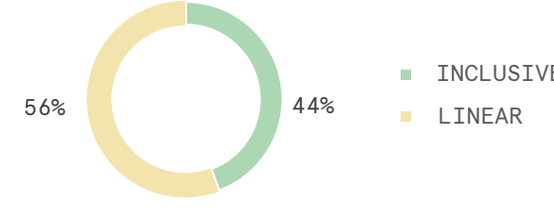
If scheme of functional zoning has an inclusive connection = 1
If scheme of functional zoning has a linear connection = 0



Inclusive



Linear



№	RESORT	Sandies Baobab Beach	The Mora	Sensations Eco-Chic Hotel	TUI BLUE Bahari Zanzibar	Meliá Zanzibar	Tulia Unique Beach Resort	The Island Pongwe Lodge	Karafuu Beach Resort & Spa	The Sands Beach Resort	Baraza Resort & Spa	Breezes Beach Club & Spa	Evergreen Bungalows	Jambiani Villas	Blue Moon Resort	Eden Rock Zanzibar	The Residence	Fruit & Spice Welness resort	Zanzi Resort
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	RANK	13	12	5	10	17	3	2	6	14	18	8	15	1	9	11	7	16	4
	PLAN TYPE	0.3		1	1	1	1	1	0.6	1	1	1	1	1	1	1	1	0.6	1
	SIZE			1			1	1		1	0.5	0.5	0.5	1	1	1	0.5	0.5	1
	TYPE OF ROOF	1		1	1	0.3	1	1	1	1		1	1	1	1	1	1	0.3	1
	ENTRANCE	1		1	0.3	0.3	1	1	1	1	1	1	1	0.6	1	0.6	1	0.3	1
	ORGANIZATION OF UNITS			0.6		0.3	1	1	0.3	0.6	1	0.6		6		0.6	1	0.6	1
	TERRACES	1	1	1	1	0.5	1	1	1	1	1	1	1	0.5		1		1	1
	FLOORS	0.5		1.0			1	1	1	1	1	0.5	0.5	0.5	1	0.5	1	0.5	1
	ORIENTATION		1		1		1	1	1								1		
	POSSIBILITY OF NATURAL VENTIALTION	1		1				1				1		1	1	1			1
	TYPE OF FUNCTIONAL ZONING	1					1		1			1		1	1			1	1
	Σ=	**8.3**	**8.5**	**11.6**	**9.6**	**6.7**	**13.3**	**14**	**10.9**	**7.6**	**6.5**	**10.4**	**7.5**	**15.6**	**10**	**9.2**	**10.7**	**6.9**	**12.2**

3.5. Comparative analysis of the resorts. Architectural metrics

Most hotels are regular shaped (78%) buildings with sloped roof (78%), small (44%) and medium size (28%).
individual entrances are present in 67% cases with separated and mix with prevalent separated (61%) organisation of the residential unites. In majority of the resorts (78%) terraces are present. 50% are 1-floor buildings.

Majority of the hotels have oportunities in both shading systems and passive cooling strategies such as natural ventilation (67% and 56%).
56% of the hotels have linear prolongated alongside the sea functional distribution of the spaces.

List of the most morphologically typical hotels is following:

3. Sensations Eco-Chic Hotel
6. Tulia Unique beach resort
7. The Island Pongwe Lodge
9. The Sands Beach Resort
13. Jambiani Villas
14. Blue Moon Resort
16. The Residence Zanzibar
18. Zanzi Resort.

Three of which that are Tulia, the Island Pongwe Lodge and Zanzi resort will be considered in details in next chapters.

In final ranking we will merge both analysis (qualitative and quantitative). Final rank will be obtained by sum of rank No.2 and rank No.3. Results are shown in the following table. Further there is the ranking of the hotels in the ascending order (from the most favourable to the least):

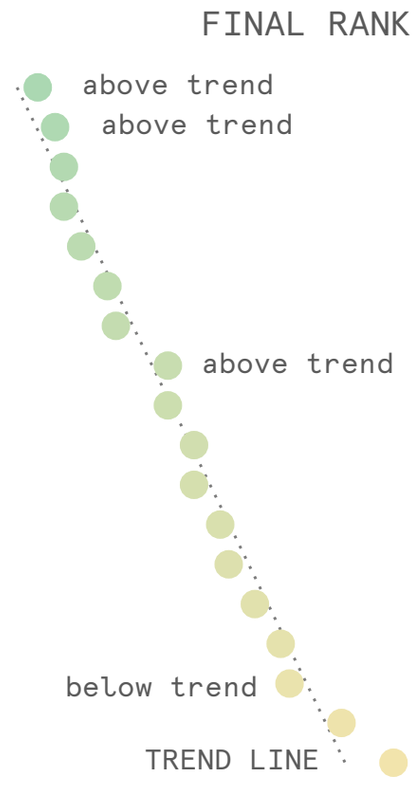
18. Zanzi Resort
6. Tulia Unique beach resort
1. Sandies Baobab Beach Zanzibar
10. Baraza Resort & Spa Zanzibar

№	Name of the hotel	FACTOR 1	RANK №1	FACTOR 2	RANK №2	FACTOR 3	RANK №3	FACTOR 4	RANK №4	FACTOR 5	RANK №5	FACTOR 6	RANK №6	Σ OF RANKS	FINAL RANKING 1	Σ VALUES	FINAL RANKING 2	FINAL RANKING 3	Σ
1	Sandies Baobab Beach Zanzibar	0.20	10	0.27	9	0.13	3	0.68	10	0.96	15	1.00	18	65	11	3.25	16	13	29
2	The Mora Zanzibar	0.43	15	0.35	11	0.17	4	1.00	18	0.99	16	0.80	17	81	18	3.74	17	12	29
3	Sensations Eco-Chic Hotel	0.14	7	0.51	15	0.42	13	0.63	9	0.66	12	0.72	16	72	15	3.08	14	5	19
4	TUI Blue Bahari Hotel	0.32	12	0.27	8	0.12	2	0.78	13	0.86	14	0.69	15	64	10	3.04	13	10	23
5	Melia Zanzibar	0.69	17	0.46	14	0.27	10	0.62	7	0.28	3	0.59	14	65	12	2.90	12	17	29
6	Tulia Unique beach resort	0.07	6	0.56	16	0.35	12	0.80	14	0.41	6	0.57	13	67	14	2.75	10	3	13
7	The Island Pongwe Lodge	0.01	1	0.36	12	0.18	5	0.88	15	0.42	7	0.54	12	52	7	2.40	6	2	8
8	Karafuu beach Resort & Spa	0.40	14	0.24	6	0.28	11	0.97	17	0.75	13	0.54	11	72	16	3.17	15	6	21
9	The Sands Beach Resort	0.26	11	0.19	4	0.57	16	0.45	3	0.61	11	0.53	10	55	8	2.61	8	14	22
10	Baraza Resort & Spa Zanzibar	0.48	16	1.00	18	1.00	18	0.63	8	0.45	9	0.44	9	78	17	4.00	18	18	36
11	Breezes Beach Club & Spa	0.36	13	0.31	10	0.46	14	0.90	16	0.29	4	0.43	8	65	13	2.74	9	8	17
12	Evergreen Bungalows	0.04	4	0.05	1	0.09	1	0.56	5	0.57	10	0.34	7	28	1	1.65	1	15	16
13	Jambiani Villas	0.02	2	0.18	3	0.20	6	0.74	12	1.00	17	0.29	6	46	6	2.44	7	1	8
14	Blue Moon Resort	0.06	5	0.26	7	0.26	9	0.50	4	0.45	8	0.29	5	38	2	1.82	4	9	13
15	Eden Rock	0.03	3	0.10	2	0.24	8	0.57	6	1.00	18	0.23	4	41	4	2.17	5	11	16
16	The Residence Zanzibar	1.00	18	0.43	13	0.62	17	0.41	2	0.16	2	0.20	3	55	9	2.83	11	7	18
17	Fruit & Spice Wellness Resort	0.16	8	0.21	5	0.22	7	0.72	11	0.34	5	0.01	2	38	3	1.66	2	16	18
18	Zanzi Resort	0.18	9	0.64	17	0.46	15	0.34	1	0.16	1	0.00	1	44	5	1.78	3	4	7

3.6. Conclusions and results.

№	Ranking №1. Name of the hotel	VALUE	№	Ranking №2. Name of the hotel	VALUE	№	Ranking №3. Name of the hotel	VALUE
12	Evergreen Bungalows	28	12	Evergreen Bungalows	1.65	13	Jambiani Villas	1
14	Blue Moon Resort	38	17	Fruit & Spice Wellness Resort	1.66	7	The Island Pongwe Lodge	2
17	Fruit & Spice Wellness Resort	38	18	Zanzi Resort	1.78	6	Tulia Unique beach resort	3
15	Eden Rock	41	14	Blue Moon Resort	1.82	18	Zanzi Resort	4
18	Zanzi Resort	44	15	Eden Rock	2.17	3	Sensations Eco-Chic Hotel	5
13	Jambiani Villas	46	7	The Island Pongwe Lodge	2.40	8	Karafuu beach Resort & Spa	6
7	The Island Pongwe Lodge	52	13	Jambiani Villas	2.44	16	The Residence Zanzibar	7
9	The Sands Beach Resort	55	9	The Sands Beach Resort	2.61	11	Breezes Beach Club & Spa	8
16	The Residence Zanzibar	55	11	Breezes Beach Club & Spa	2.74	14	Blue Moon Resort	9
4	TUI Blue Bahari Hotel	64	6	Tulia Unique beach resort	2.75	4	TUI Blue Bahari Hotel	10
1	Sandies Baobab Beach Zanzibar	65	16	The Residence Zanzibar	2.83	15	Eden Rock	11
5	Melia Zanzibar	65	5	Melia Zanzibar	2.90	2	The Mora Zanzibar	12
11	Breezes Beach Club & Spa	65	4	TUI Blue Bahari Hotel	3.04	1	Sandies Baobab Beach Zanzibar	13
6	Tulia Unique beach resort	67	3	Sensations Eco-Chic Hotel	3.08	9	The Sands Beach Resort	14
3	Sensations Eco-Chic Hotel	72	8	Karafuu beach Resort & Spa	3.17	12	Evergreen Bungalows	15
8	Karafuu beach Resort & Spa	72	1	Sandies Baobab Beach Zanzibar	3.25	17	Fruit & Spice Wellness Resort	16
10	Baraza Resort & Spa Zanzibar	78	2	The Mora Zanzibar	3.74	5	Melia Zanzibar	17
2	The Mora Zanzibar	81	10	Baraza Resort & Spa Zanzibar	4.00	10	Baraza Resort & Spa Zanzibar	18

№	Ranking №3. Name of the hotel	Σ
18	**Zanzi Resort**	7
7	**The Island Pongwe Lodge**	8
13	Jambiani Villas	8
6	**Tulia Unique beach resort**	13
14	Blue Moon Resort	13
12	Evergreen Bungalows	16
15	Eden Rock	16
11	Breezes Beach Club & Spa	17
16	The Residence Zanzibar	18
17	Fruit & Spice Wellness Resort	18
3	Sensations Eco-Chic Hotel	19
8	Karafuu beach Resort & Spa	21
9	The Sands Beach Resort	22
4	TUI Blue Bahari Hotel	23
1	**Sandies Baobab Beach Zanzibar**	29
2	The Mora Zanzibar	29
5	Melia Zanzibar	29
10	**Baraza Resort & Spa Zanzibar**	36



In the list we can see some repetitive values. Indeed, we can see how hotels with similar rank value overlap with each other - by type, morphology, and some quantitative characteristics.

First group of hotels - Zanzi, Island Pongwe and Jambiani - small sized, with green territory and separate secluded villas, located far from each other (as far as the site allows). All these hotels are single-story and accompany their service with care for nature, in addition to this, allowing tourists to feel close to nature and get in touch with the originality of the island.

Evergreen bungalows and Eden Rock are two very similar hotels - both average quality of service, with minimal amenities, united in their simplicity and locality. Both buildings are constructed from local materials and do not harm the surrounding nature, but at the same time do not stimulate it developement.

In the next chapters we would like to investigate main features of the most favourable hotel, that are Zanzi resort. Moreover it is interesting to discover the possibilities for enhancement for the last resort in the list that is Baraza Resort & Spa. Hotels Sandies Baobab Beach, Melia and The Mora Zanzibar also make a group of pretty similar resorts - by morphology and indicators. For the further research we will pick a representative of this class of hotels - Sandies Baobab beach - with a large number of rooms, extended in territory and quite crowded, with residential units of varied morphology.

8. Zanzi Resort
6. Tulia Unique beach resort
1. Sandies Baobab Beach Zanzibar
10. Baraza Resort & Spa Zanzibar

3.6. Conclusions and results

SWOT summary

In this section we summarize the SWOT analysis obtained for 18 examples of hotels. The indicators here are obtained from the most common ones in the resorts analysis. Each of the strengths encountered for each hotel is labeled with a specific letter (A, B, C, ...). The same is done with weaknesses, opportunities and threats. The aim is to conclude this chapter with the identification of which are the main strengths and what are the needed additions for the resorts in the current situation. This question then brings us closer to the main question of the thesis regarding how to harmonize the resorts with their context in a more practical manner.

Strengths
A. Local technique of thatched Makuti roofs;
B. Water recycling and storaging;
C. Use of locally sourced food and drink products;
D. Waste ecycling and compost organic waste;
E. Use of recycled and locally sourced materials in the construction;
F. Passive energy sources;
G. Low density resort;
H. Low intervention on the original environment with the preservation of existing trees;
I. Training programs for staff among the local population;
J. Acquired sustainability certification based on circular business model;
K. Providing craft teaching with the locals for tourists;
L. Several small units instead of large buildings masses;
M. Protection of the nearby barrier reef with the help of experts;
N. Farms around the property for providing zero-kilometer meals
O. Special structures for connecting land with water (dams or jetties);
P. Contextual experience provided for visitors.

Weaknesses
A. High density resort;
B. No indication of waste management;
C. Lack of passive energy sources, active environment control systems;
D. No strategies for providing contextual experiences for the visitors;
E. Use of large-scale building masses;
F. Huge intervention on the original environment;
G. No indication of engagement with the social context;
H. Limited facilities;
I. Isolated from other settlements and sightseeing locations.

Opportunities
A. Integration with the local society of the town and providing economical support to the local population;
B. Integration of passive energy sources;
C. Integration of farms around the property for providing zero-kilometer meals;
D. Use of sustainable waste management systems;
E. Close vicinity to the natural reserve;
F. Eco friendly strategies of providing unique experiences for the visitors in the nearby forests.

Threats
A. Beach erosion and rising sea levels;
B. Increasing number of hotels currently under construction in the same area and increase of competition;
C. Degradation of the soil of the organic farm;
D. Remote location;
E. Wildfire danger due to climate change and the vicinity of large forest area.

For each of the indicators, the corresponding letter is recorded in the following table. Numbers indicate the corresponding number of the case study of resort. The number of times this or that indicator was encountered in each row is indicated in the last column. This is the sum of the number of non-empty cells. From this indicator, we determine which factors are crutial for most hotels. It is on the basis of this data that we will build our subsequent chain of reasoning and try to utilize or rethink the problems that have been identified for the majority, namely more than half of the hotels.

3.6. Conclusions and results

resort	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Σ	
STRENGTHS	A	A		A	A	A	A	A	A			A	A	A	A	A		A	A	14	**A**
	B	B	B	B					B		B	B		B						7	B
	C		C	C							C	C		C						5	
	D		D	D			D				D	D								5	
	E		E	E	E						E		E	E	E	E	E	E		10	**E**
	F		F	F	F	F	F	F			F	F		F						9	**F**
	G			G			G	G		G	G	G	G	G	G	G			G	11	**G**
	H			H		H		H					H				H	H	H	7	H
	I			I			I	I			I	I		I						6	I
	J				J															1	
	K				K				K									K		3	
	L				L	L			L			L					L	L		4	
	M										M	M						M		3	
	N					N	N		N		N	N		N						6	N
	O	O			O	O	O		O	O	O	O				O	O	O	O	12	**O**
	P			P				P					P			P		P	P	6	P
WEAKNESSES	A	A	A																	2	
	B	B			B	B			B	B			B		B	B	B	B	B	11	**B**
	C	C	C	C	C	C	C		C	C	C	C	C	C	C	C	C	C	C	17	**C**
	D	D	D																	2	
	E		E																	1	
	F		F							F										2	
	G					G							G			G	G	G	G	6	G
	H							H						H	H	H				4	H
	I														I	I				2	
OPPORTUNITIES	A	A			A	A				A			A	A			A		A	8	**A**
	B	B							B	B			B			B	B	B	B	8	**B**
	C		C	C	C					C					C		C	C	C	8	**C**
	D		D																	1	
	E						E	E		E	E	E		E	E	E		E	E	10	**E**
	F														F	F	F	F		4	
THREATS	A	A	A	A	A			A	A	A	A	A	A	A	A		A		A	14	**A**
	B		B							B			B							3	
	C								C											1	
	D														D	D				2	
	E																E	E		2	

The given analysis has revealed that the most relevant, i.e. frequently encountered among the case studies of resorts are the following features:

STRENGTHS

A. Local technique of thatched Makuti roofs;
B. Water recycling and storaging;
E. Use of recycled and locally sourced materials in the construction;
G. Low density resort;
O. Special structures for connecting land with water (dams or jetties).

WEAKNESSES

B. No indication of waste management;
C. Lack of passive energy sources, active environment control systems;
G. No indication of engagement with the social context.

OPPORTUNITIES

A. Integration with the local society of the town and providing economical support to the local population;
B. Integration of passive energy sources;
C. Integration of farms around the property for providing zero-kilometer meals;
E. Close vicinity to the natural reserve.

THREATS

A. Beach erosion and rising sea levels.

A good strategy for strengthening weaknesses and retaining strengths, providing opportunities for development and addressing threats, can be to combine strategies for different factors.

For example, we see that coastal erosion and sea level rise are threatening much of the coastal resorts. Along with this we see the need for resorts to utilize platforms or some other connecting structure between the land and the sea. Both of these factors can be used together to further strategize the ocean-land relationship in a more sustainable format to maintain and develop the ocean-land relationship even while adding to the existing natural reserves of the marine and terrestrial parts of the island. We also see that often hotels try to use local techniques and work together with local people, learning new things from them, taking cooking or craft classes.

Also in a large number of cases, a great opportunity for sustainable hotel development is to integrate with the local population by providing them with economic benefits. This can be done by providing some infrastructure within the hotel itself, as well as reducing the number of barriers between outdoor spaces and the hotel's interior, both tangible and intangible. We can also see that working with agroculture can have significant benefits for both the land and the sustainability of the local community. So both for the quality of service at the hotel itself, as the quality of food grown on local land will be much higher, and the experience of tourists staying at the resort will be much more contextualized.

The factors outlined above are explored in more detail in the next chapter, where we discuss the means by which we can transform existing tropical resorts into sustainable touristic towns and villages. We also ask questions and explore different architectural and sociological methods of influencing the current less-than-sustainable environment and the relationship between the resort and the land of local people on the island of Zandibar.

Chapter IV.

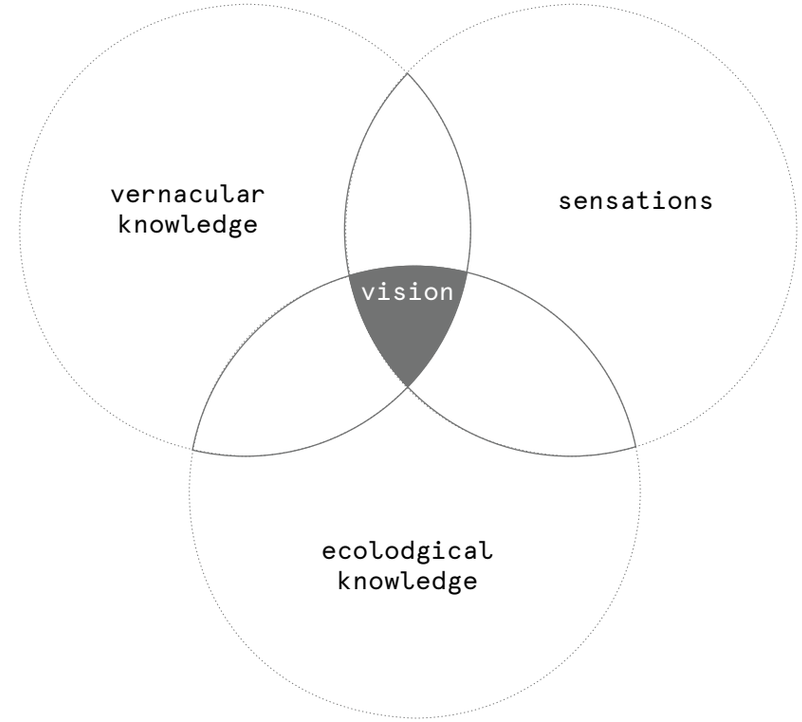
Tools to build an interplay of the industries

After an investigation of the research question through an analysis of the context which revealed the issues needed to be addressed to achieve the goals of the thesis, in line with the Lo-TEK movement methodology and according to the principles discussed in chapter I, in this chapter we aim to outline three main categories of tools which will be used to create the visions addressing the research goal.

The first group of tools consist of vernacular and local knowledge and practices regarding the use and management of space and structures. These illustrate how structures could be built using local materials and craftsmanship.

The second group, mostly related to the experiential tourism aspects, highlight the various sensual engagement tools in the islands and the architectural means to achieve them.

The third group outline all the various trees used extensively in the island and in the resorts including all their characteristics and uses. Along with the extensive data and conclusions from the previous chapters these tools will be the practical tools used to design the vision in the chapter V.



4.1. Integration of vernacular knowledge to rethink tourism

In this part the vernacular knowledge of Zanzibar is analyzed in order to identify a set of architectural and construction tools to address the highlighted problems for the realization of the design. The aim is not to imitate but, rather, to have an arsenal of contextual solutions for construction and the use of local resources with two benefits. First, to create spaces which would communicate the sense of the context to the tourists and facilitate the engagement of the senses with the use of local materials and traditions. Second, to engage the local community and artisans in the construction and maintenance process which would increase the distribution of profits and create a link between various industries and communities with the tourism industry. This study and extraction, as has been seen earlier, is also a crucial part of the methodology of Lo-TEK design.

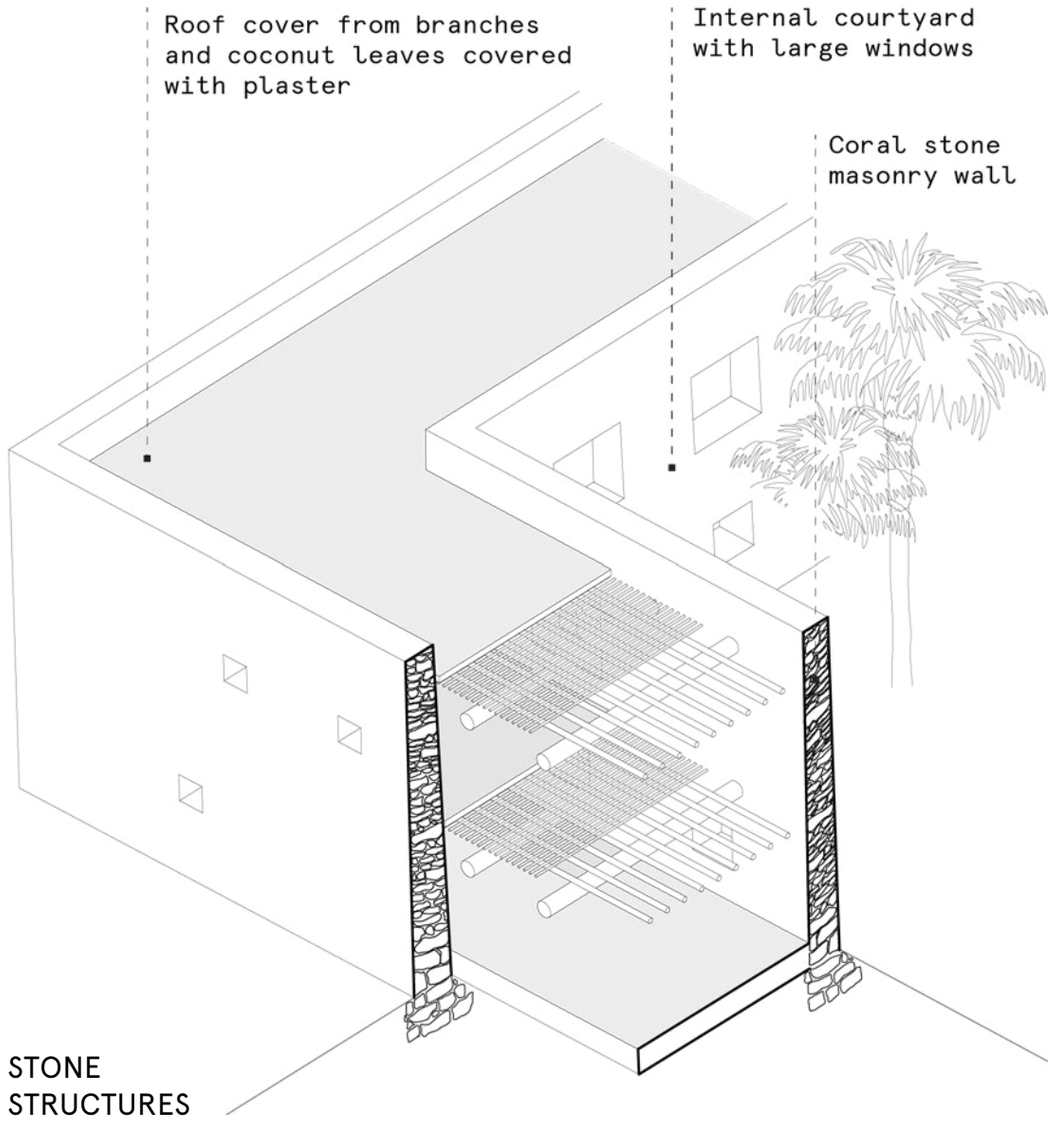
Stone structures

The traditional construction methods in Zanzibar can be distinguished into two different typologies. First there is the stone-built structures. These compromised mostly the houses of the wealthy and high-ranking citizens and public buildings. The walls of these structures were made using fossilized coral rag stone quarried from underwater 'Porites' corals and the burning of coral stone to make lime for mortar and plaster (Gensheimer, 2018). The flat roofs of this type of structure were made using mangrove or other locally available hardwood as the beams which were then covered with patches of seaweed thatches and plastered on top. The floors were made using rammed earth and all the surfaces were covered with a fine layer of lime plaster creating smooth final surfaces (Gensheimer, 2018).
Mostly the structures stood as isolated units although there are cases in which several units were attached together to form housing complexes. (Gensheimer, 2018)

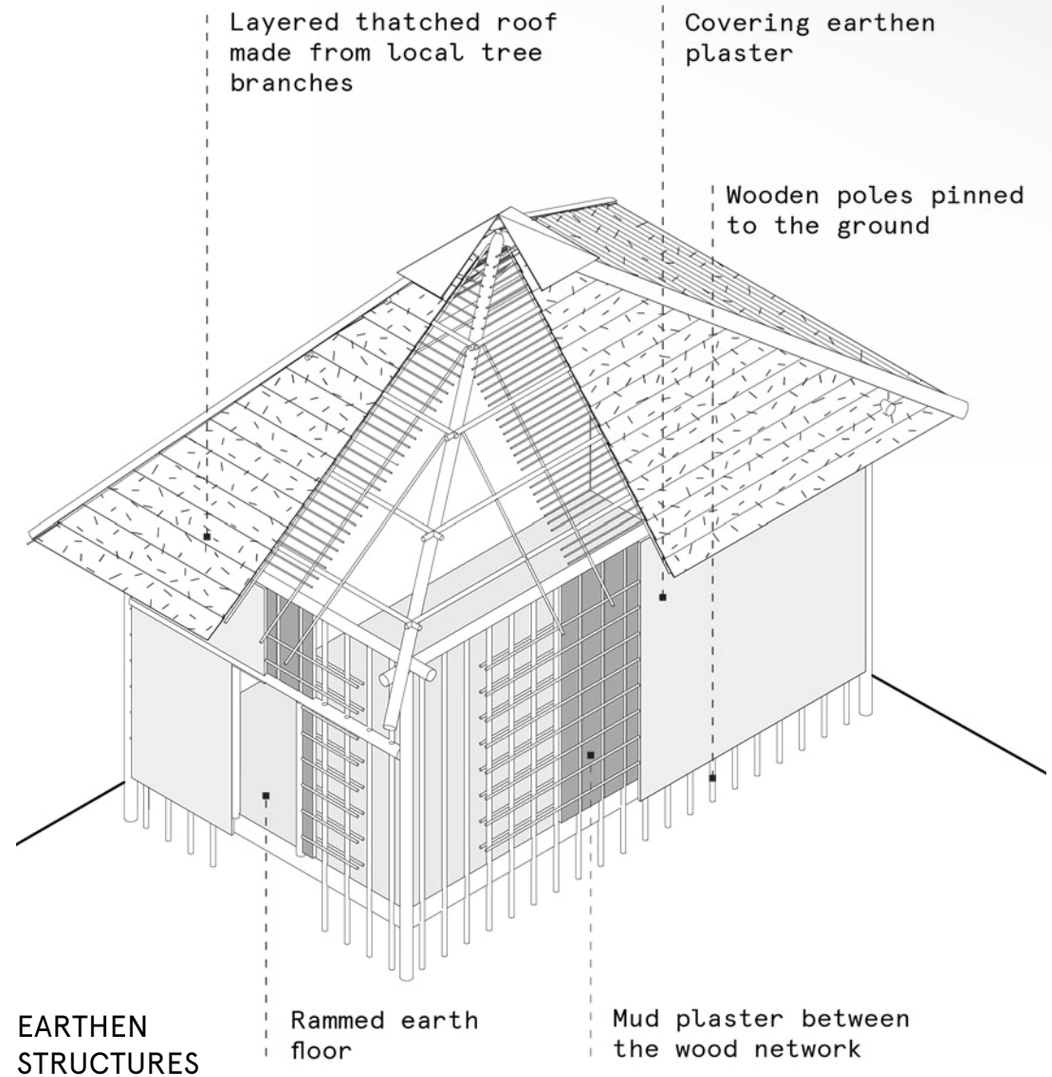
The houses had limited windows to the outside and were ventilated and lighted mainly from courtyards called 'kiwanda'. These courtyards were predominantly oriented to the north.

"The northern position of the courtyard would let sunlight penetrate the main rooms to the south of the court, allowing for maximum warming of the house during the coolest months of the year, during and following the monsoons of April through June. Similarly, this orientation minimized the sun's penetration into the house during the warmest months, January through March, as well as providing maximum protection against the strong southwest monsoon winds. When a northerly orientation was not possible, an easterly orientation was preferred, with both the northern and eastern orientations taking advantage of the prevailing winds to cool the interior of the house. Least common were southern and westerly orientations, which were more open to the monsoon winds and allowed the afternoon heat to penetrate into the house during the hottest part of the day" (Garlake, 1966). The interior of these houses would be decorated with niches which would sometimes cover whole walls.

Picture 4.1. Mtoni Palace Ruins, Malawi Road, Zanzibar. (Image source: go visit zanzibar website. Accessed November 24, 2024)



STONE STRUCTURES



EARTHEN STRUCTURES

4.1. Integration of vernacular knowledge to rethink tourism

Earthern structurs

These structures which were used mostly for domestic purposes were rectangular in plan and were constructed of wooden poles, usually mangrove, set closely together into the ground. These vertical elements were then crossed by horizontal more thin branches to create a wooden network which were filled with pressed clay earth sometimes mixed with coral chips in a wattle-and-daub technique. (Gensheimer, 2018). A protective coating of mud was applied to the interior and exterior surfaces and the floors were made using rammed earth. The roofs which were peaked were constructed with a mangrove-pole frame and were covered with a thatching of woven coconut leaves. (Gensheimer, 2018)

Picture 4.2. Native huts, showing boriti and fito (pole and lath) walls filled with mud or lime mortar and topped by makuti (thatch) roofs, Ng'ambo area, Zanzibar. (Photo by Henry Pilling, 1944)

Picture 4.3. Fito frame with udongo (mud) walls, Mwera, Zanzibar. (Photo by Garth Myers, 2006)

Unlike the stone structures these were made in separate units without internal courtyards. The lighting and ventilation were done using windows directly towards the outside without any balcony.

Dhow boats

The Dhow boats have been a backbone of the matritime industry and trade of Zanzibar playing a crucial role in the trade networks which transformed Zanzibar into a central trading hub. These boats which were first introduced to Zanzibar during the influence of Arab culture soon became adapted to the local context in terms of the used materials and building techniques.

They were made using mangrove and coconut tree due to their durability in salt water. Today these boats are still made, specifically in the Nangwi village in the north of Zanzibar and Stone town (Falck, 2014). These boats which are entirely made by eye using traditional local artisanship today act as fishing boats, also, for the transport of local goods (Falck, 2014). Nowadays a variety of different trees including mahogany, teak, mango, coconut, and to a lesser extent, magrove are used in the construction each used in different parts according to the woods charactersitic. The wood is shaped through fire-bending to create the curved form of the boats while wooden joints and hand made spikes are used instead of metal fasteners to secure the connections of the structure (Falck, 2014).

Picture 4.4.
Dhow boat waits for a load in Stone Town harbour, Zanzibar. (Photo by W. E. Falck, n.d.)

Picture 4.5.Dhow sails into Dar-es-Salaam harbour. (Photo by W. E. Falck, n.d.)

The shape of the boats is made according to the needs of the sailors. The shallow draft allows the boats to navigate close to shore which elimitaes the need for elaborate decking infrastructures while the narrow hull shape helps the boat move more effectively through the water (Falck, 2014).
The construction method utilises modular small planks which makes it idealy adapted to the context of Zanzibar where large trees are not abundant. These boats provide significant economic benefits to the local population by supporting the local artisans and timber industry while providing cheap means of fishing for fisherman.

4.1. Integration of vernacular knowledge to rethink tourism

Baobab trees

The baobab tree, named the "tree of life" is deeply connected with the culture of Africa. Being a resilient tree which adapts itself to various environments able to withstand droughts and harsh conditions aging for hundreds of years, it has a central position in the beliefs of various cultures throughout Africa (Barton 2023). However, the importance of the Baobab trees goes beyond merely symbolic significance. The tree has been used for various purposes throughout history and is also utilised nowadays for its fruits, leaves, and bark whihc is used for making ropes, baskets, and mats (Barton 2023).

Picture 4.6.
House of Hanzabe from Baobab Tree. (Photo by Idd Ninga, 2013)

Picture 4.7.
Sho't Left- Sunland Baobab. (Photo by Neil McCartney, 2011)

In west Africa various communities also use the natural cavities of the inside of the Baobab trees as spaces for various means such as storage, temporary shelter, houses, tiny markets and stores, and in case of large Baobab trees, spaces for communal meetings. These natural cavities which are formed by fungal decay, fire, or animal damage do not distrupt the growth and life of the Baobab tree due to its special structure (Barton 2023).
Several examples of the significant use of the inside cavities of Baopbab trees include the ancient baobab tree in Zimbabwe four communal gatherings, the Sunland baobab used as pub and wine cellar and the Mbili resort Baobab treehouse and residence.

The vernacular traditions introduced in this chapter reveal local knowledge for adaptable uses of the resources of the environment. These practices which are based on the use of local materials and techniques are considered as the means with which to conduct the design phase. The integration of these indigenous methods of managing the environment into the design has two main advantages. First, they are based on the use of local materials and resources, which considering Zanzibar's remote location in the middle of the sea and limited access to modern building materials, provide a cheaper and more efficient source of construction and dwelling. Second, since they engage the local community and localize the tourism industry through connecting it with the other various local industries.

The mentioned practices are aimed at creating durable and well adapted structures which also provide a link to the cultural and historical context of the island. These methods can be adapted to new forms and spaces which are required in touristic resorts while also maintaining the benefits mentioned earlier.

The boat making tradition resembles a manner of constructing structures on water. As mentioned before, the form of these boats are adherent to the necessities of moving on water. However, the same construction methods can be used for the shaping of different forms and structures which could provide the possibility of creating architectural spaces on water. The village of Nangwi attracts tourists who go to observe the construction process of the dhow boats and also experience riding them. This potential can be utilised in various manners to provide tourists with the possibility of different activities on floating structures.

The baobab trees represent a unique way of using the natural characteristics of these trees for architectural means. Considering the abundant presence of Baobab trees in Zanzibar, specifically, in the Sandies Baobab resort, this tradition provides a unique way of using these trees to provide close to nature experiences for tourists by utilizing the already present potential of these trees.

Through this analysis the thesis aims to provide an example of a methodology of utilizing the Lo-TEK approach (Chapter 1) to design and illustrate the potentials it has for the touristic sector in natural contexts.

Finally, as it has been identified in the previous chapters, a large part of the current resorts implements the use of local materials and buildings methods including the resorts with a high sustainability index. Even the resorts with the least amount of price are also integrating the use of local construction methods and materials which hints to the availability, economic feasibility, and environment friendliness of the use of local and vernacular knowledge and materials

4.2. Sensual engagement as a feature of experiential tourism

The aim of the incorporation of human senses in the design phase is in line with two goals in the thesis.First, to provide high quality touristic experiences through a focus on experiential tourism which engages all the senses of the tourist. Second, to attach the tourism industry to the natural fabric of the island in a multidimensional manner so as to strenghten the bond between the conservation of the ecology and the efficinet functioning of the tourism industry. This would guarantee the safekeeping of the various resources offering sensual experiences since they would become the backbone of tourism.

Various architectural tools can be used to engage the sense.

Hearing
The consideration of sound can have a major effect in communicating the aesthetic qualities of the island to the visitor. Designing with the use of courtyards, water elements and with the deliberate positioning of spaces near sources of the sound of waves and the wind can become an integral part of all the activities which would happen in the resorts. Furthermore, desiging considering sound can enhance specific activities which are more affected by the atmosphere such as yoga and meditation. Also, the design of gardens or beekeeping locations can draw in a wide variety of biodiversity engancing the auditory quality of the resorts.

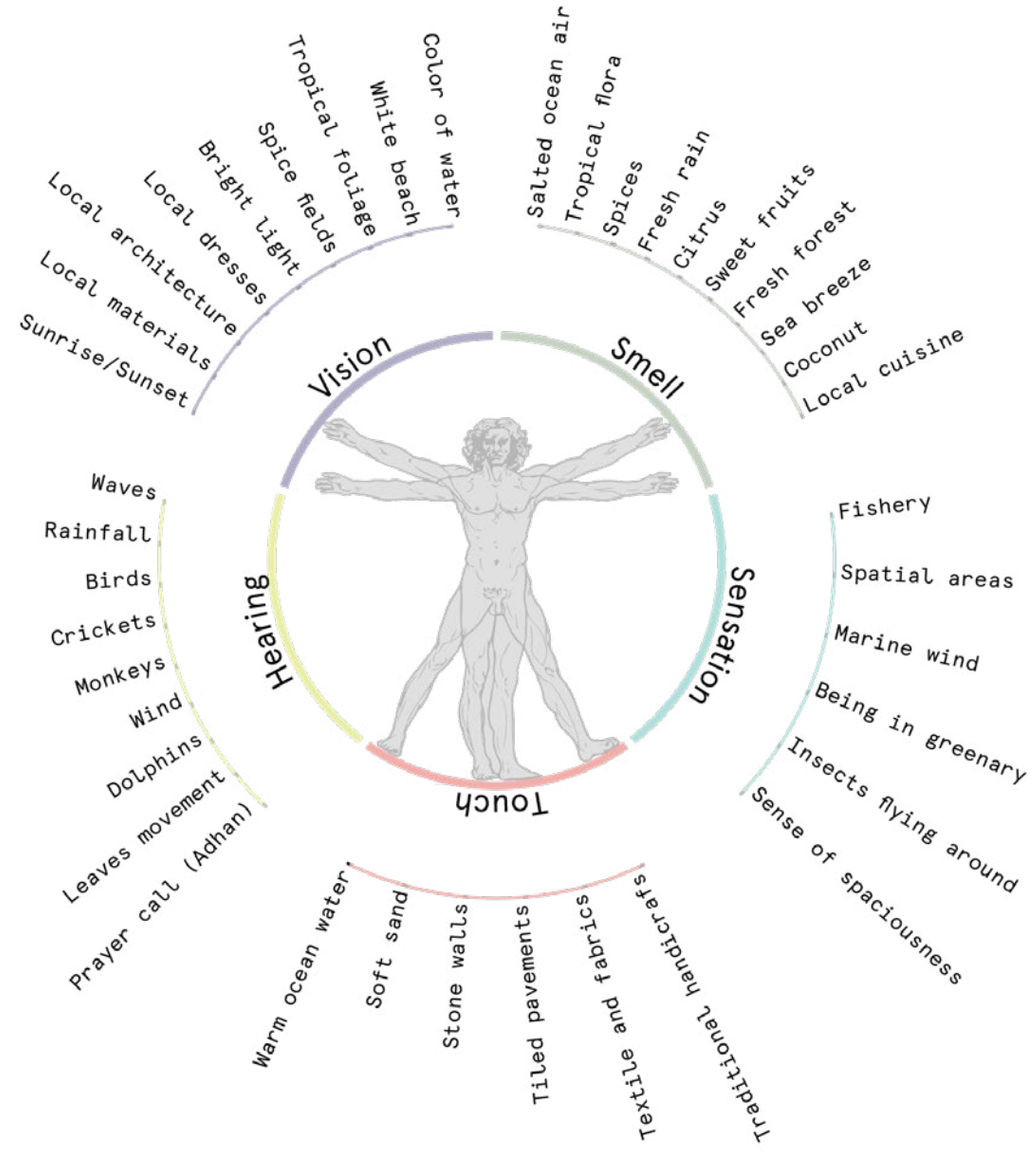
Vision
Two main tools can be used to enhance the sight of the visitors. First the use of colors which would introduce the spirit of the island to the visitors which could happen by the correct chose of colors and also the involvement of the locals in the resorts activities with their colorful dresses. Also, the design of the landscape can integrate plants and flowers with a harmonic color pallette. Second, the use of framing tools such as the specific positioning of buildings or the use of custom made frames which would highlight certain high quality views of the island including the sea and the sunrise or sunset.

Touch / sensation
The use of local natural materials in the construction can bring the feelings of the materials of the island to the touch of the visitors.
Furthermore, the proportions of the spaces and their openness can be design so as to give specific sense of space. The use of sandy ground where visitors can walk barefoot enhances the connection of the visitor with the island on a deep level. The use of water where the tourists could come into contact with their hands, feet, and whole body with it also has a high potential for engaging the senses. These senses can be used to enhance the feeling of conducting various activities by carefully choosing the materials of the most smallest objects in a throughtful manner.

Smell
The careful design and positioning of gardens and scented plants can further enhance the sensual experiences of tourists. The integration of the local population with the resorts and the careful design of their activity areas can bring the smells of local dishes, various spices, and activities such as baking cream extracted from coconut trees, and all the smells of the context closer to the tourists. Thus, the use of natural elements next to areas of activities which produce local scents can introduce the island in higher level of experience to the tourist.

Taste
Architectural spaces can provide the opportunity for various experiences of taste for the visitors. First, the design of spaces for the making and serving of local dishes can give the possiblity of tasting the local cuisine. Furthermore, gardens can be designed specifically for the visitors to stroll

through and test rhe different fruits or vegetabkles that grow locally on the island. These could be incorporated with the other tools for engaging the sense to offer a multidimensional experience for the tourist.



4.3. Role of the flora in the resort

The key element of the architecture and environmental design of a tropical resort is greenery. In this section, we consider trees, bushes and other types of greenery as a separate element of an architectural environment.

This section examines the main features of each species: the necessary conditions for existence and the resources that a tree or shrub can provide to humanity and the animal world. The spatial dimensions of each species are also given.

Tree species were identified using photos and videos available on OpenStreetMaps, hotel websites, photos and Google maps. Each species was identified using the service (PlantNet, 2024).

Trees are shown on the 4 section for representative resorts in Chapter III:

- p.p. 128-129 - Sandies Baobab Resort;
- p.p. 130-131 - Tulia Unique Beach hotel;
- p.p. 132-133 - Baraza Resort;
- p.p. 134-135 - Zanzi resort.

Below is a list of tree and shrub species. ranked in order of frequency with which each species is found in the four areas of the hotels under consideration, in descending order from the most common to the least common.

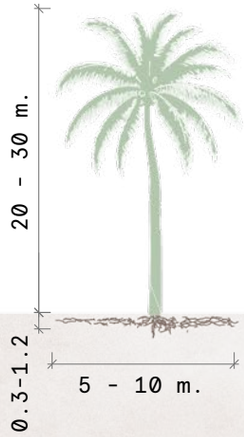
1. Coconut palm (tree)
2. Tropical almond (tree)
3. Beach sheoak (tree)
4. Button mangrove (tree)
5. Traveller’s palm (bush)
6. Baobab (tree)
7. Ipil - Ipil / Lead tree (tree)
8. Hawaiian hibiscus (bush)
9. Papaya (tree)
10. Bougainvillea (bush)
11. Golden shower (tree)
12. Areca palm (bush)
13. Queensland umbrella (tree)
14. Japanese pagoda (tree)
15. Weeping fig (tree)
16. Darwin black wattle (tree)
17. Flamboyant (tree)
18. Siris tree / Woman’s tongue (tree)
19. Fiji fan palm (bush)
20. Umbrella Sedge (bush)
21. Chinese ixora (bush)
22. Red Abyssinian Banana (bush)
23. Luckynut / Yellow oleander (tree)
24. Yellow bells (tree)
25. Cactus spurge (bush)
26. Golden Pothos (bush)
27. Palm-Grass (bush)

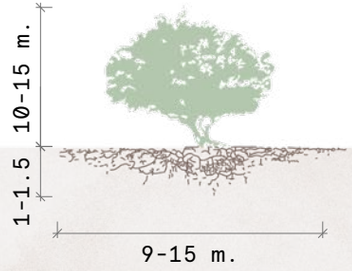
ENVIRONMENTAL NEEDS

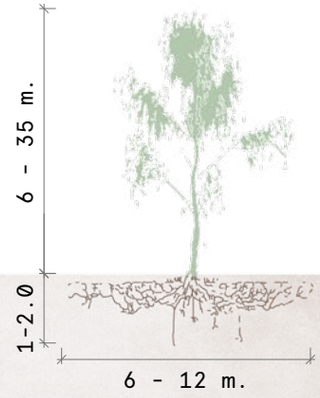
ample sunlight

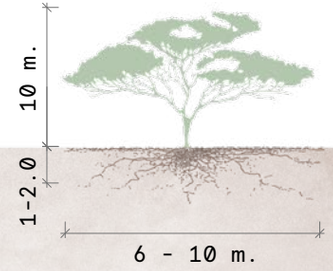
high humidity

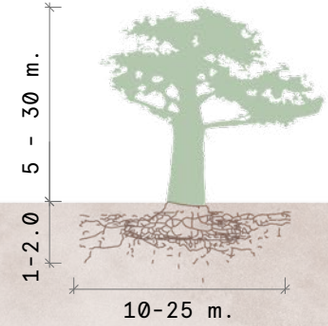
t = 21 - 35°C

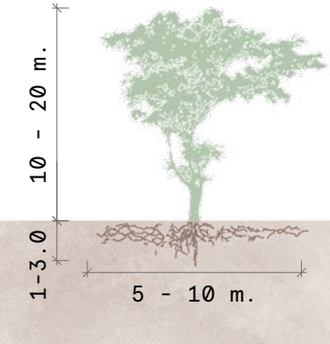












COCONUT PALM
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 21 - 35°C
t_{min} = 15°C

Yields

Coconut fruit; leaves for making baskets and roofs; trunk for bridges and buildings; fibre from trunk for ropes; coconut water; coconut oil; coconut milk; coconut shell for bowls.

TROPICAL ALMOND
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 41°C
t_{min} = 15°C

Yields

Edible seeds
Leaves used for medicinal uses
Wood used for furniture, boat and buildings

BEACH SHEOAK
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C
t_{min} = 15°C

Yields

Wood used for charcoal
Medicinal use from bark and needles

BUTTON MANGROVE
Evergreen

Environmental needs

Ample sunlight
High humidity (> 56%)
Salty air
t = 20 - 38°C

Yields

Hard seed fruit
Hardwood useful for construction
Bark and leaves medicinal use

Mildly toxic, can cause skin irritation due to sap

BAOBAB
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 21 - 35°C
t_{min} = 15°C

Yields

Baobab fruit
Edible leaves
Baobab oil
Bark used for making ropes, baskets, and fishing nets

IPIL-IPIL
Evergreen

Environmental needs

Partial sunlight
Moderate humidity
t = 20 - 38°C
t_{min} = 15°C

Yields

Wood used for fuel and charcoal, for making posts and small scale construction; Prevents soild erosion

Seeds and leaves contain mimosine, which can be toxic

4.3. Role of the flora in the resort. Trees

PAPAYA
Evergreen

Environmental needs

Partial sunlight
High humidity (> 60%)
t = 20 - 38°C

Yields

Papaya fruit
Seeds used as spice
Medicinal use of leaves”

GOLDEN SHOWER tree
Deciduous

Ample sunlight
High humidity (> 60%)
t = 20 - 41°C

Ornamental value, medicinal use, durable wood for small carpentry and furniture
Habitat for birds, bees, and insects

Seeds are toxic if ingested

QUEENSLAND UMBRELLA tree
Evergreen

Partial sunlight
High humidity (> 60%)
t = 20 - 38°C

Dense foliage provides shade
Flowers and fruits
Gathers wildlife
Medicinal uses

Toxic, contains calcium oxalate crystals that can cause irritation and oral discomfort

PAGODA tree
Deciduous

Ample sunlight
Moderate humidity
t = 5 - 35°C

Broad canopy provides shade
Medicinal use
Durable wood used for carpentry
Bee attractor

Toxic if ingested, especially to livestock

WEEPING FIG
Evergreen

Partial sunlight
High humidity (> 60%)
t = 20 - 38°C

Shade tree
Dense foliage makes it suitable as a screen plant

Mildly toxic
causes skin irritation

DARWIN BLACK WATTLE
Evergreen

Ample sunlight
moderate humidit
t = 20 - 38°C

Wood used as firewood and charcoal, moderately durable wood used for furniture and fencing
Used in agroforestry systems for soil improvement
Bark contains tannin
Pollinator support

ENVIRONMENTAL NEEDS

ample sunlight ↘↘

high humidity

t = 21 - 35°C

FLAMBOYANT
Deciduous

Environmental needs

Ample sunlight
Moderate humidity
t = 20 - 38°C

Yields

Ornamental use
Wide canopy provides shade
Soft wood used for charcoal
Pollinator support

Seeds are toxic if ingested

SIRIS tree
Deciduous

Environmental needs

Ample sunlight
Moderate humidity
t = 15 - 38°C

Yields

Ornamental use
Shade tree due to large spread canopy, used for agroforestry
Moderately durable wood used for furniture making and as charcoal
Leaves and pods can be used for animal forage

YELLOW OLEANDER
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Yields

Ornamental
Insect repellent

HIGHLY TOXIC
All parts are poisonous if ingested

YELLOW BELLS tree
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Yields

Ornamental plant
Flower attract bees and butterflies, medicinal uses
Wood used for small scale carpentry

Mildly toxic if ingested

4.3. Role of the flora in the resort. Bushes





TRAVELLER'S PALM
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 41°C

Leaves used for rainwater collection
Leaves used for thatching roof and weaving mats and baskets

BOUGAINVILLEA
Evergreen

Ample sunlight
High humidity (> 56%)
t = 20 - 38°C

Ornamental use
Used as climbing or ground cover
Pollinator attractor

TOXIC
Mildly

HAWAIIAN HIBISCUS
Evergreen

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Ornamental use
Pollinator attractor

ARECA PALM
Evergreen

Environmental needs

Ample sunlight
High humidity (> 60%)
t = 20 - 41°C

Used for feeding animals
Fronds used for weaving mates and baskets

FIJI FAN PALM
Evergreen

Ample sunlight
High humidity (> 60%)
t = 21 - 35°C

Ornamental use
Shading plant
Leaves can be used for thatching, weaving, and other crafts

UMBRELLA SLEDGE
Evergreen

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Leaves used for weaving mats and baskets

ENVIRONMENTAL NEEDS

ample sunlight

high humidity

t = 21 - 35°C

CHINESE IXORA
Evergreen

Environmental needs

Partial shade
Moderate humidity
t = 20 - 38°C

Ornamental use
Used for natural screening due to dense growth
Medicinal use in some traditions

RED BANANA
Evergreen

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Leaves used in food
Improving soil fertility

CACTUS
Evergreen

Ample sunlight
Low humidity
t = 23 - 42°C

Ornamental use
Pollinator support
In some traditions medicinal use

TOXIC
May cause skin irritation and is harmful if ingested

GOLDEN POTHOS
Evergreen

Full shade
High humidity (> 60%)
t = 20 - 41°C

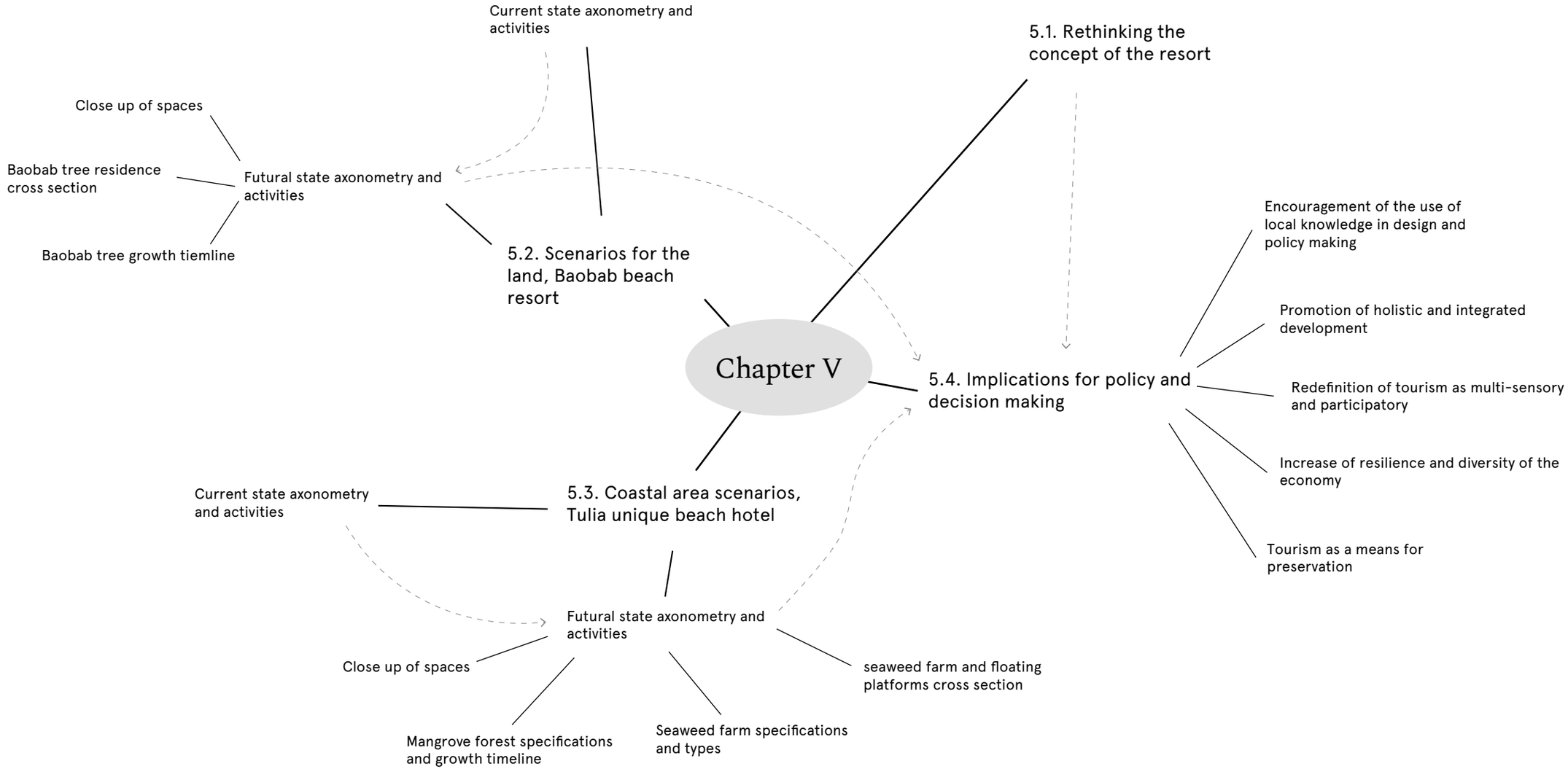
Ornamental use

TOXIC
Contains calcium oxalate crystals that can cause oral irritation if ingested

PALM GRASS
Evergreen

Ample sunlight
High humidity (> 60%)
t = 20 - 38°C

Ornamental use
Habitat for small insects
Used as fodder for livestock


Chapter V
5.1. Rethinking the concept of the resort
Encouragement of the use of local knowledge in design and policy making
Promotion of holistic and integrated development
Redefinition of tourism as multi-sensory and participatory
Increase of resilience and diversity of the economy
Tourism as a means for preservation
5.2. Scenarios for the land, Baobab beach resort
Current state axonometry and activities
Futural state axonometry and activities
Close up of spaces
Baobab tree residence cross section
Baobab tree growth tiemline
5.3. Coastal area scenarios, Tulia unique beach hotel
Current state axonometry and activities
Futural state axonometry and activities
Close up of spaces
seaweed farm and floating platforms cross section
Mangrove forest specifications and growth timeline
Seaweed farm specifications and types
5.4. Implications for policy and decision making

Chapter V.

Forming the vision through design

5.1. Rethinking the concept of the resort

This chapter aims to synthesis the body of knowledge and the contextual attributes such as the vernacular construction practices and the characteristics of the local ecology to give an answer to identified problems and also the research question. The design provides a vision for the future distributed on various timeframes regarding each solution. Furthermore, design strategies are provided for two macro and micro scales. The main design tools used to communicate the multi-lateral vision of the thesis are the use of sections and axonometric drawings coupled with detail callouts where necessary.

The solutions and strategies envision a future for Zanzibar in which the various sectors of its economy and community are weaved together to form a resilient fabric which would not only guarantee the conservation of its ecological and cultural context, but would also, enhance them through the elimination of both physical and invisible barriers. In this vision, tourism is re-defined as a new form of economic and cultural activity in which it is no longer easy to distinguish it from local practices and activities. The tourist of this future is one who not only travels to see this unique island from behind a window but to experience it in all its various dimensions. She is not the final player in a linear process of consumerism, rather, she is part of a wider resilient circle which redefines what tourism is, bonds the local community and tourism together, and provides a multi-lateral system which merges the various characteristics of the context in a holistic narrative that enhances and guarantees the flourishing and resilience of this unique corner of the world.

This chapter is structured based on the design for two cases which were analyzed in the previous chapters, the Sandies Baobab Beach resort and the Tulia resort. For each case we start with an elaborate study of the current activities using axonometric drawings of the resort which represent the greenery and the distribution of buildings and activities. After that, based on the conclusions and the research aim of the thesis we provide the proposal for the future modification of the resorts in order to point the questions put forth throughout the thesis. The proposal is presented first using an axonometric drawing including all he various activities that are proposed to be integrated which are based on the opening of the resort to the local activities and population while also enhancing the experience of the tourism, engaging all their senses. Explanation of the activities and the necessary information for the integration of ecological designs into the proposals are provided further. Finally, the chapter will be concluded by highlighting the potentials of the proposals regarding policy making and decision for a better future of Zanzibar.

Picture 5.1.
Root bridge, Riwai village, India. (Photo by Jitaditya Narzary, n.d.)

A classical touristic resort made among trees is considered appropriate when there is a clear distinction between the greenery and the living spaces and when all the additional activities related to the local culture are kept only at a distance from the tourist. The rooms are made as they would be made in any other location on earth. The vision we provide for this resort made among large Baobab trees aims to be different from this classical definition.

On the contrary, we show that the experience of the tourist can be integrated with the local activities both spatially and experientially. Residential spaces might be integrated in the large Baobab trees along with structures which resemble the local construction methods and aesthetic. This can increase awareness of the fragility of the local ecology while also providing the opportunity for the safekeeping and enhancement of the natural resources.

We show how local activities which could enhance the economy of the local population can become a part of the experience of the tourist, enhancing the biodiversity of the island while increasing the variety of natural spaces that the tourists engage with. This gives the opportunity for the tourist to engage with the local culture and ecology in a multi sensational manner.

With the integration of the Baobab trees with their natural cavities which could accommodate various activities we allow nature to take over. The current buildings can then be utilized based on their permanent structures to be used for various local activities such as beekeeping, spice farming, and the necessary spaces such as storage needed for them.

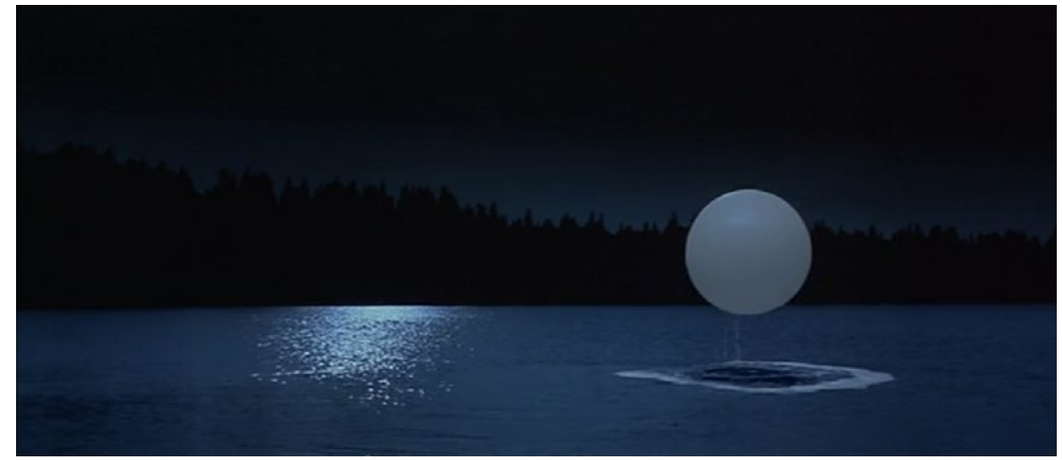
Picture 5.2.
Al-Tahla Floating islands of the Ma'dan, Iraq, (Photo by Esme Allen, n.d.)

5.1. Rethinking the concept of the resort

Picture 5.3. Daily activities of locals.
(Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film])

Picture 5.5. Daily sport exercises with kids.
(Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film])

Picture 5.4. Morning exercises of locals.
(Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film])



Picture 5.6. Travelling in the space.
(Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film])

Picture 5.7. Locals communicate with indigenous tribes through telepathy.
“They’ve been here for 40.000 years without damaging the land”. (Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film].)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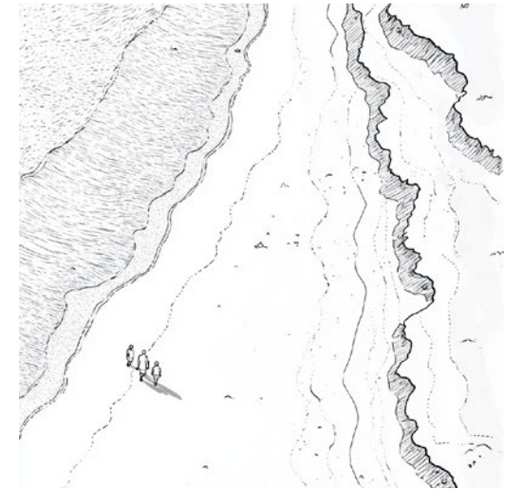
Scale 1:750

Resort activities:

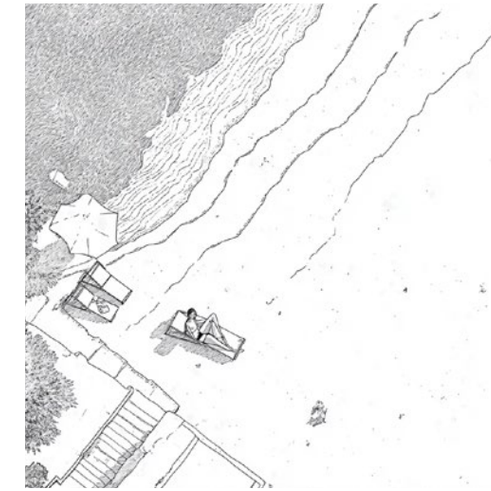
1. Bare foot walking;
2. Sunbathing;
3. Swimming with turtles;
4. Spa treatments;
5. Massages;
6. Water sports ;
7. Local food cooking classes;
8. Local handicrafts making;
9. Dining;
10. Tropical gardens;
11. Yoga and sport activities.



1. SANDY BEACH

The possibility of walking bare foot on a sandy beach is one which involves the senses of the skin considering the warm soft sand. Specifically considering the special white color of the sand in Zanzibar.

The necessary sources for this activity are a clean and well-maintained sandy beach.



2. SUNBATHING

The strong sun of Zanzibar provides the possibility of sunbathing while lying on the soft sands, providing a sensory experience engaging mostly the body and the touch.

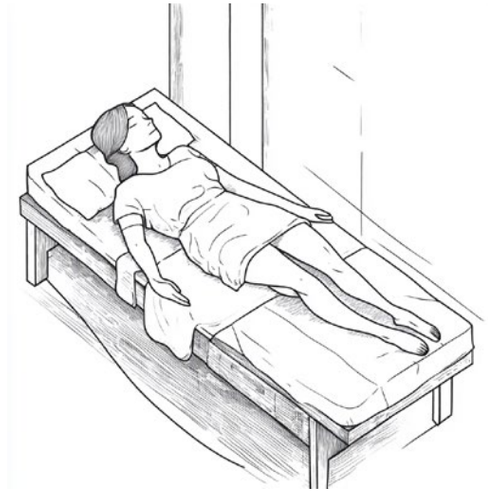
The necessary sources are access to the sun and appropriate oils harvested locally for this purpose.

5.3. Scenarios for the land. Sandies Baobab Beach Resort activities

3. SWIMMING WITH TURTLES

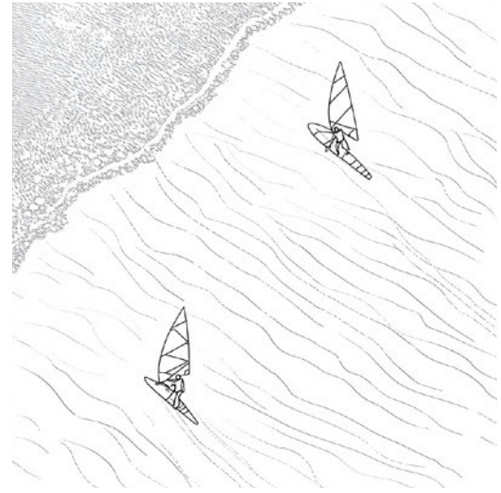
In the north of Zanzibar there is a natural lagoon full of turtles which is closest to the Baobab resort.

This experience offers the possibility of observing, touching, hearing, and smelling the natural habitat of sea turtles while having the opportunity to swim with them.



5. MASSAGES

The massages cover various types and are targeted towards various parts of the body, including face, body, and feet, each with a sperate sensual and therapeutic experience.
The natural resources utilized for this purpose are mostly organic and, in some cases, locally acquired. These include Coconut oil extracted from local coconut trees, organic cosmetics made in Zanzibar, organic oils made locally (Zanzibar warm herbal oil).



6. WATER SPORTS

All the resorts studied offer the possibility of having the experience of water sports using boards or kayaks, and sailing. These activities provide physical fitness and freshness while also providing the possibility for the visitors to experience being surrounded by the clear and shallow waters near the coast.
There are no natural resources used in this activity and the equipment are in all the resort modern ones imported from outside of Zanzibar.

7. LOCAL COOKING CLASSES

This provides the visitors with the opportunity to immerse themselves in the local cuisine and the ingredients used for it. It is a sensory experience involving tasting and smelling.

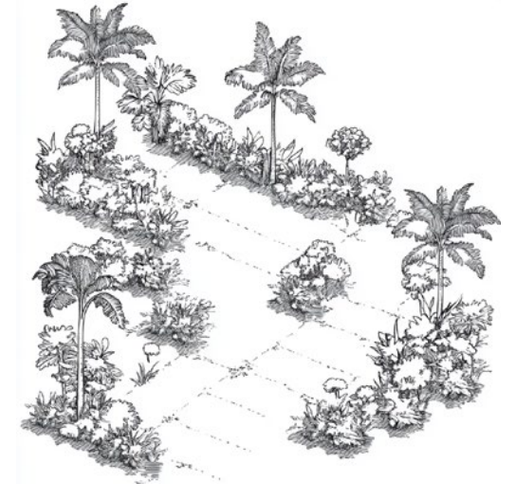
The sources required for this means is access to locally fresh ingredients which are used in the cuisine.

8. LOCAL HANDICRAFTS MAKING

Tourists can spend time with the local staff of the resort while they teach them to make different local handicrafts such as baskets and sun hats using dried palm tree leaves and mangrove branches. This activity connects the touch of the visitors with the feeling of the leaves and the involves a concentration of the mind to engulf in the moment.
The necessary sources for these activities are the presence of plants which could be used for their leaves and branches.

9. DINING

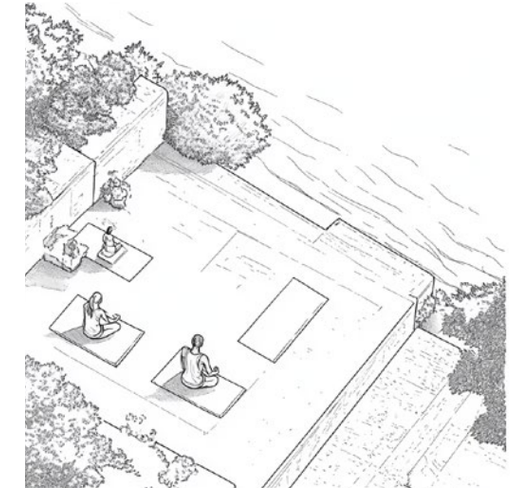
All the resorts provide opportunities for dining providing at first hand an environment which either is set in a natural scene or a traditionally styled space thus engulfing the visitors in a sensual experience while involving their sense of taste and smell with the local and also international cuisine.
The source for this means is access to fresh ingredients which in the case of Tulia is sourced from the hotel itself.



10. TROPICAL GARDENS

Resort has created a green environment with a variety of local and some foreign plants. A tropical garden contributes to the regulation of the environmental comfort and to the emotional experiences of the visitors. It creates a space filled with fresh air and the smells of tropical plants.

The necessary source is the presence of tropical plants and the suitable conditions for their maintenance.



11. YOGA & SPORTS

The yoga sessions take place in all the resorts and are normally conducted in the morning sunrise or during the evening sunset.

The sessions are held in the serene natural landscapes, either in a green space with abundant plants or in front of the sea. Thus, the resources required for this means are the natural landscapes that the resorts can provide.


Close-up view
p. 194
Bee hives under
shade of trees
First level as dwelling
for farmers and beekeepers
Residence for
tourists
Clove fields
Space for handicraft and
coconut oil production
Second level for drying
spices, coconuts and
fruits
Gathering space for local
music festivals and cultural
activities
First level as storage
for agricultural products
Rain water storage
Scale 1:750
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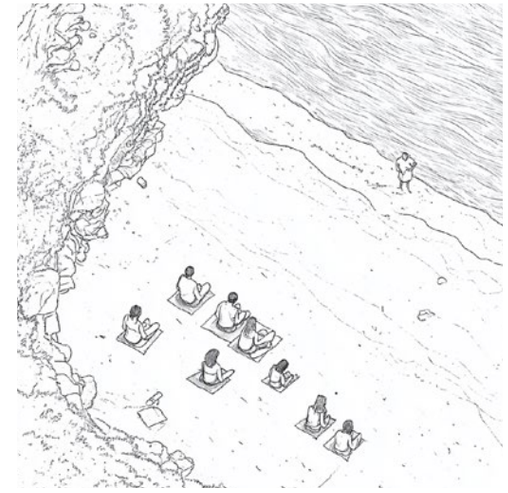
RESORT ACTIVITIES

1. Natural sound spotting;
2. Ocean sound meditation ;
3. Local music workshops;
4. Ocean top platforms;
5. Birdwatching and spotting;
6. Boat building workshops;
7. Swahili natural cosmetics and medicine workshops;
8. Butterfly farms;
9. Traditional beekeeping and honey harvesting;
10. Local building construction workshops;
11. Coconut fruit gathering, oil and milk extraction.

1. NATURAL SOUND SPOTTING

The preservation of soundscapes of the island is dependent on the preservation and maintenance of the various ecosystems and landscapes of the island. Thus, such activities could promote the safeguarding of the natural reserves which could have direct and indirect effects on all the islands.
This activity requires that the resorts create and maintain environments which would provide a full spectrum of the soundscape of the island.



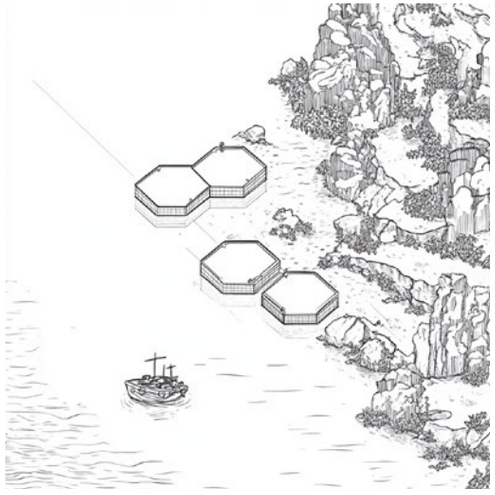
2. OCEAN SOUND MEDITATION

Sessions could create a calm and relaxing state of body and mind for the visitors where they could come to appreciate the beauty of the ocean from the point of view of its auditory sensation.
This will not only reduce the pressure from local population but will also benefit the local ecosystem which could be affected by the noise pollution of resorts.
The requirement for this activity is the availability of a quite space near the ocean without sound disturbance and pollution.

3. LOCAL MUSIC WORKSHOPS

These workshops can engage the sensation of hearing of the visitors introducing them to the traditional sounds of the culture of the island. This activity will provide more opportunities for the engagement of the local population with the tourism sector and introduce the visitors to the more authentic side of the local culture.
The necessary requirement is the presence of locals who would know how to play local instruments and the passing on of this tradition to new generations.

5.3. Scenarios for the land. Sandies Baobab Beach Resort futural activities

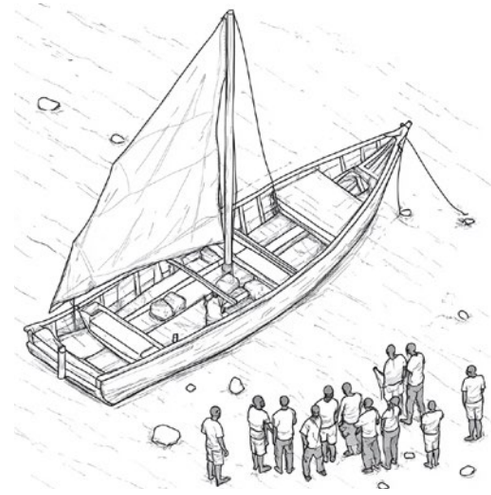


4. OCEAN TOP PLATFORMS

The resorts could invest on the floating platform on the ocean which could be used for yoga, dining and create a spaces which will provide the visitors with a multi-sensory experience of being in the middle of the ocean.
This act could utilize the local construction methods for boat making it could also provide the local population with economic sources and adaptation measures for the future.
Wood the craftmanship of the local population is required.

5. BIRDWATCHING AND SPOTTING

It can be engaged by photo shooting a sample of each species. It could engage in the maintenance and restoration of ecosystems which are the natural habitat of these birds.
This will involve caring for all the plants and species which contribute to the wellbeing of the birds on the island.
The necessary requirement for the birdwatching activities is the preservation and expansion of the natural habitat of the local birds even into the perimeters of the resorts.

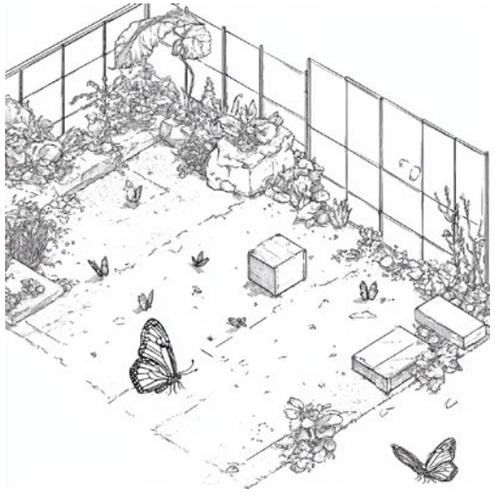


6. TRADITIONAL DHOW BOAT BUILDING WORKSHOPS

This activity could help with the preservation of woods which are necessary for this activity since it would provide an economic benefit for the locals. Furthermore, it would keep alive a local craft tradition of the island.

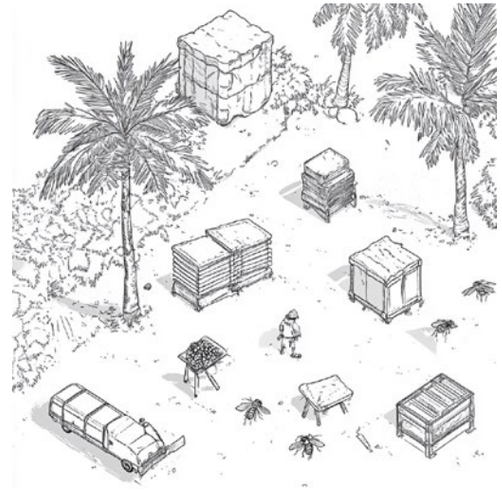
The necessity for this activity is the presence of adequate palm wood and leaves for the making of ropes.

7. SWAHILI NATURAL COSMETICS AND MEDICINE WORKSHOPS
The visitors may gather plants from the perimeter of the resort itself. It can be used in the massage of the visitors or be taken home by them. This will help with the increase of the variety of plants in the resorts some of which could also provide habitat for insects thus increasing the biodiversity of the resorts. Additionally, they will promote the local traditions of making cosmetics with local plants.
Planting and maintenance of certain plants which could be used for this means is nessesary.

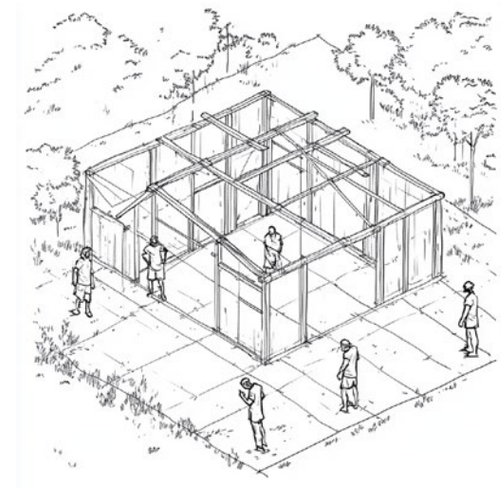


8. BUTTERFLY FARMS

Creation of butterfly farms where the visitors could participate in the maintenance and caring for the farm. This experience will engage all the senses of the visitors while contributing to the preservation of the butterfly species of the island.
Butterflies' farms could contribute to the increase of the biodiversity of the island and the upkeeping of its important ecosystems.
The necessary sources are the planting and caring for the plants which provide the basic habitat for various species of butterflies.



9. TRADITIONAL BEEKEEPING AND HONEY HARVESTING
Resorts can create spaces for the cultivation of plants which are bee attractors. The honey produced can be tasted by the visitors and used in making local sweets. It can provide an economical support for local beekeepers and expand their activity to the touristic sector.
It will transform the resorts into a hub of biodiversity.
The necessary resource is the possibility of cultivating plants with are bee attractors and providing the necessary infrastructures for honey making and bee colonization.

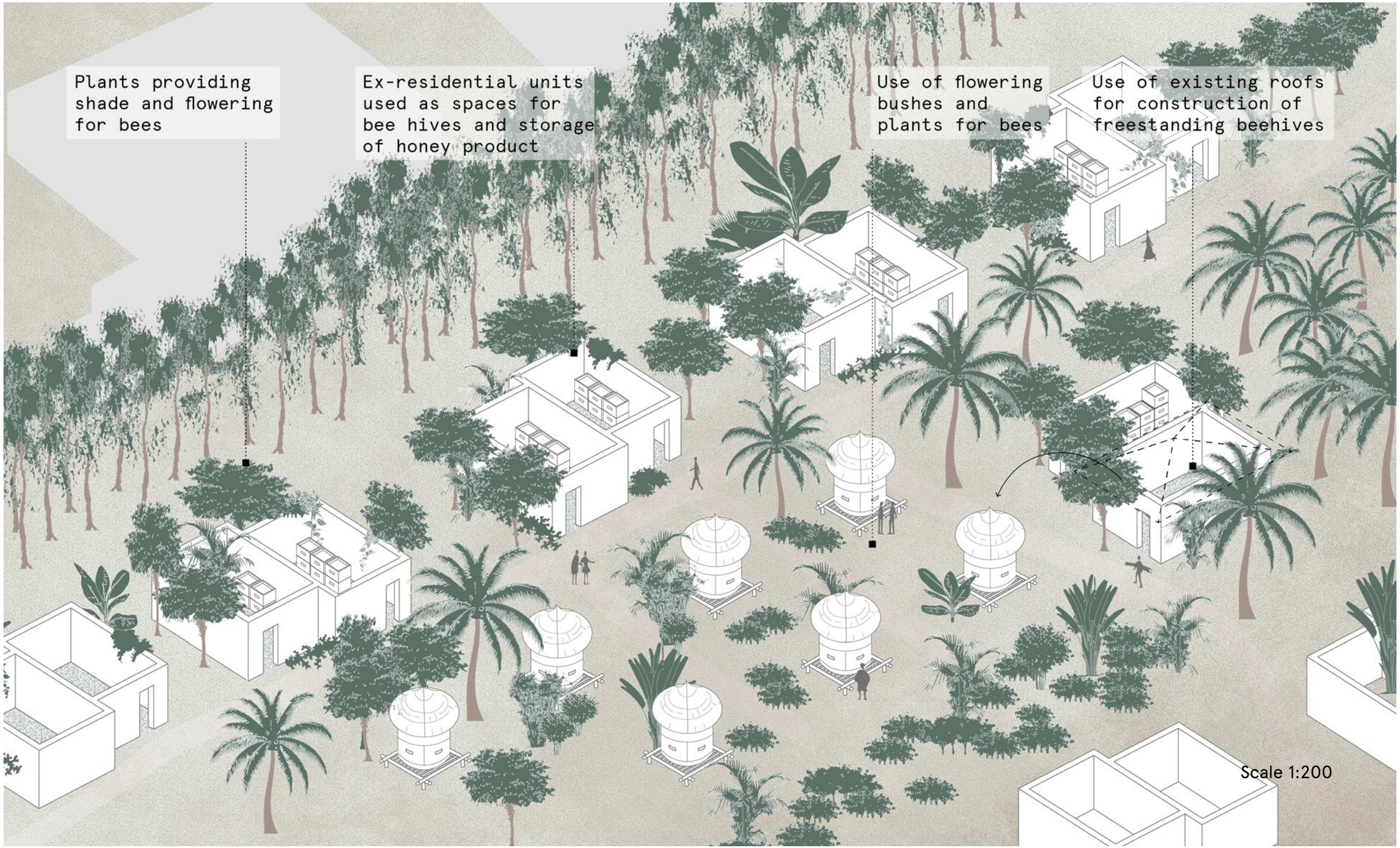


10. LOCAL BUILDING CONSTRUCTION WORKSHOPS
The visitors can take part in the making of structures (maybe even to be used further on within the resort) using lo-TEK methods with the help of local carpenters. This will ensure the upkeep of trees which provide the necessary wood for construction, these trees which are normally the main species of the island, play a crucial role in the upkeep of the ecosystems in the island.
Access to durable woods such as palm wood or button mangrove is required.

11. COCONUT FRUIT GATHERING. OIL AND MILK EXTRACTION, COCONUT LEAF GATHERING.

Visitors can experience the process of gathering coconut fruit from the top of the trees with proper and safe tools for climbing.

This activity will also ensure the planting and upkeeping of the palm tree which is a crucial chain in the ecosystem of the island.
The resources necessary for this is the presence and maintenance of palm trees.


Plants providing shade and flowering for bees
Ex-residential units used as spaces for bee hives and storage of honey product
Use of flowering bushes and plants for bees
Use of existing roofs for construction of freestanding beehives
Scale 1:200

5.3. Scenarios for the land. Features of baobab tree cavities

In the local tradition of the african people baobab trees have been utilized not only for symbolic reasons but also for utilitarian means. These trees have natural cavities created inside them which have been used by locals for various reasons including gathering spaces. This traditional way of using Baobab trees as human spaces has been utilized in the current thesis.

There are two types of cavities for baobab trees: normal cavities and false cavities. Normal cavities are usually formed by wood removal due to various reasons such as fungi decay, fire, animal damage, human activity. Even if more than 75% of young baobabs are single-stemmed, the vast majority of large and old baobabs are multi-stemmed. As baobabs age, single-stemmed specimens usually become multi-stemmed due to the baobabs' capacity to generate new stems periodically, such as other tree species produce branches [Patrut, et al., 2015]. This phenomenon occurs naturally, when new stems shoot from the roots or emerge from fallen stems. Over time, the new stems may fuse with older stem(s) or among them.

All these false cavities are natural empty spaces, which are located between several fused stems disposed in a closed ring-shaped structure. Such as the ring-shaped structures, the false cavities close progressively over time. The number of stems which build the ring is between three and eight. The thickness of the false cavity walls is usually between 1.5–2.5 m. The oldest part/point of maximum age of the fused stems is located between the false cavity walls and the exterior of each stem, always closer to the cavity, in an area which is accessible to the increment border.

Normal cavities usually have irregular shapes and are not very tall (1.0–2.7 m). By contrast, false cavities are larger and taller (3.0–8.3 m), have quasi-regular shapes and their lower part is located always at ground level. The first noticeable difference between false and normal cavities is the presence or absence of the bark inside the cavity. On the other hand, normal cavities become larger over time due to continuous decay, while false cavities become smaller because of stem growth.
In general, the cavities are created either by the fusion of several stems together or within the barks of a single large stem.

HARD BARK
Thickeness: 2 - 10 cm
through where all the veins pass bringing water to the central sponge and the branches

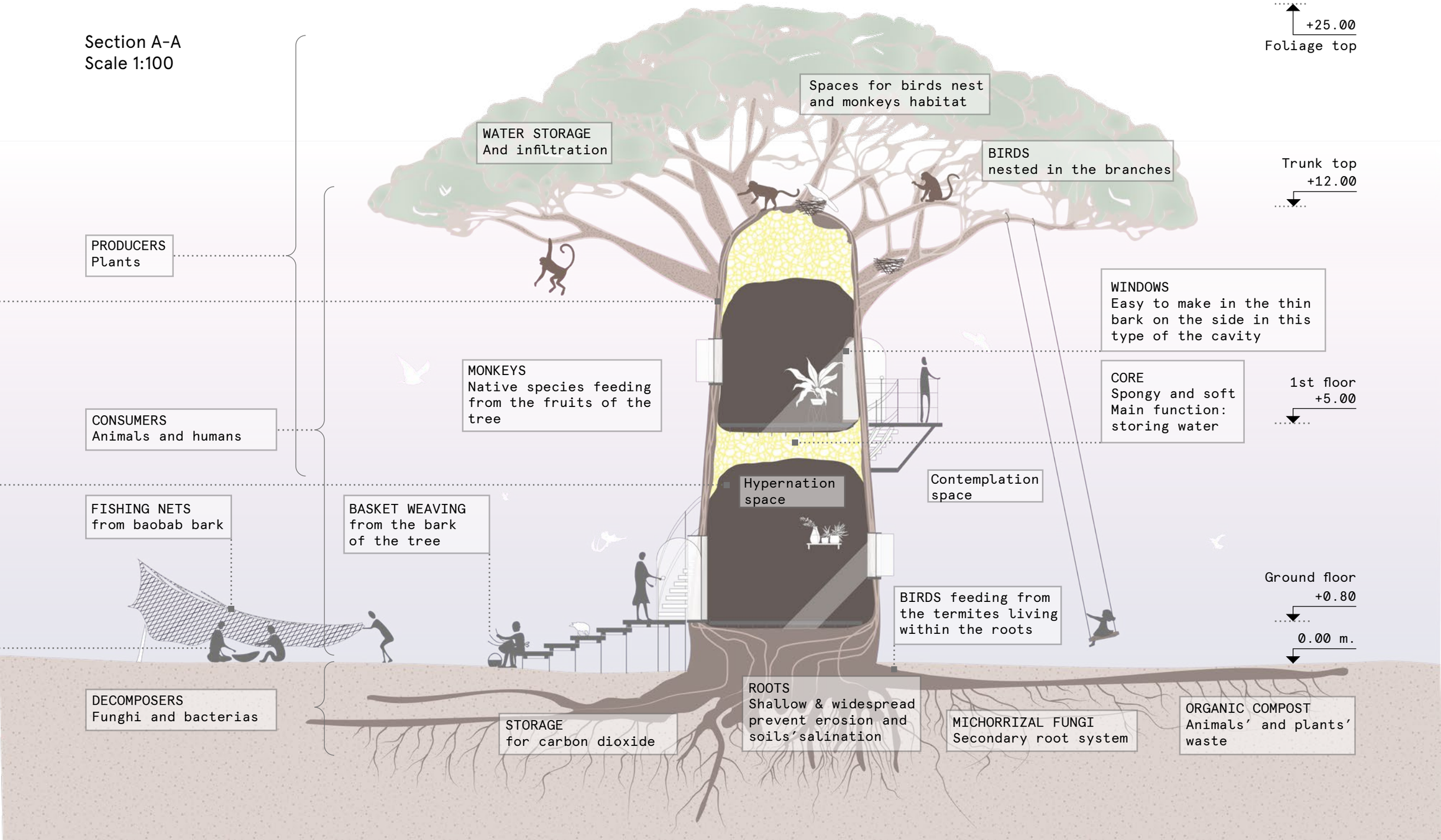
Used for making roaps, baskets and fishing nets

CAVITIES
caused by fungi decay, fire, animal damage or human activities.

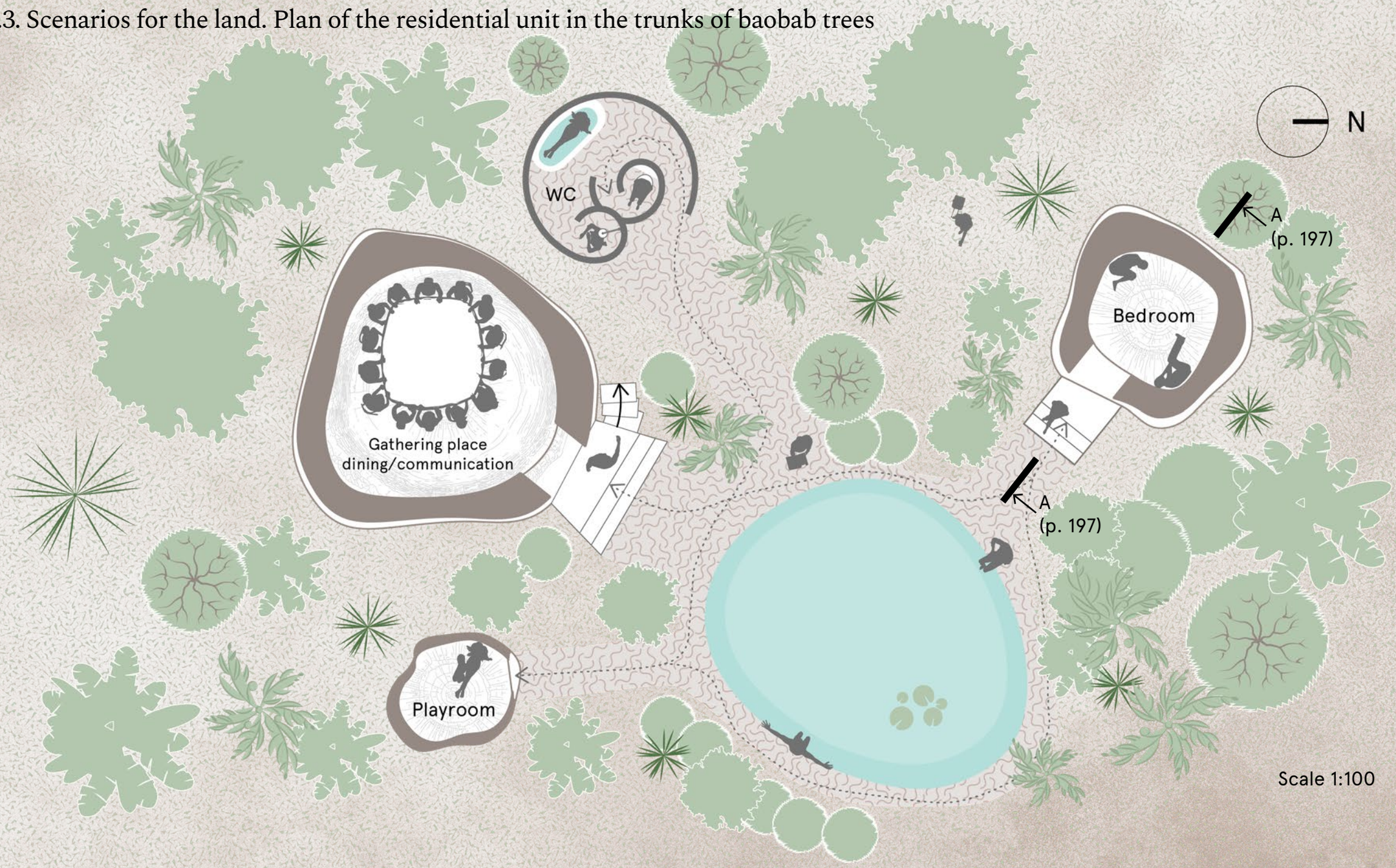
Height if formed naturally: 1 - 2.7 m.

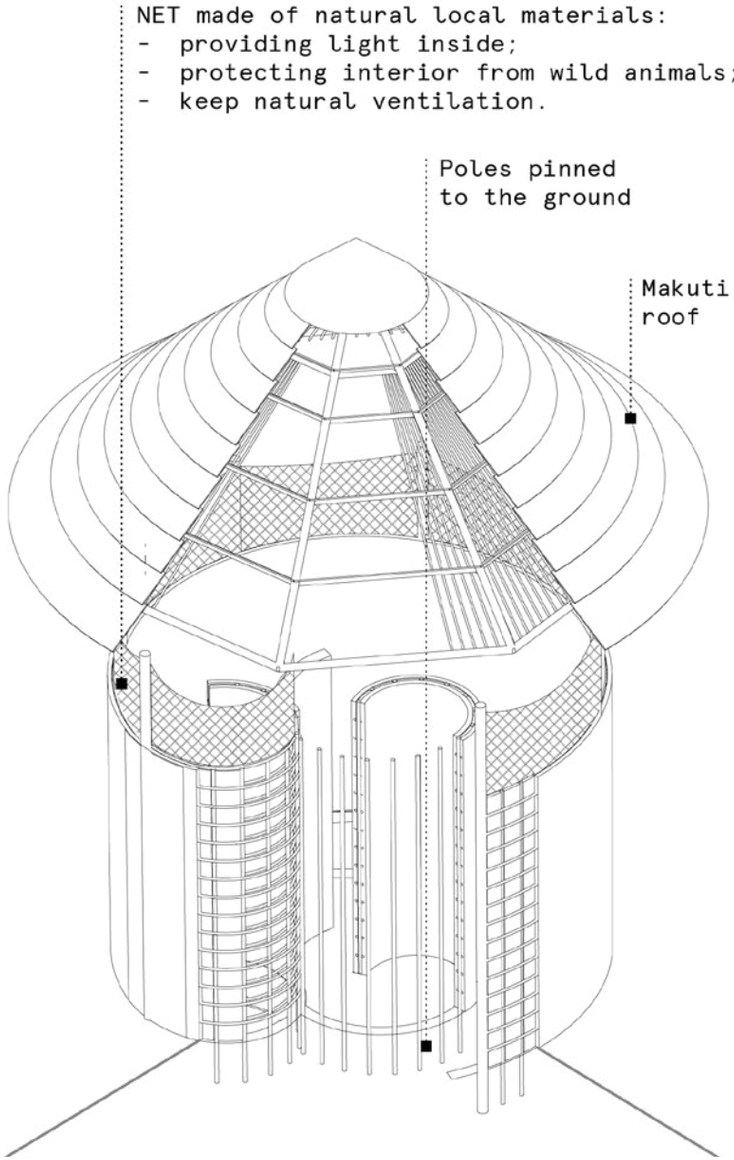
BAOBAB FRUIT used for making oil for skincare products (from seed) and nutritional food ingredient
Leaves used for making soup and sauces

Section A-A
Scale 1:100



5.3. Scenarios for the land. Plan of the residential unit in the trunks of baobab trees



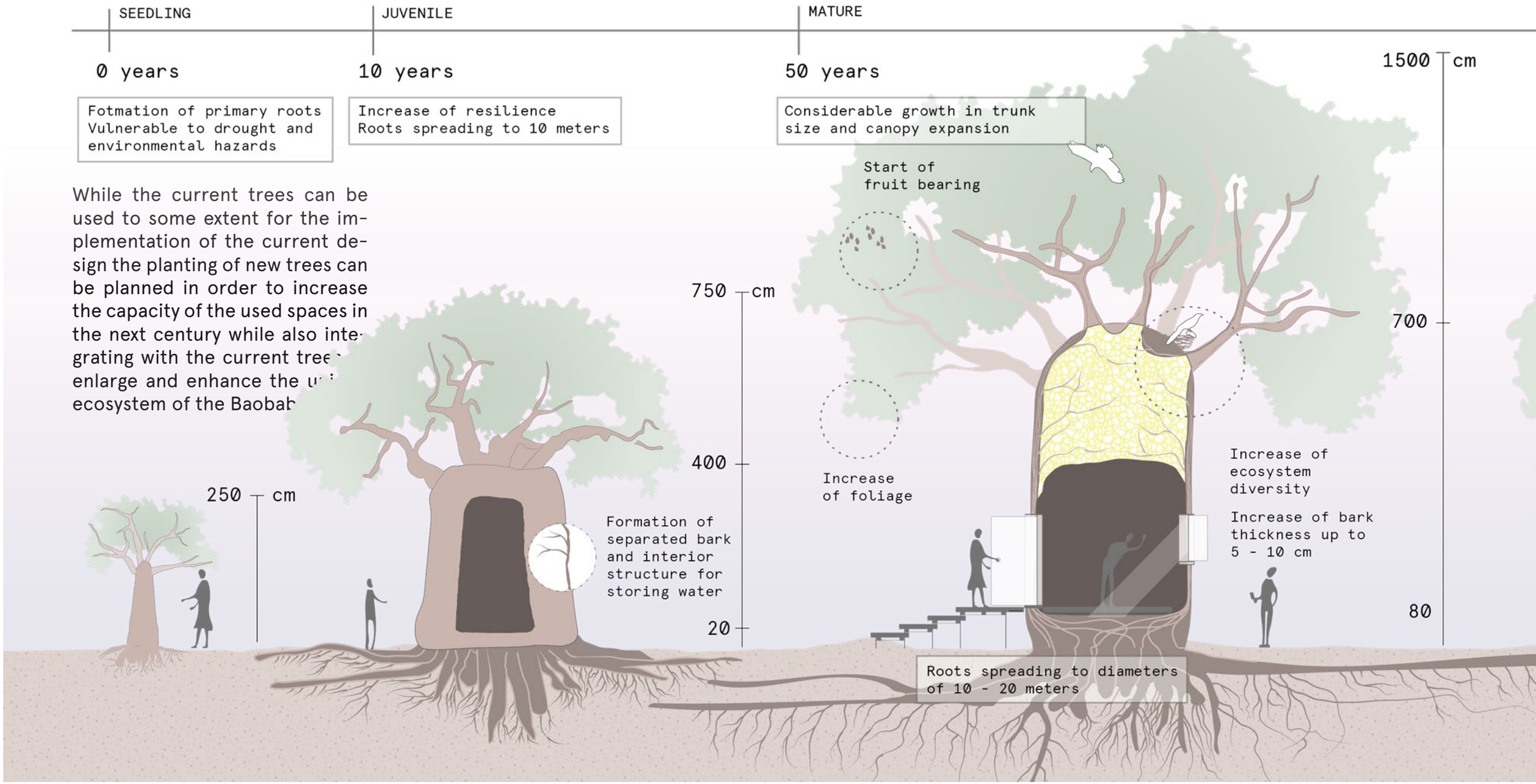


The plan shows the layout of a residential unit in a futuristic resort for a new type of experiential tourism. The dwellings (bedrooms, living rooms, rest rooms, children's rooms and playrooms) are located in natural cavities formed in the trunks of different morphotypes of baobab trees (young / mature / tall / short). Baobab trunks have been used since ancient times on this land as dwellings, shelters from tropical heavy rain, winds and wild animals.

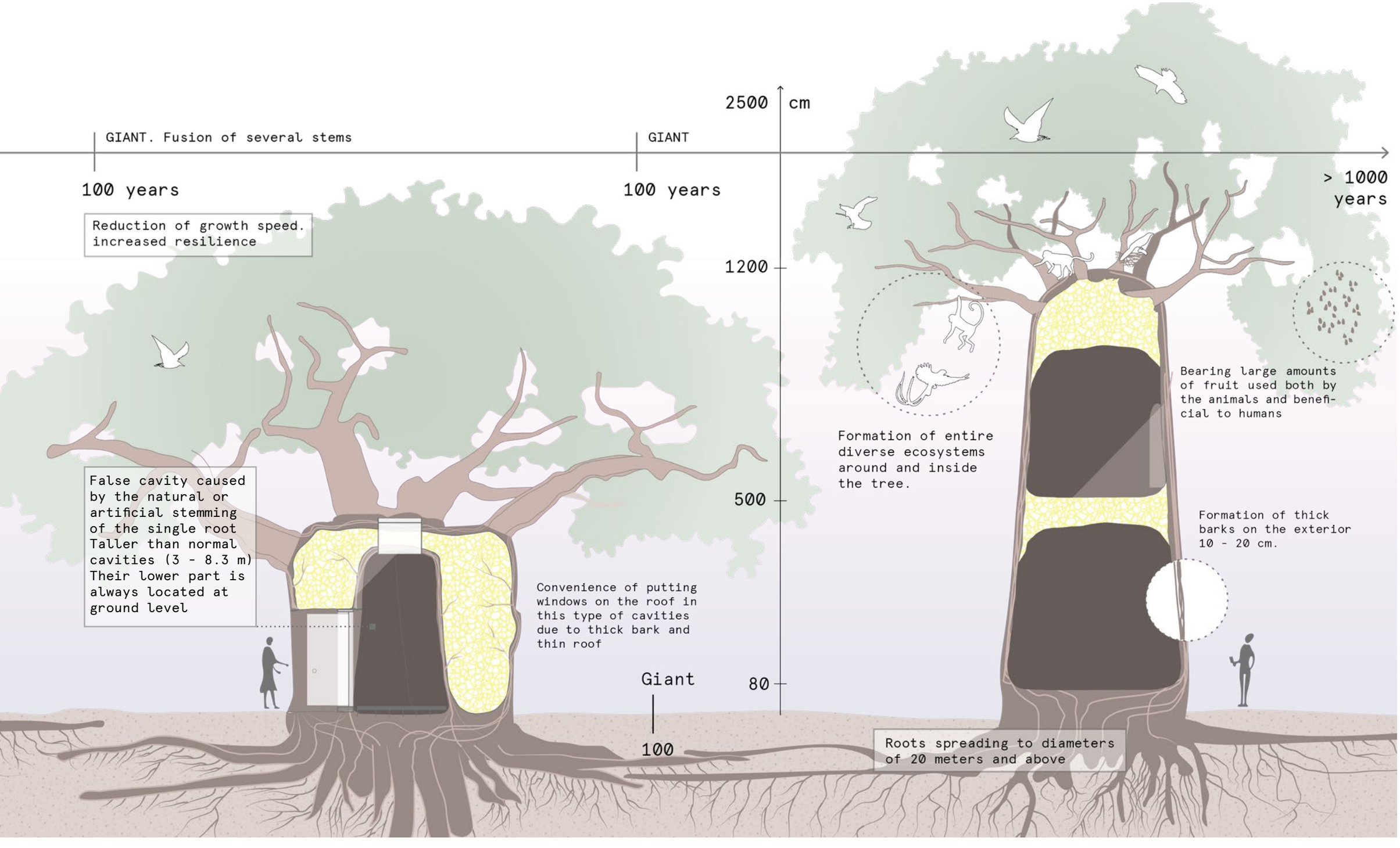
We offer tourists to experience the unity with nature in full during the stay in this type of hotel. To maintain the comfort of the stay, we design a bathroom that is equipped with all the necessary engineering systems. At the same time, in order to preserve the authenticity of the environment and to ensure the preservation of not only the impression of the stay, but also in a deeper sense to preserve the natural culture of the place, we design temporary structures according to the vernacular construction technology.

The toilet shown on the plan has wooden walls and a floor made of rammed earth. On top, a net woven from baobab bark according to local tradition is provided to preserve ventilation and natural light, but also to protect it from animals, birds and the surrounding fauna. Roofing is necessary to protect against rain and scorching sun. We design roofs of dried banana leafs using the traditional Zanzibar Makuti roofing technique. Thus, the bathroom is outdoors and at the same time provides a cozy place for privacy and relaxation.

5.3. Scenarios for the land. Timeline of the baobab tree growth



While the current trees can be used to some extent for the implementation of the current design the planting of new trees can be planned in order to increase the capacity of the used spaces in the next century while also integrating with the current tree[illegible] enlarge and enhance the u[illegible] ecosystem of the Baobab


GIANT. Fusion of several stems
GIANT
100 years
100 years
> 1000 years
2500
cm
1200
500
80
Reduction of growth speed. increased resilience
False cavity caused by the natural or artificial stemming of the single root Taller than normal cavities (3 - 8.3 m) Their lower part is always located at ground level
Convenience of putting windows on the roof in this type of cavities due to thick bark and thin roof
Giant
100
Formation of entire diverse ecosystems around and inside the tree.
Bearing large amounts of fruit used both by the animals and beneficial to humans
Formation of thick barks on the exterior 10 - 20 cm.
Roots spreading to diameters of 20 meters and above


Scale 1:1000

A tourist beach on a classic island resort is considered appropriate when it is clean, free of garbage, seaweed, and the tides are insignificant.

In this case, the beach can be considered exemplary if it does not interfere with the performance of its main function: swimming and sunbathing on sun lounges of the tourists. In an classical resort, nothing else should happen.

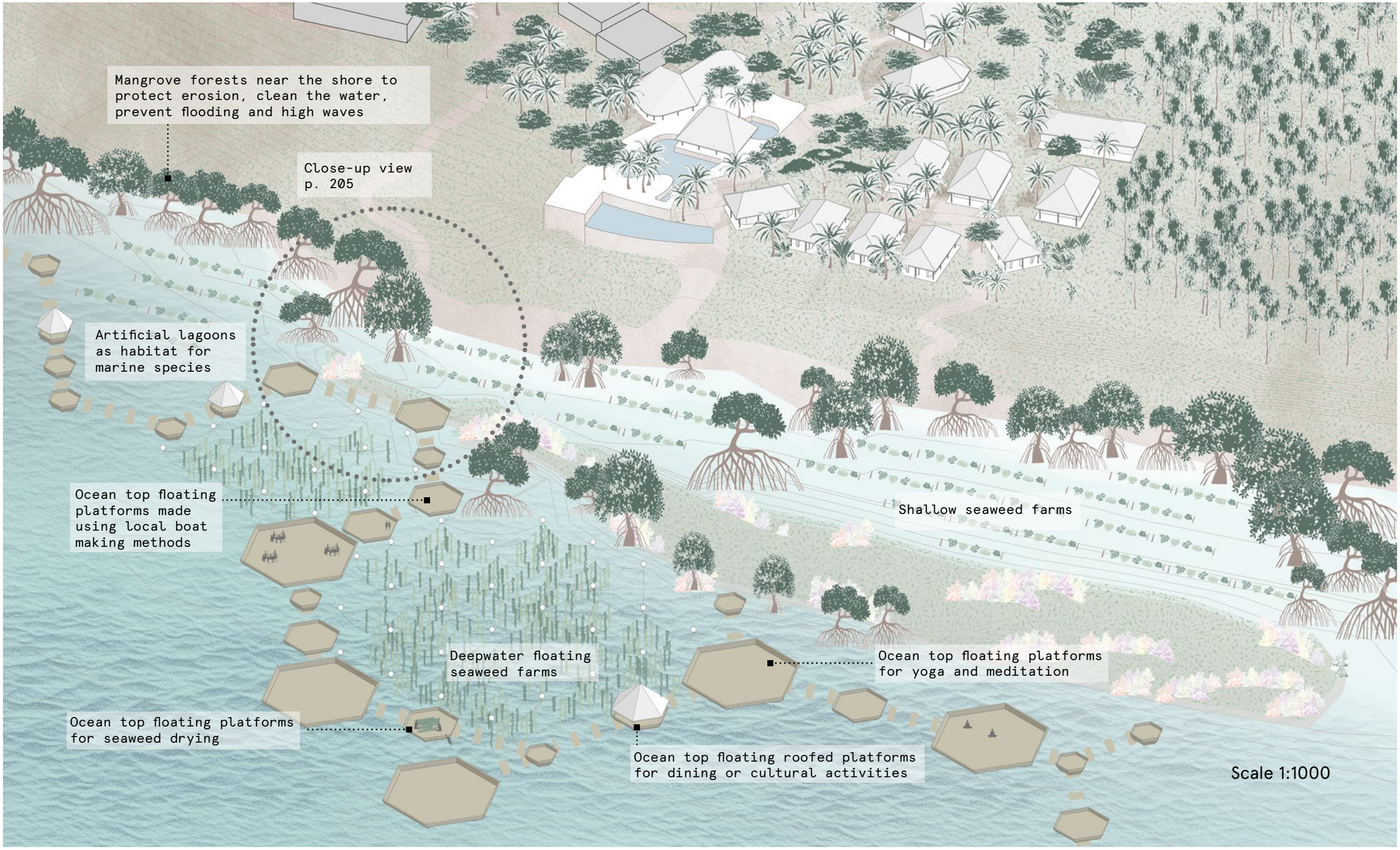
Our vision for the beach and the coastal area of a modern hotel is fundamentally different from what is commonly considered a beach holiday.

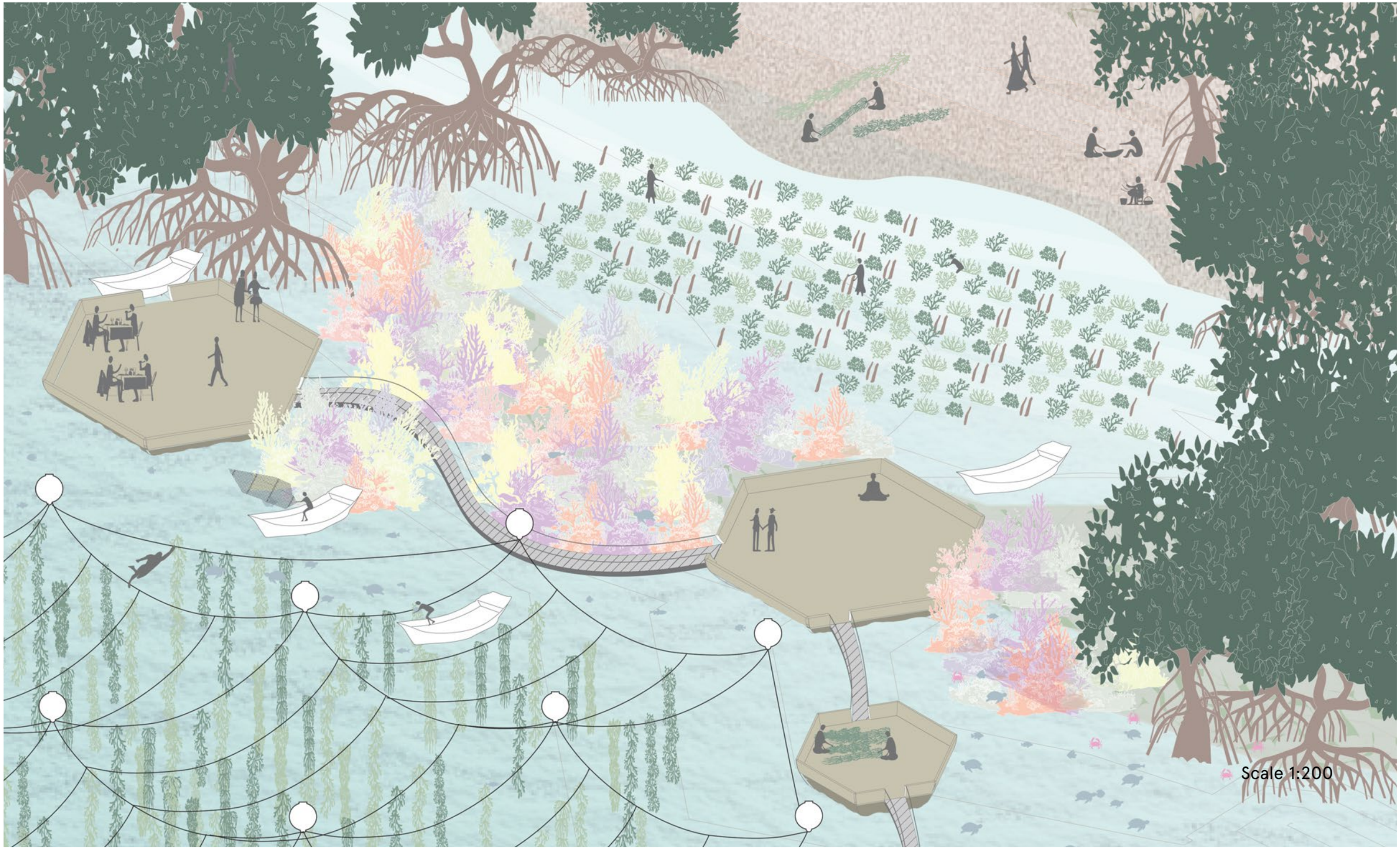
On the contrary, we show how the abundance of seaweed, the tides, the abundance of marine life might perfectly match with all the needs of the resort and ergonomically fit into the living environment of tourists. Moreover, this ecological environment can contribute to the emergence of a huge number of other activities that a tourist can do in a new environment, touching the local culture, nature and habitat.

On the contrary, we propose to populate the beach with different types of seaweed, plants, living creatures, in order to integrate natural life into the life of the resort. For this purpose, we propose to build several wooden platforms, which are designed like traditional Dhow boats. These platforms are located along the coast, some of which can be used by tourists for dinners, lunches, sports, sunbathing, communications, spending time with family, simply contemplating and enjoying the sea views. After all, there is always a high desine for the coast, precisely because the eyes rest, looking at the endless expanse of the sea, and the mind calms down.

With these platforms we increase the perimeter where tourists can enjoy the ocean views, but also use these platforms for utilitarian purposes. For example, some of the platforms can be used by both tourists and local residents to work with seaweed, which does not require a lot of maintenance, they are unpretentious and grow on their own. Their beneficial properties can be widely used in food, cooking, cosmetics, and the production of a large number of different useful ingredients.

In addition, we propose planting mangrove thickets. While most elite resorts do not include mangroves, it has a huge number of positive properties that affects the economy, ecology of the island and protects coastal inhabitants such as shallow-water fish and algae from large waves.


Mangrove forests near the shore to protect erosion, clean the water, prevent flooding and high waves
Close-up view p. 205
Artificial lagoons as habitat for marine species
Ocean top floating platforms made using local boat making methods
Shallow seaweed farms
Deepwater floating seaweed farms
Ocean top floating platforms for yoga and meditation
Ocean top floating platforms for seaweed drying
Ocean top floating roofed platforms for dining or cultural activities
Scale 1:1000


Scale 1:200

5.4. Coastal area scenarios. Mangroves

Mangrove trees shape an essential part of a large part of coastal areas around the world. Their unique characteristic makes them thrive in saline environments and tidal zones with warm temperatures and wave actions (Aksornkoae, 1993). This species of trees develop a unique root system called prop roots and pneumatophores, helping them stabilize themselves in soft grounds and facilitate gas exchange in soils with low oxygen by being able to breath from the air (WWF, 2024). Most species of mangrove trees reproduce viviparously meaning that the seedlings stay attached to the parent plant while germinating (JNCC, 2024).

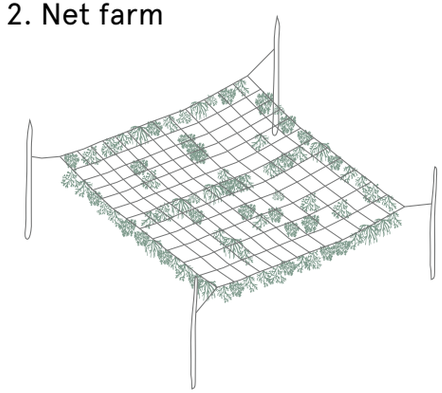
The prop roots extend above the water level growing out of the trunk and increasing the stability of the tree while allowing it to breath from the air. On the other hand, pneumatophores roots emerge vertically from the soil in order to allow the tree to access oxygen in waterlogged soils. Finally, the lateral roots extend horizontally in order to fixate the tree within the soil (Alongi, 2011).

These trees range in height from 1 to 30 meters depending on the type, environment and stage of growth (Alongi, 2011). In favorable conditions some species can grow rapidly adding 0.5 to 1.5 meters to their height every year. Due to their high resilience they can live for a large extend of time growing to immense heights and forming complex ecosystems within their forests.
The unique environmental conditions for the thriving of Mangroves include salinity, being located in tidal regions to benefit from the sediment transport of waves and changing tides (Alongi, 2011), and being grounded in soft, muddy, and anaerobic soils containing organic material with water and nutrients. Furthermore, they flourish in tropical climates with warm temperatures all year long (WWF, 2024). They should also be located in areas with moderate wave action so as to bring in nutrients and wash away excessive sedimentation which could suffocate the trees (JNCC, 2024).

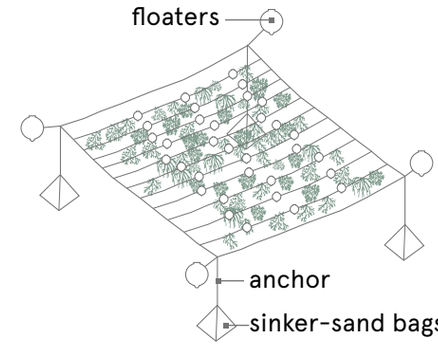
These trees play a vital role in the costal ecosystems. They serve as natural barriers against storms and coastal erosion (Alongi, 2011). Moreover, they are highly efficient in recapturing carbon dioxide storing 7.5 – 10 times more carbon per acre than tropical forests (WWF, 2024). In a report by the World Wildlife Fund it is estimated that the restoration of recently lost mangrove forests could capture one gigaton of carbon (WWF, 2024). They support a wide variety of species including both marine (fish, crabs) and terrestrial (birds, bees, snakes and other species) types thus supporting biodiversity and consequently supporting the local economy (WWF, 2024). Additionally, they increase water quality by removing pollutants and stabilizing sediments (JNCC, 2024).

1. Line farm

2. Net farm



3. Deep-water floating farm



Seaweed is considered as a rich source of dietary fiber, micronutrients and protein. It is cultivated in various areas around the world for the extraction of carrageenan, a thickening and gelling agent used in various industries such as food, cosmetics, and pharmaceuticals. Furthermore, it is also consumed fresh or used in local dishes (FAO, n.d.).

Seaweed farming was introduced to Zanzibar during the 1980's as an initiative to enhance the livestock and food security of farmers and reduce poverty. This was supported by various international organizations including the Food and Agriculture Organization (FAO) of the United Nations. (Msuya, 2013) After many years of its introduction it has become one of the main sources of income of farmers in Zanzibar specifically for women who are the main cultivators of seaweeds making Zanzibar one of the leading producers of seaweed in Africa (Msuya, 2013).

Two types of seaweed species are cultivated in Zanzibar, Eucheuma Cottonii and Eucheuma Spinosum. (Msuya, 2011). The Cottonii species has a bushy growth which can branch to significant lengths. The Spinosum species has an upright spiny structure. Both species have a reddish to greenish color depending on the environmental conditions.

Both of the species flourish in clean saline waters with a salinity level in the range of 30-35 ppt and temperatures ranges between 24 – 32°C. Furthermore, they require a high light exposure for efficient photosynthesis. This makes it crucial to locate them in shallow waters 1-2 meters deep where light penetration is sufficient. (FAO, n.d.) The ideal substrate is a hard stable ground such as sandy or rock bottoms so the roots can be secured steadily.

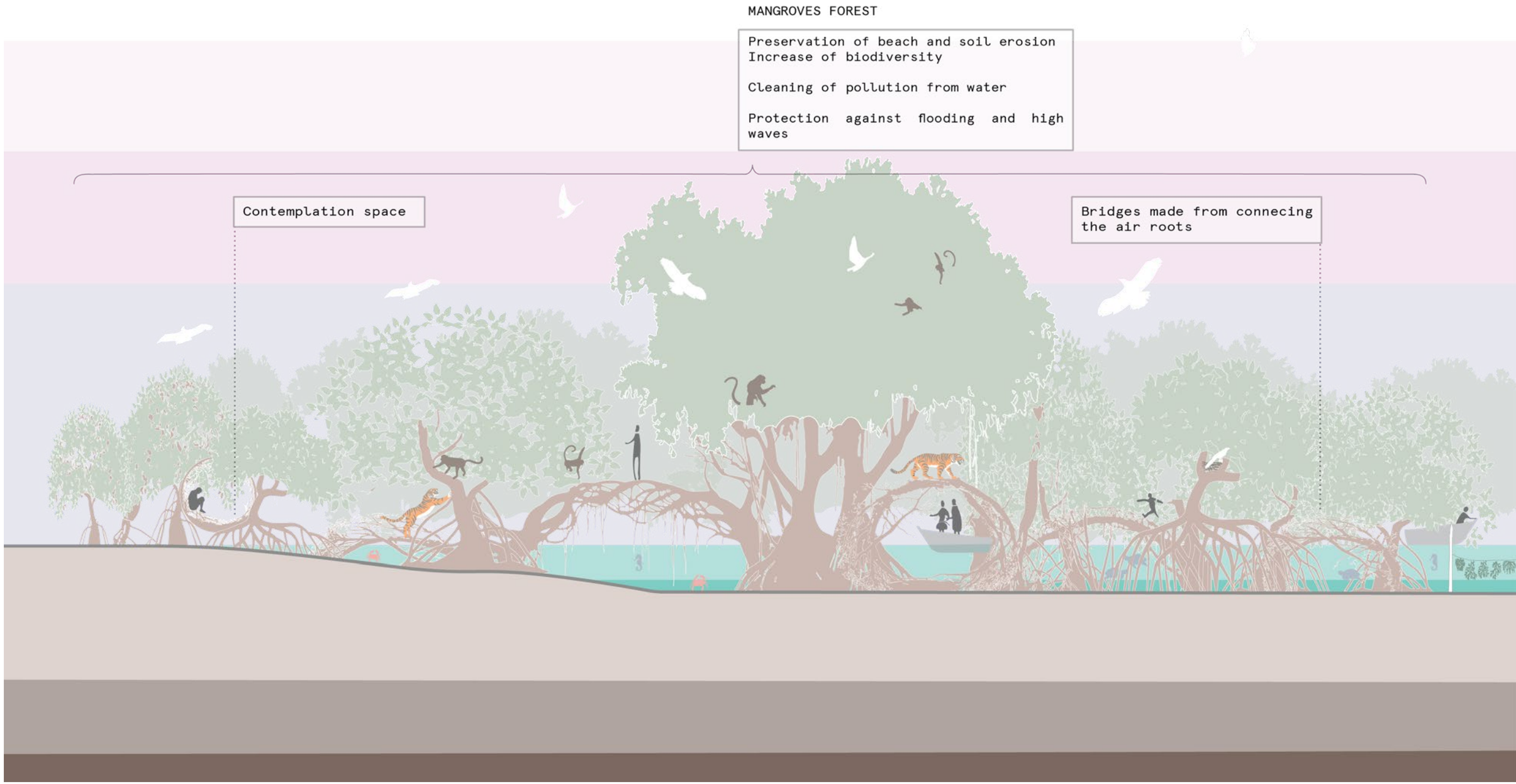
FARMING PRACTICES

There are various methods for the cultivation of seaweeds around the world and the current widespread methods can be distinguished into 3 categories (Juanich, 1988):

1. Line farms: Two wooden poles are fixed to the ground, a rope is hung between them, the plants are hung upside down from the ropes.
2. Net farm: Four poles are fixed in the ground and a net is hung from them.
3. Deep-water floating line technique: The base of the structure is fixed to the ground using sinker bags, the top part is kept afloat using floater objects.

In Zanzibar the most widespread method is the line farm in which mangrove or inland trees are used as wooden poles to hold the line. Here the farms are usually placed behind coral reefs where the water is shallow and the reef provides a natural protection from strong water currents. The drying process is done in farmhouses and mostly coconut leaves are laid as the base to dry the seaweed on them. (Msuya, 2013). Every harvest period of seaweed usually takes 6 weeks.
Integrating various methods of cultivating seaweed specifically the net farm method which is not practiced in Zanzibar and which offers a higher yield rate can have a significant impact on the boosting of the agricultural industry and the economy considering the major role that seaweed farms have gained throughout the years in the livestock, economy, and food supply of the local population also since the demand for seaweed is growing.

5.4. Coastal area scenarios. Section presenting the futural infrustructure of the coast



LINEAR SEAWEED FARMS

planted with the single line top-bottom method in the haloow areas of the coast

CORAL REEFS

Natural habitate for fishes and birds.
Protection for coast

VAST SEAWEED FARMS

Seaweed farms inside the artificial lagoon using the deep water floating line technique

Covering of platforms uses traditional MAKOOTI roof technics.

FLOATING PLATFORM

made using the traditional method of the DHOW BOAT making arranged in a circular shape to form an artificial lagoon

USE OF PLATFORMS:

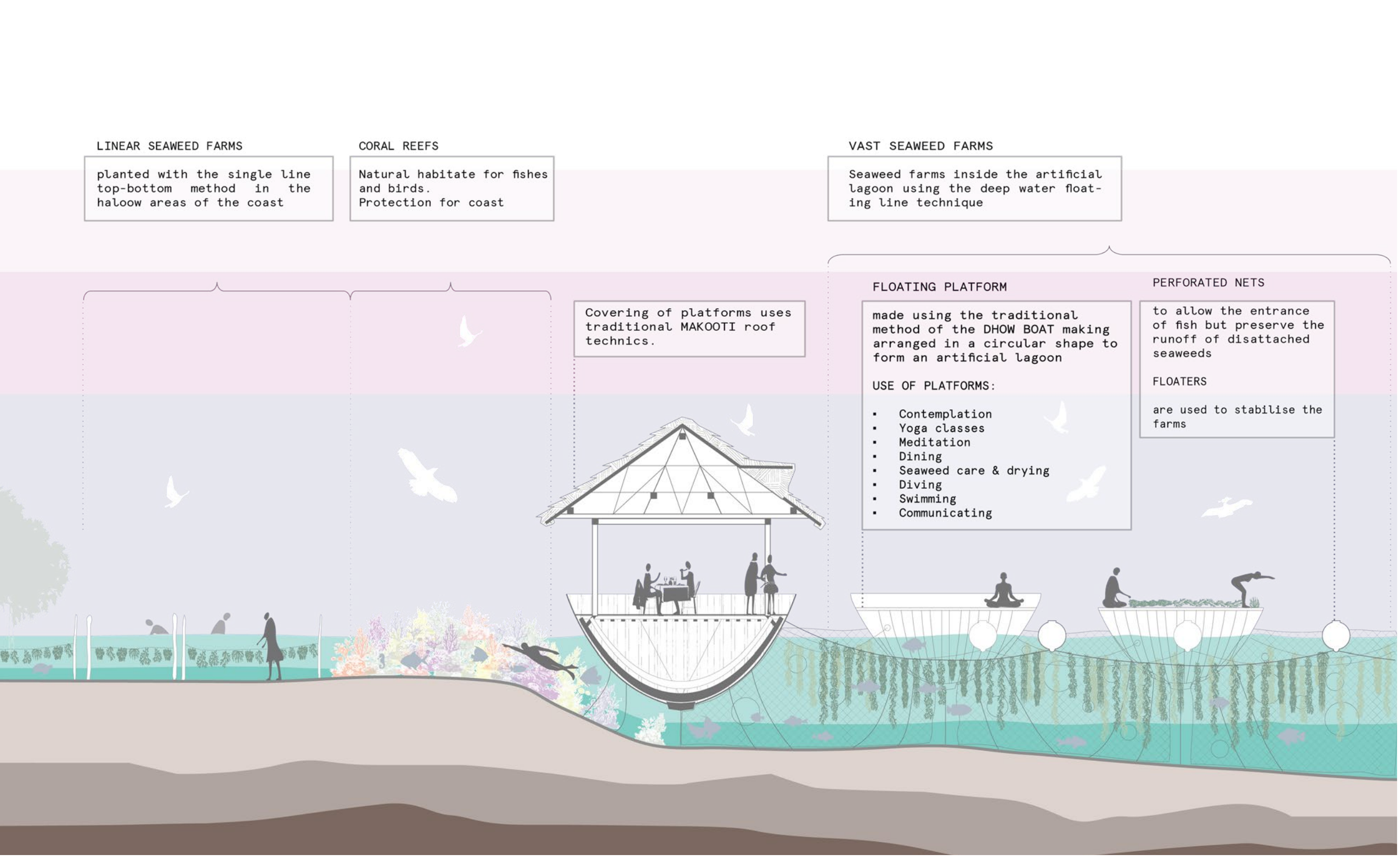
- Contemplation
- Yoga classes
- Meditation
- Dining
- Seaweed care & drying
- Diving
- Swimming
- Communicating

PERFORATED NETS

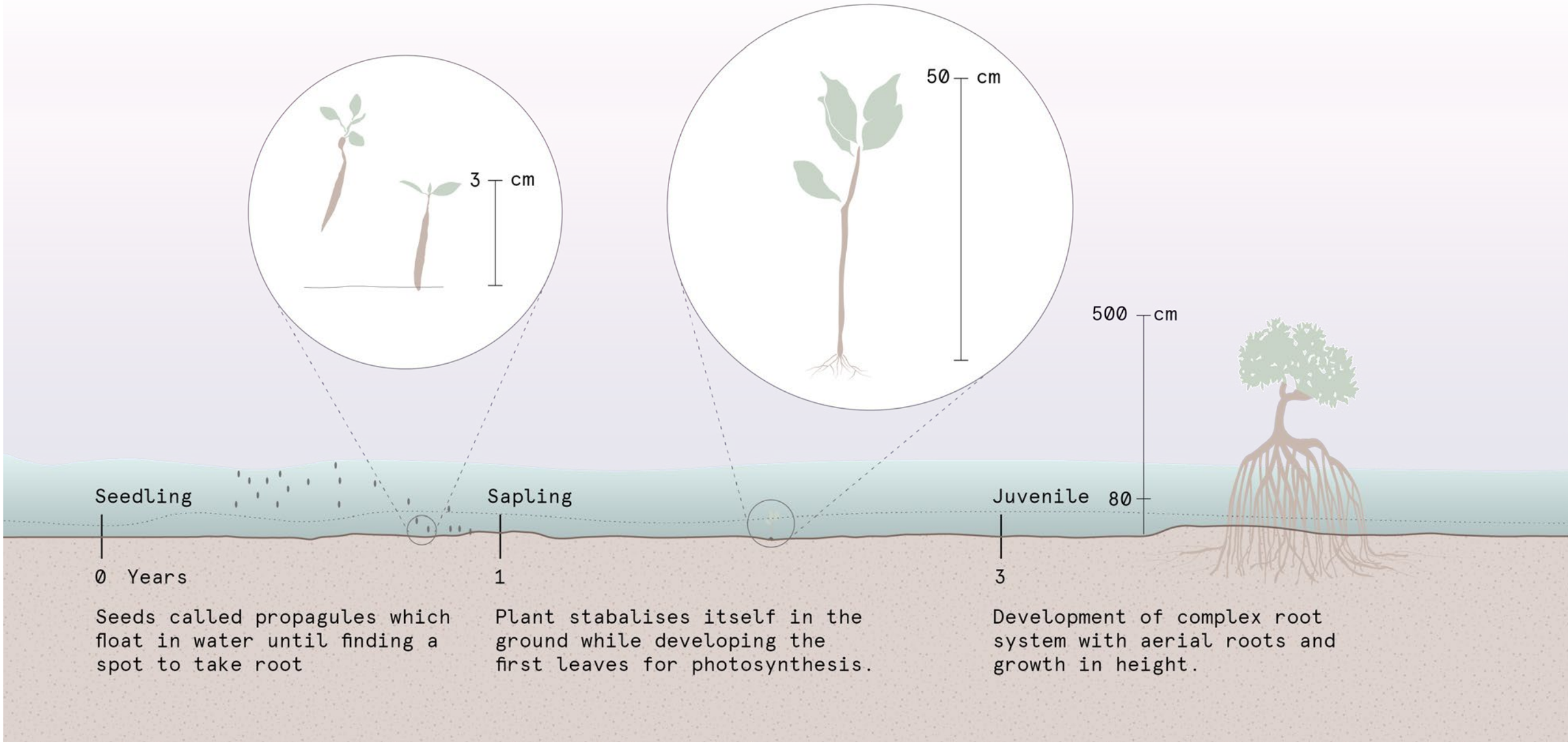
to allow the entrance of fish but preserve the runoff of disattached seaweeds

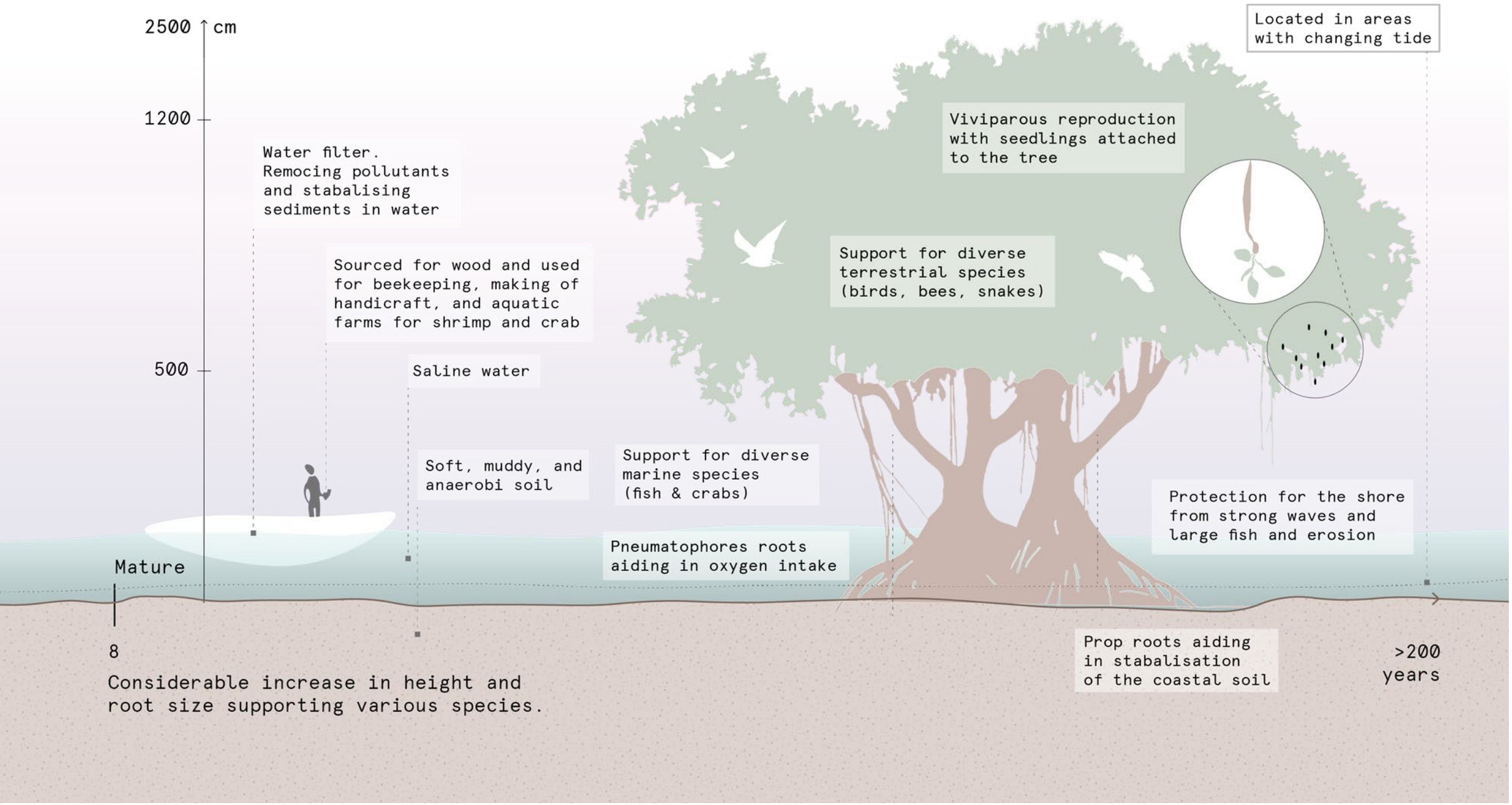
FLOATERS

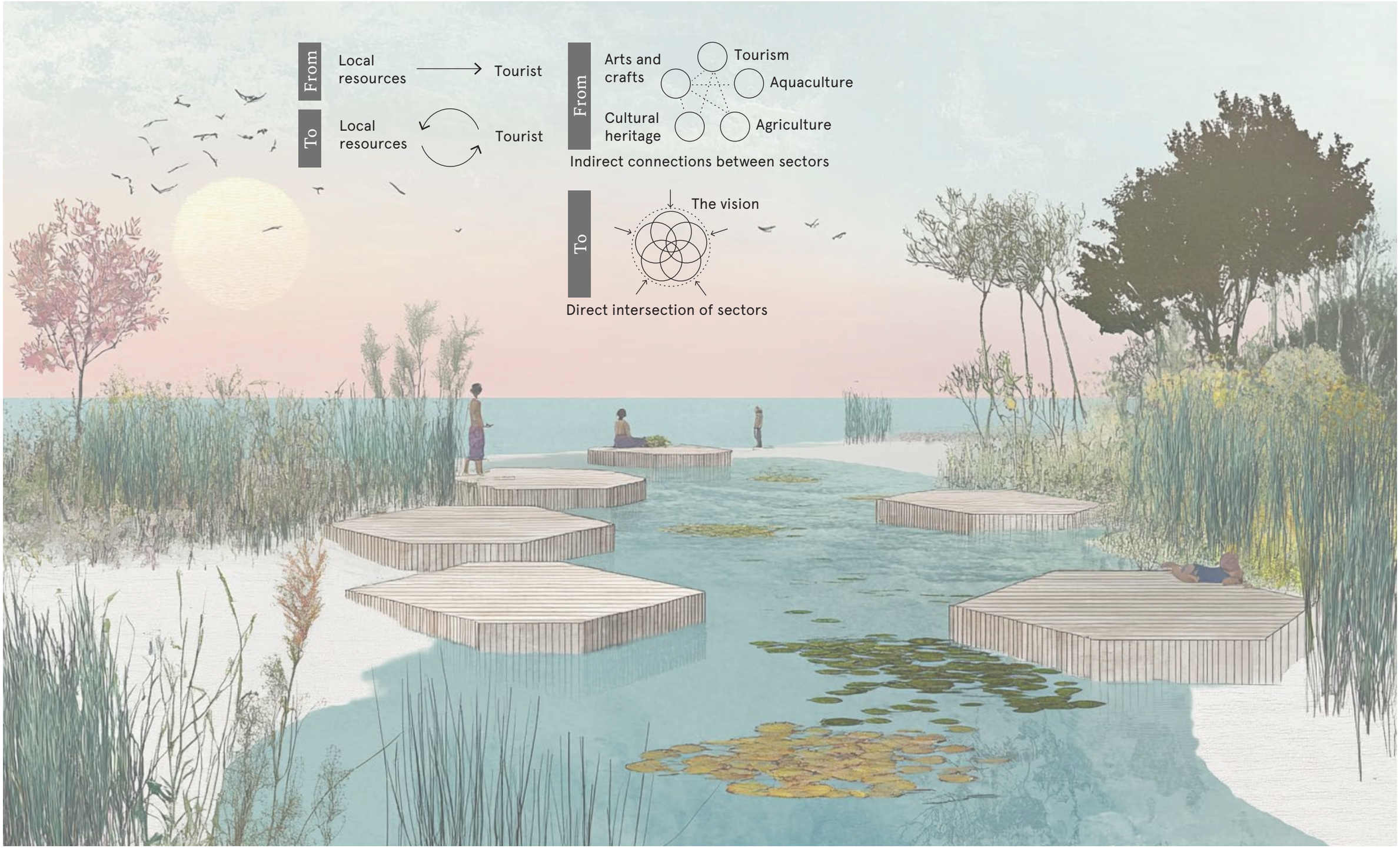
are used to stabilise the farms



5.4. Coastal area scenarios. Timeline of the mangrove tree growth




2500 cm
1200
500
Water filter.
Remocing pollutants
and stabalising
sediments in water
Sourced for wood and used
for beekeeping, making of
handicraft, and aquatic
farms for shrimp and crab
Saline water
Soft, muddy, and
anaerobi soil
Mature
8
Considerable increase in height and
root size supporting various species.
Located in areas
with changing tide
Viviparous reproduction
with seedlings attached
to the tree
Support for diverse
terrestrial species
(birds, bees, snakes)
Support for diverse
marine species
(fish & crabs)
Pneumatophores roots
aiding in oxygen intake
Protection for the shore
from strong waves and
large fish and erosion
Prop roots aiding
in stabalisation
of the coastal soil
>200
years


From
Local resources
Tourist
To
Local resources
Tourist
From
Arts and crafts
Tourism
Aquaculture
Cultural heritage
Agriculture
Indirect connections between sectors
To
The vision
Direct intersection of sectors

The idea for the use of the word vision for the proposals given in this chapter points to the fact that this thesis aimed to provide not specific solutions but holistic ideas to bring out the questions regarding tourism and its ecological and social effects on Zanzibar and outline approaches which could be used to address these questions based on ecological design principles specifically that of Lo-TEK. These visions are aimed to inspire, based on the conclusions drawn from the analysis of data, decision making and policies which would ensure that the tourism industry in Zanzibar would not only exploit the islands resources but would enhance both its ecological and cultural potentials. Below are a few of the strategic goals that the thesis aims to inspire through the design proposals.

I. Encouragement of the use of local knowledge in design and policy making

The design proposals, based on the Lo-TEK approach, promote the use of local vernacular and indigenous knowledge and demonstrate how this local knowledge can be integrated into the tourism industry in a way to provide both benefits for the local population while also encouraging innovative manners of tourism and spaces.

II. Promotion of holistic and integrated development

The thesis aims to show that the integration of various sectors of the economy is not only an additional bonus but a necessary goal which can be achieved most efficiently through the design for tourism infrastructures. This integrated approach not only ensures the equal distribution of the resources that the tourism industry provides, it also increases the quality of the tourism experience bringing innovative types of tourism into balance with the preservation of the ecology of the island.

III. Redefinition of tourism as multi-sensory and participatory

The tourism expectation can be challenged and the new demands of tourism, mostly that of experiential tourism, offer unique opportunities for the total redefinition of what tourism is. The engagement of tourists in a multi-sensory experience of the island not only promotes the education of the fragility of nature and the local eco systems while bringing the tourist in close contact with the island. Also, it transforms the tourist from only a consumer in the end of a line to an active participant in a resilient circle of ecological and cultural preservation and enhancement.

IV. Increase of resilience and diversity of the economy

The thesis demonstrates how with the rethinking of the touristic resort and the opening of its border to the public and to a wide array of activities, the integrated economy becomes more resilient towards events and occasions which could threaten an economy only reliant on single sources of income.

V. Tourism as a means for preservation

The proposals demonstrate how the activities related to the touristic resorts can encourage the preservation of the ecosystem and the biodiversity by relying the industry on these features. The suggested ideas show how the industry can also adapt to future changes related to climate change and the foreseen social changes that could occur in the near future.

Bibliography

Aksornkoae, S. (1993). Ecology and Management of Mangroves. Gland, Switzerland: IUCN.

Alongi, D. M. (2011). Carbon Payments for Mangrove Conservation: An Opportunity for the Tropics. Frontiers in Ecology and the Environment vol. 7(3), pp. 167-174.

Baraza Resort & Spa Zanzibar. (2024, June 15). Retrieved from https://www.baraza-zanzibar.com/

Barton, Karen S. (2023). Baobab Trees. Focus on Geography 66, no.1: Article 1f. https://doi.org/0.21690/foge/2023.66.1f.

Bay, J.-H., & Ong, B. L. (2006). Tropical sustainable architecture. Social and environmental Dimensions. Oxford: Elsevier.

Betti, G., Tartarini, F., Nguyen, C., & Schiavon, S. (2023). A free and open-source web application for climate analysis tailored to sustainable building design. Build. Simul. Retrieved from https://clima.cbe.berkeley.edu/

Breezes Beach Club & Spa Zanzibar Hotel. (2024, June 15). Retrieved from https://www.breezes-zanzibar.com/

Brown, J., & Petrovic, E. (2023). Weaving as Lo-TEK architectural solutions: a transition towards perishable architecture. ASA 2023 proceedings.

Cenizaro hotels & resorts. (2024, June 15). The Residence Zanzibar. Retrieved from https://www.cenizaro.com/theresidence/zanzibar

Chang, J.-H. (2016). A Genealogy of Tropical Architecture. Colonial networks, nature and technoscience. New-York: Routledge.

Dominicis, F. D., & Donato, B. D. (2023). Piccoli paradisi. Conegliano: Anteferma Edizioni.

Dorenbosch, M. (2006). Connectivity between fish assemblages of seagrass beds, mangroves and coral reefs. Evidence from the Caribbean and the western Indian Ocean. Nijmegen, The Netherlands: University Library, Radboud University Nijmegen.

Evergreen Bungalows. (2024, June 15). Evergreen. Retrieved from https://www.zanevergreenbungalows.com/

Food and Agriculture Organization of the United Nations. (2022). Framework for Action on Biodiversity for Food and Agriculture. Rome: FAO Commission on Genetic Resources for Food and Agriculture.

Food and Agriculture Organization of the United Nations. (2024, November 02). Site selection for Eucheuma farming. Retrieved from https://www.fao.org/4/x5819e/x5819e06.htm

Frampton, K. (2019). Towards a Critical Regionalism: Six points for and architecture of resistance. OASE (103), 11-22.

Gandy, M. (2022). Natura Urbana. Ecological Constellations in Urban Space. Massachusetts: The MIT Press.

Gensheimer, T. (2018). Swahili houses, in The Swahili World. New York: Routledge.

Google LLC. (05, May 2024). Retrieved from Google Earth: https://earth.google.com/

Hafidh, H. A., & Rashid, Z. A. (2021, June 11). The Impact of Tourism Development on Economic Development: The Case of Zanzibar. Asian Journal of Education and Social Studies. Vol. 18 (1), pp. 41-50.

Hardy, A., Mageni, Z., Dongus, S., Killeen, G., Macklin, M. G., Majambare, S., . . . Thomas, C. (2015). Mapping hotspots of malaria transmission frompre-existing hydrology, geology andgeomorphology data in the pre-eliminationcontext of Zanzibar, United Republic of Tanzania. Parasites & Vectors 8:41, 1-15.

Harris, R., & Myers, G. (2007). Hybrid Housing: Improvement and Control in Late Colonial Zanzibar. Journal of the Society of Architectural Historians , Vol. 66, No. 4, 476-493.

Hellerstrom, T. (2021). Invisible border. Investigating the two sides of Zanzibar city. Lund: Lund University.

Jamaludin, M. (2004). Sustainable architecture in tropical hotel developments: Approaches to the design of Malaysian coastal resorts. Ann Arbor: ProQuest LLC.

Jambiani villas. (2024, June 15). Private luxury villas. Jambiani beach, Zanzibar. Retrieved from https://jambiani-villas.com/

JNCC. (2024, November 03). The Role of Mangroves in Coastal Protection. Retrieved from https://data.jncc.gov.uk/data/586618ac-a29d-488b-9beb-2d8fb61bb0c1/wood-the-role-of-mangroves-in-coastal-protection.pdf

Juanich, G. L. (1988, April). Manual of Running Water Fish Culture 1. Eucheuma spp. ASEAN/UNDP/FAO Regional Small-Scale Coastal Fisheries Development Project, Manila, Philippines.

Kallipoliti, L. (2024). Histories of Ecological Design: An Unfinished Cyclopedia. Oxford University Press: Actar.

Karafuu Beach Resort & Spa. (2024, June 15). Karafuu Beach Resort & Spa Zanzibar. Retrieved from https://karafuuzanzibar.com/en/

Kebede, A. S., Brown, S., & Nicholls, R. J. (2010, November 05). Synthesis Report: The Implications of Climate Change and Sea-Level Rise in Tanzania – The Coastal Zones. Southampton, Highfield, United Kingdom. Retrieved from Research Gate: https://www.researchgate.net/publication/307210254

Khamis, Z. A., Kalliola, R., & Käyhkö, N. (2017, November 15). Geographical characterization of the Zanzibar coastal zone and its management perspectives. Ocean & Coastal Management, pp. 116-134.

Knight Frank Research. (2023). The wealth report. The global perspective on prime property and investment. Retrieved from Knightfrank: knightfrank.com/wealthreport

Lubida, A., Veysipanah, M., Pilesjo, P., & Mansourian, A. (2018, November 27). Land-use planning for sustainable urban development in Africa: a spatial and multi-objective optimization approach. Geodesy and Cartography. v. 45 (1), pp. 1-15.

Mabrian. (2023, August 17). Evolving traveller behaviour: the rise of experiential travelling. Retrieved from Mabrian.com: https://mabrian.com/blog/evolving-traveller-behaviour-the-rise-of-experiential-travelling/

Madeweya, K., Oka, H., & Matsumoto, M. (2004, March). Sustainable Management of Sacred Forests and Their Potential for Eco-Tourism in Zanzibar. Bulletin of FFPRI. Vol. 3 (1), pp. 22-48.

Mdoe, G. (2024, November 21). Zanzibar opens mpre than 50 mini-islands for tourism. Retrieved from The Exchange: https://theexchange.africa/investing/zanzibar-opens-more-than-50-mini-islands-for-tourism/.

Meliá proprietary information. (2024, June 15). Melia Zanzibar. Retrieved from https://www.melia.com/en/hotels/tanzania/zanzibar/melia-zanzibar

Merilen Holidays. (2024, June 15). Blue Moon resort. Retrieved from https://www.blue-moonresort.com/

Merilen Holidays. (2024, June 15). Fruit & Spice Zanzibar Wellness Resort. Retrieved from https://fruitandspiceresort.travel/

Merilen Holidays. (2024, June 15). Sensations Eco-Chic Hotel. Retrieved from https://www.sensations-zanzibar.com/

Msuya, F. X. (2011). The Impact of Seaweed Farming on the Socioeconomic Status of Coastal Communities in Zanzibar, Tanzania. Research Gate.

Msuya, F. X. (2013). Seaweed Farming in Tanzania: Farming Processes and Interactions between Farmers and Other Stakeholders. ResearchGate.

Msuya, F. X. (2024, November 02). Zanzibar Seaweed Farming: A Development Perspective. Retrieved from Women in Informal Employment: Globalizing and Organizing (WIEGO).

Mutayoba, V., & Mbwete, R. (2013, August). Is Booming Tourism in Zanzibar Pro-poor? A Micro-economic Impact Analysis. Kivukoni Journal. Vol. 1 (2), pp. 104-120.

Myers, G. A. (2002, January 28). Local communities and the new environmental planning: a case study from Zanzibar. Area. 34.2, pp. 149-159.

Naguib, M., & Hanafi, M. (2013). Exploring the Application of Bio-Eco Architecture for Sustainable Design and Construction process. European Journal of Sustainable Development, 2, 4, pp. 85-96.

Ndilwa, L. (2024, November 21). So far so good as Zanzibar registeres $321 m. projects in nine months. Retrieved from The Citizen: https://thecitizen.co.tz/tanzania/news/national/so-far-so-good-as-zanzibar-registers-321m-projects-in-nine-months-3507144

Norzaini, S., Abidin, S. N., Kassim, S. J., & Ariffin, N. A. (2019). Reinventing the passive design framework in the tropics: The experience of green rating systems and passive strategies. CIBSE Technical Symposium, Sheffield University , 25th 26th April 2019 (pp. 1-23). Sheffield: University of Sheffield United Kingdom.

Office of the Chief Government Statistician. (2024, November 24). Zanzibar in figures 2021. Retrieved from OCGS: https://www.ocgs.go.tz/infigure.

Omar, H., & Cabral, P. (2020). Ecological Risk Assessment Based on Land Cover Changes: A Case of Zanzibar (Tanzania). Remote Sensing, 1-24.

Panchuk, N. (Waterloo). An Exploration into Biomimicry and its Application in Digital & Parametric [Architectural] Design. 2006: University of Waterloo.

Pathak, S. (2019, June). Biomimicry: Innovations inspired by nature. International Journal of New Technology and Research (IJNTR). Vol. 5 (6), pp. 34-38.

Patrut, A., Woodborne, S., Reden, K. F., Hall, G., Hofmeyr, M., Lowy, D. A., & Patrut, R. T. (2015, January 26). African baobabs with false inner cavities: the radiocarbon investigation of the Lebombo Eco Trail baobab. PLoS One, vol. 10 (1).

Plaat, D. v. (2014). Architecture of Sun and Soil. European Architec-

ture in Tropical Australia. Investigating and Writing Architectural History: Subjects, Methodologies and Frontiers. Papers from the Third EAHN International Meeting (pp. 1119-1130). Turin: Politecnico di Torino.

Planhotel SA. (2024, June 15). Baobab Zanzibar. Retrieved from Sandies Resorts: https://baobabzanzibar.sandies-resorts.com/

PlantNet. (2024, September 15). Retrieved from Identify plant: https://identify.plantnet.org/

Rajapaksha, I. (2017). Effect of spatial ambience on thermal adaptation in tropics: Case of free-running shared spaces in coastal hotels of Sri Lanka. Procedia Engineering 180 (pp. 975-985). Amsterdam: Elsivier Ltd.

Revolitionary Governmant of Zanzibar. (20, September 2024). World travel in 360. Zanzibar. Retrieved from World travel in 360: https://zanzibar.worldtravelin360.com/G1Hf91fTV2/36973318p&67.98h&67.82t

Rogers, N. E. (1964, Gennaio). Homo Additus Naturae. Casabella Continuità n.283, p. 3.

Saenger, P. (2002). Mangrove Ecology, Silviculture and Conservation. Lismore, Australia: Springer Science+Business Media Dordrecht. Published by Kluwer Academic Publishers.

Serreau, C. (Director). (1996). La Belle Verte [Film].

Sharp, I. (2009). Four Seasons: The Story of a Business Philosophy. USA: Portfolio.

Smith, W. L. (2005, December). Experiential tourism around the world and at home: definitions and standards. International journal of services and standards, vol.2(1), pp. 1-14.

Stagno, B. (2020, January 31). Design Guidelines for Contemporary Tropical Architecture. Retrieved from ArchDaily: https://www.archdaily.com/928807/design-guidelines-for-contemporary-tropical-architecture

Steyn, G. (2002). The Lamu house - an East African architectural enigma. University of Pretoria, Library Services, 157-180.

Tempini, A. (2022). Traditional ecological knowledge in the Peruvian Andes: practice, synergies, and sustainability. Norwegian University of Life Sciences.

The Cocoon Collection. (2024, June 15). The Island Pongwe. Retrieved from https://www.theislandpongwe.com/

The Mora. (2024, June 15). The Mora Zanzibar. Retrieved from https://www.themora.com/zanzibar/

The revolutionary government of Zanzibar. Zanzibar planning comission. (2020, October). Zanzibar Developmant vision 2050. Zanzibar, Tanzania.

The Sands. (n.d.). The Sands Beach resort Zanzibar. Retrieved from https://www.thesandszanzibar.com/

Tripadvisor LLC. (2024, June 15). Eden Rock Zanzibar. Retrieved from Trip Advisor: https://www.tripadvisor.com/Hotel_Review-g21408683-d21286372-Reviews-Eden_Rock_Zanzibar-Mtende_Zanzibar_Island_Zanzibar_Archipelago.html

TUI Hotel Betriebsgesellschft MBH. (2024, June 15). TUI Blue Bahari Zanzibar. Retrieved from https://www.tui-blue.com/en/en/hotels/tui-blue-bahari-zanzibar/

Tulia Zanzibar. (2024, June 15). Tulia Luxury Hotels Group. Retrieved

from https://www.tuliagroup.com/

Wageningen University & Research. (2024, September 08). Root system drawings. Retrieved from WUR Image Collection: https://images.wur.nl/digital/collection/coll13/search

Wanjiku, M. W., & Maina, S. M. (2020). From Vernacular to Modern: Transitioning East African Traditional House Design to Contemporary. Africa Habitat Review Journal. Vol. 14 (3), 2081-2093.

Watson, J. (2023). Lo-TEK. Design by Radical Ingenism. Cologne: TASCHEN.

Watson, J., Abukhodair, H., Ali, N., Robertson, A., Issaoui, H., & Sun, C. (2021). Design by radical indigenism: equitable Underwater & Intertidal technologies of the global south. SPOOL. 8(3).

World Wildlife Fund. (2024, November 03). The Importance of Mangroves to Coastal Communities. Retrieved from https://www.worldwildlife.org/pages/the-importance-of-mangroves-to-coastal-communities

Yaneva, A. (2022). Latour for Architects. New York: Routledge.

Zanzi Resort. (2024, June 15). Zanzi Resort. Retrieved from https://www.zanziresort.com/

Zanzibar Investment Promotion Authority. (2024, November 22). Zanzibar Investment Guide 2023-2024. Retrieved from https://www.zipa.go.tz

List of pictures

Picture 3.2. Bird eye view of The Mora Zanzibar residential buildings. Image from agoda website. Accessed November 24, 2024, from, https://www.agoda.com/emerald-zanzibar-resort-spa/hotel/potowa-tz.html?cid=1844104&ds=edjy4mA6VzI4ajbi

Picture 3.3. Top view of the Sensations Eco Chic Hotel resort. Image from Sensations Eco Chic Hotel website. Accessed November 24, 2024, from, https://www.sensations-zanzibar.com/gallery/

Picture 3.4. Bird eye view of the TUI Blue Bahari Zanzibar. Image from Secretescapes website. Accessed November 24, 2024, from, https://www.secretescapes.com/all-inclusive-5-star-zanzibar-beach-stay-in-a-tropical-paradise-refundable-hotel-tui-blue-bahari-zanzibar-tanzania/sale-hotel?gallery=true

Picture 3.5. Residential blocks of Melia Zanzibar. Image from Melia Hotels and Resorts website. Accessed November 24, 2024, from, https://www.melia.com/en/hotels/tanzania/zanzibar/melia-zanzibar

Picture 3.6. Bird eye view of the Tulia Unique Beach Resort. Image from Tulia Unique Beach Resort website. Accessed November 24, 2024, from, https://tuliazanzibar.com/gallery/

Picture 3.7. Bird eye view of the Pongwe island. Image from The Island Pongwe website. Accessed November 24, 2024, from, https://www.theisland-pongwe.com/

Picture 3.8. Single villa of the Karafuu Beach Resort & Spa. Image from Karafuu Beach Resort & Spa website. Accessed November 24, 2024, from, https://karafuuzanzibar.com/en/gallery/

Picture 3.9. Standard bungalow unit of The Sands Beach Resort Zanzibar. Image from The Sands Beach Resort Zanzibar website. Accessed November 24, 2024, from, https://www.thesandszanzibar.com/

Picture 3.10. Royal beach two bedroom villa of the Baraza Resort & Spa. Image from Baraza Resort & Spa website. Accessed November 24, 2024, from, https://www.baraza-zanzibar.com/villas-in-zanzibar/

Picture 3.11. Top view of Breezes Beach Club & Spa. Image from Breezes Beach Club & Spa website. Accessed November 24, 2024, from, https://www.breezes-zanzibar.com/image-gallery/

Picture 3.12. Two story residential units of the Evergreen Bungalows resort. Image from Evergreen Bungalows website. Accessed November 24, 2024, from, https://www.zanevergreenbungalows.com/

Picture 3.13. View of two story single residential units of the Jambiani Villas. Image from Jambiani Villas website. Accessed November 24, 2024, from, https://jambiani-villas.com/

Picture 3.14. Superior King room of the Blue Moon Resort. Image from Blue Moon Resort website. Accessed November 24, 2024, from, https://www.blue-moonresort.com/gallery/

Picture 3.15. Single unit of the Eden Rock resort. (Photo by Hei Li K on Tripadvisor, 2022)

Picture 3.16. The Residence Zanzibar restaurant building. Image from The Residence Zanzibar website. Accessed November 24, 2024, from, https://www.cenizaro.com/theresidence/zanzibar/gallery

Picture 3.17. Bird eye view of the Fruit and Spice Wellness Resort Zanzibar. Image from Fruit and Spice Wellness Resort Zanzibar website. Accessed November 24, 2024, from, https://fruitandspiceresort.travel/

Picture 3.18. Bird eye view of the Zanzi Resort. Image from Zanzi Resort website. Accessed November 24, 2024, from, https://www.zanziresort.com/

Chapter IV.

Picture 4.1. Mtoni Palace Ruins, Malawi Road, Zanzibar. Image from go visit zanzibar website. Accessed November 24, 2024, from, https://govisitzanzibar.com/exploring-enigmatic-ruins-zanzibar-journey-through-time/

Picture 4.2. Native huts, showing boriti and fito (pole and lath) walls filled with mud or lime mortar and topped by makuti (thatch) roofs, Ng'ambo area, Zanzibar. (Photo by British Resident Henry Pilling to Secretary of State for the Colonies Oliver Stanley, 29 Sept. 1944, dispatch 68, Colonial Office Records 618/83/1, Public Record Office, London.

Picture 4.3. Fito frame with udongo (mud) walls, Mwera, Zanzibar. (Photo by Garth Myers, 2006)

Picture 4.4. Dhow boat waits for a load in Stone Town harbour, Zanzibar. (Photo by W. E. Falck, n.d.)

Picture 4.5. Dhow sails into Dar-es-Salaam harbour. (Photo by W. E. Falck, n.d.)

Picture 4.6. House of Hanzabe from Baobab Tree. (Photo by Idd Ninga, 2013)

Picture 4.7. Sho't Left- Sunland Baobab. (Photo by Neil McCartney, 2011)

Chapter V.

Picture 5.1. Root bridge, Riwai village, India. (Photo by Jitaditya Narzary, n.d.)

Picture 5.2. Al-Tahla Floating islands of the Ma'dan, Iraq, (Photo by Esme Allen, n.d.)

Pictures 5.3 - 5.7. Frames from the Serreau, C. (Director). (1996). La Belle Verte [Film].