

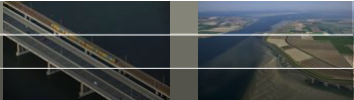


CLIMATE PROOFING AND
MASTERPLANNING OF
DELTA CITIES; THE CASE
OF BEIRA, MOZAMBIQUE

Peter Letitre



Partners involved



urban design
planning

wissing



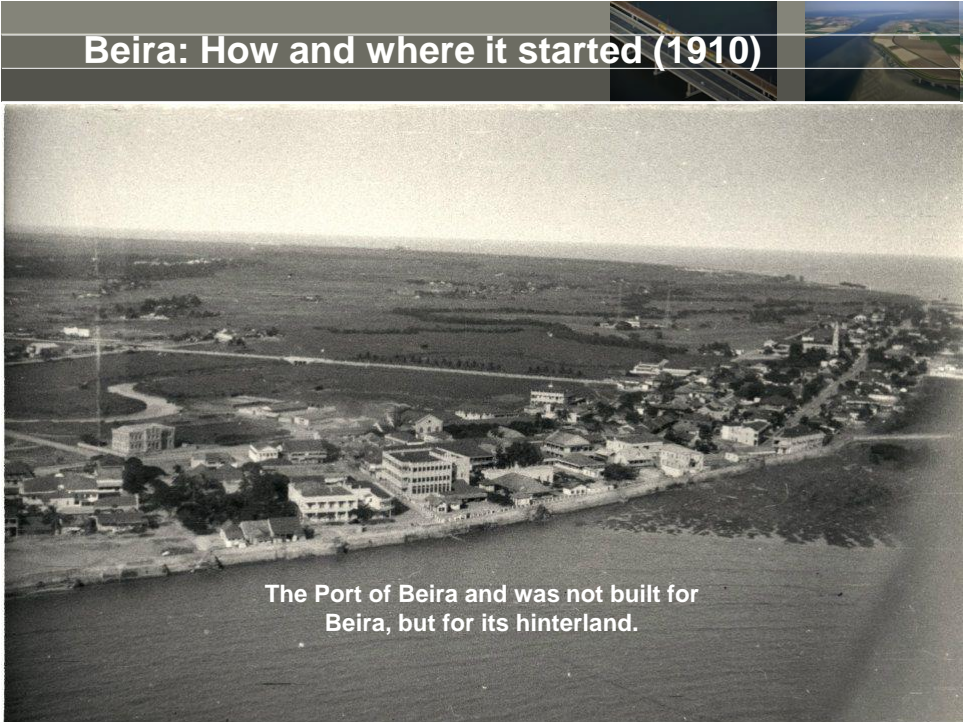
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Process: Stakeholders strongly involved in analysis and planning






SWOT analysis (schematic view)






(Climate related) threats



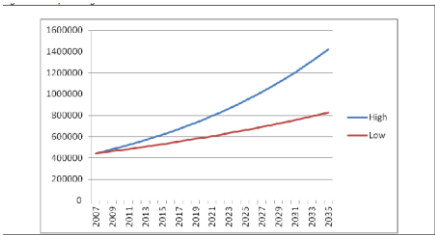
- Climate change
 - Sea level rise
 - Change rainfall patterns (more frequent and high intensity rainfall)
- Coastal protection
- Reduced drainage capacity



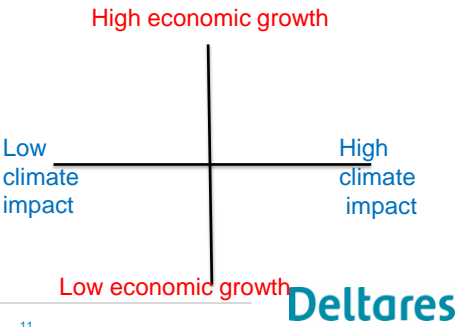
Growth and climate scenarios

Relevant climate change factors evaluated:

- 1. Low flows Pungue river 2035 (-3% low, -8% high)
- 2. Low flows Pungue river 2100 (-13% low, -32% high)
- 3. Rainfall frequency and intensity (no significant effect)
- 4. Sea level rise 2035 (0,10 m low, 0,2 m high)
- 5. Sea level rise 2100 (0,7 m low, 2 m high)



Population growth scenarios



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Projection of Future Growth

	Current	Projection 2035	
		Low scenario (2.25%)	High scenario (4.25%)
Population	443.000	827.000	1.422.000
Residential areas	7.743 ha	11.366 ha	16.991 ha
Industrial area	580 ha	1.375 ha	3.150 ha
Port area (total area)	442	575 ha	1.270 ha
Port area (net area terminals)	78 ha	237 ha	527 ha
Area requirements 2035	8.765 ha	13.320 ha	21.100 ha

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Some implications of this growth

Investment requirements

million USD	Residential	Industrial	Port	Flood Protection	Total
Low	1,832	270	64	60	2,226
High	4,676	870	186	60	5,797

Sand requirements

million m3	Residential	Industrial	Port	Flood Protection	Total
Low	54.9	10.4	3.1	1.3	69.7
High	150.2	34.0	18.0	1.4	203.6
Per Year	2.6 – 7.2	0.5 – 1.6	0.1 – 0.9	0.1	3.3 – 9.7
From Channel (max)	0.8				
From Sea	2.5 – 8.9				

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Urban development plan according to stakeholders

The map shows the urban development plan for Beira, Mozambique. It includes the Delia do Povoio river and the Indian Ocean. The plan features several zones: a large red area for expansion residential area/cidade satellite, a purple area for expansion port, a green area for expansion industry, a blue area for retention area, and a green area with a grid pattern for tourism zone. Infrastructure includes existing and new mainroads, increased public transport via existing railway, and new railways. Arrows indicate the movement of existing residential areas.

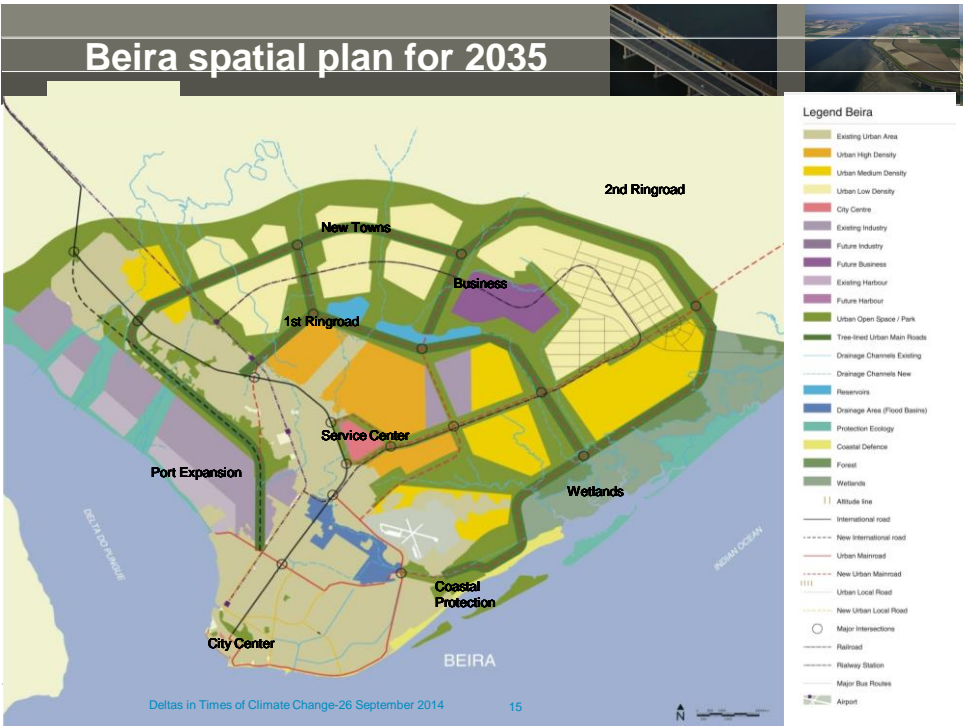
Legend

- existing mainroad
- new mainroad
- increased public transport via existing railway
- new railway
- expansion port
- expansion industry
- moving existing residential area
- expansion residential area/cidade satellite
- retention area
- tourism zone

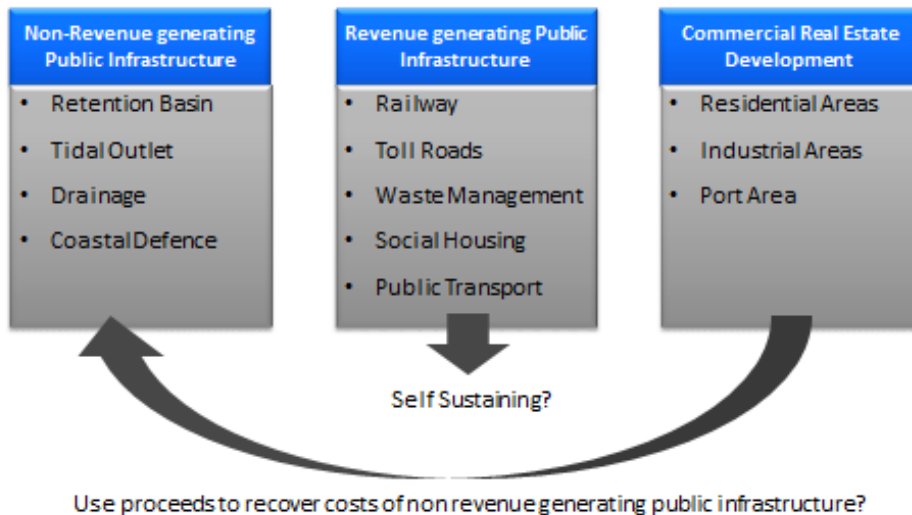
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Infrastructure Development Requirement



Beira land development (rationale)

Rationale of the Beira land development

- Concession practices and capacity to coordinate integrated urban development of CMB needs improvement (knowledge, financial, human resources, databases)
- Huge amounts of sand are needed:
 - soil conditions in future expansion areas port and industry are highly unfavorable
 - sand suppletion for coastal protection
 - railway and road construction and improvement
- Sand can be (partly) delivered by new dredging vessel
- Financing capacity of CMB is weak
- Proper planning of expansion areas is required to guarantee sustainability of new infrastructure

Beira land development (goals)

The main goals of the project are:

- To finance future expansion of Beira
- To manage for effective and efficient sand delivery and land development
- To improve capacity to coordinate concessioning and integrated urban planning
- To provide dry land and plots for residential and industrial purposes. These plots should be further made adequate for construction (i.e. leveling);
- To facilitate adequate (good quality) housing, industrial plots and basic infrastructure, specifically drainage and transport infrastructure.
- To improve financing capacity of CMB

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Challenges for Land Development

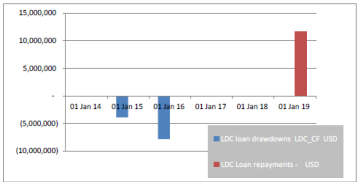


- Are Real Estate developers able and willing to pay the necessary land prices?
- Is Beira authorised to charge a fee for the use of land?
- Are developers and property buyers able to arrange finance to develop real estate?
- Outlay must precede returns

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Implementation starting on basis pilot



Date	LDC loan drawdowns (LDC_CF USD)	LDC Loan repayments (USD)
01 Jan 14	0	0
01 Jan 15	-2,000,000	0
01 Jan 16	-5,000,000	0
01 Jan 17	0	0
01 Jan 18	0	0
01 Jan 19	0	10,000,000

Conclusions:

- Pilot business case seems feasible from legal and technical point of view
- Based on business case also financially feasible.

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Next steps

- Making better use of existing programs (drainage etc.)
- Starting capacity building and on-the-job training CMB
- Fine tuning City Masterplan and Port Masterplan
- Financing and investors conference March 2015
- Maintain dynamics by coordination and support for the implementation process

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