

# MIDA CREEK

PROPOSED DEVELOPMENT  
PROJECT

## Topics of discussion

- ▶ Visioning and objective/ Business case
- ▶ Research and mapping
- ▶ Site analysis

- ▶ Developing scenarios/Timelines/ Stakeholders
- ▶ Plan proposals

## National Spatial Plan Analysis Existing and Potential Urban Based Industrial/ Agriculture Regions

### Key:

National corridors

Northern national corridors

LAPPSET corridors

National growth areas-cities

Regional growth centers

Urban growth potential areas

Principle Industrial towns

Principle Industrial towns

High agricultural potential zone (High agro-based industrial potential)

Mixed potential zone (Medium Industrial potential)

Rangelands potential zone (High livestock based industry)

Vision 2030 proposed metropolitan area

Existing metropolitan area

Water bodies

## KILIFI PROPOSED URBANISATION STRUCTURE

Population per sub-county

Tana River

Taita taveta

Kwale

Magharini

Malindi

Kilifi South <sup>Kilifi</sup> Ganze

North

Kaloleni

Rabai

Urban centers with population >2000

County Area: 12,610Km<sup>2</sup> Population: 1,109,735 (Male 52%< Female 48%)

132688

151159

249355

252924

323609

Sub-county boundaries

## KILIFI LIVELIHOOD ZONES I. Tourism + fishing:

- Tourism and Fishing major economic activities
- Deep-sea fishing lucrative venture
- Sport fishing new venture

### II. Agriculture:

- Arable land – maize and cassava are main subsistence crops
- Main cash crops (coconuts, cashew nuts, sisal) citrus fruits [Tana River](#) (mangoes, pineapple) Horticulture (Flowers, Fruits, and Vegetables)
- Opportunities exist in their expansion, fertile soils + good weather pattern

### III. Livestock:

- Livestock and poultry farming is a major economic activity

## Magharini

- Dairy and beef cattle ranches are kept as well as bee-keeping

### IV. Mining:

- Salt mining and sand harvesting
- Potential for exploitation include Iron Ore, Titanium

## Taita Taveta

## Malindi

## Ganze

Arabuko Sokoke Forest **Kaloleni** Kilifi

## South Marginal Mixed Farming

Mixed Farming

Cash Cropping

## Kwale

Ranching **Kilifi** North

## Rabai

45 % Tourism

8% Agricultural industries

5% Farming

2% Mining  
Economy activity-Kilifi county(2009)

15% Ports & Fishing  
6% Fisheries  
4% Forestry  
15% Other

Tana River

Taita tavetaKwale

## KILIFI PROPOSED URBANISATION STRUCTURE

Existing town New proposed towns

Significant County Centers  
Significant sub-county centers  
Strategic Development nodes

Transport link loop  
Multi-modal transport

Sub-modal transport

Urban centre  
Multi-modal transport

Sub-modal transport

Sub-modal transport

## KEY POINTS

- Trade potential exists – positioning on Indian ocean shoreline, proximity to international sea port in Mombasa
- Standard Gauge Railway (SGR) cuts across - Mazeras and Mariakani towns
- Active ports with potential for expansion to international standards at Mayungu and Takaungu
- 2 international trunk roads and elaborate network of national and county roads
- Malindi international airport, proximity to Moi international airport in neighboring Mombasa County
- potential for more Special Economic Zones (SEZs), Export Processing Zones (EPZ) and other industrial parks
- County with longest shoreline, great potential for trade in fish, fish products and related service, apart from trade in several cash crops and related goods and services

Gravitational centers

Major proposed air node

# KILIFI COUNTY INTERGRATED DEVELOPMENT

Existing ports

## PLAN

New ports

Mida Site

Tana River

Kwale county

Marereni

Taita taveta

RamadaKakokeni

Kakonyuni

Ngomeni

Malindi

Mazeras

Chakama

i15

i7i8

i14

i1

i1

i3  
i10  
i10  
T18  
T10 i5  
i6  
i9  
i12

i13 i11 Mariakani

Mombasa

T7  
T19  
T19  
T19

T14 ADC Baricho

T17  
T14  
T11

T7  
T13 T17

T16 T13

T3  
T15  
T17 T12

T13  
T5

T4T3

Gede

Kilifi

Takaungu

Mtwapa

Tezo

i2

Existing factory

New factory

Medium level trade center

Industrial institutional

Administrative center

Industrial town

New town

Existing town

Touristic center

Rainfed-irrigated agriculture/ranching Irrigated based agriculture

Conservation area

Mining & agriculture

Intensive agriculture & dairy farming

Intensive tourism investment

Sport tourism

Existing tarmac rd

Proposed tarmac rd

Proposed murrum rd

Existing murrum rd

Existing railway line

Proposed railway line  
Galana river  
County boundary  
Existing Airport  
Proposed factory  
Cultural bomas  
Sea ways  
Proposed industries i1/i4. Agro processing  
i2/i3/i5. Beef processing  
i6. Ship building  
i7/i8. Building materials i9. Dairy processing Existing industries  
i10. Salt extraction i11/i13. Cement factory i12. Sisal processing i14/i15. Building materials  
i16. Cashewnut processing  
Touristic and Historic sites T1. Kaya Rabai  
T2. Takaunga  
T3. Kilifi Creek  
T4. Mida Creek  
T5. Watamu  
T6. Gede  
T7. Malindi Marine Park  
T8. Vasco dagama  
T9. Mambui  
T10. Hells kitchen T11. Arabuko Sokoke forest T12. The Kayas  
T13. Beaches  
T14. Wildlife dispersal corridor T15. Holiday homes & clubs  
T16. Theme park T17. Sports tourism T18. Educative tourism T19. Culture center

## DEVELOPMENT/INVESTMENT PLANS

### Socio-economic agriculture

- 50% arable, subsistence crops -maize, cassava, green grams, cow peas, rice and bananas
- Cash crops - Cashewnut, coconut and mangoes, major fruits/horticulture pineapples, lemons, passion fruits, lime, pawpaw and water melons
- 56% of county land is suitable for agricultural practices, 44% can be transformed for agricultural purposes by investing in irrigation related technologies
- total area of 112,879 Ha of land is

under food crops while that under horticultural including fruits and vegetables is 73041.7 Ha in the county

- Working force 53 % women to men
- small scale farms is 3.6 acres, and large scale is 8.09 ha

### Mining

- Vast mineral deposits whose full exploitation could significantly transform the county in terms of poverty reduction and economic development
- Significant extractions of iron ore, manganese, cement manufacturing, coral rock harvesting, quarrying, ballast, salt and sand harvesting present eg . Mombasa cement - Takaunga and Athi River cement – Kaloleni



## Renewable energy

- 80% of the population in the county relies on wood fuel for their energy needs - deforestation
- county receives over 6 hours of sunlight, with an average of Direct Normal Irradiation (DNI) ranging between 4.0kW2/s in the hinterland areas around the western parts of Magarini sub county to 6.75 kW2/
- Strong winds on land with an average speed of between 5-71m/s present a significant opportunity for development of renewable wind energy
- Indian Ocean is a potential source of off shore energy - presence of strong winds, waves, tides and temperature that can be tapped for the development and generation of renewable marine/blue energy

## Aquaculture/mariculture/ fishing

- county relies heavily on natural water bodies for its supply of fish production, resources are subjected to over-exploitation and global climatic change
- alternative income, employment opportunities and to ensure food security in the country
- steep competition with marine fish which is lowly priced
- Water shortages, enough seeds for stocking, feeds as well in- availability of cheap fish feeds
- potential of aquaculture in the county has not been established

## Algaculture /seaweed farming

- Promotion by Pwani University in collaboration with Fisheries department and KEMFRI
- Funding from County government through Ministry of Agriculture, Livestock and Fisheries and Kenya Coastal Development Program (KCDP) for up scaling of the activities
- Improves county's economy through employment creation, foreign exchange earnings, poverty reduction and food security support

## Ports

- Kilifi county + KPA – explore possibilities developing some of harbors/bays into full fledged ports
- County is exploring the competitive advantage of developing passenger ferry services to Lamu and Mombasa, and potentially ease pressure off the main Mombasa-Malindi-Lamu highway
- Malindi - has a port that serving the local fish industry handling approximately 1,250MT per year and 8000 tourist boat moves
- Ngomeni - potential to develop as a third port of Kenya and possibly a Special Economic Zone
- Takaungu - port for the offloading of cargo from Ships that dock at Lamu Port situated about 200 km North of Malindi
- Kilifi bay - for water sports, hotel anchorage, jetty, with marina facilities for tourists also handles fish at

approximately 260MT per year

## TOURISM OPPORTUNITIES

### Archaeological monuments & sites

- such as those in Gede, Malindi, Takaungu, Mnarani and Rabai, dating back to the slave trade period
- scenic views, recreational, cultural, historical, nature and shared experiences
- long shoreline hosts innumerable marine sites that offer eco- tourism and water-sport attractions
- include the creeks at Mtwapa, Mida, Kilifi, Ngomeni and Fundisa bay

### Hotel industry

- *Palm Exotic Hotel*-an international brand being the latest having shown interest to open its doors in the region.
- *Vipingo Gold Club* records being the first Golf club to be accredited international standard in East Africa under USGA in 2016
- 8 classified hotel, 370 unclassified hotels 91.5% includes hotels, villas, cottages, lodges and guest houses and high end hotels

### Education

- upcoming *Utalii College* is expected

to open a new frontier in the tourism sector

### Transport

- ongoing expansion of *Malindi international airport and Mombasa Lamu road*, deemed to open more opportunities
- *Vipingo airstrip* has opened doors for charter planes in the region with the recently launched standard gauge railway (SGR) supporting access to the destination
- Mariakani- Kilifi road has equally eased transport with *Bamba- Kilifi and Tsavo East National Park-Malindi* road leveraging on infrastructure.
- domestic tourism market has expanded by 72% since 2010 increased investment KTB “Tembea Kenya na Mimi”

**CONSERVATION SITES** Malindi and Watamu Marine Parks are UNESCO designated biosphere reserves that are a critical habitat for some indigenous and migratory bird species. They provide breeding and nursery grounds for various endemic fish species, marine turtles and several species of Crustaceans.

### Arabuko Sokoke Forest

- Reserve-herd of about 70 elephants

- Diverse populations of reptiles and invertebrates also present in the forest
- 240 birds' species, including six globally threatened bird species eg Clarke's Weaver, Sokoke Scops Owl, Sokoke Pipit
- 261 butterflies
- 79 amphibians
- 52 mammals, including 3 taxa which are globally threatened Sokoke Bushy-tailed Mongoose, Ader's Duiker, Golden-rumped Elephant-shrew
- 600 plants species 50 of which are globally rare

### Malindi Marine Park

- endowed with magnificent resources

such as fringing reefs, coral gardens in the lagoons, sea grass beds, mangroves, mudflats, and high fish diversity, marine mammals (e.g. dolphins), turtles and various species of shorebirds

### Watamu Marine Reserve

- habitats include intertidal rock, sand and mud, fringing reefs and coral gardens, coral cliffs, sandy beaches and the Mida Creek mangrove forest
- Marine life attractions include fish, turtles, dugongs and crabs
- Mida Creek forest has a high diversity of mangrove species that provide refuge to a variety of both resident and migrant bird species

► Arabuko Sokoke Forest & Mida Creek

# ARABUKO SOKOKE FOREST

## ARABUKO SOKOKE FOREST

- ▶ largest single block of indigenous coastal forest remaining in East Africa
- ▶ approximately 41,600 ha
- ▶ three major vegetation types; Mixed Forest, Brachystegia Forest, Cynometra Forest

- ▶ rich biodiversity; a concentration of endemic and endangered flora and fauna
- ▶ Ranked as 2<sup>nd</sup> most important conservation forest in mainland Africa

## Administrative features

- National road - Malindi rd
- Site situated in Majaoni sub-location

- In close proximity to the town centre Mida and police post
- Site accessed through murrum rd and dry weather roads

## Infrastructure within the forest

level

- Perennial river in close proximity to neighboring 30A plot
- Site edge distance to the creek boundary approx. 40M
- Mida creek is a tidal creek - meandering channel in a coastal wetland subject to bi-directional tidal currents

- Lies between 0-20M above sea

# Vegetation types Population density

- largest single block of indigenous coastal forest remaining in
- Forest products apart from timber-poles, fuelwood, honey, East Africa medicine etc.
- approximately 41,600 ha
- Agro-economy is sustainable by settled mixed farming, cash
- three major vegetation types; Mixed Forest, Brachystegia crops eg coconut is intercropped with food crops eg maize Forest, Cynometra Forest
- Average farm size 3.9ha(0.2-20ha)
- rich biodiversity; a concentration of endemic and endangered
- Annual income mean ksh27,000 (ksh 500-166,440) flora and fauna
- Male:female ratio 1:1.08
- Avg household size 7.03
- Per capita income ksh 3,863/yr

## Forest management zones



- Largest single block of indigenous coastal forest remaining in East Africa
- Approximately 41,600 ha
- Three major vegetation types; Mixed Forest, Brachystegia Forest, Cynometra Forest
- Rich biodiversity; a concentration of endemic and endangered flora and fauna
- Site partly sits on intervention zone – concerned with meeting subsistent needs and improving neighboring livelihoods

## Topographical features

- Lies between 0-20M above sea level
- Perennial river in close proximity to neighboring 30A plot
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## ARABUKO SOKOKE FOREST-Forest Management

### Intervention zone

- Outside forest reserves
- Sub-locations bordering the forest
- Community willingness
- Demand for forest products
- Contribution to meeting subsistence needs and improving livelihoods of forest-adjacent communities
- Reduce pressure on natural forest
- On-farm tree planting
- Tree nurseries
- Problem animal control
- Agroforestry
- Beekeeping
- Butterfly farming
- School & education programme
- Eco-tourism
- Water source management
- Local communities
- KEFRI
- FD
- NMK
- KWS
- Educational institutes
- Tourism players

### Intervention zone

- Local community • Fuelwood
- Poles
- Tree seedlings
- Butterflies
- Silkworms
- Awareness
- Water conservation
- Crop protection
- Livelihood security
- Water conservation
- Participatory forest management plan
- Problem animal management plan
- Infrastructure development and maintenance plan
- Forest protection plan

Local communities dependent on the forest for their livelihood needs,

including: fuelwood, poles, fruits, medicinal plants, bushmeat and fodder  
populations increase=forest degradation and adverse impacts on  
biodiversity

Sokoke Amani Sunbird-near endemic

Scops Owl-near endemic

Clarke's Weaver-endemic

Sokoke Pipit-near endemic

► 230 bird species 6 globally threatened species: Spotted Ground  
Thrush, East Coast Akalat

# ARABUKO SOKOKE FOREST-Biodiversity

## ARABUKO SOKOKE FOREST-Biodiversity

Ader's Duiker Golden-rumped

Elephant-shrew

Sokoke Bushy-tailed

Mongoose

Elephants

- ▶ 52 mammal species; 3 taxa which are globally threatened, 250 recorded species of butterfly, 600 recorded plant species,

## MIDA CREEK MANGROVE

# FOREST MARINE PARK

## MIDA CREEK - VEGETATION

Site Mida creek is a tidal inlet located  
Creek has diverse ecosystems types such as in Watamu Marine  
Park and  
mangrove forest, coral reefs, and sea reserve in Kilifi County and  
covers  
grasses among other. It lacks overland an area of 3200 ha  
freshwater input but receive underground freshwater recharge from  
Arabuko Sokoke forest.

21

## MIDA CREEK – LAND USE 1969

Site

22

## MIDA CREEK – LAND USE 1989

Site



23

## MIDA CREEK – LAND USE 2010

Site

24

Mangrove ecosystem services, economic values and human wellbeing



Community awareness of mangrove regulating and cultural services

Use of mangrove-based products by local households

26

## Economic value of mangrove ecosystem services

Activities US\$/YEAR US\$/HA

Economic value of Fish 735,800 555

mangrove ecosystem

Fish breeding &

1,873,000 585

Woodfuel, timber, poles & nursery

honey Fish Firewood & charcoal

Tourism & education

Carbon sequestration

1.1 11.2

8.3

44.44.5

2 45,500 166

Building materials 13,200 16 Honey 14,700 22

Shoreline protection

2,914,000 911

Flood control 0 0 Carbon sequestration

293,400 177

Biodiversity 129,000 40 Tourism & recreation

497,500 155

Education & research

44,000 14

TOTAL 6,559,700 2,050

Malindi Marine Park  
Gede Ruins  
Hotel/  
**0.5km**  
tourism corridor  
*Mida creek*  
Watamu Marine national

Watamu Beach park

Transport nodes  
Watamu Marine Park  
Touristic nodes  
Urban nodes  
Conservation nodes

Conservation boundary 50M/30M (forest & creek)

Malindi rd -National rd 40-60M reserve

Seasonal rivers/streams

Eco-walk bridge

Motorable rd/ footpath

Touristic nodes

Community nodes

Client site 24 A



TAPPING/SCALING  
UP THE ECONOMIC  
& ECO VALUE OF  
MANGROVE/FORES  
T/CREEK/SEA

TAPPING/SCALING UP THE ECONOMIC &  
ECO VALUE OF  
MANGROVE/FOREST/CREEK/SEA

TAPPING/SCALING UP THE ECONOMIC &  
ECO VALUE OF  
MANGROVE/FOREST/CREEK/SEA

# WHAT MAKES THE SITE UNIQUE

## TOUR & ACTIVITIES HIGHLIGHTS- COMMUNITY/EDUCATION/CON SERVATION:

- Wildlife tours, nature tours, birding, and
- Guide school

forest/mangrove, snorkeling, fishing, trekking, water

- Training center

sports, surfing

- Biodiversity conservation center

• Arabuko Sokoke forest, Mida Creek

- Sustainability center

• Watamu National Park

- Affiliations/awards/associations

• Malindi Marine Park

- Local community

• Beaches

- Organic garden

• Heritage sites / culture visits

## RESORT ACTIVITIES

### TARGET

### MARKET/CUSTOMERS:

- Wellness/relaxation/fitness/spa / yoga
- Honeymoon & romantic gateways
- Family vacations
- Friend group vacations

- Adventurists – thrill seekers
- Craft activities – Farm visits/cooking/baking class/
- Escapists – disconnect to reconnect
- Nature/biodiversity researchers

NB –Tourism and recreational developments stimulated in conservation areas should be *compatible with surrounding land use patterns, cultural values of the local population and not injurious to the natural attraction of the area.*

## CURRENT SITE

## USE

damming, agriculture(rice/fish)  
potential Creek boundary 30M no  
building  
Forest boundary 50M Agricultural  
zone potential

Client site 24 A

Malindi rd -National rd 40-60M  
reserve

Seasonal rivers/streams

Eco-walk bridge

Creek – Flood zone buffer 30M,  
Conservation boundary 50M/30M (forest & creek)

Motorable rd/ footpath

**CURRENT SITE PHOTOS –**

OVERLOOKING THE CREEK  
CURRENT SITE PHOTOS –  
OVERLOOKING THE CREEK  
CURRENT SITE PHOTOS –  
OVERLOOKING THE PLOT  
CURRENT SITE PHOTOS –  
OVERLOOKING THE PLOT

Creek – Flood zone buffer 30M, damming, agriculture(rice/fish) potential  
Creek boundary 30M no building

Forest boundary 50M Agricultural zone potential

CONCEPT SKETCH/ ZONNING – theme  
(tropical paradise/sea + forest)

Views into forest villas

Views into island

Private  
villas

island

resort  
Public resort  
island

Community inclusive eg museum/learning centre

Access

Island/sea (social and recreational areas) Eg wellness / spa, restaurant

Eco-Villa units/ Resort (accommodation)

Agro-forest

Creek – Flood zone buffer 30M, damming, agriculture(rice/fish) potential Creek boundary 30M no building

Forest boundary 50M Agricultural zone potential

## CONCEPT SKETCH/ ZONNING – theme

### (tropical paradise/sea + forest)

Botanical garden Island- forest/sea (social and recreational areas) Eg wellness / spa, restaurant, viewing platforms,

Organic farm/fishing farm/ back house 6 Agro-forest

Public green space,

3

community accessible

Lodge clusters e.g. 4

Divided into 4 quadrants that can be phased,

Community inclusive e.g. 7

museum, education center, training center 1

Beach front, provides

2

access and connection to the creek for lodgers and community alike

Main rd access 8

Access

Creek – Flood zone buffer 30M, damming, agriculture(rice/fish) potential Creek boundary 30M no building

Forest boundary 50M Agricultural zone potential

## CONCEPT SKETCH/ ZONNING – theme

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Main rd access 8

Access

## CONCEPT SKETCH/ ZONNING – theme (tropical paradise/sea + forest)

3Acres

Lodge clusters Divided into 4 quadrants that can be phased,

3.5Acres @ 4 = 14Acres

6

Community inclusive e.g. museum, education center, training center, botanical garden

Community inclusive e.g. museum, education center, training center, botanical garden

3

2Acres

4

1 1.5 Acres 2

7

Organic farm/fishing farm/ back house

4.27 Acres 8

Beach front, provides access and connection to the creek for lodgers and community a like



Access and linkages

24.77 Acres TOTAL

## CONCEPT SKETCH/ ZONNING – theme (tropical paradise/sea + forest)

6

8

1

2

Public botanical garden

7

3

Organic farm/fishing farm/ back house

4

Lodge clusters Including cottages,  
glamps, tents, villas, beach clubs,  
spa/wellness center

Community inclusive museum,  
education center, training center,  
botanical garden

connection to the creek for lodgers  
and community alike

Access road 18M

Beach front, provides access and  
Lodge plots surrounding garden

Landscaped water features

**PRECEDENCE : LOCAL EXAMPLES**

FUNDU LAGOON PEMBA ISLAND, TANZANIA  
PRECEDENCE :  
ECO-LODGES/ECO-RESORT

&BEYOND MNEMBA ISLAND, ZANZIBAR

PRECEDENCE :

ECO-LODGES/ECO-RESORT

LAPA RIOS ECOLODGE, COSTA RICA

**PRECEDENCE :**

**ECO-LODGES/ECO-RESORT**

DAINTREE WILDERNESS ECO-LODGE, AUSTRALIA  
PRECEDENCE :  
ECO-LODGES/ECO-RESORT

FIVE ELEMENTS- DENPASAR

PRECEDENCE :  
ECO-LODGES/ECO-RESORT

TSARA KOMBA, COSTA RICA

PRECEDENCE :  
ECO-LODGES/ECO-RESORT

SILKY OAKS LODGE - AUSTRALIA



PRECEDENCE : VILLAS LOCAL



PRECEDENCE : ECO-VILLAS

PRECEDENCE : COTTAGE/SUITES/TENT

FLOOR PLAN TYPOLOGIES

PRECEDENCE : COTTAGE/SUITES/TENT

FLOOR PLAN TYPOLOGIES

PRECEDENCE : COTTAGE/SUITES/TENT

FLOOR PLAN TYPOLOGIES

PRECEDENCE :

CHALETE/BUNGALOW/VILLA FLOOR PLAN

TYPLOGIES

