



**Ngamani**

# Ngamani – an Island in the Sun

Rolf Lattmann, Mtwapa

Kilifi County, Kenya

# Project: Ngamani – an Island in the Sun



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Google map from September 2012

A 28 acre piece of land in Kizingitini, Mtwapa

Location: Mtwapa - Mtomondoni - Kizingitini



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Rolf Lattmann, Swiss national

Professional Background: 30 years ICT

Since 2002 in Kenya

Activities in these 14+ years:

- JuaNguvu Ltd
  - JN Cyber - internet bureau, programming databases for websites, until 2008
  - TakaNguvu - building biogas plants
  -  since 2005
- Ngamani - an Island in the Sun, since 2006





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## A Coastal Forest from a completely depleted piece of land → an Island in a "desert"

The Coastal Forests of Eastern Africa are among the 8 most threatened of total 35 biodiversity hotspots on Earth

There used to be a 60 km Forest Strip along the Kenyan Coast

Aim of the project:

- "Rebuild" a coastal indigenous forest
- High biodiversity, mainly indigenous species
- "Shelter" for wild animals which are threatened by loss of habitat and hunting



High biodiversity, shelter for wild animals

## What I encountered in 2006



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Very varied landscape: 12 valleys, 2 hills, slopes, a river delta, mangroves  
Beautiful view onto the Mtwapa Creek

Lowest point: high water level of Indian Ocean  
Highest point: 30 m above sea level

Due to the way of the local farming:  
Completely eroded land: destroyed vegetation due to slash and burn, washed away top soil, especially on top of the hills and steeper slopes  
Deep water channels, top soil concentration at the bottom of the valleys



## Principles

- Not a plantation but a forest
- Highest possible biodiversity
- Mainly indigenous species
- Little or no farming
- Apply methods of organic farming, climate-smart agriculture and sustainability:
  - agro forestry
  - organic pest management
  - mulching
  - composting



## How we improved the situation 2/7



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### The Beginning ...

- See what is still growing
- Preserve what is there
- Planting of casuarina to get organic material (dead leaves and branches) and some income (after 7 years or so)





## How we improved the situation 3/7



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... The Beginning ...

- Erosion prevention
  - Build barrages in waterways to slow down water flow, settle the soil and divert the water out of the waterway to give it a chance to drain in the soil
  - Mulching to prevent top soil drying up and being washed away through heavy rain
  - Planting trees across fall line



## How we improved the situation 4/7



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... The Beginning ...

To prevent cutting of trees, collection of firewood and hunting:

- Life fence on 3 sides (North, West, East)



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## How we improved the situation 5/7



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### ... The Beginning

- Fence outside the mangroves (South)



## How we improved the situation 6/7



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The top soil is the skin of the Earth – protect it as we do with our own skin

And then

- Building up top soil and enhance its fertility
  - The fertility is brought by the micro organism in the soil, the worms and the wadudu.
  - Therefore: **mulching, mulching, mulching**
  - Collecting and producing organic material
  - Introduced buckets full of Mombasa Express
  - Canopy through fast growing nitrogen fixing Leucina
- Planting, Planting



## How we improved the situation 7/7



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### Now

- Where we haven't planted trees yet, the bush has taken over
- This dense / impassable bush consists of trees and shrubs – low biodiversity
- In this bush we plant indigenous trees to enhance the biodiversity
- As not all animals live in forests there are also different open areas with very few trees and shrubs. Here we are cutting the grass several times during the year -> mulch
- Forest Management:
  - built and maintaining paths through the forests – this to "separate" human and wildlife
  - Cutting the vegetation around young trees to give them enough sunlight, the cuttings are another excellent mulch for them
- Naming the different areas of the "Island": North Forest, South Forest, Agriculture Area, Jungle Valley, Orchid House, Arena, River Road, Delta, Baharini, Ho Chi Minh path, etc



## Establishment of the infrastructure



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- Store
- Water
- Roads
- Access in the forest
- Cottage
- El. power

no machines used – all "hand made"



Public Road, Jan 2010

# Roads



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Construction of 900 m private and  
and rehab of 500 m public road  
crossing 4 waterways  
total difference of altitude  $\sim 120$  m

from 2006 to February 2015



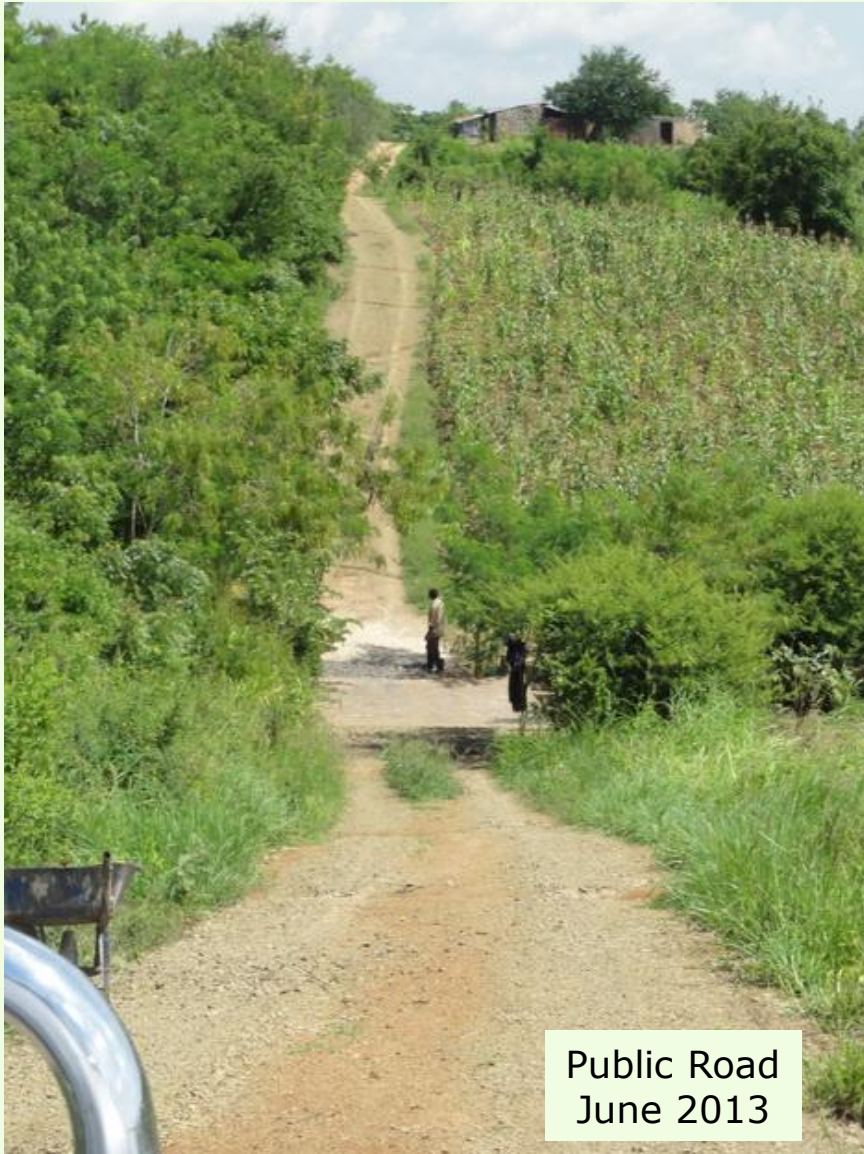
February 2009

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# Impressions of Road Construction



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Public Road  
June 2013



September 2013



December 2013

November 2016



# Impressions of Road Construction



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# Impressions of Road Construction



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# Impressions of Road Construction



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August 2006

# Wells



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April 2007  
capacity 53 m<sup>3</sup>



March 2013  
capacity 21 m<sup>3</sup>

# Rainwater Harvesting 1/4



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Capacity  $\sim 100 \text{ m}^3$



May 2007



December 2014

November 2016

# Rainwater Harvesting 2/4



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December 2007



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# Rainwater Harvesting 3/4



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November 2014



March 2013  
capacity 15 m<sup>3</sup>

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# Rainwater Harvesting 4/4



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November 2014  
capacity 15 m<sup>3</sup>

November 2016



# Once and Now – North Forest



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April 2006



December 2014

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# Once and Now – East Forest



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April 2006



December 2014

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# Once and Now – Lake Forest



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March 2006



December 2014

November 2016

# Once and Now – South Forest



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April 2006



May 2016

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# Once and Now – Arena and East Forest



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April 2006



December 2014

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# Once and Now – Agriculture Area



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April 2006



May 2016

November 2016

## Trees found or planted 1/3



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Lebbeck  
Mvule  
Muhuhu  
Mborea  
Mborea Malindi  
Mkulu  
Mgandi  
Bambakofi  
African Sausage  
"Amarula"  
Doom Palm  
Mbuyu  
Avicennia  
Raintree  
Mkungu  
Msufi  
Ylang Ylang  
Mkayukayu



## Trees found or planted 2/3



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Mukimwemwe  
Casuarina  
Neem / Mwarubaini  
Mfudu  
Mtola  
Mwavi  
Mufumbiri  
Mchumbu  
Mdungu  
Kikwata  
Mkudada  
Mjaje  
Muhowe  
Muhalanda  
Fenesi  
Mhavya  
Mungunga  
Mturituri  
Muyama





## Trees found or planted 3/3



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## Shrubs found



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Mpingo  
Kimkwachu  
Muhepe  
Mbaraka  
Mkulagembe  
Mkone  
Kidori  
Mtakwawa  
Mchekecheke  
Kirumbasi  
Mtunguja mwitu  
Munayu  
Mangi Mangi



# Mpingo – African blackwood

## *Dalbergia melanoxylon*



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### Properties

- purple black heartwood / yellow sapwood
- Specific gravity: 1.27 => 1,270 kg/m<sup>3</sup>
- Calorific value: 49,000 kcal/kg (LPG: 19,000 kcal/kg)
- carving, musical instruments, furniture
- nitrogen fixing
- 1 m<sup>3</sup> heartwood USD 20,000



# Mpingo – African blackwood *Dalbergia melanoxylon*



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Propagation of this fascinating plant

- Wikipedia: the mpingo tree is severely threatened in Kenya
- Ngamani: 2006 about a dozen older plants left
- started growing everywhere
- it likes the condition in some areas of Ngamani: poor rocky soil, very dry and hot in the dry season
- pruning the plant and clearing the root plate around the stem  
no mulching
- planted seeds
- successfully transplanted root suckers
- 2014: hundreds of mpingo are now growing
- Long term: income generation



Mpingo – African blackwood  
*Dalbergia melanoxylon*



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Mpingo – African blackwood  
*Dalbergia melanoxylon*



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# Wildlife



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## Wildlife in Ngamani

- Mammals
- Reptiles
- Insects
- Birds
- Butterflies
- spotted but no picture



# Wildlife



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# Wildlife



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# Wildlife



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# Wildlife



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# Wildlife



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# Wildlife



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# Wildlife



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# Wildlife



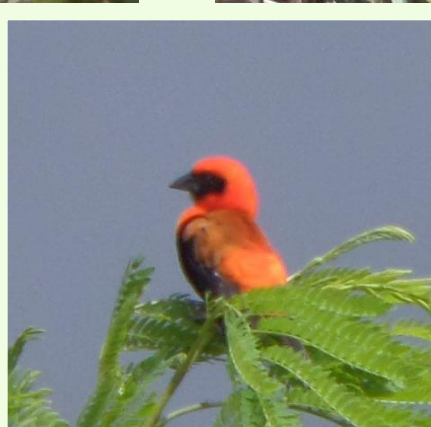
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# Birds 1



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A local expert has spotted over 75 different species of birds.  
The number and species of birds is increasing every year

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## Birds 2



# Birds 3



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# Butterflies



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# Butterflies



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# Butterflies



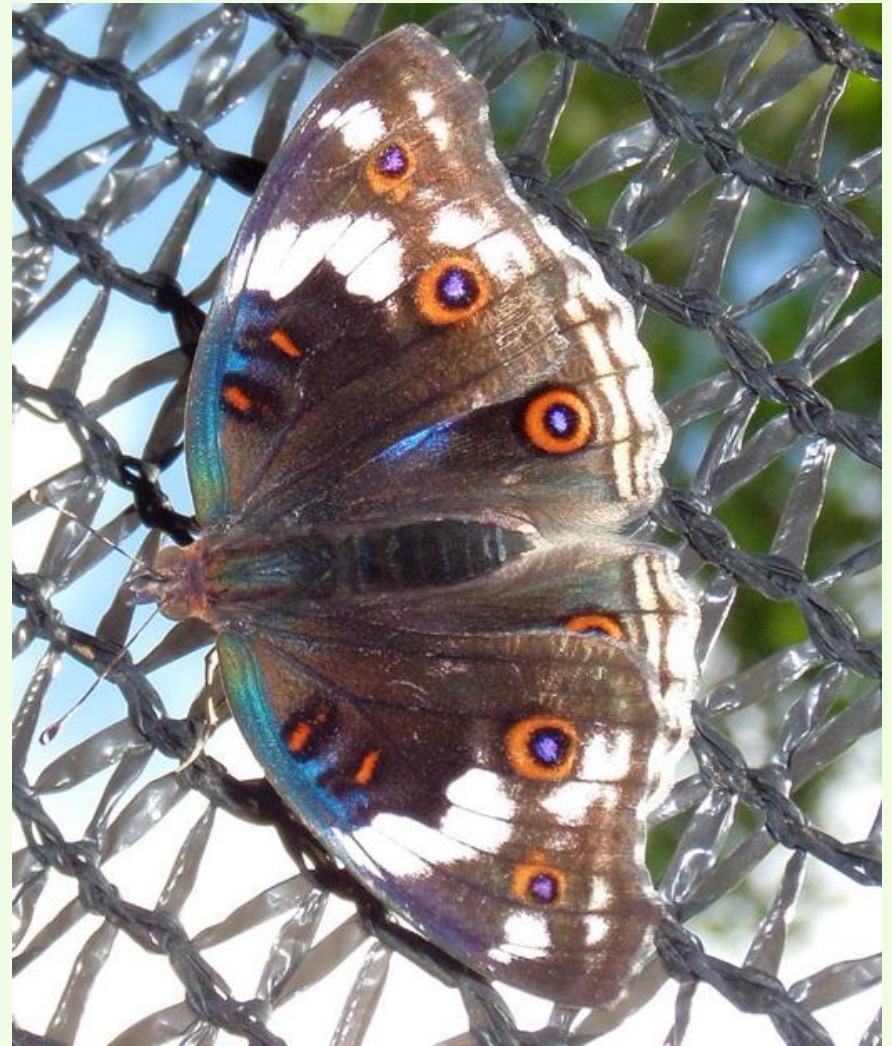
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# Butterflies



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## Wildlife – spotted but not pictured

- Suni (small antelope)
- Isa / Kasa (bigger antelope)
- Hares
- Mongoose
- Squirrel
- Panya buku
- Black footed cat / Monzo
- Tortoise
- 2 types of Elephant shrew



Civet Cat/Fungo



Bush Baby

# Flowers



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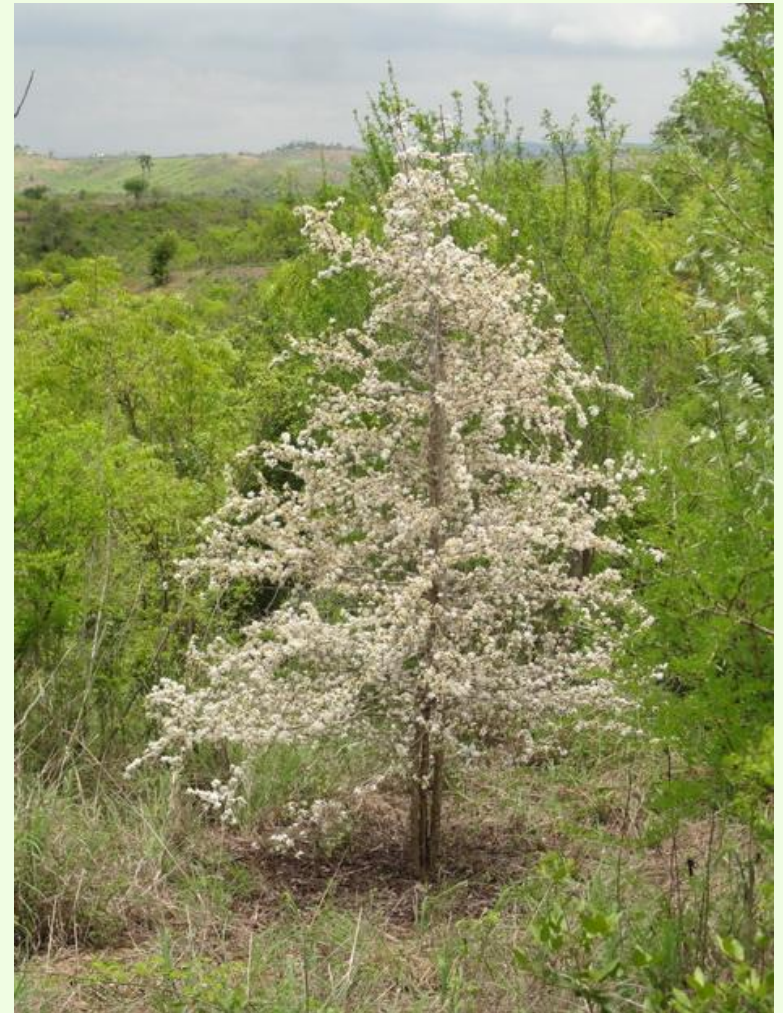
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# Flowers



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# Flowers



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# Flowers



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# Flowers



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# Flowers



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# Flowers



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# Flowers



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# Orchids



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## Orchid house

- local orchids
- orchids from the tropics from all over the world

Indigenous orchids planted in the forest





# Orchids



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# Orchids



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# Orchids



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# Commercial activities: N-blocks



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# Commercial activities



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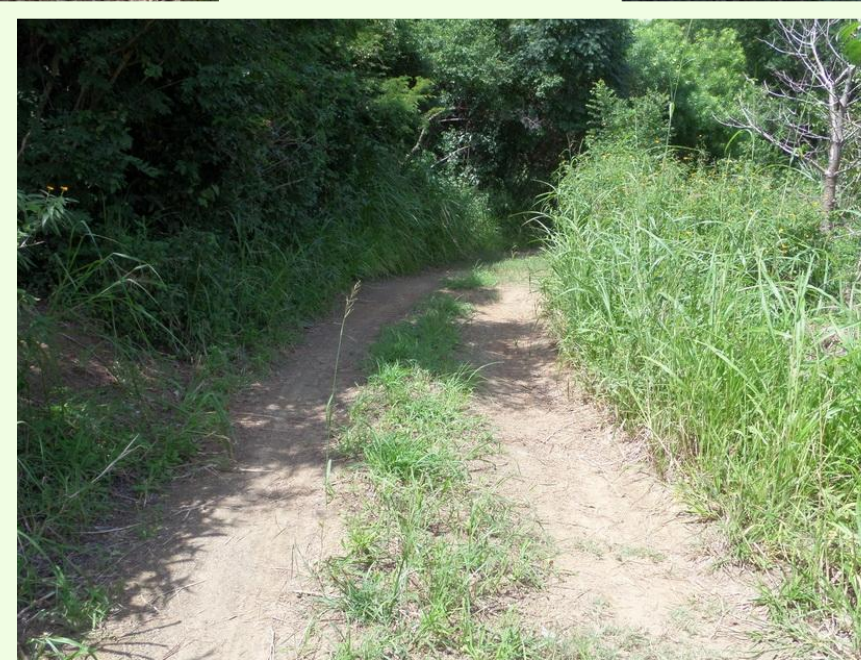
Mpingo



To walk around in Ngamani 1/3



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# To walk around in Ngamani 2/3



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# To walk around in Ngamani 3/3



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# The ones who helped to make it happen 1/2



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**Baraka**

**Allan**



**Benson**

# The ones who helped to make it happen 2/2



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Florence

Gary



Max

Moritz

Abramovich



**Archispirostreptus**  
(Mombasa Express)

## Side Effects



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Neighbours have slowly begun to change their attitude:

- less clearing of their own land -> organic matter remains
- reduced slash and burn -> mineral nutrients stay
- some like to have their own forests  
-> for recreation, for the environment as well as a source of income

My Wish: pictures like these are something of the past



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The heavy rains wash the remaining top soil away

It reaches the Mtwapa Creek

The brown water, loaded with soil, ends in the ocean

Where the load settles on the the coral reef and destroys it.

**→ Replicate the Ngamani project in the Area, for environmental and human benefits**

# Ngamani – an Island to visit



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Thank you for your interest

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