The Power of Imperfection

China-Ethiopia Industrial Parks as the Medium for Local Vitalization The Case of Eastern Industry Zone, Dukem, Ethiopia



MSc Graduation Project - P5 Presentation | Planning Complex Cities Mentors: Gregory Bracken, Claudiu Forgaci Jiaying Wu 5345936 Where

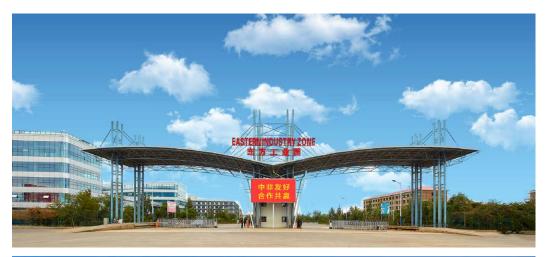






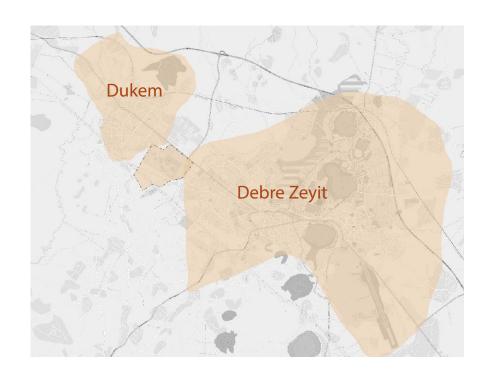










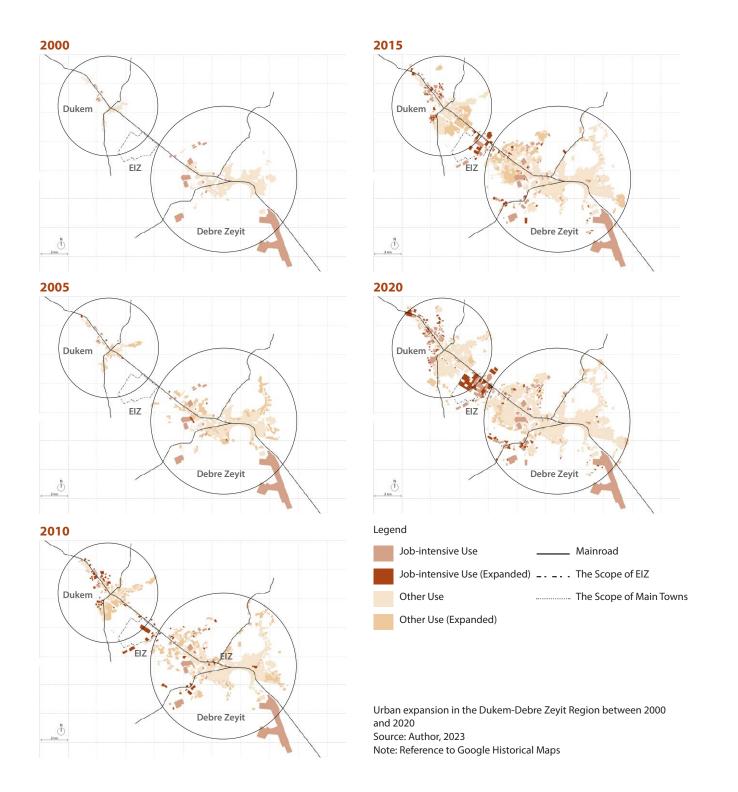








Story of EIZ



2000-2007



Construction of the EIZ officially began in 2007.

2007-2023



Context

China-Africa Relation



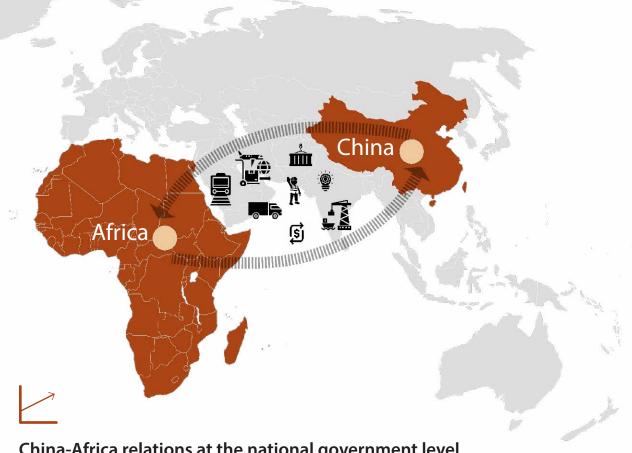
The first Ministerial Conference of FOCAC was held in Beijing on October 10-12, 2000 Source: AFP PHOTO/Stephen SHAVER



Seneglese and Chinese workers at the construction site Source: https://foreignpolicy.com/



Railway in kenya china built Source: https://www.npr.org/2014/05/27/316299135/chinaturns-to-africa-for-resources-jobs-and-future-customers

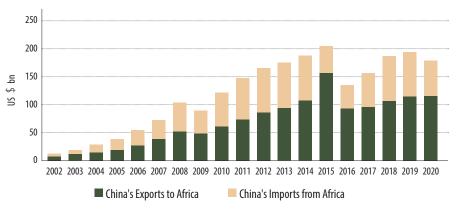


China-Africa relations at the national government level

China-Africa relations at the civil level

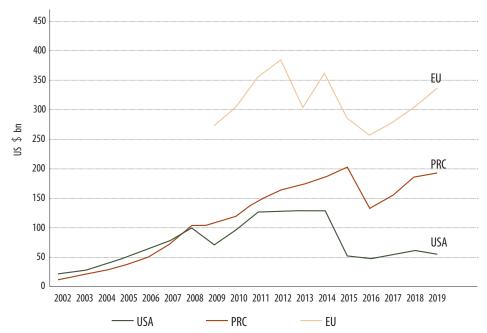
China-Africa Relation

China-Africa Trade (Jan 2022)

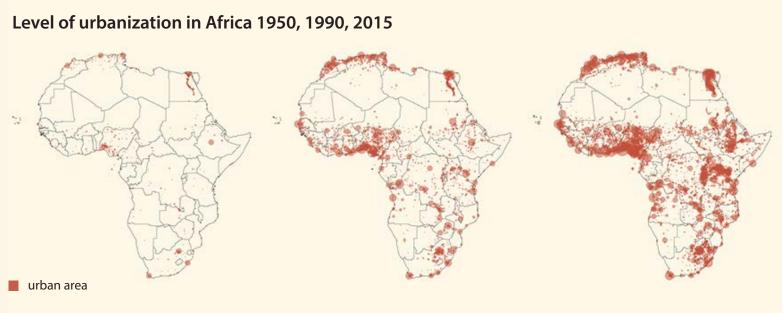


Data Source: UN Comtrade

Africa's trade with the US, China, and the EU

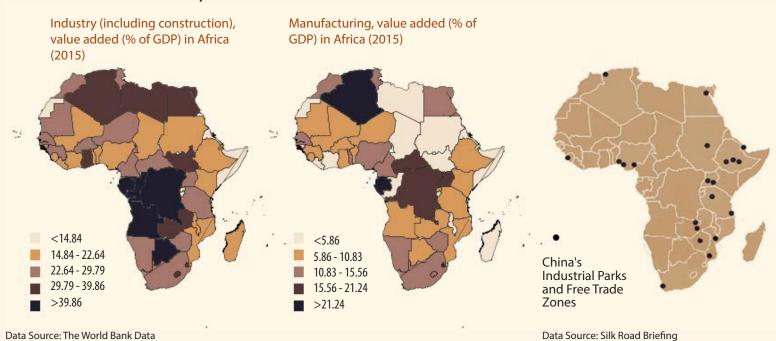


Data Source: SAIS-CARI and Eurostat



Data Source: Sahel and West Africa Club Secretariat

Africa's industrialization, and China's Industrial Parks and Free Trade Zones in Africa



China-Ethiopia Relation

Percentage of FDI attracted to Ethiopia in 2018



Data Source: EIC, 2021



Ethiopia-China Investment and Trade Cooperation Forum kicks off, 2022

Source: en.ndrc.gov.cn/news/pressreleases/202206/t20220621_1329445.html

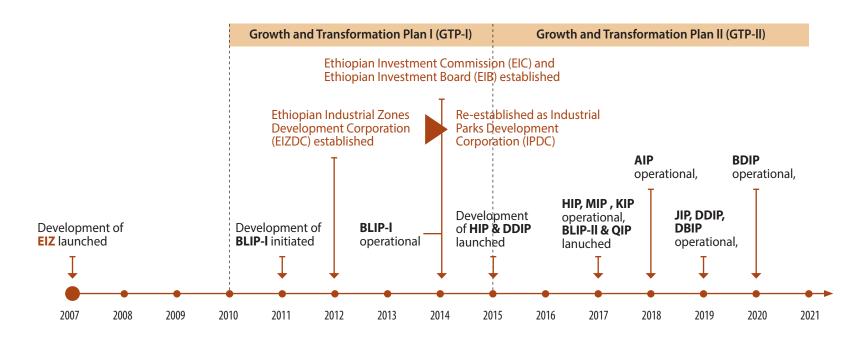


Chinese companies in Ethiopia Source: www.iol.co.za/business-report/international/ethiopia-feels-chinas-huge-presence-1726932



Ethiopia-Djibouti railway Source: en.people.cn/n3/2018/0102/c90000-9310544.html

Key Milestones of Ethiopia's Industrial Park Program

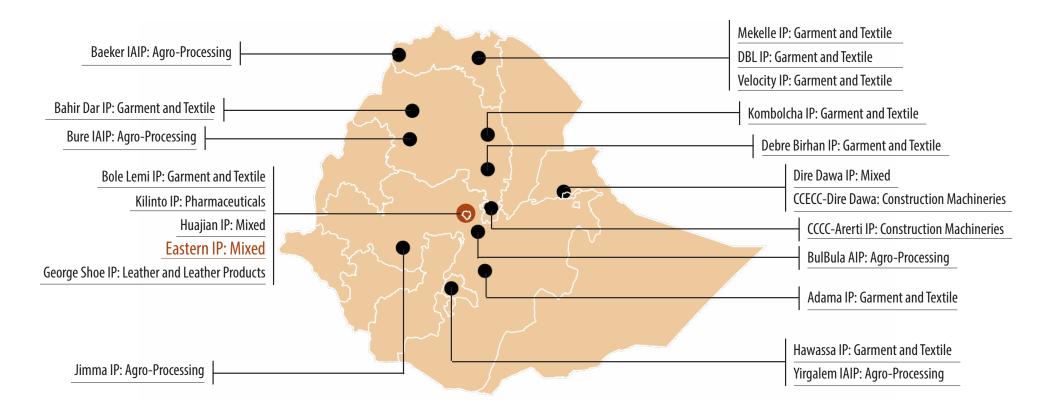


Data Source: World Bank representation based on data from IPDC.

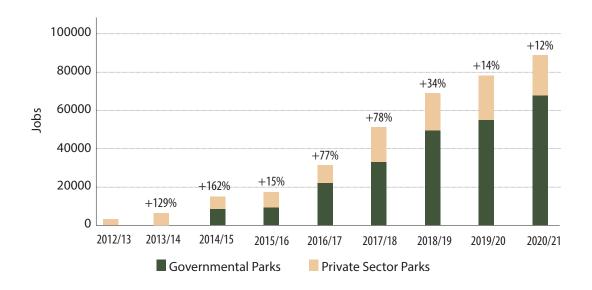
Note: BLIP-I = Bole Lemi I IP; BLIP-II = Bole Lemi II IP; DBIP = Debre Berhan IP; DDIP = Dire Dawa IP; HIP =

Hawassa IP; IP = industrial park; JIP = Jimma IP; KIP = Kombolcha IP; MIP = Mekelle IP; QIP = Kilinto IP.

Map of Industrial Parks in Ethiopia (as of 2021)



Jobs Created in Ethiopia's Industrial Parks

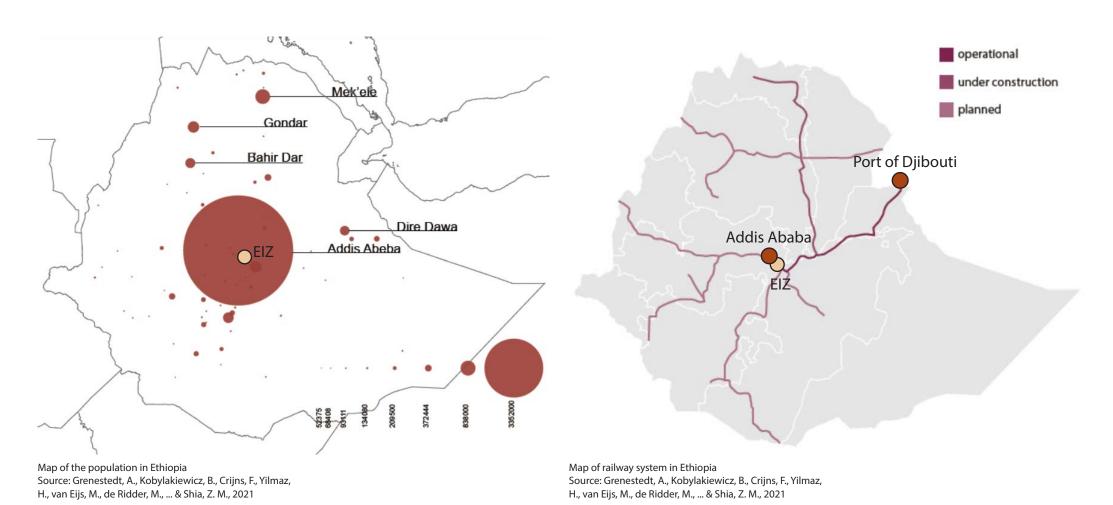


Data Source: IPDC and EIC

The Case of Eastern Industry Zone

Strategic Location:

- proximity to the metropolis (all kinds of resources and elements converge)
- key node on the Addis Ababa-Djibouti port transportation corridor (convenient transportation)



The Case of Eastern Industry Zone



- The first industrial park in Ethiopia founded in 2007
- A comprehensive industrial park.
- -In Dukem, about 30 km southeast of Addis Ababa
- Covering about 200,000 people
- Up to today, 83 companies have moved inside and nearly 20,000 job opportunities have been created for local employees.

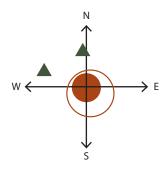
Location of Eastern Industry Zone Source: Author, 2023



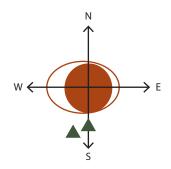
Resources & Challenges

Local Capacity Analysis

Urban Expansion Direction in Dukem



Urban Expansion Direction in Debre Zeyit

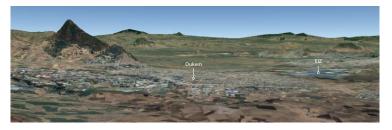


Legend

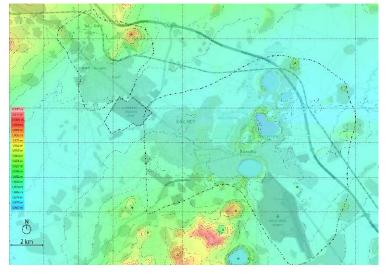




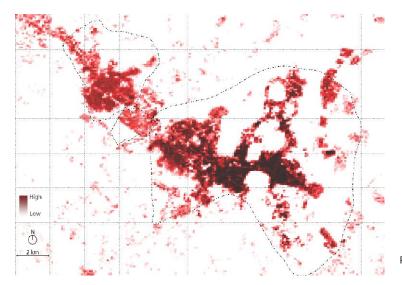




Local terrain

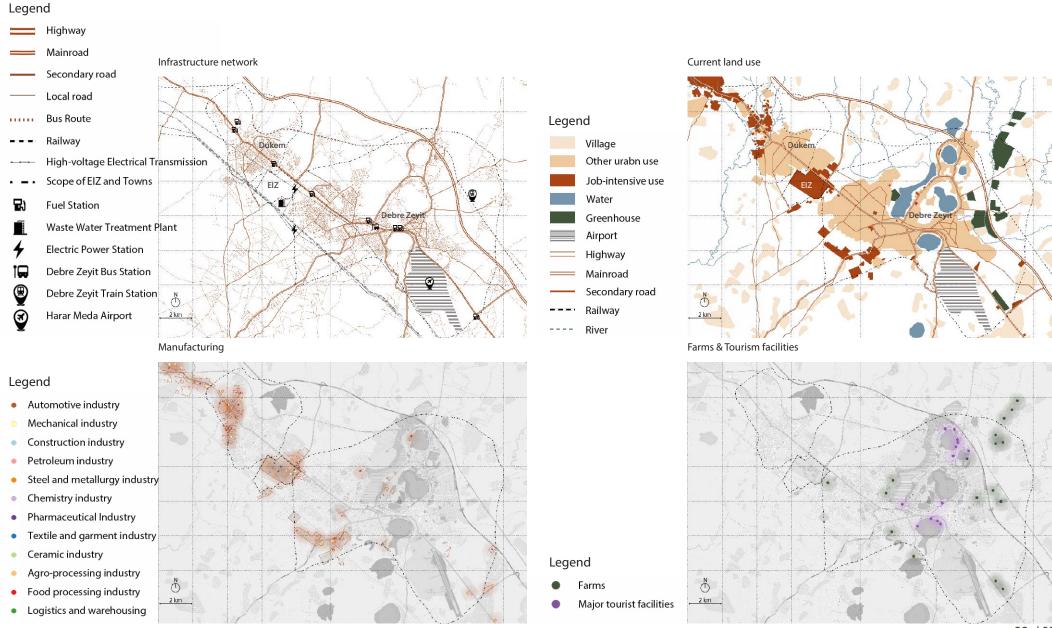


Elevation



Population density

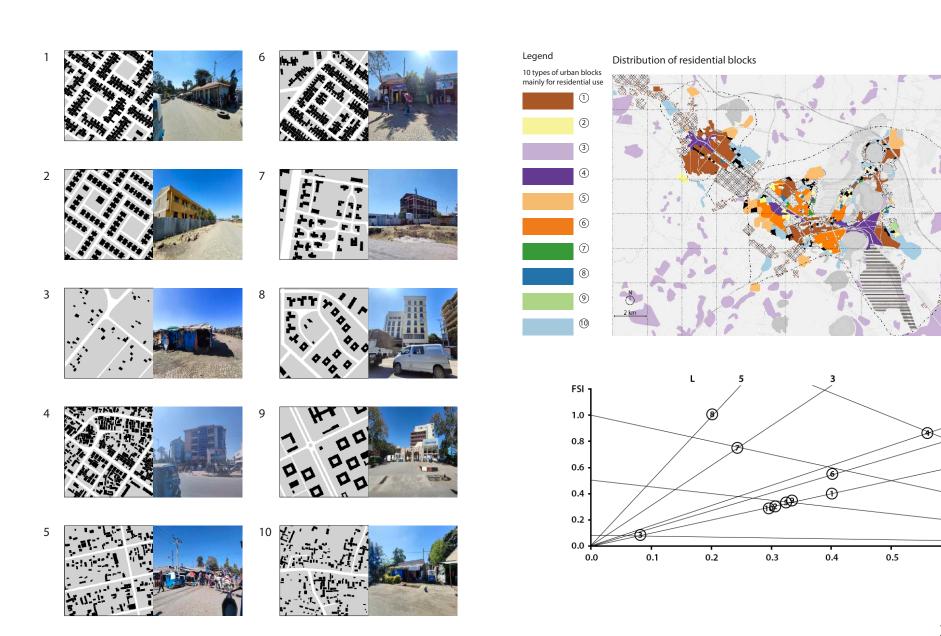
Relatively poor infrastructure connectivity Fragmented land use Uneven distribution of industries



The facilities are basically adequate; but the quality needs to be improved.



Local housing is very diverse; Some blocks with very inefficient use of land (3,5,10)



GSI

OSR

Challenges

1 - Multi-scale Dynamic Complexity

The macro-scale: The metropolitan area of Addis Ababa

The mesoscale: Dukem-Debre Zeyit area

The micro-scale: EIZ with the surrounding area



Macro scale - Addis Ababa megacity region Source: Author, 2023 Note: Data from Google



Mesoscale - EIZ, Dukem and Debre Zeyit Source: Author, 2023 Note: Data from Google Farth

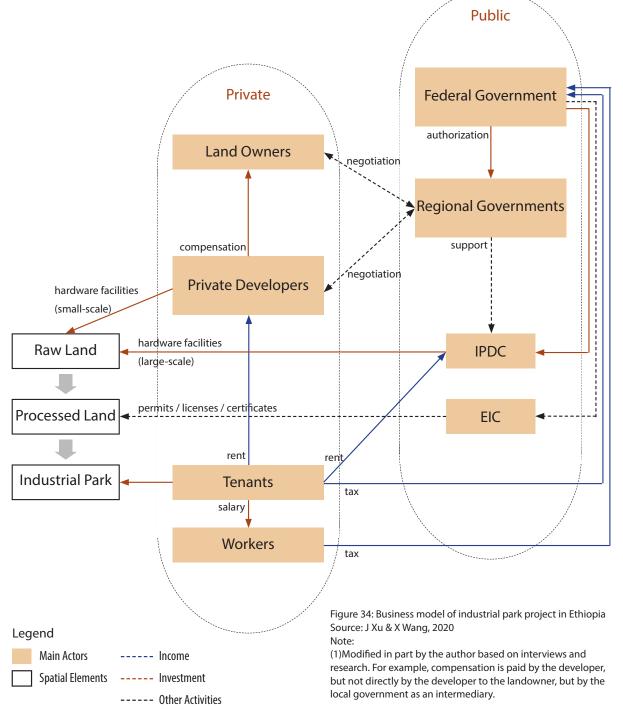


Micro scale - EIZ and surrounding environment Source: Author, 2023 Note: Data from Google Farth

Challenges

2 - A Strong Top-down Implementation

The establishment of the EIZ has been driven by a strong central authority. The Ethiopian government is actively promoting the project, and private Chinese developers are given greater authority in terms of resource allocation and investment promotion.



Challenges

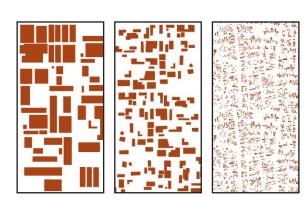
3 - Difficulty of Reconciling Different Interests

There may be conflicts between the needs of different groups. How to balance and coordinate will be the key.



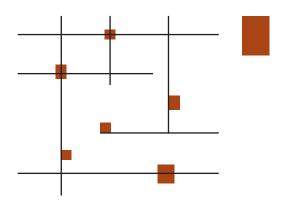
Problem Statement

Spatial Dimension



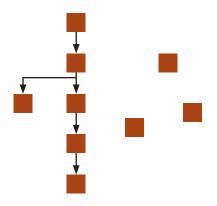
- Lack of continuity in urban fabric
- Disparity in scale
- Isolation and fragmentation

Socioeconomic Dimension



- Single function
- Not embedded in local networks
- Lack of consideration for environmental impact

Governance Dimension



- Unequal access to decisionmaking for different groups
- Lack of efficient communication mechanism
- Concerns about transparency of the relevant procedures and information

Research Aim

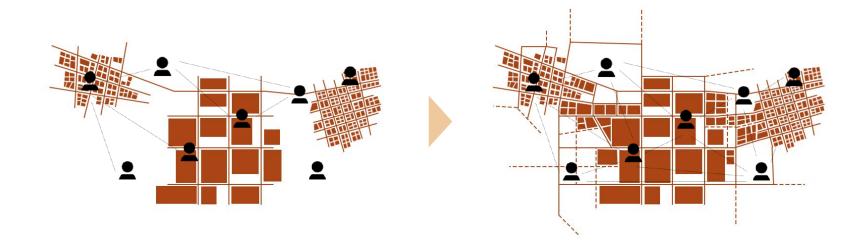
Spatial Dimension

To achieve the mixed, sustainable, and inclusive cityindustry integration Socioeconomic Dimension

To stimulate local endogenous development and encourage sustainable partnerships

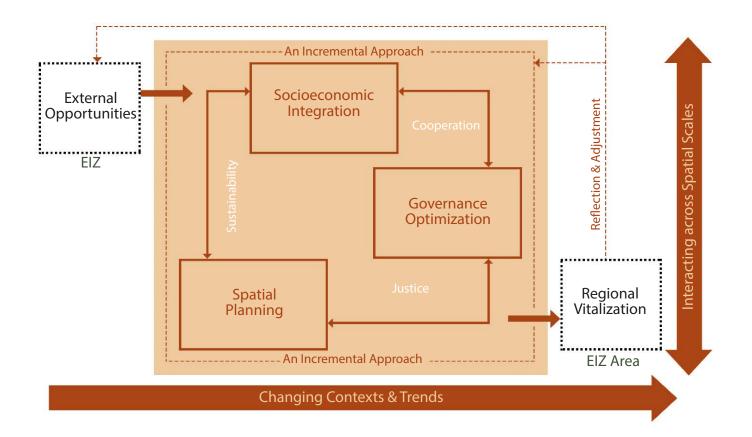
Governance Dimension

To optimize the governance system for bottom-up dynamics

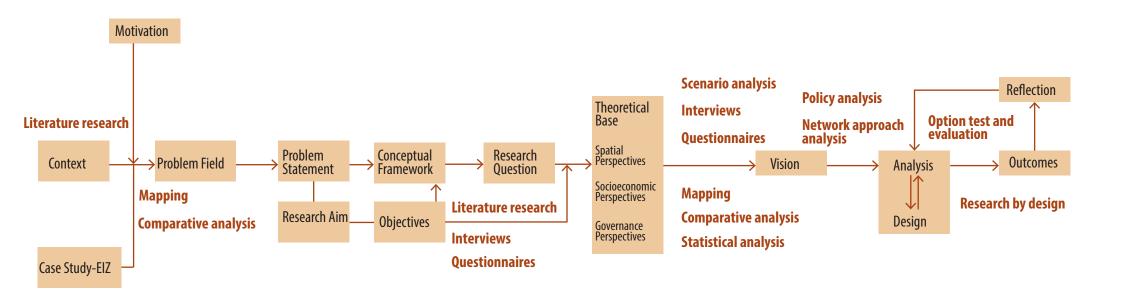


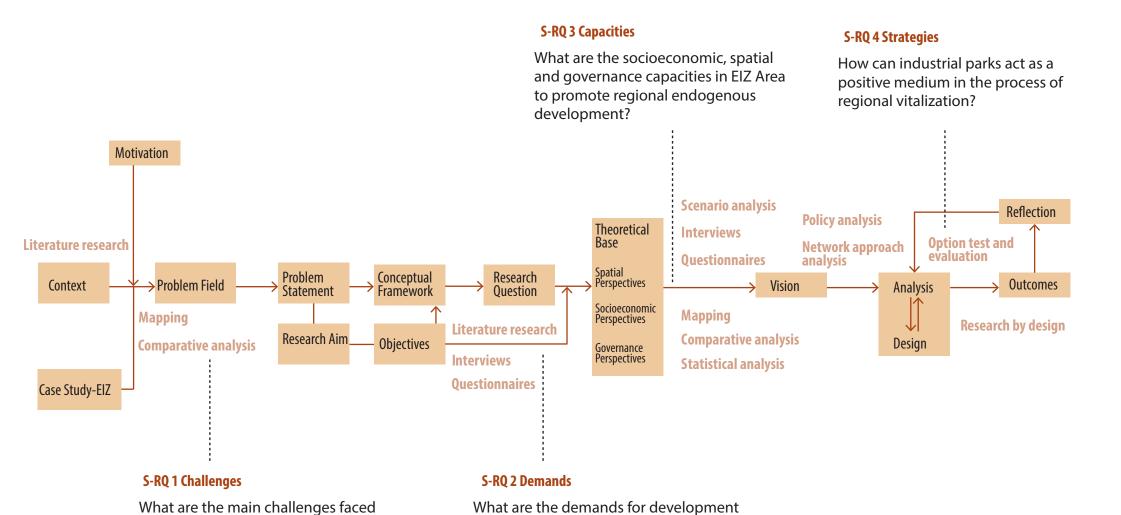
Main Research Question

How to exploit external opportunities in Ethiopia, taking Eastern Industry Zone as the medium, to achieve regional vitalization?



Methodology



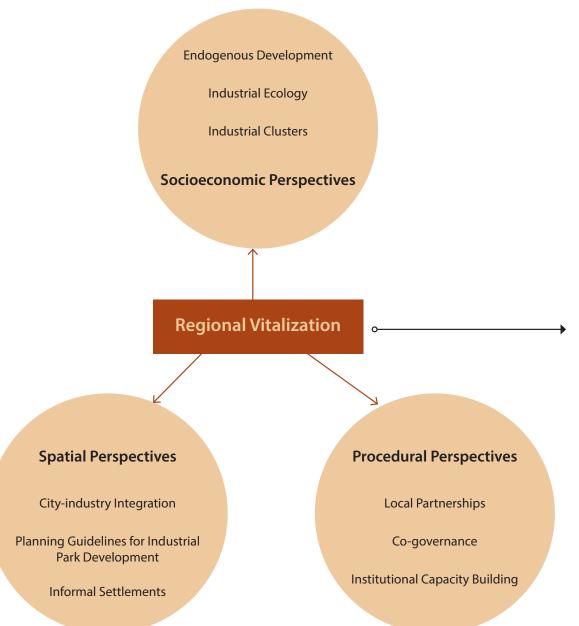


among different groups in EIZ Area?

by EIZ Area in achieving city-industry

integration?

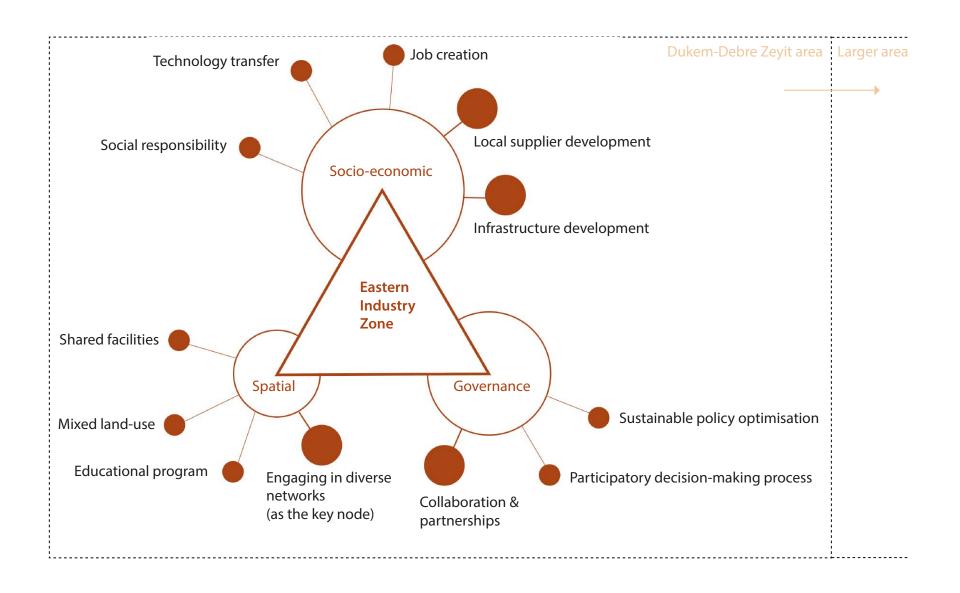
Theoretical Base

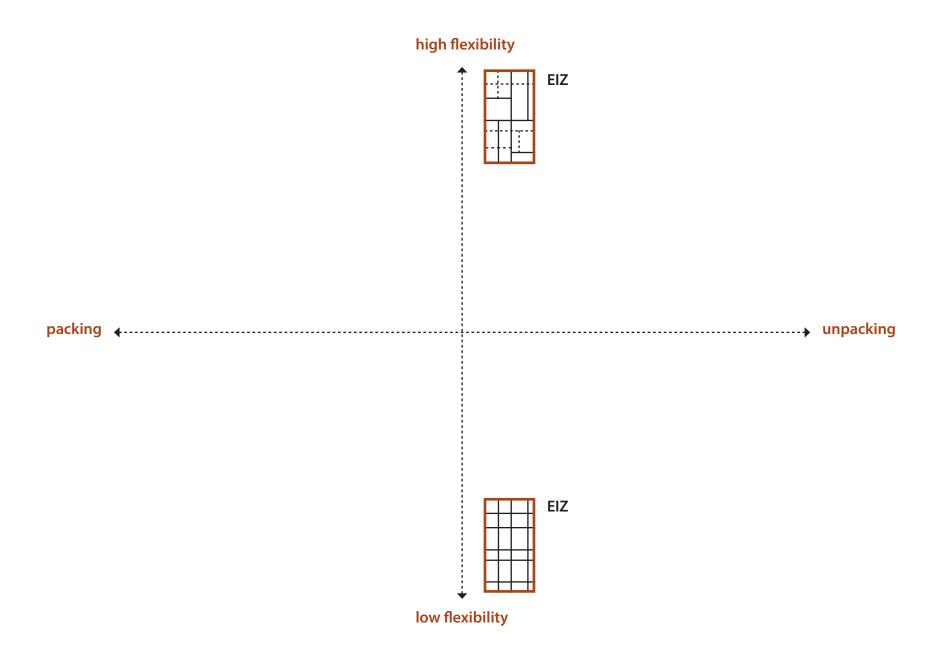


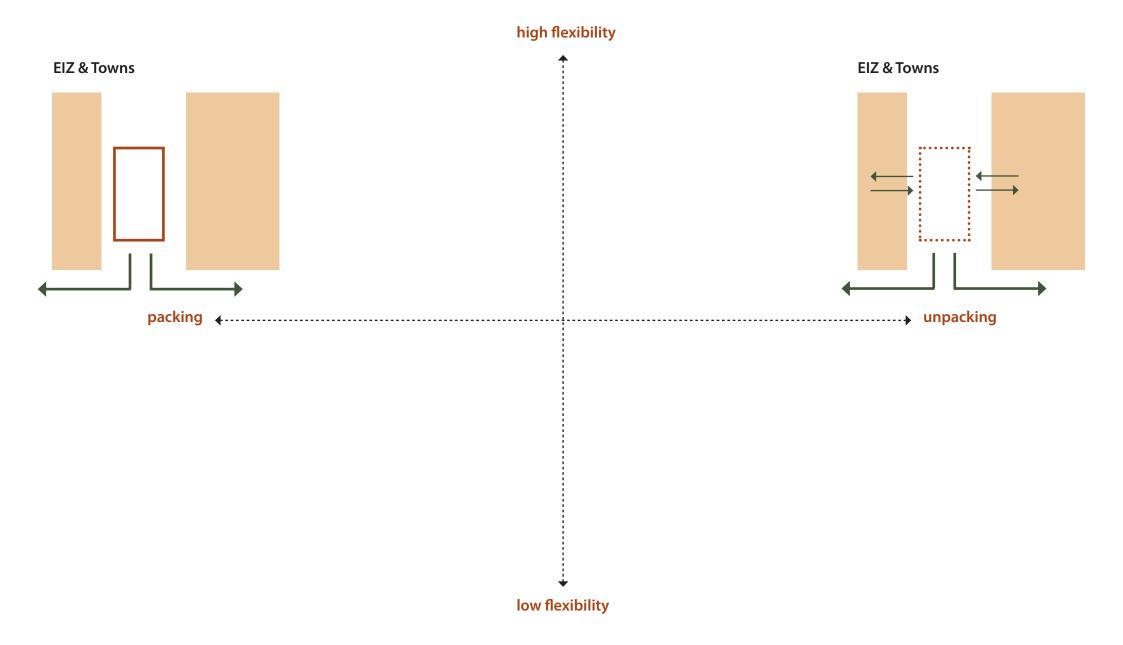
According to the objectives, regional vitalization is interpreted as the construction of economy, politics, culture, ecology, and people's well-being aiming at realizing the comprehensive development in this area by systematically allocating and efficiently managing various developmental elements, such as population, land, and industry.

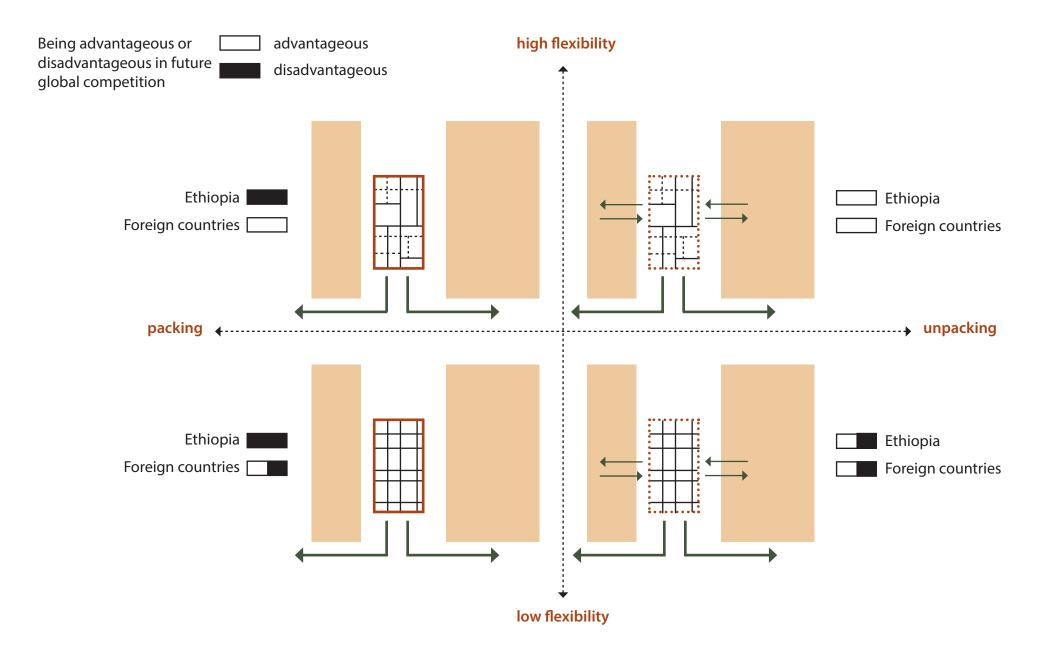
Scenario Building & Vision

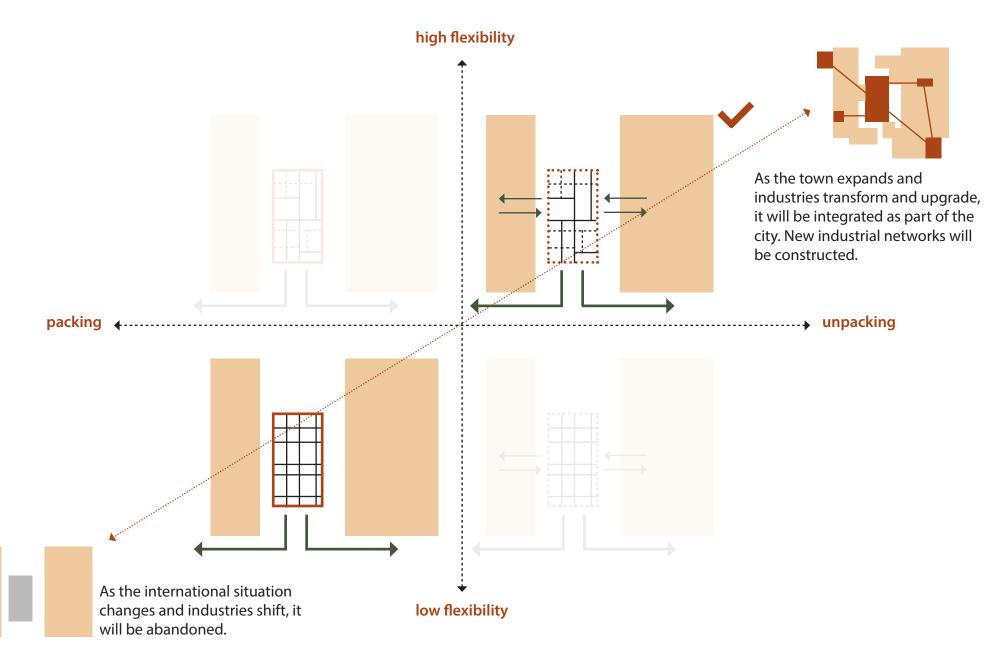
The Value of EIZ as A Positive Medium











Vision

2025

The construction of Phase II began with a new round of investment and job promotion that will improve the region's standard of living, reduce poverty, and promote economic growth. The industrial park development plan is designed together with the urban development plan.



2030-2050

In 2030, Phase II of Eastern Industry Zone will be 50% or more built, with over 5,000 jobs created by the companies already in operation. More than 30% of the companies in the first phase have transformed and upgraded their industries, and new technologies and knowledge are used in practice. The knowledge and innovation network of companies and educational and research institutions is already relatively well established.



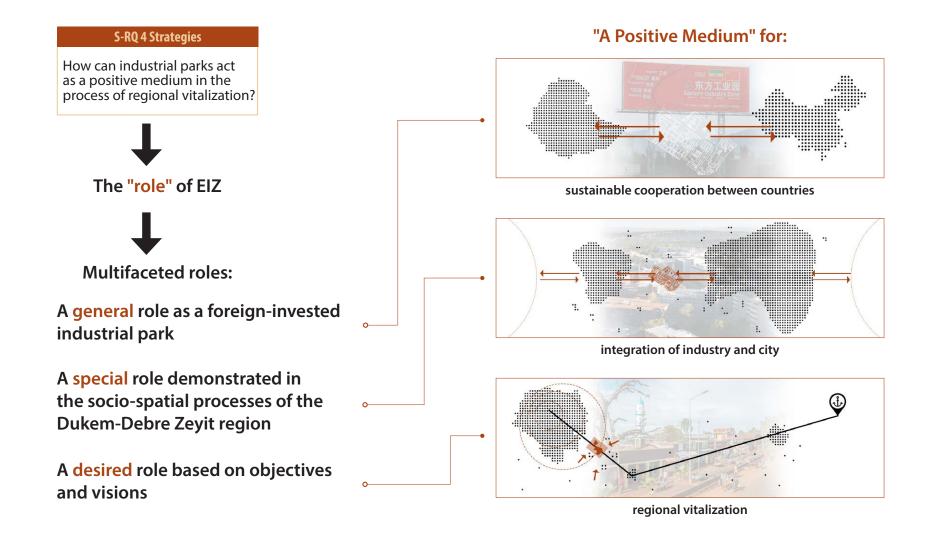
2050

By 2050, integrated with the Eastern Industry Zone, Dukem-Debre Zeyit area is the major industrial hub in Ethiopia, contributing significantly to Ethiopia's economic development. The whole region's sustained growth can stimulate innovation, research, and development, leading to the emergence of high-value industries and global competitiveness. The local communities benefit from improved infrastructure, quality education, and enhanced social services, resulting in a prosperous and inclusive society.



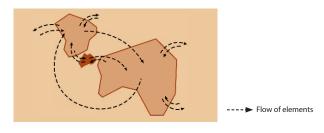
Strategy

Strategy Theme

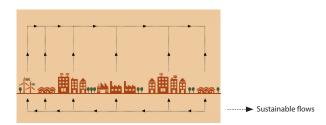


Principles

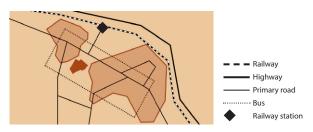
Integrated Planning



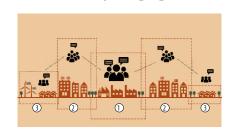
Sustainable Development



Connectivity and Accessibility

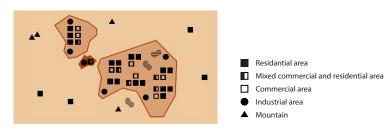


Community Engagement

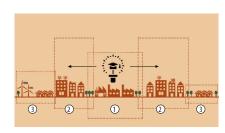


- 1 Eastern Industry Zone
- ② Town area
- 3 Rural area

Mixed-use Development



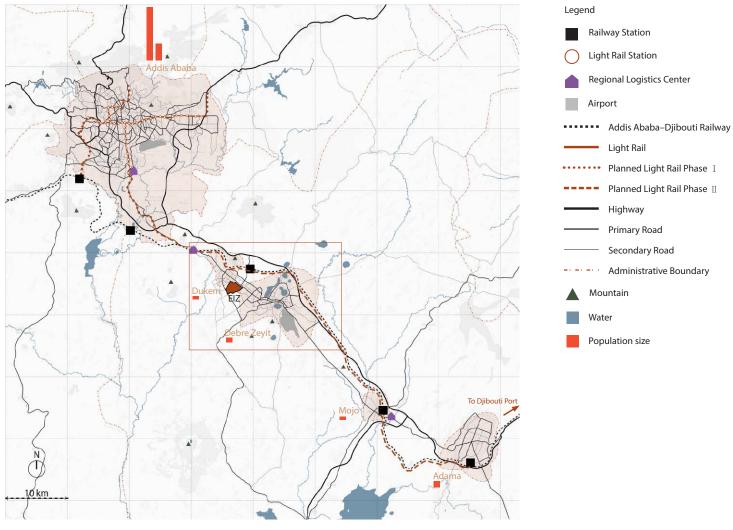
Innovation



- 1 Eastern Industry Zone
- Town area
- (3) Rural area



Infrastructure Development



Map of key transportation projects and demographic distribution at the macro scale Source: Author, 2023

Energy System Restructuring

Legend

Industrial Park

Mountain

Water

Local Industrial Cluster

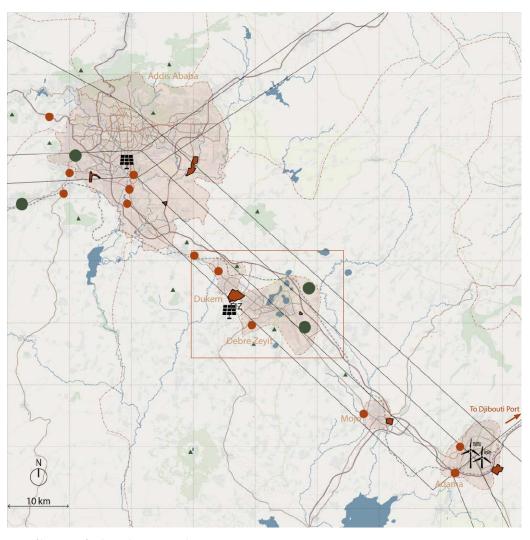
Green House Industry

Planned Solar Power Project

Energy Transmission Corridor

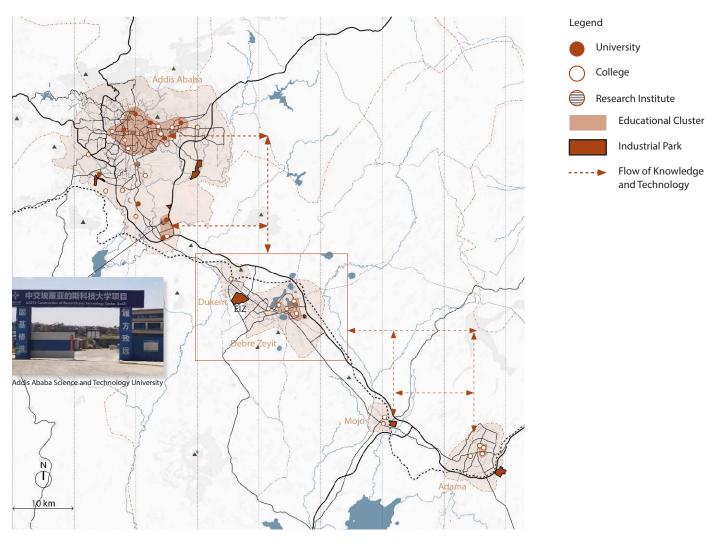
Administrative Boundary

Planned Wind Power projects



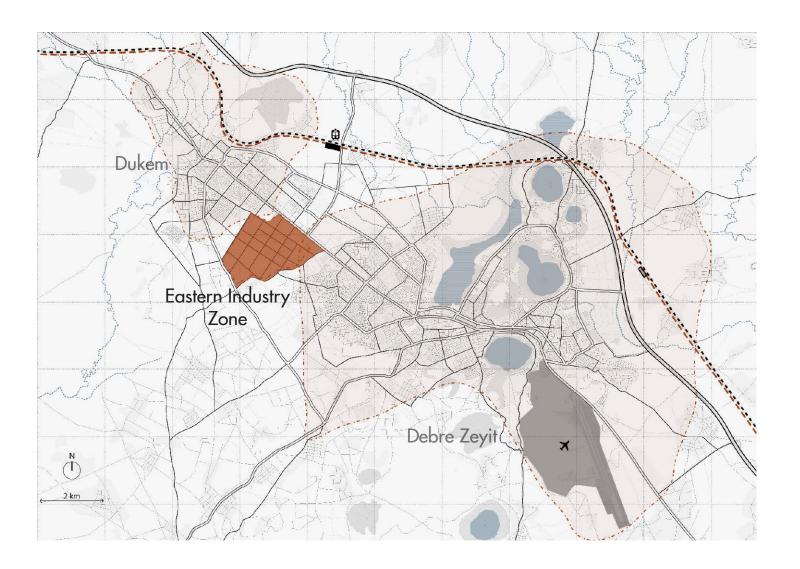
Map of location of industrial projects and energy projects at the macro scale Source: Author, 2023

Education & Innovation Network Building



Map of clusters of educational, research, and innovation institutes and the distribution of industrial parks at the macro scale
Source: Author, 2023



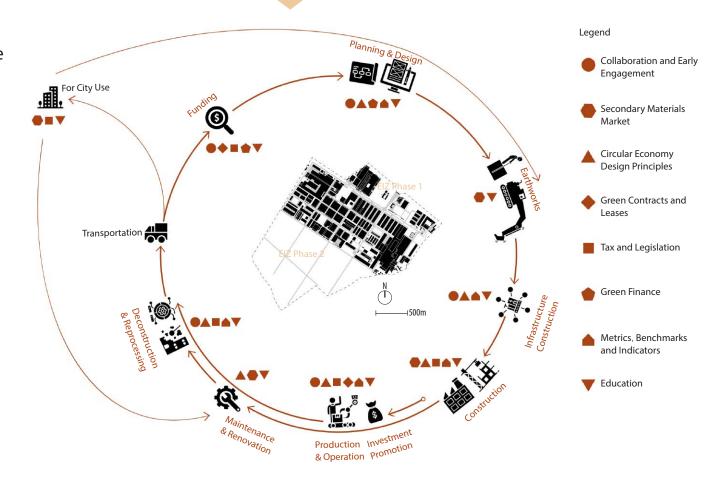


Circularity of EIZ Life Cycle

Linear mode

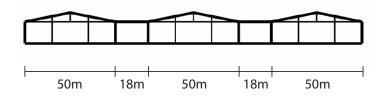
Preparation Phase	Design Phase	Construction Phase	In-use Phase	Demolition Phase
Establishment of projects Funding Site Selection Relocation & Compensation	System Design Spatial Layout Architectural Design	Earthworks Infrastructure Transportation Facility Installation Environmental and Safety Assessment	Operation Maintenance Renovation	Deconstruction Disposal

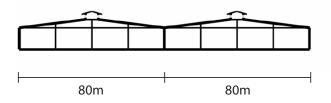
Circular mode



Sustainable Improvements of Factory Buildings

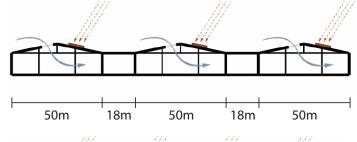
Two types of current factory buildings

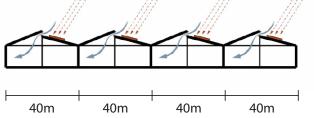


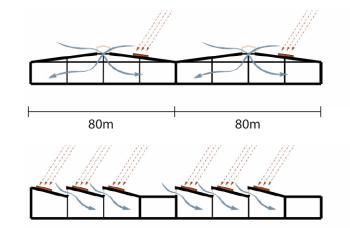




Four types of sustainable improvements





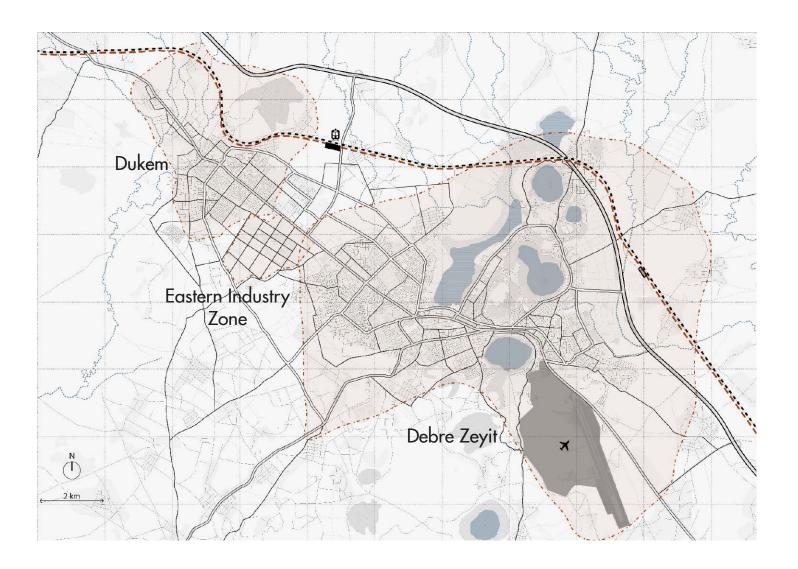


18m

60m

60m

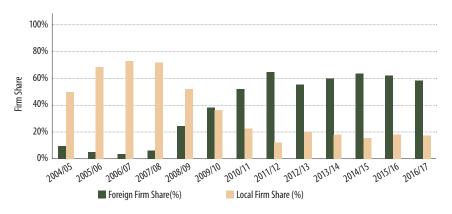
18m



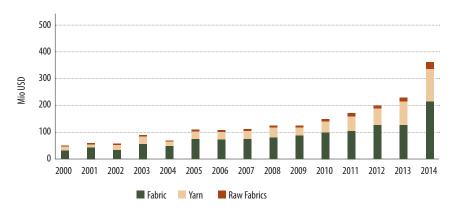
Improvements of Textile and Apparel Industry in EIZ

The Textile and Apparel Industry in EIZ

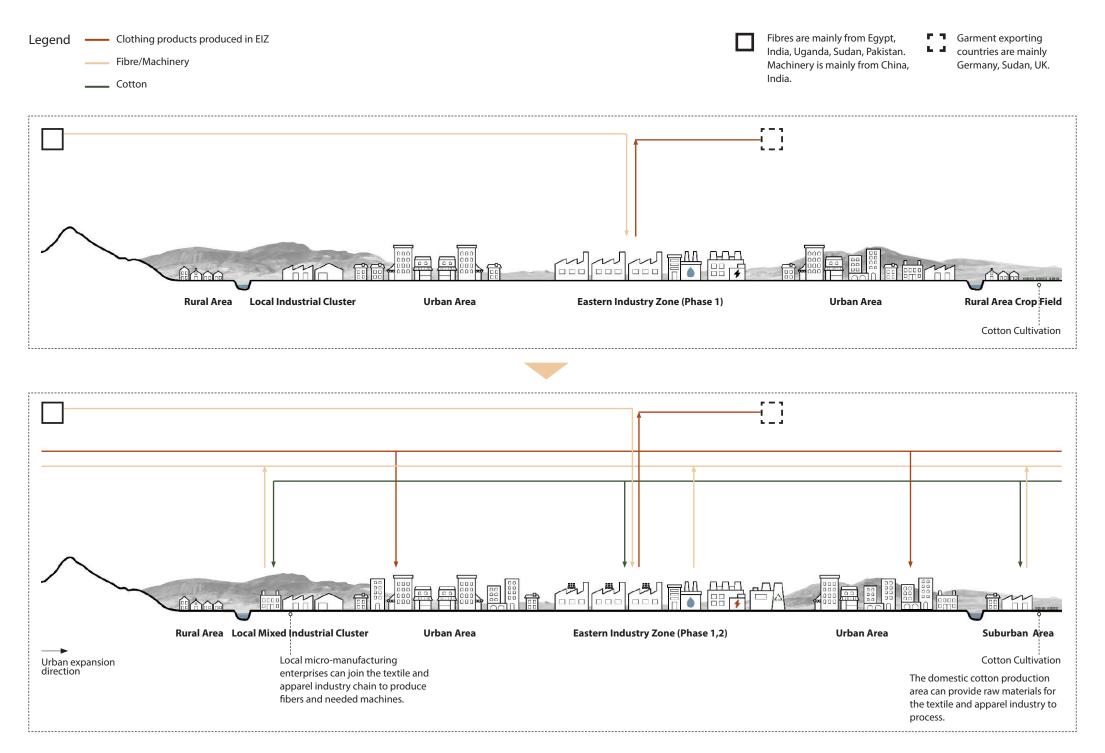


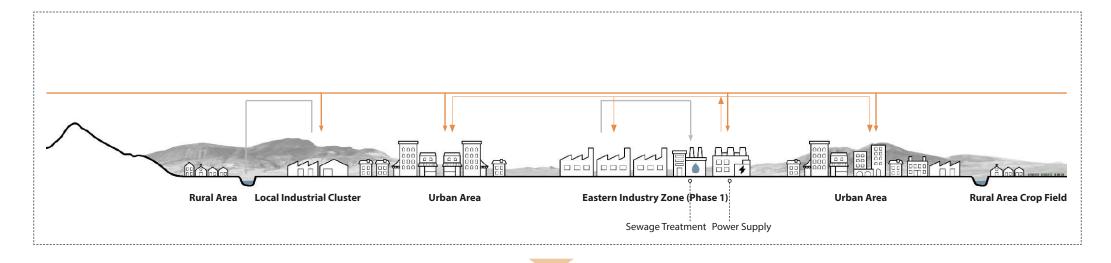


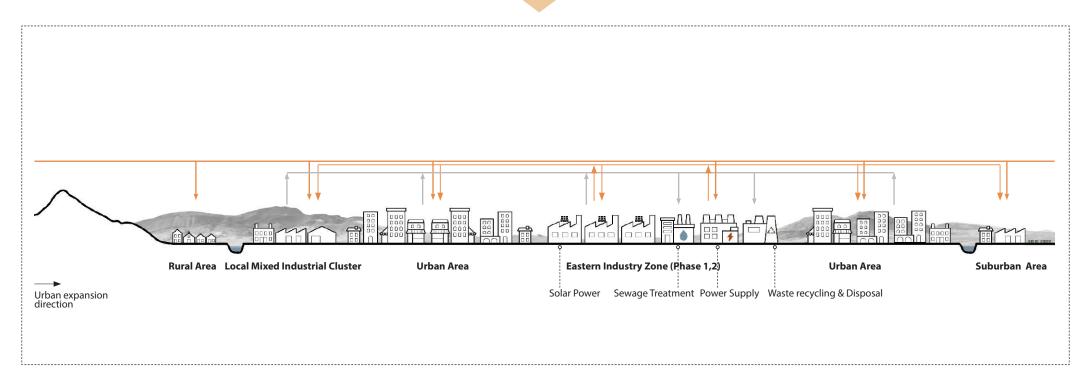
Apparel exports by local and foreign firms in Ethiopia, 2004/5-2016-17 Source: TIDI, 2017



Textile Imports to Ethiopia 2000-2014 Source: UN COMTRADE, 2015







To Addis Ababa

Highway

Local trail

Railway

Primary Road

Secondary Road

Planned Light Rail

Regional BRT Route

Town Boundary

Bus Route 1 Bus Route 2

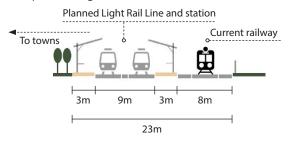
Bus Route 3

Legend

- Planned New Railway Station
- Current Railway
 Station
- Harar Meda Airport (For the military)
- Scope of EIZ
- Bus Terminus

Transportation System Planning

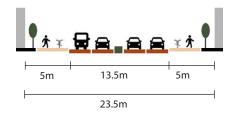
The planned light rail

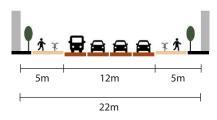




Current light rail in Adddis Ababa Source: www.crecg.com/english/2745/2808/41470/index. html

Two types of primary roads

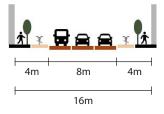


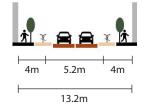


Road Surface Material:



Two types of secondary roads



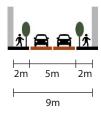


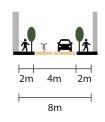
Paving Stone

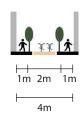


Photos of road surface material in Ethiopia Source: Author, 2023

Three types of local trails

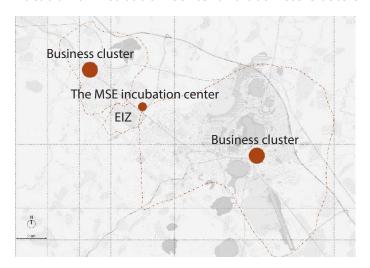




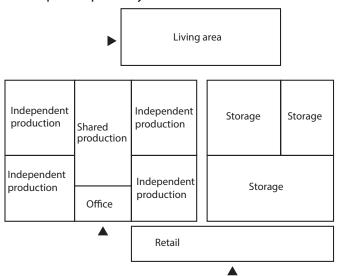


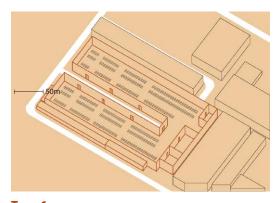
Spatial Improvements of MSEs

Location of Incubation Center and Business Clusters



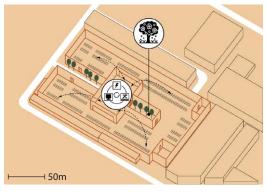
Conceptual space layout of MSEs





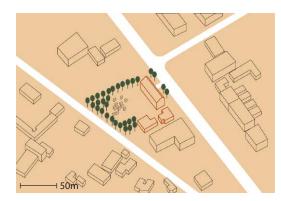
Type 1 Factory-based MSEs:

They typically have more formalized production spaces, such as assembly lines or production rooms, and may have access to shared services such as utilities, security, and transportation.



Optimization Strategy:

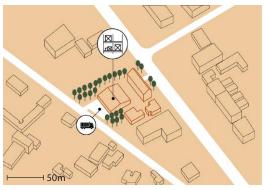
The shared space (including green space) is used to break the monotonous and boring spatial experience of large factories, while promoting the sharing of equipment and other facilities to improve the quality of the working environment for employees.



Type 2

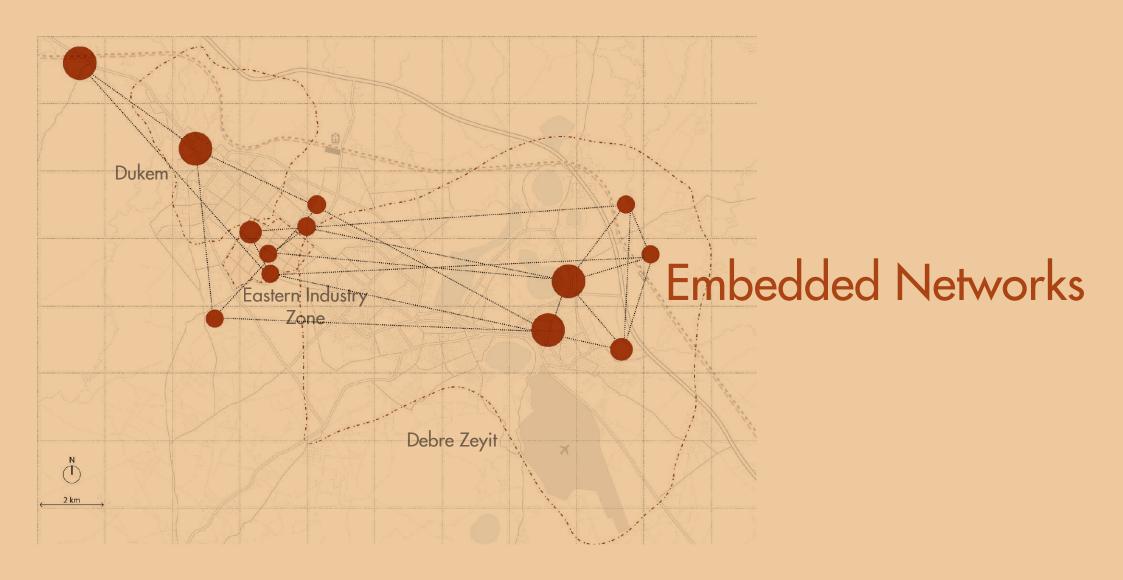
Cottage Industry MSEs:

These are MSEs that operate out of homes or small workshops, often using traditional techniques and tools. They typically have more informal production spaces that are integrated with their living spaces.

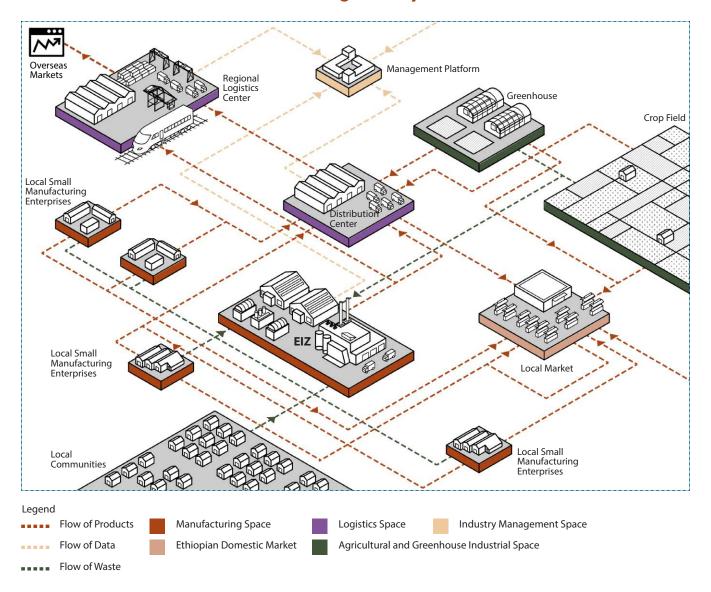


Optimization Strategy:

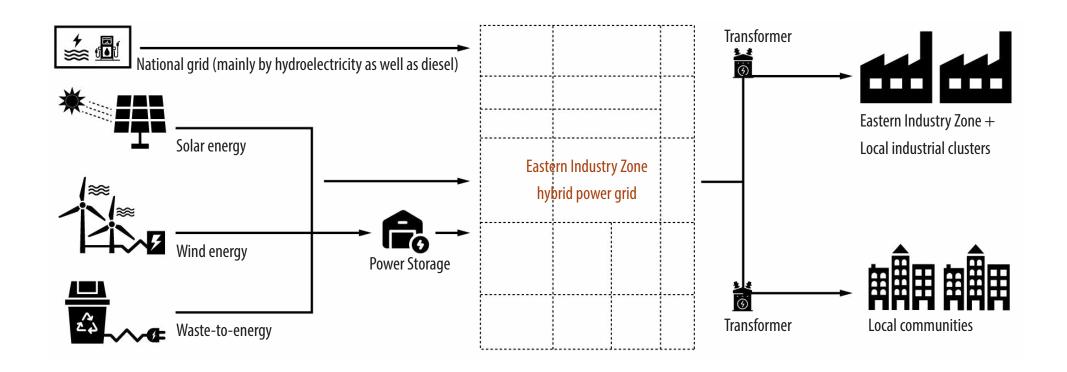
Separate living flows from logistics flows to ensure the safety of all activities. Consider the safety area for loading and unloading, and the impact on daily life. Optimize storage facilities to minimize losses.



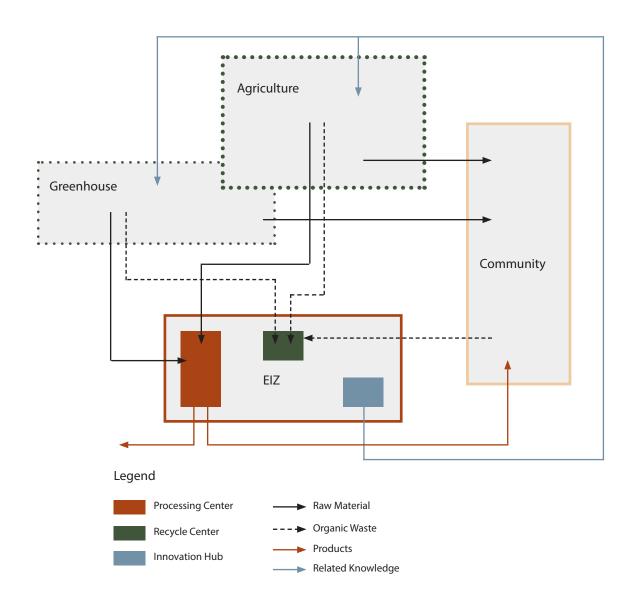
New Logistics System



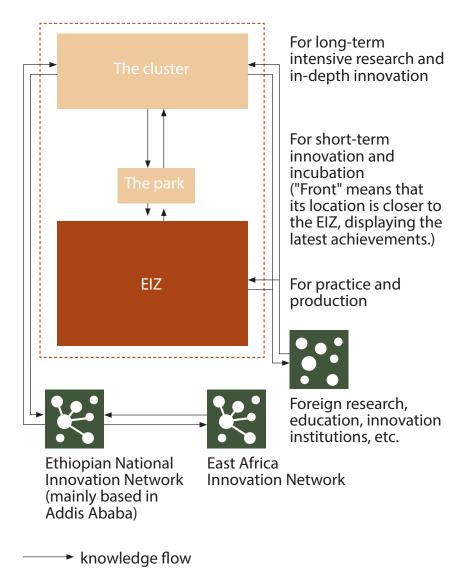
The restructured power system in EIZ



Practice-based interactions between local agriculture, greenhouse industry and EIZ



New Local Innovation System



Local educational and innovation cluster





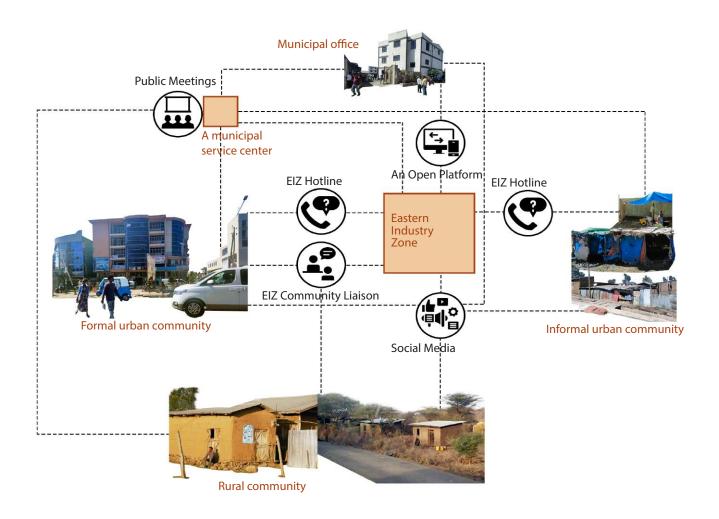
The front knowledge park





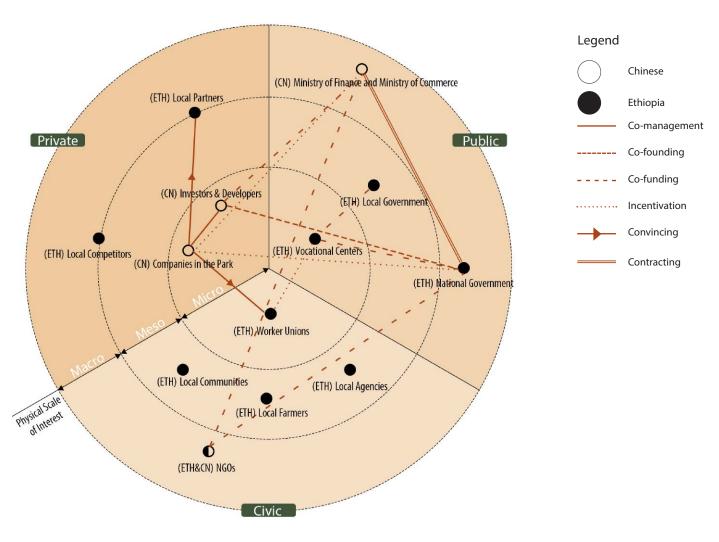
Collage of the knowledge park Source: Author, 2023

New Local Citizen Feedback Mechanism





Stakeholder Configuration



Stakeholder Configuration Source: Author, 2023

Optimization of the relationship among stakeholders

Legend

Synergy
---- Conflict

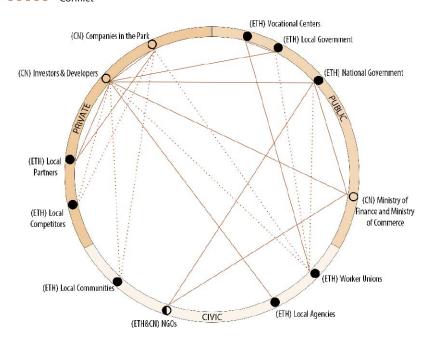


Diagram of current relationships Source: Author, 2023

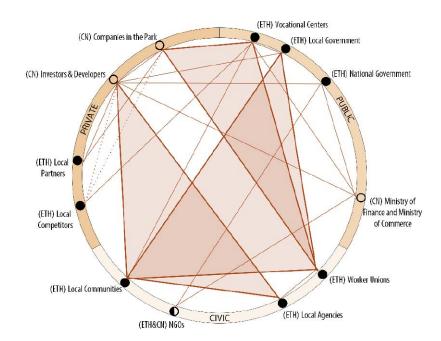
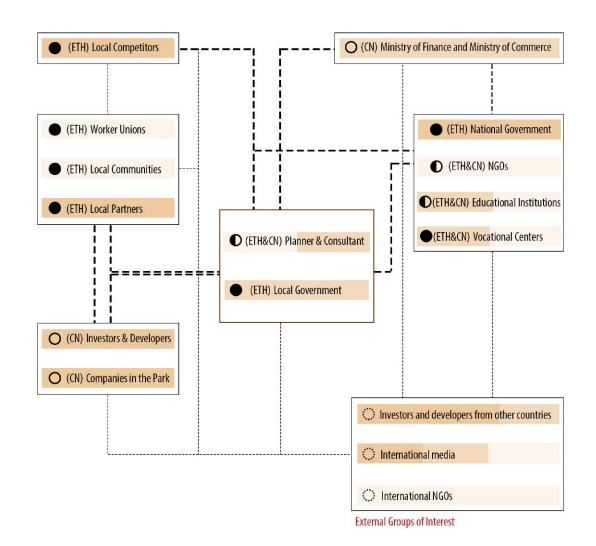


Diagram of future relationships Source: Author, 2023

A new model for co-governance based on agencies

Suitable as the agency to communicate with the private sector and civic society

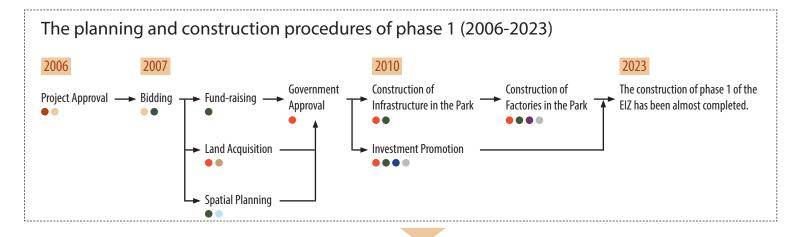
Name	Main Roles		
Ethiopian Investment Commission (EIC)	Support investors throughout the investment process, and create a conducive business environment.		
Ethiopian Industrial Parks Development Corporation (IPDC)	Coordinate the planning process, and act as a liaison between investors		
The Ministry of Capacity Building (MCB)	Serve as the focal point for supervising and coordinating a broad range of national initiatives and maintain the donor-country dialogue		
Ethiopian Chamber of Commerce and Sectoral Associations (ECCSA)	Act as the private sector counterpart in the Ethiopian Public Private Consultative Forum (EPPCF) model to dialogue with the public sectors.		



The shift to a participatory decision-making process

Main stakeholders invloved in the process

- Ethiopian National Government
- Chinese National Government
- Chinese Private Developers
- Investors
- Ethiopian Regional government
- Ethiopian Land Owners
- Chinese Design Company
- Employees in EIZ
- Manufacturing Companies
- Planning Experts & Researchers
- IPDC(The Ethiopian Industrial Parks Development Corporation)
- Citizens in Dukem-Debre Zeyit Area



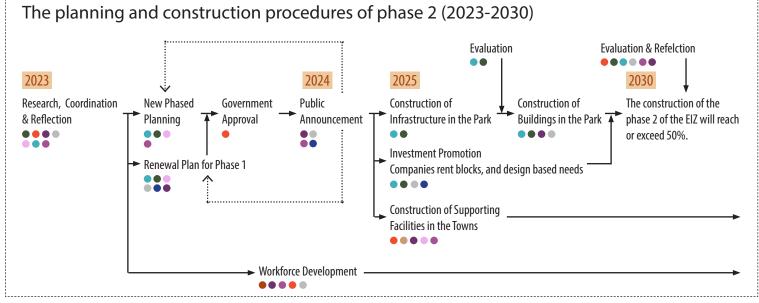
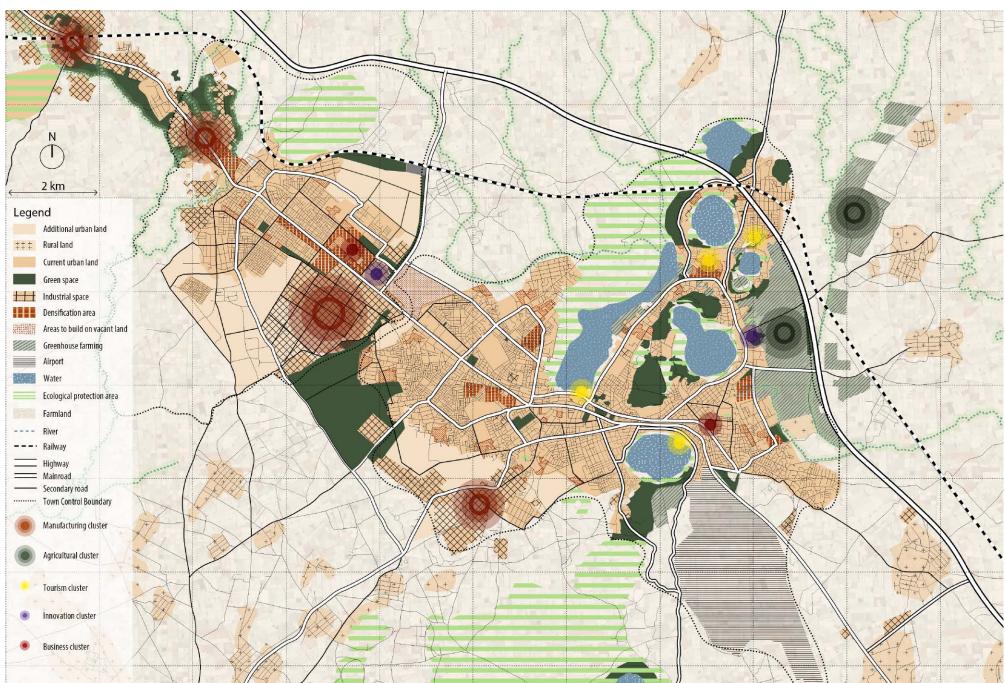


Figure 168: Satellite image of local industrial cluster in Dukem Source: Google Map, 2023 (The Ethiopian Industrial Parks Development Corporation (IPDC) was established in 2014, as one of the public enterprises.)

Master Plan



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Phasing 2023 2025 2030 ----- assessment small-scale improvements launching key transportation projects Planning light rail in the region and publicizing status assessments consolidating and optimizing the infrastructure improvements made in the earlier phases Infrastructure Development initiating the construction of light rail project fostering awareness of the circular economy promoting the restructuring of EIZ energy (pilot projects) fully promoting the restructuring of EIZ energy fully promoting the use of renewable energy in the region selecting the first companies to start piloting circular economy practices initiating the construction of waste treatment centers in EIZ Phase 2 **Transition to A Circular Economy** embedding circular economy principles as standard practices across industries improving the level of local education clusters planning local capacity-building programs publicizing and receiving feedbacks promoting innovation, completitiveness, and value-added activities among local companies and foreign companies initiating the construction of the knowledge park Stimulating the Local Endogenous Growth adjusting policies and vigorously supporting local enterprises initiating incubation programs support start-ups establishing communication channels policy adjustment policy adjustment establishing collaborative platforms initiating the construction of digital communication platforms institutionalize collaboration mechanisms and public-private partnerships Fostering Collaboration and Partnerships

Milestones

Assessment Framework

Key considerations for a comprehensive assessment of progress, outcomes, and impacts in the implementation of strategic action plans:

- ① **Set Clear and Measurable Goals:** Define measurable goals for strategies, and specify indicators to track progress. Goals may encompass infrastructure development, circular economy adoption, local business growth, collaboration, and community development.
- ② Monitor Key Performance Indicators (KPIs): Define relevant KPIs to monitor the implementation of actions. These may include metrics such as the number of infrastructure projects completed, waste reduction rates, employment generated by local businesses, the number of collaboration initiatives established, and community satisfaction surveys.
- ③ Data Collection and Analysis: Collect data on an ongoing basis to assess the implementation progress. Create a relevant database at the beginning. Data sources can include project reports, surveys, interviews, financial records, and other relevant sources. Analyze the data to identify trends, patterns, and areas for improvement.

- ♠ Stakeholder Engagement: Involve stakeholders in the evaluation process by seeking their feedback and perspectives through interviews and surveys. Conduct consultations, focus groups, and interviews with representatives from government agencies, private sector entities, academia, local communities, and other stakeholders. Their insights can provide valuable information on the effectiveness and impact of the strategies.
- (5) Reporting and Communication: Prepare comprehensive evaluation reports summarizing the findings, conclusions, and recommendations. Share the reports with relevant stakeholders, including government authorities, funding agencies, and the public. Effective communication of evaluation results helps build transparency, accountability, and support for the ongoing revitalization efforts.

Effective tools:

Performance Indicators

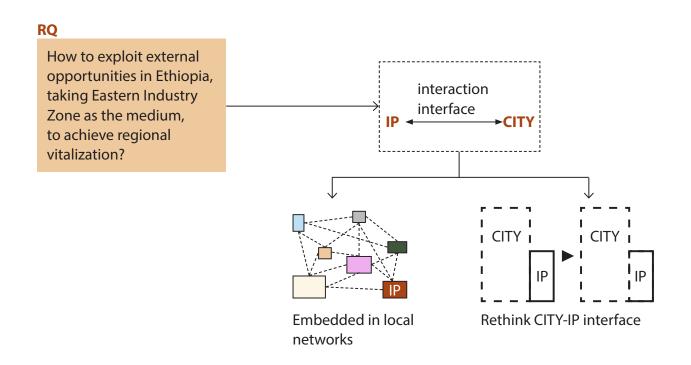
Surveys /Interviews

Database (ongoing collection and analysis)-GIS

Environmental Impact Assessment (EIA)

Design Test

Linkage between design and the research question



Three Bottom-up Spatial Patterns

Mixing of programs



Legend





Office Space



Retail Space

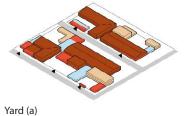


Living Space

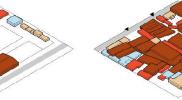
The use of public space



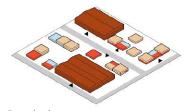
Yard (b)



Enclosed (a)

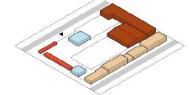


Block Composition



Detached

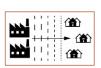


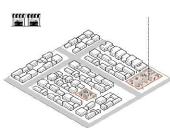


Enclosed (b)



Transition of space





Market

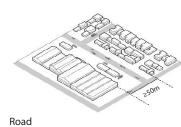


Vegetable Field



Sports Field









Park/Sports Field

Objectives

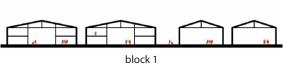
Design Guidelines

Application in the design of Phase II of the EIZ



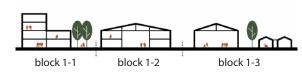
Compatible design of blocks and programs





before







Transformation from a single production building to a multifunctional production complex







































Objectives

Design Guidelines

Application in the design of Phase II of the EIZ











before





after

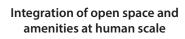


Diversified streetscape experience

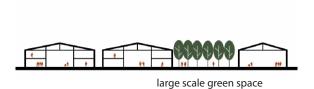


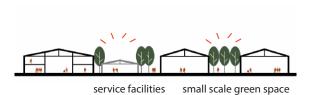
























Design Guidelines

Application in the design of Phase II of the EIZ



Safe











Active and flexible buffer areas



Safe and sustainable production

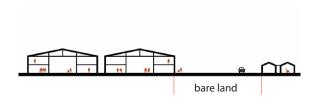












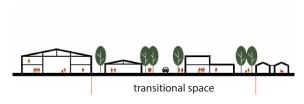






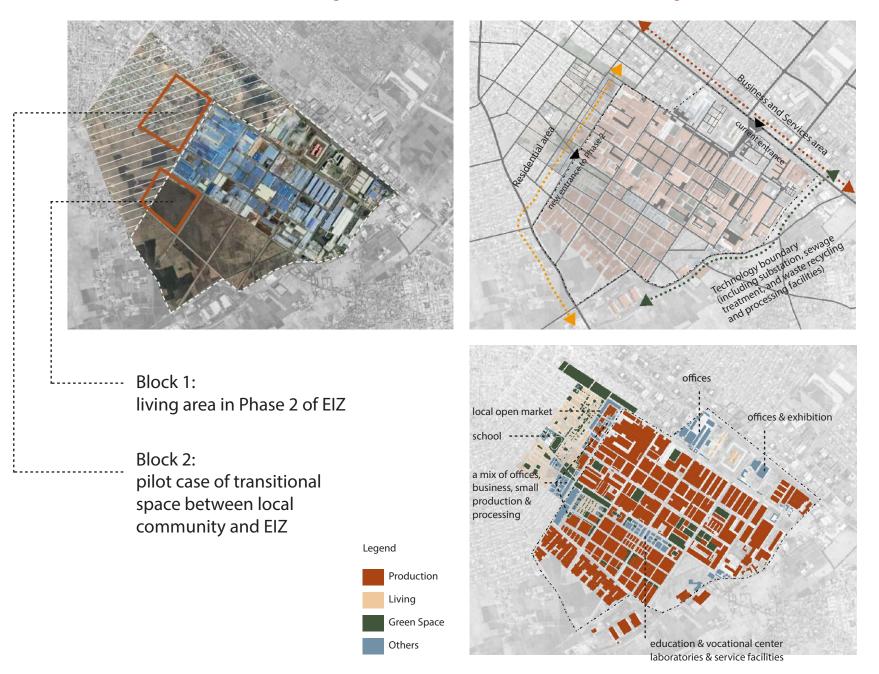


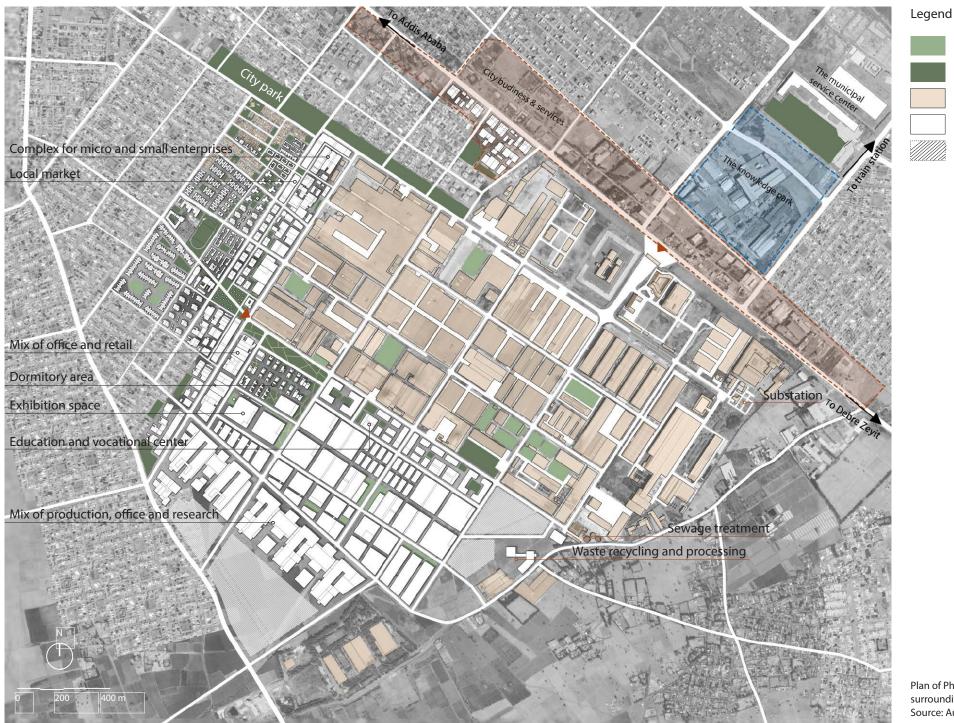






Planning of boundaries and functional zoning





Plan of Phase 2 and the surrounding area Source: Author, 2023

Current Green Space
Planned Green Space

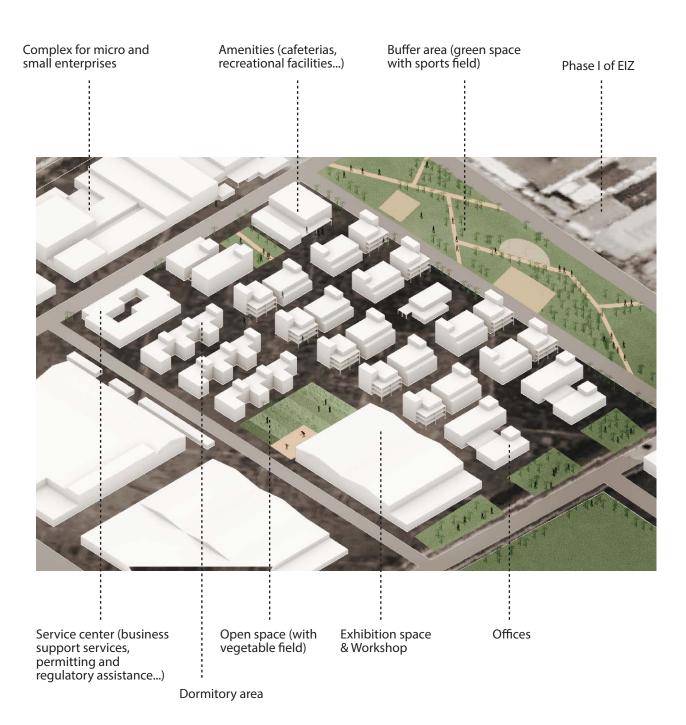
Current Buildings

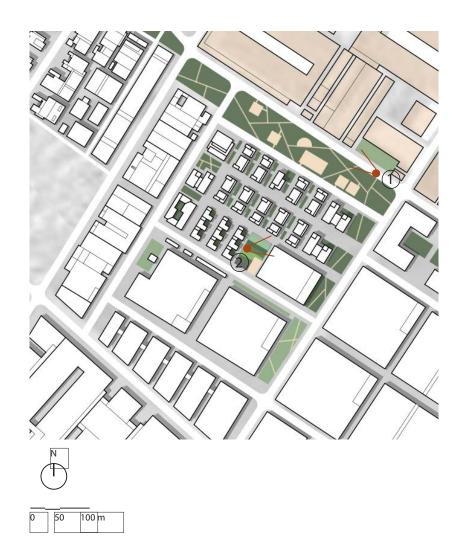
New Buildings

Reserved Land



Block 1: living area in Phase 2 of EIZ



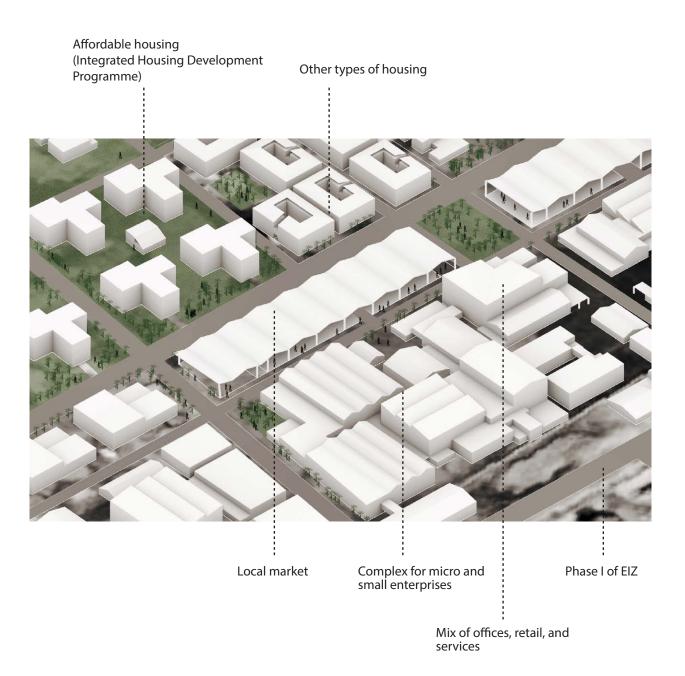








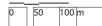
Block 2: pilot case of transitional space between local community and EIZ



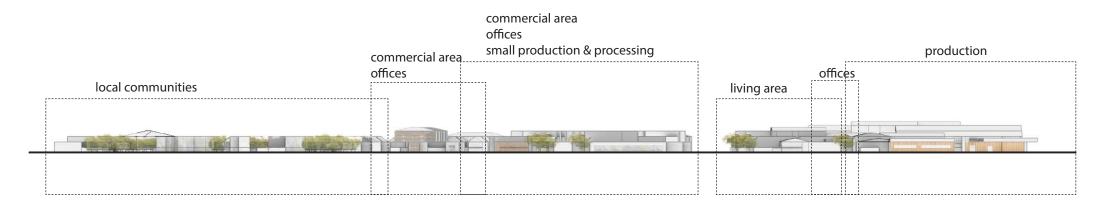












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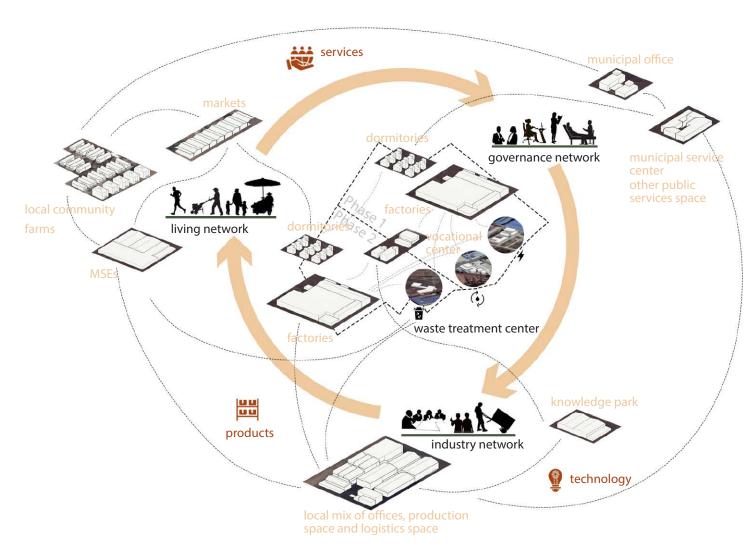




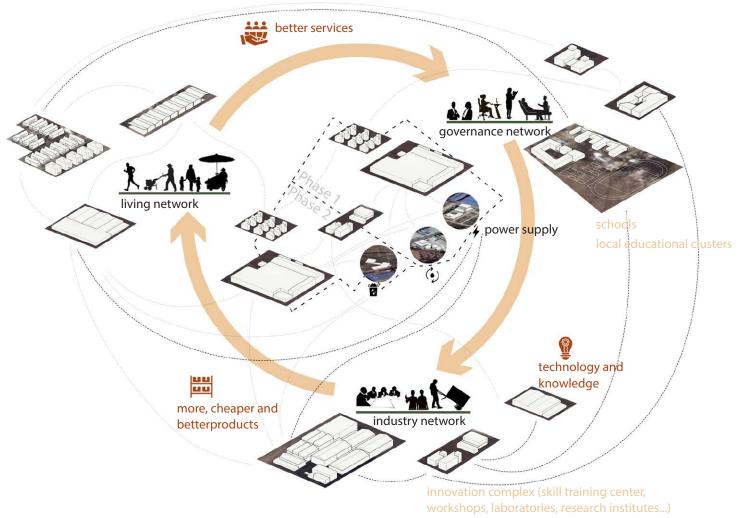
- Waste Treatment Center
- Knowledge park
- Gathering of some local businesses
- Introducing new industries and building new facilities
- Mixed development of surrounding businesses and residential areas

- The integration of industrial parks and cities is more mixed and diversified
- Based on the development of the Phase II of EIZ, further decide on the planning and design of the reserved land.





2023 2025 2030 2035 2050



Conclusion



Local endogenous development and its own economic transformation is in the first place, targeting local vitalization.



The pursuit of sustainable and inclusive growth should be closely intertwined with the pursuit of economic growth, while refraining from adopting short-term growth models.



New models of collaboration and partnerships are key to collaborative governance.

