REVITALIZATION OF THE BAIXA DE MAPUTO THROUGH DENSE INFORMAL HOUSING

MAPUTO STUDIO 2011-2012
Faculty of Architecture, TU Delft

Graduation project presentation
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MOZAMBIQUE
CONTENTS

1_Brief introduction to Maputo
2_Research questions
3_Proposed solutions
4_Urban design
5_Architectural design
6_Future steps
PART 1_brief introduction
to Maputo
Portuguese trading post Lourenço Marques
Portuguese trading post Lourenço Marques
"INFORMAL CITY"
far away from city centre
sparsely built
small “shacks”, simple materials
_INFORMAL
_colourful

daily life = outside
traditional heart of the Baixa
PART 2_research questions
Research question_1

How to integrate currently vacant plots and upper floors into a revitalization strategy for the Baixa de Maputo?
Why is a ‘revitalization strategy’ necessary?
A ‘revitalization strategy’ necessary to stop the self-reinforcing negative spiral of rundown buildings appearing.
A ‘revitalization strategy’ necessary to stop the self-reinforcing negative spiral of rundown buildings appearing.
Research question_2

How to provide shelter / living space in the dense urbanity of the Baixa de Maputo, following a local, informal style?
Informal living typology
Informal living typology _basic elements_

- toilet
- kitchen
- shadow
- subsistence farming
- garbage pit
- house
- outside space
  - neighbours
Informal living typology _growing building_
PART 3_proposed solutions
Proposed solution to **question 1** strategy for vacant plots

**CONCEPT**

small scale interventions

influence surroundings

*CATALYST*
Proposed solution to question 2 _informal living in Baixa?

METHOD of several steps
Proposed solution to **question 2** _informal living in Baixa?_

analysis following on-site research
Proposed solution to question 2 _informal living in Baixa_?

- analysis following on-site research
- densify into urban context
PART 4 _urban design
Concept of urban plan

...aims to *link* and *preserve* by introducing a subtle but tangible urban element along certain routes through the old Baixa
Routes running through the Baixa link to vacant plots
route + vacant plots filled = revitalization(?)
Design proposal for visualizing the urban routes
PART 5_architectural design
Site for architectural design
3 REQUIREMENTS

1. offer an affordable place to sleep, work and live

2. sustainable and self-sufficient (water and waste)

3. growing building typology
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1_offer an affordable place to sleep, work and live

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3 REQUIREMENTS

1. Offer an affordable place to sleep, work and live

2. Sustainable and self-sufficient (water and waste)

3. Growing building typology
TARGET GROUP

a_semi-homeless from perifery

b_homeless inside Baixa
TARGET GROUP

a_semi-homeless from perifery

b_homeless inside Baixa
CONCEPT
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The design...
Schematic build up of shapes and volumes
‘a day in the life of Angelo’

_20 years old
_orphan
_homeless
_car washer / market carrier
He wakes up, in his little living unit (3x3x3m)...
... checks cell phone for messages...then gets up.
Has a hard time finding a towel, maybe different arrangement?
Then opens the ‘door’ in his self constructed facade...
... heads for the toilets and showers...
...uses the toilet and washes himself.
Considers himself lucky to have clean water and toilet!
Heads back over to the communal kitchen, meets others...
... and heads downstairs to the public area, which is already bustling with activity...
...passes the gate that at the bottom of the stairs...
...makes a chat with (informal) vendors, and goes off to work at the central market...
He comes back from work...
...notices his piece of facade frame isn’t that well covered...
...while it’s such an easy and productive way to keep his room cool and grow some small scale crops such as corn or sorghum.
He walks into the cool shade underneath the concrete umbrellas...
Then goes to the back, to see if there are any cars to be washed.
Cooks himself a meal at the end of the day, in the communal kitchens, with methane gas from the biogas reactor...
... and as the sun sets, he goed to sleep and wishes you a goodnight!
PART 6_future steps
Future steps could concern, among others:

- monitoring large scale property development
- mapping the development of vacancies
- feasibility of the living unit
- ownership of the plot
- more detailed financial plan in terms of building costs
- continued research into income level of target group
EXTRA SLIDES
INITIAL COSTS

Building costs determinants:
surface area of one floor (m2) 270
total gross floor area (GFA) (m2) 1215
cost of structure per m2 GFA 400

building costs structure € 486.000
building costs water & waste installations € 50.000
cost of plot n.a.

Total investment necessary € 536.000

EXPLOITATION COSTS (per year)

interest (4% of investment) € 21.440
maintenance of building (1% building costs) € 4.860
maintenance of installations € 2.500
Electricity common rooms € 5.000
Concierge / caretaker € 3.000
Profit for investor € 25.000
Debt amortization € 23.000

Total exploitation costs (per year) € 84.800

Debt paid off in # years 23

REVENUES

rent per living unit / month € 50
# living units 45

rent per inhabitant / month € 10
# inhabitants 70

rent per stall / month € 50
# stalls 12

informal vending facilities pp / month € 10
# informal vendors 20

Total rent revenue (per month) € 3.750
Total rent revenue (per year) € 45.000

sale fertilizer average price / tonne € 400
solid fertilizer (ton/yr) 12,4
average price / tonne € 4.960
urine (ton / yr) 50,4
average price / tonne € 10.080

Billboards above facade
front (north-west) € 15.000
rear (south-east) € 10.000

Total revenue (per year) € 85.040
communal living and cooking area

emergency staircase

maintenance deck for wetlands

bathing men

washing

bathing women

dilatation

toilet women

toilet men

household water drain, along ceiling of floor below

methane duct, led along ceiling
primary living unit balcony, optional to be closed off and incorporated with primary living unit.

fixed brick wall concrete blocks (400 x 150 x 200 mm)

primary and secondary wooden beam (50 x 50 mm)

improvised wooden facade
bacterie rijke ondergrond

GRIND
coca cola crate
coca cola crate
coca cola crate

270 405 297
1000300010001000
783 + 6000
783 + 9000
783 + 5850
783 + 4800
783 + 7000

400 400 200

smoother concrete top floor layer

PVC drain along corridor
inside diameter = 69 mm
qs necessary = 1,3 l/s
qs possible = 2,0 l/s
gradient = 15 mm/m

methane gas duct
steel, insulated
inside diameter = 12,5 mm

electricity cables
inside PVC tube
(OPTIONAL EXTRA)
tapwater supply
PVC piping
inside diameter = 15 mm to ensure vmax < 2 m/s
(odour trap on top of drain
natural drain into green facade

top layer roofing felt (bitumen), laid into drain

rainwater drain PVC pipe through floor
inside diameter = 30 mm
leaf filter fire tightly into pipe
bottom layer roofing felt (bitumen)

1000
PVC rainwater drain
inside diameter = 150 mm
allowing water from roof area = 452 m²
allowing rain intensity = 0,03 l/(s*m²)

(OPTIONAL EXTRA)
metal frame for fixing layer
of wood, corrugated plastic
or metal to hide installations
from view and/or vandalism.
(see sketch for extra detail)

electricity meter
water meter
filtered water from wetlands
excess water from upper floors
overflow via pump to top floor
overflow with valve
overflow to floor below
excess water from floor above
SAND FILTER
CARBON FILTER
rainwater collection on roof
LEVEL 0
+ 2500
+ 4800
+ 6000
+ 9000
+ 12000
+ 15000
+ 18000
+ 21000
storm water emergency overflow
inlet from large tank on ground floor
rainwater collection on roof
water tap for market sellers
1 2 3 4 7 6 12 13 15 16 8 11
Public spaces working together
Urban element design process

MOTIVATION: cars on the pavement --> pedestrian un-friendly - (?) - > lack of informal vending.

Port of Maputo geographically close to the Baixa, but few remaining physical links.

‘street element’ from harbour: bollard

informal vending

guiding urban element, such as an ‘Amsterdammertje’
EASTERN BAIXA LARGE SCALE PROPERTY DEVELOPMENT
INFORMAL ACTIVITIES

Referring to a very wide scale of activities taking place in the public domain, and seemingly lacking organization and legality.

Determinants for informal vending: people passing by, shadow and preferably a blind wall.
The future? - the 3x3x3 sustainable Scottish box inserted into the concrete structure?
Prevailing winds on site

Source: windfinder.com, location: Maputo Bay
Angelo at the site
Distinction between general and site specific solutions for a vacant plot in the Baixa:

**GENERIC methods for approaching vacant plots in the Baixa:**
- Remove remaining ruins and possible walls along pavement;
- Small scale interventions, acupunctural, as to increase the rate at which a structure can be introduced and built;
- Catalytic interventions, as to lead to further urban upgrades in its immediate surroundings; it should radiate energy!
- Prevent long term use as car park, which further degrades the plot through unwanted activities and also further delays possible new functions;
- To make the plot accessible, link the new structure or function to the existing or future urban plan.

**SITE SPECIFIC methods for approaching one particular vacant plot, currently a ruin:**
- The intervention should be quick built and cheaply built;
- Among others, include a residential function, of which there is clearly little in the Baixa
- Allow easy accessible, shadowed, public space created on ground level; therefore the building can be seen as multifunctional (residential and public);
- A pedestrian passageway through the site “opens up” the relatively closed urban morphology of the old Baixa;
- Include a unique installations system for Maputo, which runs as a pilot project (regarding the sustainability in dense urban Maputo).

On a more controversial note: in my opinion the intervention, be it a new structure or a renovated old building, does not necessarily need to be a landmark. A functional building for the community can suffice. There is enough interesting architecture in the Baixa, but it seems to lack enough people to fully make use of the architecture. Therefore icons are not needed, but simple, cheap and socially functional structures are more valuable.
Concrete blocks production
Research sites vs. the Baixa