“Change life, change society! These precepts mean nothing without the production of an appropriate space”

Henri Lefebvre, the production of space, 1974 Paris
Investigation of reciprocating economic systems to boost informal urban areas into an era of sustained growth.
# Project Slum Booster

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Problem</th>
<th>What If</th>
<th>How to get there</th>
</tr>
</thead>
<tbody>
<tr>
<td>slums</td>
<td>poverty trap</td>
<td>sustained growth</td>
<td>Jane Jacobs and proximities</td>
</tr>
<tr>
<td>urban</td>
<td></td>
<td></td>
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<tr>
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<tr>
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</tbody>
</table>
Project Slum Booster

**introduction**
- slums
- urban
- undeveloped
- generic

**problem**
- poverty trap

**what if**
- sustained growth

**how to get there**
- Jane Jacobs and proximities

### tool: selection of booster and implementation
- business booster
- capitalism
- resources
- waste
- re-allocate
- combination
- company structure
- relocation/adaptation
- booster T=1

Wouldn't it be great if? vision: possible development scenario with sustained growth. Capitalism re-allocate business booster to slums. Poverty trap situation now. Resources waste combination company structure relocation/adaptation booster T=1.
## Project Slum Booster

### Introduction
- Slums
- Urban
- Undeveloped
- Generic

### Problem
- Poverty trap

### What If
- Sustained growth

### How to Get There
- Jane Jacobs and proximities

### Tool: Selection of Booster and Implementation
- Business booster
- Capitalism
- Resources
- Waste
- Re-allocate
- Combination
- Company structure
- Relocation/adaptation
- Booster T=1

### Wouldn’t it be great if? Vision: Possible Development Scenario with Sustained Growth

<table>
<thead>
<tr>
<th>T=0</th>
<th>T=1</th>
<th>T=2</th>
<th>T=3</th>
<th>T=4</th>
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<tbody>
<tr>
<td>Poverty trap situation now</td>
<td>waste = booster</td>
<td>orgonics</td>
<td>fertilizer</td>
<td>urban farming</td>
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<td></td>
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<td>plastic</td>
<td>pallets</td>
<td>stealing</td>
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<td></td>
<td></td>
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<td>paper pulp</td>
<td>paper factory</td>
</tr>
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</tr>
</tbody>
</table>
Introduction

Problem statement

What if

How does it work

Tool

The booster selector and implementation

Introduction

Introduction

Problem statement

What if

How does it work

Tool

The booster selector and implementation

INTRODUCTION

PROBLEM

WHAT IF

HOW

TOOL

VISION
Slums

Why slums?

- Potential

“Informal sector networks are, in fact, a key precondition for ultimate growth and integration into centres”

UN-Habitat in challenge of slums 2003 (on economic growth)
Slums

Why slums?

- Potential
- Collective
- Flexible

“Due to the illegal status, slum communities have shown to be flexible in their urban existence... ... There are many examples indicating the social cohesiveness of these informal societies ”

UN-habitat: Slums of the world 2005
Slums

Why slums?
- Potential
- Collective
- Flexible
- Self organization

“The potentials are exactly the capacities of self-organisation and also of self-organised economy which allow people to become urbanized in respect to informal city being the biggest development motor of the future ”

Jorg Stollman interviewed on 18 January 2010
Curator squat exhibition IABr 2009

“There are so many people doing ‘nothing’, just mobilize them and they’ll do the rest, and they will be proud to.”

Trans. Ronald Wall interviewed on 4 January 2010
What is a slum?

UN-Habitat definition:

1. Inadequate access to safe water
2. Inadequate access to sanitation and other infrastructure
3. Poor structural quality of housing
4. Overcrowding
5. Insecure tenure
Types of slums

- Urban and Rural

**urban slums**
- Overcrowded
- Social collective
- Flexible

**rural slums**
- Remote
- Migration
- Rigid
- Agricultural
Undeveloped slums

Where are slums?

Latin America & Caribbean: 36%
Sub-Saharan Africa: 71%

Source: UN-Habitat, World of Slums 2003 and Challenge of Slums 2005
Generic location

global problem > generic solution > generic slum
Problem statement

Introduction
- Slums
  - Urban
  - Rural
  - Developed
  - Undeveloped
- Specific
- Generic

Problem statement
- 2 billion slum dwellers
- Growth of world population
- Slum percentages in city
- Trapped in poverty trap

What if
- Upgrade goals
- Upgrade costs

How does it work
- D + A = nD
- Basic economics
- Jane Jacobs
- Collaboration

Tool
- The booster selector and implementation
- Slum solutions
  - Business booster
    - Demolish
    - Charity
    - Upgrade slums
    - Re-allocate upgrade city
    - Upgrade city
- Capitalism
- Economy
- Economic sector
- Company type
- Implementation strategy
- Implementation structure
- Issues
- Booster T=1
Problem statement

by 2050, worldwide 1 in 4 persons will live in a slum
Global population

<table>
<thead>
<tr>
<th>Region</th>
<th>Population</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>230%</td>
<td></td>
</tr>
<tr>
<td>South Central Asia</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>South East Asia</td>
<td>767.2M</td>
<td>+47%</td>
</tr>
<tr>
<td>Oceania</td>
<td>732.5M</td>
<td>-5%</td>
</tr>
<tr>
<td>South Central Asia</td>
<td>767.7M</td>
<td>+48%</td>
</tr>
<tr>
<td>Western Asia</td>
<td>520.2M</td>
<td>+30%</td>
</tr>
<tr>
<td>North Africa</td>
<td>316.9M</td>
<td>-15%</td>
</tr>
<tr>
<td>North America</td>
<td>315.9M</td>
<td>+109%</td>
</tr>
<tr>
<td>Europe</td>
<td>473.6M</td>
<td>+6%</td>
</tr>
<tr>
<td>Eastern Asia</td>
<td>520.4M</td>
<td>+47%</td>
</tr>
<tr>
<td>South Central Asia</td>
<td>1.481M</td>
<td>+7%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>1.497M</td>
<td>+141%</td>
</tr>
<tr>
<td>South East Asia</td>
<td>1.591M</td>
<td>+66%</td>
</tr>
<tr>
<td>Oceania</td>
<td>1.72M</td>
<td>+37%</td>
</tr>
<tr>
<td>South Central Asia</td>
<td>2.469M</td>
<td>+18%</td>
</tr>
<tr>
<td>Western Asia</td>
<td>2.468M</td>
<td>+18%</td>
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<tr>
<td>North America</td>
<td>2.52M</td>
<td>+47%</td>
</tr>
<tr>
<td>Europe</td>
<td>2.52M</td>
<td>+48%</td>
</tr>
<tr>
<td>Eastern Asia</td>
<td>2.56M</td>
<td>+30%</td>
</tr>
<tr>
<td>South Central Asia</td>
<td>2.56M</td>
<td>+30%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>2.91M</td>
<td>+30%</td>
</tr>
<tr>
<td>South East Asia</td>
<td>3.1M</td>
<td>+30%</td>
</tr>
<tr>
<td>Oceania</td>
<td>3.1M</td>
<td>+30%</td>
</tr>
<tr>
<td>South Central Asia</td>
<td>3.1M</td>
<td>+30%</td>
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<tr>
<td>Sub-Saharan Africa</td>
<td>3.1M</td>
<td>+30%</td>
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<tr>
<td>South East Asia</td>
<td>3.1M</td>
<td>+30%</td>
</tr>
<tr>
<td>Oceania</td>
<td>3.1M</td>
<td>+30%</td>
</tr>
</tbody>
</table>

Sources: UN-Habitat, World of Slums 2003 and Challenge of Slums 2005; citymoyars.com
Global population growth

90% of population growth to be absorbed by informal urban areas

UN-Habitat in challenge of slums 2003 (on economic growth)
Global population growth

90% of population growth to be absorbed by informal urban areas

By 2050 an estimated 2,000,000,000 people, 60% of the world's Urban Population, will be slum dwellers.
"The poor know what to do but can’t do it, they cannot meet their immediate needs (food, safe water, health care, etc.)."

Jeffrey Sachs, *Common wealth*

"Poor individuals lack collateral, which restricts their ability to raise funds. As a result, projects with large fixed costs are beyond the means of the poor, leaving them locked in a low return occupations."

Costas Azariatis and John Stachurski, Berkeley university
What if?

Introduction

Problem statement

What if

How does it work

Tool

The booster selector and implementation
What if solve the urgency?
### How far can we go?

<table>
<thead>
<tr>
<th>properties</th>
<th>generic slum upgraded</th>
<th>austerity the bare minimum for acceptable livelihood</th>
<th>average world city</th>
<th>free standing villas</th>
<th>extravagant luxury penthouse Park ave.</th>
</tr>
</thead>
<tbody>
<tr>
<td>density</td>
<td>362,318</td>
<td>20,000-50,000</td>
<td>1000-15,000</td>
<td>less then 1,000</td>
<td>30,000</td>
</tr>
<tr>
<td>living area per capita</td>
<td>4 sqm</td>
<td>8 sqm</td>
<td>21,6 sqm</td>
<td>40+ sqm</td>
<td>80+ sqm</td>
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<tr>
<td>transportation main mode</td>
<td>foot, bike, shared taxi</td>
<td>foot, bike, tram, bus, train</td>
<td>bus, train, private car,</td>
<td>private car, boat, plane</td>
<td>chauffeur, private jet</td>
</tr>
<tr>
<td>openspace</td>
<td>0,8 sqm</td>
<td>8 sqm nature</td>
<td>8 sqm park</td>
<td>30 sqm</td>
<td>n/a</td>
</tr>
<tr>
<td>unit price 8 inhabitants</td>
<td>$4,598</td>
<td>$6,500</td>
<td>$37,000 start $200,000</td>
<td>start $1,500,000</td>
<td>start $1,500,000</td>
</tr>
<tr>
<td>2,000,000,000 slum dwellers</td>
<td>$1,222 Bln</td>
<td>$1,727 bln</td>
<td>$9,833 bln start 51,153 bln</td>
<td>start 398,651 bln</td>
<td>start 398,651 bln</td>
</tr>
<tr>
<td>500,000 slumdwellers</td>
<td>$0.3055 bln</td>
<td>$0.4318 bln</td>
<td>$2.458 bln start 12.788 bln</td>
<td>start $99.663 bln</td>
<td>start $99.663 bln</td>
</tr>
</tbody>
</table>

**Sources**
- Jeffrey Sachs, Common wealth; TWF Austerity research lab 2009; Mercer building by nouvel; also see upgrade costs page; Ypenburg project site; world city list wikipedia; citymajors.com;
How can we go: upgrade

it would cost $1,222 bln to upgrade 2,000,000,000 slum dwellers

1.222 billion is:
2% of the global GDP 2009 ($57,228 bln)
7,5% of the European Union GDP 2009 ($16,191 bln)

$2478 per inhabitant of the european Union
$6196 per household (2.5 average)
How can we go: average

it would cost $9,833 bln for 2,000,000,000 slum dwellers to live in an average world city state

9.833 billion is:
17% of the global GDP 2009 ($57,228 bln)
60% of the European Union GDP 2009 ($16,191 bln)

$19.945 per inhabitant of the european Union
$49.863 per household (2.5 average)

1.5 times the year income for an average Dutch person
## How to raise $1,222bln for upgrading

<table>
<thead>
<tr>
<th>company</th>
<th>revenue 2009</th>
<th>profit 2009</th>
<th>years</th>
<th>no. companies 1 year</th>
<th>no. companies 10 years</th>
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</thead>
<tbody>
<tr>
<td>shell</td>
<td>278,188,000,000</td>
<td>12,512,000,000</td>
<td>101</td>
<td>101</td>
<td>10</td>
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<td>unilever</td>
<td>39,823,000,000</td>
<td>3,659,000,000</td>
<td>339</td>
<td>339</td>
<td>34</td>
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<tr>
<td>kpn</td>
<td>13,510,000,000</td>
<td>2,178,000,000</td>
<td>561</td>
<td>561</td>
<td>56</td>
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<td>apple</td>
<td>42,910,000,000</td>
<td>8,240,000,000</td>
<td>148</td>
<td>148</td>
<td>15</td>
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<td>yamaha</td>
<td>4,676,000,000</td>
<td>2,098,700,000</td>
<td>581</td>
<td>581</td>
<td>58</td>
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<td>wall mart</td>
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<td>11,231,000,000</td>
<td>109</td>
<td>109</td>
<td>11</td>
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<td>exxon mobile</td>
<td>339,938,000,000</td>
<td>26,130,000,000</td>
<td>47</td>
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<tr>
<td>H&amp;M</td>
<td>14,540,000,000</td>
<td>2,350,000,000</td>
<td>520</td>
<td>520</td>
<td>52</td>
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<tr>
<td>military expense</td>
<td>1,600,000,000</td>
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<td>0,76</td>
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<td>m e USA</td>
<td>685,000,000,000</td>
<td></td>
<td>1,78</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**277 days!!!!**
How to raise funds?

### How to raise $1,222bln for upgrading

**agriculture**
- $200 per hectare cost
- $450 per hectare revenue
- $250 per hectare profit

- one needs $48.88 \times 10^6 \text{ km}^2$
- globally $142.45 \times 10^6 \text{ km}^2$

34.3% of the global land area **1 year**
3.43% of the global land area **10 years**

**waste management**
- profit per year per 1 million in habitants
  - 18,000,000

- globally 2,000,000,000 slum dwellers and 50/50 with non-slum dwellers
- so we de waste is from is 4,000,000,000 population

4000 plants

profit per year globally
- 72,000,000,000

**16.7 years**
End the trap!

ending the poverty trap

poverty

public/private investment

surpass basic needs

development

private investment

Sources
Jeffrey Sachs, Common Wealth
End the trap!

temporary aid/investment

→

boost productivity

→

rise of savings/investment

→

sustained growth

Sources
Jeffrey Sachs, Common wealth
Conclusion

slum booster will end the poverty trap
How does it work?

introduction

problem statement

what if

Tool

the booster selector and implementation

PROJECT LINE
INTRODUCTION
PROBLEM
WHAT IF
HOW
TOOL
VISION
how does the economy behave?
Basic economics

The public refers to two ‘different’ systems, In a juridical view, legal/illegal, this is true.
Basic economics

But in reality it is a single system.

According to Saskia Sassen:

formal economy

informal economy
Learning from J. Jacobs

1. economic diversity is important for a city
1. economic diversity is important for a city

2. some types of work, will lead to new work, which leads to new work,.. etc.
from a type of work (D) starts a new activity (A), which starts new types of work (D's).
New work, New work

t=0  t=1  t=2

these new D's start new A's which start new D's...
this scheme can (under the right circumstances) multiply it self indefinitely
how are new activities and work added to the established old work?

1. Export multiplier effect
how are new activities and work added to the established old work?

1. Export multiplier effect
2. Import replacing multiplier effect
Import replace effect

labor divisions and new work

Japan and bicycles

1 import of western bicycles

2 need for repair shops

3 repair shops everywhere

4 repair men specialize to part manufacturers

5 parts collected

6 japanese bike distribution

Sources

Jane Jacobs, The economy of cities
but...

in order to create new work people need to collaborate
proximity is the most important requirement for collaboration
Proximity

Geographic proximity

Distance

Geographical proximity refers to the spatial separations between actors; shorter distances lead to easier and less expensive face-to-face interactions.
Cognitive proximity refers to the degree of similitude of knowledge bases of organizations, and is necessary to communicate and transfer knowledge between partners. The collaboration choice results of a situation where the organization needs external knowledge in order to innovate.
Organisational proximity

Company structure

Organisational proximity is defined as the degree of hierarchical interconnections between two organizations and reduces the uncertainty about the behaviour of the future partner.

1. Distance

2. Mental

3. Company structure
**Institutional proximity**

Workflow and ethics

Institutional proximity is defined by the similarity of informal constraints and formal rules sharing by actors, where common representations and routines of working allow organizations to realize an efficient transfer of knowledge.

1. **Distance**

2. **Mental**

3. **Company structure**

4. **Workflow and ethics**

Sources

Pier-Alexandre Baland. Proximity and the evolution of collaboration networks, university of Utrecht and Toulouse university paper
Proximity

Social proximity

Informal network

Social proximity refers directly to a kind of proximity between individuals where friendship and trust are central, the leads to diffusion of informal knowledge which facilitates collaborations.

1. Distance

2. Mental

3. Company structure

4. Workflow and ethics

5. Informal network
proximity boosts potential for collaboration

boosts the potential for new work

boosts the potential for economic development
Slum booster

starts the chain reaction

Source: Pierre-Alexandre Balland, Proximity and the evolution of collaboration networks, university of Utrecht and Toulouse university paper
Let’s start

**Tool**

**The booster selector and implementation**

- Slum solutions
  - Business booster
    - Demolish
    - Charity
    - Upgrade slums
    - Re-allocate upgrade city
    - Upgrade city
  - Capitalism
    - Communism
    - Rise taxation
  - Resources
    - Manufacturing
    - Services
    - Research and development
  - Economic sector
    - Waste
      - Recycle
      - Re-allocate
    - Oil
    - Coal
    - Ores
    - Automotive
    - Clothes
    - Electronics
    - Other
  - Company type
    - Implementation strategy
      - Instant factory
      - Manual labour
    - Implementation structure
      - Company structure
      - City structure
    - Issues
      - Relocation/adaptation
      - Noise reduction
      - Smell reduction
    - Booster T=1

**Introduction**

- Type: Urban, Rural, Specific, Generic
- Location: Undeveloped, Developed

**Problem statement**

- 2 billion slum dwellers
- Poverty trap
- Growth of world population
- Slum percentages in city
- Trapped

**What if**

- End the poverty trap

**How does it work**

- D + A = nD
- Basic economics
- Jane Jacobs
- Collaboration

**Upgrade goals**

- Clothes
- Automotive
- Electronics
- Other
Let's start

as location we will use a generic slum
the generic slum is the average of three slums; Kibera (Kenya), Dharavi (India), El Mirador (Venezuela)
### Generic Slum

#### A
- **Dharavi Koliwada**
- **Inspected area m²:** 22500
- **Total built area m²:** 13.486
- **FAR (av. 2 level):** 1.2
- **Number of structures:** 228
- **Average structure area m²:** 59.67
- **Average unit area m²:** 9
- **Number of units:** 1498
- **Average units/structure:** 6.6
- **Biggest structure m²:** 270
- **Units clustered:** 30
- **Population:** 10,044

#### B
- **Kibera Lani Saba**
- **Inspected area m²:** 22500
- **Total built area m²:** 18.972
- **FAR (av. 1 level):** 0.84
- **Number of clusters:** 266
- **Average cluster area m²:** 71.86
- **Average unit area m²:** 9
- **Number of units:** 2108
- **Average units/cluster:** 7.98
- **Biggest cluster m²:** 370
- **Units clustered:** 41
- **Population:** 8,858

#### C
- **Libertador El mirador**
- **Inspected area m²:** 22500
- **Total built area m²:** 14.922
- **FAR (av. 4 level):** 2.64
- **Number of cluster:** 129
- **Average cluster area m²:** 115.67
- **Average unit area m²:** 15
- **Number of units:** 987
- **Average units/cluster:** 6.33
- **Biggest cluster m²:** 468
- **Units clustered:** 31
- **Population:** 6,428

### A + B + C / 3 = generic

- **Proposed area m²:** 22500
- **Built density index:** 0.69
- **Number of cluster:** 219
- **Average cluster area m²:** 75.94
- **Average unit area m²:** 10
- **Number of units:** 1590
- **Average units/cluster:** 7.26
- **Biggest cluster m²:** 344.6
- **Units clustered:** 34
- **Population:**
The main morphology usually follows either nature or formal built structures. In between an endless variety of small alleys connects the slums internally.
<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Area km²</th>
<th>Density p/km²</th>
<th>GDP US $</th>
</tr>
</thead>
<tbody>
<tr>
<td>City stats</td>
<td>1,000,000</td>
<td>11.787</td>
<td>84</td>
<td>$6,8 bln</td>
</tr>
<tr>
<td>Slum stats</td>
<td>500,000</td>
<td>1,38</td>
<td>362.318</td>
<td>$65 mln</td>
</tr>
</tbody>
</table>

**Generic slum**

**INTRODUCTION**

**PROBLEM**

**WHAT IF**

**HOW**

**VISION**

**PROJECT LINE**

**TOOL**

**VISION**
T=0 slum as it is
## Change strategies

<table>
<thead>
<tr>
<th></th>
<th><strong>slum community</strong></th>
<th><strong>average population</strong></th>
<th><strong>investors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>clean up/remove</strong></td>
<td>lose</td>
<td>lose</td>
<td>(win) ~</td>
</tr>
<tr>
<td><strong>charity</strong></td>
<td>win</td>
<td>lose</td>
<td>lose</td>
</tr>
<tr>
<td><strong>upgrade</strong></td>
<td>win</td>
<td>lose</td>
<td>lose</td>
</tr>
<tr>
<td><strong>invest in city</strong></td>
<td>(win) ~</td>
<td>win</td>
<td>win</td>
</tr>
<tr>
<td><strong>invest in slum</strong></td>
<td>win</td>
<td>win</td>
<td>win</td>
</tr>
<tr>
<td><strong>infrastructure</strong></td>
<td>win</td>
<td>win</td>
<td>win</td>
</tr>
<tr>
<td><strong>invest in slum</strong></td>
<td>win</td>
<td>win</td>
<td>win</td>
</tr>
<tr>
<td><strong>business</strong></td>
<td>win</td>
<td>win</td>
<td>win</td>
</tr>
</tbody>
</table>
T=1 clean up/remove slum

e.g. slum redevelopment project, India 9200 crore INR = $1,500 mln
The Slum ceases to exist after the event at T=1: cleaned up.
T=1 charity

e.g. colourful kampung Jakarta, Indonesia; Young Indonesian Architects

e.g. Favela painting; Jeroen Koolhaas & Dre Urhahn
Painting the slum does not have an effect on the economic performance, hence no development.
T = 1 upgrade slum

e.g. upgrade slum, UNEP Kibera cost is $1.2 bln
one house = $6000
Upgrade slum results

Upgrading the slum can lift the prosperity level of the slum. The economic performance needed for sustained growth is absent.
T = 1 invest in city

e.g. Bogota: Transmelenio, 388km road $3.3 bln
1km = $8.5 mln
Invest in city results

The slum is more accessible. Economic performance rises, the slum starts to develop slowly.

level

- luxury penthouses
- free standing villas
- average world city
- austerity
- upgraded slum
- slum

Sources: Legatum Prosperity index; TWF Austerity research lab 2009; Mercer building by nouvel; also see upgrade costs; Yeoupburg projectsite; world city list wikipedia; citymajors.com,
T =1 invest in Slum

e.g. Caracas cable train (2km): $80 mln
1 km = 40 mln
Less impact, same result as roads, higher expenses. Focused on slum dwellers, a good example.
How to boost

the best way to save the generic slum is to invest in economic performance, with the potential to multiply and diversify
The generic city has a capitalistic economy for the booster to work. This means the economy follows this general diagram.
Everything starts with resources.

**Primary sector business**

Everything starts with resources.
Business potential

<table>
<thead>
<tr>
<th>High Risk Factor</th>
<th>Low Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>leverage</strong></td>
<td><strong>bottle-neck</strong></td>
</tr>
<tr>
<td><strong>strategic/critical</strong></td>
<td><strong>non critical</strong></td>
</tr>
</tbody>
</table>

**Value/potential**

**Project Line**

**Introduction**

**Problem**

**What If**

**How**

**Vision**

**Sources**

Marijn Mulders, 75 management modellen; Kraljic model

**Tool**
Business selection

this project will focus on waste management as new program
Waste

- Primary sector
  - Resources
  - Food
  - Raw materials
  - Food
  - Energy
  - Products
  - Materials
  - Consumer goods
  - Services
  - R & D
  - Invest

- Secondary sector
  - Processing
  - Recycling and biofuel production
  - Waste

- Tertiary sector
  - Commercial
  - Services
  - Consumer goods
  - Waste

- Quaternary sector
  - Service
  - R & D
  - Invest

Sources:
- Dr. A Heertjes, Elementaire economie, Wikipedia Economics page; the author
Waste labour knowledge technical re-allocation, innovation, new products, new markets + RDF Plastics Paper Organics re-allocate recycle downgrading, closed system upgrading, open system labour knowledge re-allocation, innovation, new products, new markets a true booster
the implementation should have a high degree of proximity, to have a maximum potential for collaboration
Implementation goals

We will venture through 3 options for the implementation of a booster:

1. Instant Factory
   (developed city)

2. Manual labour
   (undeveloped slum)

3. combination
Implementation goals

We will venture through 3 options for the implementation of a booster:

1. Instant Factory (developed city)

2. Manual labour (undeveloped slum)

3. Combination

What is the best?

Each implementation has pros & cons towards to city and slum.

The Graph shows how a concept relatively scores (1-3) on the 5 types of proximity, the base for collaboration.


**Instant factory**

Investment: 72 mln  
Capacity: 500 Ton/day  
Revenue: 65 mln/year  
Costs: 30 mln/year  
Profit: 35 mln/year

---

**proximity score city**

93.3%

**proximity score slum**

33.3%
Manual labour

Investment: $0
Capacity: 500 Ton/day
Revenue: 10 mln
Profit: $0.5 mln

proximity score city

proximity score slum

sources: Generic slum research; Pierre-Alexandre Balland; Proximity and the evolution of collaboration networks, university of Utrecht and Toulouse university paper
Combination

Investment: 30 mln
Capacity: 500 Ton/day
Revenue: 65 mln/year
Costs: 50 mln/year
Profit: 15 mln/year

proximity score city
- Geographic proximity: 72.6%
- Organizational proximity: 66.6%
- Cognitive proximity: 66.6%
- Institutional proximity: 66.6%
- Social proximity: 66.6%

proximity score slum
- Geographic proximity: 66.6%
- Organizational proximity: 66.6%
- Cognitive proximity: 66.6%
- Institutional proximity: 66.6%
- Social proximity: 66.6%
Compare goals

The proximity to the slum is most critical.

‘Centralized’ or ‘slummified’ will neither succeed; the slum needs to collaborate within itself and with the city to develop.
Process implementation

waste

RDF auto factories

spin-off sectors

organic plastic paper

market

auto factories

spin-off sectors

auto factories

spin-off sectors

auto factories

spin-off sectors

auto factories

spin-off sectors

auto factories

spin-off sectors

market

RDF organic plastic other paper
How will it work

The slum
How will it work

The scheme

**input**
- waste

**basic sorting**
- process
- packing
- selling

**output**
- resources/products

- paper
- organics
- plastics
- RDF
- other

---

**PROJECT LINE**
- INTRODUCTION
- PROBLEM
- WHAT IF
- HOW
- TOOL
- VISION
How will it work

basic sorting to specific lanes

**input**
- waste

**basic sorting**
- specific sorting

**process**
- packing
- production

**selling**

**output**
- resources/products
- paper
- organics
- plastics
- RDF
- other
How will it work

Specific sorting for processes

**input**
- waste

**output**
- paper
- organics
- plastics
- RDF
- other

**basic sorting**
- process
- packing
- production

**specific sorting**
How does process works

Production, packing and selling

**Input** waste

**Basic sorting** waste

**Specific sorting** waste

**Process** waste

**Packing** waste

**Production** waste

**Selling** waste

**Output** resources/products

- paper
- organics
- plastics
- RDF
- other
How will it work

New waste back into process

**input** waste

**output** resources/products

- basic sorting
- specific sorting
- process
- packing
- production

- paper
- organics
- plastics
- RDF
- other

PROJECT LINE

INTRODUCTION

PROBLEM

WHAT IF

HOW

TOOL

VISION
Demand higher production

Initial upgrade through products of process: cross-fertilization
Specific production

Start of development through knowledge: cross-fertilization
Boost two types

to reach the goal:
1. boost future manual labour
2. boost future automated facilities
manual labour T0
manual labour T0
Bins for different types of waste help the sorting to boost the sorting productivity.

Slumbooster provides bins raise productivity need for machines to process
Roads made from recycled stones further boost productivity, accessibility, and health.

Roads and sanitation infrastructure increase productivity of manual labour.
Roads made from recycled stones further boost productivity, accessibility, and health.

Roads and sanitation infrastructure increase productivity of manual labour.
de-centralized storage improves capacity asked for by automated process
capacity machines grows, need for more input slumbooster provides decentralized storages
meanwhile

The future automated areas go through a similar process.
Automated T0
specific machines to create high quality products are put in place where necessary

Slumbooster provides machines for initial automation. Small scale productivity rises.
A road is built, and more machines are made available to increase production.

Roads increase productivity of manual labour, capacity automated area must rise: more machines.
automated T0,75

more machinery boosts this area into a fully functioning factory area with maximum capacity

Manual labour full capacity, slum booster provides final machines
The slum dwellers counteract the factory by building a concrete shell to reduce noise and increase efficiency.

Slum dwellers react and make the plant more efficient. Development will start..
Implementation complete!
What is the result?
Overview T1
Check implementation

Before implementation
average income generic slum: $ 93.35/month

After implementation:
$45mln/30 000 = $1500/year = $125/month = 34%
increase

34% raise income workers

Before implementation
average income generic slum: $ 93.35/month

500 000*93.35 = $46 675 000

After implementation:
470 000*93.35 = 43 874 500
30 000*125 = 3 750 000
3 750 000 + 43 874 500 = 47 624 500

2% raise income generic slum
+ 15mln profit

After implementation:
47 624 500 + 15 000 000 = 62 624 500
62 624 500 / 46 675 000 = 1,34
level

Economic performance boosted
Prosperity starts to grow

Economy performance boosted.
Result implementation

balance graph  generic slum

million US dollars

T2  T3  T4  T5  T6  Tx

Time

slum profit per year
wouldn’t it be great if? Vision; Possible development scenarios with sustained growth

T=1: Re-allocation
- Organics
  - Biofuel
  - Fertilizer
- Refuse derived fuel
  - Raw oil
- Paper
  - Paper pulp
- Plastic
  - Pallets
- Other
  - Metals
  - Electronics
- Stone
  - Use as roads
  - Car factory

T=2: Export
- Biofuel
- Export
- Refine
- Export
- News papers
  - Paper factory
- Printer
- Binder
- Mold for Lego
- Mold to Crates
- Ship container
- Export

T=3: Vertical farm
- Farming
- Gasoline
- Paint industry
- Export
- Plastics
- Export

T=4: Food
- Export methods
- Education biology
- Export
- Graphic design
- Book store
- Publishers
- Export
- Plastic slum
- Plastic architect
- New houses
- Faculty of architecture
- Export

T=5: Export
- Genetically modified food
- Export

T=6: Textile
- Instant factory
- Manual labour
- Combination
- City structure
- Company structure booster T=1
- Noise reduction
- Smell reduction
- Relocation/adaptation

T=7: Textile
- Else disciplines
- Art history
- Management
- UNESCO area
- Swiss plastic museum

T=8: Textile
- Building tech
- Architectural exchange
Visionary evolution

How can the area evolve?
new work returns
re-allocation plant
investment: 30 mln
profit: 15 mln/y
payback time: 2.3 years

urban farm
investment: 80 mln
profit: 14,5 mln/y
payback time: 5.7 years

pipe infrastructure
investment: 50 T pastic/d
profit: 18000 T plastic/y
it takes 110 days to give all structures plastic piping
(5200 T plastic)
Visionary evolution

Road to T = 2
Recap T1
The fertilizer produced in the organic lanes is used for small roof gardens.

basic need food: farming using fertilizer in organic street
The fertilizer produced in the organic lanes is used for small roof gardens.
A collaboration with the plastic lane allows for a type of greenhouse which increases yields.

Collaboration with plastic street: “glass”-house made from plastic increases efficiency.
A collaboration with the plastic lane allows for a type of greenhouse which increase yields.
The potential is seen! Greenhouses are linked together to further increase yields.

Market for food grows, reaction: bigger better and faster urban farming.
The potential is seen! Greenhouses are linked together to further increase yields making it a profitable venture.
The potential is seen! More and more greenhouse-snakes are linked together. Utilizing fuel form the RDF plant to create electricity to further increase capacity!
The potential is seen! more and more greenhouse-snakes are linked together. Utilizing fuel from the RDF plant to create electricity to further increase capacity!
Urban farming snakes appear over the slum.

Urban farms located in the collaboration zone between the organic street and plastic street.
Results T2

Economic performance grows further through urban farm.

Plastic used as pipes for basic infrastructure, boosts health index

Level

- luxury penthouses
- free standing villas
- average world city
- austerity
- upgraded slum
- slum

Time

- T=0
- T=1
- T=2
- T=4
- T=5
- T=6
- T=7

Sources
Legatum Prosperity Index
Results T2

balance graph  generic slum

Source: Lyns LTD; Vertical Farm Colombia university
new work returns

re-allocation plant
investment: 30 mln
profit: 15 mln/y
payback time: 2.3 years

urban farm
investment: 80 mln
profit: 14.5 mln/y
payback time: 5.7 years

mini power plants
investment: 10 mln
profit: 5 MW
5000 100W bulbs for 10 hour
cost: 6T of biomass

greenhouse
investment: 100 mln
profit: 50 mln/y
payback time: 7.5 years

pipe infrastructure
investment: 50 T pastic/d
profit: 18000 T plastic/y
it takes 110 days to give all structures plastic piping (5200 T plastic)
RDF create electricity from RDF fuel and RDF fuel powerplants give the slum electricity.
Result T3

Electricity increases safety.

level

luxury penthouses
free standing villas
average world city
austerity
upgraded slum
slum

Time
Results T3

balance graph  generic slum

-100  0  100  200  300  400  500  600

million US dollars

T2 T3 T4 T5 T6 Tx

Time

8.2 years
10 mini powerplant 500kws,
production: 1785/TL lights 28W
everyhouse hold has one

22 years
10 vertical farms,
production: 600.000 people
profit/y: 140 min

Sources
Lyn LRD; Vertical farm colombia univeristy; BluEnergyControl - Michele Giacalone;
new work returns

re-allocation plant
investment: 30 mln
profit: 15 mln/y
payback time: 2.3 years

urban farm
investment: 80 mln
profit: 14,5 mln/y
payback time: 5.7 years

mini power plants
investment: 1 mln
profit: 500kwh
5000 100W bulbs for 1 hour
cost: 600kg of biomass

9 vertical farms
investment: tot 720 mln
profit: 126 mln/y
payback time: 12.5 years

pipe infrastructure
investment:50 T pastic/d
profit: 18000 T plastic/y
it takes 110 days to give all structures plastic piping (5200 T plastic)

Sources:
Economic considerations vertical farm, Colobia University NY; Verticalfarm.com; Gogreen what it costs.com
Vertical farms, electricity is widely available.

vertical farms: a collaboration between the city, plastic street and organics, knowledge and products.
Vertical farms, electricity is widely available.

Vertical farms: a collaboration between the city, plastic street and organics, knowledge and products.
Vertical farms, electricity is widely available

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vertical farms: a collaboration between the city, plastic street and organics, knowledge and products
Vertical farms, electricity is widely available

vertical farms: a collaboration between the city, plastic street and organics, knowledge and products
More vertical farms produce more food. The economic performance increases, as do all others.
Result T4

Source: LRD, Vertical farm Colombia University, BluEnergyControl, Michele Giacalone

- Slum profit per year
- Slum upgrading quote
- 24 years
- 306 mln

Graph: Balance graph, generic slum

Balance graph: T1, T2, T3, T4, T5, T6, Tx

Profit: Slum

8.2 years
10 mini powerplants 500kwe, production: 17857 Tl, lights 28W
Every house hold has one

22 years
10 vertical farms, production: 500,000 people
Profit: 140 mln
New work returns

re-allocation plant
investment: 30 mln
profit: 15 mln/y
payback time: 2.3 years

urban farm
investment: 80 mln
profit: 14.5 mln/y
payback time: 5.7 years

mini power plants
investment: 1 mln
profit: 500kwh
5000 100W bulbs for 1 hour
cost: 600kg of biomass

9 more vertical farms
investment: tot 720 mln
profit: 126 mln/y
payback time: 12.5 years

What if the plastic gets stolen?
investment: $0
profit: 18000T plastic/y
it takes 41.3 years to duplicate slum (743400T)

pipe infrastructure
investment: 50 T plastic/d
profit: 18000 T plastic/y
it takes 110 days to give all structures plastic piping (5200 T plastic)
plastic gets stolen, but is reused as cheap building material

Informal network collaboration in the slum
Result T5

A small dip in safety as organised crime starts stealing plastic. Plastic maffia! A few bribes on the maffia keeps the area safe again.

The plastic becomes a source for cheap living area growth. A niche in the market.
Result T5

balance graph generic slum

plastic gets stolen and is used as construction material.

increase of living: plastic slum houses

8.2 years
10 mini powerplant 500kwe, production: 17857 TL lights 28W every house hold has one

22 years
10 vertical farms, production: 500,000 people profit/y: 140 min
New work returns

re-allocation plant
investment: 30 mln
profit: 15 mln/y
payback time: 2.3 years

plastic gets stolen
investment: $0
profit: 18000T plastic/y
it takes 41.3 years to duplicate slum (743400T)

pipe infrastructure
investment: 50 T pastic/d
profit: 18000 T plastic/y
it takes 110 days to give all structures plastic piping (5200 T plastic)

urban farm
investment: 80 mln
profit: 14,5 mln/y
payback time: 5.7 years

paper pulp to insulation
investment: 25 mln
profit: $6 387 500 per year
payback time: 3.9 years

1 m³ paper pulp isolation: 50kg =
revenue = $50
isolation 160mm > 1m³ = 6.25m²
plant produces 25T per day, revenue:
$25000
costs: $7500
profit: 17500 per day = 6387500 per year

mini power plants
investment: 1 mln
profit: 500kwh
5000 100W bulbs for 1 hour
cost: 600kg of biomass

9 more vertical farms
investment: tot 720 mln
profit: 126 mln/y
payback time: 12.5 years
At the end of the paper street, a new processing factory is built to create paper insulation. Former slum collaborates to increase living comfort and decrease energy usage.
Result T6

- Insulation increases the health, environment, and economic performance index.

- Level:
  - Luxury penthouses
  - Free standing villas
  - Average world city
  - Austerity
  - Upgraded slum
  - Slum

- Time:
  - T=0
  - T=1
  - T=2
  - T=3
  - T=4
  - T=5
  - T=6
  - T=7

Sources:
- Legatum Prosperity Index;
- Insulation increases the health, environment, and economic performance index.
Result T6

balance graph  generic slum

8.2 years
10 mini powerplant 500kwe,
production: 17857 TL lights 28W
everyhouse hold has one

22 years
10 vertical farms,
production: 500,000 people
profit/y: 140 mln
Leap into the future Tx

New work returns

- re-allocation plant
  - investment: 30 mln
  - profit: 15 mln/y
  - payback time: 2.3 years

- urban farm
  - investment: 30 mln
  - profit: 14.5 mln/y
  - payback time: 5.7 years

- mini power plants
  - investment: 1 mln
  - profit: 500kwh
  - 5000 100W bulbs for 1 hour
  - cost: 600kg of biomass

- 9 more vertical farms
  - investment: tot 720 mln
  - profit: 126 mln/y
  - payback time: 12.5 years

- pipe infrastructure
  - investment: 50 T pastic/d
  - profit: 18000 T plastic/y
  - it takes 110 days to give all structures plastic piping (5200 T plastic)

plastic gets stolen

- investment: $0
- profit: 18000T plastic/y
- it takes 41.3 years to duplicate slum (743400T)

paper pulp to insulation

- investment: 25 mln
- profit: $6 387 500 per year
- payback time: 3.9 years

- 1 m3 paper pulp isolation: 50kg = revenue = $50
- isolation 160mm > 1m3 = 6.25m2
- plant produces 25T per day, revenue: $25000
- costs: $7500
- profit: 17500 per day = 6387500 per year

green city initiative

- investment: $25 per tree
- 12.5 mln one tree per person

university campus

- investment: $50 mln
- profit:???

hospital

- investment: $150 mln
- profit:???

cable train

- investment: $190 mln
- profit:???

night club

- investment: $15 mln
- profit:5

laboratorium

- investment: $200mln

shopping mall

- investment: $110 mln

museum

- investment: $25 mln

Music venue

- investment: $50 mln

Imagine the possible....
The slum has expanded upwards, new initiatives rise all over. The poverty trap is no more.
New initiatives are taken to increase health and education, schools, universities, hospitals, genetic research facilities, trees, parks, nightclubs, hotels.