SELF-SALVATION BEYOND GROWTH

*Transformative Planning for **SMART SHRINKAGE** in Chinese resource-exhausted cities*

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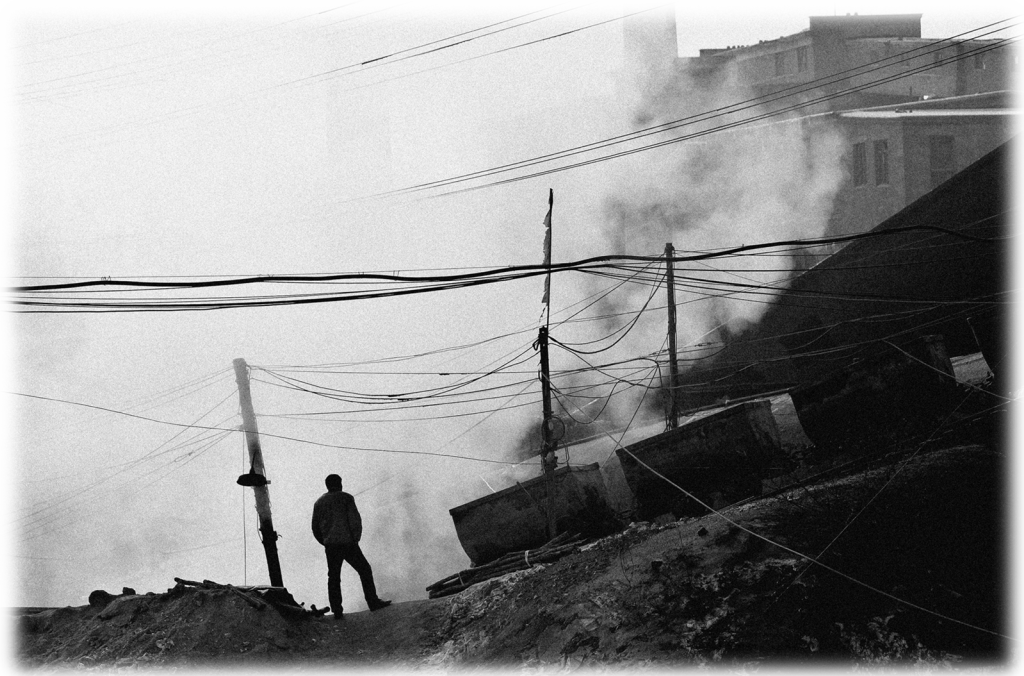
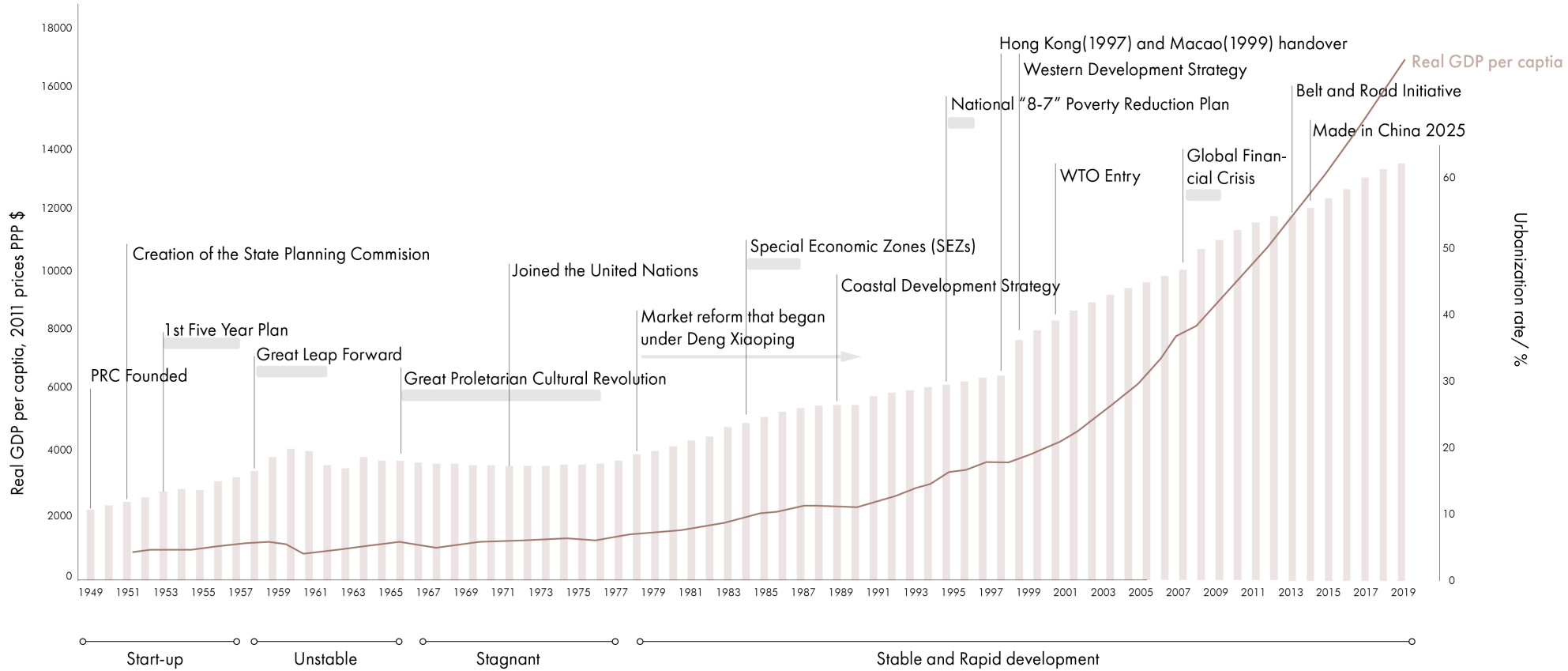
P5 Presentation



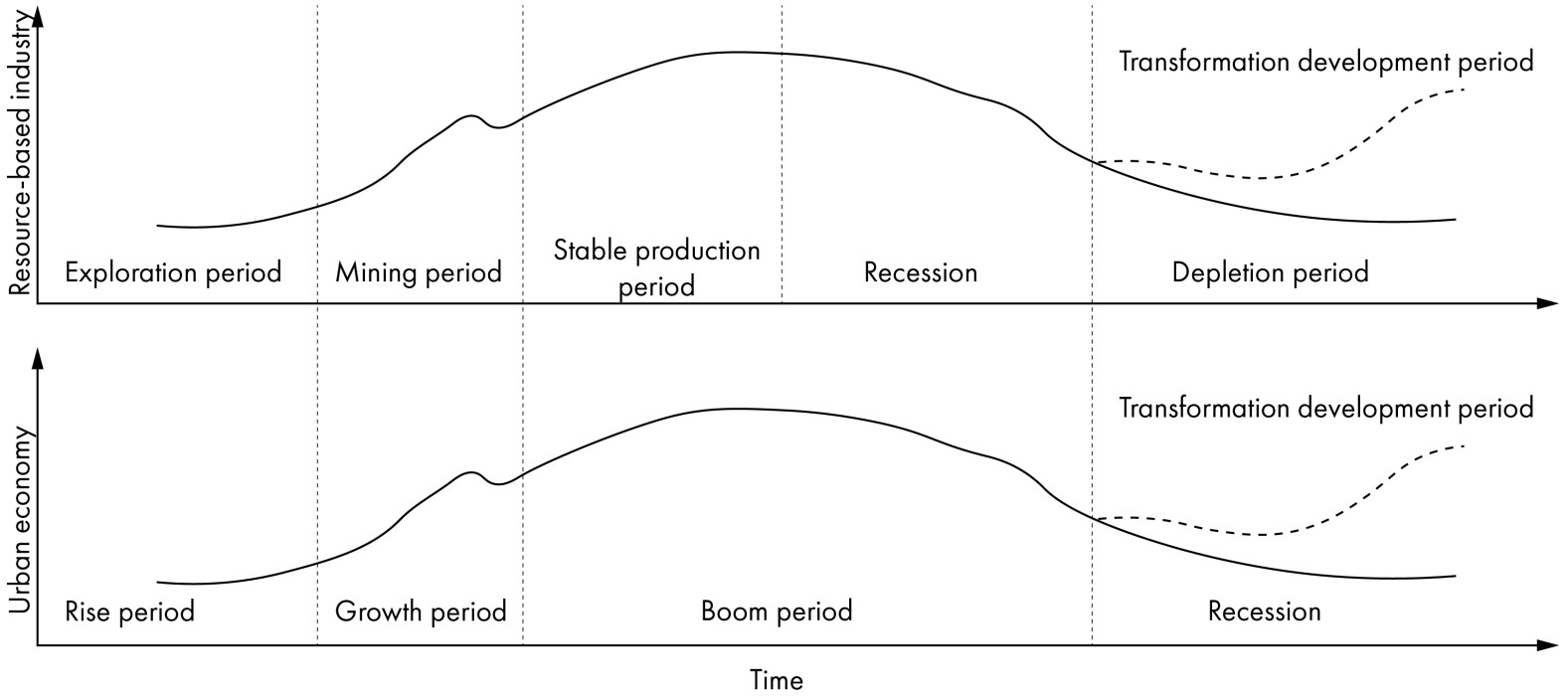
CONTEXT
&
PROBLEM DEFINITION



China has experienced rapid development since 1949, the founding of PRC.

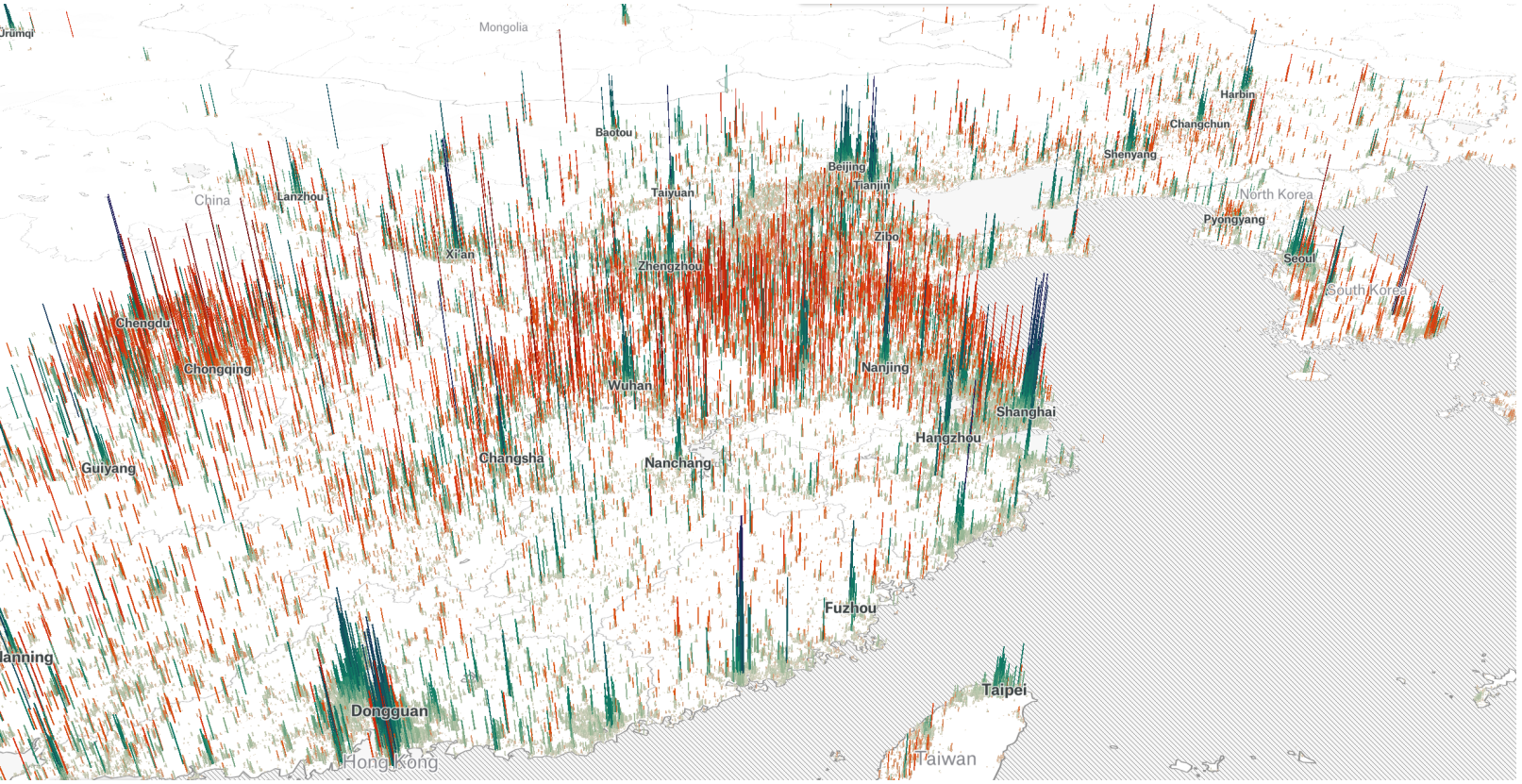
Resource-based cities refer to those with mining and natural resources processing as the leading industries (The State Council of the PRC, 2013). The emergence and development of such cities are inseparable from industrialization, mainly rely on local natural resources for industrial layout and economic development.

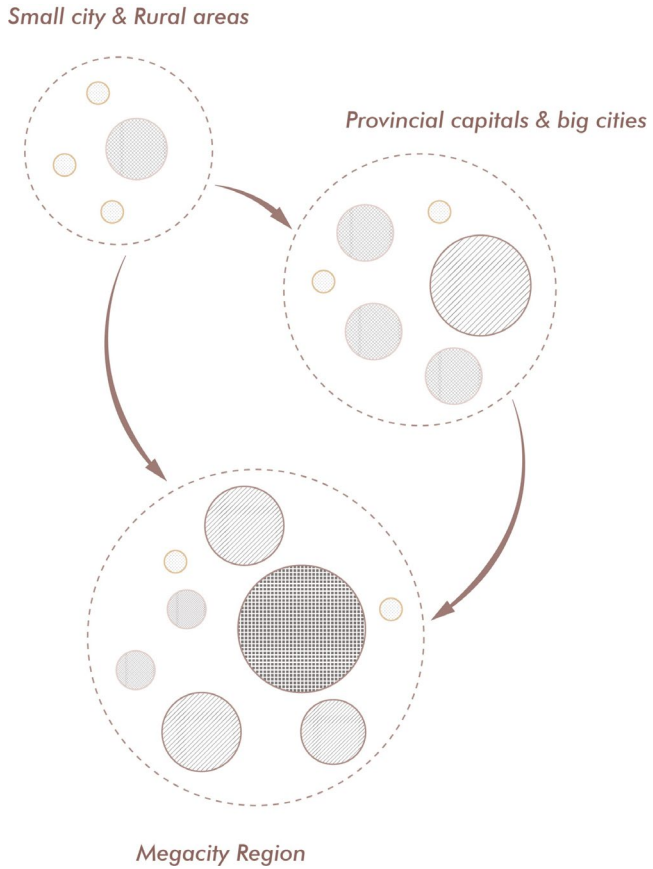

刻字
印字
游戏



Because of the resource depletion, resource-based cities are facing difficulty of transition.

Negative attitude towards the future of resource-exhausted cities.

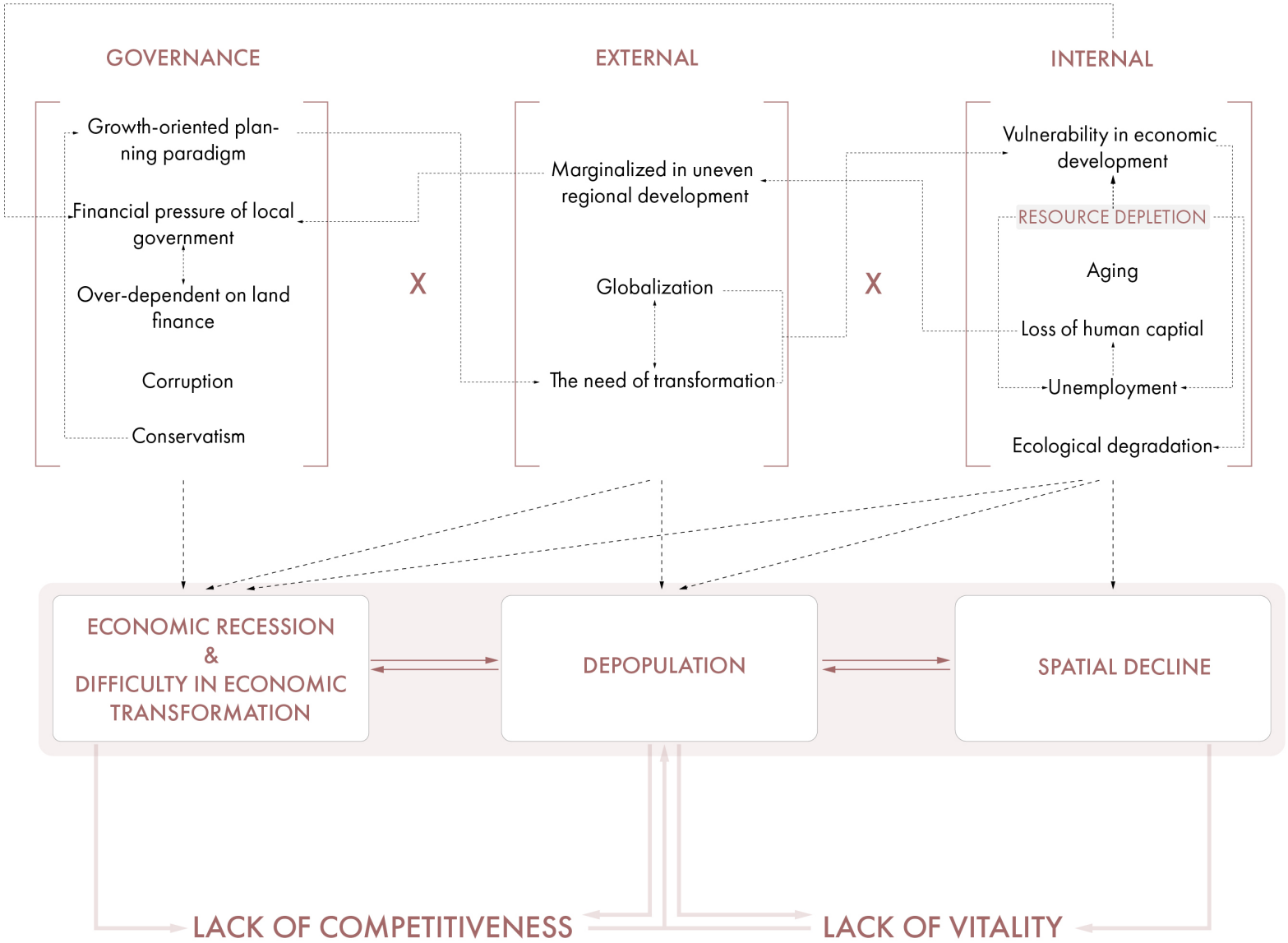




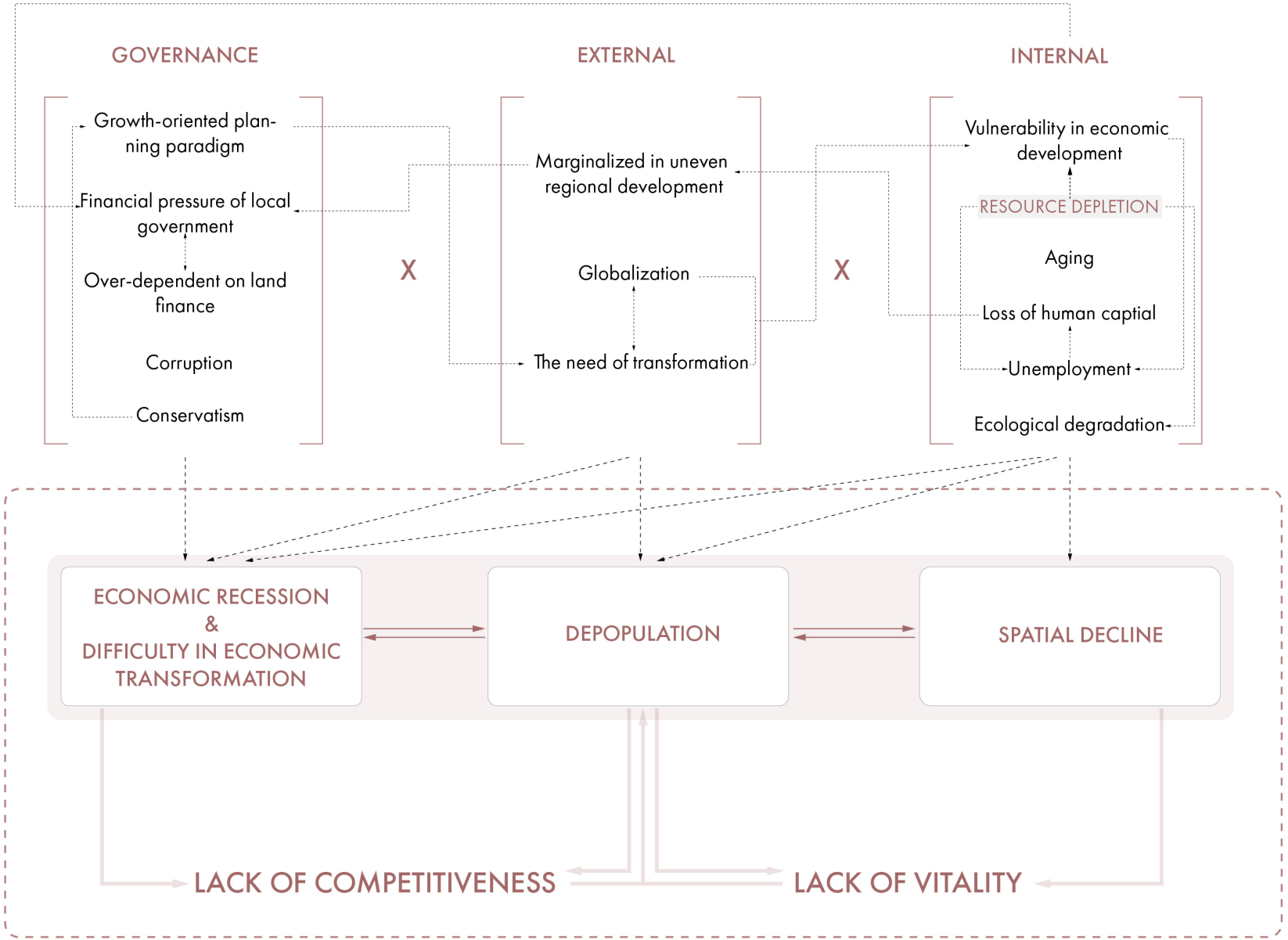
Attractiveness from large cities encourages labors and talents to migrate.

https://www.thinkchina.sg/how-chinas-housing-market-landed-deep-freeze

PROBLEM STATEMENT



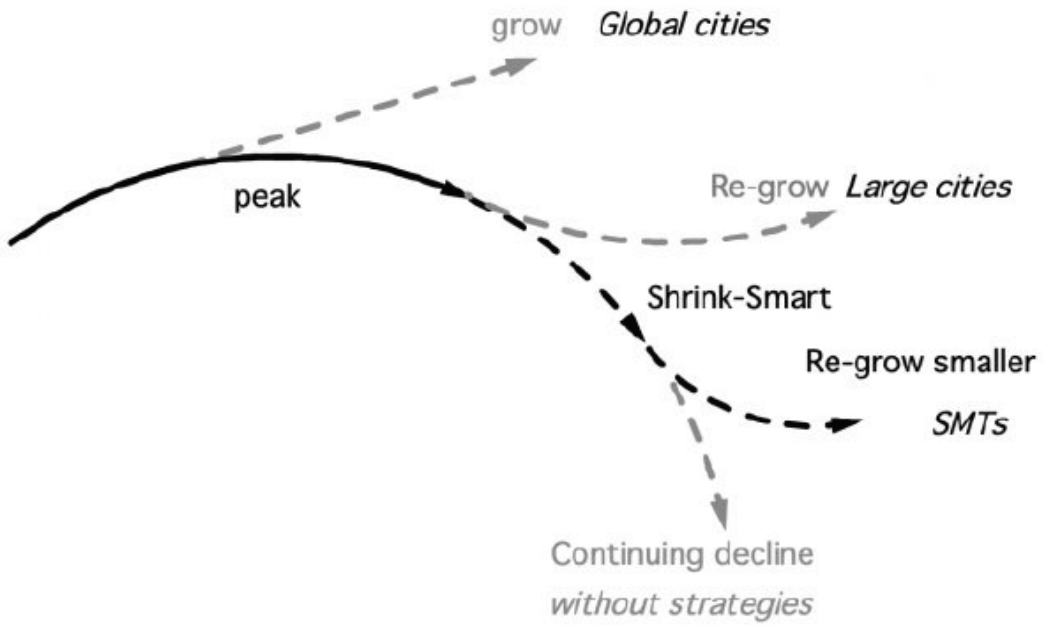
PROBLEM STATEMENT



" SHRINKAGE "

THE STRUCTURAL CRISIS IN SHRINKING RESOURCE-EXHAUSTED CITY

SMART SHRINKAGE



Popper and Popper (2002) define smart shrinkage as "*planning for less—fewer people, fewer buildings, fewer land uses.*"

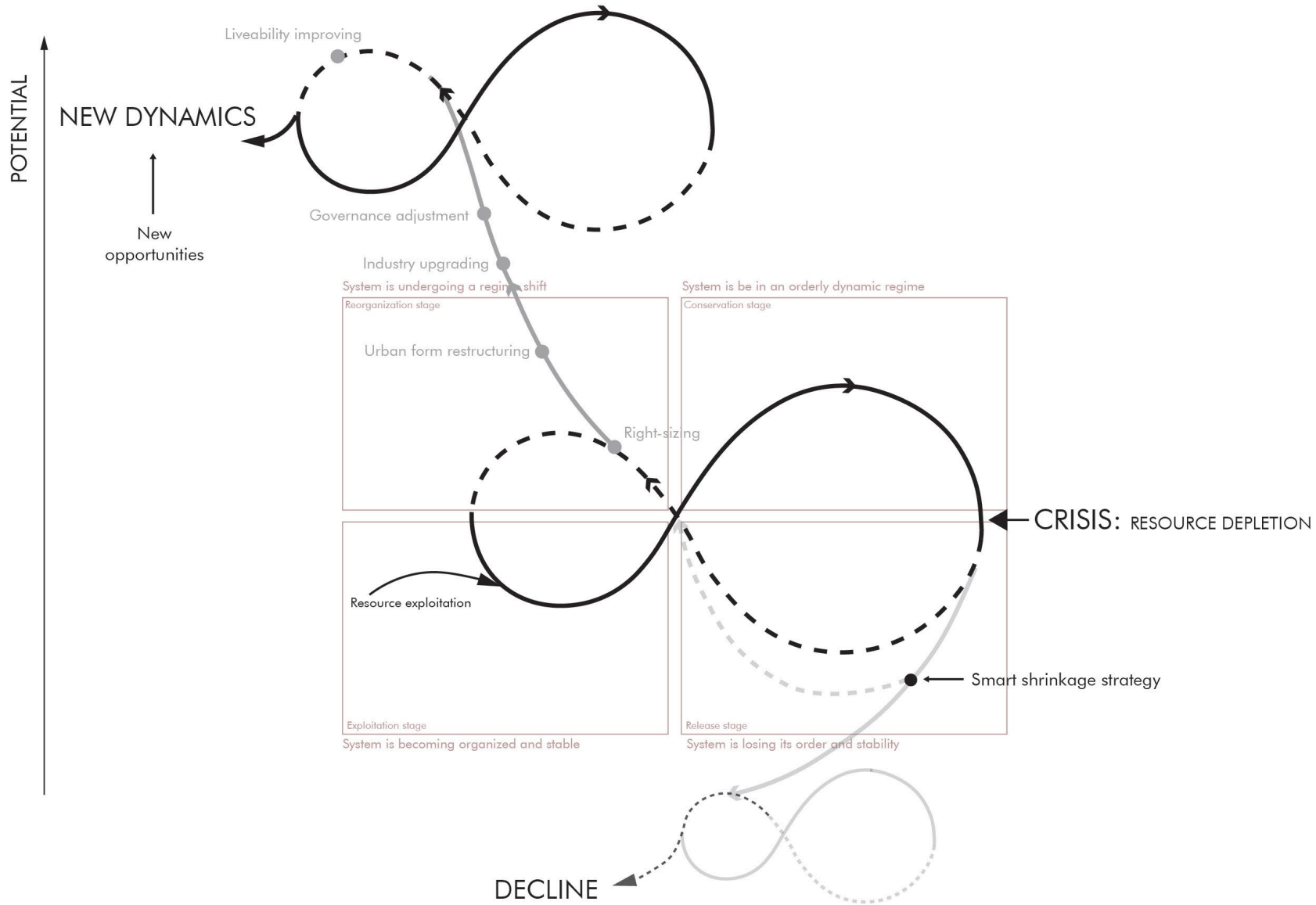
RESEARCH QUESTION

How can smart shrinkage be used as a transformation strategy in the resource-exhausted cities in China to RECOVER them as resilient urban systems?

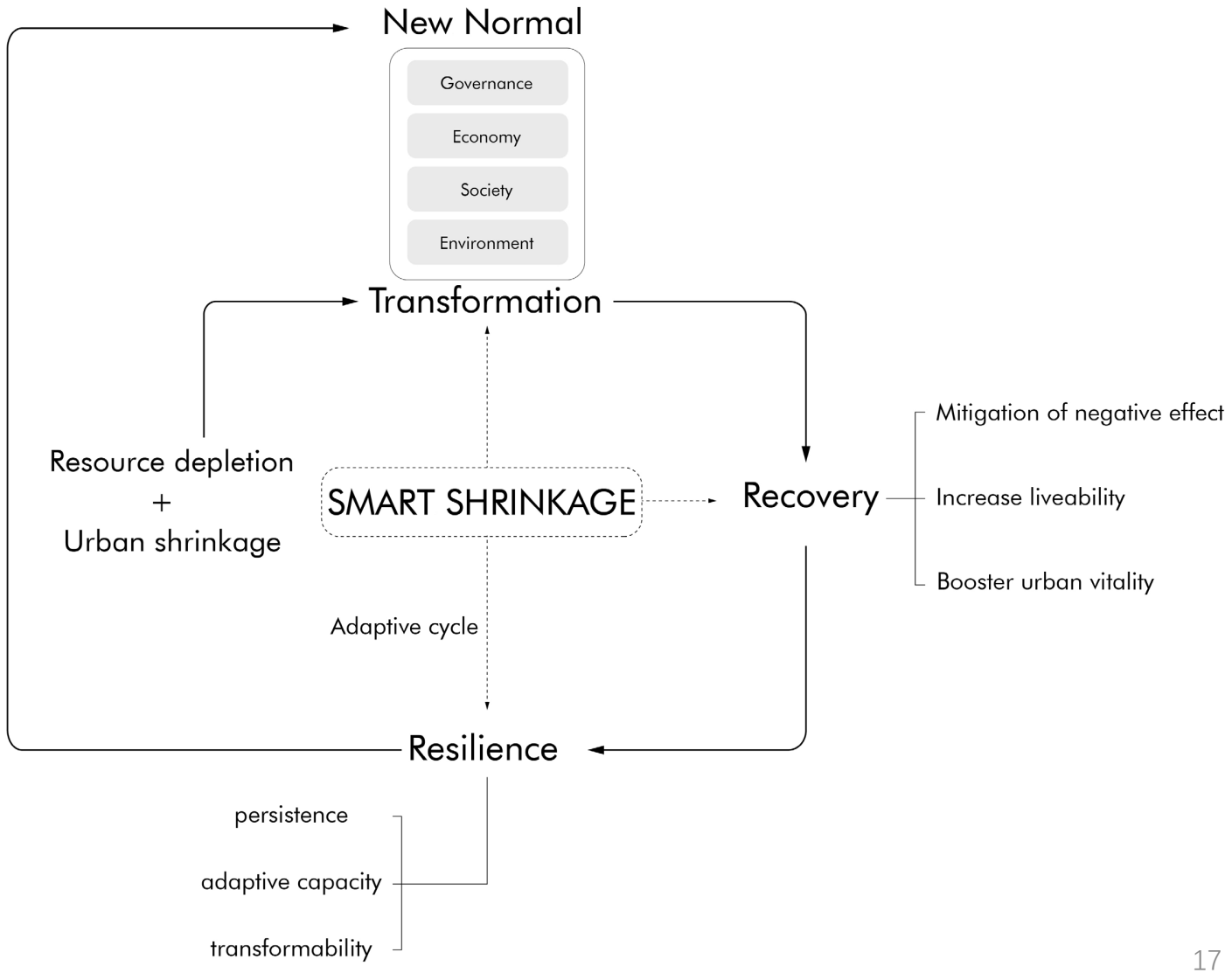
Three values of URBAN RECOVERY

- ***Mitigate the negative impacts of urban shrinkage***
- ***Increase liveability under shrinking trend***
- ***Boost the urban vitality of development***

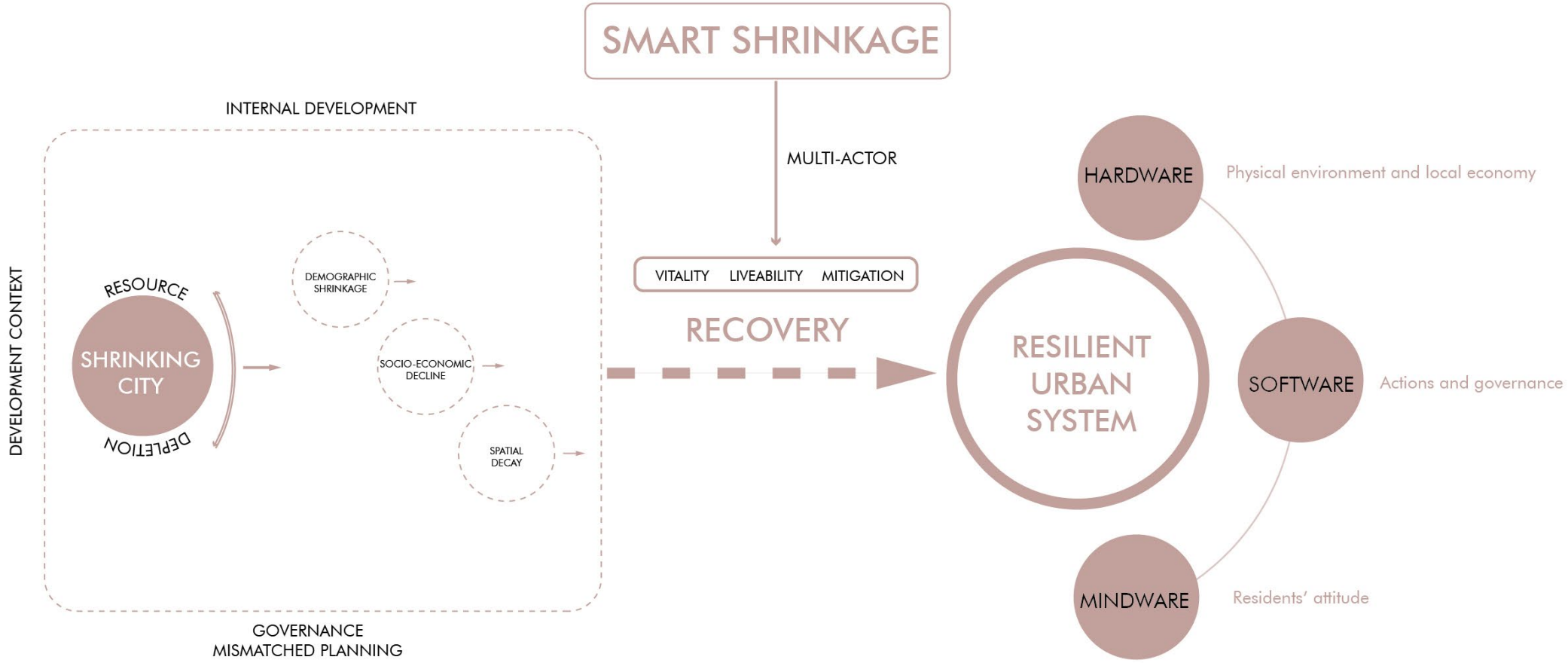
RESILIENCE


POTENTIAL
NEW DYNAMICS
New opportunities
Liveability improving
Governance adjustment
Industry upgrading
System is undergoing a regime shift
Reorganization stage
System is be in an orderly dynamic regime
Conservation stage
Urban form restructuring
Right-sizing
CRISIS: RESOURCE DEPLETION
Resource exploitation
Smart shrinkage strategy
Exploitation stage
Release stage
System is becoming organized and stable
System is losing its order and stability
DECLINE

THEORETICAL FRAMEWORK



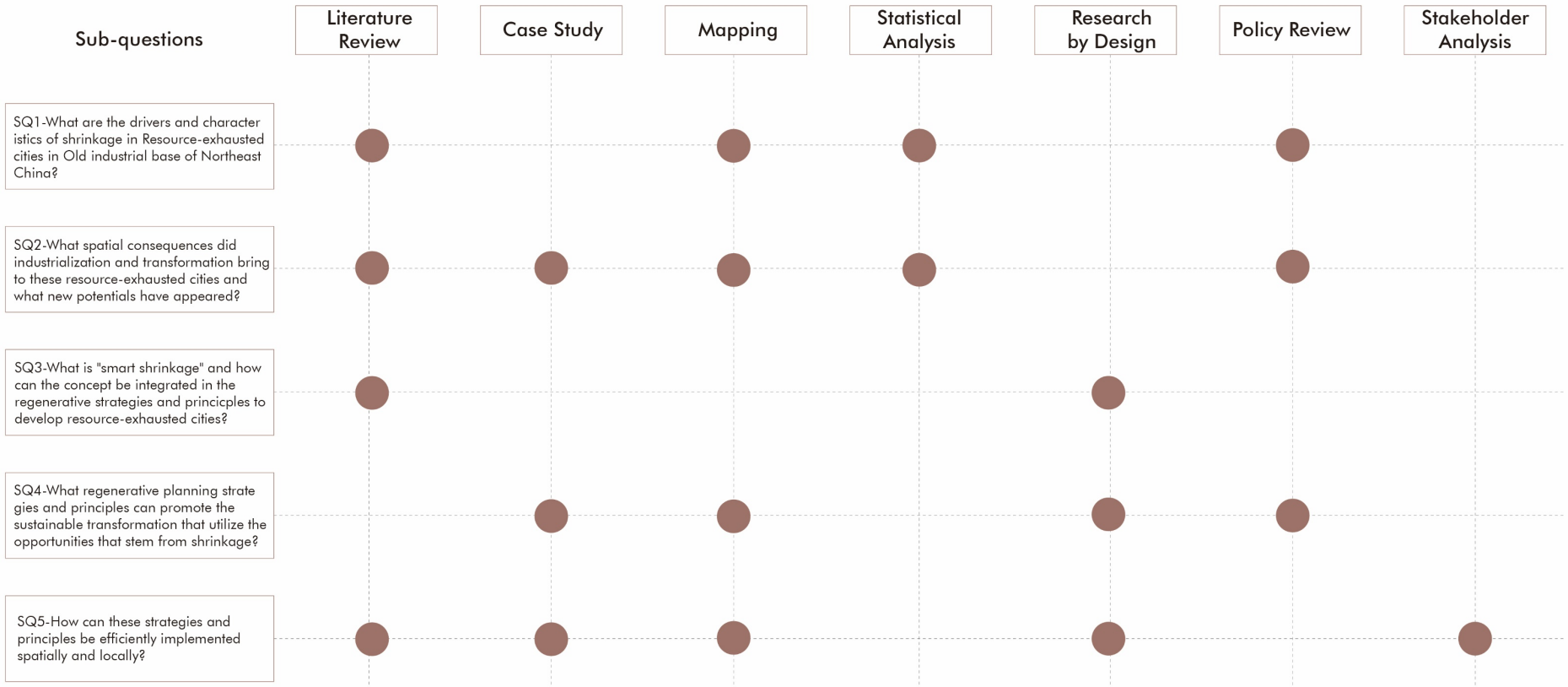
CONCEPTUAL FRAMEWORK



METHODOLOGY

RESEARCH QUESTION

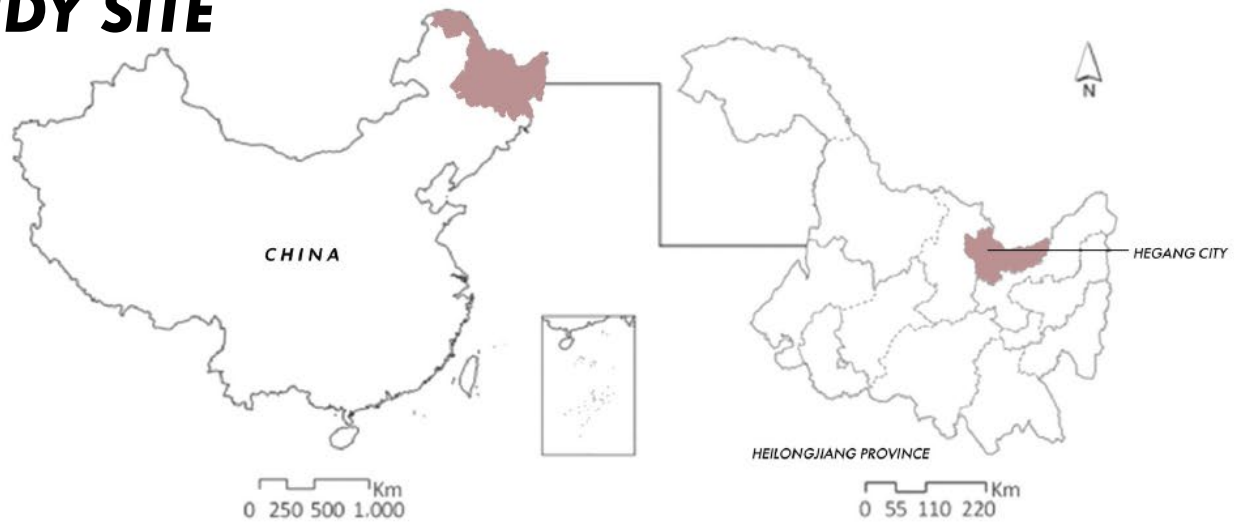
How can smart shrinkage be used as a transformation strategy in the resource-exhausted cities in China to recover them as resilient urban systems?



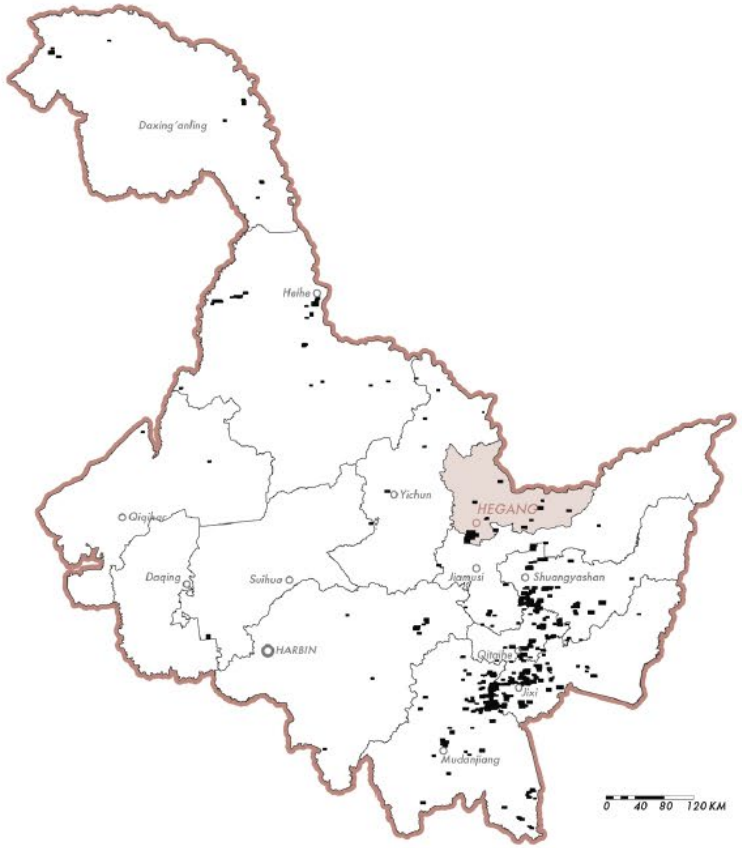
ANALYSIS


HE GANG
CITY
COAL
MINING

STUDY SITE

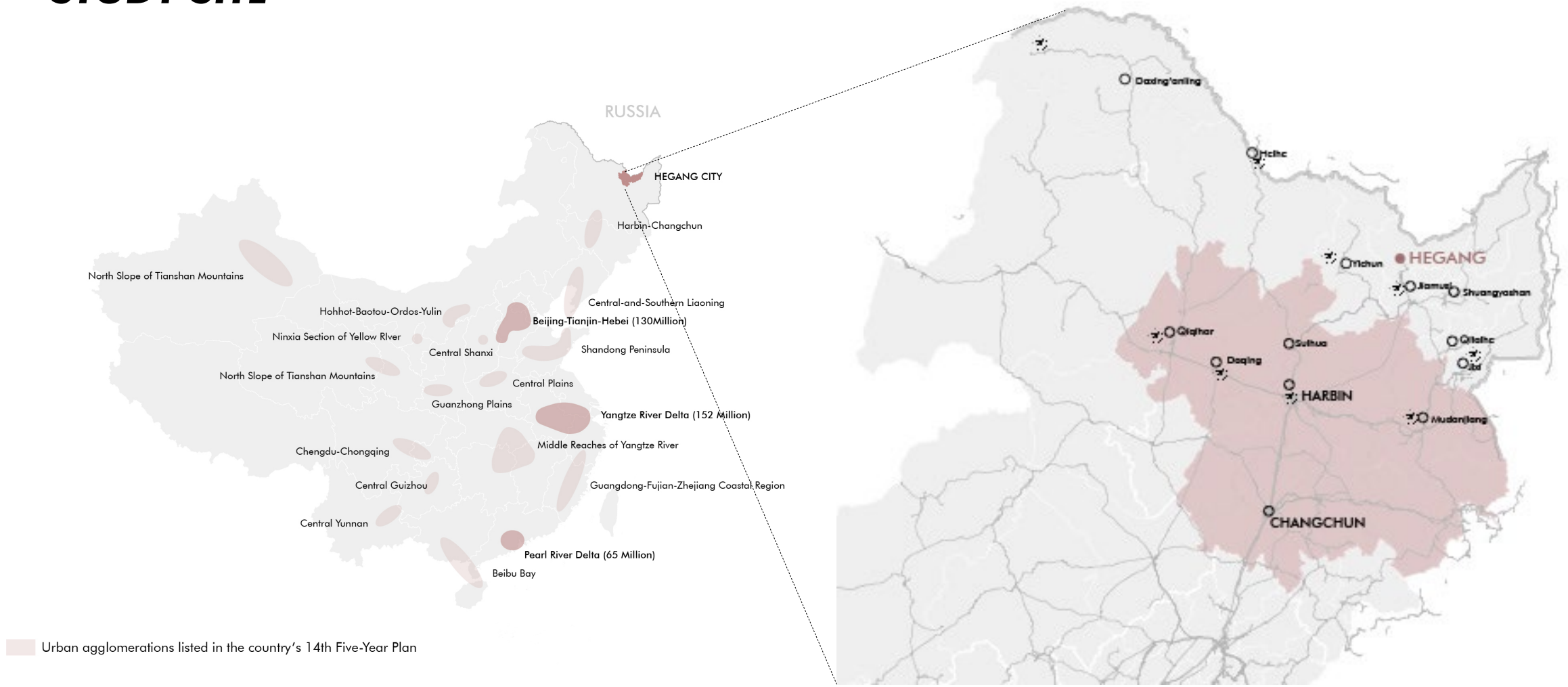


Located at northeastern border of China



One of the famous coal mining cities in Heilongjiang Province

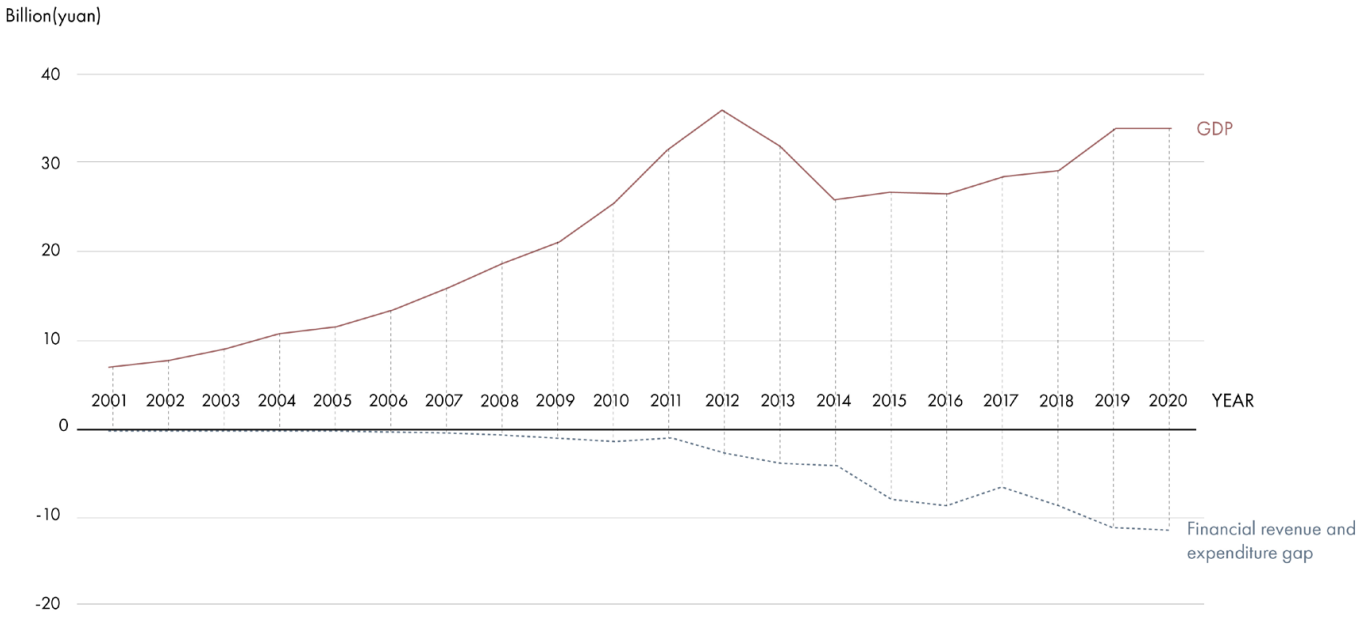
STUDY SITE



Less influenced by Harbin-Changchun urban agglomeration

ANALYSIS

Fiscal burden



Former Chinese coal-mining city of Hegang in dire financial straits

Commentators say the city's financial woes are the tip of the iceberg, amid spiraling local government debt.

By Qiao Long and Chingman
2021.12.29

People walk past residential buildings in Hegang, Heilongjiang province, northeastern China, Jan. 2, 2020.

Reuters

ANALYSIS

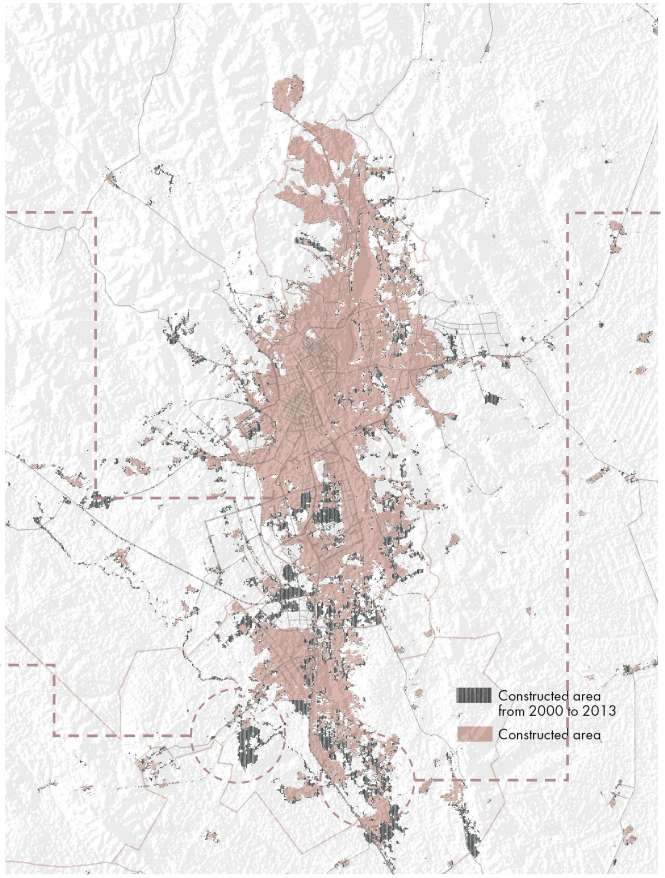
Economic recession

Economy has declined since 2012, especially the secondary industry.

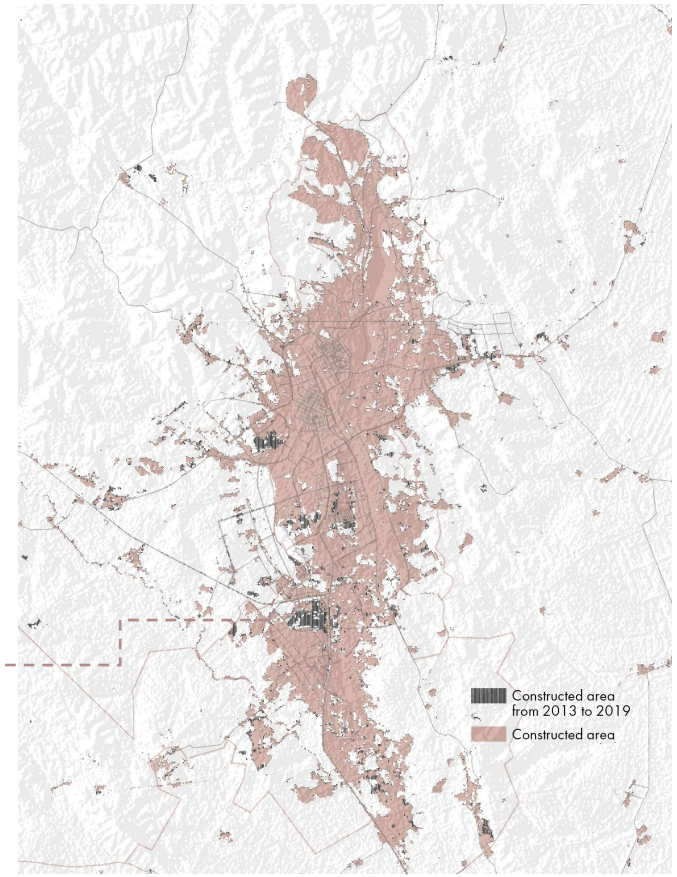
ANALYSIS

- *Human-land scale contradiction*

Residencial area



Coal mining area

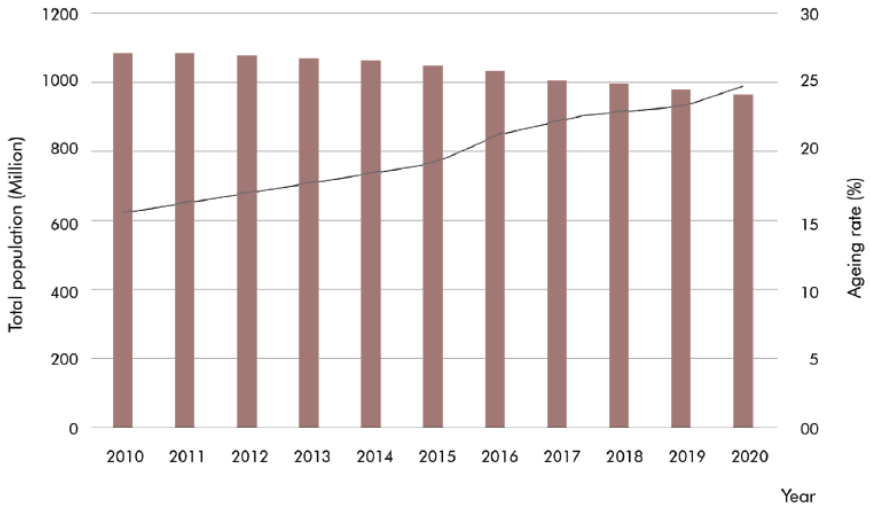


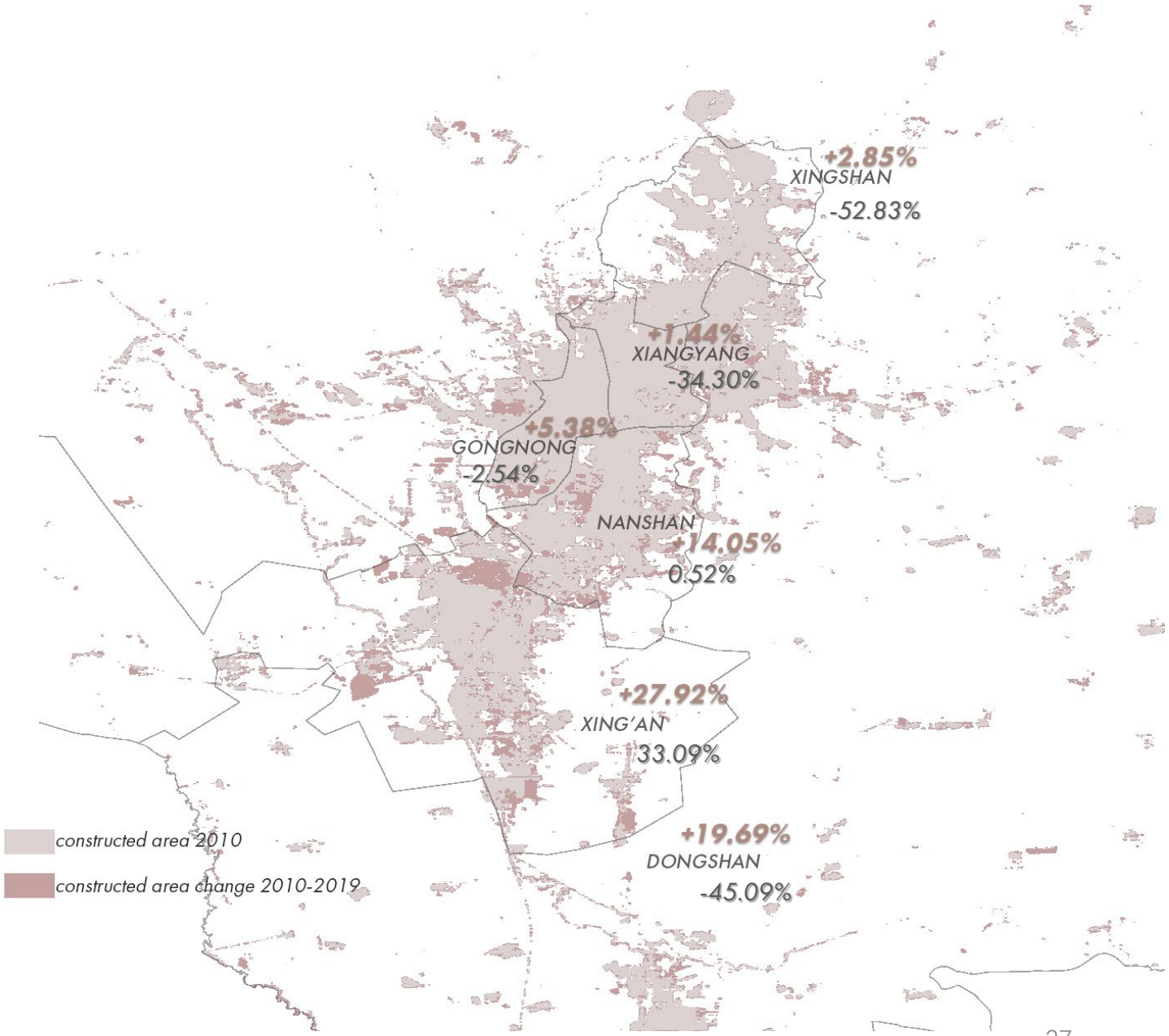
Industrial area

Residencial area/Resettlement housing

ANALYSIS

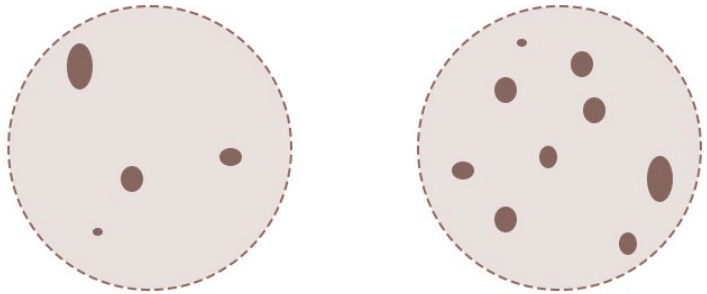
- *Human-land scale contradiction*





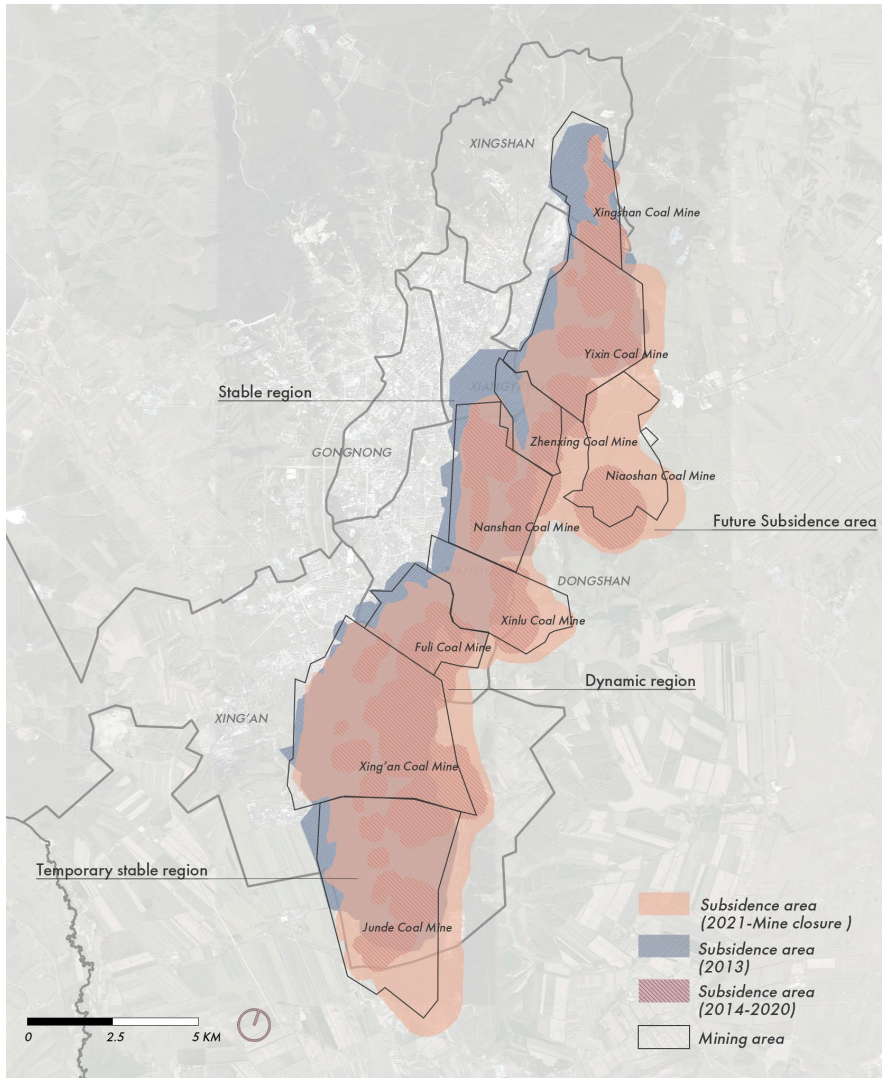
ANALYSIS

Fragmented shrinkage



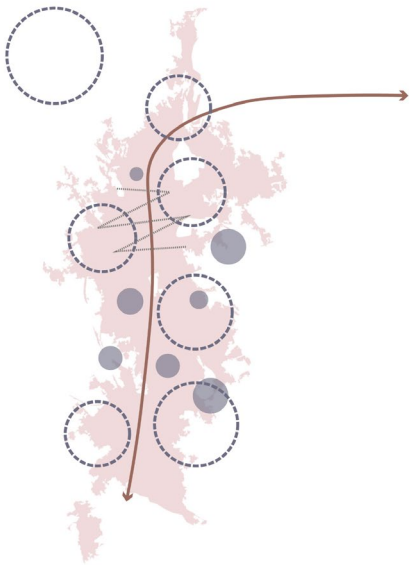
ANALYSIS

- *Vulnerable ecological environment*



ANALYSIS

- *Loose urban spatial structure*



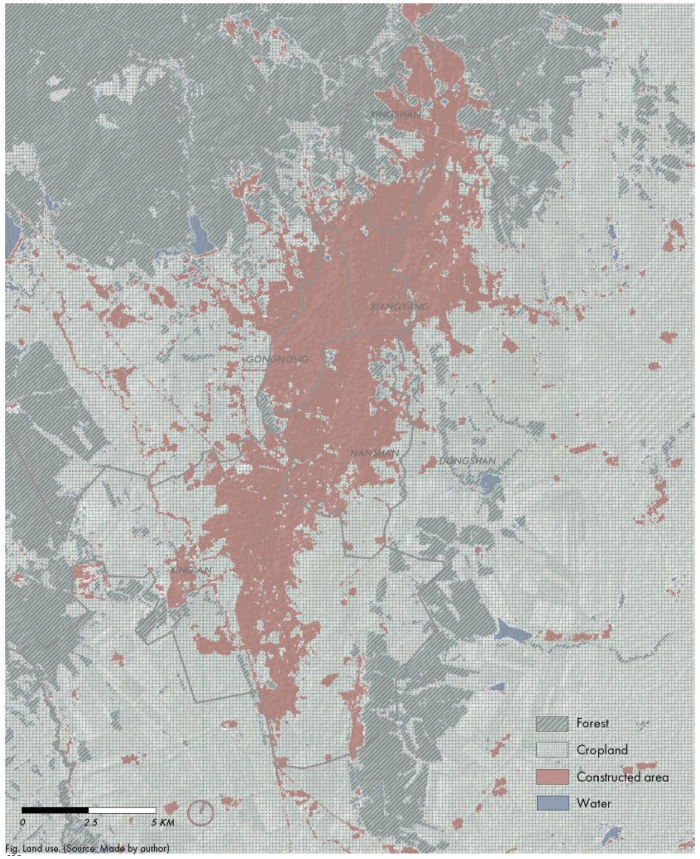


Fig. Land use. (Source: Made by author)

Detailed land use

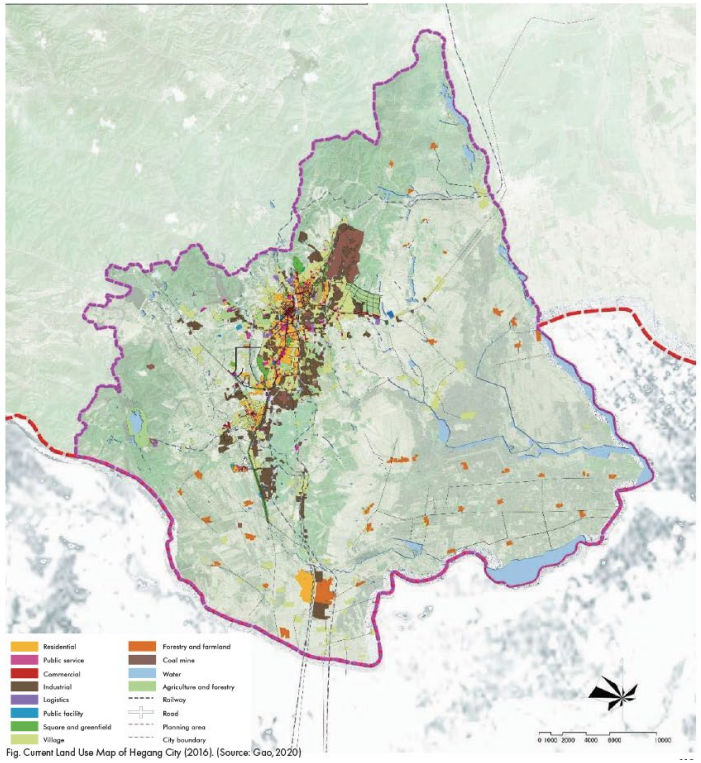
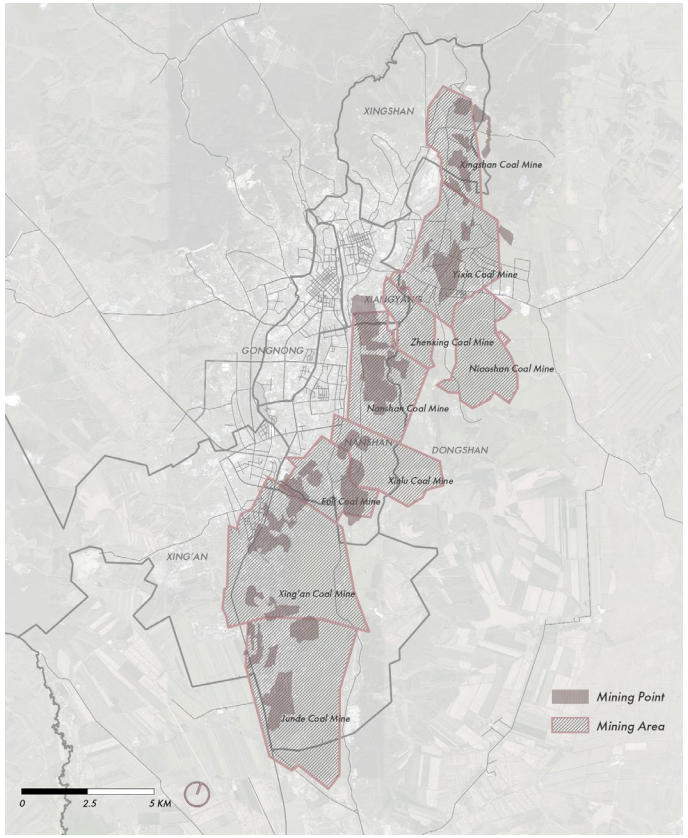
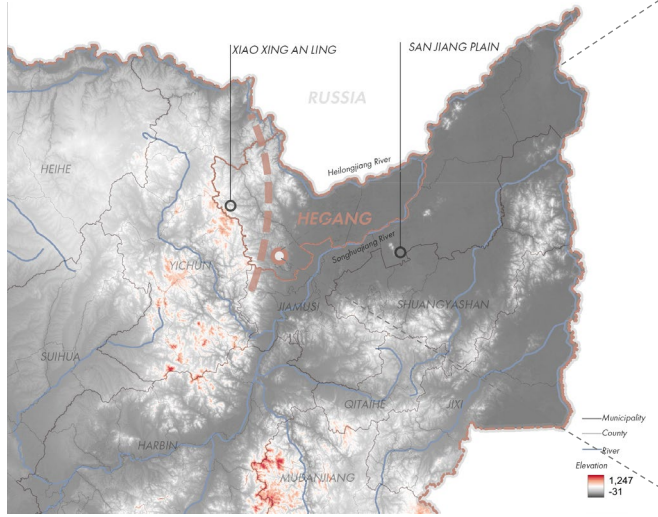


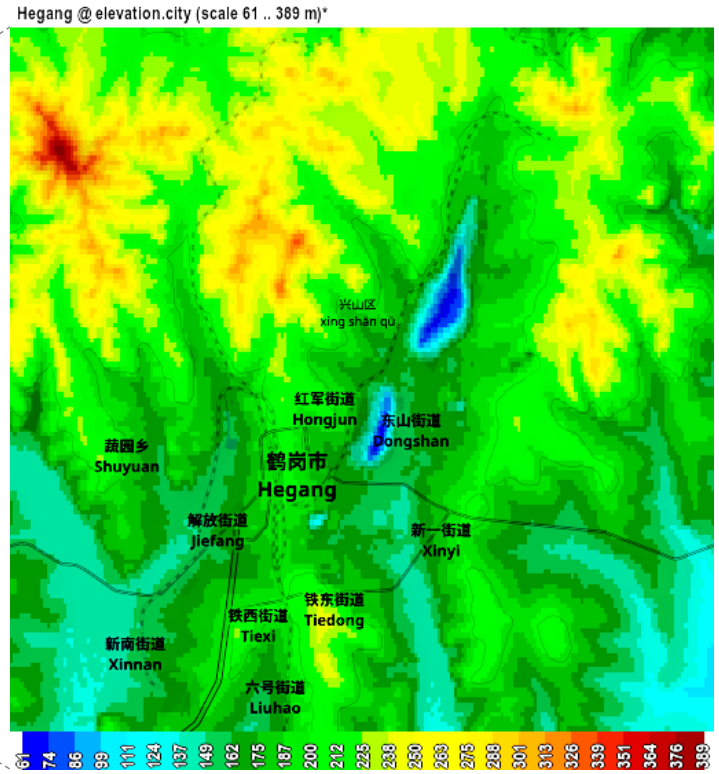
Fig. Current Land Use Map of Hegang City (2016). (Source: Gao, 2020)

ANALYSIS

- *Limited development space*

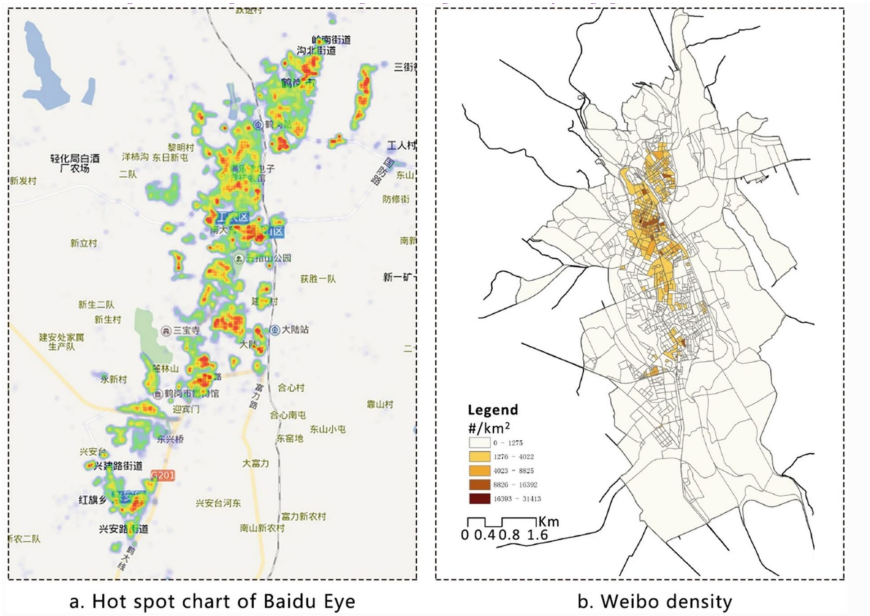






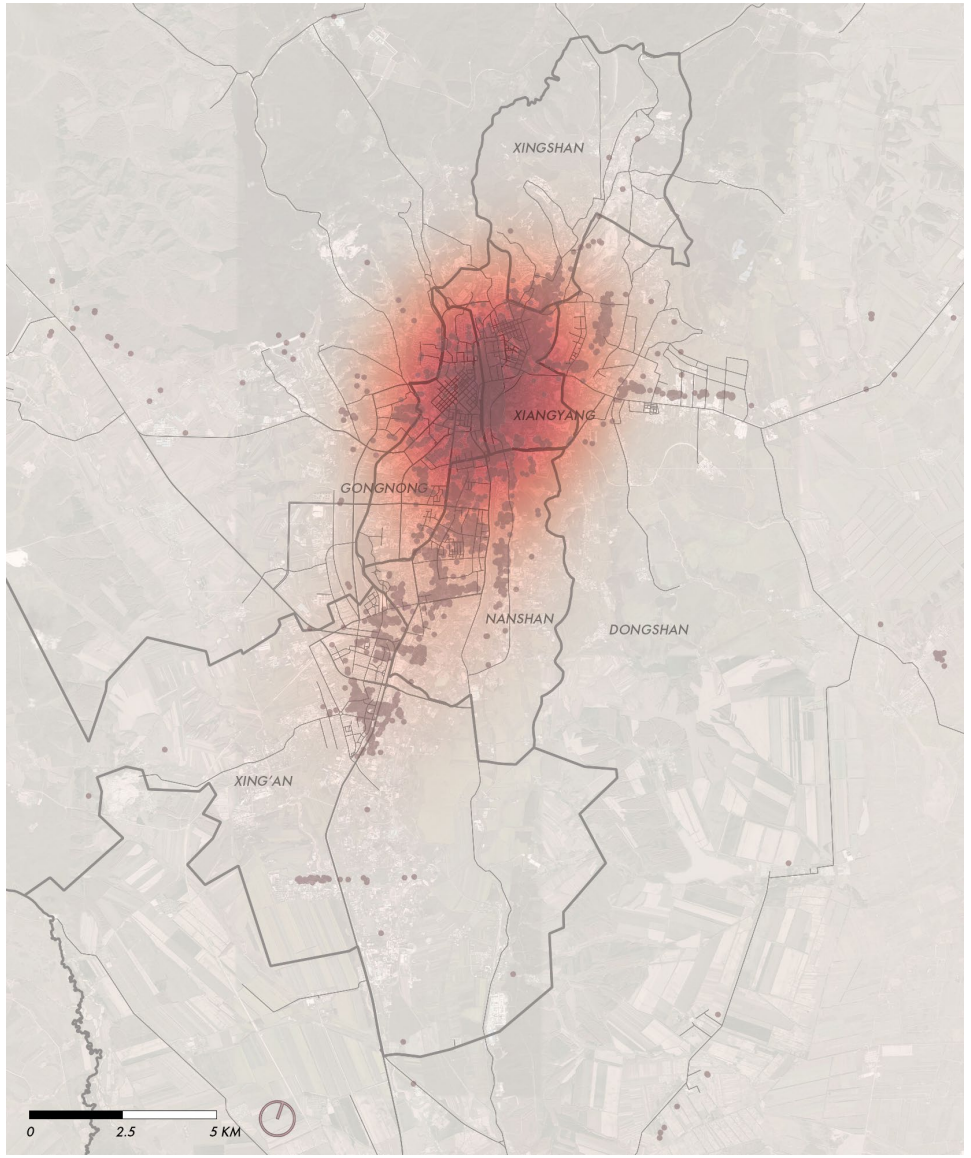
ANALYSIS

- *Unbalanced distribution of functions within the city*



a. Hot spot chart of Baidu Eye

b. Weibo density



Why *SMART SHRINKAGE*?

"A great city should not be confounded with a populous city."

——*Aristotle*

VISIONING

'TOWARDS A MORE INTEGRATED AND LIVEABLE POST-INUDSTRIAL CITY'

ECOLOGY

PRODUCTION

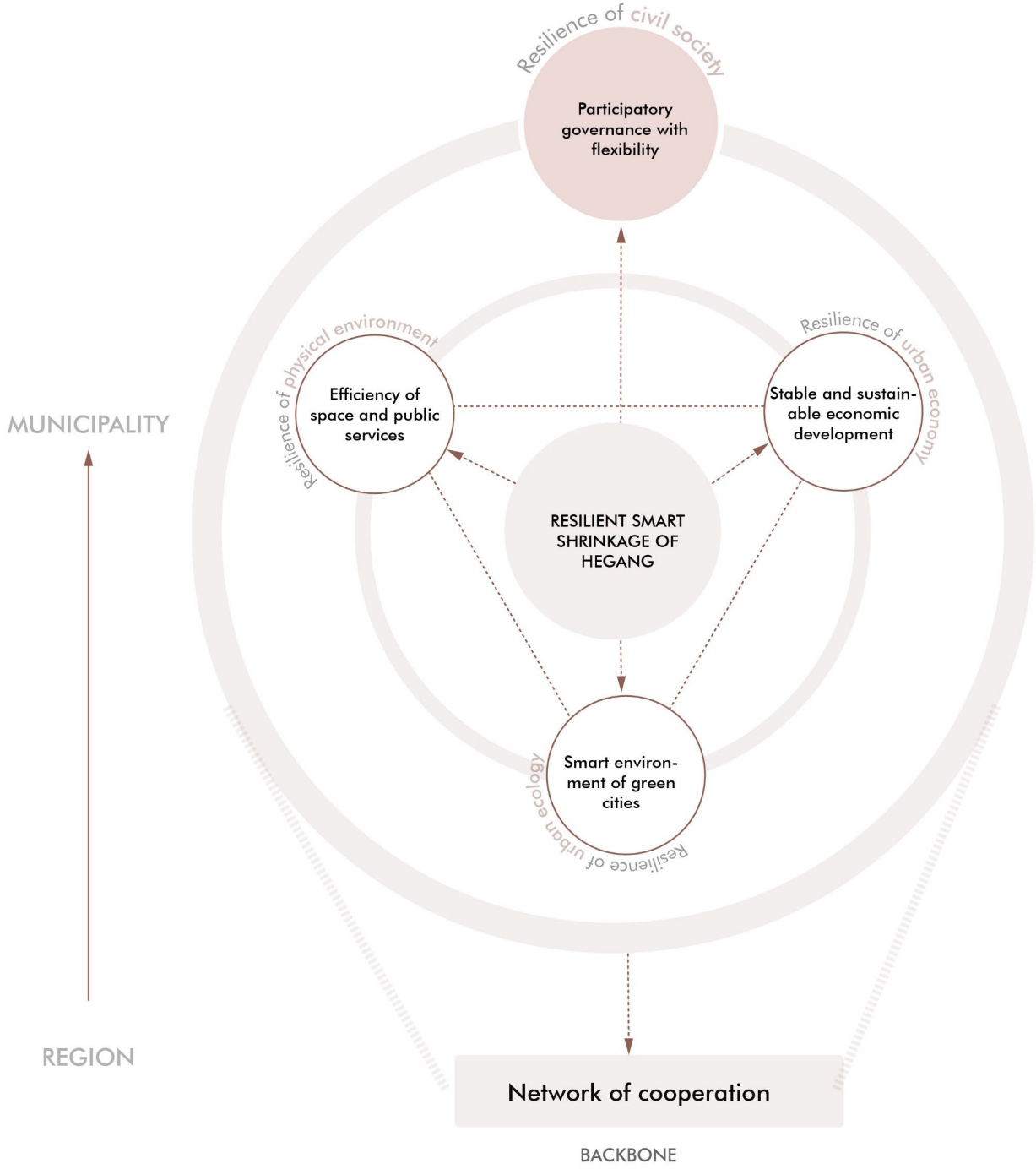
LIVING

VISIONING

'TOWARDS A MORE INTEGRATED AND LIVEABLE POST-INUDSTRIAL CITY'

Strategy building

PRINCIPLES


Resilience of civil society
Participatory governance with flexibility
Resilience of physical environment
Efficiency of space and public services
Resilience of urban economy
Stable and sustain-able economic development
RESILIENT SMART SHRINKAGE OF HEGANG
Smart environ-ment of green cities
Resilience of urban ecology
MUNICIPALITY
REGION
Network of cooperation
BACKBONE

Strategy

- Identify and Assess the urban space
- Establish the Database of urban space and public services
- Build industrial development sharing platform
- Adjustment of industrial structure
- Build "Industry+life" community
- Reorganize the industrial distributions
- City public transport network upgrading

Sustainable economic transition

Stable and sustainable economic development

- Ecological restoration
- Construct Disaster prevention facility
- Build Green infrastructure system
- Recover the coal mining land to cropland

Build Green infra-structure system

Smart environment of green cities

- Low-end Labor training
- Rightsize public service facilities
- Renewal of vacant space
- Adjustment of urban spatial structure
- Improve the living quality

Smart management of urban space

Efficiency of space and public services

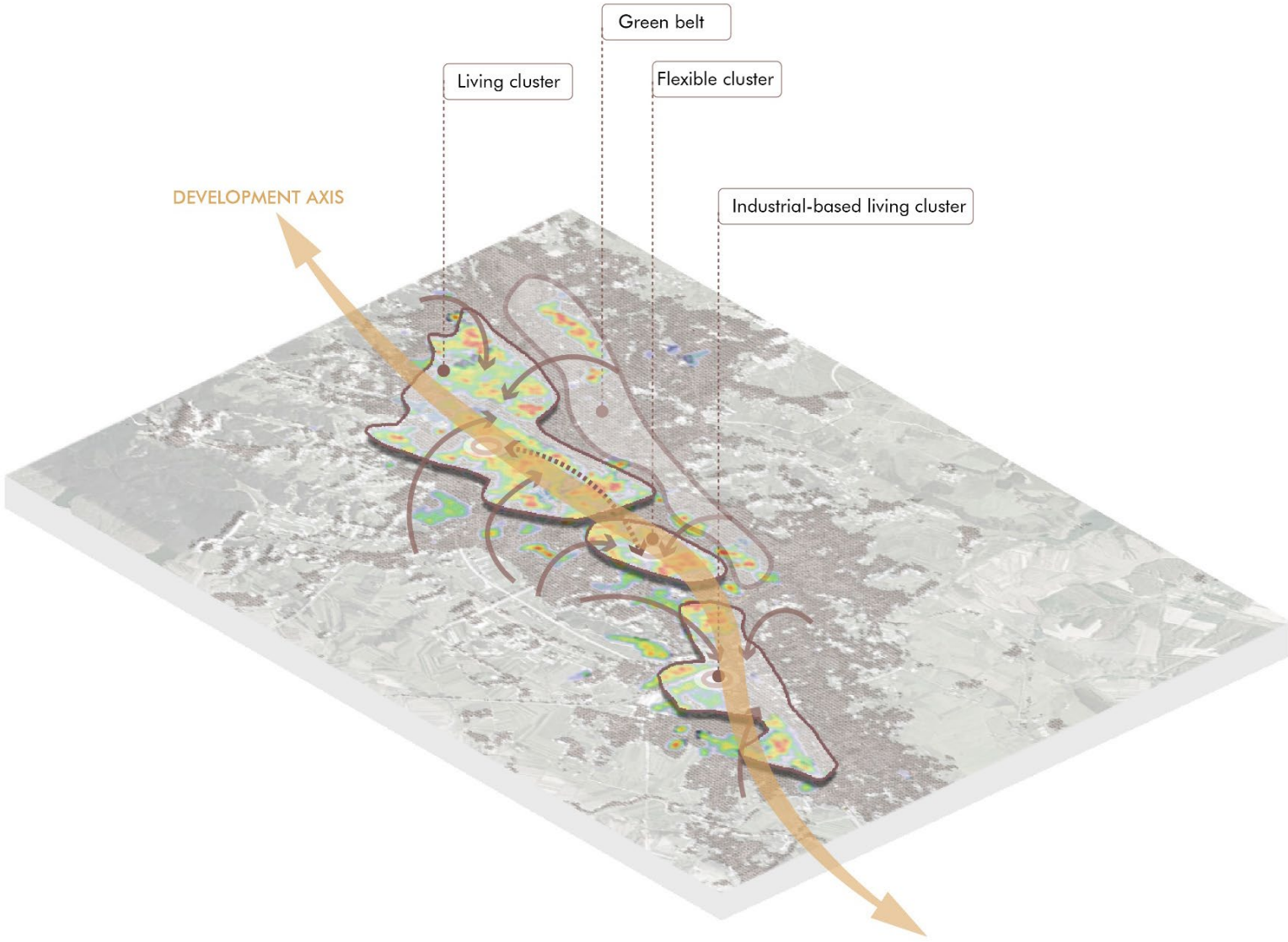
Participatory governance with flexibility

- Build 'Land bank' system
- Encourage collaborative planning
- Living laboratory
- Low-end Labor training
- Build Regulatory agency
- Build Stable and sustainable community

STRATEGIC PLANNING

I. Smart management of urban space

- ☐ Adjustment of urban spatial structure
- ☐ Rightsize public service facilities
- ☐ Improve living quality
- ☐ Renewal of vacant space



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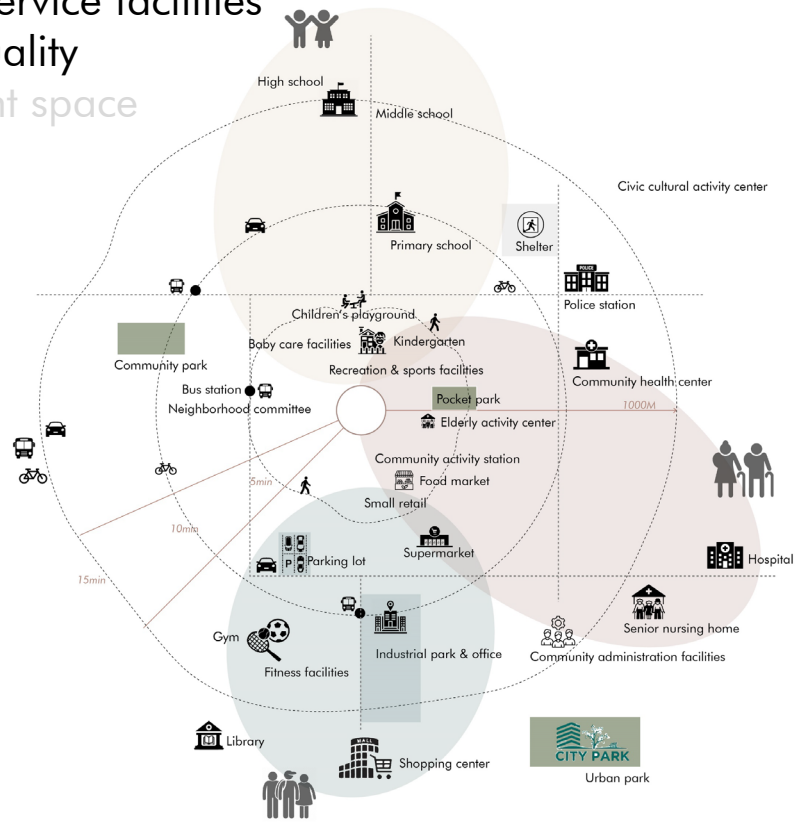

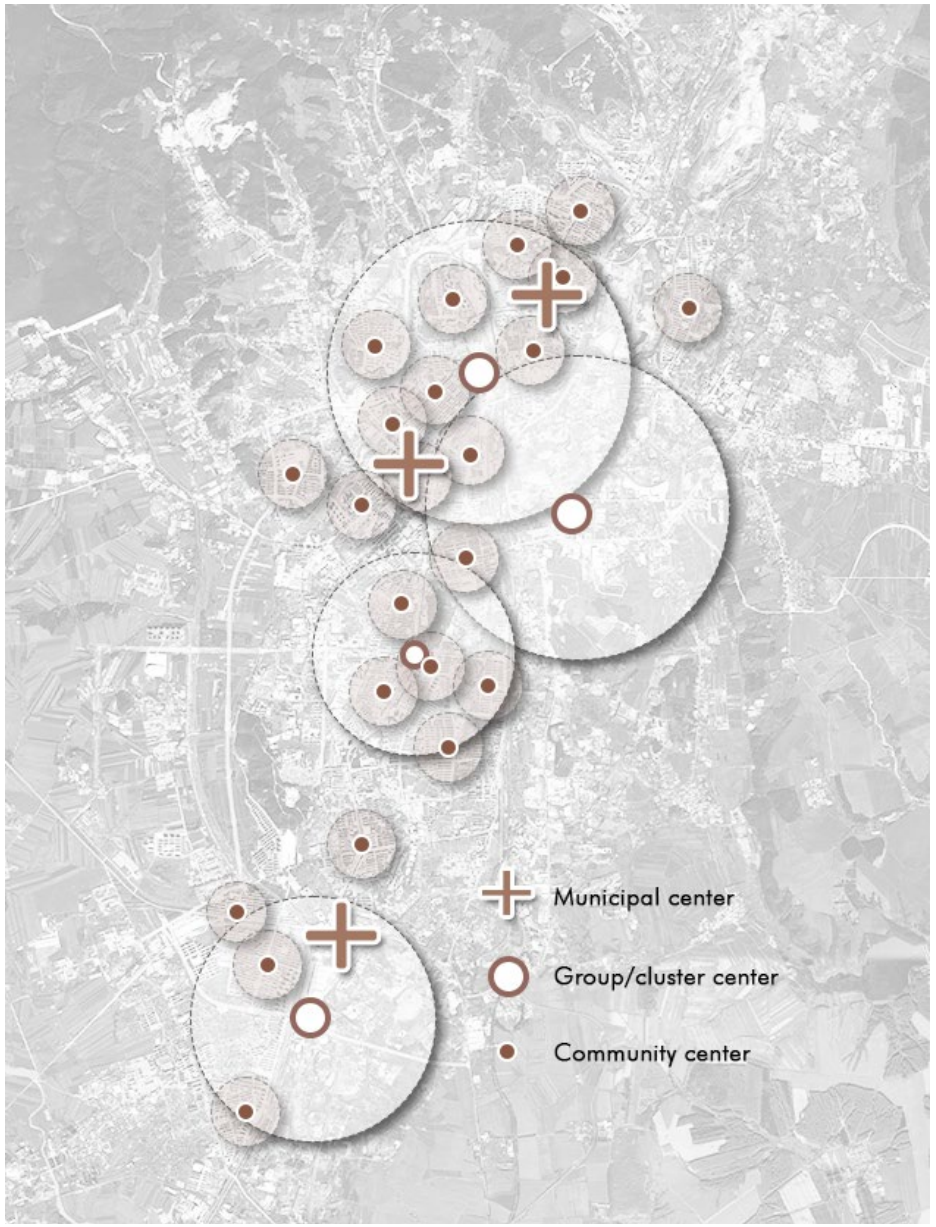

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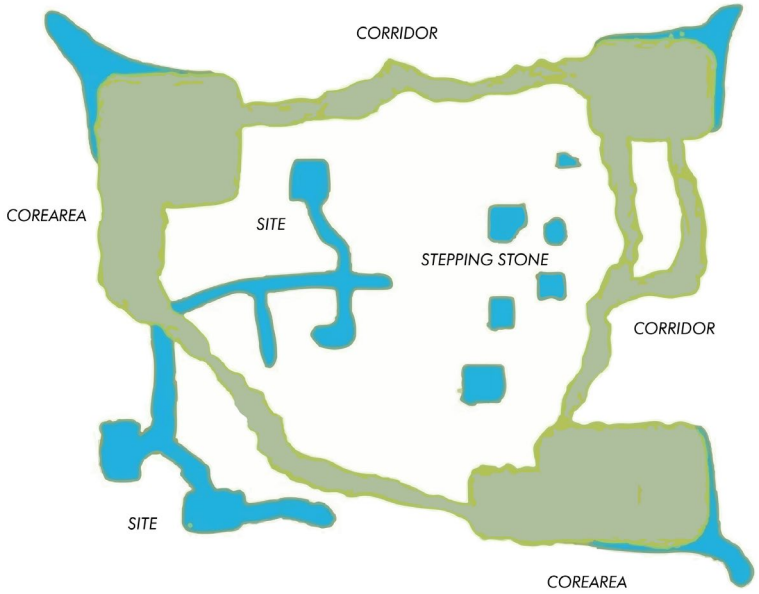
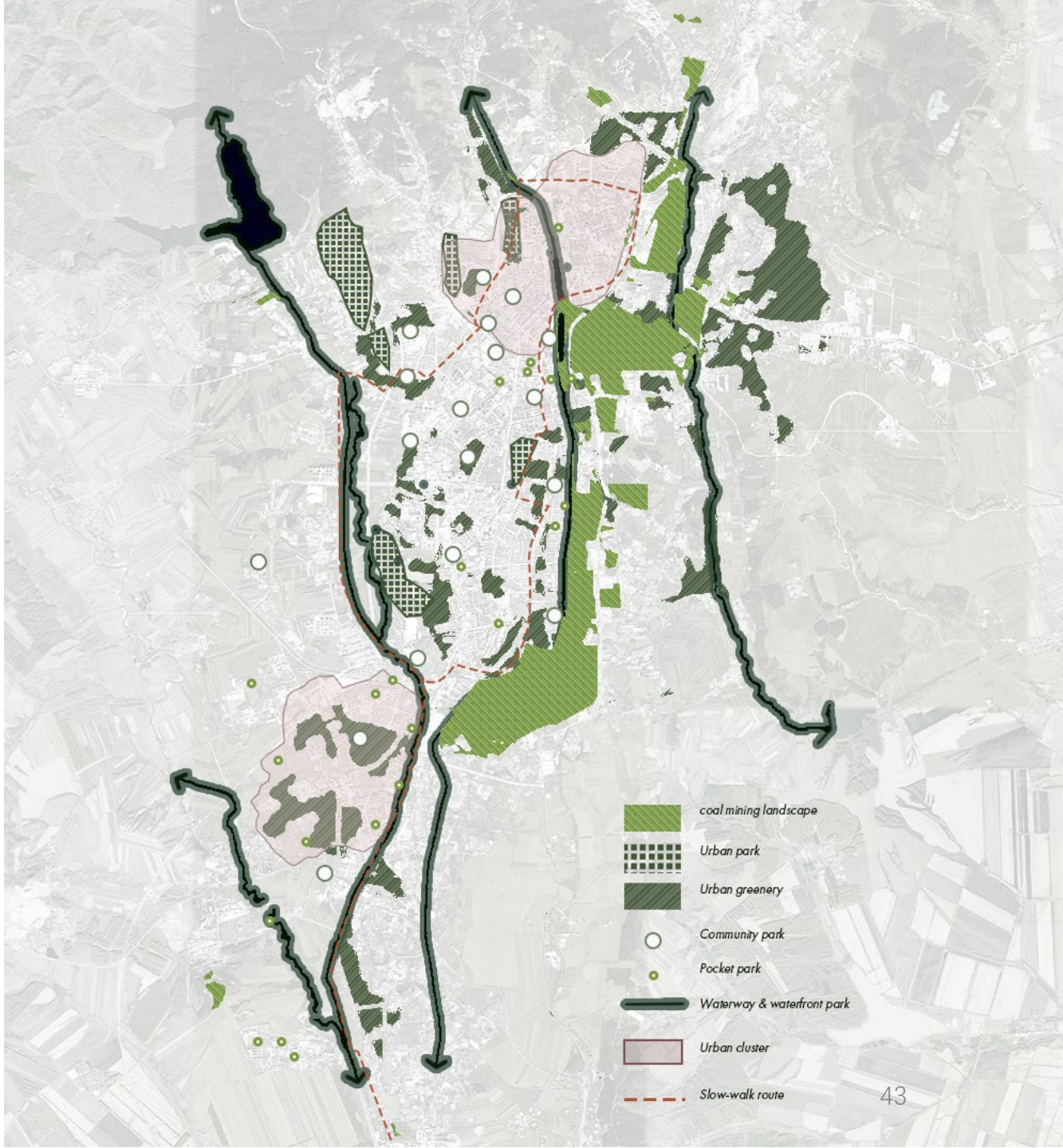
MODE	ATTITUDE TO SHRINKAGE	ACTION	PARTICIPATION MECHANISM
Demolition	Not admit/Seek for growth	Demolish the vacant buildings	Government-led/Attract market
Transferability	Admit/Solve problem	The land bank reclaims vacant land, and grass-roots organizations such as neighborhood committees obtain the right to reuse the land	Government-led/Attract residents
Transition	Admit/Wait for growth	Transit vacant industrial or commercia land by encouraging local businesses and organizations to actively envision new uses for vacant land, transforming vacant resources into temporary places with multiple functions.	Government-guided/Social participation
Change	Admit/Utilize shrinkage	Reuse the vacant property and give it new function; Turn vacant land into "green infrastructure"	Government-led/Social participation

STRATEGIC PLANNING

II. Build green infrastructure system

- [x] Build green infrastructure system
- [ ] Ecological restoration





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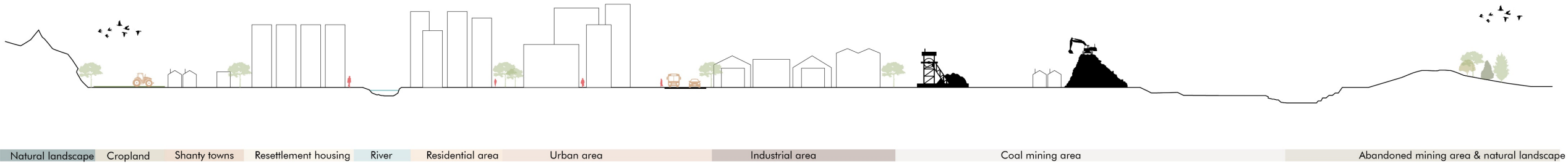

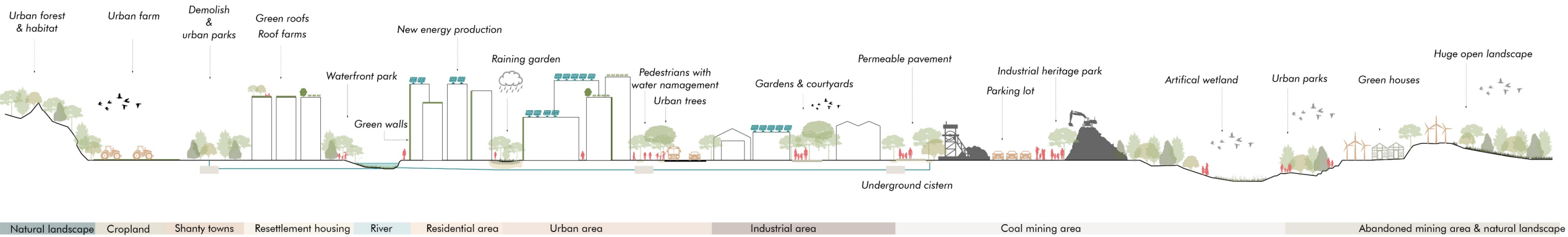

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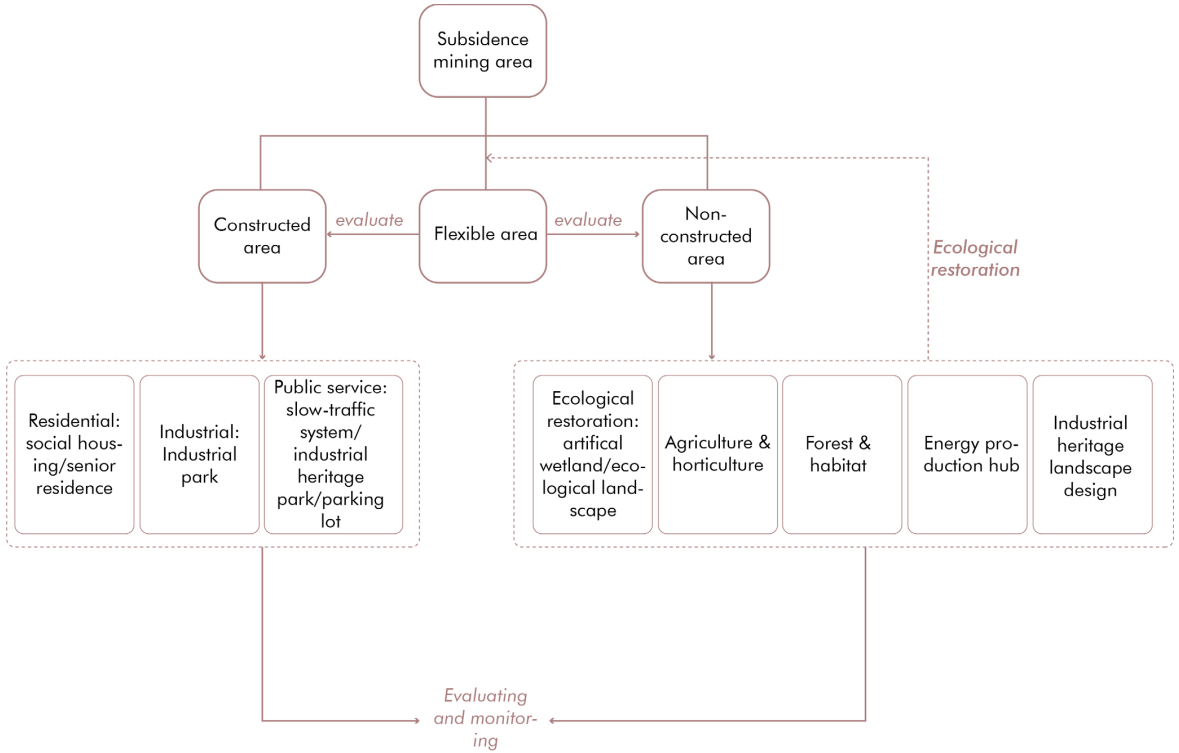

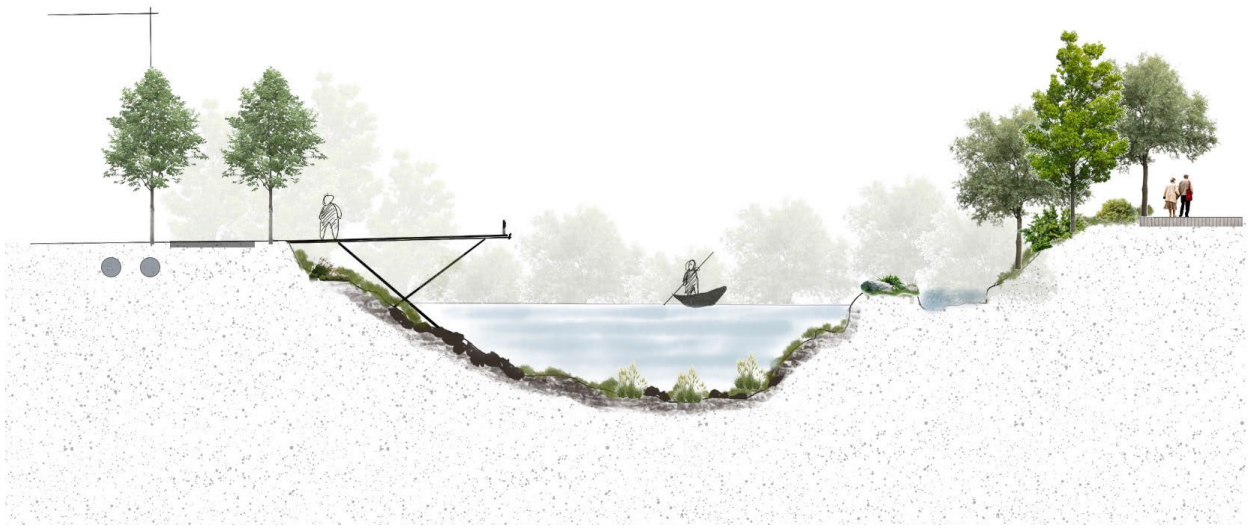

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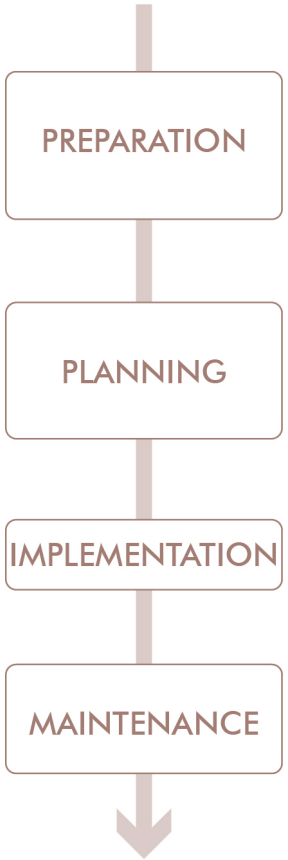


Step1: Analyse the need of land use and Identify the current natural landscape resources, Research on the current local soil conditions
Step2: Reclassify the land use and vacant buildings
Step3: Assess the value of the land based on residents' preference

Step4: Confirm the locations /types/stakeholders of green infrastructure
Step5: Make the green infrastructure network plan and the green corridor
Step6: Design on sites
Step7: Make the plan for ecological restoration

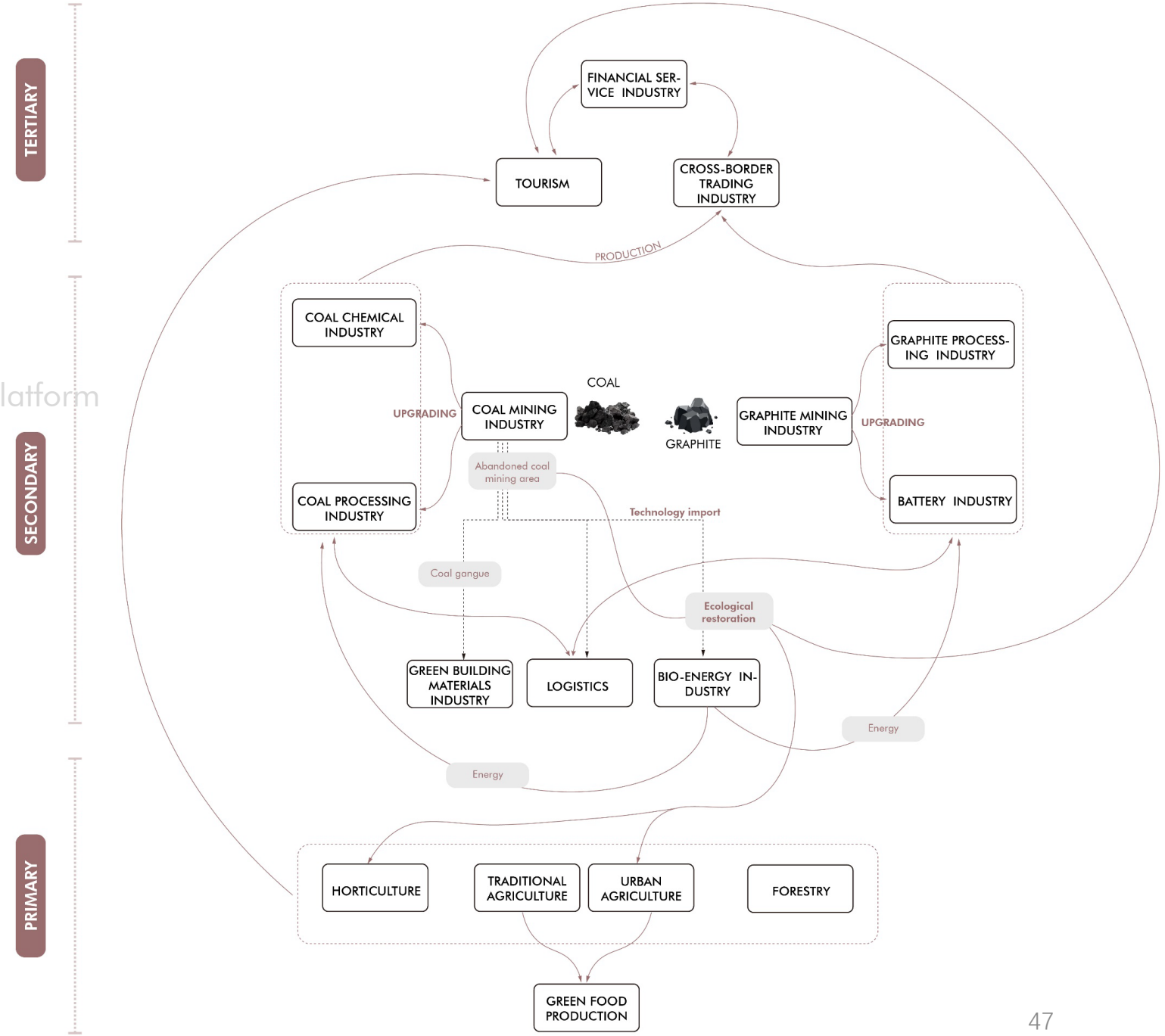
Step8: Demolish/Renewal the vacant building
Step9: Transform the vacant space to green infrastructure

Step10: Public participation
Step11: Make the strategies for short-term and long-term maintenance
Step12: Maintain

STRATEGIC PLANNING

III. Sustainable economic transition

- ☐ Adjustment of industrial structure
- ☐ Build industrial development sharing platform
- ☐ Reorganize the industrial distributions
- ☐ Build 'Industry+Life' Community



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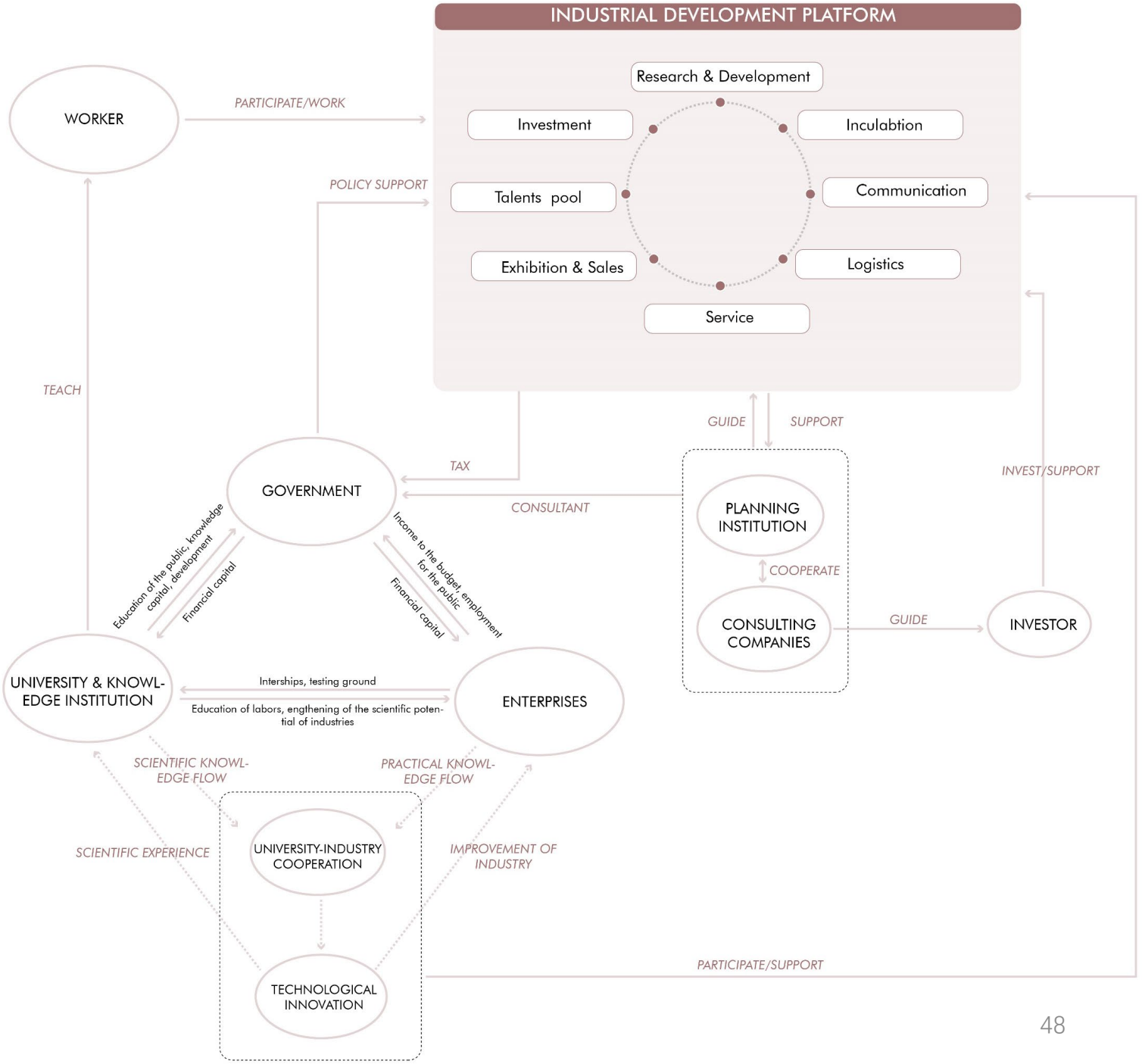

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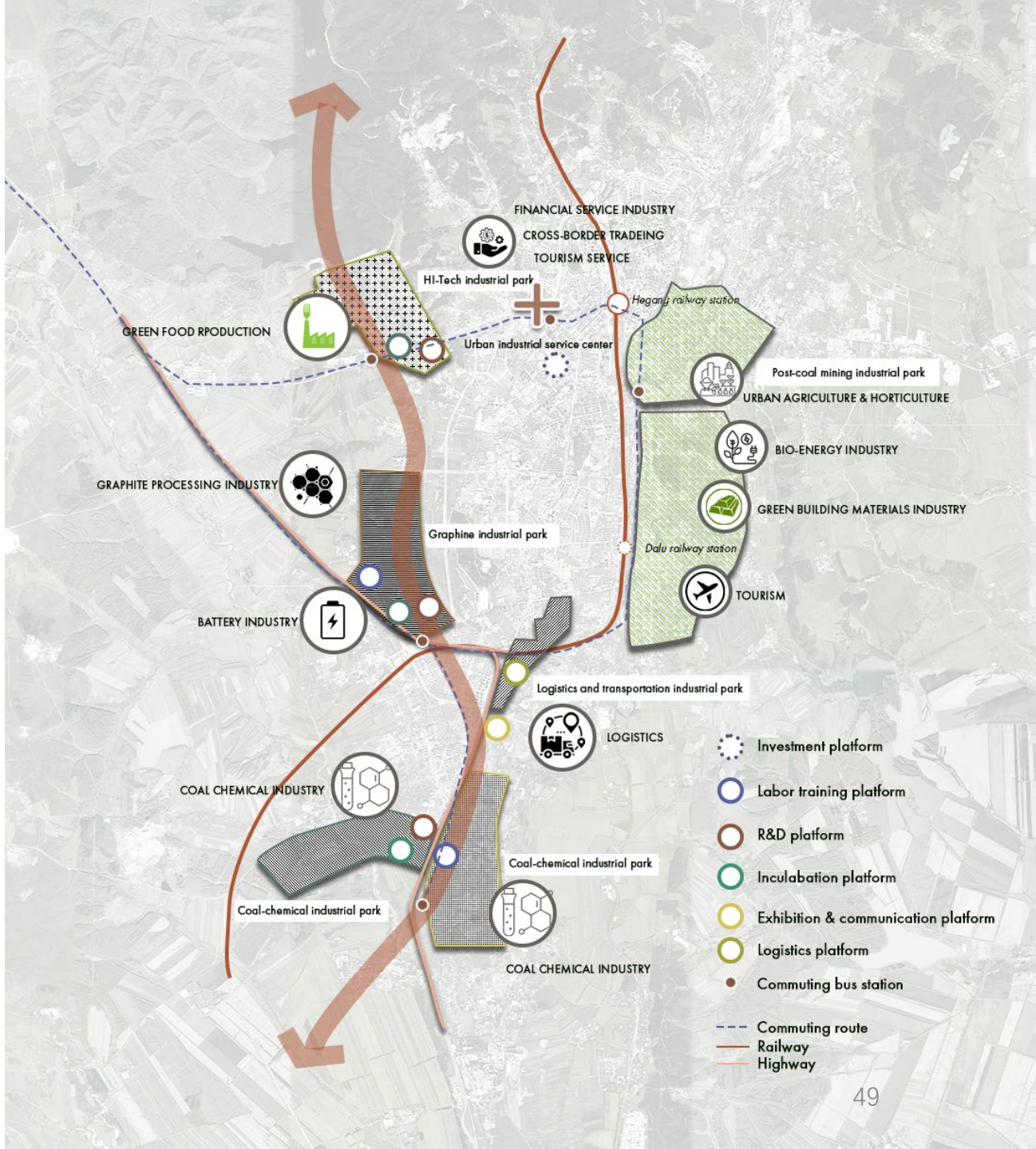
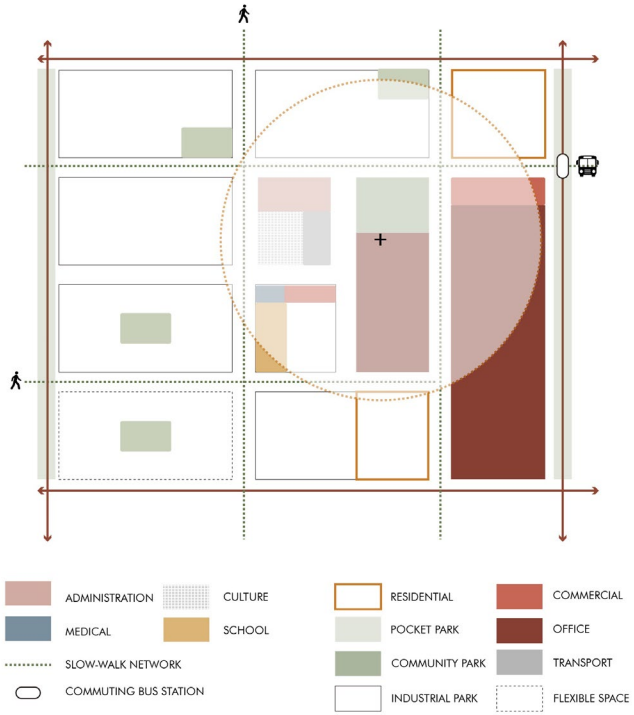
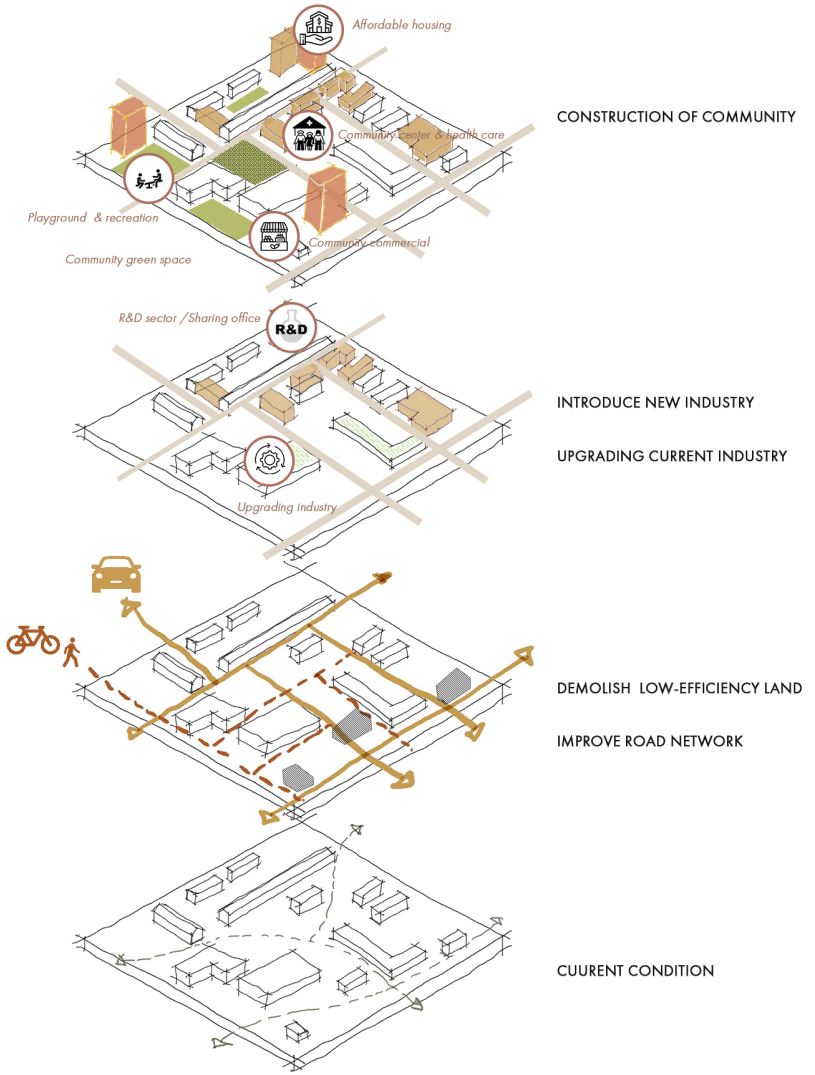


STRATEGIC PLANNING

III. Sustainable economic transition

- Adjustment of industrial structure
- Build industrial development sharing platform
- Reorganize the industrial distributions
- Build 'Industry+Life' Community

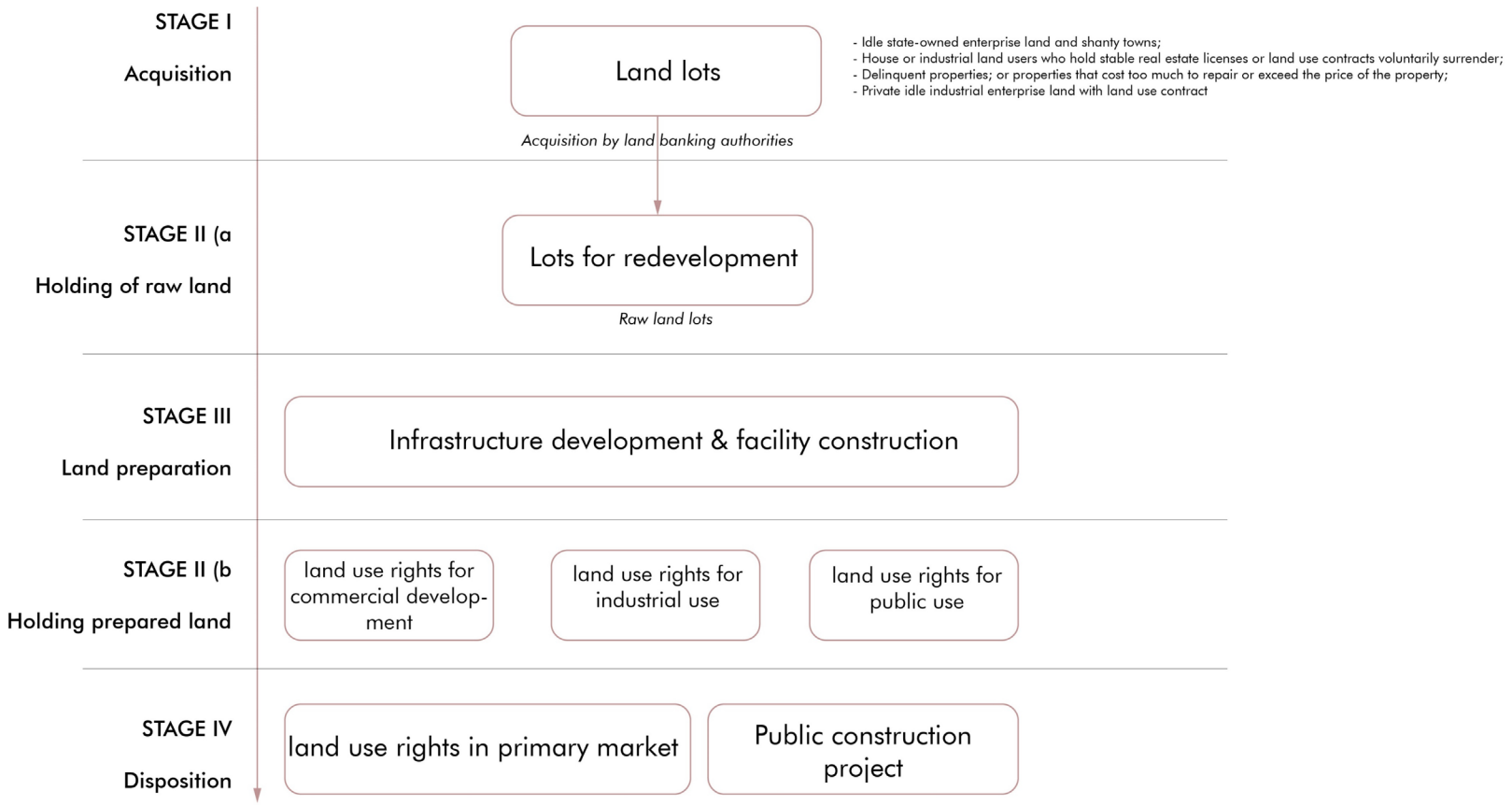




STRATEGIC PLANNING

IV. Participatory governance with flexibility

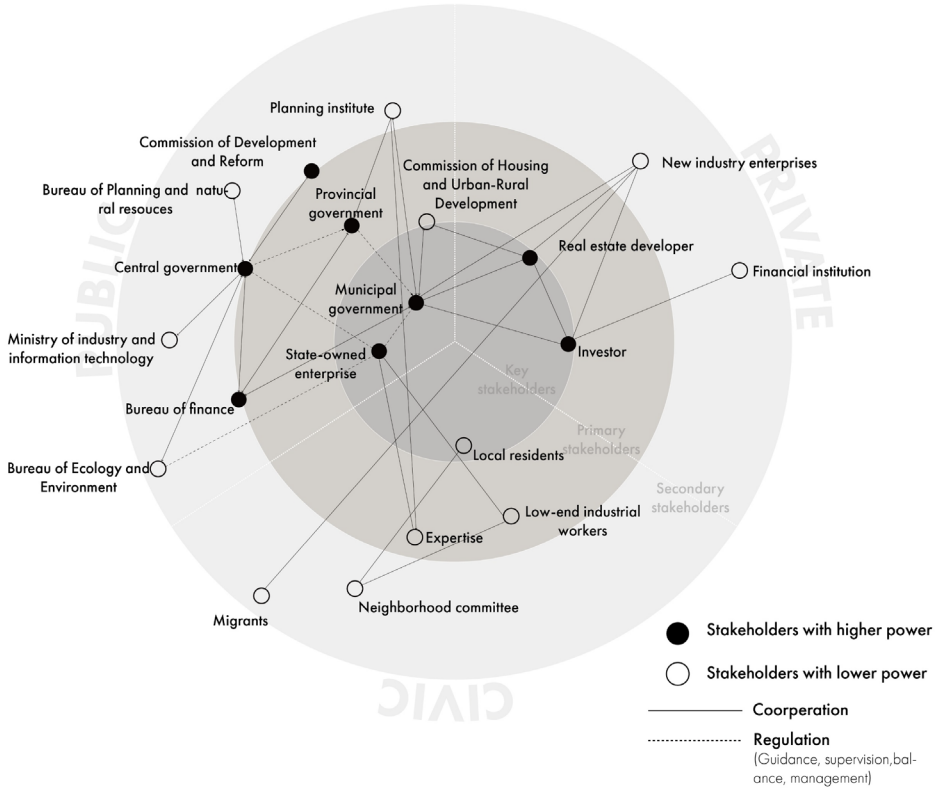
- ☐ Build Land bank system
- ☐ Encourage collaborative planning

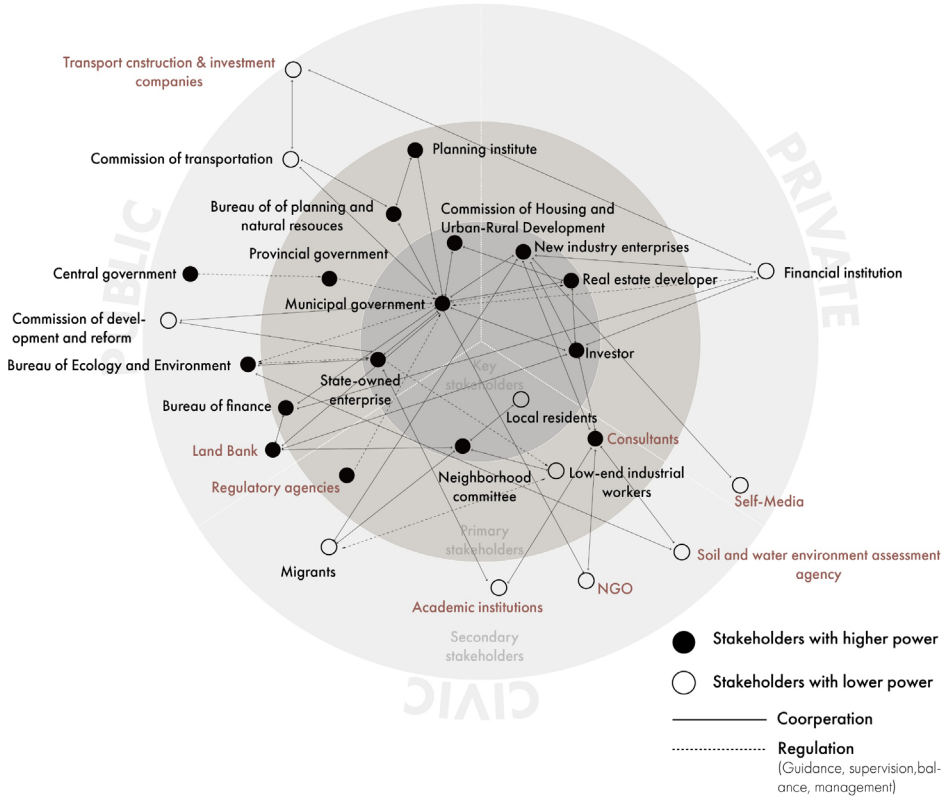


STRATEGIC PLANNING

IV. Participatory governance with flexibility

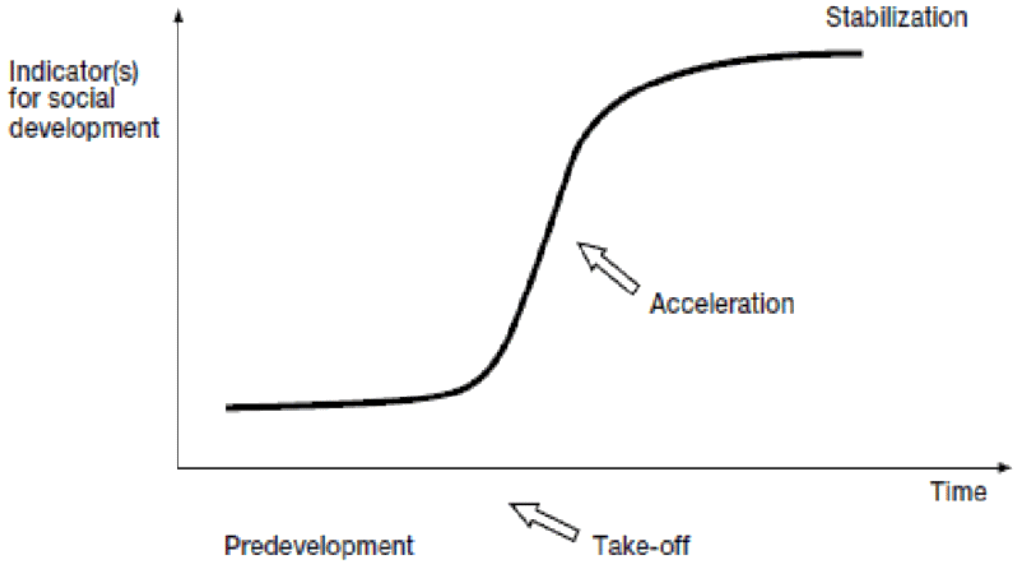
- ☐ Build Land bank system
- ☐ Encourage collaborative planning





IMPLEMENTATION

Time phasing

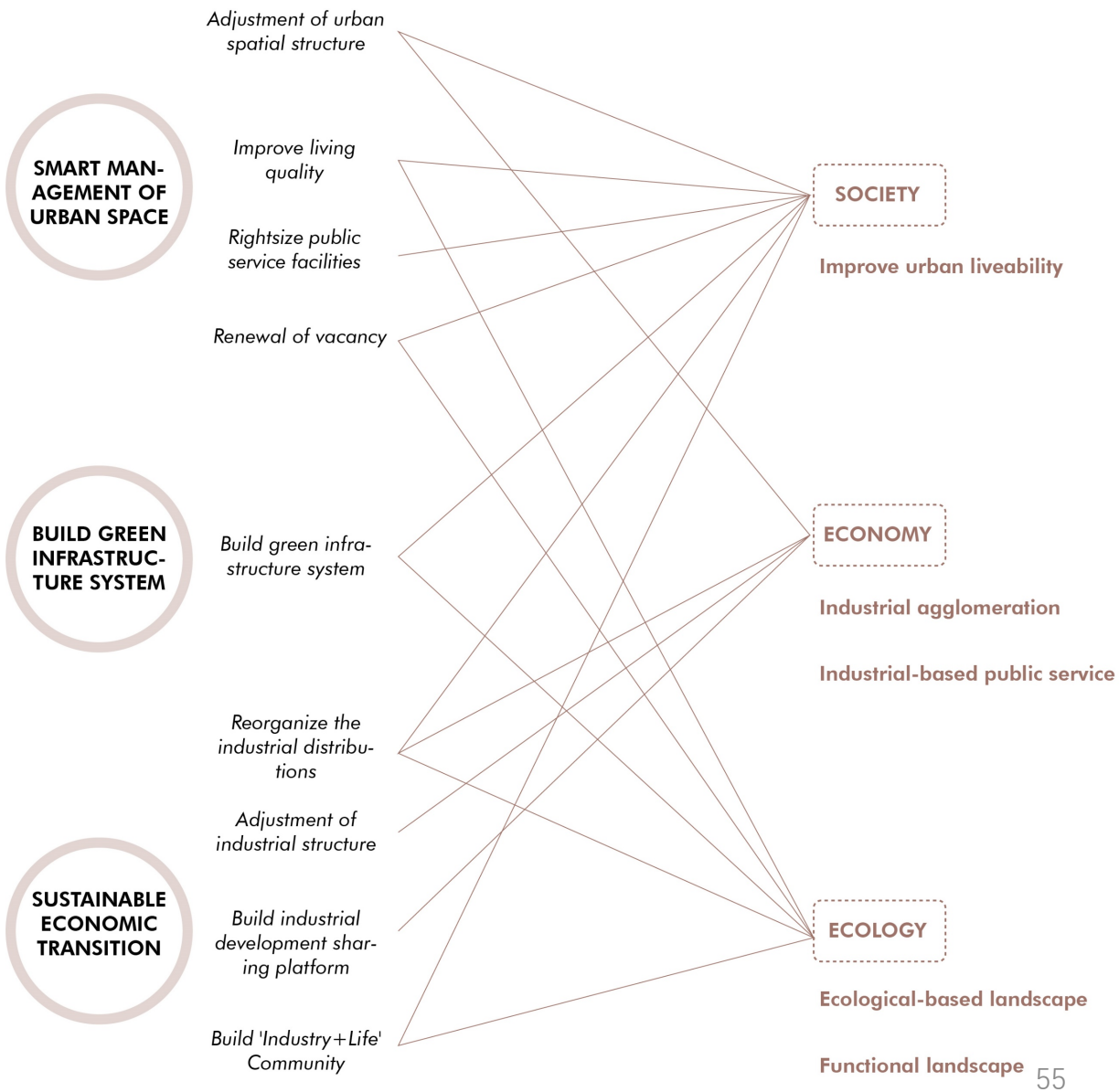


	PREDEVELOPMENT	TAKE-OFF	ACCELERATION	STABLIZATION
GOAL	ASSESSMENT& IDENTIFICATION	CONSTRUCTION OF INCUBATION BASE	REMOVAL OF TRANSITION BARRIERS	EVALUATION & IMPROVEMENT OF PROJECTS
	VISIONING & PRELIMINERY PLANNING	CO-PLANNING & CO-DESIGN	CO-DEVELOPMENT	
	ACCUMILATION& PREPARATION FOR DEVELOPMENT	PILOT PROJECTS DEVELOPMENT		MAINTENANCE OF NEW NORMAL
	NETWORKING AMONG ACTORS	ADJUSTMENT & UPGRADING OF PLAN	IMPLEMENTATION OF PLANNING WIDELY [CONTINUING TRANSITION]	

TESTING

SPATIAL IMPLEMENTATION OF DESIGN

Spatial Design toolbox

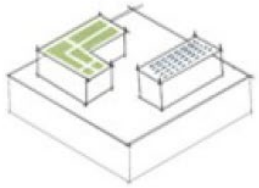


IMPLEMENTATION OF DESIGN

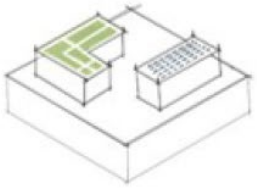
Design toolbox

IMPROVE URBAN LIVEABILITY

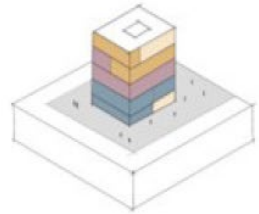
1 Rooftop gardening & farming



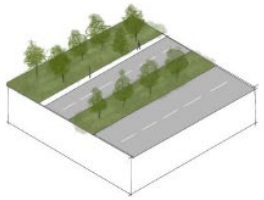
2 Rooftop energy



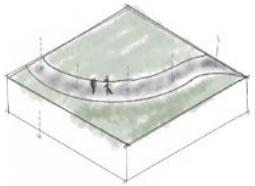
3 Vertical mixed use



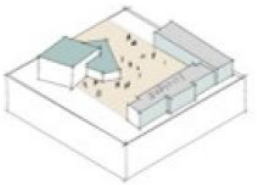
4 Greenstreet & slow traffic system



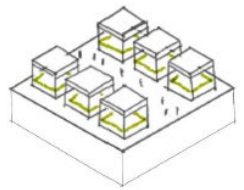
5 Permeable pavement



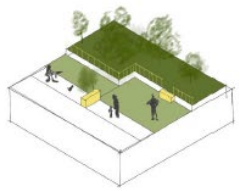
6 Flexible open space



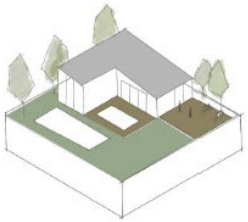
7 Food market



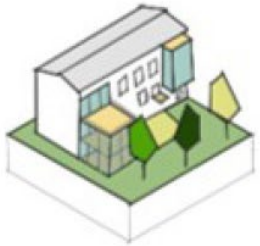
8 Pocket park



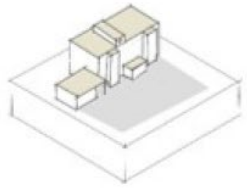
9 Community center



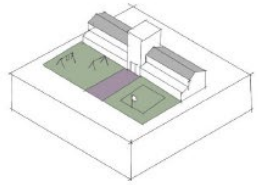
10 Elderly care



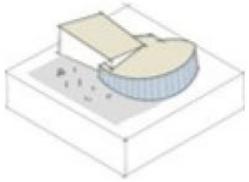
11 Hospital



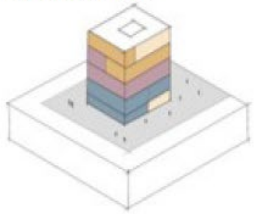
12 School (including kindergarten)



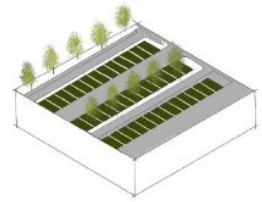
13 Cutural activity center & Public gym



14 Flexible space for temporarily use



15 Green parking lot

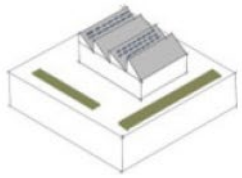


IMPLEMENTATION OF DESIGN

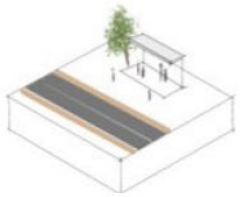
Design toolbox

INDUSTRIAL AGGLOMERATION

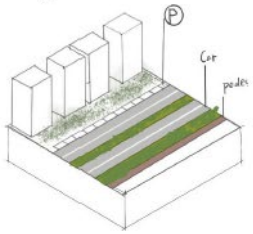
1 Renewal of industrial buildings



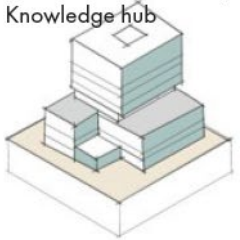
2 Commuting bus station



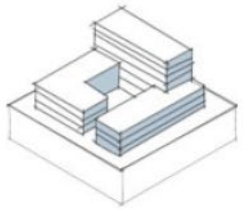
3 Improve infrastructure



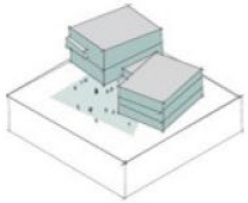
4 R&D sector/ Knowledge hub



5 Sharing office

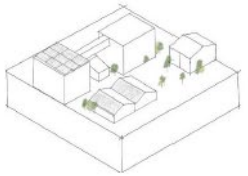


6 Exhibition hall/ Communication center



7 Sustainable industrial park

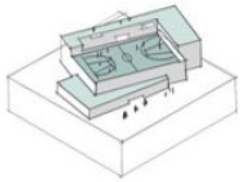
8 Labor training center



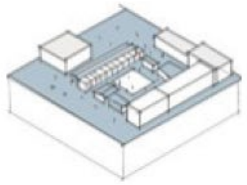
INDUSTRIAL-BASED PUBLIC SERVICES

1 Talents housing/ Affordable housing

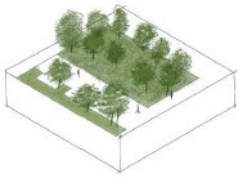
2Social activity center



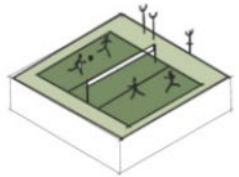
3 Commercial



4 Community park



5 Recreation&sports field



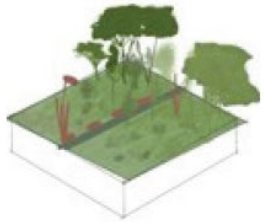
IMPLEMENTATION OF DESIGN

Design toolbox

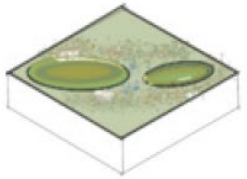
ECOLOGICAL-BASED LANDSCAPE

1Garbage backfill

2 Bio-landscape and raining garden

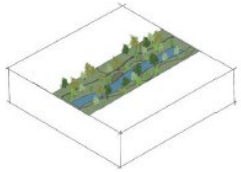


3 Artificial wetlands



4 Plant purification

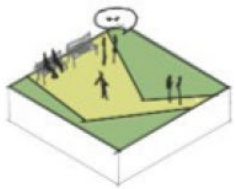
5 Waterfront park



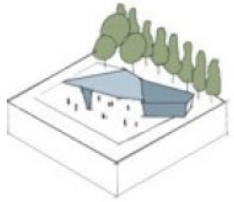
FUNCTIONAL LANDSCPE

1Pedestrian pathway

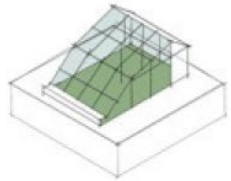
2 Recreation space



3 Open Pavillion

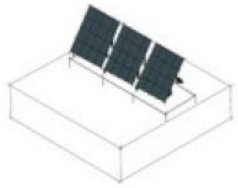


4 Greenhouses



5 Urban farming

6 Clean energy production

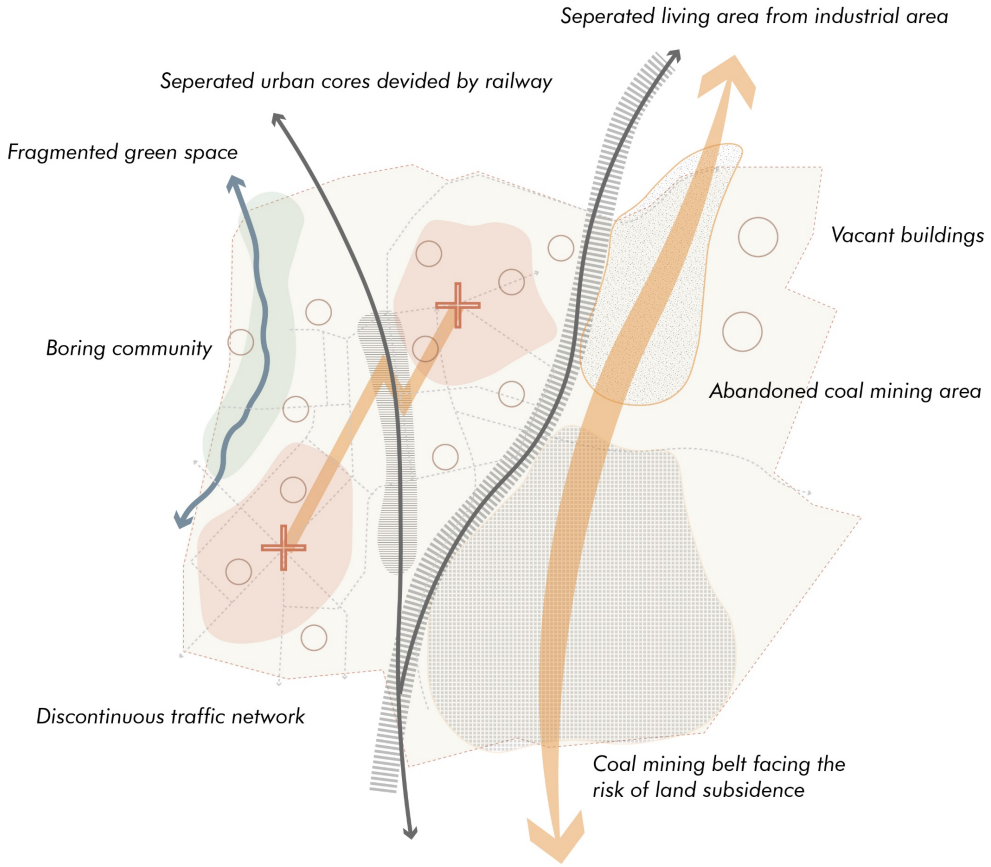


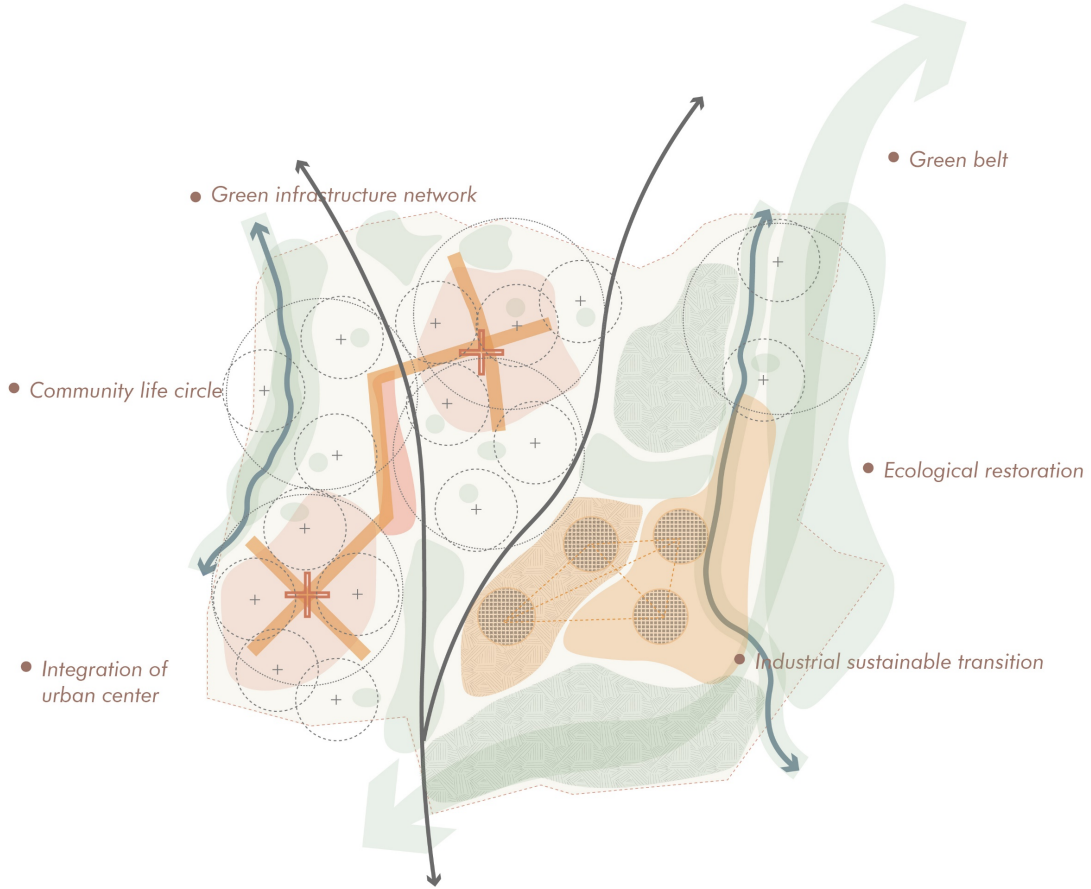
IMPLEMENTATION OF DESIGN

Design site-I

IMPLEMENTATION OF DESIGN

Design site-I





IMPLEMENTATION OF DESIGN

Design site-I

- Structural planning

TOD development node
Urban central core
Commuting bus
Railway & railway station
Green infrastructure
Urban central axis
Energy hub
Community center
Labor community
Industry Service center
Ecological restoration urban park
Eco-farm
Reclaimed cropland & Urban farming
Green building material industrial park
Urban forest

IMPLEMENTATION OF DESIGN

Design site-I

☐ Structural planning

- *Ecological restoration*
- *Infrastructure optimization*

- *Integration of urban center*
- *Sustainable industrial start-ups*

- *Community center upgrading*
- *Related service optimization*

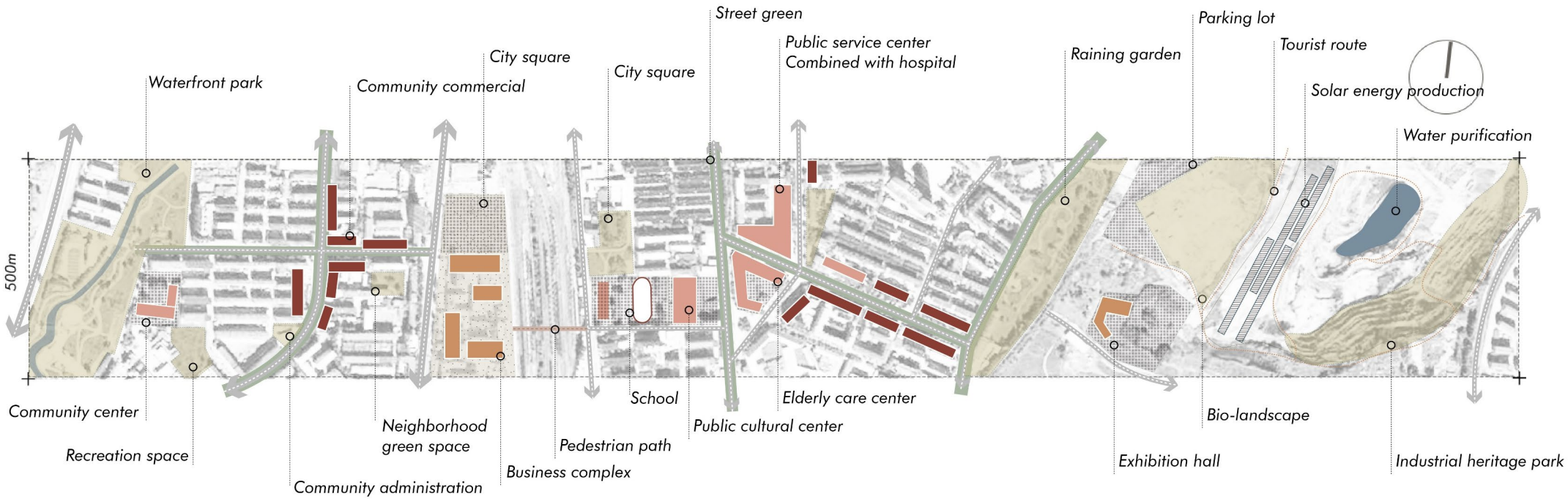
IMPLEMENTATION OF DESIGN

Design site -I

- Detailed planning

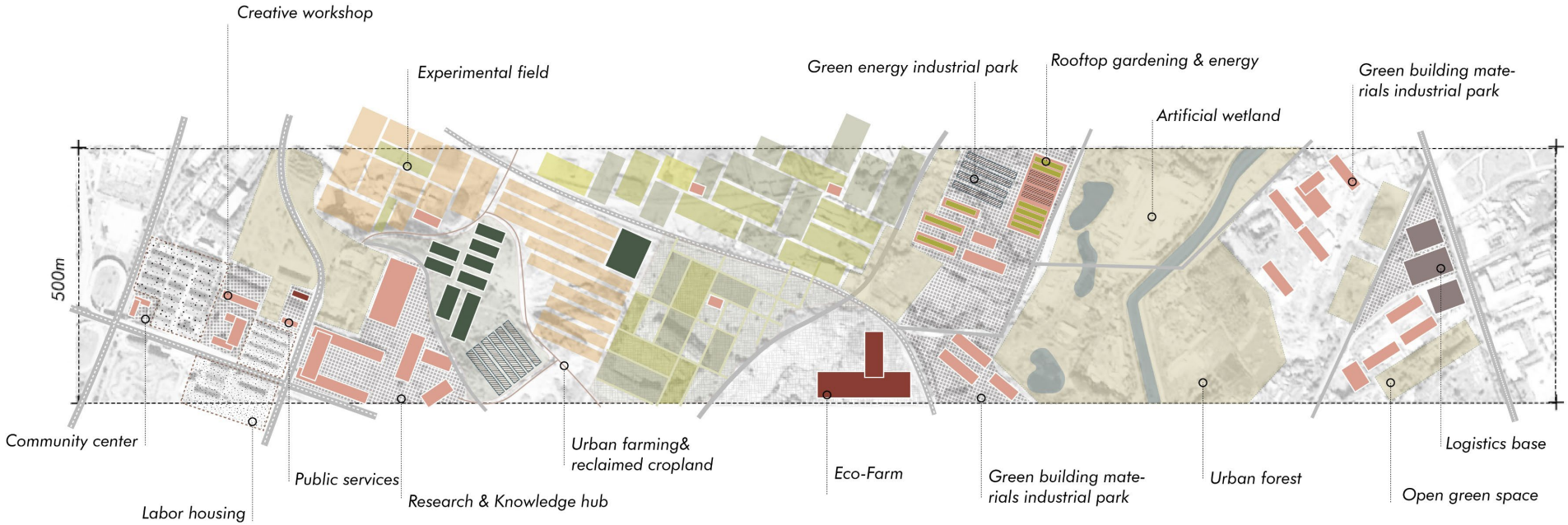
IMPLEMENTATION OF DESIGN

Design site-I-A



IMPLEMENTATION OF DESIGN

Design site-I-B

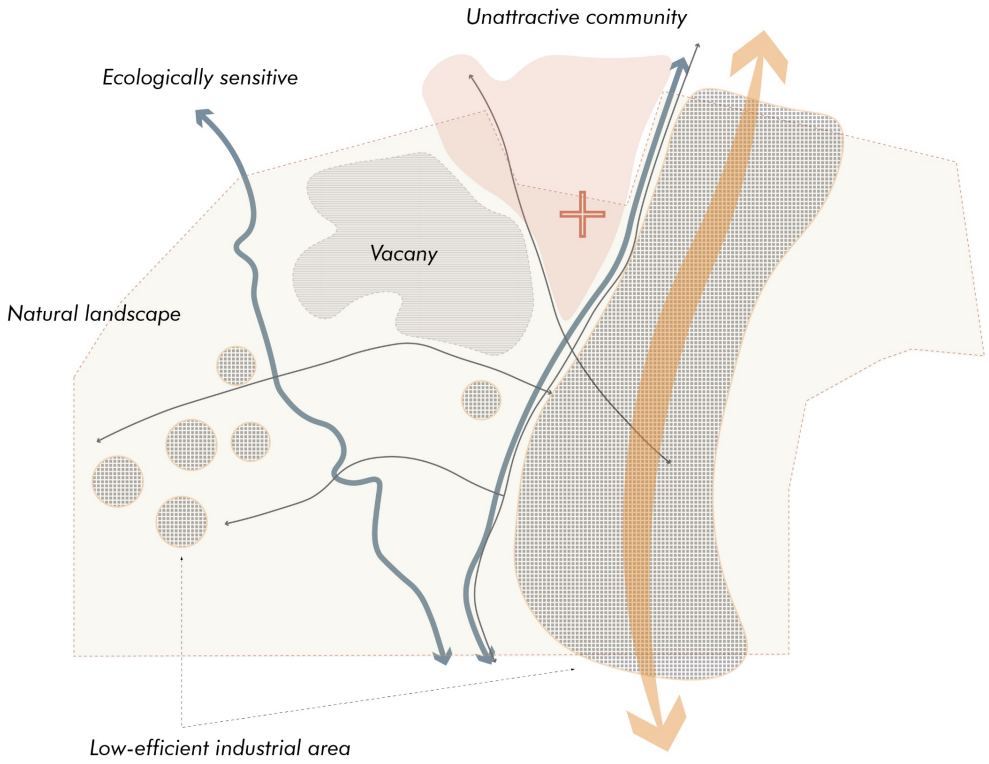


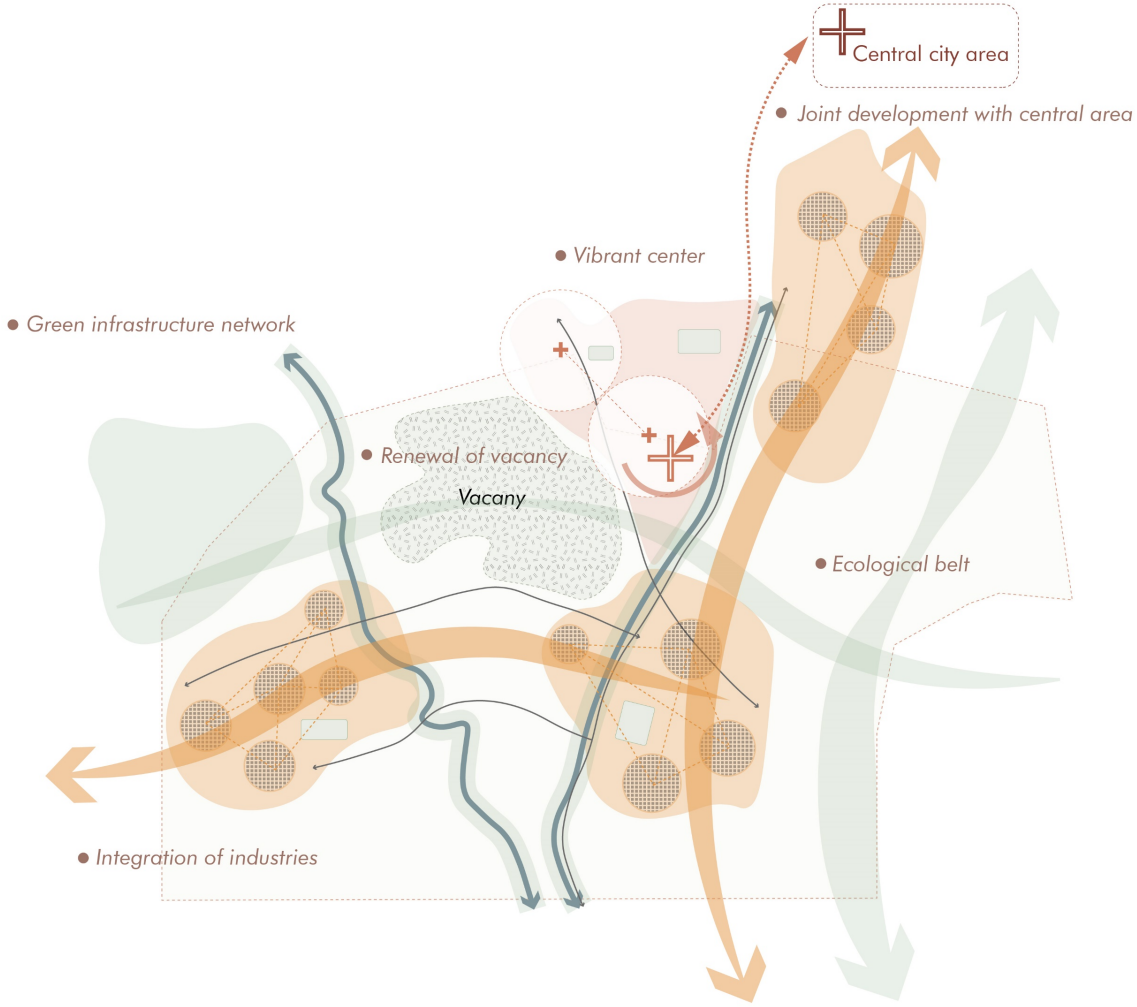
IMPLEMENTATION OF DESIGN

Design site-II

IMPLEMENTATION OF DESIGN

Design site-II

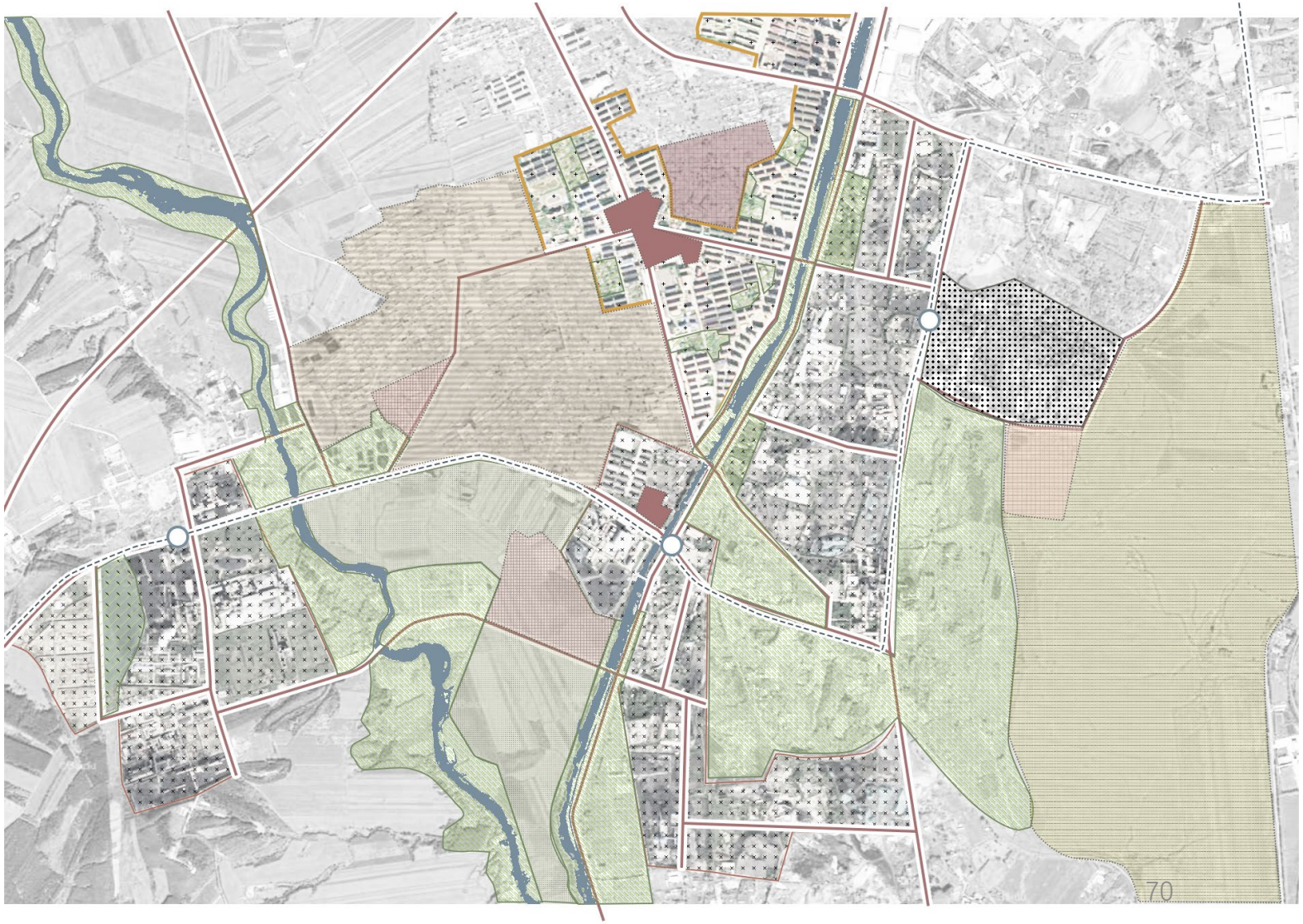




IMPLEMENTATION OF DESIGN

Design site-II

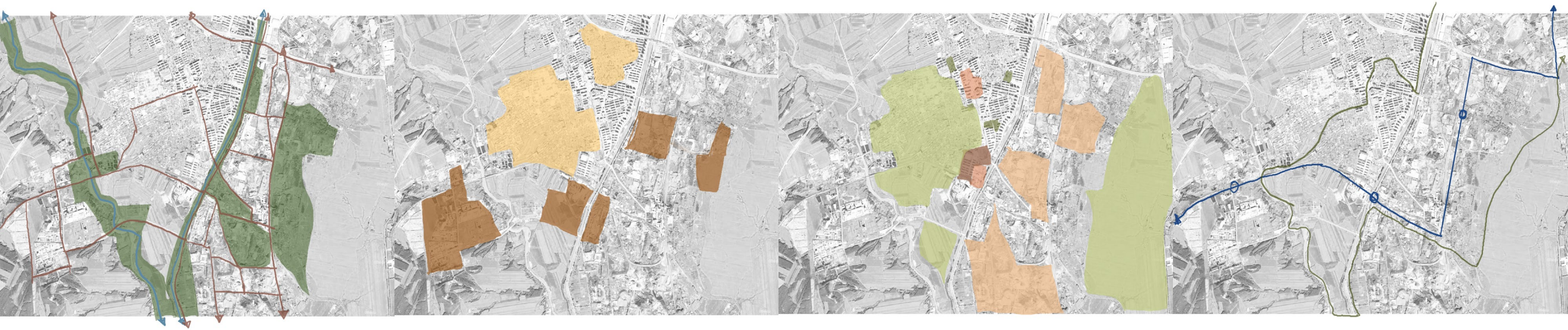
- Structural planning



IMPLEMENTATION OF DESIGN

Design site-II

- Structural planning



- *Ecological restoration*
- *Infrastructure optimization*

- *Pilot industrial project*
- *Renewal of vacancy, reclaim cropland*

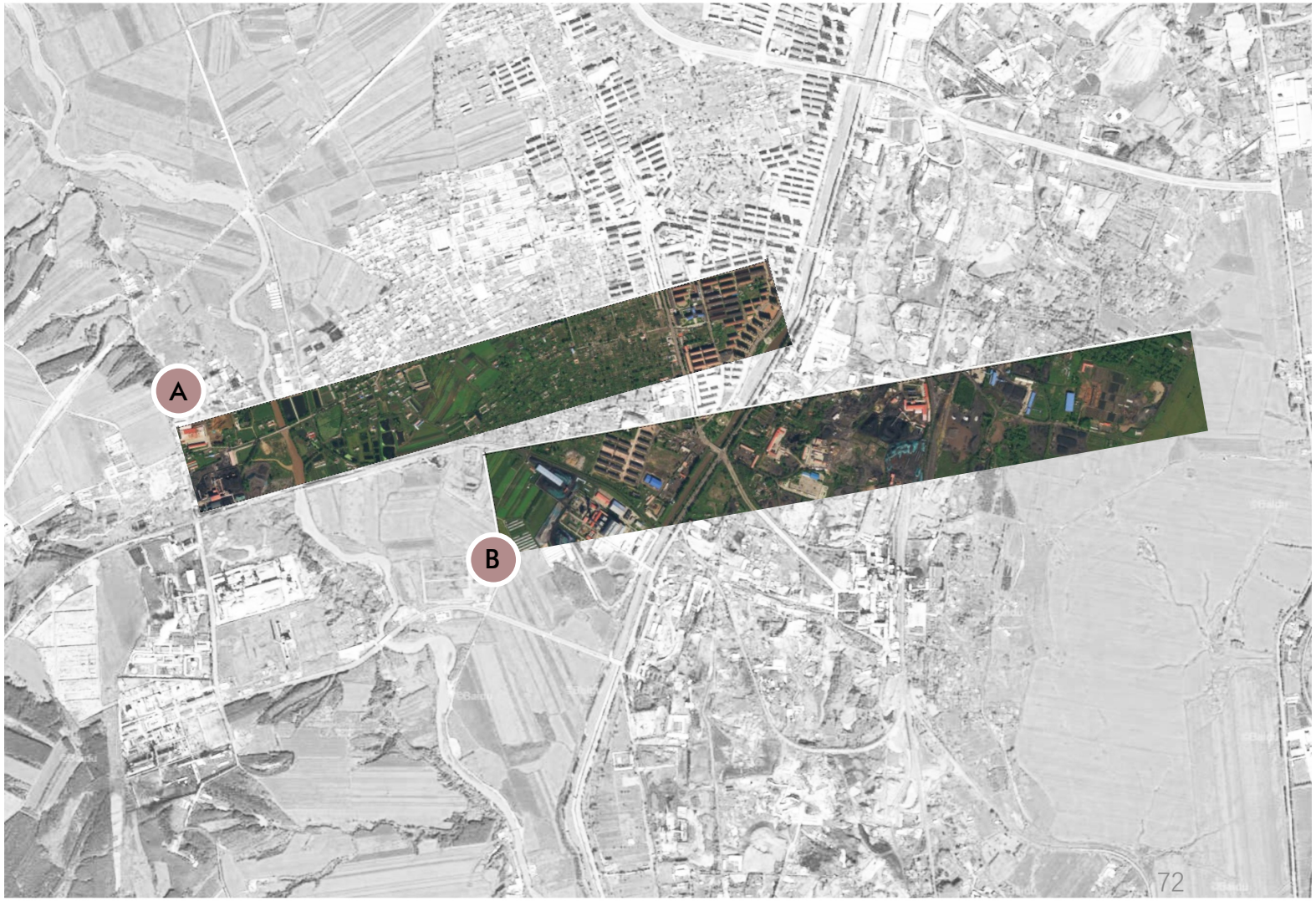
- *Industrial upgrading and integration: industry & urban farming*
- *Industrial+living community*

- *Slow traffic network*
- *Industrial-related service optimization*

IMPLEMENTATION OF DESIGN

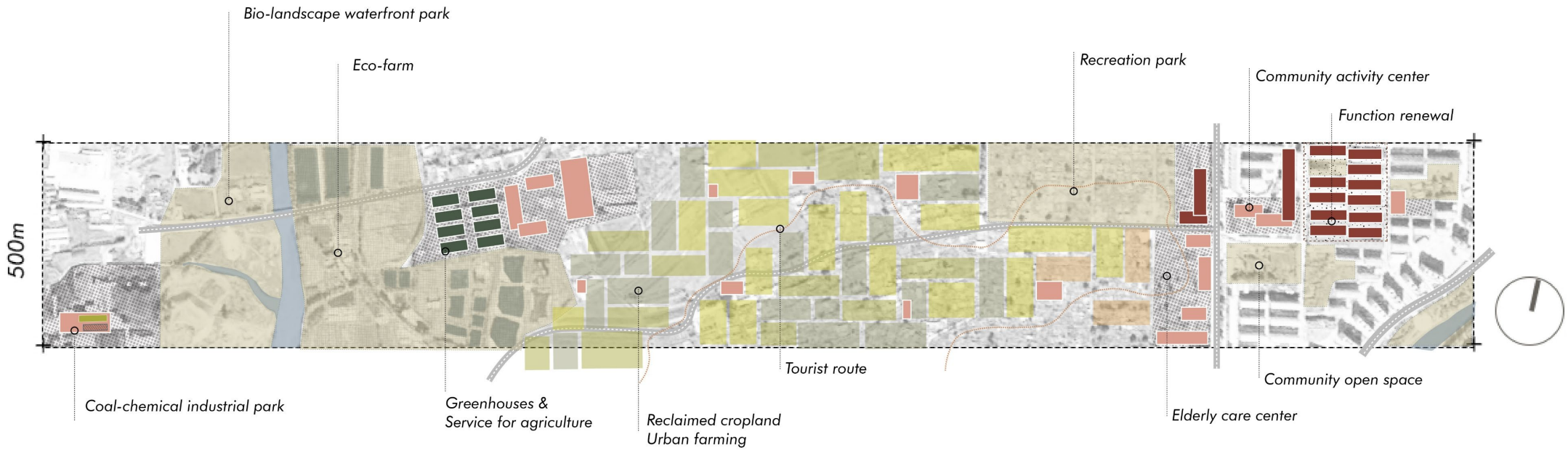
Design site-II

- Detailed planning



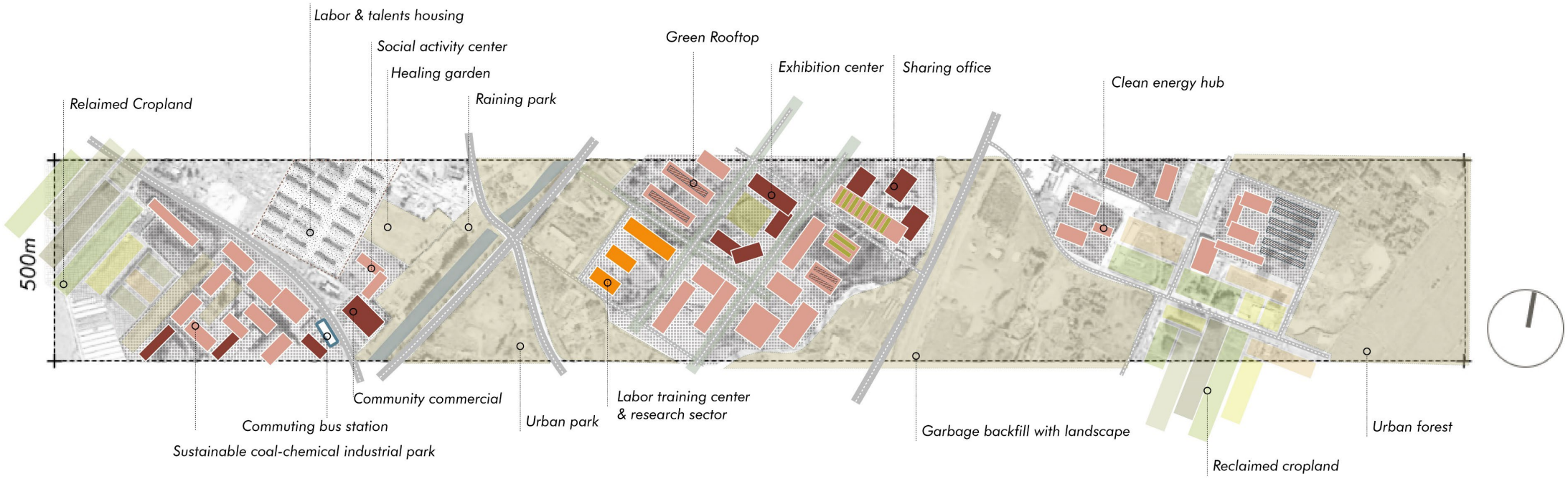
IMPLEMENTATION OF DESIGN

Design site-II-A



IMPLEMENTATION OF DESIGN

Design site-II-B




17 21 27
17 10 МИН
56 52
56 85 МИН

CONCLUSION

External impacts

Uneven development

Globalization

Internal impacts

Single-product economy

Resource depletion

Ecological degradation

Fiscal burden

Governance

Growth-oriented planning paradigm

Depopulation

X

Economic recession

X

Spatial decline

Object

Urban shrinkage

X

Resource-exhausted cities

Accept shrinkage

X

Utilize shrinkage

'Smart shrinkage' as guidance

RECOVERY

Mitigate the negative impacts of urban shrinkage

Increase liveability under shrinking trend

Boost the urban vitality of development

[NEW NORMAL]

Industrial upgrading

Urban and industrial integration development

Production

VISION

Ecology

Living

Environmental restoration

Green infrastructure network

Reestablishment of urban space

STRUCTURE x VACANCY x EQUALITY

Governance

Participatory and collaborative planning

Resilient urban system

Principle I: Network of cooperation

Principle II:Efficiency of space and public services

Principle III: Smart environment of green cities

Principle IV: Stable and sustainable economic development

Principle V: Participatory governance with flexibility

THANK YOU !

感谢聆听

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APPENDIX

	PRINCIPLES	SMART SHRINKAGE CONCEPT	LOCAL CONTEXT
REGIONAL	Network of cooperation	/	- **Internal and External Limited developing conditions**: Remote location; Periphery of urban cluster; Lack of internal development momentum; Limited urban expanding space; - **Provincial industrial planning requirements**: Regional cooperation in clusters - **Similar development context** (history and culture) as surrounding cities
MUNICIPAL	Efficiency of space and public services	- Right-sizing of urban scale and reduce the scope of infrastructure services - Re-adjust the built environment - Focus on high quality urban center - Dense community - Re-adjust to the aging and less child future - 'Land bank' and land management	- High vacancy of space and buildings (resettlement housing) -Abandoned coal mining area and demolished shanty towns - Population decline and change of demographic structure - Low space quality: space disorder - Inequality of development within central city
	Smart environment of green cities	- Re-adjust to Green infrastructure (e.g. bike infrastrurcture/food infrastructure) - Green retirement city (e.g. urban gardening)	- Pollution and ecological degradation caused by coal mining industry - Rich and original natural landscape resources -Call for green development and ecological restoration
	Stable and sustainable economic development	- Industrial upgrading and transition	- The recession of secondary industry and Facing the industrial transformation - Potential of Internet celebrity economy: social media - Potentials from transition - Location advantage : border trade economy - Lack of basement for other industry - New resources: graphite industry
	Participatory governance with flexibility	- stimulate and encourage the public participation - participate in urban self-constrtuction through studios and projects(e.g. living laboratory) - stronger and stable community - land management and land bank	- Solidified governance system - Growth-oriented planning paradigm in the past - Shift of consciousness of government and local residents - Migration of population

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◘ Detailed strategy

PRINCIPLE- Network of cooperation

- **Regional transport infrastructure upgrading**

  To provide development basis for regional integration.

- **Ecourage Regional cooperation and establish regional industry development cluster**

  To utilize the foundation and advantages of regional industrial development, avoid disadvantages such as remote locations, then promote the formation of collaborative industrial development clusters with extended industrial chain.

PRINCIPLE- Efficiency of space and public services

- **Identify and Assess the urban space**

  Investigate and collect the urban space data, according to current conditions, identify the low-efficiency land in the urban area of the whole city by combining social, economic and various conditions.

- **Establish the Database of urban space and public services**

  To manage the urban space and public services data in a smart and digital way.

- **Rightsize the urban scale and public service facilities**

  Promote the centralized distribution and rational layout of medical care, social welfare, commercial facilities and residences; Improve the value and efficiency of facilities and urban space, and reduce the waste of space and government expenditure.

- **Renewal of vacant space**

  Utilize the urban vacant space as 'Resource' , for instance, transform low-efficiency and vacant land into green spaces, public activity spaces, cultural activity centers, sports venues, etc. through green infrastructure, tempo rary use, function replacement and other updating methods to stimulate the value of vacant spaces, avoid further deterioration of the area, and maintain regional image.

- **Centralize and decentralize population and land use**

  Centralized population and functions reduces unnecessary investment for construction and enable the gathering of funds, resources, talents, etc, which finally contributes to long-term cost-effective development.

- **City public transport network upgrading**

  Complete the accessibility of public transport, improve urban slow-walk traffic system and thereby timprove quality of residents' urban normal life.

- **Improve the spatial quality**

  Improve the overall appearance of the city, form a multi-level community life circle suitable for aging, child-friendly, walk-friendly, green and low-carbon vision.

PRINCIPLE- Smart environment of green cities

- **Ecological restoration**

  Restoring and protecting regional ecological space, establishing ecological corridors and national parks, using greening to nourish towns and other measures, and promoting the formation of an ecological pattern of natural and harmonious symbiosis in the region; On the basis of protecting natural landscape land, provide residents with places for entertainment, experience, communication and learning, and form an ecological environment for sustainable urban development.

- **Build Green infrastructure system**

  Form a multi-scale, networked, multi-functional sustainable green infrastructure system.

- **Construct Disaster prevention facility**

  In view of the risks such as ground subsidence that may occur in the long run, prepare for the urban disaster prevention space plan.

- **Recover the coal mining land to cropland**

  Return part of the construction land to farmland, renovate the farmland by integrating the scale of the farmland, replanning the roads in the field, transforming and improving the irrigation and drainage facilities, and improving the soil of the farmland to improve the quality of the farmland; realize the further development of regional modern agriculture and forestry.

PRINCIPLE- Stable and sustainable economic development

- **Build industrial development sharing platform**

  Construct a sharing platform, establish relevant industrial infrastructure and service, provide communication chance for domestic and foreign researchers and industries, and provide a place for citizens to experience and learn in person.

- **Adjustment of industrial structure**

  - **Establish the sustainable green structure of graphite industry**

    Utilize existing product resources, promote the development of graphite-related secondary industries through the circular economy development model, and achieve technological innovation and product upgrades through international cooperation channels.

  - **Extend the chain of coal-chemical industry**

    Optimize advantageous industries, upgrade the original industrial model with advanced technology and concepts, promote the sustainable and green transformation of industries with backward structures, strengthen competitiveness, and create new brands.

  - **Market building for cross-border trading industry, tourism business and agriculture**

    Excavate and refine the development foundation and advantages of the region, and create a development foundation and future market by formulating relevant encouragement and development policies at the government level to attract and gather related industries.

  - **Encourage the collaboration among industries**

    Realize the coordinated development of the primary, secondary and tertiary industries in the region.

- **Low-end Labor training**

  Provide skills upgrading training for workers to better adapt to the upgraded industry and reduce unemployment.

- **Build "Industry+life" community**

  Promote the matching of industrial space and living space in close proximity, provide workers and other workers in and around the industrial park with perfect residential, commercial, service or green space functions, so that production, living and ecology are coordinated with each other and the economic vitality of the park is enhanced.

- **Reorganize the industrial distributions**

  Gather the industries and form industrial clusters; provide reserved space for start-ups and future development; Improve the industtrial park and related community, and formulate the basis for working and living.

PRINCIPLE- Participatory governance with flexibility

- **Build 'Land bank' system**

  Collect, temporarily manage and dispose of vacant properties, transforming vacant land and buildings into green assets to maintain neighborhood stability and encourage property reuse; also as an economic and community development tool to restore real estate markets in shrinking cities

- **Living laboratory**

  Based on the principle of people-oriented, pay attention to the needs and life of residents, and attach importance to urban public activities and social interactions; promote the enthusiasm of local people for life and realize the revitalization of the neighborhood through public participation in community construction and community building.

- **Build Regulatory agency**

  Add supervisory agencies to urge the public to actively participate from the bottom up, and to make government information policies open and transparent.

- **Encourage collaborative planning**

  Encourage cooperation between the government, professionals, research institutions, universities, enterprises and the public, build a framework for cooperation planning, realize technological innovation and improve the quality of the urban physical environment; the public participates through various channels and provides feedback and information.

- **Build Stable and sustainable community**

  Improve the living environment and improve public service facilities; fully consider the age structure of the community population and respect the wishes of residents; use the neighborhood committee as the grass-roots autonomous network to improve community management, and build a platform for residents to fully participate in planning and construction to achieve multi-party co-construction

APPENDIX

- Detailed design guideline of vacancy renewal

CLASSIFICATION			MEASURE INDICATOR (Demand / Location / Quality / History)	STAKEHODER	STRATEGIES
RESIDENTIAL BUILDINGS	Demolition	Low centrality Low quality High vacancy		Government/enterprises	Demolish buildings
	Renewal	High centrality High quality Low vacancy		Government/enterprises/citizen/innovative team/Land Bank/NGO/Planner/Neighborhood committee	Land Bank Vertical mixed function -Commercial -Public service Temporarily use Elderly care center Community activity center Urban farming Half of a good house Talents & social housing
INDUSTRIAL BUILDINGS	Demolition	Low centrality Low quality Bad environment		Government/enterprises	Demolish buildings
	Renewal	Centralized distribution High/moderate quality Historic value		Government/state-owned enterprises/citizen/innovative team/Land Bank/NGO/Planner/private enterprises	Land Bank Creative workshop Green infrastructure Art gene activation Industrial heritage exhibition Community function inception Energy production facility Sustainable industrial park
PUBLIC BUILDINGS	Demolition	Low centrality Low quality High vacancy		Government/enterprises	Demolish buildings
	Renewal	High centrality High quality Low vacancy		Government/state-owned enterprises/citizen/innovative team/Land Bank/NGO/Planner	Land Bank Public function improvement Vertival mixed use Quality improvement

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CLASSIFICATION			MEASURE INDICATOR (Demand / Location / Quality / History)	STAKEHODER	STRATEGIES
VACANT LAND	Infrastructure			Government/enterprises	Green buffer Protection green
	Parking lot	Near roads Small areas		Government/enterprises/NGO	Green parking facility Permeable pavement
	Square	Near active zone High accessibility		Government/citizen/N-GO/planner	Public service infrastructure Landscape element/Sculpture Interactive scenery Portable pavillion/Market
	Park	Near residential area Near rivers; Large area		Government/citizen/NGO	Urban vegetation/Event lawn Waterfront sidewalk Playground Slow walk
	Garden	Near residential area Small area		Government/citizen/NGO	Healing garden Permeable pavement Recreation facility Fitness equipment
	Farm	Far from residential area With farm Large area		Government/enterprises/citizen	Reclaim farm Urban farming Horticultural alley Green house Build shutter
	Restoration Coal mine	Small/Large		Government/enterprises/citi-zen/NGO/consulting compa-ny/planner/scholar	Refuse backfill Landscape design Bio-landscape & wetland Recreation park Urban Habitat Energy supply Ecological restoration Reclaim cropland Agriculture & Horticulture Industrial heritage park Underground Storage
SHANTY TOWNS	Demolished shanty towns	Scattered distribution		Government/enterprises/N-GO/innovative team/plan-ner	Raining garden Urban farming Event lawn Recreation center Elderly community center
	Demolition	Low historic value Low quality High vacancy		Government/enterprises	Demolish buildings
	Renewal	High historic value High quality Low vacancy		Government/enterprises/citi-zen/innovative team	Partly remediation Function transformation

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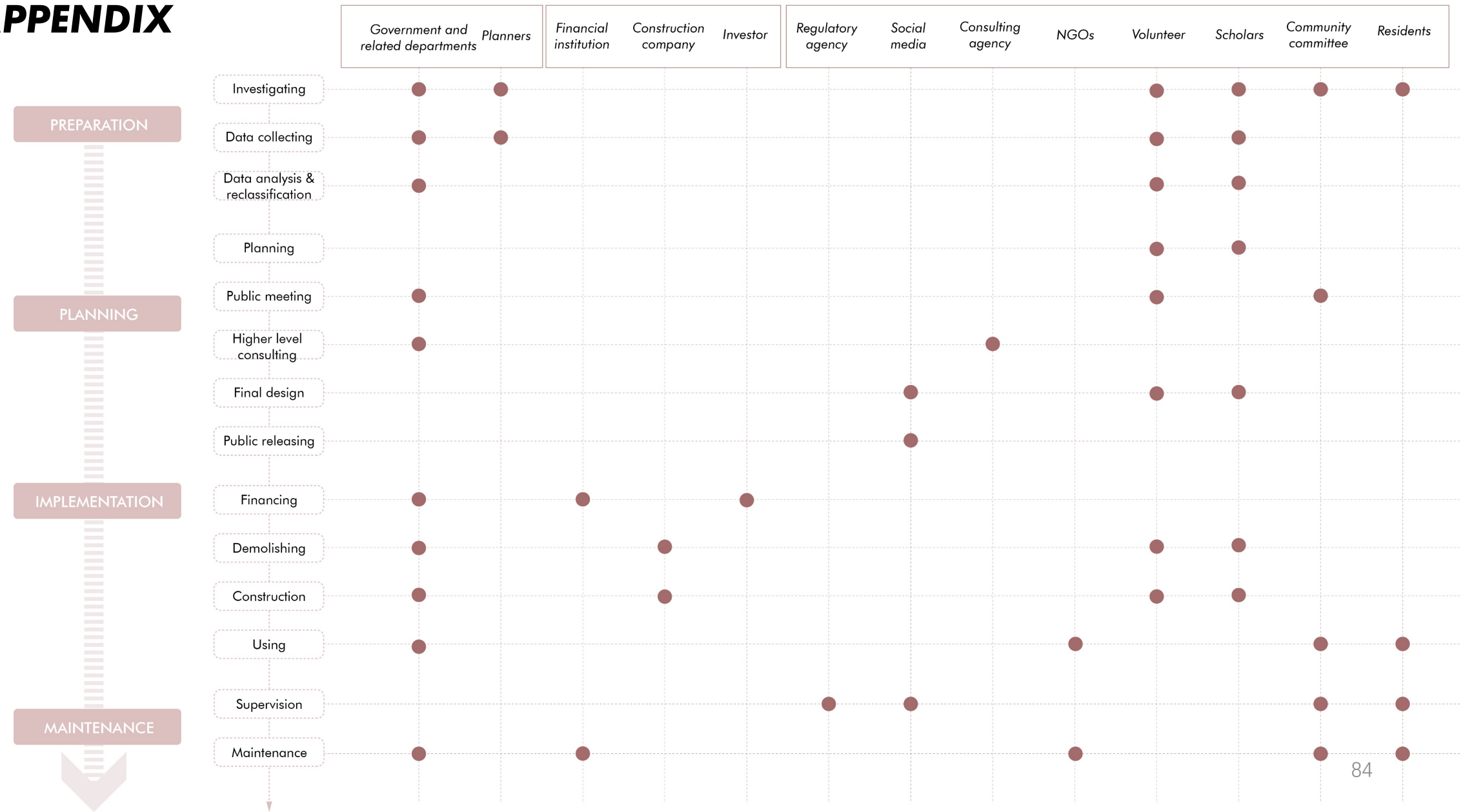
☐ Participatory governance of GI system



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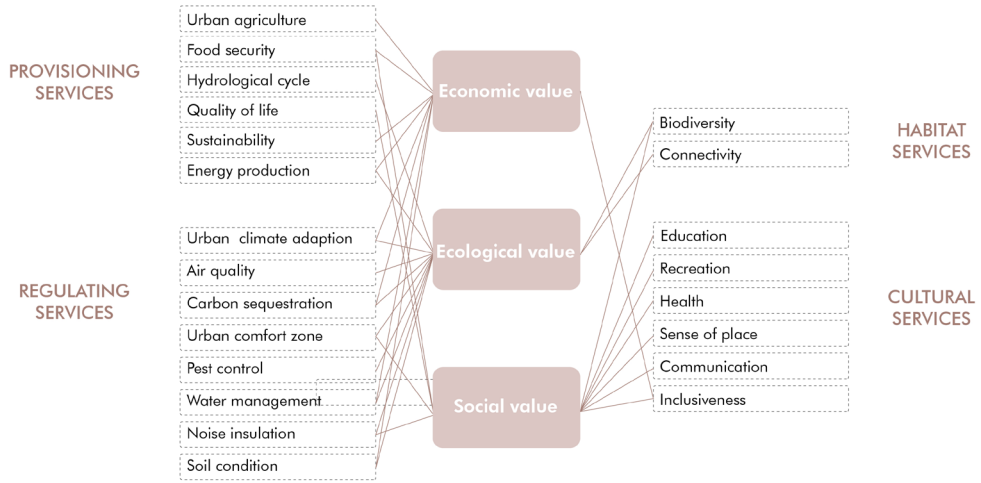
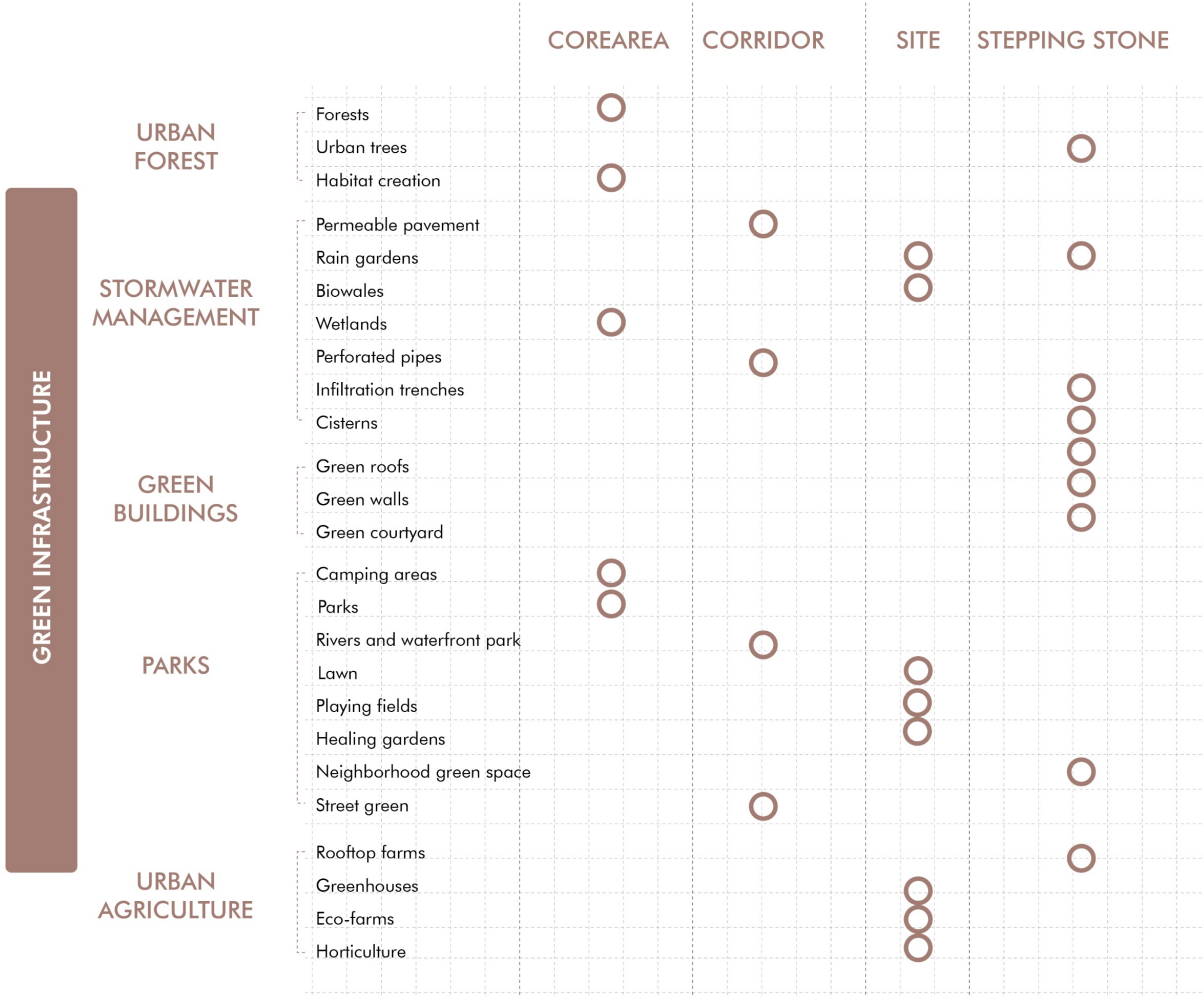
GI system





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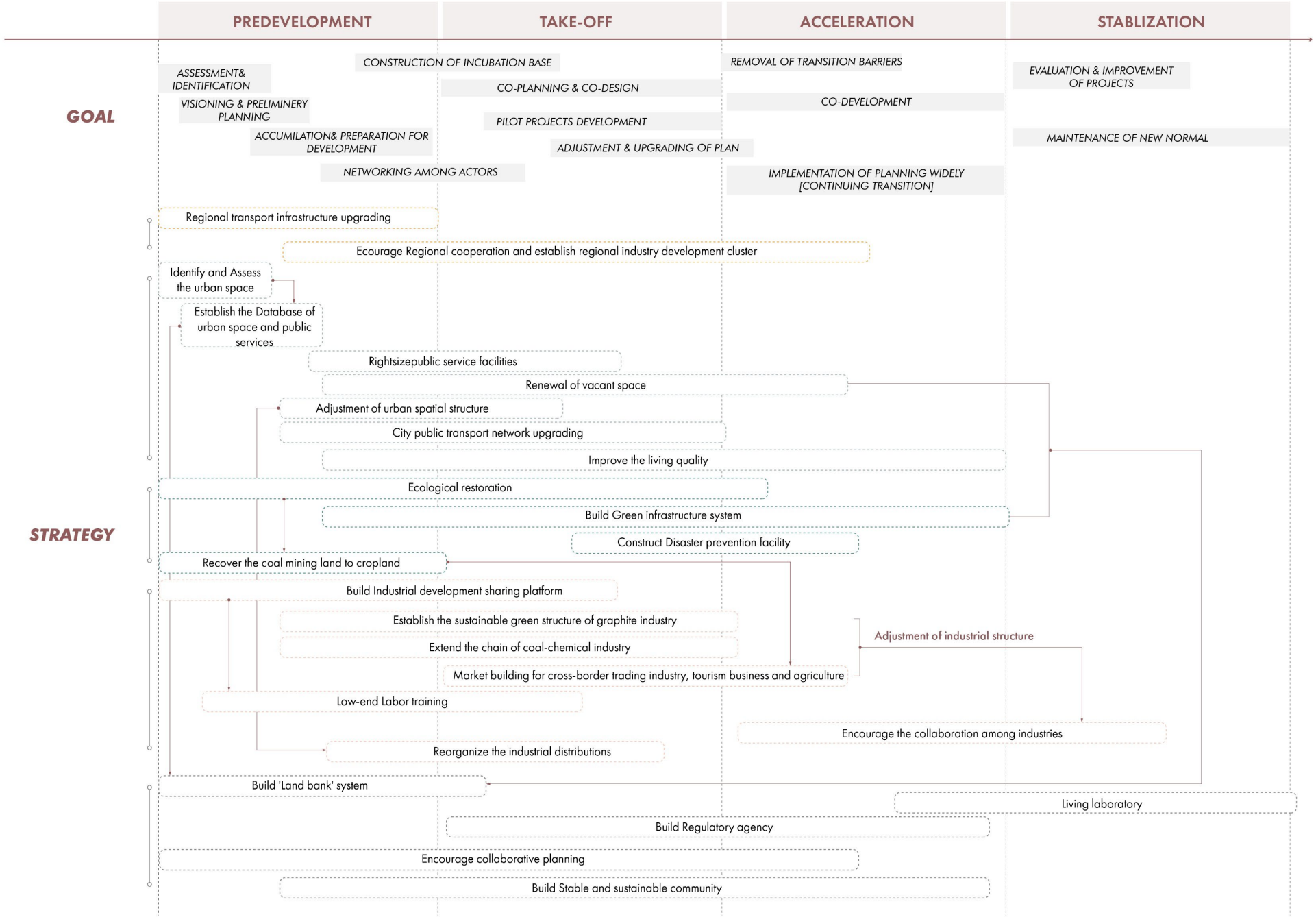
- Detailed strategy



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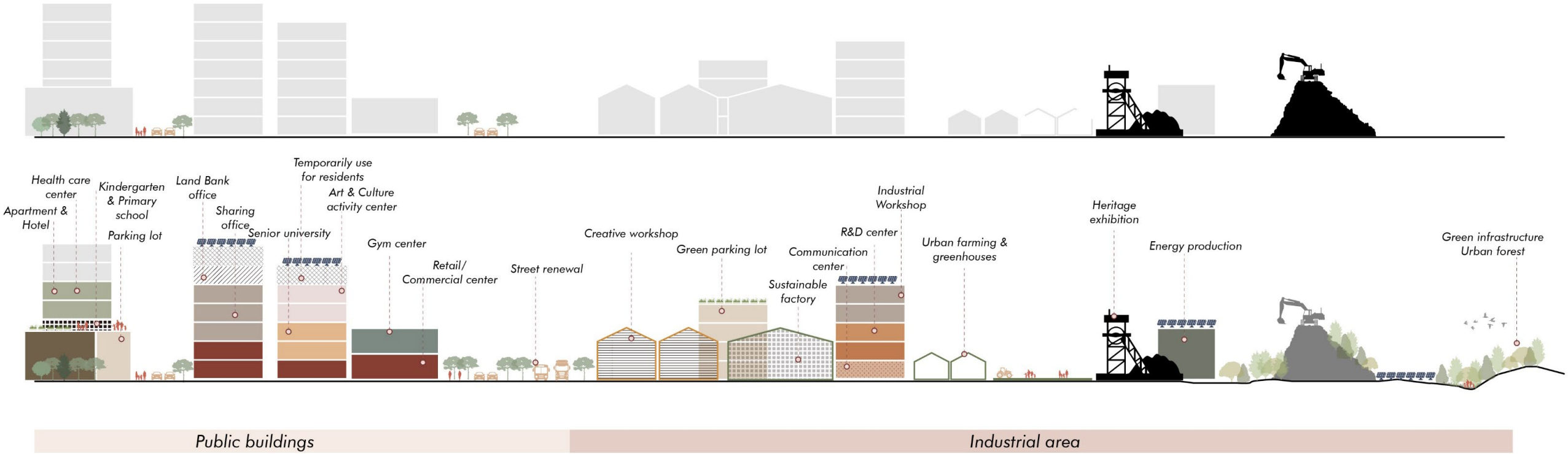
- Renewal of vacant space



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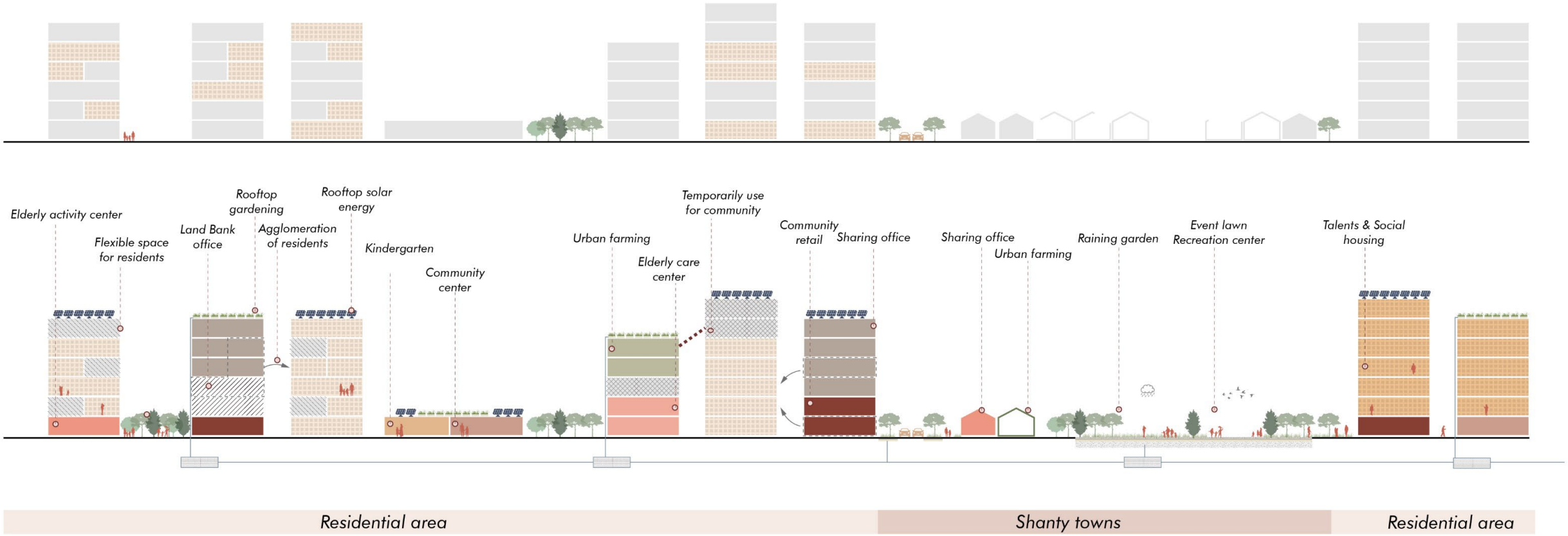
- Renewal of vacant space



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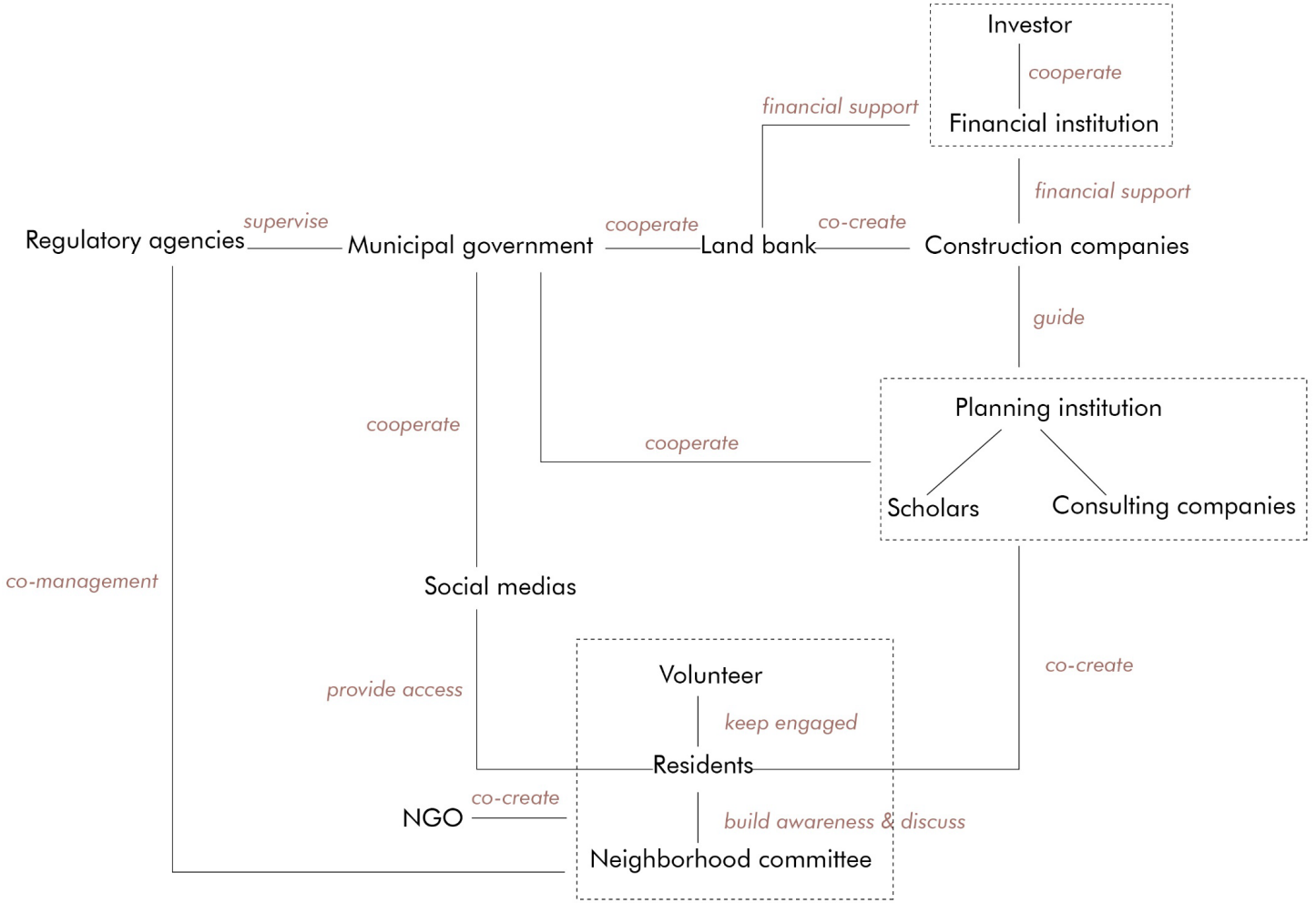
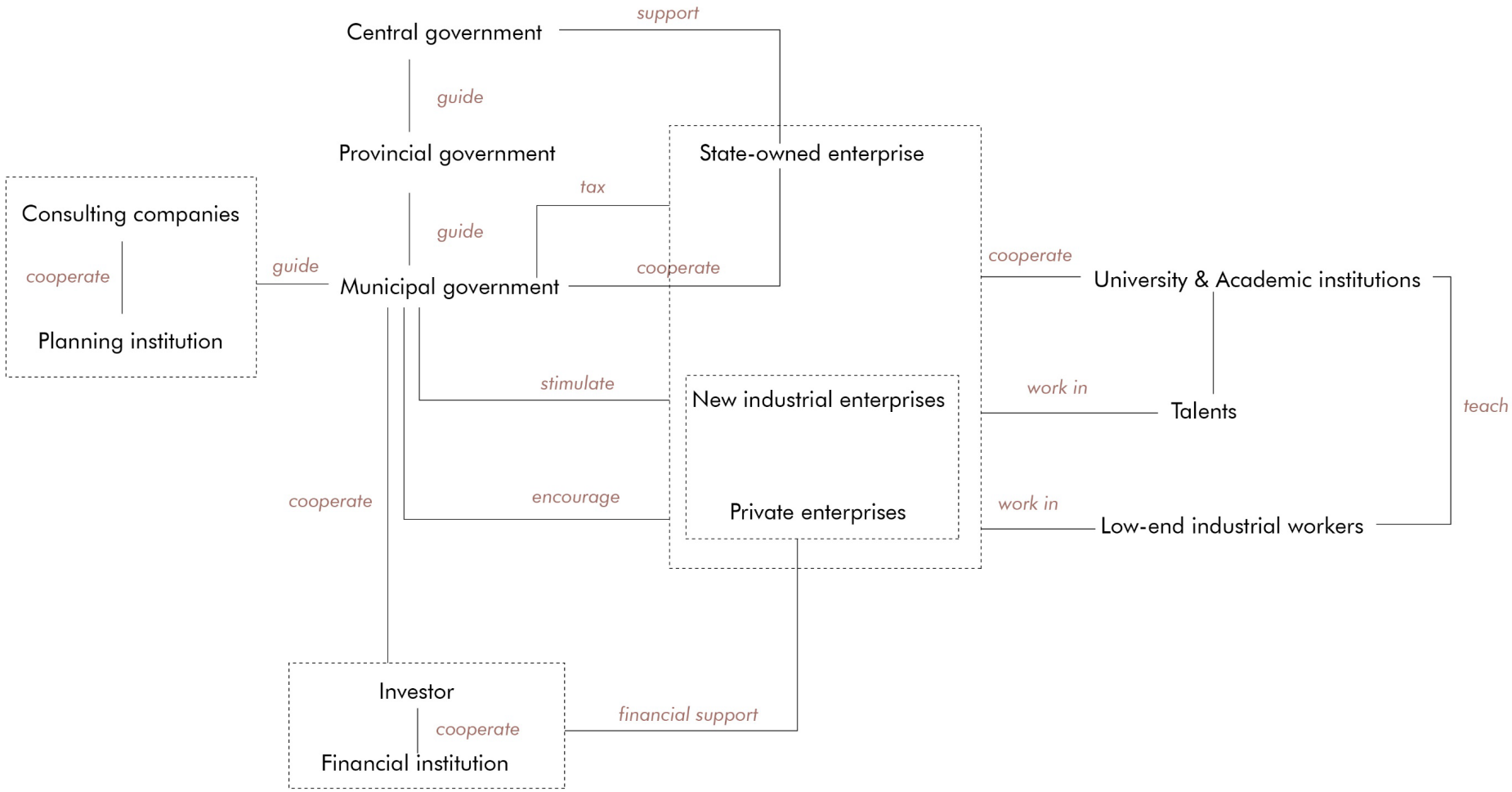
- Encourage collaborative planning - *Ecology*



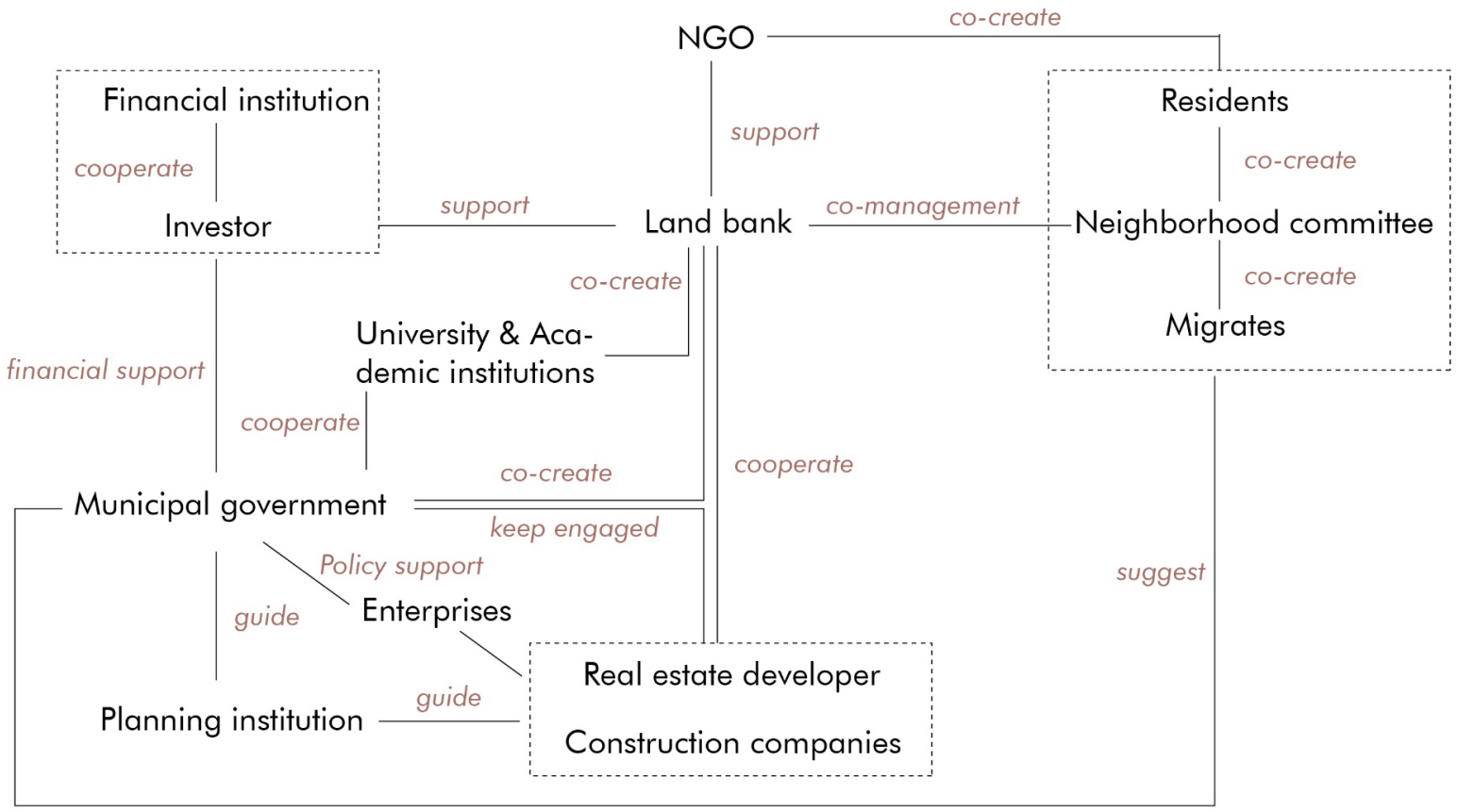
APPENDIX

◘ Encourage collaborative planning - *Production*



APPENDIX

- Encourage collaborative planning - *Living*



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- Land bank