URBAN -
RURAL
ASSEMBLY

Imprint

URBAN - RURAL ASSEMBLY

Workshop Dossier 2023

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Introduction

About the Project:
Urban-Rural Assembly

Inclusive transformation-to-sustainability processes at the urban-rural interface of the Huangyan-Taizhou region in China.

The immense scale of urbanisation across China in recent years has demonstrated the inherent implications of uneven economic, social, and environmental development. As a result, it is vital to expand urban-oriented research and policy design towards fostering more efficient and socio-ecologically balanced transformation processes between large urban concentrations and their rural hinterlands. This is the starting point for the Sino-German research and development project ‚Urban-Rural Assembly' (URA), which applies the vastly urbanising region of Huangyan-Taizhou in Zhejiang Province in China as a unique research laboratory and development environment.

Building on cooperations between leading academic and non-academic partners in the field of sustainable urban and regional transformation in Germany and China, URA creates an inter- and trans-disciplinary research approach aiming to: (1) build a multi-scalar understanding of trans-local urban-rural interdependencies and metabolisms at the urban-rural interface; (2) strengthen urban-rural linkages through developing and implementing community-driven pilot interventions that enhance resource efficiency and reinforce regional circular economies in the fields of cultural heritage, renewable resources and food security, tested in Local Transformation Laboratories (Reallabore); and (3) develop new strategic multi-level, multi-actor governance tools that enable local municipalities to manage urban-rural linkages towards a progressive regional model that builds on socio-ecologically inclusive and cooperative development approaches.

URA's research focuses on Huangyan-Taizhou urban region in Zhejiang province. Two places are being studied in depth by URA: The agricultural Beyiang Town and Xinqian Neighbourhood, located to the west of Huangyan city centre. They are the the so calle urban rural living labs of the URA project.

Through the development of transferable planning and governance approaches that include enabling tools and guidelines (i.e. the Raumbild/Leitbild approach), the project seeks to foster knowledge dissemination across the coastal urbanisation corridor in the research region. URA strives to contribute to the urgent need for creative approaches towards localisation and implementation of the Sustainable Development Goals (SDGs), the New Urban Agenda in China, and beyond.

URA is sponsored by the German Federal Ministry of Education and Research (BMBF) as part of the FONA programme Sustainable Development of Urban Regions based on BMBF's China Strategy. An initial Definition Phase from 04/2019 to 09/2020 will be followed by the Research and Development Phase (R&D) from 10/2020 to 09/2024. The project has the potential to be extended to an additional two-year Implementation phase from 10/2024 to 09/2026.

Fields of research, Institutions and Team

URA sets up a mutually beneficial learning partnership linking German, Chinese and International consortium partners in the field of sustainable urban and regional transformation.

Urban-Rural Socio-Spatial Practices
● TU Berlin, Habitat Unit, Department for International Urbanism and Design
● Tongji University Shanghai, CAUP, Department of Urban Planning

Urban-Rural Mobility & Migration
● TU Berlin, Center for Cultural Studies on Science and Technology in China
● Shanghai University, Department of Architecture

Urban-Rural Material Cycles
● TU Berlin, Department of Circular Economy and Recycling Technology
● Zhejiang University, College of Environmental and Resource Sciences

Urban-Rural Landscapes & Spatial Typologies
● Bauhaus University Weimar, Department for Landscape Architecture and Planning
● Zhejiang University, Institute of Landscape Architecture

Urban-Rural Ecosystems
● IOER Dresden, Leibnitz Institute of Ecological Urban and Regional Development
● Tongji University Shanghai, Center for Ecological Wisdom and Practice Research

Sustainable „Raumbild Strategy
● TU Berlin, Habitat Unit, Department for International Urbanism and Design
● Bauhaus University Weimar, Department for Landscape Architecture and Planning
● forward Berlin
& Urban Catalyst GmbH

Urban-Rural Governance & Policies
● ICLEI East Asia Secretariat

Urban-Rural Linkages in a lobal Perspective
● UN Habitat, Urban Practices Branch

Project Coordination
● TU Berlin, Habitat Unit, Department for International Urbanism and Design

URA Research Team in Wuyantou Village, URA Kick-Off Workshop, 2019
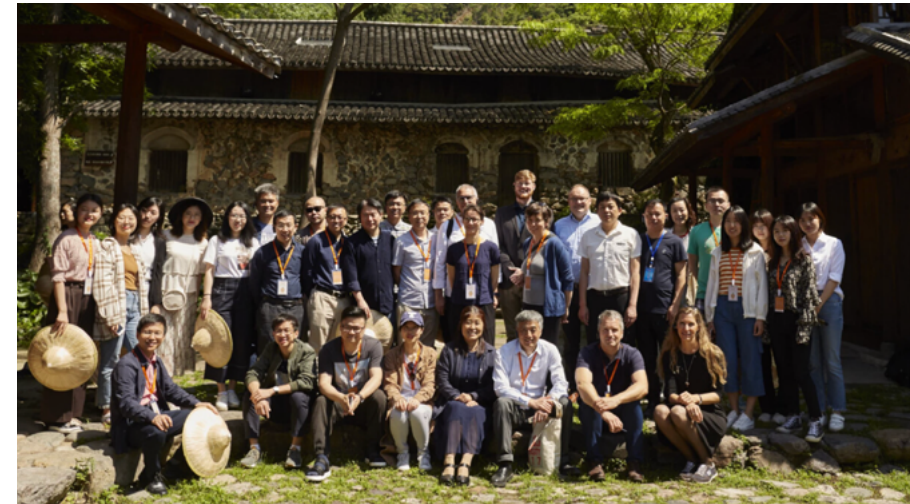
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Case Study Region
Huangyan-Taizhou

Jiaojiang River
椒江

Jiaojiang
椒江区

Huangyan
黄岩区

Luqiao
路桥区

Guan ʻaocun
官岙村

Toutuozhen
头陀镇

Yongning River
永宁江

Changtan Town
长潭乡

Beiyangzhen
北洋镇

Changtan
Reservoir
长潭水库

Xiaoliqiaocun
小里桥村

Qinglongtou
Village
青龙头村

Urban-Rural Living Lab #2
Xinqian Sub-District

Gongdong Town
拱东乡

Yongning River
永宁江

Dujia
杜家

Xicheng
Residential
District
西城

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Interim Research Results

Urban-Rural Socio-Spatial Practices
Research Introduction

In the context of rapid urbanisation processes in Huangyan-Taizhou, new forms of socio-spatial practices (e.g. lifestyles, employment, dwelling and public spaces) have emerged at the urban-rural interface. These changes are gradually reshaping our old ideas about how people live in cities and rural areas. WP2 focuses on studying these everyday practices through ethnographic research. The goal is to understand the challenges and opportunities faced by the people living there and how they adapt or change their behaviour to deal with them.

The research team uses research methods including on-site interviews, remote digital methods, participant observations, GIS-mapping, and focus group meetings. The identified themes of 'social inclusion', 'agriculture transformation', and 'sustainable land use' serve as guidelines for the research. The reseach aims to 1) map 25-30 'practice profiles' as part of an open online database/archive and 2) conduct in-depth ethnographic research on everyday practices in two selected Urban-Rural Living Labs (URLLs) - Smart Moulding Town (SMT) and Beiyang Town. The goal is to provide a comprehensive description of the various types of knowledge, habits, and norms that shape everyday activities in areas where urban and rural elements come together. This will not only build an in-depth understanding of actor-based practices in the research region, but also offers potential to integrate it into future spatial planning and implementation strategies.

two exemplary practice profiles

Sansheng Temple

Yongnig river
Mr. Zhu

Village ponds

Household vegetable gardens
along the river

Water Bamboo cooperative

Outgoing watermelon farmers

Seher farm

Juyandi Orange Farm

Rural-Urban commuters

Toutou o

Smart Agriculture Technology Company
(Nanjing Shuxi Tech. Co.)

Cultural hall

Lanmei Farm

Beiyang Township government

Remaining rural population

Factories in the industrial zone

Changtan Reservoir

Elderly migrant workers

Social inclusion & mobility

Agriculture

Water landscape

Ecosystems

Map designed by: Habitat Unit, TU Berlin
Satellite Picture: Esri, Maxar, Earthstar Geographics,
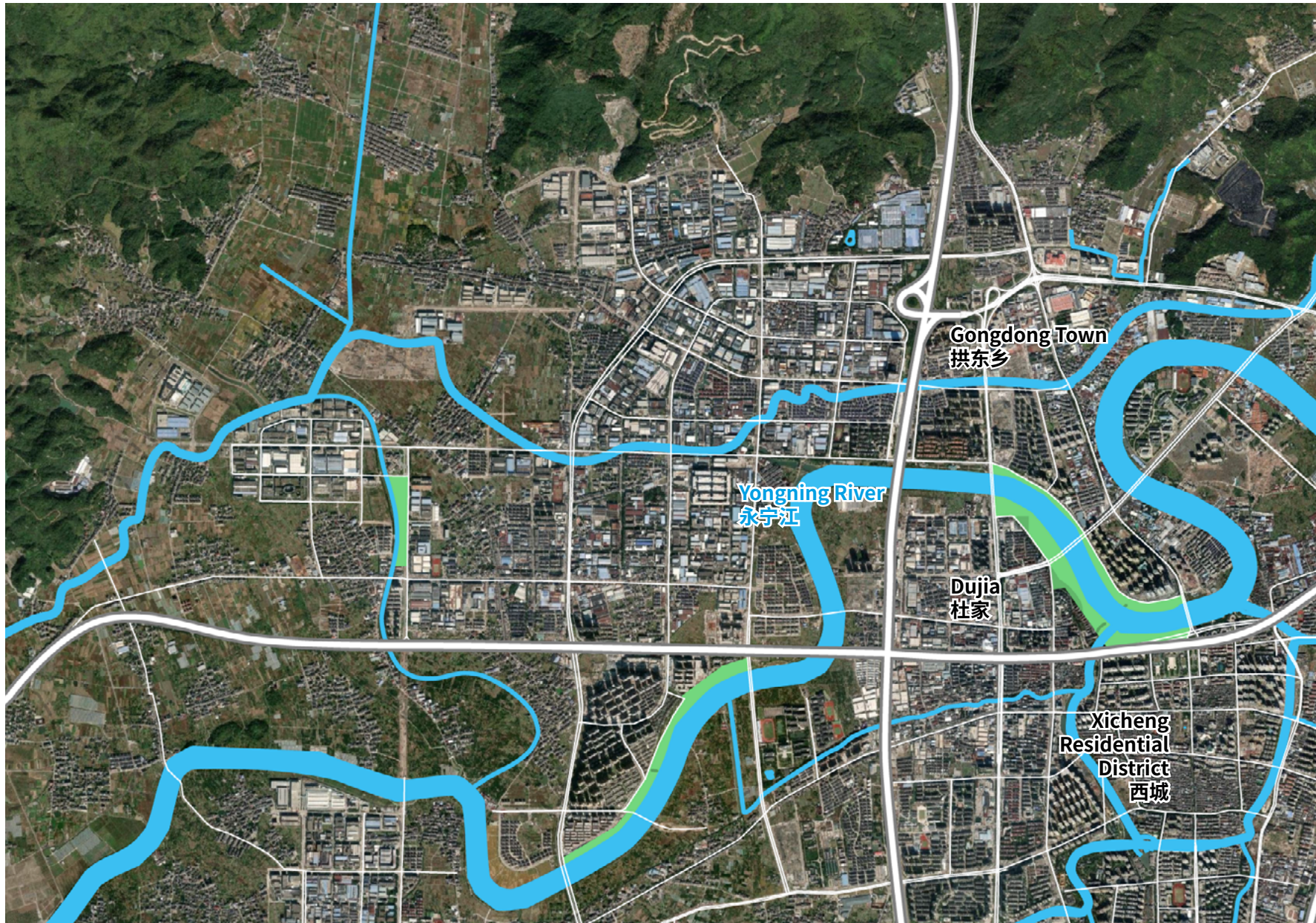and the GIS User Community

Urban-Rural Actors & Networks
Actors Map

Urban-Rural Mobility & Migration
Research Introduction

Urban-rural interfaces are characterised by socioeconomic inequalities, social inclusion/exclusion, and uneven public service distributions, particularly for migrant groups. By identifying 'mobile' social groups and key drivers of their social and physical mobilities, the research team aims to understand population change in urban-rural regions as well as interactions both between migrant and local populations, and within these diverse social groups. Furthermore, we aim to explain the motivations and constraints of different types of migrants in the context of local and regional transformation, and identify spaces of their social exclusion and inclusion.

In terms of research method, the researchers conducts interviews with migrant workers and entrepreneurs, left-behind villagers, village governors, factory owners and public service providers (e.g. school principles). Participant observation and GIS-mapping is used to indicate how different types of people use various spaces in the neighbourhood for their daily activities. In addition, WP6 conducts population census analysis to understand demographic change and support our development of different 'profiles' of migration and the drivers behind them. This is supported by policy analyses on the ongoing Hukou (household registration) system reform, which has historically played a significant role in regional and local mobility, generating long-standing inequalities for migrant social groups. Empirical data collected during the field trip aims to illuminate the on-the-ground impact and local perceptions of the policy change – yet to be substantially researched in the literature.

Urban-Rural Mobility & Migration
Research Outcomes

Located within the economically developed province of Zhejiang, Taizhou plays a significant role in the Yangtze River Delta urban belt and is characterised by a strong manufacturing industry. There is a significant inflow of population to Taizhou, primarily from economically less developed domestic provinces, i.e. in Western China, and there is currently an urgent need for skilled workers in the area.

A substantial floating population has specifically been attracted by employment and investment opportunities at the urban-rural interface of Huangyan District, which is characterised by its local moulding industry and innovative agricultural practices. On the other hand, the outflowing population primarily moves towards more developed and urbanised regions.

Collective

	The vegetable garden on the vacant site
Village	Xifan
Material space	Vacant lot between factories, new village housing site, and school
Everyday practise	Appropriation tactics on vacant space, tending to vegetable plots, farming for leisure
Interface	Perceived encroachment of top-down development, son's moulding business

■ Material space
■ Everyday practise
■ Interface

Source: own table and diagram
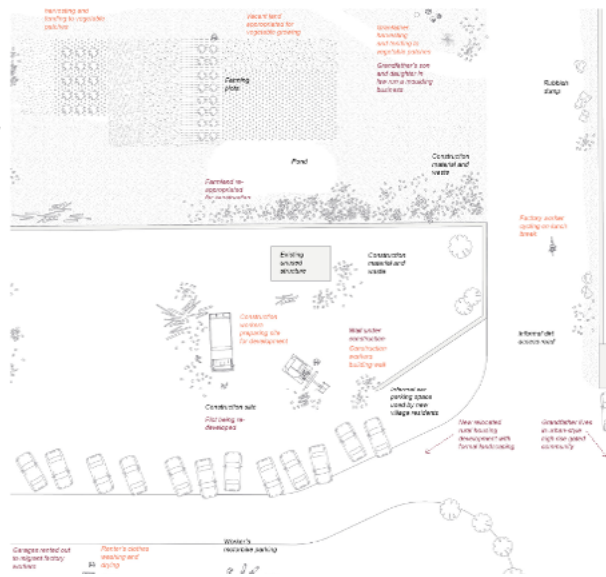
Collective

"I don't consider myself 'rich'- I still do this farm work here just for my family's daily life. I don't own this land, I just started using the lot because it was empty and nothing else was happening here."

Source: own photos

"By the time I arrived in Huangyan, my son had already made a lot of money in the moulding industry and was able to purchase one of these apartments. The moulding business is not that good this year, but in past years it was going really well."

Socio-spatial profile | incoming industrial workers and family members: Socio-spatial analysis of a vegetable garden on the vacant site near SMT

This profile expresses the temporality of migration which impacts most people who have come to live and work in the area. In this case, the elderly migrant ex-farmer perceives his time as temporary and has not transferred his hukou. Despite the ongoing construction due to the SMT development plans, the man was only fixated on the immediate impact on his rural everyday habits (i.e. the threat of construction of his vegetable plots). His son represents an opposite case, however, as he established a local family moulding business when he arrived 8 years previously, which now has over 40 employees. The family has thus become well connected in the local area and was able to purchase an exclusive urban-style apartment. Normally purchasing this type of housing is only accessible to those with local hukou, or informally with strong bargaining power.

Urban-Rural Migration & Mobility
Actors

Migrant farmers at the water bamboo cooperative

Seasonal migrant farmers
With its relatively rich agricultural resources and experience, Huangyan has attracted incoming seasonal farmers while also maintaining an outward flow of agricultural practitioners. For example, a group of around 30 migrant farmers travels every year from Guizhou province to the water bamboo cooperative in Guan'ao village in Beiyang. They take on labour intensive jobs which are undesirable to local villagers and receive relatively low wages. On the other hand, local water-melon planters constitute a significant, regular out-going migrant group that has been well established in Beiyang for many years. They are highly mobile agricultural entrepreneurs who establish large-scale watermelon farms across the country every year, yet also remain closely tied to their homeland socially, culturally, and financially. The watermelon planting business has turned seasonal agricultural production into a major income source for the rural population in Huangyan.

Migrant factory workers
In both Smart Moulding Town (SMT) and Beiyang Town, migrant workers constitute the major workforce in the factories. In SMT, with a high density of factories, the migrant population has surpassed the local population, and is highly varied in terms of age, socio-economic condition, family structure, place of origin, and length of stay. Depending on these factors, migrants have established different levels of place attachment and a sense of belonging to the local area. While some struggle with low-paid, labour-intensive jobs with long working hours, others have established their own businesses, integrated in strong local social networks, and have purchased commercial urban housing. Some must leave their children in their hometown or send them to migrant children's schools, while others are entitled to public school quotas, benefiting from purchased properties in Huangyan or company-paid social security. In more rural areas of Beiyang, on the other hand, the migrant group is much smaller but slowly growing, mostly consisting of elderly and lower-skilled labourers and concentrated in developing industrial zones.

Remaining rural population

After the young generation move out to search for employment elsewhere, due to the lack of well-developed social infrastructure, public spaces and diverse employment opportunities, their families, especially the elderly and children, are left behind in rural areas. Their lives face many difficulties, such as limited income and labour capacity, land abandonment and lack of social contacts. In many villages, elderly people are still engaged in small-scale farming or light labour work, such as manually assembling plastic and electronic parts out-sourced by nearby factories to maintain a small income while mostly dependent on limited pensions or financial support from younger family members.

Agricultural entrepreneurs

Beiyang is host to four large-scale modern farms, including Lvwochuan, Zhongde, Lanmei, and Seeher. These farms are seen as innovators in the region in terms of their eco-farming or entrepreneurial practices that are suitable for the next generation of agriculture practitioners. For example, Lvwochuan farm is specialised in smart agriculture, focusing on soilless planting of strawberries, hydroponic vegetables, and seedlings, while Lanmei farm positions itself as an agri-tourism park. Beside the modern farms, traditional farms producing economic crops (orange, loquat fruit, water bamboo) are also powerful actors in the region. Driven by policy incentives, many factory owners have shifted to the orange planting business. They already have strong economic and social capital, and are open to trying out new technologies. Although the jobs provided by these farms are limited because of the scale and high level of mechanisation, they are legally required to contribute part of their profits to local villages where their farms are located. However, conflicts arise due to land use regulations that restrict farm owners integrating diverse business functions into the farm. Sightseeing, educational activities, and facilities like restaurants and storage buildings are forbidden, creating challenges for some agricultural entrepreneurs to generate more profits and maintain their businesses.

Industrial entrepreneurs
The mould and plastic industry in Huangyan hold a significant historical importance and serves as a vital economic pillar for the region. Among key actors in Huangyan, industrial entrepreneurs play a crucial role in reshaping the urban-rural landscape, generating numerous employment opportunities, and influencing migration patterns. These factory owners have the potential to positively impact the well-being of their employees (both local and migrant), contribute to local infrastructure development, and shape future growth trajectories through enhanced support of local environmental and social development.

Image: Yuanbin Shi

Local governments
Within the political context of China, local governments continue to be the primary driving force behind socio-spatial development at various scales. The general challenge faced by both district and township governments is how to fill the gap between everyday needs on the ground and the strictly imposed policies from upper-level governments. For example, there is increasing conflict between the demand for construction land and policies aiming to preserve arable land for food security. The national and provincial level governments have established detailed classifications and designations for agricultural land, which restrict flexible land use. Consequently, this hampers local governments from utilising land as a fiscal resource to finance local development. To address this challenge, local governments have been employing a strategy that involves reducing the average living area per capita in rural areas to release land quotas for urban growth.

Image: Township Masterplan of Beiyang Township, Huangyan District, Taizhou City (2016-2035)
http://www.tzfdc.com/fc/gh/201803/74260_4.html

Urban-Rural Migration & Mobility
Spaces

Xinqian market street
Benefiting from the land rent Benefiting from the land rent and stall fees, Xifan village has become the most prosperous village in the Xinqian area. Industrial development has attracted numerous migrant workers to live and work in and around Xifan village, which contributed to the development of the Xifan market street into the „sub-centre" of Huangyan. The bustling market streets are places where a wide variety of goods such as vegetables, fruits, cloths, and electronic parts are sold and everyday services such as barber shops, repairing shops, and supermarkets are located. It is lively throughout the day and turns into a vibrant food market in the evening, where migrant workers and locals hangout after work. It thus functions as a type of social space wic brings together many different types of social groups and activities that may not necessarily use the same spaces in other parts of the area.

Spaces around factory dormitories
Housing for migrant industrial workers is mostly concentrated in villages around factories and industrial areas, taking a wide range of accommodation types from rooms rented by local villagers to temporary containers. In Beiyang town, the most common option is factory dormitories where multiple people share one room. However, most factories lack space for social activities. Public spaces around the factories and dormitories are often underdeveloped. Many migrant factory workers work long hours and lack time for leisure activities or use public spaces in the nearby villages. Furthermore, many are focused on saving as much money as possible by limiting their spendings outside the factory zone. Migrant workers, in particular vulnerable groups such as elderly workers, have minimal social and institutional engagement with the local community. Therefore, the spaces around factories and dormitories have great potential to provide social and leisure activities for migrant workers. By using land flexibly, open spaces can be created to support their integration and social interactions.

Cultural halls and temples
Temples in Huangyan have a long history serving multiple functions as community centres, hosting religious ceremonies, birthdays, funerals, and even serving as COVID-19 test sites. Adorned with traditional paintings and banners advocating respect for elders, the temples foster socialisation, especially for the elderly who gather to play mahjong. Cultural halls emerged in the 2000s, often located within or near the village government buildings and temples. These halls primarily entertain rural elders with TV and mahjong, occasio-nally hosting popular evening dances. The typologies of cultural halls vary widely, some located in dishevelled wooden structures, and others in brand new formalised concrete structures several storeys high in new rural housing developments. While some functions overlap with temples, cultural halls carry greater political significance, showcasing agendas from village and upper-level governments. Overall, both spaces carry important cultural and social meanings for villagers, offering potential for different social groups to interact.

Migrant children schools
Because of Hukou system restrictions, migrant children and rural children without urban Hukou are not eligible to attend public schools in Huangyan, leading to the establishment of private schools. These schools usually charge more tuition fees and provide lower-quality education. On one hand, these schools are symbols of social inequality, on the other, they function as alternative choices for migrant children or rural children without urban Hukou, offering an opportunity for improved social inclusion. Current policies are oriented towards improving the education quality of migrant children's schools or even completely eliminating them (by loosening Hukou restrictions). However, the capacity of local public schools remains limited for accommodating the large volume of migrant children.

Public spaces in Smart Moulding Town
Public space in the Smart Moulding Town (SMT) area has been characterised by informal use of land. Small vegetable plots opportunistically planted in leftover spaces are commonly observed all over this region, vividly representing the multi-layered lifestyles at the urban-rural interface. As the area becomes more urbanised, an urban style park was constructed in recent years, with the vision of integrating green spaces around the SMT. This park connects in with other strategic greenway developments along the Yongning River, and has become a very active public space heavily used by migrants and locals alike who live and work in the SMT area. It is especially lively during the evenings (afterwork hours), with many people walking around, dancing, singing karaoke, and doing sports.

Urban-Rural Mobility
& Migration
Key Challenges

HUANGYAN REGION

\#   Rural livelihoods and lifestyle are challenged by rural-urban land transformation

\#   Uneven urban-rural development in terms of social and physical mobility (unbalanced infrastructure, social services, job opportunities, education, etc.), generating socio-spatial inequality, especially for vulnerable social groups (migrants, elderly, women and children)

\#   The relationship between urban and rural is unbalanced as rural land and labour are still used for engineering urban growth

\#   Limited local / migrant interactions, especially in Beiyang town and its surrounding areas

\#   Unequal employment conditions for local and migrant workers

\#   Harsh work-life balance of migrant workers, leading to a lack of leisure time / time to establish and maintain social networks

\#   Institutional inequalities (i.e. related to hukou system): unequal accessibility to housing and social and public services between migrant and local population

BEIYANG TOWN

\#   Left-behind population, 'brain drain'

\#   Unattractive small towns and rural areas: labour intensive work like farming or factory jobs are not desirable for young labourers, and there is a lack of high skilled or income job opportunities and urban entertainments

\#   Large scale and modern farms are mostly run by external entrepreneurs, which bring limited economic benefits and jobs to local population

\#   Land use restriction prohibits agriculture entrepreneurs to maintain or expand their businesses (e.g. no where to build warehouses, food processing workshops, or tourism facilities)

XINQIAN DISTRICT

\#   Weak place attachment or sense of belonging for migrants

\#   Social injustice induced by rural to industrial land transformation (e.g. inadequate or unfair land compensations)

\#   Mismatch between urban style housing and public space design and previous everyday practices (e.g small scale farming)

\#   Further development may cause gentrification in the area

Urban-Rural Mobility & Migration
Key Potentials

HUANGYAN REGION

* Well connected physical mobility infrastructure (daily commutes between urban and rural areas)
* Yongning River and the new greenways can act as a tie for different social groups and connect different urban-rural regions (improve social and physical mobility)
* Diverse economic opportunities attract migrants to the region
* Informal and formal housing options accommodating diverse social groups
* Both locals and migrants are embedded in trans-local economic networks and production lines (e.g. household workshops)
* Reform of the hukou system and improvement of the education system

URLL#1 – BEIYANG TOWN

* Relatively prosperous rural region, new industrial zone and rural tourism bringing more people and opportunities
* Cheap land enables construction of affordable housing, which consequently increases population inflow
* Rich tourism potentials: farm stays, fruit picking sites, Changtan Reservoir, Chaoji old street, etc.
* Potential for eco- and smart- agriculture development. Four innovative modern farms have already been established in the area. Government is supporting the capacity building of farmers.
* Out-going watermelon plantation has been developed into a mature and lucrative business model and can potential benefit local development

URLL#2 – XINQIAN SUB-DISTRICT

* Strong economy because of the mould and plastic industry; Rich village committees from renting land to factories
* Well developed public infrastructure (e.g elderly home, public spaces); New public spaces being built as part of SMT and wider district development plans
* Vibrant and attractive peri-urban environment with convenient services and entertainment
* Attractiveness to immigrants and skilled people
* Practice of small-scale vegetable planting could have potential connect different social groups

湖北省

Henan - 河南省   Anhui - 安徽省   Jiangsu - 江苏省

Hubei

Sichuan - 四川省

Chongqing - 重庆市

Guizhou - 贵州省

Yunnan

云南省   Hunan - 湖南省   Jiangxi - 江西省

Interim research results – Urban-Rural Mobility & Migration

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Huangtan Reservoir 黄潭水库

Jiaojiang River 椒江

Yuxia Town 屿下乡

Jiangkou Residential District 江口

Xitou Town 溪头乡

Mao'erkeng Reservoir 猫儿坑水库

Gongdong Town 坑东乡

Shangnian Town 上垟乡

Xinqian Neighborhood 新前

Yongning River 永宁江

Zhendong Town 镇东乡

Yutou Town 屿头乡

Jiaojiang 椒江

Hu'ao Village 湖岙村

Toutuo Town 头陀镇

Jiaokeng Town 焦坑乡

Dujia 杜家

Huangyan Central Area 黄岩中心区域

Hongqi Town 红旗乡

Yongning River 永宁江

Beiyang Town 北洋镇

Lingu Town 临古乡

Chengjiang Neighborhood 澄江

Changtan Town 长潭乡

Jiang Channel 江南渠道

Nancheng Neighborhood 南城

Ningxi Town 宁溪镇

Xiaoliqiao Village 小里桥村

Gaoqiao Bridge Residential District 高桥

Changtan Reservoir 长潭水库

Maoshe Town 茅畲乡

Luqiao 路桥

Jianhu Town 鉴湖乡

Wanji Town 湾珶

Pingtian Town 平田乡

Foling Reservoir 佛岭水库

Xiaokeng Town 小坑乡

Xiuling Reservoir 秀岭水库

Leqing 乐清

Shangyang Town 上垟乡

Yongjia 永嘉

Urban-Rural
Mobility & Migration
Fazit Map

Key | 图例:

- ⬜ Urban area | 城市区域
- ⬜ Huangyan District border | 黄岩区行政边界
- ⬜ Other administrative borders | 其他地区行政边界
- —— Highway | 高速公路
- --- Railroad | 铁路
- 🟦 Water bodies and rivers | 水体和河流

- 🟪 Industrial zones till 2010 | 工业用地 (2010)
- ▨ Further industrial zones development from 2010 to 2021 (based on google satellite imag | 2010年至2021年新增工业用地 (基于谷歌卫星图像)
- → Settlement expansion (comparison of landuse data from 2015 and 2019) | 定居点扩张 (2015年和2019年土地使用数据对比)
- • Former and current village centers (incomplete selection along the Yongning River) | 以前和现在的村庄中心 (永宁江沿岸的不完全绘制)
- Migration flows | 人口流向

Urban-Rural Material Cycles & Agriculture
Research Introduction

Interactions between rural and urban material flows are little understood and can be characterised as disrupted. At the same time, a transition towards a Circular Economy (CE) requires a holistic view on production and consumption systems along the value chain and lifecycle of products at the local scale. The working package 'Urban-Rural Material Cycles' aims at understanding and supporting the management of material flows in the context of urban-rural spatial human-environmental interactions, agricultural production, and urban-rural linkages. Specifically, a quantitative material flow analysis (MFA) was used to assess the recycling potential of the region. At the same time, the sustainable pathways were outlined for urban and rural metabolism in the case study area.

The research team uses methods including MFA, Stakeholder analysis, Geographic Information System (GIS) mapping, etc. MFA is a systematic assessment of the flows and stocks of materials within a system defined in space and time. All the sources, pathways, and intermediate and final sinks of material is connected through MFA. MFA includes product flow accounting, material balances, and total material flow accounting, and it also includes elemental and chemical flow analysis. At the same time, in order to establish mechanisms for influencing regional material flows through effective dialogue, stakeholder analysis can be done through a combination of top-down and bottom-up approaches, creating a list of different players such as governments, farmers and businesses, and identifying their interests and concerns. While GIS mapping will help to visualise and analyse the results of the study. Through the extraction of remote sensing images and preliminary identification of agri-

cultural land, the main geographical boundaries of agricultural production activities in the region were identified. It was then divided into grids of different sizes to finely delineate the categories of agricultural production activities, providing a basis for the pattern of change and differentiation characteristics at different spatial and temporal scales.

The following potential outcomes are endeavoured to be achieved through the WP3 research:

- Build an inter-disciplinary and multi-scale understanding of trans-local interdependencies and metabolism at the urban-rural interface.
- Develop and implement community-driven pilot interventions enhancing resource efficiency and reinforcing regional circular economies.
- Develop and demonstrate new multi-level, multi-actor governance tools that enable local municipalities to manage urban-rural linkages towards a progressive urban-regional model that builds on socio-ecologically inclusive and cooperative development approaches.

Urban-Rural Material Cycles
Research Outcomes

Key spaces and actors in URLL#1 Beiyang Town

Material and stakeholder linkages at the rural-urban interface
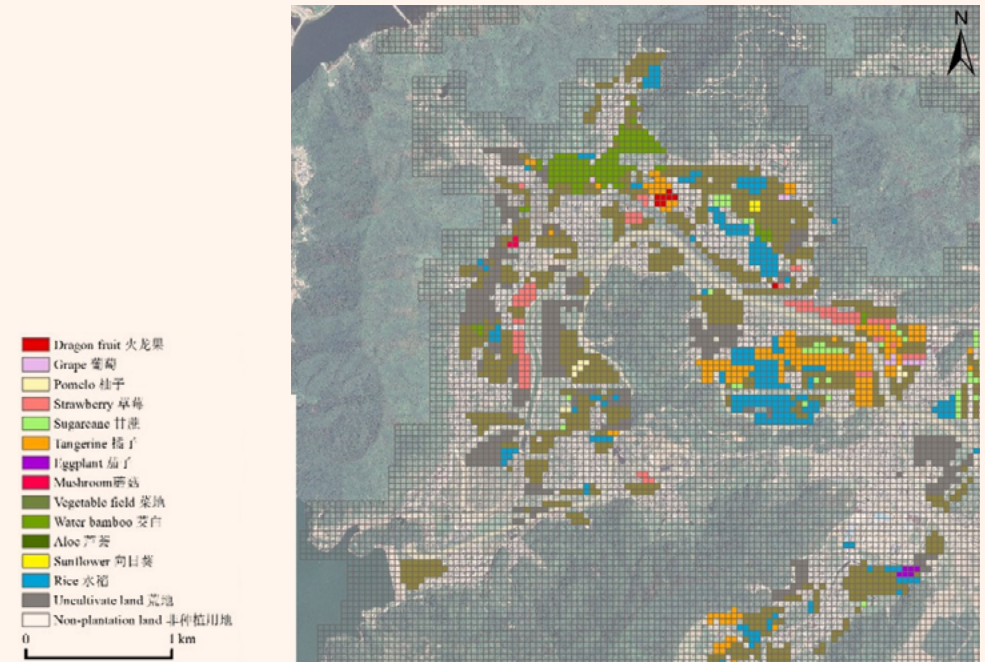
Preliminary results of GIS grid-based analysis of acreage coverage of crops grown in Beiyang Township.

In URLL#1 (Beiyang Township) the research team focuses more on agricultural production activities, so we define the main key spaces as ecological farms (Seeher farm), organic farms (Sino-German farms) and the surrounding villages. And the key actors would include farm owners, villagers and local government.
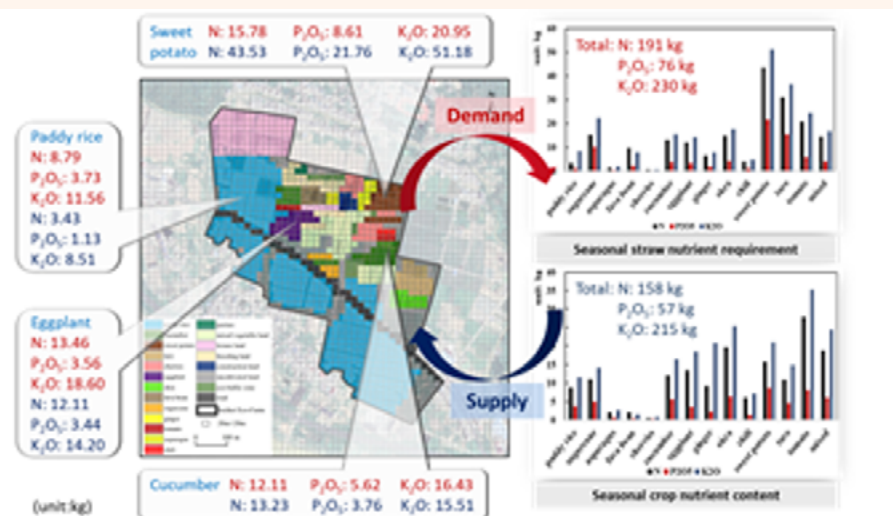
Sino-German Farm Nutrient Cycle (Demand and Supply) Analysis
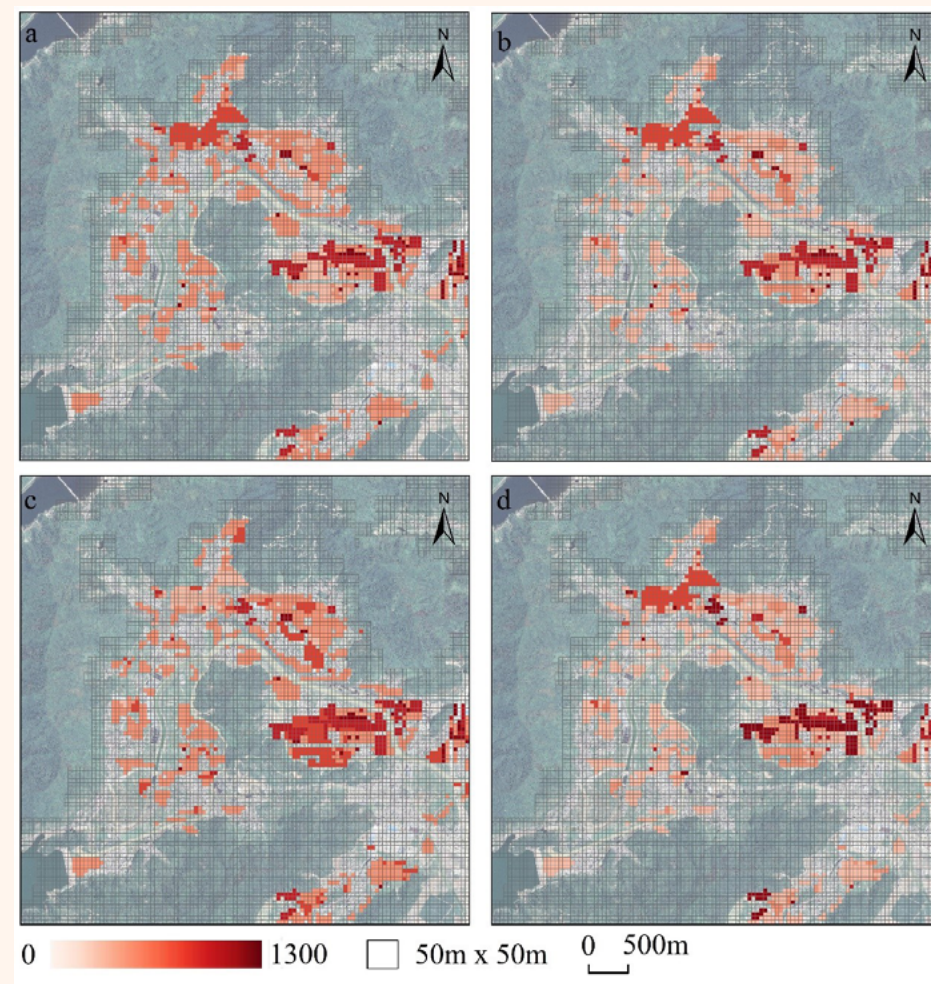
Biogas potential corresponding to the main crops at Beiyang Town (a: BMP model; b: simplified ADM1 model; c: Gradient Boosing model; d: random forest model)

Urban-Rural
Material Cycles
Spaces & Actors

*organic
farm land*

*wild rice shoots
farming and
processing area*

Sample collected from the fields

Gong Garden Orange Garden

Urban-Rural
Material Cycles
Key Challenges

HUANGYAN REGION
\#   Integrate circular economy planning into territorial planning.
\#   Integration of the circular economy at different levels.
\#   Integrate innovative methods and tools into local cultural values.

BEIYANG TOWN
\#   Uncertainties of quantitative evaluation results.
\#   Lack of understanding from local residents, high prices of agricultural products, and waste disposal.
\#   Conflict between limited arable land resources, the demand for healthy agricultural products, and leisure needs of city dwellers.

XINQIAN SUB-DISTRICT
\#   The economy and applicability of circular economy projects.
\#   Techniques and methods applied in the circular process and in the potential assessment process.
\#   Break through stakeholder considerations to achieve circularity.

Urban-Rural
Material Cycles
Key Potentials

HUANGYAN REGION
*   Diversity of material and energy flows and pollutants in rural and (sub)urban agricultural lands and waters.
*   Development and evolution of circularization of environmental, ecological and housing facilities.
*   Synthesis and practice of regional symbiosis of circular agriculture and circular agriculture pathways.

BEIYANG TOWN
*   Integration of farmers' awareness, economic leverage, cultural climate and policy support.
*   Diversity of circular agriculture path development and experimentation.
*   Support and cooperation of government and multi-stakeholders for agricultural circular economy.

XINQIAN SUB-DISTRICT
*   Basis of circular approaches towards (sub)urban agriculture and park development.
*   Significant policy driven transformation processes.
*   Circular economy dynamics and development mechanisms brought about by regional industrial structure transformation and territorial planning.
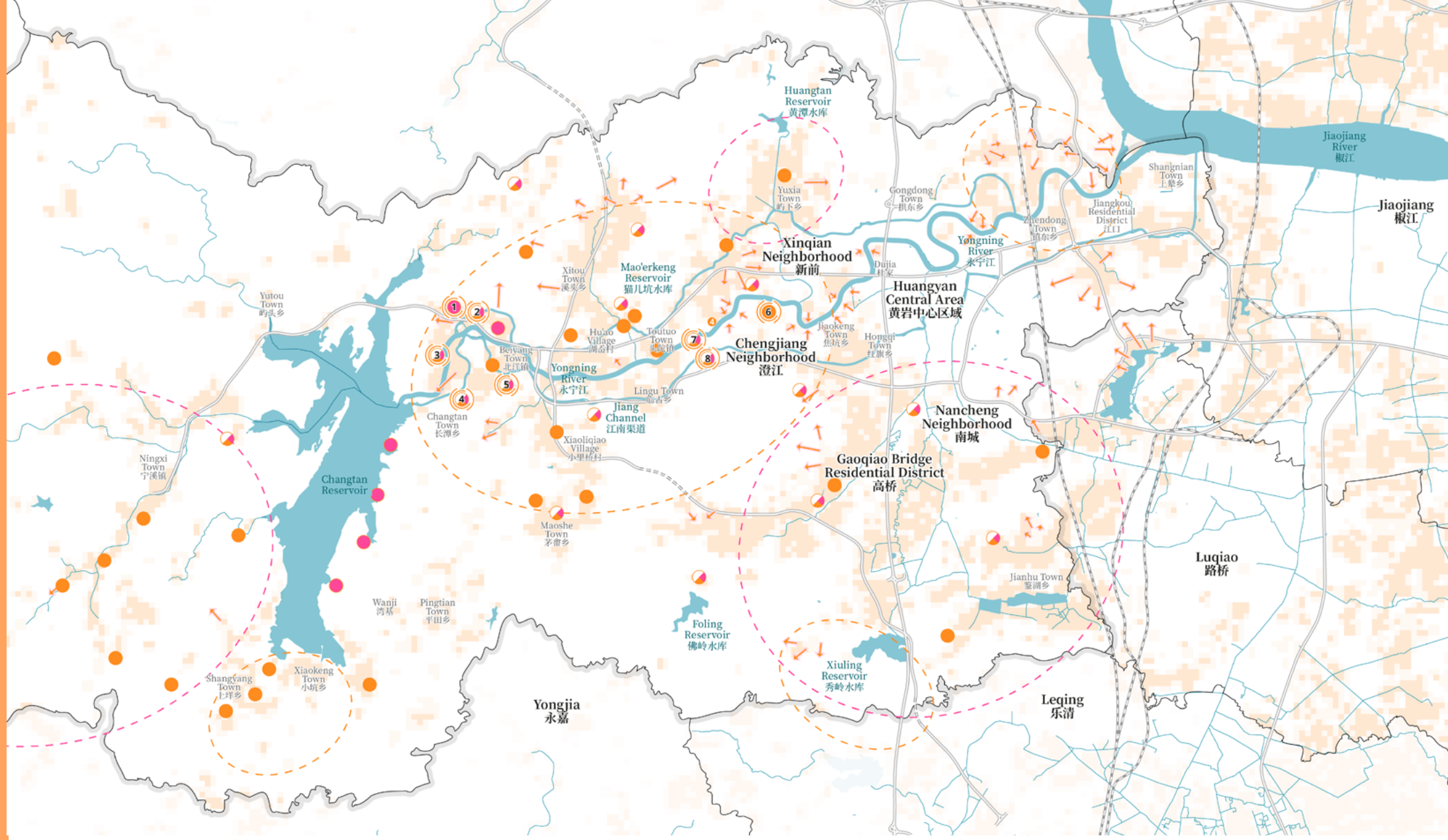
Urban-Rural Material Cycles
Fazit Map

Key | 图例：

☐ Huangyan District border | 黄岩区行政边界
☐ Other administrative borders | 其他地区行政边界
— Highway | 高速公路
-- Railroad | 铁路
▬ Water bodies and rivers | 水体和河流
▨ Agricultural production (predominant landuse) | 农业生产（主要用地）
▨ Agricultural production (partial landuse) | 农业生产（部分用地）

→ Agriculture landuse expansion | 农业生产新增用地
(comparison of landuse data from 2015 and 2019) | (比较2015和2019年的数据)

◌ Predominant orange production | 主要柑橘种植区
◌ Predominant grain production | 粮食生产区

Farms (incomplete selection) | 农场（不完全绘制）：
● Orange farm | 橘园
● Other single-function farm | 其他单一功能农场
◑ Multifunctional farm | 多功能农场

◯ Actors:
1. Water bamboo cooperative | 官岙荽白合作社
2. Xihe Farm | 曦禾农场
3. Lvwochun Farm | 绿沃川农场
4. Lan mei tian yuan Farm | 蓝美田园
5. Sino-German Farm | 中德农场
6. Juyuandi Orange Farm | 橘源地柑橘农场
7. China Citrus Museum | 中华橘源博物馆
8. China Citrus Expo Garden | 中华柑橘博览园

Urban-Rural Landscapes
& Spatial Typologies
Research Introduction

The research team examines interrelations of water and settlement structures within current dynamic processes of landscape transformations. The researchers understand landscapes as an integral system with which urbanisation logics and dynamics can be understood on the basis of natural spatial conditions. The focus is not so much on the existing artefacts (e.g. building structures, agricultural land) but rather the underlying processes of these manifestations. In this way, landscapes describe complex relational structures of socio-spatial and natural dynamics as well as urban-rural linkages. Against this backdrop, the researchers are primarily looking at the transformation of water structures, as they are the driving force in everyday life, in agriculture and also in industrial production. Starting from an understanding of the impacts of water-urbanisation dynamics, the aim is to propose sustainable water-based development pathways.

To understand the interdependencies of natural processes and urbanisation dynamics, the researchers use on-site interviews, walks, desktop analysis of ancient maps and current discourses and especially mappings. Hence mapping practices play a crucial role in reading and revealing landscape and settlement structures and patterns across various scales (marco, meso, micro), uncovering the internal mechanisms and underlying structures of landscapes.

The aim is to develop future issues of sustainable and landscape-based settlement development and associated spatial strategy approaches. To this end, the researchers are working on a map series based on the following three focal points:

(A) The hidden meanings of the Yongning landscape based on translated village names.

(B) Transformation processes of the Yongning landscape from a highly dynamic, tidal watercourse to a standing watercourse with technological flood protection

(C) Urbanisation and industrialisation process along the Yongning River with a focus on agricultural and industrial productions in the context of the urban-rural-living-labs in Beijang and SMT.
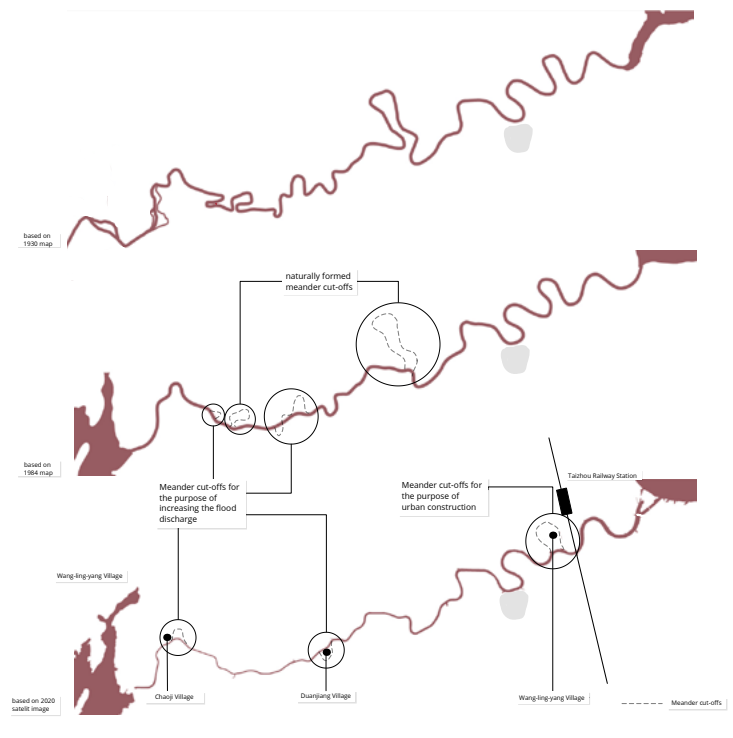
Spatial Analysis of the current and historical water structure
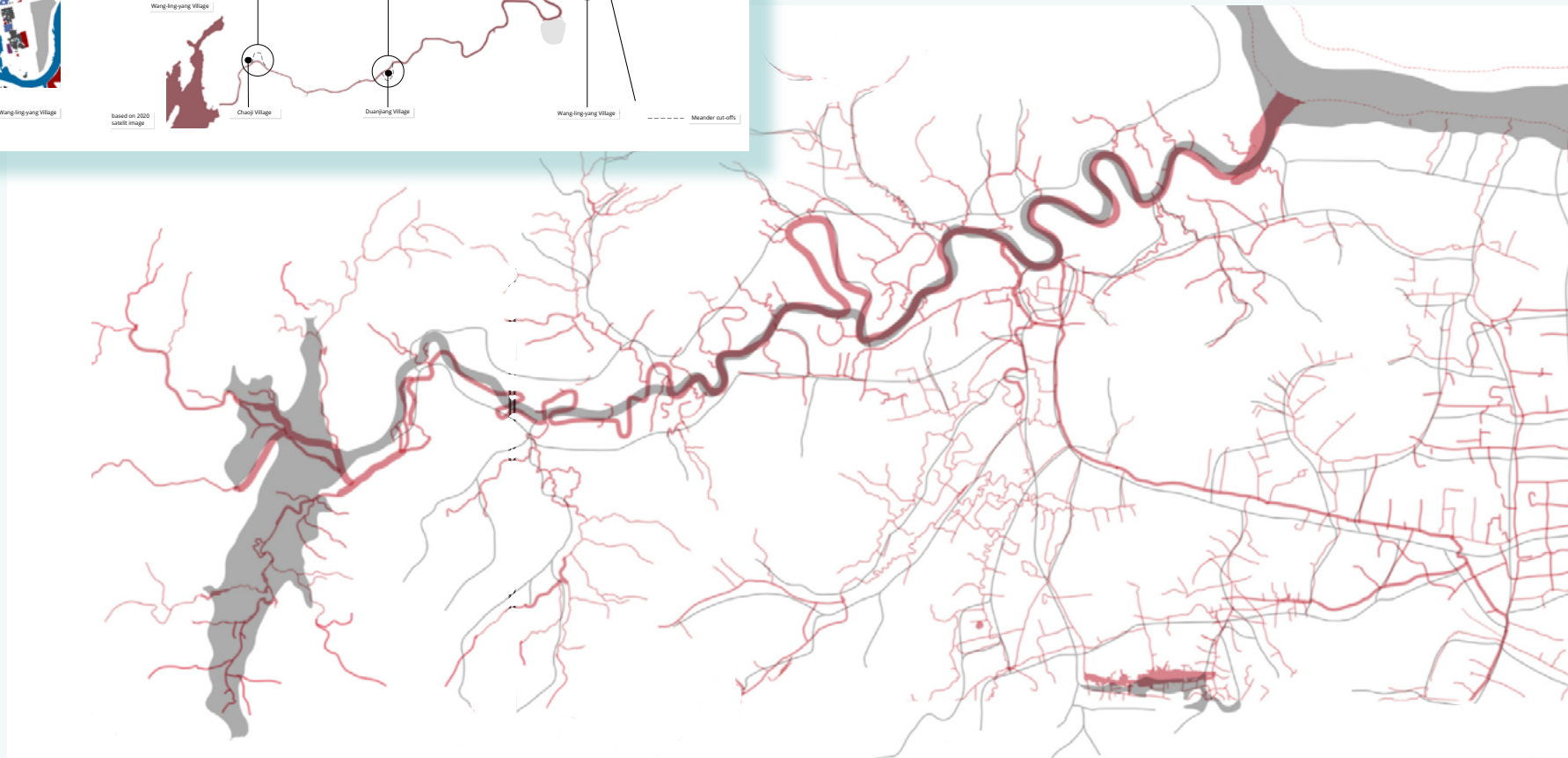
Urban-Rural Landscapes & Spatial Typologies
Spaces & Actors

Remaining traditional water infrastructures (ponds/ditches/channels/canals/sluices/bridges)

Riverbanks/ the interface of the Jiangnan/ Jiangbei Canal with the intersecting rivers/channels

The interface of different land use/the interface of roads/highways with surrounding water bodies and settlement.

Urban-Rural Landscapes & Spatial Typologies
Key Challenges

HUANGYAN REGION

The preservation of water landscape heritage under rapid urbanization
Cross-sector collaboration in water affairs
Establishment of integrated up- and down-stream water management system

BEIYANG TOWN

Agricultural area, Non-source pollution control from farm-land is challenging due to the current unsustainable agri-in-dustrialization process
lack of irrigation water, as the Changtan Reservoir mainly serve for the urban drinking water supply

XINQIAN SUB-DISTRICT

The industrial areas, with a large influx of migrants. The lack of a sense of belonging and the lack of a voice for mi-grant workers has resulted in a low level of participation in the co-management of the water.
Densely built areas and lack of green-blue spaces resulted in non-source pollution from urban run-off and risk of floo-ding

Urban-Rural Landscapes & Spatial Typologies
Key Potentials

HUANGYAN REGION

* Rich history/culture of water management/practice
* Diverse natural landscapes from mountain valleys to open estuaries
* The administrative division includes a whole watershed and is geographically located at a water source position in the Wen-Huang plain
* Certain water networks and water-sensitive settlement structures that have developed over a long history still exist

BEIYANG TOWN

* Located in upstream with better water quality, potential to ease the downstream water shortage and pollution
* Backyards of dense urban areas have a better natural en-vironment while being relatively well connected to the city center in terms of transportation.

XINQIAN SUB-DISTRICT

* Located in the middle course of the river, the interface of urban and rural areas, thus the industry zone is often sur-rounded by villages and farmland, which have the potential to ease the urban heat and runoff
* Industry areas have the potential supplement to the social/water infrastructure of surrounding villages, which enhan-ces the urban-rural integrated/cooperative water manage-ment.
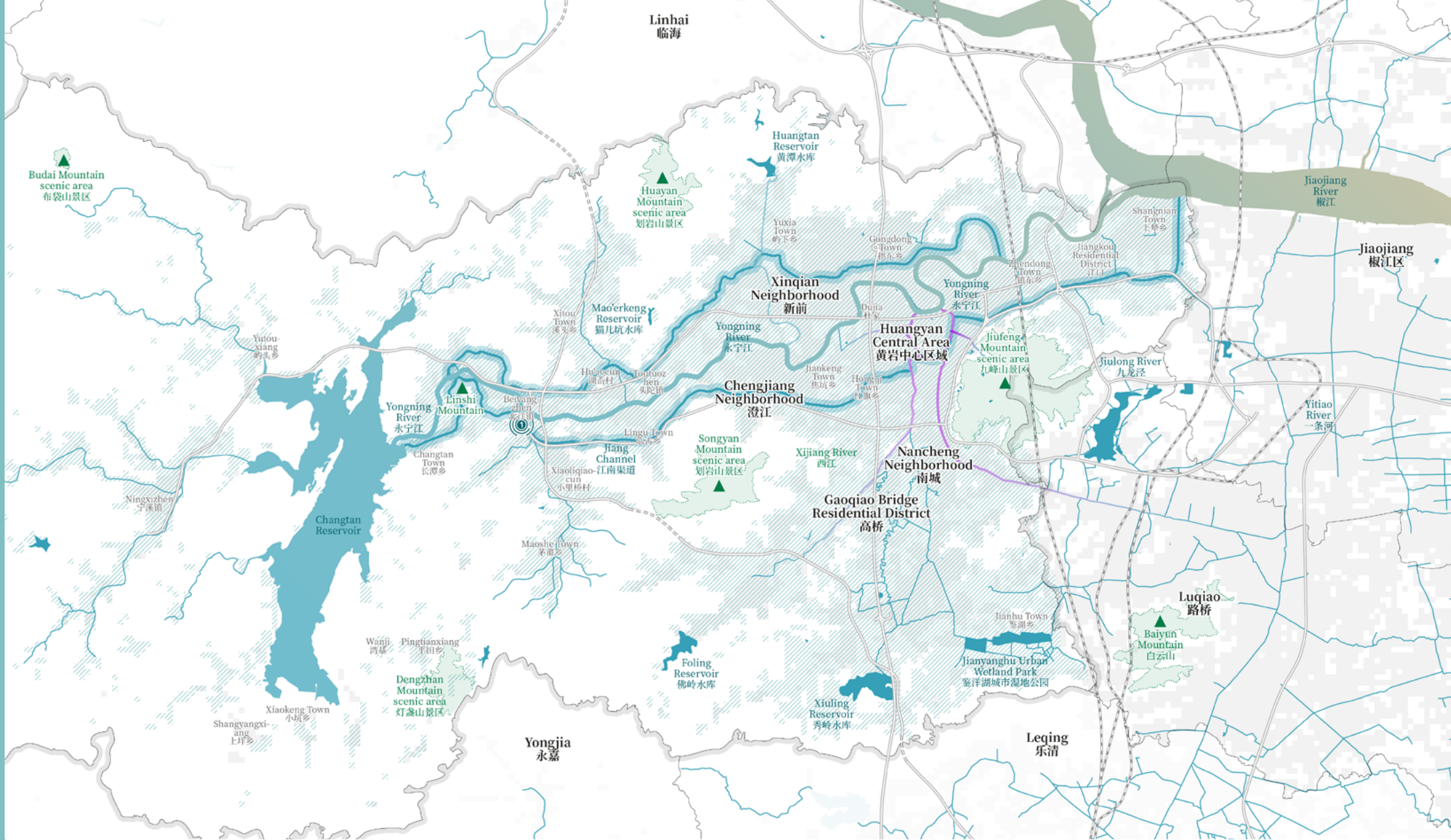
Urban-Rural Landscapes & Spatial Typologies
Fazit Map

Key | 图例:

- Urban area | 城市区域
- Huangyan District border | 黄岩区行政边界
- Other administrative borders | 其他地区行政边界
- Highway | 高速公路
- Railroad | 铁路
- Water bodies and rivers | 水体和河流
- Mountain | 山体

- Pollution (low to high) | 污染程度 (由低到高)
- Healthy canals | 健康的水渠
- Ancient canal system | 古代水渠系统
- Low flood protection (Huangyan district data only) | 防洪能力低 (仅黄岩区数据)

Map labels:

Linhai 临海

Budai Mountain scenic area 布袋山景区

Huangtan Reservoir 黄潭水库

Huayan Mountain scenic area 划岩山景区

Jiaojiang River 椒江

Jiaojiang 椒江区

Yuxia Town 屿下乡

Gongdong Town 拱东乡

Shangnian Town 上垟乡

Xitou Town 溪头乡

Mao'erkeng Reservoir 猫儿坑水库

Xinqian Neighborhood 新前

Yongning River 永宁江

Dujia 院桥

Yongning River 永宁江

Zhendong Town 镇东乡

Jiangkou Residential District 江口

Yutou-xiang 屿头乡

Huxie-cun 湖岙村

Toutuozhen 头陀镇

Jiaokeng Town 焦坑乡

Hongtu Town 洪泽乡

Huangyan Central Area 黄岩中心区域

Jiufeng Mountain scenic area 九峰山景区

Jiulong River 九龙泾

Yongning River 永宁江

Linshi Mountain

Beiyang Zhen 北洋镇

Lingu Town 宁溪

Chengjiang Neighborhood 澄江

Xijiang River 西江

Nancheng Neighborhood 南城

Yitiao River 一条河

Changtan Town 长潭乡

Jiang Channel 江南渠道

Songyan Mountain scenic area 划岩山景区

Gaoqiao Bridge Residential District 高桥

Ningxizhen 宁溪镇

Xiaoliqiao-cun 小里桥村

Changtan Reservoir

Maoshe Town 茅畲乡

Luqiao 路桥

Jianhu Town 繁湖乡

Baiyun Mountain 白云山

Wanji 湾基

Pingtianxiang 平田乡

Foling Reservoir 佛岭水库

Jianyanghu Urban Wetland Park 鉴洋湖城市湿地公园

Dengzhan Mountain scenic area 灯盏山景区

Xiuling Reservoir 秀岭水库

Xiaokeng Town 小坑乡

Shangyangxi-ang 上垟乡

Yongjia 永嘉

Yongning 永宁江

Leqing 乐清

Urban-Rural Ecosystems
Research Introduction

Urbanisation is always accompanied by a range of challenges and problems directly caused by the development of land or indirectly by the extraction of materials for construction or production, leading to the degradation of ecosystems and their biotic and abiotic elements. Today the environment is being significantly transformed by the expansion of urban areas, the fragmentation of landscapes and degradation of ecosystems, thereby reducing the diversity of habitats and biodiversity.

Ecosystem Services (ESS) is defined as the range of goods and services provided by a spatially delimited ecosystem. ESS can be separated into several subcategories covering supporting (e.g. soil formation, biodiversity), providing (e.g. timber, food), regulating (e.g. flood protection), and cultural ecosystem services (such as recreation). The ecosystem service concept is not only helpful for a better understanding of the interaction between human and nature but offers an important tool for future resource management and landscape planning.
To build a better understanding of the urban-rural constellation and interdependencies in China from an ecosystem perspectives, we try to answer three questions:

- How do urbanisation processes influence the supply of ESS ?
- What is the demand and preference of ESS for local people ?
- How to support sustainable and inclusive development through improve planning system and integrating ESS concept?

Based on the preliminary analysis and field survey in local areas, in this study, we focus on these three services: biodiversity, flood risk control and recreation.

The term of Ecosystem Services (ESS) gained significant meaning to describe and assess natural benefits provided for humans. Evaluating these with GIS-based methods gives useful environmental insights to build starting points to address ecological problems and support sustainable territorial-spatial-planning. Analyzing ecological dynamics of land use and ESS showed a general decline for ESS due to strong urbanization trends over the past three decades, despite improvement in some places or at some times.

Urban-Rural Ecosystems
Research Outcomes
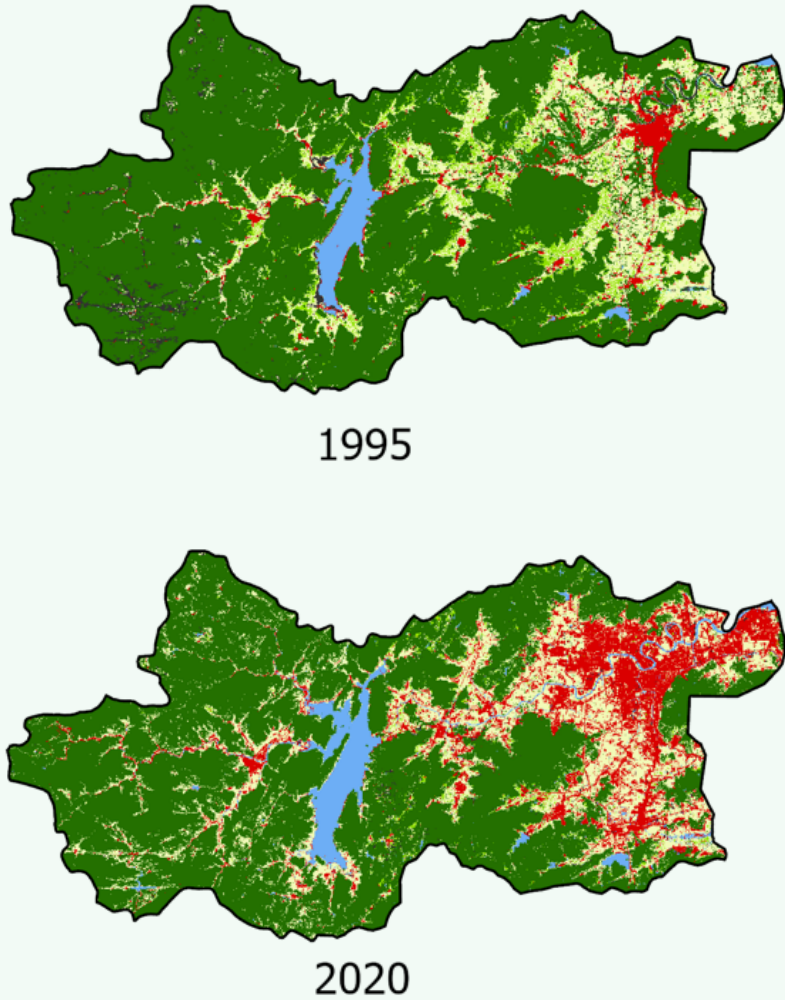
1995

2020

Land use and land cover in Huangyan in the years of 1995 and 2020 (own figure)
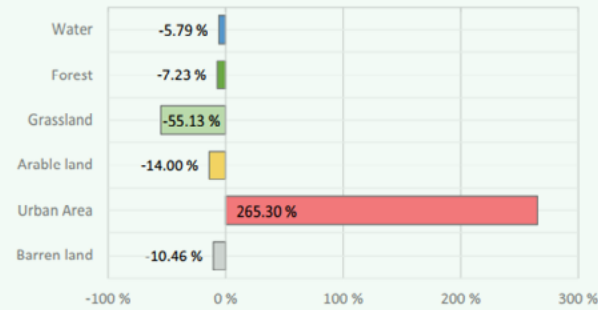
Relative change in land cover classes in Huangyan in the period of 1992–2020; (Xiao et al., 2022)
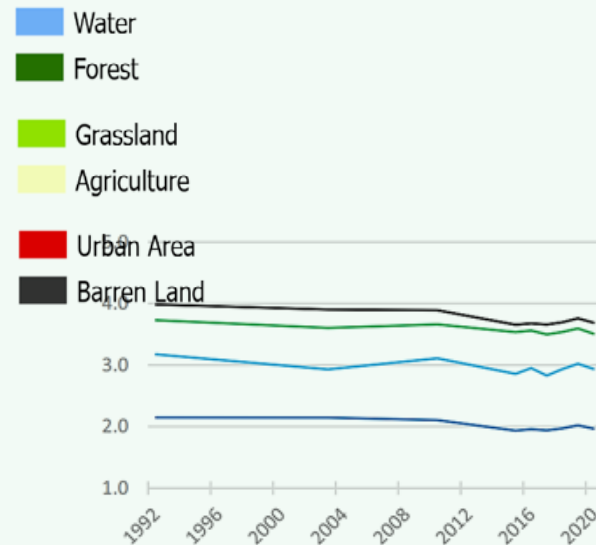
Trends in ESS capacities in Huangyan; (Xiao et al., 2022)
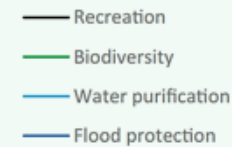
The overall ESS capacity shows a general downward trend in Huangyan from 1992 to 2020. This trend clearly correlates with the decline in vegetated land during the research period. The loss of forest area, primarily caused by urbanization and the connected expansion of arable land, seems to be the main driver of the decline in ESS capacity. This underlines the importance of protecting and restoring forest cover in the years to come, especially in the suburban area. The ecosystem service showing the highest capacity in Huangyan is recreation, quickly followed by biodiversity. Water purification and flood protection also plays a vital role. Since Changtan reservoir in Huangyan is the great drinking water reservoir of Taizhou. This lack of buffer zones leads also to an even lower capacity of flood retention. Especially along the riversides and canals, there are no enough blue-green spaces to support in potential flood risk.

Zoom-In Beiyang Town

1992   2020

- Water
- Forest
- Grassland
- Agriculture
- Urban
- Barren Land

Biodiversity
0 (low diversity) to 5 (high diversity)
1,3   2,5   3   4   4,5

Natural Flood Protection
0 (low protection) to 5 (high protection)
0   0,9   1   1,5   3
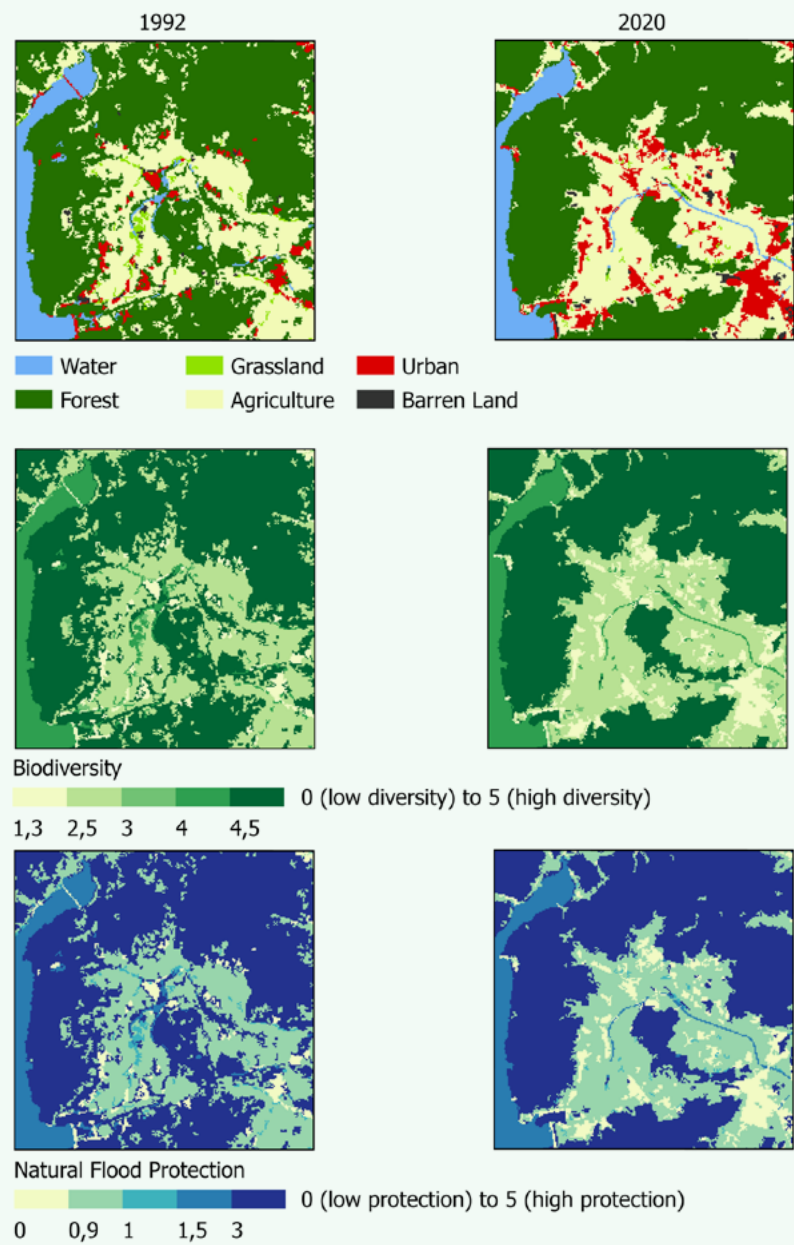
Zoom-In Xinqian District

1992   2020

- water
- forest
- grassland
- agriculture
- urban
- barren land

Biodiversity
0 (low diversity) to 5 (high diversity)
1,3   2,5   3   4   4,5

Natural Flood Protection
0 (low protection) to 5 (high protection)
0   0,9   1   1,5   3
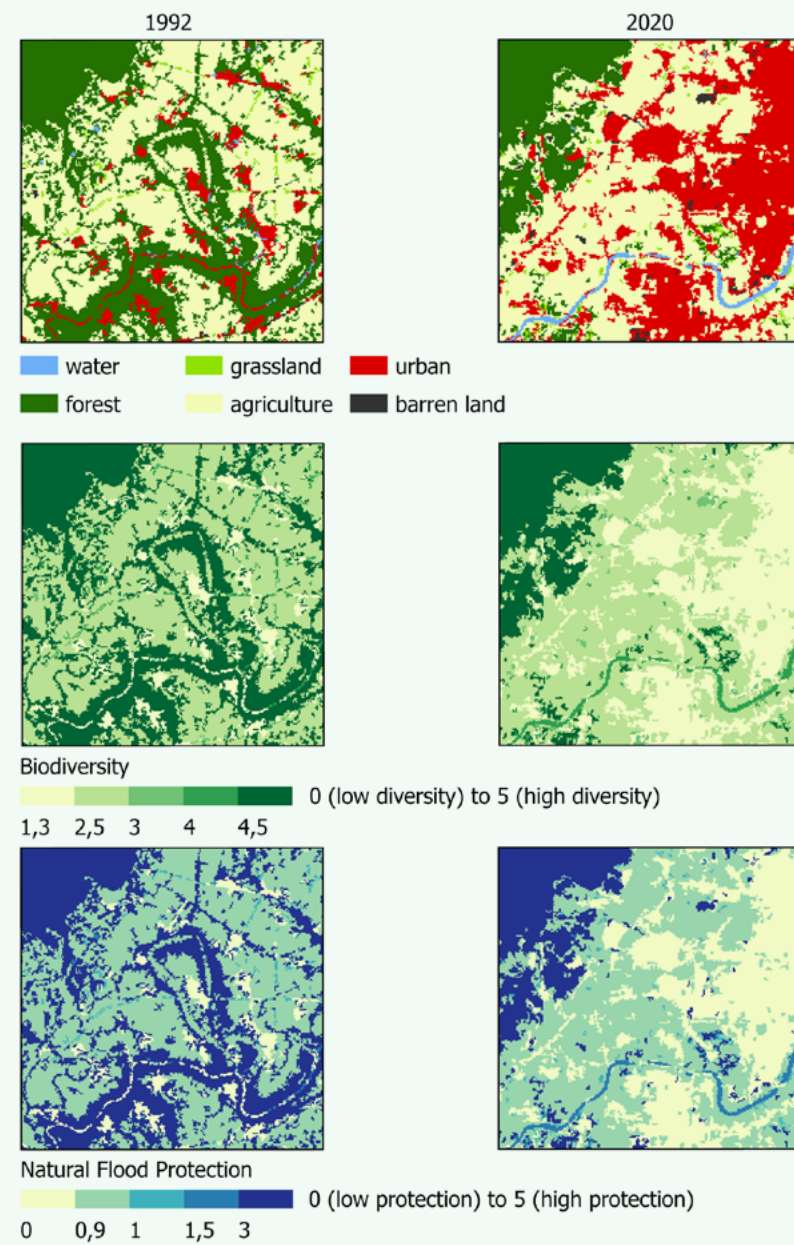
Urban-Rural Ecosystems
Spaces & Actors

broad-leaved forest (up) and coniferous forest (down)

Small plots of informal agricultural lands (eg. Vegetable gardens) for planting crops

Urban-Rural Ecosystems
Key Challenges

HUANGYAN REGION
A general downward trend of ESS in Huangyan from 1992 to 2020.
Landscape homogenization has increased fragmentation of habitats and further lead to biodiversity loss
Trade-off and informal use of green space (eg. public parks or private vegetable gardens) due to lack of overall planning and integrated management

BEIYANG TOWN
Many smaller habitats and biotopes are being eliminated by more intensive land use through urbanization and agricultural use, resulting in a major homogenization of the landscape and its habitats.
Disconnecting of ecosystems and biodiversity hotspots, as well as loss of recreational and flood retention areas.

XINQIAN SUB-DISTRICT
Urban area increased ca.395% in the past three decades. At the same time, forest area decrease almost 225%. The sprawl of urban area is fast and vast. Protecting green-blue space is imperative.
ecological degraded in general , especially in some mining and transportation areas

Urban-Rural Ecosystems
Key Potentials

HUANGYAN REGION
* Integrating Ecosystem Services (ESS) into Urban-rural development planning gives fundamental insights to ensure sustainable transformation
* Ecological Restoration in the urban rural interface safeguard for clean water, fresh air, biodiversity, flood management as well as recreation

BEIYANG TOWN
* Protecting current forest in the middle of the town for biodiversity and recreation
* Increase stepping stone habitats in the north part
* Reconnecting ecosystem in the south forest part and the river system

XINQIAN SUB-DISTRICT
* Ecological restoration for biodiversity and sustainable agriculture (eg., fruits gardens)
* Take vegetable garden (for family or community) into planning system in addition to formal public green space development (eg, parks and roadside greening)
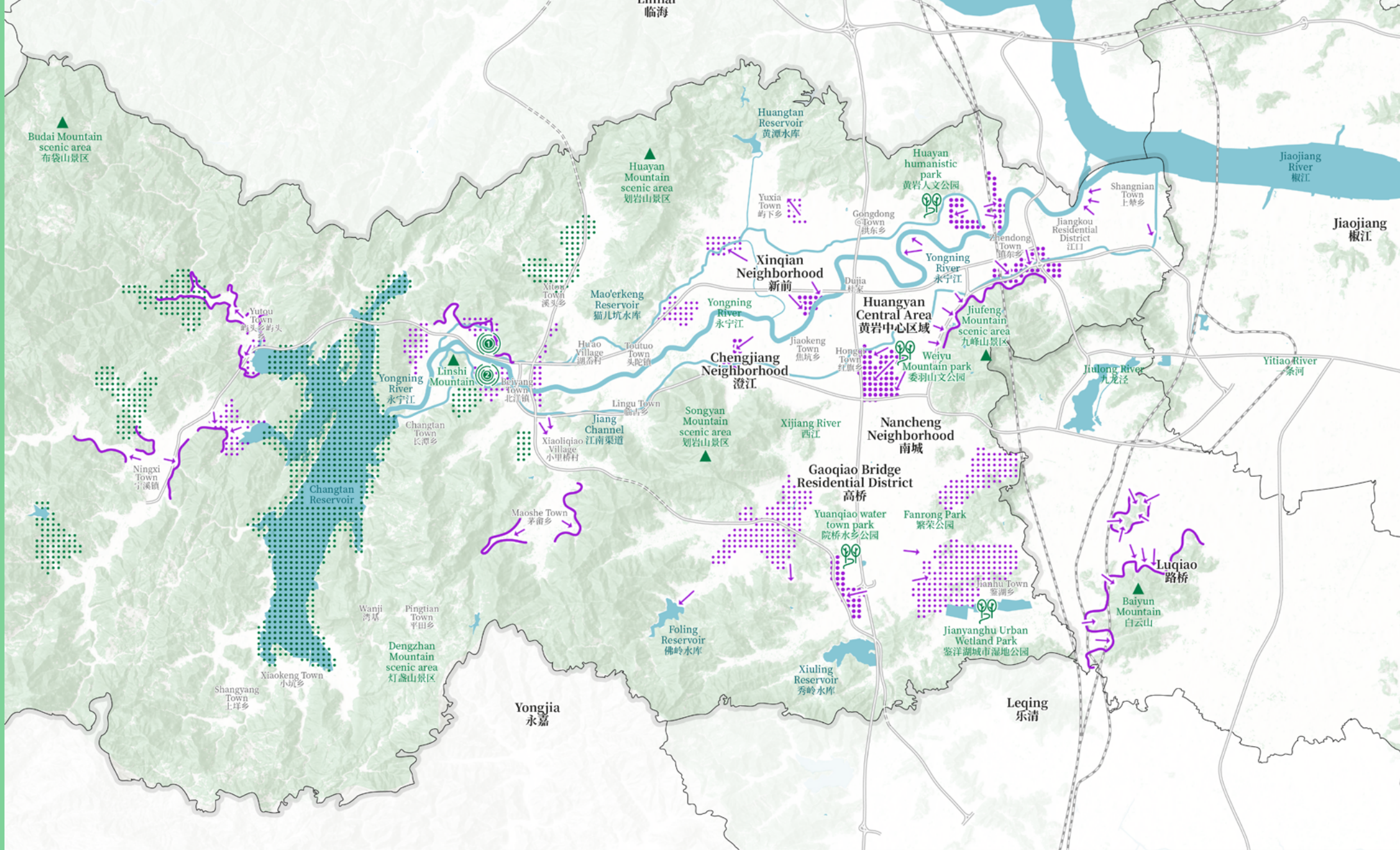
Urban-Rural Ecosystems
Fazit Map

Key | 图例:

- ▭ Huangyan District border | 黄岩区行政边界
- ▭ Other administrative borders | 其他地区行政边界
- — Highway | 高速公路
- -- Railroad | 铁路
- ▬ Water bodies and rivers | 水体和河流
- Forest | 森林
- ▲ Mountain | 山体

- ❦ Park | 公园
- Biodiversity increase | 生物多样性增加
- Moderate biodiversity decrease | 生物多样性略有减少
- High biodiversity decrease | 生物多样性严重减少
- → Settlement expansion (comparison of landuse data from 2015 and 2019) | 定居点扩张 (2015 和 2019 年土地使用数据对比)
- Endangered forest edges | 濒危森林边缘

Map labels:

Budai Mountain scenic area 布袋山景区
临海 Linhai
Huangtan Reservoir 黄源水库
Huayan Mountain scenic area 刘岩山景区
Huayan humanistic park 黄岩人文公园
Jiaojiang River 椒江
Yuxia Town 屿下乡
Gongdong Town 拱东乡
Shangnian Town 上輦乡
Jiaojiang 椒江
Xinqian Neighborhood 新前
Yongning River 永宁江
Zhendong Town 镇东乡
Jiangkou Residential District 江口
Mao'erkeng Reservoir 猫儿坑水库
Xiteng Town 溪头乡
Dujia 杜家
Huangyan Central Area 黄岩中心区域
Yongning River 永宁江
Jiufeng Mountain scenic area 九峰山景区
Shangnian Town
Yutou Town 屿头乡屿头
Yongning River 永宁江
Hu'ao Village 屿岙村
Toutuo Town 头陀镇
Jiaokeng Town 焦坑乡
Hongjia Town 红家乡
Weiyu Mountain park 委羽山文公园
Jiulong River 九龙泾
Yitiao River 条河
Linshi Mountain
Beiyang Town 北洋镇
Chengjiang Neighborhood 澄江
Lingu Town 临古乡
Songyan Mountain scenic area 刘岩山景区
Xijiang River 西江
Nancheng Neighborhood 南城
Changtan Town 长潭乡
Jiang Channel 江南渠道
Xiaoliqiao Village 小里桥村
Gaoqiao Bridge Residential District 高桥
Fanrong Park 繁荣公园
Luqiao 路桥
Ningxi Town 宁溪镇
Maoshe Town 茅畲乡
Yuanqiao water town park 院桥水乡公园
Jianhu Town 鉴湖乡
Baiyun Mountain 白云山
Changtan Reservoir
Wanji 湾基
Pingtian Town 平田乡
Jiangyanghu Urban Wetland Park 鉴洋湖城市湿地公园
Foling Reservoir 佛岭水库
Xiaokeng Town 小坑乡
Dengzhan Mountain scenic area 灯盏山景区
Shangyang Town 上垟乡
Xiuling Reservoir 秀岭水库
Yongjia 永嘉
Leqing 乐清

3

Raumbild Approach

Raumbild Strategy

In the European urban and regional planning context, a strategic planning and steering approach is already being tested with the so-called Raumbild strategy, which promotes cooperative modeling processes for e.g. municipal associations, urban regions and/ or urban-rural regions. The aim of this transdisciplinary approach is to identify the multi-layered transformation processes and their inherent development potentials across administrative boundaries, sectors as well as institutions and groups of actors with the help of actor- and user-oriented, informal and cooperative research and planning tools, in order to subsequently make them more tangible and to be able to link them together in a future-oriented and sustainable way within the framework of regional spatial images. The resulting Raumbild scenarios illustrate potential development paths of a socially, economically and ecologically economically and ecologically sustainable development of urban-rural regions, but also show concrete approaches to implementation and options for action.

The aim of URA is to further develop this still very new and unexplored planning approach together with German and Chinese practice partners conceptually, methodologically and practically in order to make it visible and applicable in the international planning context. planning context. This process is based on the ongoing results of the discipline-specific research packages of the URA research project as well as applied workshop formats (Multiple Actor Workshops) with selected actors within the three focus areas (Urban-Rural Living Labs) in the research regions in China and Germany.
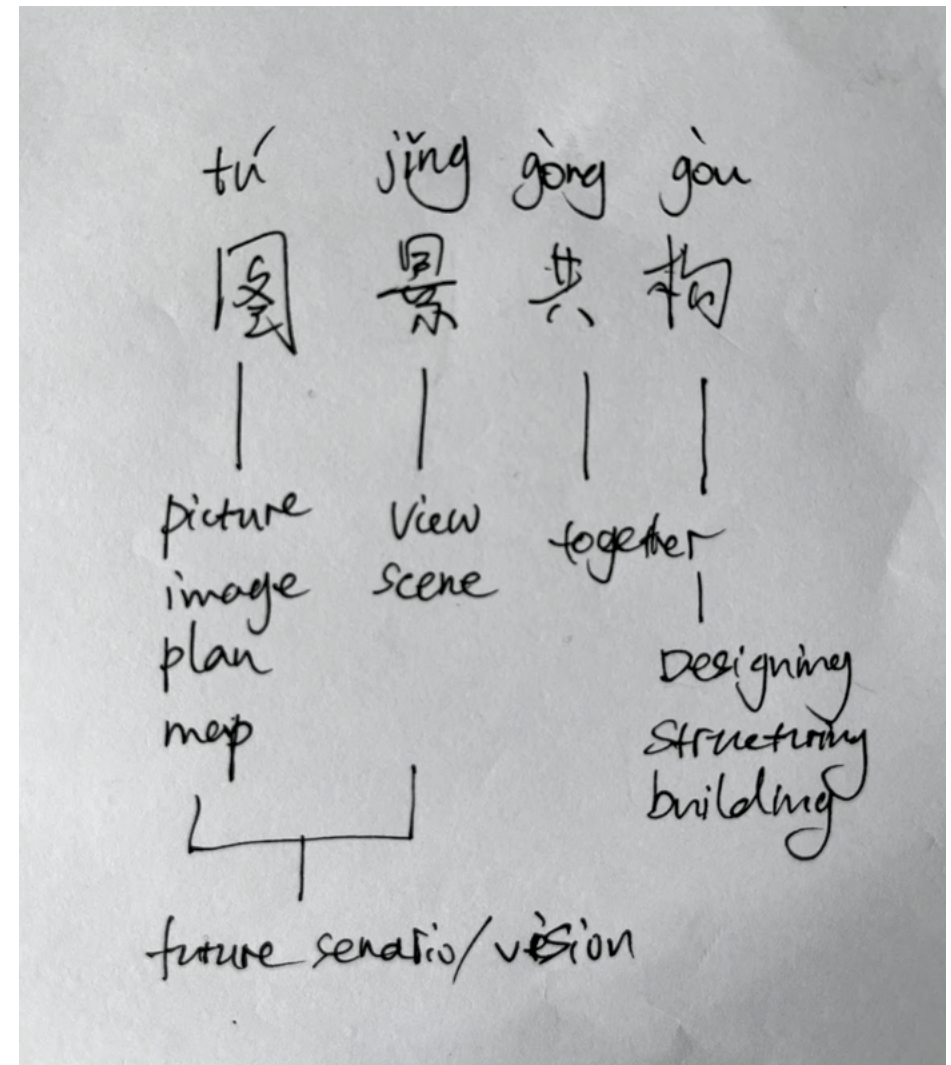
first translation of the Raumbild term into Chinese

Raumbild Formats
Focus Group Workshops

Focus group workshops are conducted in small groups. At the workshop tables, stakeholders discuss specific topics such as agriculture, neighbourhoods, culture, mobility or ecology. Each workshop is moderated by a researcher from the URA project. All participants should be given the opportunity to take part in the discussion.

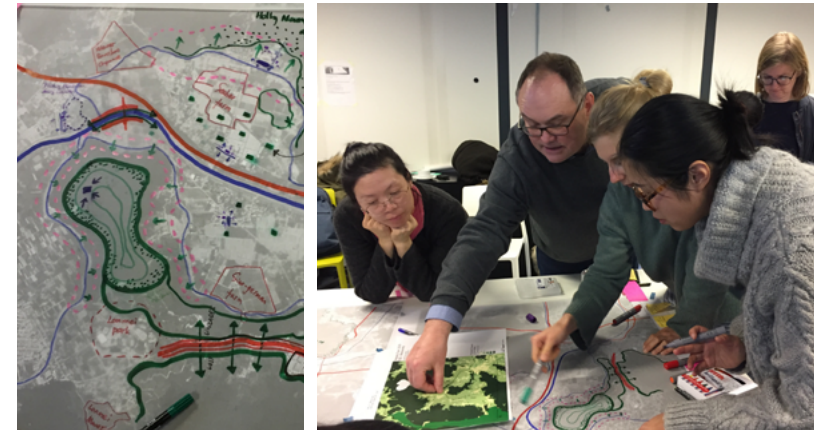*Focus Group Discussions during the Raumbild Workshop in Thuringia (Germany)*

Raumbild Formats
Collaborative Mapping

Together with local stakeholders, URA would like to create maps of the study region. The maps will show special places, challenges and potentials of Huangyan.

Collaborative Mapping during a Raumbild Workshop in Berlin (Germany)

Raumbild Formats
Plenary Discussions

In the plenary discussions, the results from the workshop groups are compiled and discussed together. Here, stakehol-ders have the opportunity to ask questions to other workshop groups. There is also a discussion on how the workshop topics are connected to each other.

Plenary Discussions during a Raumbild Workshop in Thuringia.

Raumbild Formats
Interactive Tools

In some workshops, the URA research team uses interactive, playful formats such as large models or planning games. These formats help to develop new ideas and be creative.

Interactive Workshop Tools at the Raumbild Workshop in Thuringia.

URA Research Team on an excursion in Thuringia .

We look forward to welcoming you to our
URA Raumbild Workshop 2023 in Huangyan.

With kind regards
Your URA Research Team