PRODUCTIVE ADDIS

INCREASING ACCESSIBILITY TO LOCAL INCOME GENERATION BY DESIGNING A PRODUCTIVE OPEN SPACE SYSTEM

CHRIS BARTMAN // 4468929

P5 PRESENTATION
COMPLEX CITIES
ROBERTO ROCCO
STEFAN VAN DER SPEK
31-10-2018
**PROLOGUE: MEET THE MAIN CHARACTERS:**

Haile Kassahun - 40 years, 6 kids
Rural Oromya -> Urban Addis

Betty Bekele - 30 years
Kebele -> condominium
PROLOGUE: MEET THE MAIN CHARACTERS:

Haile Kassahun - 40 years, 6 kids
Rural Oromya -> Urban Addis

Betty Bekele - 30 years
Kebele -> condominium
1. From rural Ethiopia via the kebele to the Condominium

2. Productive Open Space System: vision and methodology

3. Theory meets empirical: design principles

4. Weyira sefer: spatial analysis

5. Strategy: design and implementation

6. Phasing and performance

7. Ten years later....Haile and Betty’s improved life
1. FROM RURAL ETHIOPIA, VIA THE KEBELE, TO THE CONDOMINIUM

“[…] The migrant is not coming to the city for housing. He is coming for a job. For survival. .”
(Charles Correa)
1. FROM RURAL ETHIOPIA

Sudan

South Sudan

Benishangul-Gumuz

Gambela

Sudan

Tigray

Amhara

Afar

Djibouti

Yemen

Somalia

Dire Dawa

Somali

S.N.N.P.

Kenya

Addis Ababa

Oromia
1. TO URBAN ADDIS ABABA
1. ROTTERDAM REGION REFERENCE
1. ADDIS ABABA: POPULATION GROWTH

CSA, 2008; UN-Habitat, 2017
1. ADDIS ABABA: POPULATION GROWTH

CSA, 2008; UN-Habitat, 2017
1. POOR ACCESS TO INCOME GENERATION

High concentration of jobs
1. POOR ACCESS TO INCOME GENERATION

- JEMO: 1 - 2 hours
- BOLE ARABSA: > 2 hours
- KLINTO: ~ 3 hours

- High concentration of jobs
- Condominium locations
- Route to central area

Map showing the distribution of job concentrations and access times to central areas.
### 1. INCOME GENERATION IN ADDIS ABABA

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>INCOME GENERATING PRACTICES</th>
<th>SPATIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>Coffee shop owner/employee</td>
<td>Building</td>
</tr>
<tr>
<td></td>
<td>Shop owner/employee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restaurant owner/employee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Market</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Construction material</td>
<td>Building</td>
</tr>
<tr>
<td></td>
<td>Recycling</td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>Civil servant (e.g. teacher)</td>
<td>Building</td>
</tr>
<tr>
<td></td>
<td>Private employee (e.g. banker)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minibus owner/operator</td>
<td>Minibus/taxi</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Farmer</td>
<td>Private compound/open field</td>
</tr>
<tr>
<td></td>
<td>Pastoralist</td>
<td></td>
</tr>
<tr>
<td>Informal</td>
<td>Streetvendor</td>
<td>Sidewalk</td>
</tr>
<tr>
<td></td>
<td>Car cleaner</td>
<td>Large open space (e.g. Meskel sq.)</td>
</tr>
<tr>
<td></td>
<td>Shoe shiner</td>
<td></td>
</tr>
<tr>
<td>From others</td>
<td>Pension</td>
<td>Private compound</td>
</tr>
<tr>
<td></td>
<td>From family members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subletting</td>
<td></td>
</tr>
</tbody>
</table>
1. PRIVATE COMPOUND: SMALL SCALE

Used for daily activities and small scale income generation
Empty spaces, unused
1. MAIN STREET OPEN SPACE

Main streets used for informal income generation

1. MESKEL SQUARE: MOST PUBLIC SPACE
1. CONDOMINIUM OPEN SPACE? NO

Unused or inaccessible open space
1. PROBLEM ANALYSIS AND POTENTIALS: CONCLUSION

high travel costs, poor access to local income generation.

However, the potential lies in the underused open spaces in the sefer. Opportunity to connect these spaces and make them productive!

HYPOTHESIS:

A PRODUCTIVE OPEN SPACE SYSTEMS CONTRIBUTES TO THE INCREASED ACCESS TO LOCAL INCOME GENERATION.
2. PRODUCTIVE OPEN SPACE SYSTEM [POSS]; VISION AND METHODOLOGY
2. POSS: HAILE’S STREET BEFORE
2. POSS: HAILE’S STREET AFTER
2. POSS: BETTY’S SPACE BEFORE
2. POSS: BETTY’S SPACE AFTER
2. POSS: OVERVIEW
2. POSS: METHODOLOGY

**PROBLEM FIELD**
*RURAL TO URBAN KEBELE TO CONDOMINIUM*

**SPATIAL ANALYSIS**

**SITE DEFINITION**
Weyira Sefer

**SWOT ANALYSIS**
LIVING ENVIRONMENTS

**VISION**
PRODUCTIVE OPEN SPACE SYSTEM (POSS)

**ANALYTICAL FRAMEWORK**

**SPATIAL**
layered

**THEORETICAL**
confront

**EMPIRICAL**

**DESIGN PRINCIPLES**
OPEN SPACE TYPOLOGIES

**ON SITE POSS-STRATEGY**
Integrated master plan
Design
Implementation

**EVALUATION**

**OBJECTIVES**
QUANTIFIED OBJECTIVES

**TOPICS**

- Integrated master plan
- Design
- Implementation

**CONCEPTS**

- PROBLEM FIELD
- SPATIAL ANALYSIS
- SITE DEFINITION
- SWOT ANALYSIS
- LIVING ENVIRONMENTS
- VISION
- PRODUCTIVE OPEN SPACE SYSTEM (POSS)
- ANALYTICAL FRAMEWORK
- SPATIAL	nested
- THEORETICAL
- EMPIRICAL
- DESIGN PRINCIPLES
- OPEN SPACE TYPOLOGIES
- ON SITE POSS-STRATEGY
- EVALUATION

**METHODS**

- Design
- Implementation
## 2. POSS: Quantified Objectives

<table>
<thead>
<tr>
<th>Layer</th>
<th>Problem</th>
<th>Parameters</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POSS</strong></td>
<td>Unused open space</td>
<td>% open space</td>
<td>20 % open space / total</td>
</tr>
<tr>
<td></td>
<td>High travel costs (money and time)</td>
<td>travel time</td>
<td>1/2 * [current travel time]</td>
</tr>
<tr>
<td><strong>INCOME</strong></td>
<td>Limited access to local income generation</td>
<td>amount of jobs in sefer</td>
<td>&gt; 25 % of working population job in sefer</td>
</tr>
<tr>
<td><strong>GENERATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PUBLIC</strong></td>
<td>Limited access to schools</td>
<td>amount of schools/inhabitants</td>
<td>1:250 primary school</td>
</tr>
<tr>
<td><strong>FACILITIES</strong></td>
<td>Limited access to health facilities</td>
<td>amount of health centers/inhabitants</td>
<td>1:1200 secondary school</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HOUSING</strong></td>
<td>Need to accommodate high population growth</td>
<td>population density</td>
<td>150 % * [current inhabitants]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. POSS: SPACE FOOTPRINT PER COMPOUND (16 INHABITANTS)

- Leftover space: 300
- Productive space: 70
- Compound size: 20
- Agriculture: 10
- Manufacturing: 6
- Commerce: 5
- Services: 5
- Primary school: 6
- Secondary school: 6

Total: 455
2. POSS: SPACE FOOTPRINT 96 INHABITANTS
2. POSS: SPACE FOOTPRINT 800 INHABITANTS
3. THEORY MEETS EMPIRICAL: DESIGN PRINCIPLES

“What attracts people most, it would appear, is other people.” (Whyte, 1980)
3. THEORETICAL FRAMEWORK

“WHAT DESIGN ELEMENTS ARE NEEDED TO CREATE PRODUCTIVE OPEN SPACE SYSTEM?”

SOCIAL MOBILITY

AFFORDABLE SEFERS =

Increased access to
LOCAL:
income generation +
public facilities +
social activity

Thesis objective ...

Saunders, 2011
Aravena, 2016

Design hypothesis

"[...] The migrant is not coming to the city for housing. He is coming for a job. For survival. So either he finds living space near his work or he has access to affordable transport that brings him to his work. That is how housing becomes affordable." (Charles Correa in: van Andel et al., 2015)

Whyte, 1980
Gehl, 2011
PPS.org, 2018
KDI, 2006

PRODUCTION OPEN
SPACE SYSTEM

Design objective

34 / 94
3. CONFRONTING THEORY

"WHAT ELEMENTS MAKE A SUCCESSFUL OPEN SPACE?"

Spaces in the sun most popular
(Whyte, 1980)
3. CONFRONTING THEORY WITH EMPIRICAL DATA

Reality in Ethiopia

Whyte, 1980

https://fulbrightmekelle.files.wordpress.com/2014/01/umbrellas-of-timkat.jpg
3. DESIGN PRINCIPLES: SHELTER ATTRACTS ACTIVITY
3. DESIGN PRINCIPLES: TRANSIT AND COMMERCIAL SPACE

3. DESIGN PRINCIPLES: SANITATION UNIT

http://www.kounkuey.org/Kibera_PPS1.html#
3. DESIGN PRINCIPLES: INCREMENTAL HOUSING DEVELOPMENT

“Empower Shack”

Belapur housing

http://u-tt.com/project/empower-shack/

3. DESIGN PRINCIPLES: OVERVIEW
4. WEYRIA SEFER: SPATIAL ANALYSIS
4. LAYERED ANALYSIS AND DESIGN APPROACH

- **Layer 4: Population**
- **Layer 3: Education + Health**
- **Layer 2: Local Income Generation**
- **Layer 1: Productive Open Space System**
- **Layer 0: Current Situation**
4. WEYIRA: BASE

- 06:00: Haile's home
- 06:15: Taxi terminal
- 06:00: Betty's home
- 08:30: Work @ Piazza
4. WEYIRA: LAYER 1: CURRENT OPEN SPACE SYSTEM
4. WEYIRA: LAYER 1: CURRENT OPEN SPACE SYSTEM

Open space as dump site

Wasted land

Open space for goats

Inaccessible open condominium space
4. WEYIRA: LAYER 1: CURRENT OPEN SPACE SYSTEM
4. WEYIRA: LAYER 1: CURRENT OPEN SPACE SYSTEM
4. WEYIRA: LAYER 2+3: CURRENT LAND-USE

Income generation
Education
Public toilet
Church
4. WEYIRA: LAYER 2+3: CURRENT LAND-USE
4. WEYIRA: LAYER 2+3: CURRENT LAND-USE

St. Giorgis church  
Public toilet - terminal
4. WEYIRA: LAYER 4: CURRENT HOUSING

- > 300 inhabitants/hectare
- 250 - 299
- 200 - 249
- < 199
- Unbuilt space
4. WEYIRA: CONCLUSION MAP
4. WEYIRA: CONCLUSION OPEN SPACE TYPOLOGY
4. WEYIRA: TYPOLOGY --> DESIGN

Sefer OS

Housing
Social
Public
Employment
Producing
Commerce

Public facilities OS

Housing
Social
Public
Employment
Producing
Commerce

Sub-sefer OS

Housing
Social
Public
Employment
Producing
Commerce

Community OS

Housing
Social
Public
Employment
Producing
Commerce
5. POSS STRATEGY: IMPLEMENTATION AND DESIGN
5. LOCAL GOVERNANCE: CURRENT SITUATION

<table>
<thead>
<tr>
<th>SCALE</th>
<th>REPRESENTATIVE GOVERNMENT</th>
<th>PLANNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>National: government</td>
<td>National Planning Commission (NPC)</td>
<td></td>
</tr>
<tr>
<td>State: Addis Ababa autonomous region</td>
<td>Addis Ababa planning commission</td>
<td>Derived from the 2017 Master plan</td>
</tr>
<tr>
<td>Sub-city: Kolfe Keranyo</td>
<td>Local Development Plan</td>
<td></td>
</tr>
<tr>
<td>Woreda: 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. LOCAL GOVERNANCE: IDDIR

Executive committee

Savings / insurance

Emergencies
Credit
Community development
5. LOCAL GOVERNANCE: SPATIAL REPRESENTATION
5. LOCAL GOVERNANCE: SEFER COUNCIL PROPOSAL

Sefer Iddir Representatives of:
- Presidents of community iddir
- Woreda Planning commission
- Religious organisations
- Small-business owners
5. LAYERED DESIGN: 1_POS

Main stakeholders:
- Ministry of infrastructure
- Anbessa bus company
- Private firms
- Collectives
- Local workers
- Local community

Productive Open Space
- New roads
- Agriculture
- Manufacturing
- Commercial
- Service
- Primary school
- Secondary school
- Health and sanitation center
- Housing development
- Minibus stop

Transport connection

200 meter walking radius
5. LAYERED DESIGN: 2_LOCAL INCOME GENERATION

Main stakeholders:
- Private firms
- NGO’s (Urban Harvest)
- University (EiABC)
- Minibus operators
- Government for basic structures
- Collectives
- local workers
- local community
- local entrepreneurs
- IceAddis (incubator)
- Orange Corners
- Universities
5. LAYERED DESIGN: 3_PUBLIC FACILITIES

Main stakeholders:
- Ministry of health
- Ministry of education
- UN (Sustainable Development Goal)
- The Worldbank
- NGO's
- Start-ups
- local teachers, nurses, doctors...

Productive Open Space
New roads
Agriculture
Manufacturing
Commercial
Service
Primary school
Secondary school
Health and sanitation center
Housing development
Minibus stop
Transport connection

50 100 400 500 m
5. LAYERED DESIGN: 4_HOUSING

Main stakeholders:
- Private developers
- Social housing corporations
- Residents
- Collectives
- Private firms
- Collectives
- EiABC
- Network of local workers

Productive Open Space
- New roads
- Agriculture
- Manufacturing
- Commercial
- Service
- Primary school
- Secondary school
- Health and sanitation center
- Housing development
- Minibus stop
- Transport connection
5. LAYERED DESIGN: INTEGRATED MASTERPLAN

- Productive Open Space
- New roads
- Agriculture
- Manufacturing
- Commercial
- Service
- Primary school
- Secondary school
- Health and sanitation center
- Housing development
- Minibus stop
- Transport connection
- 200 meter walking radius
5. DAILY LIFE TRAJECTORIES DEFINE THE ROUTE
5. DAILY LIFE TRAJECTORIES DEFINE THE ROUTE

8:00
Haile’s Home

17:15
Bus terminal

19:00
8:00

19:10
8:00

St. Mariam

8:00
19:10
Betty’s Home

Work Betty at EiABC

Bus terminal
5. BETTY’S HOME: BASE; BEST PLACE FOR AGRICULTURE?

Sunlight Hours analysis
mid January
5. BETTY’S HOME: LAYERED DESIGN

L3: Parking

L2: Daily activities: semi-private transition zone

L1: Productive Open Space System
5. BETTY’S HOME: ENTRANCE TO THE CONDOMINIUM
5. FROM BETTY TO TERMINAL: PUBLIC CORRIDOR
5. NEW TERMINAL: JOBS AND TRANSPORT HUB: LAYERED

L3: Housing development

L2: Land-use; employment and education

L1: Productive Open Space System
5. NEW TERMINAL: JOBS AND TRANSPORT HUB: OVERVIEW
5. HAILE’S HOME: LAYERED DESIGN

L2: Public facilities

L1: Productive Open Space System
6. PHASING AND PERFORMANCE: WHAT IS ACHIEVED?
6. PHASING: PHASE 1

- Investments infrastructure
- Minibus network sefer
- Open spaces
- Income generation projects
- Public buildings construction
- Development housing projects

- Local governance

- BRT-network Addis Ababa city region
- Redevelopment of private and kebele compounds

- Bus stops and network
- Open space
- Income generation projects
- Public buildings construction
- Development housing projects

- Minibus network sefer

- Extra inhabitants

- Amount of jobs
6. PHASING: PHASE 1
6. PHASING: PHASE 2 + 3 + 4
<table>
<thead>
<tr>
<th>LAYER</th>
<th>OBJECTIVES</th>
<th>SURFACE IN STRATEGY</th>
<th>ACHIEVED</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSS</td>
<td>20 % open space / total</td>
<td>151.826 m²</td>
<td>22 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2 * [current travel time]</td>
<td>-</td>
<td>N / A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INCOME GENERATION</td>
<td>manufacturing [10m²]: 581 jobs</td>
<td>5120 m²</td>
<td>512 jobs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>agriculture [20m²]: 581 jobs</td>
<td>12756 m²</td>
<td>637 jobs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>service [5m²]: 581 jobs</td>
<td>4502 m²</td>
<td>900 jobs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>commercial [5m²]: 581 jobs</td>
<td>7274 m²</td>
<td>1454 jobs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2324 jobs within the sefer</td>
<td></td>
<td>total: 3505 jobs (=38%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUBLIC FACILITIES</td>
<td>250 m² footprint for 250 primary students (= 2 floors)</td>
<td>2000 m²</td>
<td>8 primary schools</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1200 m² footprint for 1200 secondary students (= 3 floors)</td>
<td>2400 m²</td>
<td>2 secondary schools</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 m² per sanitation unit</td>
<td>360 m²</td>
<td>9 sanitation units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOUSING</td>
<td>6000 inhabitants [18.75 m²]</td>
<td>67.096 m²</td>
<td>3578 inhabitants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8 dwellings (4 inhabitants)
30m² open space per household
Total compound: 340 m²

10.6 m² footprint / person
6. PERFORMANCE: RETURN TO THE VISION

A PRODUCTIVE OPEN SPACE SYSTEMS CONTRIBUTES TO THE INCREASED ACCESS TO LOCAL INCOME GENERATION.
### 6. PERFORMANCE: RETURN TO THE VISION

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>POSS STRATEGY</th>
<th>CURRENT APPROACHES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESSIBILITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to income generation</td>
<td>&gt;25% within own sefer</td>
<td>high travel costs</td>
</tr>
<tr>
<td>to public services</td>
<td>schools + health within sefer</td>
<td>high travel costs</td>
</tr>
<tr>
<td>Integration</td>
<td>housing - employment</td>
<td>no integration</td>
</tr>
<tr>
<td><strong>GOVERNANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>local: focus on civic sector (iddir)</td>
<td>top-down. only government + private actors</td>
</tr>
<tr>
<td>use of resources</td>
<td>focus on human capital</td>
<td>lack of financial capital</td>
</tr>
<tr>
<td>Stakeholders involvement</td>
<td>horizontal; all stakeholders involved whole process</td>
<td>vertical hierarchy</td>
</tr>
<tr>
<td><strong>SOCIAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mixity</td>
<td>mixing of income groups</td>
<td>creation of income enclaves</td>
</tr>
<tr>
<td>social sustainability</td>
<td>existing social networks</td>
<td>relocation disrupts social ties</td>
</tr>
<tr>
<td><strong>SPACE-USE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>productive use</td>
<td>open space for productive use</td>
<td>open space for more buildings</td>
</tr>
<tr>
<td>water resilience</td>
<td>Protective buffer zones around rivers</td>
<td>Protective buffer zones around rivers</td>
</tr>
<tr>
<td><strong>HOUSING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>typologies</td>
<td>Mixed</td>
<td>Copy paste and modern materials</td>
</tr>
<tr>
<td>private space</td>
<td>creating private open spaces</td>
<td>No private open space</td>
</tr>
</tbody>
</table>
6. REGIONAL DREAM

- Center
- Weyira sefer
- Other sefers
- Cluster
- Sub-center cluster
6. REGIONAL DREAM

- Center
- Weyira sefer
- Other sefers
- Cluster
- Sub-center cluster
- High-speed transit line
- MRT
7. EPILOGUE: 
TEN YEARS LATER
7. TEN YEARS LATER: HAILE AND BETTY’S IMPROVED LIFE

Haile

Betty