


GREEN LUNGS OF THE CITY - FOREST AND WETLANDS PARK, YIWU, ZHEJIANG PROVINCE, CHINA

Section	 <p>CLEARINGHOUSE 中欧城市森林应对方案</p> <p><i>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821242</i></p>
1	TITLE OF CASE STUDY AREA: Green Lungs of the City Project, Yiwu, Zhejiang Province, China
2	<p>INTRODUCTION</p> <p>Yiwu City is located in the east of China, in central Zhejiang Province and has a metropolitan area of 1105.46 km². The built-up area of Yiwu City comprised 108.02 km² in 2019 and the urbanisation rate of Yiwu reached 77.6%. The permanent resident population in Yiwu counts 1.31 million inhabitants. Yiwu City is famous worldwide because of the well-developed small commodities international trade. It attracts many buyers from all around the world, more than 50,000 customers visit Yiwu Market every day. As an international trade city, Yiwu experienced large population mobility and rapid urbanisation. However, in the built-up area, the ratio of greenspace is 23.34%, while the urban parks per capita comprise only 7.82 m². Thus, the current urban greenspace in the built-up area failed to meet the demands of residents in the city. Rapid urbanisation also has a negative influence on the city environment.</p> <p>To create more greenspace for residents in Yiwu, as well as to mitigate the environment pressures and improve the city resilience, the Municipal Government in Yiwu has planned to create 'green lungs of the city' in 2006 (s. Master Plan of Yiwu), and finally launched the Green Lungs of the City project (GLCP) in 2019, which planned to build a forest-wetland ecological park in the city central area. The planning area of GLCP is 8.4 km². The aims of GLCP are to build a big botanical garden for the City, create a forest-wetlands park and develop an agricultural park for citizens. GLCP is a typical ongoing project which uses urban forest and trees, as well as wetlands as Nature-based Solutions to promote the sustainable urban development and to provide multiple ecosystem services for human-beings in a highly urbanised area.</p>
3	<p>KEY FACTS AND FIGURES OF THE CASE STUDY AREA</p> <p>Biogeographic region¹: Humid Continental/North China Plain Surface area: 8.4 km² (840 ha) Country: China Region/Province: Yiwu, Zhejiang Province, China (code of Administrative boundary: 330782)</p>

¹ <https://www.eea.europa.eu/data-and-maps/data/biogeographical-regions-europe-3>

<p>4</p>	<p>LOCATION MAP(S)</p> <p>Location in China Location in Zhejiang Province Location in Jinhua City Yiwu City</p> <p>C 总体规划 规划功能分区</p> <p>农田景观+生态休闲区 农田+湿地景观+农耕体验区</p> <p>Planned area of Green Lungs</p> <p>Layout of Green Lungs of City</p> <p>This layout map is modified base on the Green Lungs of City Design and Planing</p> <p>Location of the study area – Green Lungs of the City project in Yiwu, Jinhua, Zhejiang Province, China (modified by Jiali Jin)</p>
<p>5</p>	<p>NAME OF MUNICIPALITY AND WEBSITE ADDRESS</p> <p>City of Yiwu: http://www.yw.gov.cn/ Yiwu Natural Resources and Planning Bureau: http://www.yw.gov.cn/col/col1229123254/index.html</p>
<p>6</p>	<p>LEAD ORGANISATIONS:</p> <ul style="list-style-type: none"> Metropolitan City of Yiwu Yiwu Natural Resources and Planning Bureau
<p>7</p>	<p>LOCAL CONTACT(S)</p> <p>Yiwu Natural Resources and Planning Bureau Yiwu, Zhejiang Province, China Tel: + 86 0579-85589088</p>
<p>8</p>	<p>PRINCIPLE UF-NBS (Urban Forests as Nature-Based Solutions) ACTION(S)</p> <p>Provision of new infrastructure/facilities:</p> <ul style="list-style-type: none"> Reforestation and afforestation, including forest plantations Restoration of wastelands and wetlands/ponds Improvement of urban forest and wetlands landscape connectivity by creating the ecological corridors Conserve plants around reservoirs to improve the water quality Remove the dilapidated buildings and reforested Protect native tree species Create a green way for bicycling

9	<p>OTHER PRINCIPLE NBS ACTION(S) – non-UF</p> <ul style="list-style-type: none"> • Build new public infrastructures (e.g. roads, toilets) • Recreational and environmental educational activities (e.g., workshops for urban birds, bees or butterfly biodiversity, as well as native tree species, based on the botanic garden and wetlands park) • Develop the cultural tourism industry (e.g. play yard or playground for experiencing the agricultural activities, catering services), eco-agricultural industrialisation, health industry (e.g. green care) 				
10	<p>LOCAL STAKEHOLDERS LIST ONLY</p> <p>1. Governing authorities:</p> <ul style="list-style-type: none"> • Metropolitan City of Yiwu • Yiwu Natural Resources and Planning Bureau <p>2. Associations:</p> <ul style="list-style-type: none"> • Bureau of Ecology and Environment • Water Authority • Yiwu Bureau of Culture and Tourism • Sciences and technology associations (e.g. education and cultural), • Cultural, and sports, non-government actors (e.g. project contractors, seedling nursery developers, NGO/volunteers, farmers, previous land contractors, scholars and social media) <p>3. Citizens:</p> <ul style="list-style-type: none"> • Park wardens (mostly non-volunteer, usually the government pays for them) • Citizens for maintain and cleaning gardens (not volunteer, e.g. gardeners) • Farmers • Citizens who are related association members. <p>4. Municipalities:</p> <ul style="list-style-type: none"> • Municipalities of sub-districts (Futian, Houzhai) <p>5. Public/private institutions:</p> <ul style="list-style-type: none"> • Public institutions: <ol style="list-style-type: none"> 1) Related departments in Yiwu Natural Resources and Planning Bureau (e.g. planning, budget, communication); 2) Municipalities of local sub-districts (e.g. District Gardening and Greening Bureaus); Research institutes or universities that have be involved in this project (e.g. Beijing Forestry University, Research Institute of Forestry Chinese Academy of Forestry); • State-owned enterprise: Yiwu City Investment and Construction Group Co., Ltd <p>6. Park planner and authorities:</p> <ul style="list-style-type: none"> • Planner: Beijing Beilin Landscape Garden Layout Design Institute Co., Ltd.; • Authorities and administrative Division: Metropolitan City of Yiwu <p>7. Technicians for park maintenance/monitoring and to educate and support citizens:</p> <ul style="list-style-type: none"> • Yiwu City Investment and Construction Group Co., Ltd • Other contractors (companies that have contracts with Yiwu City Investment and Construction Group Co., Ltd) 				
11	<p>UF-NBS FRAMEWORK</p> <table border="1" data-bbox="210 1688 1497 2119"> <tr> <td data-bbox="210 1688 274 2119">a.</td> <td data-bbox="274 1688 555 2119">UF-NBS typology</td> <td data-bbox="555 1688 874 2119"></td> <td data-bbox="874 1688 1497 2119"> <ul style="list-style-type: none"> • Forest plantation; • Woodland play area (e.g. urban forest parks); • Tree rows; • Wooded banks of rivers, ponds and lakes, natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); • Ornamental trees; • Arboretum (botanic garden); • Bioswales with trees and constructed wetlands; • Choice of plants (i.e., native tree species, non-indigenous ornamental tree and plant species), selected tree species that could avoid the plant source pollutions (e.g. willow, pollen pollutions) </td> </tr> </table>	a.	UF-NBS typology		<ul style="list-style-type: none"> • Forest plantation; • Woodland play area (e.g. urban forest parks); • Tree rows; • Wooded banks of rivers, ponds and lakes, natural and semi-natural water bodies and hydrographic networks (i.e., river corridor, lake banks, pond); • Ornamental trees; • Arboretum (botanic garden); • Bioswales with trees and constructed wetlands; • Choice of plants (i.e., native tree species, non-indigenous ornamental tree and plant species), selected tree species that could avoid the plant source pollutions (e.g. willow, pollen pollutions)
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b.	Integration		<ul style="list-style-type: none"> • Water management system (e.g., restoration of wetlands); • Built-up structure (e.g., environmental education bases); • Transport infrastructure (e.g., parking lots, above-ground roads connecting to the park are planned); • Organic farm play yard • Catering services (eco-hotel, restaurants)
c.	Network/connectivity		<p>Reconnected the roads, rivers, ponds and lakes by trees to create ecological corridors.</p> <ul style="list-style-type: none"> • GLCP aims to connect the existed urban forests patches by planting more tree rows along rivers and roads. • GLCP aims to connect the existed ponds, rivers, lakes and three reservoirs and to create cycle systems for water purification.
d.	Multifunctionality		<ul style="list-style-type: none"> • Water quality purification, • Biodiversity conservation, • Provide the ES for community such as create space for recreation, social activities, environmental education, areas for dogs
e.	Multi-scale		<p>GLCP was planned and implemented at municipal (Master Plan of Yiwu City) and sub-district levels.</p>
f.	Strategic planning processes		<ol style="list-style-type: none"> 1) Made a decision: The local government of Yiwu approved the launch of the Green Lungs of the City project in 2006, which had been included in the Master Plan of Yiwu City (2013-2030). 2) Developed a scheme for GLCP: Yiwu Natural Resources and Planning Bureau commissioned Beijing Beilin Landscape Garden Layout Design Institute Co., Ltd. to develop the GLCP design and planning. 3) Implementation: GLCP has been implemented under the Public-Private Participation (PPP) mode. Yiwu City Investment and Construction Group Co., Ltd. as a Special Purpose Vehicle (SPV), has a contractor with the municipal government of Yiwu, will invest and implement GLCP in the operational period. 4) Management: Once the operational period ends (expiration of the contract period), the local government will take GLCP back. GLCP will be managed by the associated bureaus or departments.
g.	Inter- and transdisciplinary		<p>GLCP brings together, in a synergistic participatory process, a variety of actors and their knowledge from different disciplines, such as ecology, urban planning, urban forestry, forest management, agriculture,</p>

			wetlands, social economy etc. Also including administrative authorities, landscape planners, scholars/professional experts, farmers, businessman and technicians who educate and support citizens activities.
	h.	Social cohesion and biocultural diversity	<p>A rich cultural heritage of Yiwu City is preserved in the Green Lungs of the City project.</p> <ul style="list-style-type: none"> • Wetlands ecological culture • Farming cultures • Folk cultures (e.g. farmer painting, Chinese paper cutting, pottery) • Traditional customs
	i.	Governance arrangements	<p>I. Project management structure.</p> <p>Project coordinator: Yiwu Natural Resources and Planning Bureau, altogether 2 sub-district departments; Project coordinators usually confirm other project collaborator by opening tenders.</p> <p>Project Planner: Beijing Beilin Landscape Architecture institute co. Ltd. (private company, commissioned by Yiwu Natural Resources and Planning Bureau)</p> <p>Project implementation (investment, construction, operation): Yiwu City Investment and Construction Group Co., Ltd.</p>
<p>II. Local community engagement and the nature of their engagement.</p> <p>Experts community (e.g. researchers, professionals, urban planner, ecologist): experts who study urban planning, forestry, landscape ecology, biodiversity, landscape architecture, arboriculture, urban forestry, wetlands were engaged in this project when developing the plan scheme. Their engagement was to review the draft master planning of GLCP and to give their comments/suggestions to improve the quality of the draft.</p> <p>Local citizen community: The Planner revised the plan of GLCP after several seminars. When the final plan was ready, it was posted on the official website of local government. The open online version was welcome for citizen's comments or feedback.</p>			
<p>III. City-scale and/or region-wide governance for the project and/or UF-NBS (city and regional stakeholders and character of their engagement)</p> <p>Yiwu Natural Resources and Planning Bureau is the project coordinator, working with other departments in 2 sub-districts (Futian and Houzhai). Beijing Beilin Landscape Architecture institute co. Ltd. did the GLCP design and planning. Yiwu City Investment and Construction Group Co., Ltd. is implementing the GLCP.</p>			
<p>IV. National and international governance context (national and</p> <p>First level control on the city level that monitors the project implementation.</p>			

		international stakeholders and character of their engagement)	
		V. Other (specify)	n/a
j.	Institutional frameworks	I. Project staff responsibilities.	<p>Local government: project coordinator, including project communication.</p> <ul style="list-style-type: none"> • Planning and organisation of project's activities • Quality control • Planning, organisation, and implementation of project's communication activities • Informing project manager about progress and problems with communication activities • Management <p>Beijing Beilin Landscape Architecture institute co. Ltd.:</p> <ul style="list-style-type: none"> • Project background analysis • Spatial analysis and planning • General Layout the GLCP • Strategies for constructing GLCP • Landscape architecture design and planning • Road design and planning • Investment estimation <p>Yiwu City Investment and Construction Group Co., Ltd. (during the operational period)</p> <ul style="list-style-type: none"> • Investment • Construction • Operation
		II. Project Management Committee (Y/N) if Y.	Y. Consists of representative of project partners (project managers of project coordinator's organisations)
		III. Frameworks <u>above the project</u> that exert influence on the project and/or UF-NBS e.g. Municipality, National Forestry Department.	Yiwu Municipal Government approves the Green Lungs of the City project.
		IV. Private companies that work on behalf of/or are embedded within the project.	<ul style="list-style-type: none"> • Project planner: Beijing Beilin Landscape Architecture institute co. Ltd. • Construction contractors: companies that planting trees, build houses.
		V. Trade representative organisations that are involved in the project	n/c
		VI. Regulatory	Urban and Rural Planning Law of the People's Republic

		frameworks that the project operates within (i.e. bylaws, municipal laws, national laws, licences and leases, partnership agreements etc)	of China Forestry Law of the People's Republic of China Master Plan of Yiwu City (2013-2030) Plan for Yiwu New town based on the high-speed train system (2017-2035) Master Plan of Yiwu Information Photoelectric High-tech Zone (2017-2035)
		VII. Other (specify)	The State-owned company, Yiwu City Investment and Construction Group Co., Ltd. is responsible for implementing the whole project during the operational period.
k.	Economic frameworks	I. Community fundraising	n/a
		II. Project delivered services and monies raised by project	n/a
		III. City, regional general funds	The local government provided very limited funding to launch GLCP (e.g. commissioned the Beijing Beilin Landscape Architecture institute Co. Ltd. to develop the design and planning)
		IV. Special funds e.g. National Lottery, Challenge funds	n/a
		V. National government funds	n/a
		VI. Private sector investment	Non-government investment also exists, for various economical purposes such as tourism.
		VII. International funds e.g. European Union structural funds, LIFE + etc.	n/a
		VIII. Other (specify)	This project was funded by the state-owned company: Yiwu City Investment and Construction Group Co., Ltd.
i.	Sino/European comparative relevance		Yiwu is a famous international trade city. It is a county-level city with a high density of population (also include the international population mobility). As a small city, Yiwu is comparable to most European cities. GLCP will be one of the largest ecological projects in Yiwu and the whole cycle of implementation will continue in the coming two years. Like all other UF-NBS projects in Europe, GLCP aims to improve the urban green and blue space systems that can promote city resilience and meet the demands of citizens. However, the multi-functional approach GLCP is quite different from European example, which is valuable for comparison (to find the similarities and differences).
m.	UF-NBS valorisation		Increased forests or trees (e.g. woodland or other greenspace) can maintain and improve the biodiversity in urban areas. GLCP also can contribute

			to purify the water quality, provide the recreation space for citizens, which can benefit human health and wellbeing. Besides, GLCP can provide more green job opportunities for social society (e.g. need more workers or staff to manage the new afforestation sites, develop eco-tourism).
n.	Procurement of UF-NBS		<p>The Public-Private-Participate (PPP) is used in this project. The whole cycle of this project can be summarized into six steps:</p> <ol style="list-style-type: none"> 1) The local government of Yiwu approved the launch of the Green Lungs of the City project which had been included in the Master Plan of Yiwu City (2013-2030). 2) Yiwu Natural Resources and Planning Bureau opened a tendering for the society to select an organisation/company to develop a Master Plan of the GLCP. 3) Beijing Beilin Landscape Architecture Institute Co. Ltd. was commissioned to develop the GLCP design and planning 4) Once the plan was approved by the municipal government, they confirmed the Special Purpose Vehicle (Yiwu City Investment and Construction Group Co., Ltd.) to implement the whole project. 5) The contractor implemented and manage the project in a concession duration (during this time, they can invest to plant trees, build infrastructure according to the master plan of this project). <ul style="list-style-type: none"> • The first phase of construction: 250.7 ha, which was planned to invest 428 million; • The second phase of construction: 386.8 ha, which was planned to invest 265 million. 6) When the operational duration ended, the government will take this forest-wetlands park back, and the related department or bureaus will do the maintenance.
p.	Ecosystem services (list the three most important services being provided in no more than 50 words)		<ul style="list-style-type: none"> • Improved the green and blue landscape connectivity in urbanised area, which is good for biodiversity conservation and water purification; • the health and wellbeing benefits gained through the use of the recreation facilities; • the provision of educational facilities for local residents and visitors.
q.	Renaturing		Reforestation and environmental redevelopment of areas that were once built-up area, uncultivated lands, ponds, lakes and vacant lots.

12	LESSONS AND TRANSFERABILITY <p>The Public-Private-Participation in this Green Lungs of the City project has improved the efficiency and effectiveness of the project in an urbanised area. Despite the ecosystem services (e.g. biodiversity conservation) provided by increased urban green and blue spaces, GLCP will contribute to improve the citizens' participation in environmental protection. As it is an on-going project, this project will be a good field lab for UF-NBS (Urban Forests as Nature-Based Solutions) (e.g. during the progress of implementation and management).</p>
13	REFERENCES (Harvard style) <p>All information is based on interviews and the concept plan of the Green Lungs of the City project.</p>