Voluntary Local Review on the Implementation of UN Sustainable Development Goals in Yangzhou (2022)
The Implementation of 2030 Agenda by Canal Cities

CONTENTS

Foreword

Sustainable development is an important issue recognized globally today. During the Summit on Sustainable Development in September 2015, the United Nations formally adopted the outcome document of unprecedented scope and significance: Transforming Our World: The 2030 Agenda for Sustainable Development (2030 Agenda), mapping out the blueprint for global cooperation on sustainable development. The 17 Sustainable Development Goals (SDGs) and related 169 targets are at the heart of the 2030 Agenda. China highly recognizes the relevance of the 2030 Agenda. Aiming at sharing China’s solution and experience in implementing the SDGs with the world, Chinese President Xi Jinping announced the Global Development Initiative at the United Nations General Assembly in September 2021, advocating that all countries should put development at the center of the international agenda and implement the 2030 Agenda and adhere to the concept of a community with a shared future for mankind.

Yangzhou is located in the middle of Jiangsu Province, on the north shore of the lower reaches of the Yangtze River, with a total area of 6,638 square kilometers and a permanent population of 4.58 million. As the central hub in China's most vibrant "Yangtze River Delta" economic circle, Yangzhou’s GDP reached 669.6 billion CNY in 2021. During Chinese President Xi Jinping’s trip to Yangzhou on November 13th 2020, he stated that “Yangzhou is a good place. It is built by the water, prospered by the water, and beautiful because of the water. It is one of the most important historical and cultural cities in China.” Yangzhou has over 2500 years of history. Historically, it is the starting point of the Grand Canal. Within the past decades, the city has made important contributions to the Grand Canal’s nomination as world heritage site and its heritage protection. Yangzhou is also an ecologically friendly and environmentally beautiful city. Nationally, it has been named as excellent tourism city, ecological demonstration city, forest city, and health city. Internationally, Yangzhou earned the UN Habitat Scroll of Honour Award in 2006.

Guided by concepts put forth by the Chinese government on sustainable development, Yangzhou takes a leading role among canal cities, to actively promote the implementation of the sustainable development goals. In recent years, Yangzhou has comprehensively benchmarked the UN SDGs and has promulgated and implemented a series of policies and actions, including Opinions on Accelerating the Construction of Emerging Cities with Advanced Science and Technology, Implementation Opinions on Promoting the Integrated Development of Culture and Tourism Industry (2021-2023), Implementation Plan For Comprehensively Promoting the Construction of Healthy Yangzhou, Regulations for the Protection of Historic and Cultural Cities in Yangzhou (2015-2030), Yangzhou Ecological River and Lake Action Plan (2018-2020). Yangzhou’s policy actions have achieved remarkable results in urban sustainable development, accelerating the city’s progress on an innovation-oriented path. 71.4 percent of Yangzhou’s population now lives in the city, its regional GDP reached 500 billion CNY in 2017 and totaled 600 billion CNY in 2020, and its per capita GDP also exceeded 140,000 CNY in 2021. Yangzhou’s poverty alleviation campaign has lifted all registered low-income persons out of poverty, increasing residents’ income and improving the quality and coverage of social security. In addition, Yangzhou’s campaign of constructing beautiful countryside has significantly improved rural living environment in three years, and increased the proportion of ecological coastline of the Yangtze River, achieving extraordinary results in ecological civilization construction. Furthermore, Yangzhou has successfully held canal themed events and forums, including World Canal Cities Forums, the first provincial-level Grand Canal Culture and Tourism Expo, and the Grand Canal Cultural Development Forum, and was named the "World City of Canals", "UNESCO City of Gastronomy" and "Culture City of East Asia".

In the spirit of the follow-up and review mechanisms of the 2030 Agenda, local and regional governments are increasingly engaging in Voluntary Local Reviews (VLR). Yangzhou is the first prefecture-level city in China to submit a VLR to the United Nations. It is at the invitation of the United Nations Development Programme (UNDP), the Chinese Academy of Social Sciences (CASS) and the World Canal Historical and Cultural Cities Cooperation Organization (WCCO). The VLR aims at assessing Yangzhou's progress in implementing the 2030 Agenda. While conducting the assessment, special attention was paid to Secretary-General's voluntary common reporting guidelines and the principle that the VLRs will be inclusive and participatory. During the assessment process, representatives from various departments of the Yangzhou Government and public and private stakeholders were invited to the consultation sessions, presenting the implementation of the 2030 Agenda in Yangzhou in a comprehensive and objective manner.

The assessment result shows that Yangzhou has made solid progress towards the SDGs with an overall realization of the 5P dimensions at 92.2 percent, higher than the expected 67 percent completion rate set as an intermediary target to be reached by 2020. People, Prosperity, Planet, Peace and Partnership-based indicators have reached 83.2 percent, 84.1 percent, 99.1 percent, 100 percent and 94.9 percent achievement rates respectively. Thirty-two indicators have already met their 2030 targets, including population under the national poverty line, maternal mortality rate, proportion of navigable sections of the canal, direct economic loss caused by disasters as a percentage of GDP, per capita green space.

Making cities and human settlements inclusive, safe, resilient and sustainable is one of the 17 SDGs set forward by the 2030 Agenda and a common theme of sustainable urban development around the world. As a city with long history and rich cultural heritage that is surrounded by water, Yangzhou has distinctive geographical location and characteristics among the 35 cities along the Grand Canal, posing comparative advantages and values for demonstration in promoting sustainable development. At the critical point in the comprehensive promotion of the SDGs, the assessment of Yangzhou's sustainable development actions, progress and experience can help identify its strengths and weaknesses and provide guidance for the realization of the SDGs. Yangzhou will strive to make the Grand Canal a river with vibrant culture and healthy ecological environment that benefit our offspring, drive the regional economic development and facilitate inclusive exchange. It will also strengthen exchanges and cooperation with other canal cities to jointly promote the protection of canal cultural heritage and the sustainable development of canal cities. In this regard, Yangzhou's experience will form an applicable and replicable model, providing practical experience for similar cities at home and abroad to implement the 2030 Agenda.

Secretary of Yangzhou Municipal Committee of the Communist Party of China

Executive Summary

Voluntary Local Review on the Implementation of UN Sustainable Development Goals in Yangzhou (2022): The Implementation of 2030 Agenda by Canal Cities includes five chapters: The first chapter presents the audience with the assessment method and the assessment process; The second chapter briefly introduces Yangzhou's policies and enabling environment for implementing the SDGs; The third chapter of the report presents the assessment results of Yangzhou's SDGs implementation progress, while the fourth chapter concludes the assessment and offers policy implications. The last chapter introduces nine case studies that illustrate Yangzhou's successful experience in implementing the 2030 Agenda for Sustainable Development.

Yangzhou is the starting point of the Grand Canal in history and the source city of the eastern route of the South-North Water Transfer Project. As the leading city for the Grand Canal's nomination as an UNESCO World Heritage Site, Yangzhou has accumulated rich experience in the heritage protection and development and utilization of canal resources along the Grand Canal. Among the 35 cities along the Grand Canal, Yangzhou is one that has unique geographical location and exceptional historical and cultural value. The six key functions of canals --- waterway transportation function, water transmission and supply function, irrigation function, flood control and drainage function, rich ecosystem and cultural heritage through enhanced exchanges --- provide Yangzhou with excellent transportation network, well-developed industrial system, emerging sectors of strategic importance, and beautiful green ecological districts. enabling Yangzhou to contribute to SDG attainment in areas such as no poverty, zero hunger, clean water and sanitation, decent work and economic growth, reduced inequalities, climate action, and partnerships for the goals.

Guided by concepts put forth by the Chinese government on ecological civilization and sustainable development in the new era, Yangzhou has comprehensively benchmarked the SDGs and introduced a series of policies and regulations in 5P dimensions of the SDGs, namely People, Prosperity, Planet, Peace, Partnership, aiming at promoting sustainable development and aligning its development strategy to the SDGs for balanced and high-quality development. Relevant guidance documents and policy documents include: Implementation Plan For Comprehensively Promoting the Construction of Healthy Yangzhou, 13th Five-year Plan for Sanitation and Health Development of Yangzhou, Opinions on Accelerating the Construction of Emerging Cities with Advanced Science and Technology, Implementation Opinions on Promoting the Integrated Development of Culture and Tourism Industry (2021-2023), Implementation Plan of Yangzhou's Three-year Action in Imposing Emission Control Measures, Opinions on the Implementation of "Coal Reduction" Work in Yangzhou City for Pollution Prevention and Control, Yangzhou Ecological River and Lake Action Plan (2018-2020), Yangzhou's Urban Security Development Action Plan (2018-2020). Yangzhou's actions have benefited the citizens, protected the world cultural heritage, enhanced the city's popularity and international influence, and promoted the achievement of the SDGs.

This report takes Yangzhou as a model for applying SDG assessments specifically focused on the unique environment and development of canal cities. It adopts the methodology used in the previous United Nations Development Programme (UNDP) assessment of the sustainable development across cities in China. This methodology is based on the 5P categorization of the SDGs and also utilizes the Chinese City SDGs Assessment Index (CCSAI) for canal cities. The report evaluates Yangzhou's sustainable development progress since the year 2000, based on 87 indicators,

56 of which are quantifiable, as well as identifies implementation gaps, intending to provide a comprehensive assessment of sustainable development in Yangzhou. All indicators are compared to a 2000 baseline for the assessment of progress and evaluated against their 2030 targets to calculate implementation gaps. The conclusion are as follows:

(1) Yangzhou has made solid progress towards the SDGs, at 92.2 percent overall. People, Prosperity, Planet, Peace and Partnership-based indicators have reached about 83.2 percent, 84.1 percent, 99.1 percent, 100 percent and 94.9 percent of their targets respectively.

(2) Yangzhou has fully met the SDG targets for 32 of the 56 quantifiable indicators, such as the share of the population living below the national poverty line, maternal mortality, proportion of navigable sections of the canal, the proportion of direct economic losses caused by disasters, and per capita green space.

(3) Among a subset that defines 33 core indicators, 26 achieved better progress than expected. However, advancement was slower than anticipated for number of hospital beds per 10,000 populations, the number of patents per 10,000 populations, holdings in public libraries per capita, R&D spending as a proportion of GDP, per capita GDP, disposable incomes of residents, and the student-teacher ratio in general primary schools.

Voluntary Local Review on the Implementation of UN Sustainable Development Goals in Yangzhou (2022): The Implementation of 2030 Agenda by Canal Cities is jointly authored by Yangzhou Municipal People's Government, UNDP, WCCO and the Research Center for Sustainable Development, Chinese Academy of Social Sciences (RCSD). Meanwhile, The Implementation of 2030 Agenda by Canal Cities—Yangzhou Sustainable Development Report (2021) was also launched. In addition to the above-mentioned institutions, experts from the Development Research Center of the State Council, China Society of Urban Economy, Administrative Office for the Protection of Grand Canal Heritage, Yangzhou University and other institutions have also made contributions to the research. We want to acknowledge and appreciate their technical inputs and constructive advice regarding the research and the drafting and revision of the report, since December 2020.

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Chapter 1

Assessment Method and Assessment Process

- 1.1 CANAL CITIES' CONTRIBUTION TO SDGS ATTAINMENT AND YANGZHOU' S PRACTICES AND EXPERIENCES FOR IMPLEMENTING THE SDGS
- 1.2 NECESSITY OF THE RESEARCH
- 1.3 CANAL CITY SDGS ASSESSMENT INDEX (CCSAI): THE THEORETICAL FRAMEWORK
- 1.4 THE CANAL CITY SDG ASSESSMENT INDEX: THE METHODOLOGY
- 1.5 THE FORMULATION OF THE REPORT

Making cities and human settlements inclusive, safe, resilient and sustainable is an important goal set forward in the 2030 Agenda, and is a common theme for sustainable urban development around the world. The six key functions of canals --- waterway transportation function, water transmission and supply function, irrigation function, flood control and drainage function, rich ecosystem and cultural heritage through enhanced exchanges --- provide canal cities with excellent transportation network, well-developed industrial system, emerging sectors of strategic importance, and beautiful green ecological districts. enabling canal cities to contribute to SDG attainment in areas such as no poverty, zero hunger, clean water and sanitation, decent work and economic growth, reduced inequalities, climate action, and partnerships for the goals. The assessment methods compatible with the data of canal cities need to be redeveloped by drawing from the UN’s indicator system and many city-level ones. This chapter develops a 5P-based methodology applicable to assess SDGs progress of canal cities. The methodology establishes an indicator system containing 87 indicators, specifying the assessment period of 2000-2030, to assess the implementation progress of all indicators relative to the year 2000 and the implementation gap to the year 2030. This report objectively describes and demonstrates the implementation progress of the indicators and the overall goals through quantitative calculations and graphics.

1.1 Canal cities’ contribution to SDGs attainment and Yangzhou’s Practices and Experiences for Implementing the SDGs

1.1.1 Characteristics and Common Features of Canal Cities

According to Dictionary of World Canals[1], there are 1088 entries in the category of "canals". It also indicates that there are 664, 117, and 95 canals and canalized rivers in Europe, America, and Asia respectively, which accounts for 96 percent of the total number of canals in the world. The top three countries in the world that are home to most canals and canalized rivers are the Netherlands, the United States and France, each has 199, 144, and 105 canals respectively. After the Canal du Midi of France was classified as a World Heritage in 1996, more attention was paid to heritage canals. With 40 canals, China takes the seventh place, with its Grand Canal being one of the 48 heritage canals in the world[2].

1. According to the World Canal Dictionary, there are 1088 entries in the category of "canals". Since the number of canal entries provided by the WCCO Secretariat and relevant experts has not been exhausted and will not be for the time being, the statistics in this dictionary are only for comparative reference.

2.The term "heritage canals" is a broader concept, referring to both the heritage canals included in the UNESCO World Heritage List (including the Canal du Midi [1996] in France, the Central Canal [1998] in Belgium, the Rideau Canal [2007] in Canada, the Grand Canal [2014] in China, etc.) and those included in the Tentative List (e.g. the Lingqu Canal in China), but also national heritage level canals selected by countries around the world (e.g. the Champlain Canal, which is listed on the National Register of Historic Places in the United States; Lachine Canal, which is listed in the National Historic Sites of Canada), and also "canals associated with an area that is an important heritage site" (e.g. Amsterdam Canals associated with the World Heritage Site "17th Century Canal Zone of Amsterdam in The Netherlands [2010]").

and also "canals associated with an area that is an important heritage site" (e.g., Amsterdam Canals], associated with the World Heritage Site "17th Century Canal Zone of Amsterdam, The Netherlands [2010]").

As the oldest and largest-scaled man-made canal in the world, the Grand Canal of China is a great triumph of hydraulic engineering and also an emblematic linear cultural heritage. In 2014, it was inscribed as a UNESCO World Heritage Site[3]. Composed by Beijing-Hangzhou Grand Canal, Zhedong Canal and Suitang Canal, the Grand Canal is a vast waterway system that stretches almost 3,200 kilometers[4], passing through 35 cities, including Beijing, Tianjin, Langfang, Cangzhou, Hengshui, Xingtai, Handan, Anyang, Hebi, Xinxiang, Jiaozuo, Dezhou, Liaocheng, Tai'an, Jining, Zaozhuang, Xuzhou, Suqian, Huzhou, Jiaxing, Suzhou, Wuxi, Changzhou, Zhenjiang, Huaibei, Luoyang, Zhengzhou, Kaifeng, Shangqiu, Suzhou, Huai'an, Yangzhou, Hangzhou, Shaoxing and Ningbo.

The Grand Canal connects five major river systems of China, namely Haihe River, Yellow River, Huaihe River, Yangtze River and Qiantang River. Through human intervention and regulation through the ages, many natural river sections were further dug and dredged, connecting the original rivers, lakes, bottomlands and man-made water transport channels, forming an important water network connecting North and South China. In ancient China, the Grand Canal was a central pillar for grain transportation, commercial traffic, and military resources deployment. It also furthered the clustering of population and served as the economic lifeline of local trades, which helped many towns along its route gradually developed into central cities in the region. In general, canals play important role in waterway transportation, water transmission and supply, irrigation, and flood control and drainage. They are also important sources of biodiversity and through their historic relevance they are often important centers of cultural heritage benefitting cities along their course in multiple ways.

Waterway transportation function: this is one of the important functions of the Grand Canal. The Grand Canal formed a large water network across China. Its open for navigation have largely increased freight traffic volume and speed, while reducing freight costs, leading to the rapid clustering of industries and commerce along their course. Such cluster support development trades, cooperation and cultural exchanges among canal cities. In addition, the convenience of transportation has led to large-scale and long-term development of the local tourism economy.

Water transmission and supply function: Water is the key source of survival and development of cities, therefore urban rivers are vital for sufficient water supply[5]. For instance, while locally the Grand Canal serves as an important source for safe and quality residential water use and industrial water use, some of its sections also supply water to North China through the East Line of the South-North Water Diversion Project, playing an important role in the construction of China's water allocation structure.

3.Wang Ankun. Analysis of the functions and attributes of the Grand Canal [J]. Yellow River. Loess. Yellow Race, 2020(20):27-31.

4.The Central People's Government of P.R.C, the General Office of the CPC Central Committee and the General Office of the State Council issued the Plan for the Protection, Inheritance and Utilization of the Grand Canal Culture [EB/OL]. [2021-7-25]. http://www.gov.cn/zhengce /2019-05/09/content_5390046.htm.

5.Yan Maowen, Liu Deling, Li Zhenqing, et al. The function of the urban section of the Beijing-Hangzhou Grand Canal [J]. Shandong Water Conservancy Science and Technology Forum,2007(00):305-308.

Irrigation function: Irrigation is another important function of canals. Historically, irrigation was an important purpose for canal constructions. Water conservancy fields along the canal were significantly expanded, especially the polders in South of the Yangtze River, and the cropland with silts in the North. In addition, the irrigation network of the Grand Canal expanded the acreage and number of water conservancy fields, which allowed the transplantation and cultivation of crop varieties between the North and the South. The widespread cultivation of cash crops and the development of commercial agricultural economy led to a significant increase of local productivity level and laid a solid foundation for regional food security .

Flood control and drainage function: Running through the middle and lower reaches of China's major rivers and plains, the Grand Canal is the fundamental carrier for flood control and drainage in the basin. Thanks to the reservoir capacity of canals' large water bodies as well as their infiltration capacity of their riverbanks and floodplains that can slow down the peak flow of the flood, safeguarding not only the canal itself but also human life, property and cultural heritage along its shores.

Canal's rich ecosystem: The course of the Grand Canal has spanned different types of natural, semi-natural, and artificial ecosystems across China. Through the flow and circulation of energy and materials over the centuries, the Grand Canal is granted with a unique and complex ecosystem . The ecosystem adjusts micro-climate, improves landscape diversity, recharges groundwater, and enrich biodiversity, improving cities' ability to resist and adapt to climate-related disasters and natural hazards, and sets the stage for sustainable urban development.

Canals' cultural heritage, through enhanced exchanges: This is the most important attribute of the Grand Canal. With the Canal's opening for navigation, the convenient transportation has bestowed the regions along the Canal with social and economic prosperity and mixed cultures. Over the centuries, as local and foreign cultures have collided and mingled with each other, the unique cultural characteristics of the canal cities have come into being. Canal culture embodies tangible cultural heritage, such as ancient buildings, ancient tombs, ancient ruins, stone carvings, and intangible cultural heritage such as handicrafts, folklores and folk arts. Up until today, regions along the route of the Grand Canal are home to more than 1,200 tangible cultural heritage and 450 national intangible cultural heritage, 85 river heritage sites that are listed as world cultural heritage, one world natural heritage, and two world natural and cultural dual heritage sites. It provides dynamic and open culture life and recreation for the residents along the route, while enhancing the cohesion, harmonious interaction, friendly exchanges, mutual respect among different ethnic groups and contributing to the development of local tourism economy.

Canal cities not only enjoy the development foundation like other cities do, but also have unique and strong capacity and potential to ensure food security, strengthen regional cooperation, and address climate change. Therefore, the assessment of SDGs in canal cities can help identify the strengths and weaknesses of sustainable development of these cities and provide guidance for the realization of their 2030 SDGs. Meanwhile, it can form an applicable and replicable model, which can provide practical experience for similar cities at home and abroad to implement the UN 2030 Agenda for Sustainable Development.

7.Yan Mowen, Liu Deling, Li Zhenqing, et al. The function of the urban section of the Beijing-Hangzhou Grand Canal [J]. Shandong Water Conservancy Science and Technology Forum,2007(00):305-308.

8.Yu Kongjian, Li Dihua, Li Wei. The complete values of the Beijing-Hangzhou Grand Canal[J]. Advances in Geographical Sciences,2008(02):1-9.

1.1.2 Yangzhou’s uniqueness and significance as a canal city

Yangzhou is the starting point of the Grand Canal in history and the source city of the eastern route of the South-North Water Transfer Project. As the leading city for the Grand Canal’s nomination as an UNESCO World Heritage Site, Yangzhou has accumulated rich experience in the heritage protection and development and utilization of canal resources along the Grand Canal. Yangzhou section of the Grand Canal starts from the junction of Huai’an and Yangzhou to Yangzhou’s Guazhou Town in Hanjiang District, with a total length of about 150 kilometers, making it an important part of Huaiyang Canal. It is also one of the first canals constructed in China that is still operating[9].

Yangzhou took the lead in the nomination of the Grand Canal in China as an UNESCO World Heritage Site. In 2007, Yangzhou coordinated 34 other cities along the Canal to work on the nomination of the Grand Canal. At the 38th World Heritage Conference held in Doha, Qatar in June 2014, the Grand Canal of China was selected and included into the World Heritage List[10]. Yangzhou has made important contributions to the protection and management of the canal heritage and has accumulated rich experience.

Yangzhou is a key city of the Eastern Route of South-North Water Transfer Project. The Eastern Route of South-North Water Diversion Project fosters balanced development of South and North China, which is vital to the national economy and people's livelihood. The project lifts water from Jiangdu pump station in Yangzhou and sends water to the north along the Beijing-Hangzhou Grand Canal, a main branch of the Grand Canal. Each year, more than 15 billion cubic meters of water from the Yangtze River is diverted to North China, effectively alleviating the water shortage in Beijing, Tianjin, Hebei province and Shandong Province. In recent years, the examining result of 12 main rivers of the South-North Water Transfer Project in Yangzhou shows that their water quality is all good or fair, and the overall water quality of the Yangzhou section of the Beijing-Hangzhou Grand Canal is excellent[11].

Yangzhou has pledged to protect, inherit and utilize the heritage of the Grand Canal. Yangzhou is a pioneer in heritage protection in China. Over the years, the city has also been actively renovating local historic sites and cultural relics, improving the quality of local riverways, formulating local plannings and implementing policies and regulations of cultural heritage protection, many of which are facilitated by digital and scientific means. In terms of heritage protection, Yangzhou renovated Shaobo Ancient Street, Gaoyou Yucheng Courier Station and The Former Residence of Salt Merchant Wang Lumen. In terms of heritage inheritance, Yangzhou has been investing in the establishment of 13 inheritance and training centers for traditional culture such as woodblock printing and paper-cutting art, 486 heritage blocks, numbers of culture blocks such as Guqin and Chinese Zither culture park, 25 professional studios for renowned traditional artists, and cultural research institutions such as the Grand Canal Research Institute of China. In 2009, with the approval of the State Council, Yangzhou initiated and established the World Historic and Cultural Canal Cities

9.Yangzhou Municipal Committee, Yangzhou Municipal People’s Government. Yangzhou City Grand Canal Cultural Protection and Heritage Utilization Implementation Plan [R]. Yangzhou, Jiangsu, 2020-12-31.

10.CPC Yangzhou Municipal Committee, Yangzhou Municipal People’s Government. Yangzhou City Grand Canal Cultural Protection and Heritage Utilization Implementation Plan [R]. Yangzhou, Jiangsu, 2020-12-31.

11.Yangzhou Release. National People’s Congress Representative Zhou Shanhong: The Establishment of the South-North Water Transfer East Source Ecological Compensation Mechanism [2021-03-04]. http://www.yznews.cn/p/1355103.html.

Cooperation Organization (WCCO) and held 14 World Canal Cities Forums consecutively. The city has hosted the World Canals Conference twice and held multiple canal related cultural exhibitions and performances each year, such as Grand Canal Book Inheritance and Development Forum, Canal Charms and Canal Culture Carnival. In terms of heritage utilization, on the basis of the implementation of "Three changed to Two" construction project, Yangzhou extended or re-constructed multiple navigation locks of the canal's trunk line in recent years, including Shiqiao Lock and Shaobo Lock. Now, Yangzhou section of the canal becomes the inland waterway in China that has the highest shipping density. With the new navigation locks, the canal has reach 422 million tons ship diversion as of 2019, which is 2.9 times as heavy as that of the Three Gorges navigation locks. In addition, the irrigation area along the Canal reaches 1.1 million mu, and the designed speed of water pumping in first phase of the Eastern Route of the Yangzhou South-North Water Transfer Project is 500 cubic meters per second.[12]

Among the 35 cities along the Grand Canal, Yangzhou is one that has unique geographical location and exceptional historical and cultural value. Therefore, taking Yangzhou as an example for implementing the SDGs assessment of canal cities, can not only fully showcase the actions and achievements and effectively identify the weaknesses of the city's urban sustainable development, but also pinpoint the key areas for future improvement and accumulate practical experience SDGs localization. The challenges and experiences of the implementation of SDGs in Canal Cities will then be able to be shared with a broader audience around the globe.

1.2 Necessity of the Research

Canal cities play an essential role in achieving the 2030 SDGs

As remarkable creations of human beings in the process of living with nature, canals are great witnesses of the human civilization. Since the ancient time, canals have nurtured cultures, given birth to cities and bestowed them with growth and prosperity[13]. Canal cities have superior location and transportation conditions, well-developed industrial systems, safe and livable space, healthy ecological environment, and diversified and inclusive culture thanks to the canals' water transportation function, water transmission and supply function, irrigation function, flood control and drainage function, rich ecosystem, and cultural heritage. In addition, canal cities develop, flourish and become attractive because of water which is the most important resource and the core of sustainable development of these cities. Therefore, whether canal cities develop sustainably determines sustainable development prospects for other cities around the world. Water is the key resource of canal cities and a building block of the 2030 Agenda for Sustainable Development: while Goal 6 is clean water and sanitation, Goals 11, 13, 14 and 15 are all have dimensions related to water. Water management, protection, conservation and utilization in canal cities is highly compatible with the concept of the SDGs and will provide great reference for the realization of sustainable development globally.

12.CPC Yangzhou Municipal Committee, Yangzhou Municipal People's Government. Yangzhou City Grand Canal Cultural Protection and Heritage Utilization Implementation Plan [R]. Yangzhou, Jiangsu, 2020-12-31.

13. 100 Ancient Towns of Global Canal Cities Gathered in Yangzhou to Discuss Sustainable Development [EB/OL]. Zhejiang Online. https://china.zjol.com.cn/gnxw/201805/t20180516_7280844.shtml.

Creating a Methodology for Assessing SDG Progress in Canal Cities

Since the World Commission on Environment and Development (WECD) first proposed the concept of sustainable development in the report Our Common Future in 1987, there has been no shortage of methodologies and indicator systems for assessing sustainable development. Given different understandings of sustainable development, there has been disagreement in choosing assessment methods, indicators and weightings, making it difficult to establish a globally recognized and universally applied methodology. The 2030 Agenda and subsequent assessment system made up of 232 indicators launched in 2016 helped establishing a standard system with unified evaluation methods and comparable evaluation results.

However, issues still exist when the methodology for assessing the SDGs at the global and national level are directly applied to the assessment of cities. Indicators selected and designed for assessing SDGs at the national level may not be applicable to assessing SDGs at the urban level. In addition, indicators for assessing SDG progress in an urban area --- such as the ones developed by the Sustainable Development Solutions Network (SDSN) for American and European cities, focus on the general attributes of cities--- may not be a good indicator for assessing SDG progress in canal cities with unique characteristics. A new methodology is required for appropriately assessing SDGs in canal cities that is based on SDG indicator systems and takes into account urban characteristics.

1.3 Canal City SDGs Assessment Index (CCSAI): The Theoretical Framework

1.3.1 Traditional Sustainable Development Assessment Methods and their shortcomings

Composite index assessment method: weak comparability

The comprehensive indicator assessment method is one of the traditional methods commonly used for assessing sustainable development. Sustainable development pursues economic performance, social equity and environmental sustainability. Therefore, comprehensive indicator assessment methods are based on an assessment system composed of 3E goals: economy, equity and environment. Economic performance refers to a high economic growth rate at the macro-economic level, or maximization of profits or income at the micro-economic level. Social equity refers to equity among different social groups or individuals of the same social group, including intergenerational equity. Environmental sustainability is defined as meeting future needs for human development within natural boundaries[14].

Some research based on the 3E assessment framework proposes a multi-dimensional assessment system focused on the economy, environment and (social) equity, including resources, ecosystems, population and society. Some simplify the 3E framework to use fewer dimensions, such as resource and environment input, economic and social output, along with sustainable development status and dynamics. There is no standardized method: assessment systems often use different indicators, they attach different weightings to the indicators, while biased by considerable subjectivity in choosing the level of dimensions and complexity of the assessment itself. Overall, these assessment systems produce non-comparable results.

14.Jiahua, Pan, “Rethink on Economy of Sustainable Development”, Renmin Daily, 29 May 2015.

Monetary value assessment method: poor applicability

The monetary value assessment method evaluates the overall value of a city over different periods by converting it to monetary units. It measures the market value of basic factors for sustainable development such as resources and environment. The values of each factor are added up to reflect the overall performance of a city's sustainable development. Although the monetary value assessment method overcomes the problem of measurement in multi-target methods, it is not widely accepted by the academic community and public, and is not applicable universally. Three reasons can explain why. Firstly, it lacks a basis in ethical values. There is no basis in ethics for measuring the market value of one's health, life, or the extinction of a species. Secondly, it lacks scientific support. There is not enough research on the pricing mechanism for heavy metal pollution in soil and air pollution, for example, to effectively incorporate the harm in the cost of production. Thirdly, methods for determining the monetary value of different environmental goods vary considerably and are often complex, resulting in un-comparable results. [15]

Theoretical flaws of traditional assessment methods: the development paradigm of industrial civilization

Overall, existing sustainable development assessment methods, whether the comprehensive indicator assessment method or the monetized value assessment method, are based on the theory of value in classical economics, which is the development paradigm of industrial civilization. The latter emphasizes economic growth over environmental sustainability and intergenerational equity. The development paradigm of industrial civilization is flawed theoretically and methodologically in two ways. First, it adheres to the monism with human beings as the agency, regards nature as an objective entity in an inanimate state, and believes that the purpose of resource conservation and ecological protection is to ensure the sufficient supply of human consumption. Such view ignores the common ground between human and nature and the possibility for co-existence, mutual benefit and co-prosperity. Second, future returns are highly uncertain due to insufficient information and perceptual gaps. The paradigm fails to effectively take into account the needs of future generations by considering that resources that are not needed to satisfy the present are not necessary or valuable to protect. These realizations seriously undermine environmental sustainability. Both the 3E-based indicator assessment method and ecological monetized value assessment method measure development primarily by economic growth, neglecting environmental sustainability and intergenerational equality. The application of such methods in policy-making results in increasing challenges in implementing environmental sustainability[16].

1.3.2 The Theoretical Framework: The 5Ps

Sustainable development: the paradigm of ecological civilization

Sustainable development under the paradigm of industrial civilization has been explored in theory, method and practice for years, but still faces multiple challenges and difficulties. China is proposing to move from a development paradigm based on industrial civilization to one based on ecological civilization, focused on achieving harmony between humans and nature, and improving the theoretical underpinnings, research methodologies, policy decisions and practices. China's innovation in introducing and mainstreaming ecological civilization concepts and systems have some important lessons for the global realization of the 2030 Agenda.

15.Pan Jiahua. Rethinking the Economics of Sustainable Development. People's Daily, 2015-06-29(022).
16.Pan Jiahua. Rethinking the Economics of Sustainable Development. People's Daily, 2015-06-29(022).

As China's economy and society transform and develop, the environment is no longer considered valueless, but is gradually being recognized as an important part of social welfare and productivity. Conclusions such as "the environment is the people's livelihood", and "lush mountains and clear waters are our invaluable assets" illustrate the transition, reflecting a dialectical unity that acknowledges and emphasizes the value of nature. According to the Chinese conceptual framework, the core of sustainable development lies in ensuring the peaceful co-existence of humanity and nature. Human activities must respect, comply with and protect nature; otherwise, dire consequences could ensue. The theory of sustainable development under the paradigm of ecological civilization emphasizes respecting, complying with and promoting human-nature harmony, instead of transforming, monetizing or destroying nature for humanity's sake. As Chinese experts see it, the ethical basis of the paradigm of ecological civilization is no longer utilitarianism, as it is currently perceived for the paradigm of industrial civilization. That is replaced with respect for human beings and nature and the pursuit of eco-equity and social justice. As a result, promoting production and accumulating wealth go hand in hand with environmental protection, pollution control, and an efficient use of natural resources. The theory for assessing sustainable development under the paradigm of ecological civilization requires seeking social and ecological equity and ensuring ecological security[17].

The 5Ps

In the 2030 Agenda, the development of the 5P concept is an important innovation and key conceptual framework for sustainable development. 5P concept goes beyond Green-GDP, 3E, and SDGs-17G assessment methods in terms of ethical cognition, theoretical basis, target function, and institutional design (as shown in Table 1-1). The 5Ps include:

"People" stands for everybody in the sense of "leave no one behind"; it does not refer to individuals or ethnic groups, nor to the public or groups in general. The "People" concept focuses on human beings, including eliminating poverty and hunger in all forms, so that all people can fulfil their potential in a healthy environment, equally and with dignity.

"Planet" refers to the natural resources and habitat for human development. It addresses not only local environmental pollution, ecological degradation and resource exhaustion, but also emphasizes issues affecting the future survival of humanity, including climate change, a healthy marine environment, and ecosystem biodiversity. This means maintaining a peaceful coexistence between humanity and nature, building global environmental security, pursuing sustainable consumption and production, effective management of natural resources, taking prompt action to address climate change and ensuring global climate security.

"Prosperity" goes beyond simple economic growth and enrichment of material assets, embracing sustainable, green, and common prosperity. It aims to promote economic transformation and progress, realizing sustainable prosperity so that everyone can live a prosperous and fulfilling life. It also seeks to achieve economic, social and technological advancement, while coexisting peacefully with nature.

17.Pan Jiahua. Rethinking the Economics of Sustainable Development. People's Daily, 2015-06-29(022).

"Peace" is not a simple concept, or the opposite of "war". It means social inclusiveness and harmony. It strives for social justice and harmony, focusing on creating a society free from fear and violence that is peaceful, fair and inclusive, respecting different cultures, ethnicities and belief systems, as well as supporting mutual tolerance between individuals and societies[18].

"Partnership" emphasizes mutually beneficial cooperation between countries, as well as between countries and non-state actors in the international governance system. It aims to improve and promote cooperation between all stakeholders, increasing the participation of all individuals in efforts to meet the needs of the poorest and most vulnerable . [19]

	Green-GDP	3E	SDG-17G	SDG-5P
Ethical cognition	Labor theory of value	Labor theory of value	Nature-theory of value	Nature-theory of value
Theoretical basis	Environmental Externality Theory and Resource Economics Theory under the Paradigm of Industrial Civilization	Sustainable Development Economics Theory and Ecological Economics Theory under the Paradigm of Industrial Civilization	Sustainable Development Theory under the Paradigm of Ecological Civilization	Sustainable Development Theory under the Paradigm of Ecological Civilization
Target function	economic profit maximization	social welfare maximization	social welfare and sustainable development	social welfare and sustainable development
Institutional design	More protection of capital, less focus on human and nature	More protection of capital, less focus on human and nature	More focus on human and nature	More focus on human and nature
Assessment dimension(s)	1 dimension	3 dimensions	17 dimensions	5 dimensions

Table 1-1 Sustainable Development Assessment Methods

18.Pan Jiahua, Chen Zi. A transformational agenda for sustainable development in 2030[M]. Social Sciences Literature Press: Beijing, 2016: 6-7
19.Ibid.

Beyond the Traditional Development Concept

Sustainable development based on the 5Ps goes beyond the traditional sustainable development concept based on the 3Es, economy, (social) equity and environment. First, two more dimensions are included: peace (social justice and harmony) and partnerships (implementation). Peace is more of a governance goal for a country or region, providing the foundation for meeting all SDGs, while improving partnerships, addresses international or trans-regional governance, providing critical support to the Goals. Second, the 5Ps have a richer content and stronger policy directive than the 3Es. The "People" concept incorporates more than traditional social equity to include the key pledge of the 2030 Agenda: "leave no one behind". The "Planet" concept refers to more than traditional resources and environmental protection. It highlights the significance of the stability of the ecosystem. The "Prosperity" concept, in addition to the traditional idea of overall prosperity, focuses more on each person's prosperity within natural boundaries.

1.4 The Canal City SDG Assessment Index: The Methodology

1.4.1 Selection of indicators

The assessment of SDG implementation progress of canal cities is to construct Canal City SDG Assessment Index system under the guidance of theory, collect data of the assessment indicators, and analyze the SDG implementation progress of the canal city based on the assessment formula. Indicators' selection is critical for progress' assessment. Based on specific research objectives, different indicator selection methods can be adopted. In this study, indicators are selected based on the following three criteria: (1) Indicators applicable to urban SDG evaluation from the 232 SDG global indicators. (2) Indicators selected from China's five-year plans and Canal planning documents or various urban planning processes. (3) Other relevant indicators with commonly available data at Chinese municipal level.

Indicators applicable to urban SDG evaluation from the 232 SDG global indicators.

The list of global SDG indicators contains 232 individual indicators. Since the SDGs focus on assessing sustainable development at the national level, some indicators are not applicable at the urban level. Therefore, indicators not suitable for urban-level assessment are eliminated in the 5P-based indicator system.

Indicators selected from China's five-year plans and Canal planning documents or various urban planning processes

Promoting urban development via urban planning is a widely recognized practice. China's consecutive "five-year economic and social development plans" have provided road maps for urban growth and built a foundation for urban development data collection. The continuity of data from the five-year plans enables the evaluation of dynamics and trends in different areas. Besides the five-year plans, departments of local and municipal governments often conduct special planning in various areas, such as spatial structure, economic development, environmental protection, social

welfare, etc. In addition, cities along the course of the Canal often have canal-related planning documents to clarify the requirements on functions, protection and development of the Canal. These special planning efforts offer another source of data and some of their indicators are included in the CCSAI for a more comprehensive overview of SDG progress.

Other relevant indicators with commonly available data at Chinese municipal level.

The CCSAI includes a third category of indicators reflecting the correlation between indicators, with high policy relevance to guide future urban development. Examples of such indicators include decoupling indicators that reflect the elasticity between economic/social development and environmental resource consumption, as well as landscape fragmentation indicators, measuring the level of segmentation of large habitats or smaller land areas following urbanisation, with significant impact on ecosystem conservation. Although the landscape fragmentation indicator has limited historical data for a robust analysis, evaluation data can still be obtained from remote-sensing image data at different stages. Forward-looking indicators

1.4.2 The Canal City SDG Assessment Index System

The assessment of SDG implementation progress of canal cities is to construct Canal City SDG Assessment Index system under the guidance of theory, collect data of the assessment indicators, and analyze the SDG implementation progress of the canal city based on the assessment formula. Indicators' selection is critical for progress' assessment. Based on specific research objectives, different indicator selection methods can be adopted. In this study, indicators are selected based on the following three criteria: (1) Indicators applicable to urban SDG evaluation from the 232 SDG global indicators. (2) Indicators selected from China' s five-year plans and Canal planning documents or various urban planning processes. (3) Other relevant indicators with commonly available data at Chinese municipal level.

(1) Canal City Specific Indicators

Many cities originated from canals. Canals have made important contributions to the cities' economic development, social harmony, cultural prosperity, and ecological protection, and to a certain extent, promotes cities' sustainable development process. In order to highlight the characteristics of canal cities and fully demonstrate the role of canals in sustainable urban development, this study has creatively developed a characteristic indicator system for assessing the sustainable development of canal cities based on five canal-related dimensions: protection, research, inheritance, cultural promotion, and utilization, as shown in Table 1-2.

Dimension	Indicator	No.	SDGs
People	Proportion of water bodies with good water quality in the canal	PPL-C060203	Goal 6
	Per capita expenditure on preserving, protecting and conserving all cultural and natural heritages	PST-C110401	Goal 11
	Expenditure on preserving, protecting and conserving all cultural and natural heritages as a percentage of financial expenditure	PST-C110402	Goal 11
	Whether the city has formulated laws and regulations for the protection of the canal heritage, and established the hierarchical and classified list and archives of the canal cultural heritage, as well as the information database of cultural relics resources and protection achievements	PST-C110404	Goal 11
	Proportion of the area of the canal control and protection zone to the city' s land area	PST-C110405	Goal 11
	Protection rate of natural wetlands	PLN-C150202	Goal 15
	Proportion of ecological canal banks	PLN-C150203	Goal 15
Research	Number of institutions and academic research institutes established to carry out canal protection and heritage utilization	PST-C090501	Goal 9
	Total number of published canal-related research results	PST-C110406	Goal 11
Inheritance	Number of canal-themed literary and artistic works	PPL-C040702	Goal 4
	Number of projects included in the representative list of national intangible cultural heritage	PST-C110407	Goal 11
	Total number of representative inheritors of intangible cultural heritage at the city-level or above	PST-C110409	Goal 11
Cultural promotion	Number of schools that have carried out education on canal culture	PPL-C040701	Goal 4
	Whether the city has written the idea of canal culture into the urban economic and social development plan	PST-C110410	Goal 11
	Number of canal-related international events as an organizer or co-organizer	PTS-T170602	Goal 17
Utilization	Added value of the tourism industry as a percentage of GDP	PST-C080901	Goal 8
	Added value of cultural and related industries as a percentage of GDP	PST-C080902	Goal 8
	Area of culture-tourism integration demonstration area	PST-C080903	Goal 8
	Proportion of navigable sections of the canal	PST-C090105	Goal 9

Table 1-2 Canal City Specific Indicators

(2) The Generic Canal City SDG Assessment Index (CCSAI)

Based on the 5P concept and indicator selection criteria discussed, this study builds a generic Canal City SDG Assessment Index (CCSAI) consisting of five dimensions – the 5Ps – totaling 87 indicators (Figure 1-3). The dimension of "People" contains 32 indicators, "Planet" contains 9 indicators, "Prosperity" contains 37 indicators, "Peace" contains 4 indicators and "Partnership" contains 5 indicators.

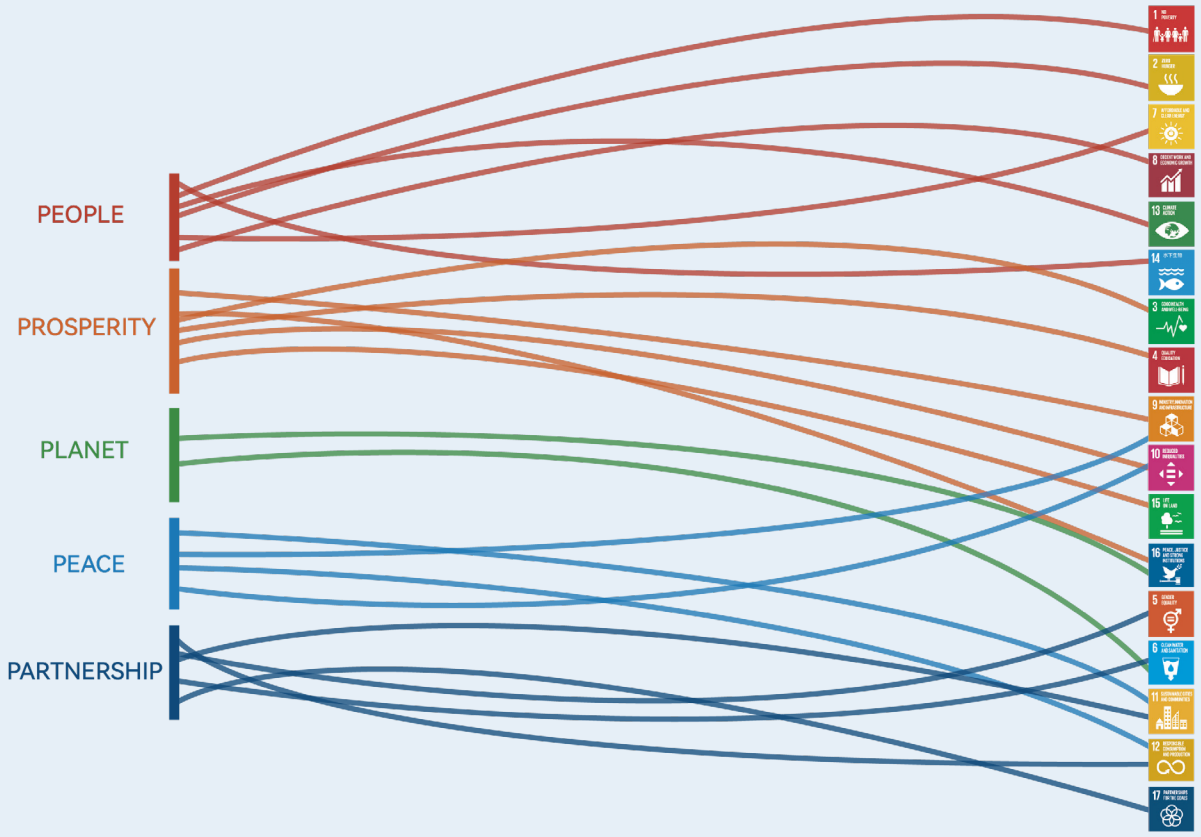


Figure 1-1 5P-based Urban SDG Assessment Indicator Selection

(3) Key indicators and Core indicators in the CCSAI system

This study deconstructs the CCSAI system into three levels, as shown in Figure 1-2.

The first level contains 37 core indicators, which reflect the level of sustainable development of cities and that can be used for horizontal comparison among canal cities and with other types of cities.

The second level contains 68 key indicators, including core ones (refer to indicators other than canal-specific ones in Table 1-3). These indicators embody the 5P concept of the 2030 Agenda at the city level, indicating the progress and gaps in sustainable development of cities.

The third level represents the overall CCSAI system that contains 87 indicators, including core, key and canal-specific indicators. It is the most complete reflection of canal cities' sustainable development progress.

5P	SDGs	Indicators	No.
PEOPLE	Goal 1: End poverty in all its forms everywhere	Population under the national poverty line	PPL-C010101
		Basic medical insurance participation rate*	PPL-T010301
		Basic pension insurance participation rate*	PPL-T010302
	Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Disposable income of residents*	PPL-T020101
		Annual production of food crops per unit of sown area	PPL-T020301
	Goal 3: Ensure healthy lives and promote well-being for all at all ages	Number of practicing (assistant) physicians per 10,000 people*	PPL-C030101
		Mortality rate of children under five	PPL-C030102
		Death rates of pregnant and lying-in women	PPL-C030103
		Deaths from traffic accidents per 100,000 people	PPL-C030104
		Vaccination rate	PPL-C030105
		Infant mortality rate	PPL-C030201
		Life expectancy	PPL-G030001
		Number of hospital beds per 10,000 people*	PPL-T030801
	Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Student-teacher ratio in general primary schools*	PPL-C040101
		Student-teacher ratio in general secondary schools*	PPL-C040102
		Over-15 illiteracy rate	PPL-C040103
		Average years of schooling	PPL-C040104
		Net enrollment ratio of school-age children in primary schools	PPL-C040105
		Number of schools that have carried out education on canal culture	PPL-C040701
		Number of canal-themed literary and artistic works	PPL-C040702
		Share of education expenditure in GDP*	PPL-T040301
	Goal 5: Achieve gender equality and empower all women and girls	Whether a city has formulated legal frameworks to promote, practice and monitor equality and the elimination of gender discrimination*	PPL-C050101
		Share of women among the Municipal People Congress representatives	PPL-C060101
	Goal 6: Ensure availability and sustainable management of water and sanitation for all	Proportion of sewage centrally treated in wastewater treatment plants*	PPL-C040702
		Water consumption per unit of GDP*	PPL-C060102
		Proportion of water bodies with good environmental water quality	PPL-C060201
		Water quality compliance rate of urban centralized drinking water sources	PPL-C060202
		Proportion of water bodies with good water quality in the canal	PPL-C060203
		Water supply rate*	PPL-T060101

5P	SDGs	Indicators	No.
PEOPLE	Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all	Share of population with access to electricity*	PPL-C070101
		Proportion of non-fossil energy in primary energy consumption	PPL-C070201
		Energy consumption per unit of GDP*	PPL-T070301
PROSPERITY	Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Per capita GDP*	PST-C080101
		Urban registered unemployment rate*	PST-C080201
		Added value of the tourism industry as a percentage of GDP	PST-C080901
		Added value of cultural and related industries as a percentage of GDP	PST-C080902
		Area of culture-tourism integration demonstration zone	PST-C080903
		Whether the city developed and operated a youth employment strategy as a separate strategy or as part of an urban employment strategy	PST-T080101
		Added value of the tertiary industry as a percentage of GDP*	PST-T080301
		Decoupling indicator between energy consumption and economic growth	PST-T080401
	Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Proportion of R&D expenditure in GDP*	PST-C090101
		Proportion of navigable sections of the canal	PST-C090105
		Highway Density	PST-C090106
		Number of institutions and academic research institutes established to carry out canal protection and heritage utilization	PST-C090501
		Patents per capita*	PST-T090001
	Goal 10: Reduce inequality within and among countries	Per capita income ratio between urban and rural residents	PST-C100101
		Actual foreign capital utilization as a percentage of total foreign direct investment*	PST-T100001
		Theil index	PST-T100201
	Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable	Whether city has the disaster emergency plan*	PST-C110101
		Ratio of bus travel to vehicle travel during peak traffic	PST-C110102
		Whether population forecasts and resource demand are reflected in the city’ s urban and regional development plans	PST-C110103
		Direct economic loss caused by disasters as a percentage of GDP*	PST-C110201
		Annual average PM2.5 concentration*	PST-C110202
		Whether the city has established an urban planning structure that operates regularly and democratically with direct participation of civil society	PST-C110204
		Per capita expenditure on preserving, protecting and conserving all cultural and natural heritages	PST-C110401

5P	SDGs	Indicators	No.
PROSPERITY	Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable	Expenditure on preserving, protecting and conserving all cultural and natural heritages as a percentage of financial expenditure	PST-C110402
		Whether the city has formulated laws and regulations for the protection of the canal heritage, and established the hierarchical and classified list and archives of the canal cultural heritage, as well as the information database of cultural relics resources and protection achievements	PST-C110404
		Proportion of the area of the canal control and protection zone to the city' s land area	PST-C110405
		Total number of published canal-related research results	PST-C110406
		Number of projects included in the representative list of national intangible cultural heritage	PST-C110407
		Total number of representative inheritors of intangible cultural heritage at the city-level or above	PST-C110409
		Whether the city has written the idea of canal culture into the urban economic and social development plan	PST-C110410
		GDP output per unit of built-up area	PST-T110001
		Proportion of new green buildings in cities and towns	PST-C090101
		Proportion of navigable sections of the canal	PST-T110002
		Urban road network density	PST-T110201
		Holdings in public library per capita *	PST-T110401
		Greening coverage rate in built-up area*	PST-T110601
	Goal 12: Ensure sustainable consumption and production patterns	Whether there is already a city-wide action plan, priority or target for practicing sustainable consumption and production	PST-C120101
		Non-hazardous domestic waste treatment rate*	PST-C120201
PLANET	Goal 13: Take urgent action to combat climate change and its impacts	Whether mitigation, adaptation, impact reduction and early warning of climate change is already a part of the curricula for elementary and middle schools well as higher education institutions*	PLN-C130101
		Whether capacity building for coping with climate change is comprehensively carried out	PLN-C130102
		Whether city has an organization that is set up to address climate change*	PLN-C130201
	Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Share of natural reserve in total land area	PLN-C150201
		Protection rate of natural wetlands	PLN-C150202
		Proportion of ecological canal banks	PLN-C150203
		Ratio of industrial solid waste utilized*	PLN-T150102

5P	SDGs	Indicators	No.
PLANET		Per capita green space*	PLN-T150501
PEACE	Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Whether a city has formulated legal frameworks to promote, practice and monitor equality of ethnic groups*	PEC-T160001
		Criminal cases per 10,000 people*	PEC-T160101
		Coverage rate of township (street) public legal service centers	PEC-T160301
		Whether the registration of birth has been conducted*	PEC-T160901
PARTNERSHIP	Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development	Proportion of mobile users in permanent residents*	PTS-T170601
		Whether city has conducted at least one population and household census in the past 10 years*	PTS-C170001
		Whether city has a coordination policy mechanism for sustainable development*	PTS-C170101
		Share of internet users*	PTS-C170102
		Number of hosted/ co-hosted canal-related international events	PTS-T170602

Note: Indicators marked with * are core indicators.

Table 1-3 City SDGs Assessment Index System

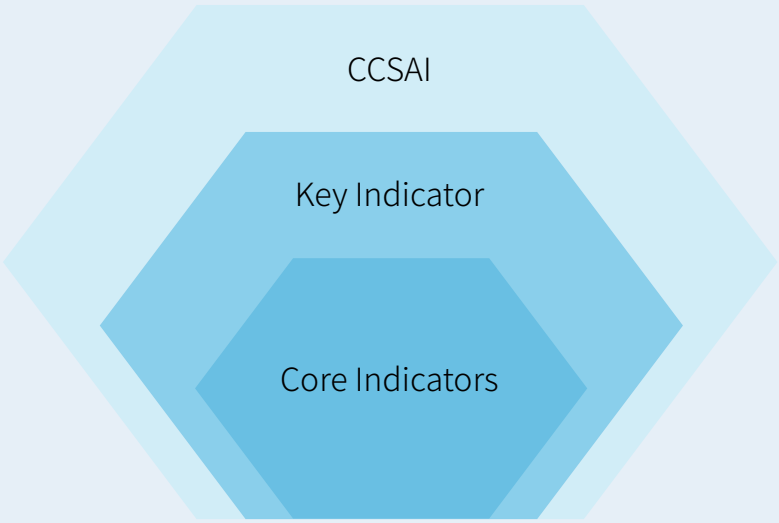


Figure 1-2 of CCSAI

1.4.3 Assessment Methodology for the Chinese City SDG Assessment Index

(1) Implementation progress and gap assessment methodology

The assessment of urban sustainable development focuses on measuring the implementation progress and gaps to 2030 targets. Implementation progress assessment (Figure 1-3) refers to differences between the current implementation status and the benchmark, the development made since the start of the assessment, fixed, in this study, to the year 2000. The target gap assessment (Figure 1-4) refers to the difference between current progress and

the target fixed for 2030. The progress assessment, from an historical point of view, highlights areas where development and achievement of SDGs have been realized and to which degrees of success. The gap assessment points to areas with room for improvement, requiring more attention for future development.

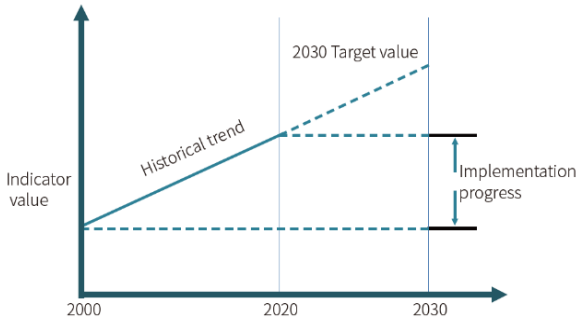


Figure I-3 Progress Assessment[20]

The implementation progress assessment formula is as follows:

$$PAI_i = \frac{IV_i^{2020} - IV_i^{2000}}{TG_i^{2030} - IV_i^{2000}} \times 100\% \quad (1.1)$$

Specifically, PAI_i represents the percentage of the implementation progress of indicator; and refer to the value of the indicator i; IV_i^{2000} and IV_i^{2020}, refer to the value of the indicator i in 2000 and 2020, respectively; and TG_i^{2030} represents the target value of the indicator i in 2030[21].

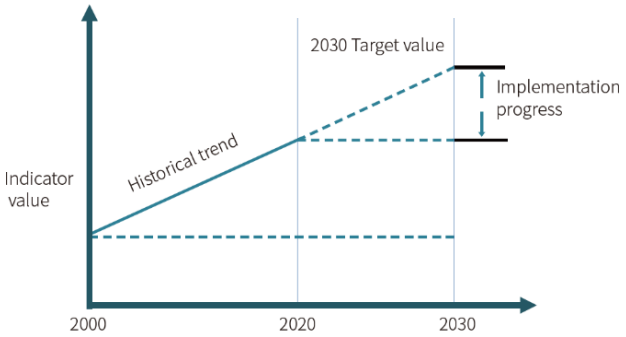


Figure I-4 Target Gap Assessment

The target gap assessment formula is as follows:

$$TGA_i = \frac{IV_i^{2030} - IV_i^{2020}}{TG_i^{2030} - IV_i^{2000}} \times 100\% \quad (1.2)$$

Specifically, TGA_i Target Gap Assessment index, represents the percentage of the target gap of indicator i, $IV_i^{2000}$and IV_i^{2020} refer to the value of the city indicator i in 2000 and 2020, respectively; and TG_i^{2030} represents the target value of indicator in 2030.

(2) Development of the Canal City SDG Assessment Index

The Canal City SDG Assessment Index

Next key step once progress assessment indices for each selected indicator have been calculated is to determine the weight to use to calculate the assessment index at the urban level. With the development of information technology, methods for determining the weighting of indicators have diversified, ranging from subjective weighting methods to objective ones.

Subjective weighting assessment methods, which adopt qualitative approaches, obtain weights according to the subjective judgments of experts based on their experience and assessment of the indicators. In this category, commonly used methods include analytic hierarchy process, Delphi method, order correlation analysis method, etc. The analytic hierarchy process and Delphi method are most widely used, as they are able to hierarchically address complex problems and quantify qualitative problems.

20.This graph only reflects the progress of indicators whose directions are positive. Indicators with reverse directions share the same principle.
21.With reference to the methodology of the 2020 Chinese Cities SDG Report, progress was calculated from scratch for indicators with missing 2000 data.

Objective weighting methods measure indicators according to the correlation between indicators, or relationship between indicators and assessment results, and are based on historical information of the indicator, enabling researchers to reduce the influence of human factors as much as possible and generate weighting results with stronger objectivity. Examples include entropy weight method, principal component analysis, variable coefficient method, Topsis, etc. The entropy weighting method is most widely used, using the decision matrix as the input.

Finally, there is the subjective-objective method, a combined weighting approach which considers the advantages and disadvantages of the weight determination process under subjective and objective methods.

Having compared advantages and disadvantages of various weighting methods and considered the objectivity and comparability of the assessment results, this paper adopts the equal weighting method, as an objective assessment. This method is used in the global Human Development Index (HDI), and in assessing SDG progress globally.

Once indicators are standardized and weights are determined, the value of the urban sustainable development process can be calculated. The formula to do so is as follows:

$$CCSAI_k = \sum W_{ki}\, CCSAI_{ki} \quad (1.3) \qquad CCSAI = \frac{1}{5}\sum CCSAI_k \quad (1.4)$$

Specifically, W_ki is the weight of the i-th indicator in the k-th dimension at the 5P level; 〖CCSAI〗_k is the percentage of implementation progress of the i-th indicator in the k-th dimension among the 5P; is the percentage of implementation progress of the k-th dimension at the 5P level; CCSAI is the comprehensive evaluation value of 2030 sustainable development goals implementation progress, ranging from the minimum 0 to the maximum 1. Higher scores indicate higher implementation level of sustainable development as per the SDGs' indicators.

CCSAI core Indicators

The CCSAI consists of multiple indicators. Although each indicator, representing the work done in one aspect, is equally important for a balanced implementation of the 2030 Agenda, some are considered more representative and more important than others given a specific time (development stage) and a specific knowledge background (cognition).

In order to identify these core indicators, this study adopts the Delphi method, also known as the expert investigation method, to score and screen the core indicators under each P. The paper then assesses the implementation progress and gaps of these core indicators to detect future priorities.

1.4.4 Setting the 2030 Target Value for the Indicators

The indicators' 2030 target value refers to the future level which each indicator is expected to achieve in 2030. The target value for each indicator is the basis for assessing implementation progress and gaps. The 2030 target value is determined in the following ways:

Firstly, for some indicators, the target value is clearly defined in the SDGs framework. Of the 232 SDG indicators, a few are assigned with specific target values. For example: one of the indicators in SDG 1 - No Poverty – is a 0 percent extreme poverty rate (indicator 1.1.1), in line with its target to "end poverty in all its forms everywhere". The 2030 target values for these types of indicators will be determined based on the SDG indicator description.

Secondly, for indicators whose target value is yet to be defined in the SDG targets, the 2030 target value will be determined by the following methods:

- The SDGs in Chinese Cities: Progress Assessment Report. In 2019, UNDP China conducted SDGs progress assessments for 90 Chinese cities and produced a report, setting the 2030 target value for indicators as the value of the 95th percentile city. It reflects the overall level of Chinese cities in certain target areas and avoids the impact of extreme outliers. These target values can continue to be used as 2030 target values for SDGs assessment of canal cities.
- Various urban development plans, where some indicators' target values are generally set for the medium-and long-term development of a city. These target values are also measured in line with local development levels and trends, which can be used as 2030 target values, or as a starting point to derive values for the assessment indicators of the CCSAI calculated here.
- The average value of the performance of the five top-performing cities worldwide: for some indicators without a scientific basis to calculate and estimate the 2030 target value, the paper sets the 2030 target value of the indicator as the average of the top five cities globally in the selected development area.
- The average value of the performance of the top five OECD countries, when data of some indicators is difficult to obtain, as members of the Organization for Economic Cooperation and Development (OECD) have relatively comprehensive data collection. Also, their overall development is relatively high, and as such can represent the "advanced" level in many areas.

1.5 The Formulation of the Report

The cooperation between UNDP and Yangzhou started in April 2021. Taking Yangzhou--- the origin city of the Grand Canal in China--- as an example, the cooperation takes place in areas including the implementation of the 2030 Agenda in canal cities, the construction of ecological civilization, high-quality development, and international exchanges of canal cities. The cooperation will also develop the first SDG assessment index system for canal cities, assess Yangzhou's sustainable development progress and deliver the The Implementation of 2030 Agenda by Canal Cities ---Yangzhou Sustainable Development Report.

22.Ritchie, Roser, Mispy, Ortiz-Ospina, "Measuring progress towards the Sustainable Development Goals." SDG-Tracker.org, website,2018. Available at https://sdg-tracker.org/no-poverty#:~:text=Definition%3A%20Indicator%201.1.,location%20(urban%2Frural)%2. &text=Goal%3A%20By%202030%20eradicate%20extreme, less%20than%20%241.90%20a%20day%20.

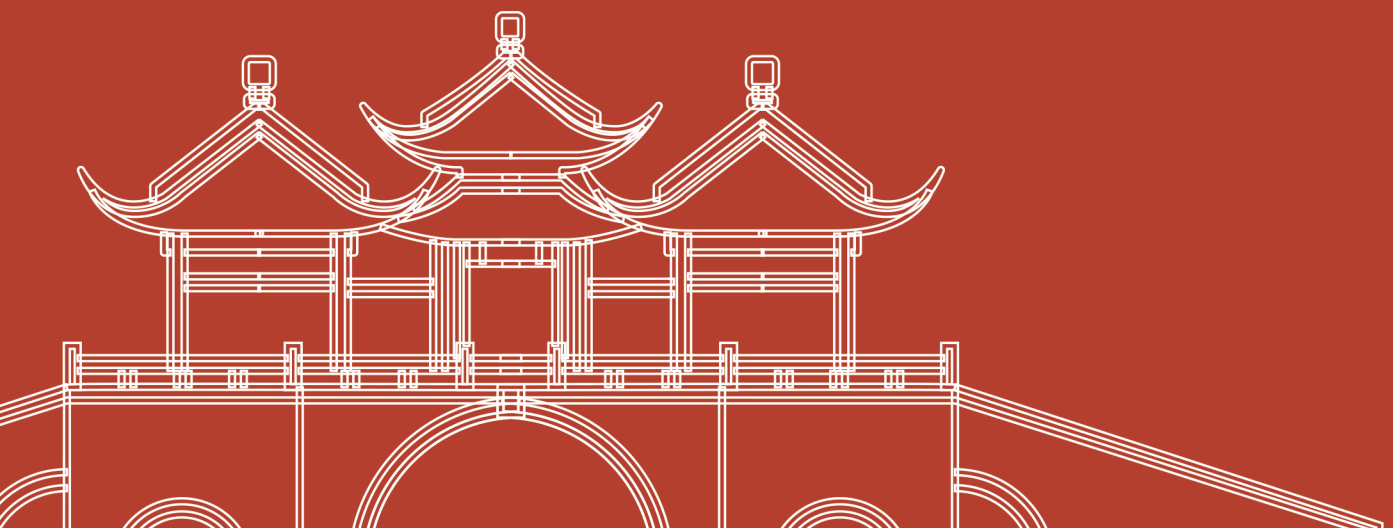
Jointly led by UNDP, the Research Center for Sustainable Development, Chinese Academy of Social Sciences (RCSD) and the World Historic and Cultural Canal Cities Cooperation Organization (WCCO), a joint working team has been set up for Yangzhou's sustainable development progress assessment and the report compilation. A core research team led by RCSD was also set up. The working group and the core research team went to Yangzhou for on-site investigations and had exchange with relevant departments of Yangzhou government, gaining full understanding of actions taken and achievements made by Yangzhou in promoting the SDGs. In order to develop the CCSAI system, the working group has had in-depth consultation sessions with Yangzhou's Development and Reform Commission, Ecological Environment Bureau, Statistics Bureau, Transportation Bureau, Foreign Affairs Office and other government departments, which are coordinated and organized by the Yangzhou Municipal Government, solicited opinions and suggestions from relevant stakeholders, and consulted experts in the field of sustainable development. Many departments of the Yangzhou Municipal Government actively facilitated the working group in the data provision and collection, the verification of case studies and revision of the report.

TWO

Chapter 2

Yangzhou’s Policy and Enabling Environment for Implementing the SDGs

- 2.1 POLICIES AND EFFECTIVENESS OF IMPLEMENTING SDGS IN YANGZHOU
- 2.2 YANGZHOU'S EXPERIENCE IN PROMOTING SUSTAINABLE DEVELOPMENT



As the origin city of the Grand Canal, Yangzhou has thoroughly established and practiced the Two Mountains Theory (Lucid waters and lush mountains are invaluable assets). Yangzhou has released and is implementing a series of plans, policies and actions aimed at promoting sustainable development, aligning its development strategy to the SDGs aiming for balanced and high-quality development. The city is committed to developing a sustainable development model that can be applied, replicated, and promoted, thus providing experience for canal cities to implement the 2030 Agenda for Sustainable Development.

2.1 Policies and Effectiveness of Implementing SDGs in Yangzhou[23]

Yangzhou has formulated and implemented relevant policies and measures for sustainable development. Based on the 5P concept, the analysis of Yangzhou's policies, actions and results in implementing the SDGs will help better benchmark against the 2030 Agenda.

2.1.1 People

Policy actions

Aimed at improving the level of social welfare and creating a dignified, equal, and healthy environment for the local population to fully realize their potentials, Yangzhou has introduced and promulgated guidance documents and policy documents (details in Table 2-1), including (1) Implementation Plan For Comprehensively Promoting the Construction of Healthy Yangzhou; (2) 13th Five-year Plan for Sanitation and Health Development of Yangzhou; (3) Opinions on Accelerating the Implementation of Education Modernization in Yangzhou; (4) Yangzhou Municipal Government's Policy on the Establishment of Functional Zones for Grain Production and Important Agricultural Products Production Reserves; (5) Implementation Plan for the Action Program of Civic Scientific Literary in Yangzhou (2016-2020); (6)The 13th Five-Year Plan for the Development of the Cause of Persons with Disabilities in Yangzhou，and (7) Opinions on Further Strengthening the Management and Protection of Drinking Water Source in the City.

Policy	Goals	Actions
Implementation Plan for Comprehensively Promoting the Construction of Healthy Yangzhou	The population's health literacy level improves significantly. Healthy lifestyles gain more popularity. The rising disease incidence of major chronic diseases is under control. The health conditions of key populations continue to improve. The health protection capacity is enhanced. The development of public health system is accelerated.	Carrying out comprehensive health promotions. Implementing health interventions. Optimizing health services. Strengthening full-cycle health maintenance. Accelerating the construction of a healthy environment. Continuously improve health protection. Accelerating the development of health industry. Promoting the establishment of healthy villages, towns, campuses, enterprises, etc.

23.The policies and data mentioned in this section mainly derived from the "Outline for the 14th Five-Year Plan for Economic and Social Development and Long-Range Objectives through the Year 2035 of Yangzhou City" and other policy documents released by the Yangzhou Municipal Government

Policy	Goals	Actions
13th Five-year Plan for Sanitation and Health Development of Yangzhou	Safeguard and improve people's health and being the pioneer in the province. Further constructing Yangzhou as an exemplary healthy city of China. A modern medical and health service system is built	While building a modern public health service system, focus on fairness and accessibility. Implement the family planning policy and build a well-organized service management system. Building modern medical service system through innovation mechanisms. Modernizing medical security system through strengthened regulation and management. Standardizing medication distribution and building a modern medication supply system. Improving governance capacity and building a modern medical and health supervision system. Promoting inheritance and innovation, and improving the traditional Chinese medicine service system. Strengthening personnel training and building a health science and technology innovation system. Strengthening informatization and building a smart medical solutions system.
Opinions on Accelerating the Implementation of Education Modernization in Yangzhou	Fully realize the development goals of education at all levels and establish an education system that is vibrant, efficient, more open, and fully supports high-quality development. Educational equity becomes more prominent, the quality of education continues to improve, the educational structure becomes more scientific, high-quality educational resources becomes more abundant, and the educational opportunities becomes more accessible for all.	Improve the comprehensive quality of students; promote the high-quality development of basic education; deepen the integration between industry and education in vocational education; promote the optimization and innovation of higher education; improve the national lifelong learning system and cultivate qualified teaching staff; promote the construction of smart education system; strengthen foreign exchanges and cooperation.
Yangzhou Municipal Government’ s Policy on the Establishment of Functional Zones for Grain Production and Important Agricultural Products Production Reserves	Sufficient, modernized functional zones for grain production and important agricultural products production protection reserves that have reasonable layout, facilities, improved production capacity, management and protection system, ensuring the grain production security and stable agricultural infrastructure in Yangzhou,	Improve comprehensive production capacity; develop moderate-scale management; optimize agricultural industrial structure; improve the level of agricultural services.
Implementation Plan for the Action Program of Civic Scientific Literary in Yangzhou (2016-2020)	Progress made in education, dissemination and popularization of science and technology. Establishment of modern scientific literacy organization and implementation system, infrastructure system, condition guarantee system, and monitoring and evaluation system that meet the needs of higher-level innovative cities.	Promote scientific literacy among teenagers, farmers, urban laborers, cadres and civil servants. Implement the projects in areas including scientific education and training, community science popularization, and science informatization.

Policy	Goals	Actions
The 13th Five-Year Plan for the Development of the Cause of Persons with Disabilities in Yangzhou	By the end of 2020, the city's social security system and service system for the disabled persons will be completer and more accessible. Disabled persons have access to quality education, employment, health care, elderly care, supportive housing, and social assistance. The living conditions of disabled persons have been further improved, with their family per capita income stabilized at more than 80% of the city's per capita income level, and the basic living conditions reach a moderately prosperous level.	Implement the "Basic Security Improvement Plan for Disabled Persons" to improve the social security level of disabled persons. Implement the "Livelihood and Development Plan for disabled persons" to enhance the ability of the disabled persons in participating in social activities; Strengthen the safeguard measures and optimize the environment for promoting the development of disabled persons.
Opinions on Further Strengthening the Management and Protection of Drinking Water Source in the City	By 2020, all districts should establish dual-source water supply or emergency water sources, improve water source management agencies, establish management systems, allocate sufficient funds, and improve emergency response facilities, effectively establishing a territorial management mechanism with institutionalized, standardized, informatized water source management and protection system. The water supply guarantee rate and the water quality of the drinking water sources in the city are above 98%.	Formulate scientific plans ensuring water source safety; strictly define water source protection areas; set standardized water source signage facilities; improve environment in water source protection areas; carry out regular water quality assurance check and risk investigations; enhance emergency management of water sources

Table 2-1 Goals and Policy Actions in the “People” Dimension

Results

People's living standards. As of the end of 2020, all registered low-income households in Yangzhou have been lifted out of poverty. The per capita disposable income of urban and rural residents reached CNY 47,202 and CNY 24,813 respectively, an increase of 43.3 percent and 49.3 percent respectively comparing to 2015. The income ratio of urban and rural residents has been further reduced.

Food security. In 2020, the grain area in Yangzhou has reached 5.82 million mu and the total grain output will reach 2.87 million ton. A total of 1.56 million mu of high-standard farmland have been built, with 75 percent of the agricultural products being green and high-quality.[24]

24.This refers to agricultural products meeting the standards outlined in the Green Agricultural Products Label Management Measure issued by the Ministry of Agriculture. http://www.moa.gov.cn/govpublic/SCYJJXXS/201006/t20100606_1532925.htm

Social security. The minimum standard of basic pension for urban and rural residents raised from 105 CNY per person per month in 2015 to 175 CNY in 2020. The minimum living security standards for residents was increased from CNY 390 to CNY 710 per person per month in 2015. The coverage rate of urban and rural basic pension insurance and basic medical insurance reached 98%.

Quality education. In 2020, 98.3 percent of Yangzhou’ s compulsory education schools have met the standards issued by provincial authority, while 75.5 percent met higher quality standards of education issued by the Ministry of Education of China. 100% of Yangzhou's provincial high schools are rated three stars or above. The rate of undergraduate admission to general second tier and above universities per 10,000 people in Yangzhou has ranked first in the province for 4 consecutive years, and Yangzhou’ s quality of high school education is one of the best in the province as indicated by the college entrance examination results. In addition, Yangzhou hosts six provincial model vocational schools, two high quality special vocational schools, and various exemplary training schools (2 pilot secondary vocational schools, 15 modernized training bases and 21 modernized professional groups).

Healthcare services for all and main health indicators. Yangzhou currently has 1 national key clinical specialty and 32 provincial key clinical specialty. Yangzhou has achieved “full coverage of five major treatment centers”, including for chest pain, stroke and trauma at district and county level, while 18 rural medical and health centers have now equipped with upgraded medical facilities as Secondary Hospital. Yangzhou’ s average life expectancy has been steadily increasing, and the infant mortality rate and the mortality rate of children under 5 years old have dropped to 2.14‰ and 3.53‰ in 2020 respectively.

Good water quality. Yangzhou’ s 10 centralized drinking water sources are 100 percent up to the national standard. The overall water quality of the Yangzhou section of the Beijing-Hangzhou Canal is good, and the water quality of the national and provincial test sections all rated Class I, II, and III.

2.1.2 Prosperity

Policy Actions

Aimed at achieving prosperous and fulfilling life for all and sustainable economic and social development, Yangzhou has introduced and promulgated guidance documents and policy documents (details in Table 2-2), including: (1) Opinions on Accelerating the Construction of Emerging Cities with Advanced Science and Technology, (2) 13th Five-Year Plan of Yangzhou Circular Economy Development Plan, (3) Implementation Opinions on Promoting the Integrated Development of Culture and Tourism Industry (2021-2023), (4) Virtual Yangzhou Action Plan (2017-2020), (5) Yangzhou Action Plan for Promoting Intelligent Manufacturing and High-end Equipment Industry Development (2017-2020), (6) Yangzhou Action Plan for Creating a Demonstration City of Modern Comprehensive Transportation System in the Province, (7) Yangzhou Vocational Skills Enhancement Action Plan (2019-2021), and (8) Implementation Plan for Establishing a More Effective New Mechanism for Regional Coordination and Development.

Policy	Goals	Actions
Opinions on Accelerating the Construction of Emerging Cities with Advanced Science and Technology	The overall innovation efficiency of the city has been significantly improved, the framework of technological infrastructure and public service platforms has been established, the accumulation of scientific and technological talent resources has accelerated, and the technological innovation ecosystem has been basically established. The core competitiveness of the industry has shifted to focusing on technological innovation.	Accelerate the cultivation of innovative industrial clusters; build scientific and technological innovation carriers; attract innovative and entrepreneurial talents; accelerate the improvement of corporate innovation capabilities; promote open, integrated and innovative development.
13th Five-Year Plan of Yangzhou Circular Economy Development Plan	By 2020, the circular economy industrial layout of "one industrial base and three industrial parks" will be established in Yangzhou. Key circular industrial chains established in the fields of industry, agriculture and service industries. A city-wide resource recycle system established. A number of circular economy demonstration projects completed. Yangzhou becomes a national circular economy demonstration city with well-developed circular economy.	Continue to promote the construction of circular economy industrial bases, accelerate the cultivation of circular economy industrial parks and establish or improve the circular industry chain for domestic waste, kitchen waste recycling, construction waste recycling, metal recycling, electronic waste recycling, textile recycling, vehicle dismantling and recycling, waste paper utilization, medical waste disposal, crop straw utilization, livestock and poultry breeding, and aquatic ecological farming. Build a circular tourism service system; promote the green development of catering and accommodation industry, and establish a green modernized logistics system.
Implementation Opinions on Promoting the Integrated Development of Culture and Tourism Industry (2021-2023)	By 2023, the total number of tourists will exceed 100 million and Yangzhou’s tourism revenue will exceed 130 billion CNY with more than 550 cultural enterprises. The added value of cultural industry and tourism industry will account for 5% and 9% of the regional GDP respectively.	Accelerate the construction of key cultural and tourism projects, strengthen marketing and promotion of urban intellectual property, improve the modern public service system, promote the healthy development of the cultural and tourism market, and strengthen the integrated development of cultural and tourism.
Virtual Yangzhou Action Plan (2017-2020)	Implement projects that aim to build shared and open data resource system and integrate safe and controllable network security system. Yangzhou will play an exemplary role in fields such as shared services, urban governance, and industrial innovation, and become a national demonstration smart city.	Build Yangzhou big data center and urban operation management platform; construct "virtual Yangzhou" security system and improve safe operation capabilities; develop big data platforms for medical care and ecological environment monitoring and management platform.

Policy	Goals	Actions
Yangzhou Action Plan for Promoting Intelligent Manufacturing and High-end Equipment Industry Development (2017-2020)	Investment in intelligent manufacturing has been optimized; intelligent manufacturing capabilities have been significantly enhanced; the size of high-end equipment has been greatly increased; and high-end equipment technology has continued to make breakthroughs.	Implement four major projects to promote intelligent manufacturing; take four major actions to develop high-end equipment; strengthen four major supports to improve the industrial ecology
Yangzhou Action Plan for Creating a Demonstration City of Modern Comprehensive Transportation System in the Province	By 2025, Yangzhou’ s regional transportation hub will be in place. The city will become a provincial demonstration city of modern transportation system. The "9631" transportation circle and the integrated development of regional transportation and urban and rural transportation will be realized.	Optimize and improve the comprehensive transportation network; improve the quality and efficiency of transport services; improve the effectiveness of industry governance capacity.
Yangzhou Vocational Skills Enhancement Action Plan (2019-2021)	Take vocational skills training as a key initiative to maintain employment stability and alleviate structural employment conflicts, and as an important support for economic transformation/upgrading and high-quality development. Carry out vocational skills training on a large scale, so that by the end of 2021, the proportion of skilled workers among employed persons will be more than 28%, and the proportion of highly skilled personnel among skilled workers will be more than 30%.	Strengthen on-the-job training and job-changing training; strengthen vocational skills upgrading and entrepreneurship training for key employment groups; provide safety trainings for personnel in high-risk industries and special operations; ensure that enterprises play an important role in training; expand vocational college training; and support private training and institutions to carry out training sessions.
Implementation Plan for Establishing a More Effective New Mechanism for Regional Coordination and Development	By 2035, a new mechanism for coordinated regional development will be established to match the goal of basic realization of modernization, providing important support for building a modern economic system; by the middle of this century, the new mechanism for coordinated regional development will be more effective in improving the regional governance system, enhancing regional governance capacity and achieving common prosperity.	Build a regional coordinated development mechanism; improve the mechanism for integrated market development; deepen the mechanism for regional cooperation; optimize the mechanism for regional mutual assistance; improve the mechanism for equalization of basic public services; improve the mechanism for regional policy regulation and control.

Table 2-2 Goals and Policy Actions in the “Prosperity” Dimension

Results

Accelerated economic transformation. In 2020, the per capita GDP of Yangzhou exceeded CNY 130,000, ranking 14th among all Chinese cities, higher than Ningbo, Nantong, Wuhan, Xiamen, Qingdao[25]. A total number of 57 provincial and municipal production service industry clusters (demonstration) areas were built, including 14 provincial service industry clusters (demonstration) areas. The added value of the service industry as a proportion of GDP was 4.8 percent points higher than that of 2015, the total annual revenue of tourism industry exceeded CNY 100 billion. Yangzhou's technology trading market size ranked 1st in Jiangsu Province for three consecutive years, with technology contract turnover jumping from CNY 2.17 billion in 2015 to more than CNY 10 billion in 2020.

Innovation-focused development. In 2020, the R&D expenditure counted 2.5% of Yangzhou's GDP, and the number of patents owned has reached 18/10,000 people. The contribution rate of scientific and technological progress has reached 65%. There are more than 1,600 high-tech enterprises in the city, with the output value of high-tech industry accounting for 48 percent of the output value of the industry, and the added value of strategic emerging industries accounting for 18 percent of GDP. Yangzhou has also built more than 6 million square meters of various science and technology industrial clusters, accommodating more than 5,000 enterprises and more than 50,000 innovative and entrepreneurial talents.

Establishing and improving public cultural service system. As part of the provincial project of constructing "book cities", Yangzhou has built and 50 urban libraries that operate 24 hours with 1.8 million visitors each year. 1,325 comprehensive cultural service centers in rural areas (communities) were built in Yangzhou, which all reached the national standard. Yangzhou now has more than 486 intangible cultural heritage clusters, 70 intangible cultural heritage museums, four national cultural industry bases (parks) and four provincial cultural industry bases (parks). Yangzhou Jiangguang Smart City was selected as a provincial level cultural industry demonstration park.

Modernizing the transportation system. Lianyungang-Huai'an-Yangzhou-Zhenjiang high-speed railway was opened. The Yangtze River - 12.5 m deep water channel phase II project was completed and come into service. The Jiangmen-Guangzhou high-speed expansion project and the Suqian-Yangzhou high-speed were opened to traffic. A number of major traffic projects are under construction, including the Beijing-Shanghai Expressway expansion project, Wufeng Mountain river-crossing highway connection, Longtan river-crossing, the Beijing-Hangzhou Canal green shipping demonstration area, Yangtze International Airport expansion, etc. In rural areas, 1,600 km of roads, 400 bridges are newly built to ensure rural communities' access to reliable public transportation. All administrative villages now have two-lane level-4 roads and bus services.

2.1.3 Planet

Policy Actions

Yangzhou has released of a series of plans and documents that provide the high-level design for promoting economic transformation and development, implementing measures for sustainable consumption and production, sustainable management of natural resources, and addressing climate change. Relevant guidance documents and policy documents include: (1)Implementation Plan of the Three-year Action Plan for Protecting Yangzhou's Blue Skies (2)

25.Yangzhou Evening News-Yangzhou. http://www.yznews.com.cn/wap/2021-10/03/content_7318283.html

Opinions on the Implementation of “Coal Reduction” in Yangzhou in Winning Uphill Battle for Prevention and Control of Pollution, (3) Yangzhou Ecological River and Lake Action Plan (2018-2020), (4) Work Plan for Rectifying Yangzhou's Wastewater Discharge in Yangtze River, (5) Implementation Plan of Yangzhou Yangtze River Protection and Restoration Action Plan, and (6) Plan for Prevention and Response to Low Temperature Rain and Snow Freezing Weather. (For details, see Table 2-3)

Policy	Goals	Actions
Implementation Plan of the Three-year Action Plan for Protecting Yangzhou’s Blue Skies	By 2020, total emissions of sulfur dioxide, nitrogen oxides, VOCs and PM2.5 concentration rate shall reduce over 20% comparing to 2015; the proportion of good air quality days shall reach 73.9%, and the proportion of heavily polluted days shall be 25% less than in 2015.	Adjust and optimize the industrial structure, and promote the green industrial development; accelerate the adjustment of energy structure, building a clean, low-carbon and efficient energy system; adjust the transport structure, building a green transportation system; optimize the land-use structure; implement major special projects to reduce pollutant emissions; strengthen regional effort in the prevention, control and response to heavily polluted weather; improve the legal and regulatory system and promulgate environmental economic policies.
Opinions on the Implementation of “Coal Reduction” in Yangzhou in Winning Uphill Battle for Prevention and Control of Pollution	By the end of 2018, Yangzhou's thermal power industry, gas industry, water industry (including stand-alone power plants) will reduce their total amount of coal consumption by 450,000 tons, comparing to 2016.	Strengthen control measures in order to reduce coal consumption; rectify coal-fired boilers; accelerate industrial upgrading and transformation; improve the quality of coal; strictly control increased production capacity from fixed asset investment activities; develop renewable energy.
Yangzhou Ecological River and Lake Action Plan (2018-2020)	Through comprehensive implementation of ecological river and lake actions, establishing interconnected, well-functioned, high-quality and ecologically diverse lake water systems by 2020. With improved water quality, people’s life satisfaction will be significantly improved.	Strengthen water security, water resources protection, water pollution prevention and control, water environment management, water ecology restoration, protection of cultural properties of water, water project management and water system innovation.
Work Plan for Rectifying Yangzhou’s Wastewater Discharge in Yangtze River	Comprehensively grasp the current situation of wastewater discharge in the Yangzhou section of the Yangtze River through investigation, measurement, tracing and treatment; remediate illegal wastewater discharge in rivers; further improve the long-term supervision mechanism and reinforce local community’s responsibility; strive to enhance the ecological protection of the Yangtze River.	Find out the total number of wastewater discharge drains in rivers, carry out wastewater discharge monitoring, improve traceability of sewage discharge.

Policy	Goals	Actions
Implementation Plan of Yangzhou Yangtze River Protection and Restoration Action Plan	Enhanced protection for ecological functions of wetlands along the mainstream and tributaries of Yangtze River and key lakes. ecological water demand will be secured; ecological and environmental risks will be mitigated, and ecological environment quality will continue to improve. By the end of 2019, the water quality of the control sections of the main tributaries of the Yangtze River will reach the standard, and most of the polluted water bodies in the urban built-up areas will be eliminated. By the end of 2020, 71.9% of the city’ s water quality reached Level III standard in provincial reviews, and the proportion of good water quality of centralized drinking water sources in cities at the county level and above is higher than 98%.	Strengthen the monitoring of ecological environment while strictly adhering to the ecological protection red line; investigate and eliminate illegal sewage discharges, and promote the unified supervision of land and water; strengthen industrial pollution control to effectively prevent ecological and environmental risks; continue to improve the environment of rural habitat and curb agricultural pollution; strengthen the construction of environmental infrastructure to ensure the safety of drinking water sources; strengthen the prevention and control of shipping pollution, and prevent environmental risks in ships and ports;; optimize the allocation of water resources and secure ecological water demand; strengthen ecosystem management and protection, and ban actions that cause ecological damage; strive to repair the ecological environment of the Yangtze River
Plan for Prevention and Response to Low Temperature Rain and Snow Freezing Weather	By formulating pre-incident plans, prevent and respond to disasters resulting from snow and ice storms and minimize the impact and harm on urban operations and people's life.	Identify the warning period for disasters resulting from snow and ice storms, formulate prevention and response plans, cut down emergency response time, ensure sufficient goods and equipment supply in case of emergency, strengthen news media publicity and social mobilization.

Table 2-3 Goals and Policy Actions in the “Planet” Dimension

Results

By the end of 2020, the city’ s chemical industrial areas were reduced from 22 square kilometers to 9 square kilometers, and a total of 501 highly polluted chemical enterprises were shut down. The proportion of the Yangtze River ecological coastline increased from 47.5% in 2018 to 56.9%. Compared with 2015, the PM2.5 concentration dropped by 34.5 percent, the share of good air quality days rose by 12.2 percentage points, 84.4% of the city’ s water quality reached good/fair standard in provincial reviews, and most urban built-up areas have remediated highly polluted water bodies. Furthermore, Yangzhou has adopted the river chief and lake chief systems, supporting volunteer river chiefs as an important public force for water governance. Yangzhou has also passed the national forest city assessment, with its forest coverage rate of 24 percent. With these results, Yangzhou is named as national ecological city, national water ecological civilization city, and national model city for water conservation.

2.1.4 Peace

Policy Actions

Yangzhou City has made efforts to modernize its social governance to create a peaceful, just, and inclusive society free from fear and violence. The guidance documents and policies including: (1) Yangzhou's Urban Security Development Action Plan (2018-2020), (2) Implementation Opinions on Promoting Reform and Development in Work Safety, (3) Implementation Opinions on Strengthening the Construction of Safety Risk Control System in Primary and Secondary Schools and Kindergartens, and (4) 13th Five-Year Plan for the Construction of Emergency Response System in Yangzhou City. (For details, see Table 2-4)

Policy	Goals	Actions
Yangzhou's Urban Security Development Action Plan (2018-2020)	By 2020, a comprehensive and systematic urban security development system shall be established. An urban security social governance structure featuring joint contribution and shared benefits shall be developed. The level of urban security shall be significantly improved.	Recognize the importance of urban security in urban development, and lay a solid foundation for urban security; strengthen the safety of key urban industries, and capacity of urban emergency management and rescue and cyber security.
Implementation Opinions on Promoting Reform and Development for Work Safety	Prevent serious large-scale production and safety incidents, reduce the total number of production and safety incidents, and prevent occupational diseases. By 2030, modernize the safety production governance system and enhance governance capacity, improve the population's safety competency.	implement the safety production responsibility system; reform the safety supervision system; promote the rule of law; establish a safety prevention and control system; strengthen capacity building in safety infrastructure security.
Implementation Opinions on Strengthening the Construction of Safety Risk Control System in Primary and Secondary Schools and Kindergartens	In accordance with the principles of overall coordination, people-oriented, and rule of law, establish a scientific and systematic school safety risk prevention and control system.	Improve the school safety risk prevention system, safety risk control mechanism, safety accident handling and risk resolution mechanism.
13th Five-Year Plan for the Construction of Emergency Response System in Yangzhou City	Establish an emergency response system that matches the risk of public safety and covers the full cycle of emergency management, improve the overall level of prevention and response to emergencies and reduce emergency incidents and the harm they cause.	Strengthen the construction of the emergency organization system, security system, monitoring and early warning system, emergency planning system, emergency response system, recovery and reconstruction system, and emergency education system.

Table 2-4 Goals and Policy Actions in the "Peace" Dimension

Results

With the survey result of the city's sense of public security remained above 95% for 17 consecutive years, Yangzhou is regarded as one of the safest cities in both Jiangsu province and China, and was awarded with "National Model City in Social Governance Advancement". Yangzhou's grid-based and refined social governance has been applied in communities and tourist attractions, such as Wenchang Garden, Qionghua Taoist Temple, and Anping Community. Thanks to the solid steps it has taken on improving the rule of law, Yangzhou was named as national model city for enhancing legal awareness. Yangzhou has advanced local legislation process, introducing legislations of new categories. Yangzhou City Park Regulations was introduced as the province's first legislation for open parks. The city has also been modernizing its social governance system, seamlessly connecting the city, county and township levelled departments to ensure a holistic urban and rural management system. The first municipal social governance modernization command center has been set up in this regard.

2.1.5 Partnership

Policy Actions

Yangzhou has established a governmental committee that guides and oversees its participation in China's national efforts in supporting the Belt and Road Initiative and the Yangtze River Economic Belt. It also took the initiative to integrate into the construction of the Yangtze River Delta and the Nanjing-Zhenjiang-Yangzhou city cluster. Yangzhou has fully implemented dual management system of pre-establishment national treatment and negative lists for foreign investment market access. Besides, Yangzhou has implemented the "530" investment action plan and the "6+X" mechanism to attract Fortune 500 and multinational companies through coordination among government departments. The city has cooperated with the World Historic and Cultural Canal Cities Cooperation Organization (WCCO), other canal cities, and internationally renowned canal management agencies to host the World Canal Cities Forum. It has signed friendship agreements with a number of cities and expanded exchange and cooperation in foreign trade, education, culture, tourism and other areas. (For details, see Table 2-5).

Partner	Cooperation Program	Actions
Yangzhou Development and Reform Commission, Jiangsu Hanjian Group, Yangzhou, World Historic and Cultural Canal Cities Cooperation Organization Cultural Development Foundation, etc.	Yangzhou "Belt and Road" Development Promotion Association	Conduct policy and information exchange, consultation, investment and financing, member training, international exchange, etc.
World Historic and Cultural Canal Cities Cooperation Organization (WCCO), domestic and international canal cities, and internationally renowned canal management agencies	World Canal Cities Forum, etc.	Promote economic and cultural exchanges among canal cities, share development experiences, promote mutually beneficial cooperation and common prosperity of canal cities

Partner	Cooperation Program	Actions
23 friendship cities in 15 countries including Japan, the United States and Germany	Friendship city	Exchanges and cooperation in areas such as politics, economic development, science and technology, education, culture, health, sports, environmental protection and youth development
50 Friendly-Exchange City 30 countries such as Canada, Germany and Korea	Friendly interaction city	Carry out various forms of exchanges in areas such as investment, trade, culture, education, personnel exchanges, capital flows, and information integration

Table 2-5 Programs and Actions in the “Partnership” Dimension

Results

The first comprehensive service platform for the “Belt and Road Initiative” (BRI) in Jiangsu Province— Yangzhou “Belt and Road” Development Promotion Association was established. Yangzhou Economic and Technological Development Zone (YEDZ) became the shareholder of China-UAE Industrial Capacity Cooperation Demonstration Zone, a national-level BRI capacity cooperation park. Yangzhou Urban Construction State-Owned Assets Holding and Yangzhou Economic Development Zone Co., Ltd each successfully issued 300 million USD of overseas bonds, and the third phase of the Tangwang Sewage Treatment Plant secured a 40-million-euro loan lent by the German government. Yangzhou has more than 100 manufacturing enterprises that have implemented overseas projects, mainly in Southeast Asia, the Middle East and Africa. Yangzhou has also established a BRI project library, connecting national and provincial key project libraries. In the library, there are 31 new projects of Fortune 500 companies and multinational companies, such as Compagnie de Saint-Gobain S.A., SAF-HOLLAND Group, and Rettig Heating. Yangzhou has also strengthened communication and exchange with countries across world in particular other canal cities. Yangzhou has signed friendship city agreements with 23 cities from 15 countries and established friendship ties with 50 cities from 30 countries. Remarkably, Yangzhou led the initiation of World Historic and Cultural Canal Cities Cooperation Organization (WCCO), aiming at promoting canal culture to the world through World Canal Cities Forums and World Canal Conferences. WCCO is now participated by more than 60 canal cities around the world, and Yangzhou has hosted World Canal Cities Forum for 14 consecutive years and hosted World Canal Expo for two years. The city has been named as World City of Canals, UNESCO City of Gastronomy, Culture City of East Asia.

2.2 Yangzhou's Experience in Promoting Sustainable Development

Yangzhou’s successful experience in promoting economic, social and cultural development and international exchanges while embracing environmental sustainability deserves to be learnt from and provides a valuable reference for the sustainable development of other canal cities.

2.2.1 The Regulatory Framework

Over the years, Yangzhou has integrated the concept of sustainability into its development approach and planning, paying attention to the coordinated development of the economy, society, culture and environment. A coordination mechanism among departments at the municipal level was put in place, guided by documents in the fields of economic development, social governance, cultural development and ecological protection, paving the way for implementing the sustainable development plan. These documents include: Opinions on Accelerating the Construction of Emerging Cities with Advanced Science and Technology, Yangzhou Action Plan for Promoting Intelligent Manufacturing and High-end Equipment Industry Development (2017-2020) Implementation Opinions on Promoting the Integrated Development of Culture and Tourism Industry (2021-2023), Implementation Plan For Comprehensively Promoting the Construction of Healthy Yangzhou, 13th Five-year Plan for Sanitation and Health Development of Yangzhou, Opinions on Accelerating the Implementation of Education Modernization in Yangzhou, 13th Five-year Plan for Cultural Development, Regulations for the Protection of Historic and Cultural Cities in Yangzhou (2015-2030), Yangzhou Ecological River and Lake Action Plan (2018-2020), Implementation Plan of the Three-year Action Plan for Protecting Yangzhou’s Blue Skies, Work Plan for Rectifying Yangzhou’s Wastewater Discharge in Yangtze River.

2.2.2 Innovation-driven Development and Quality Economic Growth

Yangzhou prioritizes innovation-driven high-quality development and strives to optimize its economic structure. It has actively implemented the strategic planning for transforming the city into regional science and innovation center. Relying on intelligent manufacturing and deep integration of industrialization and information technology, Yangzhou has made solid progress in industrial transformation and upgrading and is meeting the demands of enterprises in the “323+1” advanced manufacturing clusters[26]. The proportion of Yangzhou’s added value of strategic emerging industries in GDP continues to increase. The city is now completing the construction of an independent and controllable advanced manufacturing system, and focused on developing advanced manufacturing projects.

2.2.3 Fair and Accessible Public Service for All

With freedom, equality, justice, rule of law, tolerance, pluralism and openness becoming the mainstream social values for Yangzhou. In recent years, Yangzhou has continued to optimize and enhance its public services, including building urban park network, revamping old housing areas, constructing demonstration communities with accessible elderly care, innovatively promoting networked and refined social governance with Yangzhou characteristics, providing citizens with a full range of services 24/7, effectively enhancing the people's sense of gain, happiness and security.

26. "323+1" industrial cluster: "3" refers to three hundred billion-level clusters such as automobiles and parts, high-end equipment, and new power equipment; "2" refers to two 50-billion-level clusters such as microelectronics and software and information service industries, high-end textiles, and clothing; "3" refers to three ten-billion-level clusters such as offshore equipment and high-tech ships, biomedicine and new medical devices and food; "1" refers to the aviation industry cluster.

2.2.4 Prioritizing Heritage Protection and Embracing the Canal Culture

Canal culture has become an important cultural symbol of Yangzhou, thanks to Yangzhou's protection and inheritance of the cultural heritage of the Grand Canal. Thanks to Yangzhou and efforts of 35 cities along the Canal, the Grand Canal of China was inscribed on the UNESCO World Heritage List. In addition to building the China Grand Canal Museum and Canal Three Bays Ecological and Cultural Park, Yangzhou has also been promoting canal culture in creative ways through creating culture blocks for non-traditional heritage and professional studios for renowned traditional artists. The formation of the World Historic and Cultural Canal Cities Cooperation Organization (WCCO) was also initiated by Yangzhou, aiming at promoting canal culture to the world through World Canal Cities Forums and World Canal Conferences. Canal culture has become an important cultural symbol of Yangzhou. The practice of protecting and inheriting the cultural heritage of the Grand Canal in Yangzhou is in line with the concept of the SDGs. Yangzhou's experience will provide reference for the world canal cities to promote the implementation of the SDGs and make further efforts to protect the world cultural heritage.

2.2.5 Green Development

Yangzhou has been actively practicing the Two Mountains Theory and taken the lead in building the Jianghuai Ecological Corridor, using greenbelt parks and corridors to set a strong ecological security barrier for the Grand Canal. By connecting these green corridors, ecological functions of the green areas were enhanced. The planned area of the chemical industrial park in Yangzhou has been reduced from 22.57 square kilometers to 9.6 square kilometers. A total of 501 highly polluted chemical industrial enterprises have been shut down. 3,974 fishermen were stopped from fishing in prohibited fishing areas. Yangzhou insists on promoting livelihood projects, ensuring its residents' full access to clean drinking water, safe food, and clean air, improving rural living environment and launching water conservancy projects to eliminate water-related disasters. The improved urban environment was proven to attract people, eventually becoming a driver of the city's economic growth and social progress.

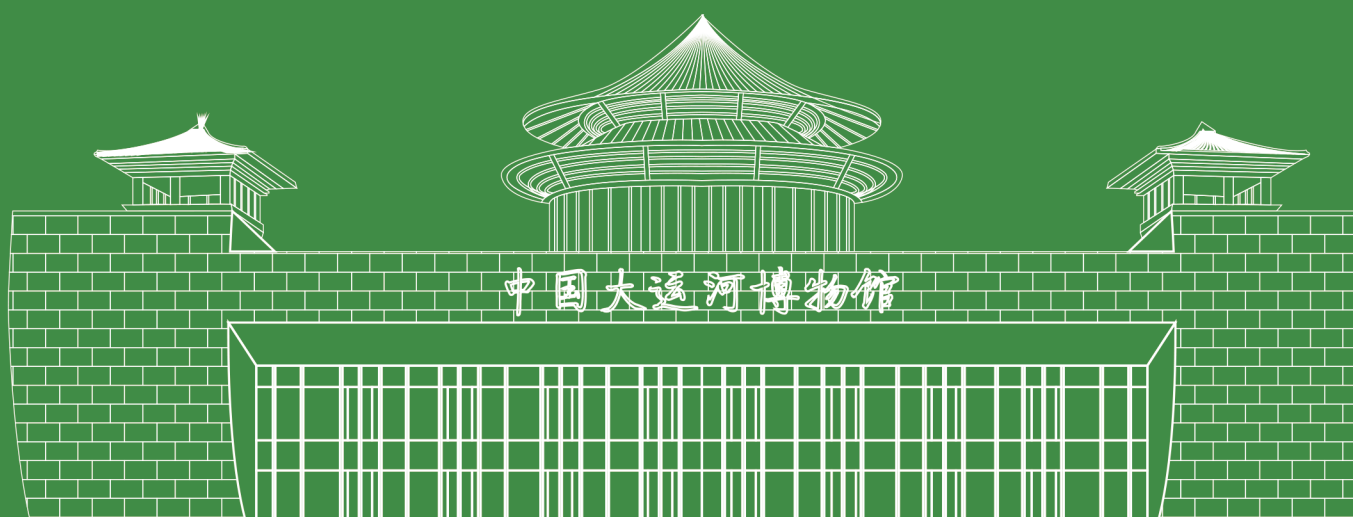
2.2.6 Sharing the Development Experience Through Opening-up and Cooperation

Believing in the idea that opening-up is the basis for enhancing the free flow of inputs of production, in particular high-quality production factors, to increase the value addition of its products, Yangzhou has always positioned itself in relation to global partnerships and competition, setting goals and expanding development areas according to international standards. Through cooperation, development dividends can be shared, and development costs can be lowered. Opening-up and cooperation allowed Yangzhou to narrow the gap and share its experiences with other cities in China and the world. Upholding an open and win-win attitude in promoting international cooperation, Yangzhou has become friendship cities with 23 cities in over 15 countries, and established friendship ties with 50 cities in over 30 cities. Yangzhou is a prominent member of the international canal city alliance, along with more than 60 canal cities around the world. The city also supported the 6th China-Central Asia Cooperation Forum, World Geographical Indication Conference, Jianzhen International Half Marathon, International Automotive Lightweight Conference and other international events. By strengthening in-depth, broad and multi-faceted exchanges and cooperation with foreign government agencies, international organizations, enterprises, research and consulting agencies, and civil society groups, Yangzhou is able to share experiences and lessons with its partners and jointly promote the implementation of the SDGs.

THREE

Chapter 3

SDGs Implementation Progress Assessment in Yangzhou



Based on the systematic data processing and assessment methodology introduced, taking Yangzhou as an example, this chapter applies such methodology to assess the overall progress of SDG implementation in Yangzhou and the progress of indicators in the five dimensions of "People", "Prosperity", "Planet", "Peace", and "Partnership".

3.1 The Yangzhou CCSAI indicators listed according to the 5Ps Indicator

People-based indicators

Proportion of the population below the national poverty line

Indicator No.: PPL-C010101

Indicator direction: Reverse

Description: Percentage of the population below the national poverty line

Unit: %
2000: 0
2020: 0
2030: 0

Source: official website of the Yangzhou Municipal People's Government

Basic medical insurance coverage

Indicator No.: PPL-T010301

Indicator direction: Positive

Description: Percentage of persons covered by basic health insurance in persons eligible for basic health insurance

Unit: %
2000: —
2020: 98
2030: 95

Source: Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035, UNDP Assessment Report on the Progress of Chinese Cities

Urban and rural basic pension insurance coverage

Indicator No.: PPL-T010302

Indicator direction: Positive

Description: Percentage of persons covered by urban and rural basic pension insurance in persons eligible for urban and rural basic pension insurance

Unit: %
2000: —
2020: 98
2030: 95

Source: Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035, UNDP Assessment Report on the Progress of Chinese Cities

Household disposable income

Indicator No.: PPL-T020101

Indicator direction: Positive

Description: Sum of residents' wage income, net operating income, net property income and net transfer income

Unit: CNY
2000: 4628
2020: 38843
2030: 64479

Source: Statistical Yearbook of Jiangsu 2007, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035

Number of professional (assistants) physicians per 10,000 people

Indicator No.: PPL-C030101

Indicator direction: Positive

Description: Number of professional (assistants) physicians per 10,000 people

Unit: People
2000: 13.0
2020: 29.0
2030: 35.0

Source: Statistical Yearbook of Chinese Cities 2001, Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035, Implementation Plan of Comprehensively Promoting Healthy Yangzhou

Under-five mortality rate

Indicator No.: PPL-C030102

Indicator direction: Reverse

Description: Probability of a child (including infant) dying between birth and exactly 5 years of age, expressed per 1,000 live births

Unit: ‰
2000: —
2020: 2.8
2030: 5

Source: Implementation Plan of Comprehensively Promoting Healthy Yangzhou

Maternal mortality

Indicator No.: PPL-C030103

Indicator direction: Reverse

Description: Number of maternal deaths per 100,000 pregnancies. From the beginning of pregnancy to 42 days after delivery, maternal deaths due to various reasons (except accidents) are counted.

Unit: per 100,000
2000: —
2020: 0
2030: 5

Source: Implementation Plan of Comprehensively Promoting Healthy Yangzhou

Average life expectancy of the population

Indicator No.: PPL-G030001

Indicator direction: Positive

Description: Average number of years that people born in the same period can expect to survive if the current age-specific mortality rate remains unchanged.

Unit: age
2000: —
2020: 77.9
2030: 80

Source: Implementation Plan of Comprehensively Promoting Healthy Yangzhou

Number of hospital beds per 10,000 population

Indicator No.: PPL-T030801

Indicator direction: Positive

Description: Number of hospital beds per 10,000 people

Unit: bed per 10,000 people
2000: 23.3
2020: 41.3
2030: 77.4

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Chinese Cities 2020, UNDP Assessment Report on the Progress of Chinese Cities

Student-teacher ratio in general primary schools

Indicator No.: PPL-C040101

Indicator direction: Reverse

Description: Ratio of students to teachers in ordinary primary schools

Unit: —
2000: 21.2
2020: 15.9
2030: 12.6

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Jiangsu 2020, UNDP Assessment Report on the Progress of Chinese Cities

Student-teacher ratio in general secondary schools

Indicator No.: PPL-C040102

Indicator direction: Reverse

Description: Ratio of students to teachers in ordinary secondary schools

Unit: %
2000: 15.7
2020: 10.8 (in 2019)
2030: 8.8

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Jiangsu 2020, UNDP Assessment Report on the Progress of Chinese Cities

Over-15 illiteracy rate

Indicator No.: PPL-C040103

Indicator direction: Reverse

Description: Ratio of the illiterate population over 15 years old to the total population over 15 years old

Unit: %
2000: 9.2
2020: 3.16
2030: 0.4

Source: Census Data by County 2000, Statistical Yearbook of Chinese Population and Employment 2020, average of top 5 countries in the International Statistical Yearbook 2018

Average years of schooling

Indicator No.: PPL-C040104

Indicator direction: Positive

Description: Average number of years that a certain population group received academic education (including adult academic education, excluding various academic training) in a certain period of time and in a certain area

Unit: year
2000: 7.7
2020: 9.7
2030: 13.4

Source: Census Data by County 2000, Data from the Seventh Census of Yangzhou City, average of top 5 countries published on the official website of the UNDP

Net primary school enrollment rate

Indicator No.: PPL-C040105

Indicator direction: Positive

Description: Number of children of official primary school age who are enrolled in primary education as a percentage of the total children of the official school age population

Unit: %
2000: 100 (in 2001)
2020: 100 (in 2008)
2030: 100

Source: Statistical Communiqué on National Economic and Social Development of Yangzhou City 2001, the official website of Jiangsu Provincial Bureau of Statistics

Availability of legal framework to promote, enforce and monitor the achievement of equality and non-sex-based discrimination

Indicator No.: PPL- C050101

Indicator direction: Positive

Description: Whether the city has developed a legal framework to promote, enforce and monitor the achievement of equality and non-sex-based discrimination (1 is "Yes", 0 is "No")

Unit: —
2000: 1
2020: 1
2030: 1

Source: Law of the People's Republic of China on the Protection of Rights and Interests of Women, Law of the People's Republic of China on the Protection of Rights and Interests of Women, UNDP Assessment Report on the Progress of Chinese Cities

Proportion of sewage centrally treated in wastewater treatment plants

Indicator No.: PPL-C060101

Indicator direction: Positive

Description: Proportion of treated domestic sewage and industrial wastewater in total sewage discharge

Unit: %
2000: 48.85
2020: 88.6
2030: 98.1

Source: Statistical Yearbook of Chinese City Construction 2006, Statistical Yearbook of Chinese Cities 2019, UNDP Assessment Report on the Progress of Chinese Cities

Proportion of water bodies in the canal with good water quality

Indicator No.: PPL-C060203

Indicator direction: Positive

Description: Proportion of national and provincial surface water examination sections of the Beijing-Hangzhou Grand Canal with water quality at grade Ⅰ, Ⅱ, Ⅲ in the total national and provincial surface water examination sections of the Beijing-Hangzhou Grand Canal

Unit: %
2000: —
2020: 92.3
2030: 100

Source: Yangzhou Ecological Environment Bureau

Water quality compliance rate of urban centralized drinking water sources

Indicator No.: PPL-C060202

Indicator direction: Positive

Description: Percentage of qualified water in the total water withdrawn from a centralized water source supplying drinking water to an urban area

Unit: %
2000: —
2020: 100
2030: 100

Source: Yangzhou Ecological Environment Bureau

Water supply penetration rate

Indicator No.: PPL-T060101

Indicator direction: Positive

Description: Ratio of the population with access to water supply to the total population of the city

Unit: %
2000: 90.1
2020: 100
2030: 100

Source: Statistical Yearbook of Chinese City Construction 2006, Statistical Yearbook of Yangzhou 2019, UNDP Assessment Report on the Progress of Chinese Cities

Share of population with access to electricity

Indicator No.: PPL-C070101

Indicator direction: Positive

Description: Proportion of the population with access to electricity in the city

Unit: %
2000: —
2020: 100
2030: 100

Source: National Energy Administration, UNDP Assessment Report on the Progress of Chinese Cities

Proportion of non-fossil energy in primary energy consumption

Indicator No.: PPL-C070201

Indicator direction: Positive

Description: Proportion of non-fossil energy in primary energy consumption

Unit: %
2000: —
2020: 17
2030: 25.0

Source: Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035, Building on Past Achievements and Launching a New Journey for Global Climate Actions

Prosperity-based indicators

GDP per capita

Indicator No.: PST-C080101

Indicator direction: Positive

Description: Ratio of gross regional product to total population

Unit: Yuan
2000: 10515
2020: 132784
2030: 215000

Source: Statistical Yearbook of Yangzhou 2019, Yangzhou Development and Reform Commission

Urban registered unemployment rate

Indicator No.: PST-C080201

Indicator direction: Reverse

Description: It is the ratio between urban registered unemployed and the sum of all types of persons that is eligible for employment, that excludes retirees, people with disabilities, students and other groups of people who are defined ineligible for employment.

Unit: %
2000: 3.0
2020: 1.8
2030: 1.7

Source: Statistical Yearbook 2007 for the Yangtze and Pearl River Deltas and Hong Kong and Macao Special Administrative Regions, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, UNDP Assessment Report on the Progress of Chinese Cities

Whether the city has developed and is operating a youth employment strategy, as a separate strategy or as part of the city's employment strategy

Indicator No.: PST-T080101

Indicator direction: Positive

Description: Whether the city has developed and is operating a youth employment strategy, as a separate strategy or as part of the city's employment strategy (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: Yangzhou's 13th Five-Year Plan for Human Resources and Social Security Development, Yangzhou Municipal Government's Implementation Opinions on Implementing Employment Priority Policies and Further Stabilizing Employment

Share of added value of tertiary industry in GDP

Indicator No.: PST-T080301

Indicator direction: Positive

Description: Proportion of the added value of the tertiary industry in the gross regional product

Unit: %
2000: 33.5
2020: 48.9
2030: 52.0

Source: Statistical Yearbook of Yangzhou 2019, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, Yangzhou Development and Reform Commission

Decoupling indicators between energy consumption and economic growth

Indicator No.: PST-T080401

Indicator direction: Reverse

Description: Decoupling of energy consumption growth from economic growth can be expressed as elasticity values where the percentage change of energy consumption is divided by the percentage change of GDP in a given time period. Decoupling index = (the percentage change of energy consumption)/(the percentage change of GDP)=(energy consumption growth rate)/(GDP growth rate)

Unit: —
2000: 1.78
2020: 0.17
2030: 0

Source: Calculation by the research team based on relevant data

Proportion of R&D expenditure

Indicator No.: PST-C090101

Indicator direction: Positive

Description: Proportion of R&D expenditure in the gross regional product

Unit: %
2000: 1.1
2020: 2.5
2030: 4.0

Source: Statistical Yearbook of Chinese Technology 2003, Yangzhou 13th Five-Year Economic and Social Development and Strategic Positioning of the 14th Five-Year Development, UNDP Assessment Report on the Progress of Chinese Cities

Proportion of the navigable reach of the canal

Indicator No.: PST-C090105

Indicator direction: Positive

Description: Proportion of navigable reaches to the total length of the canal within the city in a certain period of time

Unit: %
2000: —
2020: 100
2030: 100

Source: Transportation Bureau of Yangzhou

Highway Density

Indicator No.: PST-C090106

Indicator direction: Positive

Description: Year-end opening mileage of urban expressways and land in administrative areas land area ratio

Unit: kilometer / 100 square kilometers
2000: —
2020: 4.5
2030: 7.1

Source: estimation based on the data provided by the "China Urban Statistical Yearbook" and the Municipal Transportation Bureau, and the "2030 Target Value Basis" provides by the Municipal Transportation Bureau

Patents per 10,000 population

Indicator No.: PST-T090001

Indicator direction: Positive

Description: Number of invention patents granted per 10,000 population

Unit: patent per 10,000 population
2000: 0.01
2020: 3.28
2030: 8.82

Source: Statistical Yearbook of Jiangsu 2011, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, UNDP Assessment Report on the Progress of Chinese Cities

Proportion of realized FDI

Indicator No.: PST-T100001

Indicator direction: Positive

Description: Proportion of realized FDI to the Gross Regional Domestic Product (GRDP) of the year

Unit: %
2000: 1.2
2020: 1.5
2030: 1.6

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Jiangsu 2020, Yangzhou Development and Reform Commission

Theil Index

Indicator No.: PST-T100201

Indicator direction: Reverse

Description: A statistic used to measure the income gap between individuals and regions

Unit: —
2000: 0.128
2020: 0.032
2030: 0.008

Source: Calculation by the research team based on index formula, calculation by the research team based on index formula, average of top 5 countries

Whether a city has a disaster emergency plan

Indicator No.: PST-C110101

Indicator direction: Positive

Description: Whether the city formulates disaster response plans (1 is “Yes”, 0 is “No”)

Unit: —
2000: 1
2020: 1
2030: 1

Source: Law of the People's Republic of China on Flood Control, Emergency Plan for Natural Disaster Relief in Yangzhou City, UNDP Assessment Report on the Progress of Chinese Cities

Whether population forecasts and resource demand are reflected in the city's urban and regional development plans

Indicator No.: PST-C110103

Indicator direction: Positive

Description: Whether the city implements urban and regional development plans that integrate population forecasts and resource needs (1 is "Yes", 0 is "No")

Unit: —
2000: 1
2020: 1
2030: 1

Source: Yangzhou City Master Plan (2002-2020), Yangzhou City Master Plan (2011-2020)

Direct economic loss caused by disasters as a percentage of GDP

Indicator No.: PST-C110201

Indicator direction: Reverse

Description: Direct economic loss caused by disasters as a percentage of GDP

Unit: %
2000: 0.54
2020: 0.06
2030: 0.09

Source: Jiangsu statistical yearbooks over the years, UNDP Assessment Report on the Progress of Chinese Cities

Annual average concentration of PM2.5

Indicator No.: PST-C110202

Indicator direction: Reverse

Description: Annual average of the content of particulate matter with an aerodynamic diameter less than or equal to 2.5 microns per cubic meter of air, used to reflect the air quality status

Unit: Mg/m^3
2000: 70 (First monitoring data in 2013)
2020: 36
2030: 27

Source: Statistical Yearbook of Chinese Environment 2014, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, UNDP Assessment Report on the Progress of Chinese Cities

Establishment of an urban planning structure that operates regularly in a democratic way with the direct participation of civil society

Indicator No.: PST-C110204

Indicator direction: Positive

Description: Whether the city has established an urban planning structure that operates regularly in a democratic way with the direct participation of civil society (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: Measures for the Administration of Urban and Rural Planning in Yangzhou City, etc.

Whether the city has formulated laws and regulations for the protection of the canal heritage, and established the hierarchical and classified list and archives of the canal cultural heritage, as well as the information database of cultural relics resources and protection achievements

Indicator No.: PST-C110404

Indicator direction: Positive

Description: Whether the city formulated laws and regulations for the protection of the canal heritage, established a classified catalogue and archives of the canal cultural heritage, and a database of cultural relic resources and protection achievements (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 0
2030: 1

Source: Implementation Plan for the Protection, Inheritance and Utilization of the Grand Canal Culture in Yangzhou City

Whether the city has written the idea of canal culture into the urban economic and social development plan

Indicator No.: PST-C110410

Indicator direction: Positive

Description: Whether the city incorporated the cultural dimension of the canal into the city's economic and social development plan (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: Yangzhou Fourteenth Five-Year Plan for National Economic and Social Development of Yangzhou City and Outline of Long-Term Goals for 2035

Proportion of new green buildings in cities and towns

Indicator No.: PST-T110002

Indicator direction: Positive

Description: Proportion of newly-built green buildings to newly-built civil buildings in the city

Unit: %
2000: —
2020: 99.8
2030: 100

Source: Housing and Urban-Rural Development Bureau of Yangzhou

Holdings in public library per capita

Indicator No.: PST-C110404

Indicator direction: Positive

Description: Number of books in public libraires per person

Unit: book per person
2000: 0.3
2020: 1.2
2030: 2.2

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Jiangsu 2020, UNDP Assessment Report on the Progress of Chinese Cities

Green space in built-up areas

Indicator No.: PST-C110601

Indicator direction: Positive

Description: Ratio of the green coverage area to the total urban built-up area

Unit: %
2000: 35.9
2020: 44.0
2030: 46.4

Source: Statistical Yearbook of Chinese Cities 2001, Statistical Yearbook of Chinese Cities 2019, UNDP Assessment Report on the Progress of Chinese Cities

Whether there is already a city-wide action plan, working priority or target for sustainable consumption and production

Indicator No.: PST-C120101

Indicator direction: Positive

Description: Whether the city has formulated an urban action plan for sustainable consumption and production or has incorporated sustainable consumption and production as a priority or goal into its urban policy (1 is “Yes”, 0 is “No”)

Unit: %
2000: 0
2020: 1
2030: 1

Source: Yangzhou Energy Conservation 13th Five-Year Development Plan

Harmless treatment rate of domestic garbage

Indicator No.: PST-C120201

Indicator direction: Positive

Description: Percentage of the amount of garbage treated in a harmless manner to the total amount of domestic garbage

Unit: %
2000: 100
2020: 100
2030: 100

Source: Statistical Yearbook of Chinese Cities 2003, Statistical Yearbook of Chinese Cities 2019, UNDP Assessment Report on the Progress of Chinese Cities

Planet-based indicators

Whether mitigation, adaptation, impact reduction and early warning of climate change is already a part of the curricula for elementary and middle schools well as higher education institutions

Indicator No.: PLN-C130101

Indicator direction: Positive

Description: Whether the city has integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: National Disaster Reduction Day Activity Plan, UNDP Assessment Report on the Progress of Chinese Cities

Whether the city fully carries out capacity building in response to climate change

Indicator No.: PLN-C130102

Indicator direction: Positive

Description: Whether the city fully carries out capacity building in response to climate change (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: Jiangsu Province Eco-Environmental System Capacity Building Training in Response to Climate Change held in Yangzhou

Whether relevant institutions in response to climate change are established

Indicator No.: PLN-C130201

Indicator direction: Positive

Description: Whether relevant institutions in response to climate change are established (1 is "Yes", 0 is "No")

Unit: —
2000: 0
2020: 1
2030: 1

Source: Notice of the Yangzhou Municipal People's Government on the Establishment of Yangzhou Leading Group for Climate Change Response, UNDP Assessment Report on the Progress of Chinese Cities

Comprehensive utilization rate of general industrial solid waste

Indicator No.: PLN-T150102

Indicator direction: Positive

Description: Percentage of general industrial solid waste comprehensive utilization in the sum of general solid waste production and comprehensive utilization storage volume in previous years

Unit: %
2000: 91.8
2020: 94.6
2030: 99.1

Source: Statistical Yearbook of Chinese Cities 2006, Yangzhou Ecological Environment Bureau, UNDP Assessment Report on the Progress of Chinese Cities

Per capita green space

Indicator No.: PLN-T150501

Indicator direction: Positive

Description: Per capita occupation of urban park green area

Unit: square meters per capita
2000: 15.87 (as in 2006)
2020: 19.6
2030: 19.5

Source: Statistical Yearbook of Chinese City Construction 2006, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2020, UNDP Assessment Report on the Progress of Chinese Cities

Peace-based indicators

Availability of legal framework to promote, enforce and monitor equality of ethnic groups

Indicator No.: PEC-T160001

Indicator direction: Positive

Description: Whether a legal framework is developed to promote, enforce and monitor equality of ethnic groups (1 is "Yes", 0 is "No")

Unit: —
2000: 1
2020: 1
2030: 1

Source: Constitution of the People's Republic of China, etc., UNDP Assessment Report on the Progress of Chinese Cities

Coverage rate of township (sub-district) public legal service centers

Indicator No.: PEC-T160301

Indicator direction: Positive

Description: Ratio of the number of townships (sub-districts) with public legal service centers to the total number of townships (sub-districts) in the city

Unit: %
2000: —
2020: 100
2030: 100

Source: Official website of the Jiangsu Provincial People's Government

Whether the registration of birth has been conducted

Indicator No.: PEC-T160901

Indicator direction: Positive

Description: Whether the city registers births for all (1 is "Yes", 0 is "No")

Unit: —
2000: —
2020: 1
2030: 1

Source: Implementation Opinions of the General Office of Jiangsu Province on Addressing Household Registration for Unregistered Residents, UNDP Assessment Report on the Progress of Chinese Cities

Partnership-based indicators

Percentage of mobile phone users in permanent population

Indicator No.: PTS-T170601

Indicator direction: Positive

Description: Percentage of mobile phone users in total population

Unit: %
2000: 8.3
2020: 100
2030: 100

Source: Statistical Yearbook 2005 for the Yangtze and Pearl River Deltas and Hong Kong and Macao Special Administrative Regions, Statistical Communiqué on National Economic and Social Development of Yangzhou City 2019, UNDP Assessment Report on the Progress of Chinese Cities

Whether the city has conducted at least one population and housing census in the past ten years

Indicator No.: PTS-C170001

Indicator direction: Positive

Description: Whether the city has conducted at least one population and housing census in the past ten years (1 is "Yes", 0 is "No")

Unit: —
2000: 1
2020: 1
2030: 1

Source: The Fifth National Census on November 1, 2000, the Seventh National Census carried out in 2020, UNDP Assessment Report on the Progress of Chinese Cities

Whether the city formulates a sustainable development coordination policy	
Indicator No.:	PTS-C170101
Indicator direction:	Positive
Description:	Whether the city formulates a sustainable development coordination policy (1 is "Yes", 0 is "No")
Unit:	—
2000:	0
2020:	1
2030:	1
Source:	Yangzhou City Master Plan (2011-2020), Yangzhou Ecological River and Lake Action Plan (2018-2020), UNDP Assessment Report on the Progress of Chinese Cities

Internet penetration rate	
Indicator No.:	PTS-C170102
Indicator direction:	Positive
Description:	Number of Internet users in the city as a percentage of the city's total permanent population
Unit:	%
2000:	10.6
2020:	77.6
2030:	76.0
Source:	Informatization Research Department of State Information Center, Jiangsu Communications Administration, Digital In 2018

3.2 Assessment Results

Overall and separate assessments were carried out to measure implementation progress of sustainable development in Yangzhou as well as the gaps to the 2030 SDGs. The report reaches the following conclusions.

3.2.1 Overall Assessment

(1) Progress evaluation of the 2030 SDGs: the 5Ps

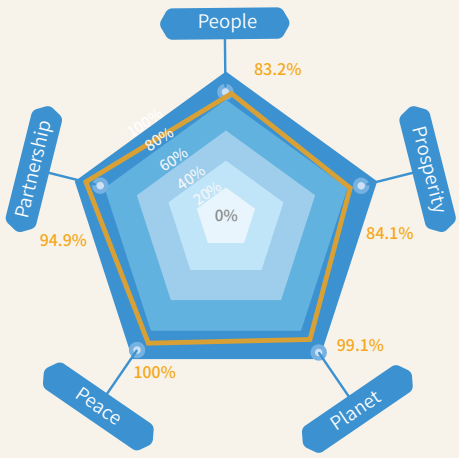


Figure 3-1 Assessment of the 5P dimensions in Yangzhou

Based on the CCSAI, Yangzhou has had good results in the overall completion of its 2030 targets towards the SDGs between 2000 and 2020, with an overall achievement rate of all targets at 92.2 percent. Targets in the Peace dimension have been achieved. The other sub-indices, People, Prosperity, Planet and Partnership have scored achievement rates of 83.2 percent, 84.1 percent, 99.1 percent, and 94.9 percent respectively.

Progress evaluation of the 2030 SDG: the core indicators

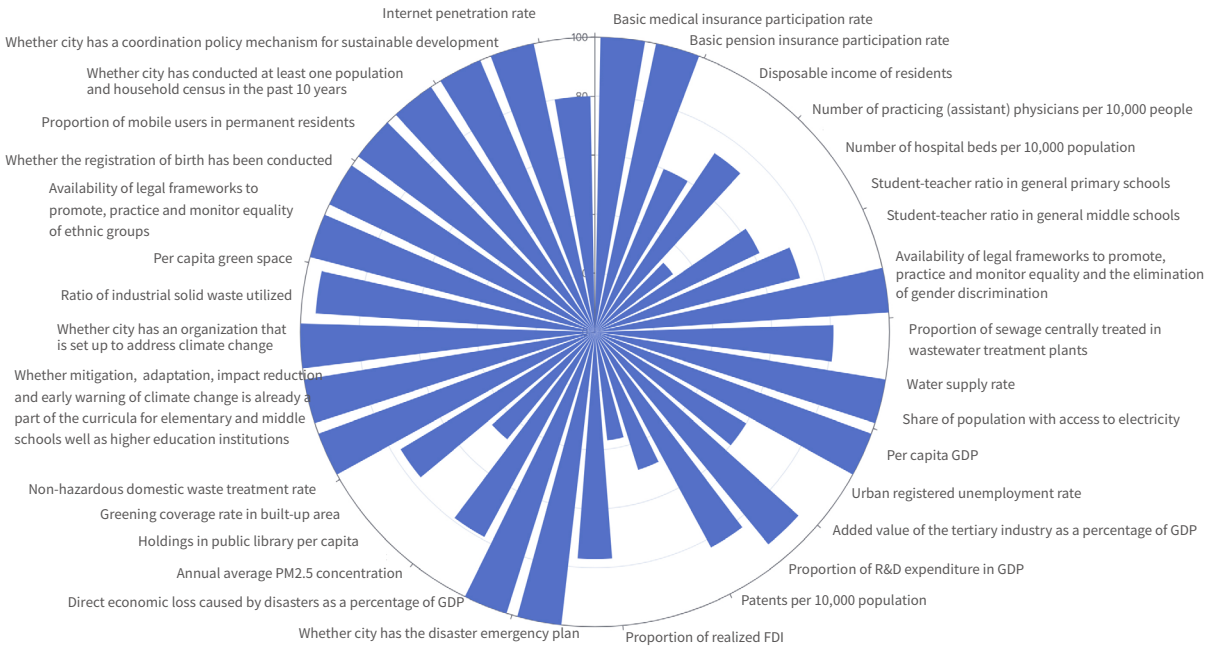


Figure 3-2 Implementation Progress Assessment of Core Indicators

Good progress was made for the core indicators, with an overall realization rate of 83.6 percent. Specifically:

- Core indicators that already met the targets in 2020: basic medical insurance participation rate, basic pension insurance participation rate, whether a city has formulated legal frameworks to promote, practice and monitor equality and the elimination of gender discrimination, water supply rate, share of population with access to electricity, whether city has the disaster emergency plan, direct economic loss caused by disasters as a percentage of GDP, non-hazardous domestic waste treatment rate, whether mitigation, adaptation, impact reduction and early warning of climate change is already a part of the curricula for elementary and middle schools well as higher education institutions, whether city has an organization that is set up to address climate change, per capita green space, whether a city has formulated legal frameworks to promote, practice and monitor equality of ethnic groups, whether the registration of birth has been conducted, whether city has conducted at least one population and household census in the past 10 years, whether city has a coordination policy mechanism for sustainable development, and proportion of mobile users in permanent residents.

- Core indicators that have met 90 percent of their targets: urban registered unemployment rate and ratio of industrial solid waste utilized.

- Core indicators with relatively slow progress: disposable income of residents, number of hospital beds per 10,000 populations, student-teacher ratio in general primary schools, per capita GDP, proportion of R&D expenditure in GDP, patents per capita, holdings in public library per capita, all of which have achieved less than 67 percent of their targets.

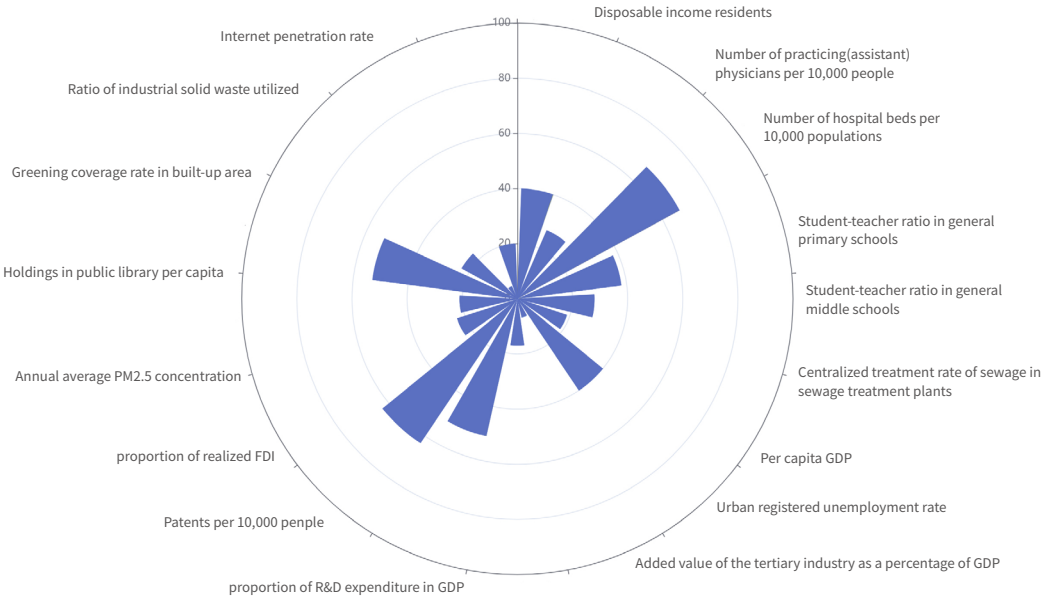


Figure 3-3 Implementation Gap Assessment of the Core Indicators

3.2.2 Assessment of the People Indicators

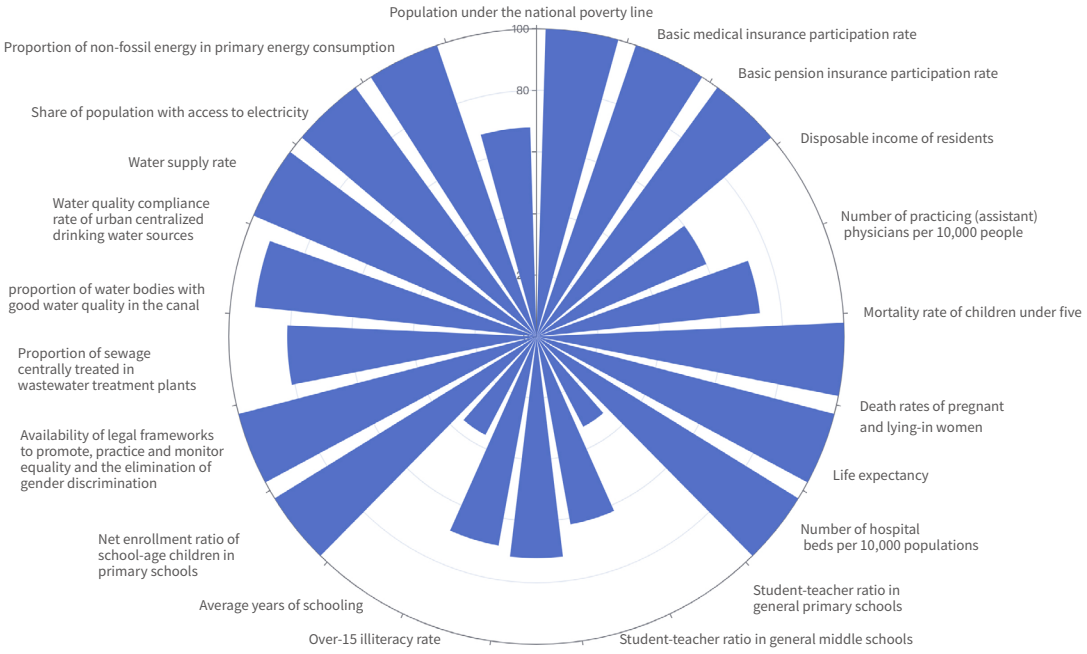


Figure 3-4 Implementation Progress Assessment of the People Indicators

Good progress was made towards the People indicators, despite the overall realization rate of 83.2 percent being the lowest among the 5Ps. Specifically:

- Indicators that had already met their global targets in 2020: population under the national poverty line, basic medical insurance participation rate, basic pension insurance participation rate, mortality rate of children under five, death rates of pregnant and lying-in women, life expectancy, net enrolment ratio of school-age children in primary schools, whether a city has formulated legal frameworks to promote, practice and monitor equality and the elimination of gender discrimination, compliance rate of urban centralized drinking water sources, water supply rate, and share of population with access to electricity.
- Indicators that have met 90 percent of their targets: proportion of water bodies with good water quality in the canal
- Indicators with relatively slow progress: disposable income of residents, number of hospital beds per 10,000 populations, student-teacher ratio in general primary schools, and average years of schooling, all of which record a completion rate of less than 67 percent.

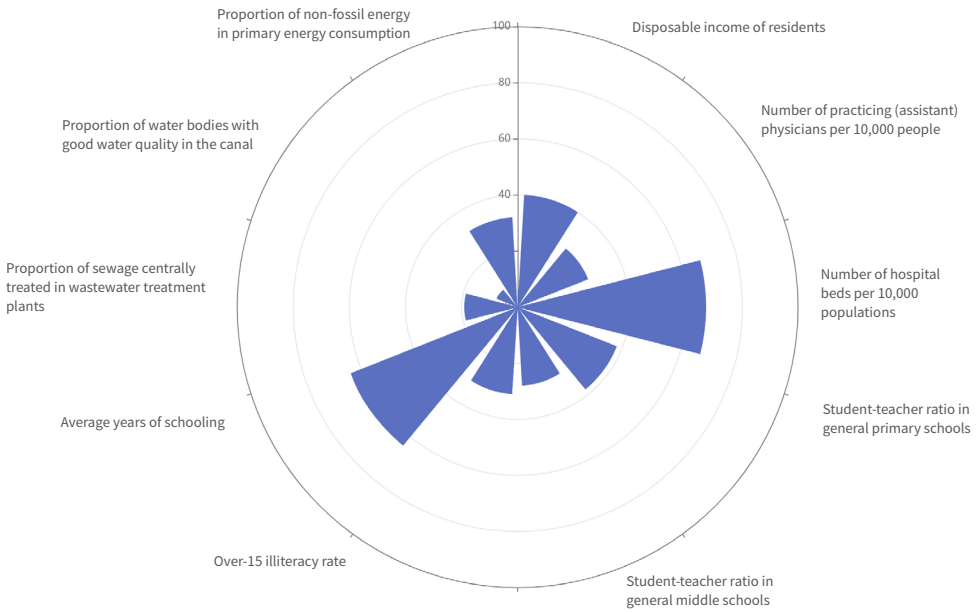


Figure 3-5 Implementation Gap Assessment of the People Indicators

3.2.3 Assessment of the Prosperity Indicators

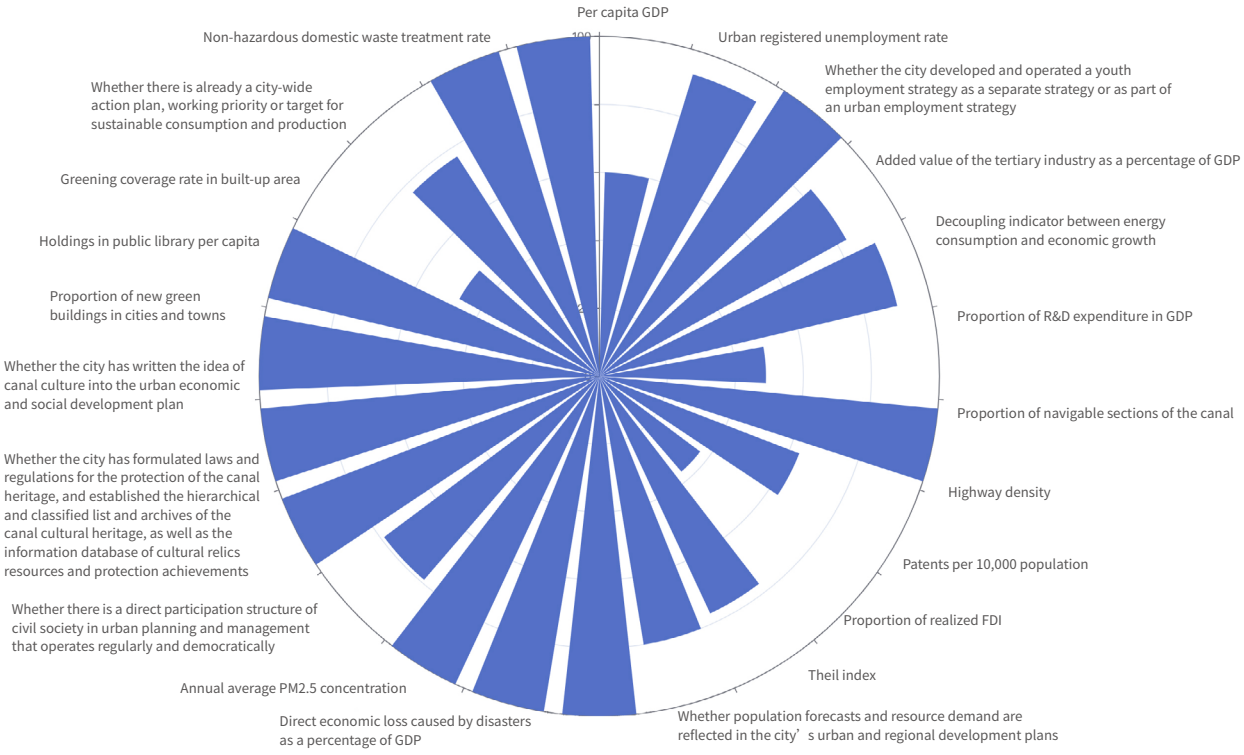


Figure 3-6 Implementation Progress Assessment of the Prosperity Indicators

Yangzhou has made relatively rapid and balanced progress towards the Prosperity indicator targets with an overall realization rate of 84.1 percent. Specifically:

- Indicators that had already met their global targets in 2020: whether the city developed and operated a youth employment strategy as a separate strategy or as part of an urban employment strategy, proportion of navigable sections of the canal, whether city has the disaster emergency plan, whether population forecasts and resource demand are reflected in the city's urban and regional development plans, direct economic loss caused by disasters as a percentage of GDP, whether there is a direct participation structure of civil society in urban planning and management that operates regularly and democratically, whether the city has formulated laws and regulations for the protection of the canal heritage, and established the hierarchical and classified list and archives of the canal cultural heritage, as well as the information database of cultural relics resources and protection achievements, whether the city has written the idea of canal culture into the urban economic and social development plan, proportion of new green buildings in cities and towns, whether there is already a city-wide action plan produced or target set up for practicing sustainable consumption and production, and non-hazardous domestic waste treatment rate.
- Indicators that have met 90% of their targets: urban registered unemployment rate, and decoupling indicator between energy consumption and economic growth.

- Indicators with relatively slow progress: highway density, per capita GDP, proportion of R&D expenditure in GDP, patents per capita, and holdings in public library per capita, all of which record a completion rate of less than 67 percent.

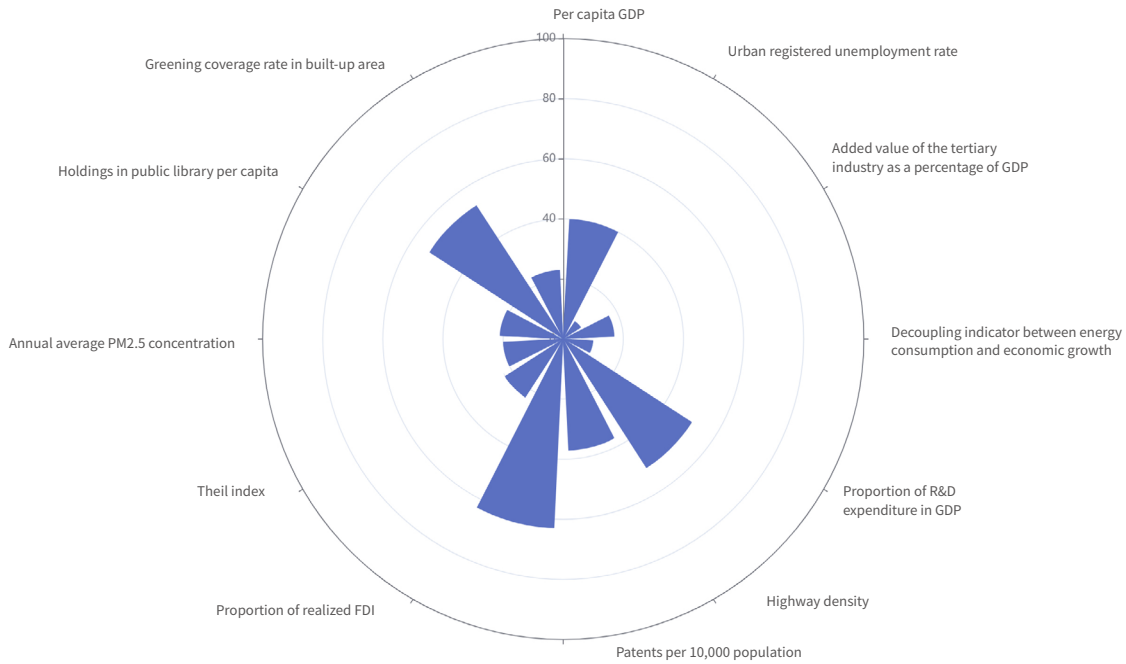


Figure 3-7 Implementation Gap Assessment of the Prosperity Indicators

3.2.4 Assessment of the Planet Indicators

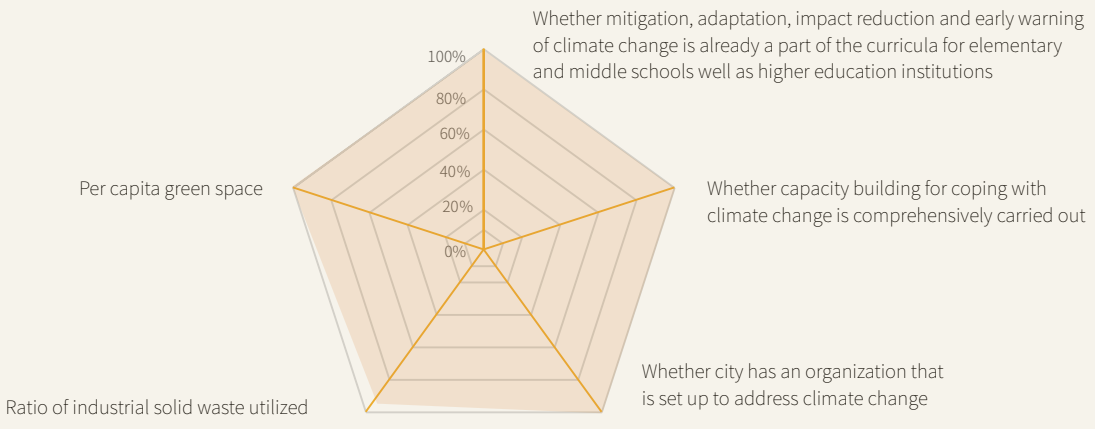


Figure 3-8 Implementation Progress Assessment of the Planet Indicators

Overall implementation of the Planet indicators has been good, with an overall realization rate reaching 99.1%.

- Indicators that had already met their global targets in 2020: whether mitigation, adaptation, impact reduction and early warning of climate change is already a part of the curricula for elementary and middle schools as well as higher education institutions, whether capacity building for coping with climate change is comprehensively carried out, whether city has an organization that is set up to address climate change, and per capita green space.
- Indicators with relatively slow progress: ratio of industrial solid waste utilized.

3.2.5 Assessment of the Peace Indicators

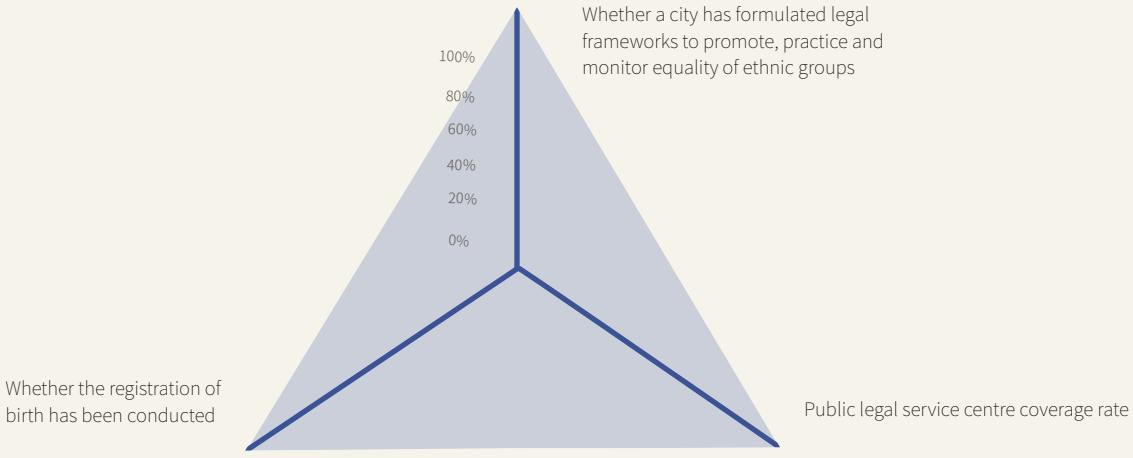


Figure 3-9 Implementation Progress Assessment of the Peace Indicators

For the Peace indicators the overall realization rate was 100%, with all three indicators – whether a city has formulated legal frameworks to promote, practice and monitor equality of ethnic groups, public legal service center coverage rate, and whether the registration of birth has been conducted - having all of them reached the 2030 target.

3.2.6 Assessment of the Partnership Indicators

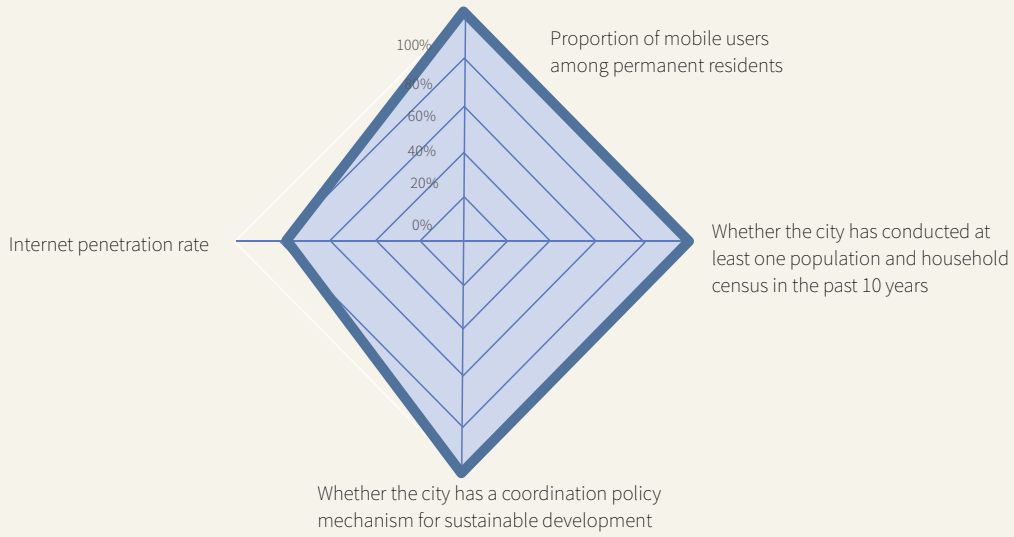


Figure 3-10 Implementation Progress Assessment of Partnership Indicators

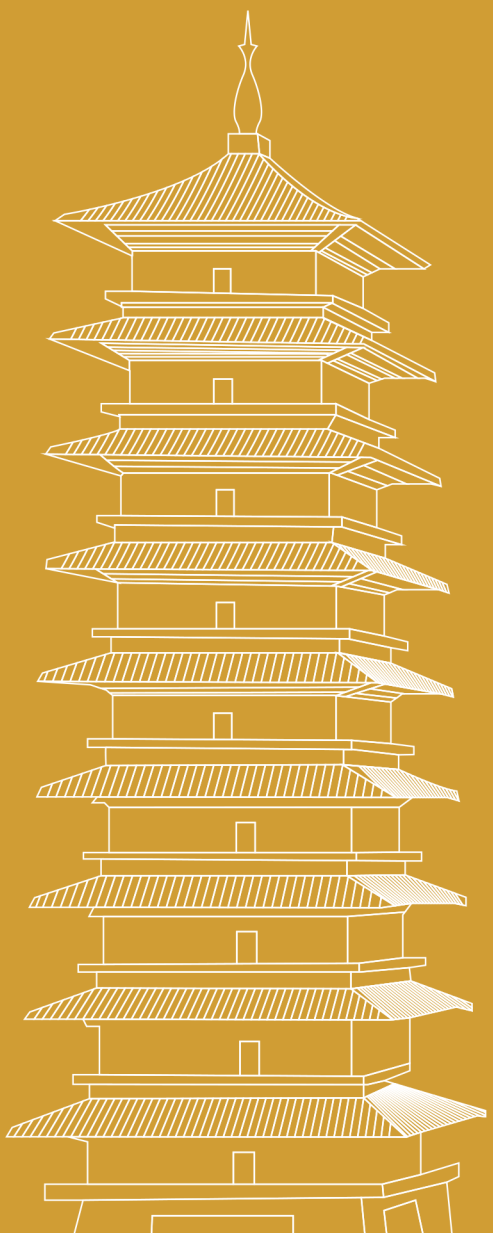
Sound progress was made on the Partnership indicators, with an overall realization rate of 94.9 percent. Specifically, three of the four indicators – proportion of mobile users among permanent residents, whether the city has conducted at least one population and household census in the past 10 years, and whether the city has a coordination policy mechanism for sustainable development – already achieved their 2030 target. The internet penetration rate has also reached 80% of its targets.

FOUR

Chapter 4

Conclusions and Policy Implications

- 4.1 OVERALL PROGRESS FOR THE CCSAI INDICATORS HIGHER THAN EXPECTED
- 4.2 57 PERCENT OF THE INDICATORS REACHED THEIR 2030 TARGETS; 84 PERCENT HAVE HIGHER THAN THE EXPECTED IMPLEMENTATION PROGRESS
- 4.3 CORE INDICATORS' IMPLEMENTATION RATE IS 83.6 PERCENT, HIGHER THAN THE EXPECTED



This study conducts an overall assessment of Yangzhou's SDG implementation progress and the implementation gap towards the 2030 targets. The assessment conclusions and policy implications are as follows:

4.1 Overall progress for the CCSAI Indicators higher than expected

As is described in Chapter 3, the overall realization of the 5P dimensions is as high as 92.2 percent, higher than the expected 67 percent completion rate set as an intermediary target to be reached by 2020. Indicators in the Peace category already achieved their 2030 targets. As for the other dimensions, the best performers were Planet, whose indicators recorded fulfilment rates of 99.1 percent.

People					
1 NO POVERTY	Proportion of the population below the national poverty line	Basic medical insurance coverage	Urban and rural basic pension insurance coverage		Goal 1
2 ZERO HUNGER	Household disposable income				Goal 2
3 GOOD HEALTH AND WELL-BEING	Average life expectancy of the population	Number of professional (assistants) physicians per 10,000 people	Under-five mortality rate	Maternal mortality	Goal 3
	Number of hospital beds per 10,000 people				
4 QUALITY EDUCATION	Student-teacher ratio in general primary schools	Student-teacher ratio in general secondary schools	Over-15 illiteracy rate	Average years of schooling	Goal 4
	Net primary school enrollment rate				
5 GENDER EQUALITY	Availability of legal framework to promote, enforce and monitor the achievement of equality and non-sex-based discrimination				Goal 5
6 CLEAN WATER AND SANITATION	Centralized treatment rate of sewage treatment plants	Water supply penetration rate	Water quality compliance rate of urban centralized drinking water sources		Goal 6
	Proportion of water bodies in the canal with good water quality				
7 AFFORDABLE AND CLEAN ENERGY	Proportion of population with access to electricity	Proportion of non-fossil energy in primary energy consumption			Goal 7
Prosperity					
8 DECENT WORK AND ECONOMIC GROWTH	GDP per capita	Whether the city has developed and is operating a youth employment strategy, as a separate strategy or as part of the city's employment strategy	Urban registered unemployment rate	Share of added value of tertiary industry in GDP	Goal 8
	Energy consumption and economic growth decoupling index				
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	Patents per 10,000 population	Proportion of R&D expenditure	Proportion of the navigable sections of the canal	Highway Density	Goal 9
10 REDUCED INEQUALITIES	Theil Index	Proportion of realized FDI			Goal 10
11 SUSTAINABLE CITIES AND COMMUNITIES	Proportion of newly-built green buildings in the city	Disaster response plans	Implementation of urban and regional development plans that integrate population forecasts and resource needs	Direct economic loss caused by disasters as a percentage of GDP	Goal 11
	Annual average concentration of PM2.5	Establishment of an urban planning structure that operates regularly in a democratic way with the direct participation of civil society	Number of books per person	Whether the city formulated laws and regulations for the protection of the canal heritage, established a classified catalogue and archives of the canal cultural heritage, and a database of cultural relic resources and protection achievements	
	Whether the city incorporated the cultural dimension of the canal into the city's economic and social development plan	Green coverage rate in built-up area			
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Whether the city has formulated an urban action plan for sustainable consumption and production or has incorporated sustainable consumption and production as a priority or goal into its urban policy	Harmless treatment rate of domestic garbage			Goal 12

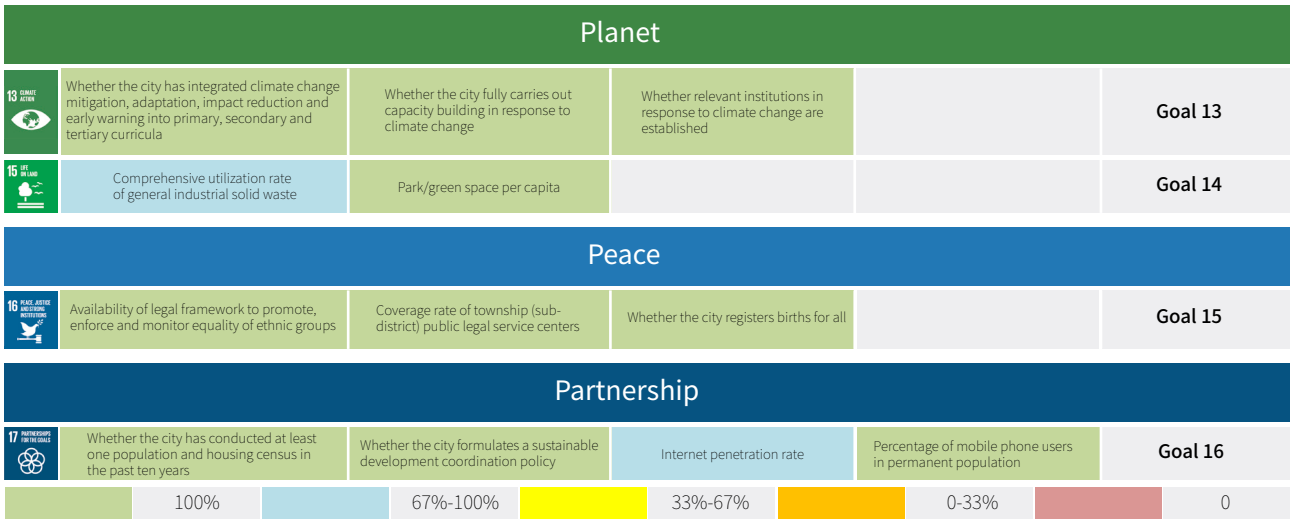


Figure 4-1 Yangzhou’s SDGs Indicator Dashboard

4.2 57 percent of the indicators reached their 2030 Targets; 84 percent have higher than expected Implementation Progress

By 2020, among all assessment indicators (Figure 4-2), Yangzhou has achieved 57 percent of the 2030 targets. Additionally, 27 percent of the remainder have achieved more than 67 percent of their targets. As such, around 84 percent of the indicators have progressed more than 67 percent towards their goals, while 16 percent of them have lagged behind, with achievement rates of less than 67 percent.

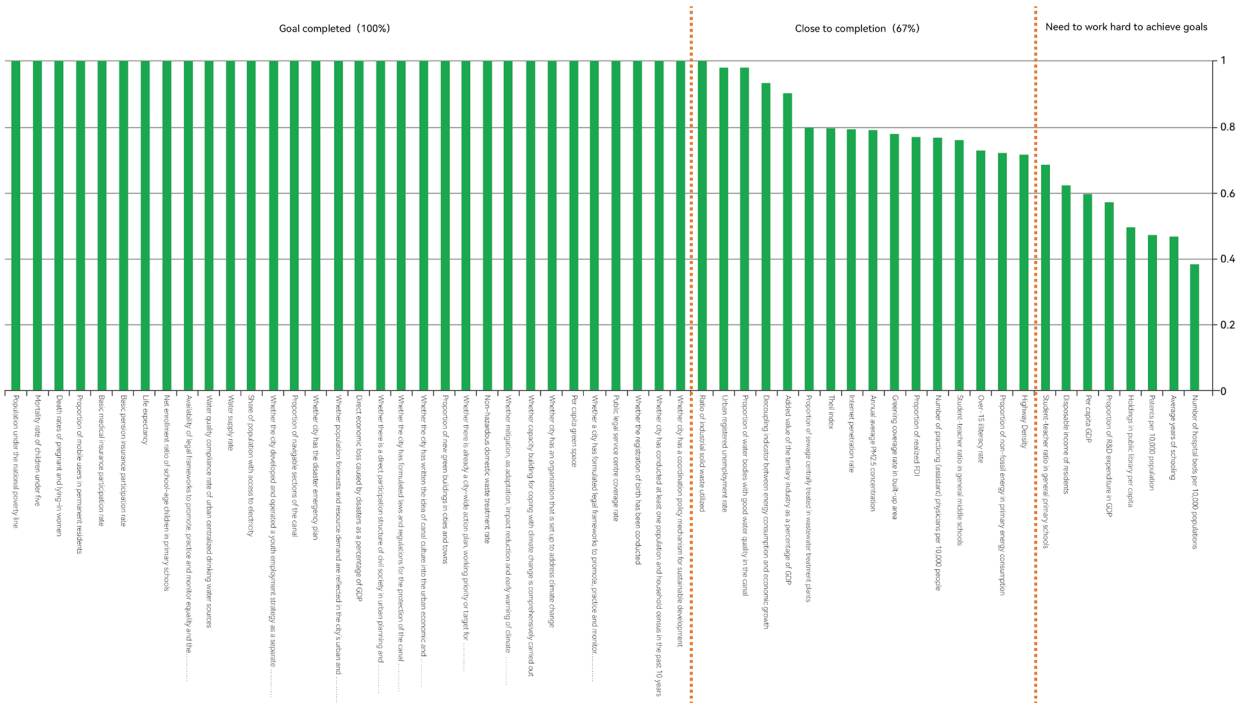


Figure 4-2 Results of Implementation Progress Assessment of All Indicators

Note: Descending indicators are considered and adjusted.

4.3 Core indicators' implementation rate is 83.6 percent, higher than expected

In general, good progress was made in the 37 CCSAI core indicators, with an overall realization rate of 83.6 percent. Specifically, besides the Peace dimension that has met all of the 2030 SDG targets considered in this CCSAI, Planet, Partnership, People and Prosperity had realization rates of 98.9 percent, 94.9 percent, 80.1 percent, and 75.2 percent, respectively.

Among the 33 core indicators (Figure 4-3), 49 percent have already met the 2030 SDG targets, 30 percent of the rest have met more than 67 percent of targets. Together, 79 percent of core indicators have met more than 67 percent of the target. However, advancement was slower than anticipated for the number of hospital beds per 10,000 population, number of patents per 10,000 people, public libraries per capita, R&D spending as a proportion of GDP, disposable income, per capita GDP and the student-teacher ratio in primary schools.

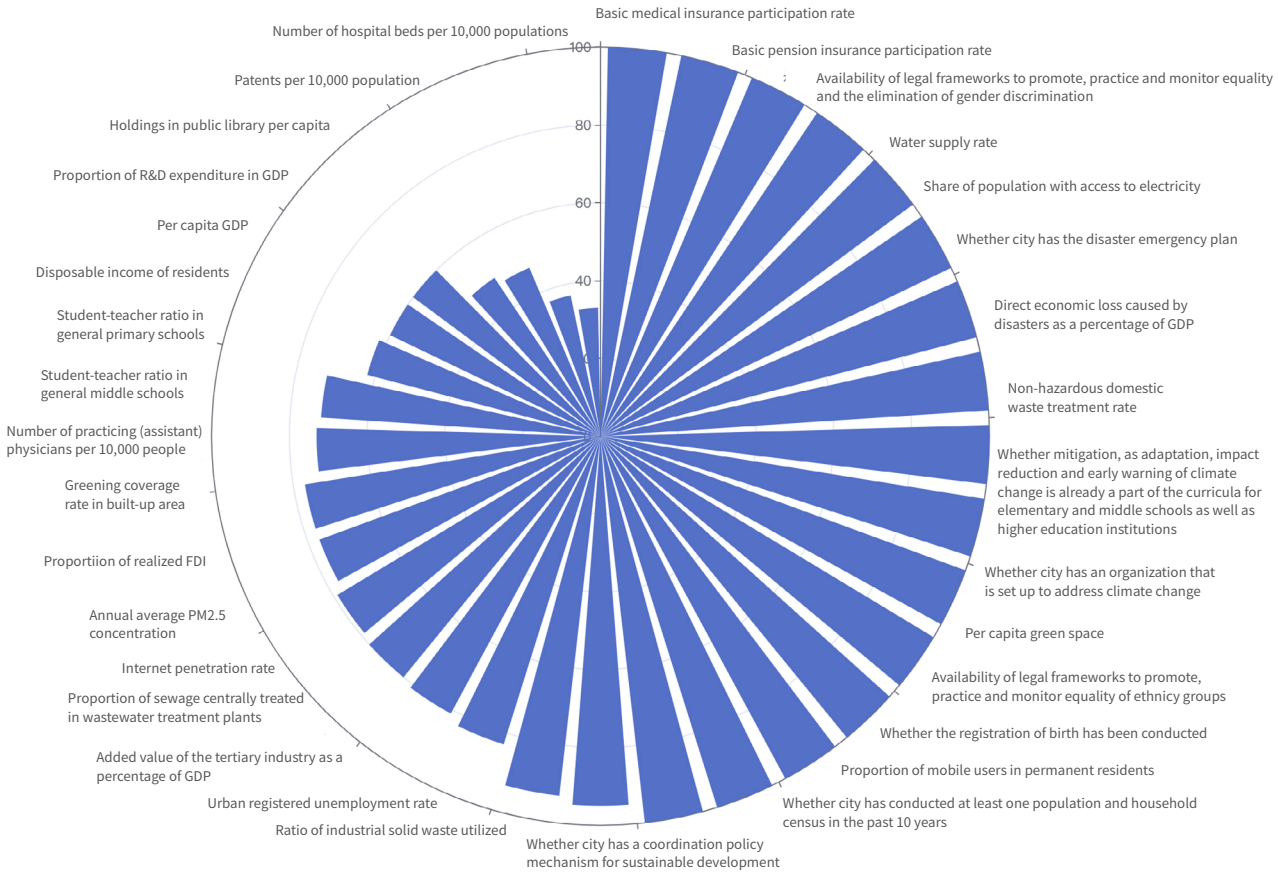


Figure 4-3 Implementation Progress of CCSAI Core Indicators

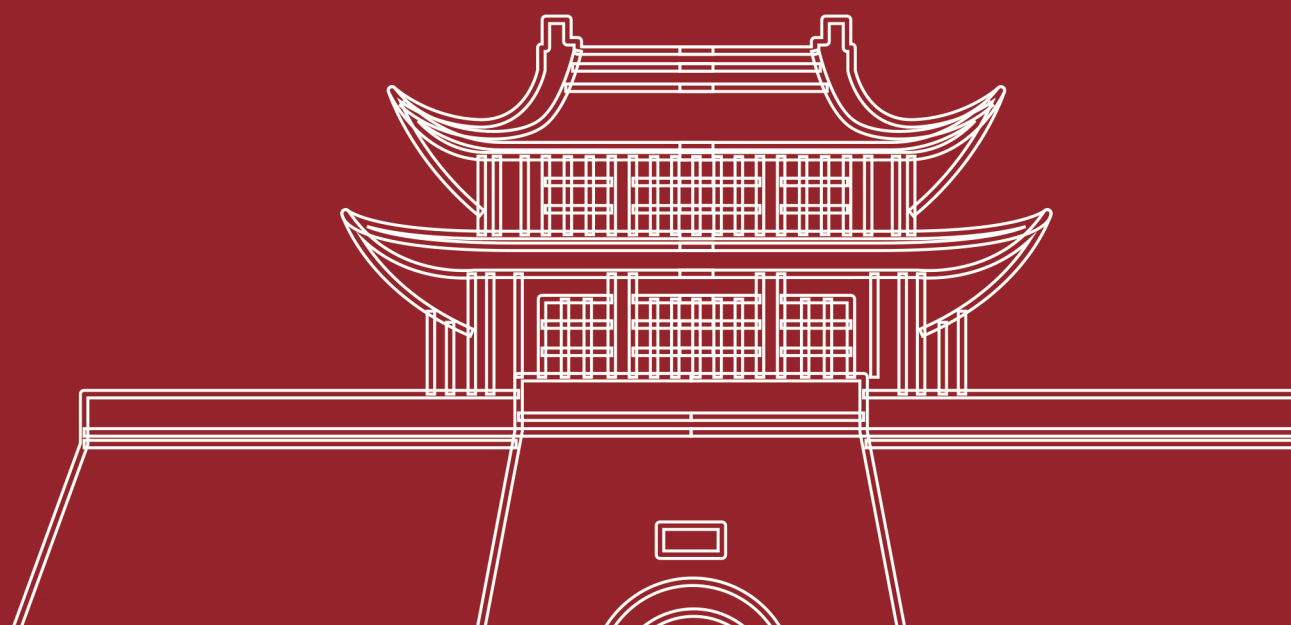
In recent years, Yangzhou paid great attention to urban sustainable development via integrated practices including urban planning, policy guide, technical support, mechanism innovation, public participation and international exchanges etc. Improvements are seen in the areas such as Grand Canal cultural heritage protection, eco-environmental governance, and cooperation and exchanges. The overall realization of all targets reaches 92.2 percent. Half of the indicators have already met their 2030 SDGs targets and most of the indicators' made better-than-expected progress. However, advancement was slower than anticipated for the number of patents per 10,000 people, the comprehensive use of general industrial solid waste, public libraries per capita, R&D spending as a proportion of GDP, disposable incomes, per capita GDP, the student-teacher ratio in primary schools, and expressway density. Therefore, areas such as innovation, education, medical resources and growth of income are the key for future development.

FIVE

Chapter 5

Yangzhou Sustainable Development Case Studies

- 5.1 ECONOMIC DEVELOPMENT: ACCELERATING THE DEVELOPMENT OF SERVICE INDUSTRY IN YANGZHOU ---UNESCO CREATIVE CITY OF GASTRONOMY
- 5.2 SOCIAL GOVERNANCE: BUILDING REGIONAL MEDICAL AND HEALTH CENTER IN RURAL AREAS AND PROMOTING ACCESSIBLE PUBLIC SERVICES FOR ALL
- 5.3 SOCIAL GOVERNANCE: PROMULGATING REGULATIONS ON SHIP POLLUTION PREVENTION AND INNOVATING CANAL POLLUTION PREVENTION MECHANISM
- 5.4 CIRCULAR AGRICULTURE: "GROWING ONE SEASON OF RICE AND HARVESTING THREE BATCHES OF SHRIMPS" TO ACHIEVE DUAL USE OF WATER AND MORE HARVESTS IN ONE FIELD
- 5.5 ECO-ENVIRONMENTAL MANAGEMENT: CONSTRUCTING THE JIANGHUAI ECOLOGICAL CORRIDOR ALONG THE CANAL
- 5.6 CASE OF CLIMATE ACTIONS: ACHIEVING THE DUAL-CARBON GOALS THROUGH LOW-CARBON INNOVATION
- 5.7 CASE OF CULTURAL PROTECTION AND INHERITANCE: PROTECTING AND DEVELOPING HISTORICAL AND CULTURAL BLOCKS FOR BETTER URBAN CULTURE
- 5.8 CASE OF SPATIAL OPTIMIZATION: OPTIMIZING PARKS AND GREEN SPACES TO IMPROVE PEOPLE’ S LIVELIHOOD AND WELL-BEING
- 5.9 CASE OF INTERNATIONAL COOPERATION: THE 2021 WORLD HORTICULTURAL EXPO WAS SUCCESSFULLY HELD, EXPANDING INTERNATIONAL EXCHANGES



Yangzhou has been actively implementing the 2030 Agenda in terms of economic development, social governance, ecological environment governance, climate actions, cultural protection and inheritance, spatial distribution optimization, and international cooperation, and strives to achieve sustainable development goals. Its experience is illustrated by nine case studies, including "accelerating the development of service industry in Yangzhou - UNESCO Creative City of Gastronomy, "building regional medical and health center in rural areas and promoting accessible public services for all" and "promulgating regulations on ship pollution prevention and innovating Canal pollution prevention mechanisms". These cases correspond to SDGs 2, 3, 6, 8, 11, 13, 15, and 17.

5.1 Economic Development: Accelerating the Development of Service Industry in Yangzhou - UNESCO Creative City of Gastronomy

5.1.1 Corresponding SDG

Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all

Economic growth that is sustained and inclusive can advance society, produce good jobs for all, and raise standards of living. Even before the outbreak of COVID-19, one in five countries – where billions of people live in poverty – were likely to see per capita incomes stagnate or decline in 2020. Now, the already stagnant economic growth is being derailed by the economic and financial shocks related to COVID-19, which include interruptions in industrial production, declining commodity prices, financial market volatility, and rising insecurity. These shocks also compound the elevated risks from other factors. Governments may work to create thriving, innovative, sustainable, and people-centered economies. In particular, they might encourage women's economic empowerment, youth employment, and fair employment for all. Local authorities and communities need to renew and plan the cities and human settlements so as to foster community cohesion and personal security and to stimulate innovation and employment. [27]

5.1.2 Background

As the starting the point of the Grand Canal of China historically, Yangzhou is developed into an international cultural tourism city. It is a distinctive feature of Yangzhou to integrate culture with tourism into its urban development. As the living standard rose quickly over the past decades in Yangzhou, people no longer worry about food security; they now seek healthy food and enjoy cultural delicacies. In recent years, Yangzhou has nurtured a sound development environment for all kinds of creative industries focusing on food, through providing policy support, constructing creative industrial parks and building talent service system. At the same time, major national strategies, such as the Belt and Road Initiative and the Grand Canal Cultural Belt brings more positive changes to Yangzhou. The city government takes tourism as a permanent basic industry and actively transforms the city into an international tourism and cultural

27.https://www.un.org/sustainabledevelopment/zh/economic-growth/

destination. All these efforts create precious opportunities and unlocks the creativity of the food industry. However, Yangzhou is also facing challenges in the development driven by creative food industry, such as inadequate creative ideas, the negative impact of mass production on local food culture, and lack of advertisement of local food culture. Over the years, Yangzhou has consistently taken food creativity as an essential driving force for transformation and development, and has been vigorously nurturing an inclusive, sustained and vibrant urban business ecology.

5.1.3 Actions

1. Implementing Yangzhou Food and Health Sustainability Plan. Adhering to the 2030 Agenda, Yangzhou promotes the formation of a collaborative and sustainable food industry under the existing "field to table" food safety co-governance system. Specific plans include creating a green “central kitchen” in East China, promoting the certification of produce with geographical indication of Yangzhou; establishing a database for sustainable and healthy food in Yangzhou; and launching entrepreneurship and employment initiatives in the food industry for rural revitalization.

2. Launching Huaiyang Food Education Project. With the formulation of Yangzhou Food Education Implementation Outline, a mass food education system for schools and families is gradually established, while anticipating participation of government departments and social welfare organizations. Meanwhile, food education and skill training centers were established for specific groups. Yangzhou launched city-wide food activities, such as “seasonal food table” and “dining & politeness” in communities, as well as agricultural products fair, tea culture festival, double-yolked egg festival and other exhibitions and activities for farmers. Professional design teams and food styling teams were invited to create creative projects centered on local produce to promote the integration of rural tourism and Huaiyang cuisine.

3. Carrying out food creativity incubation project. Food culture innovation and incubation workshops were set up in museums, concert halls, art galleries, cinemas, theaters, 486 intangible heritage sites and other cultural venues. Food Creativity Incubation Fund was established to support and inspire more restaurants to focus on integrating creative elements into their cuisine, promoting Huaiyang cuisine, and improving and innovating catering services. Yangzhou actively promoted the integration of food with art and design, tourism and cultural industries. Actions were taken to transform and upgrade the landscape of the production and living space of urban traditional food.

5.1.4 Performance

Yangzhou currently holds 52 intangible cultural heritage in the food category, such as Yechun pastry making techniques and Fuchun tea making techniques, and has a number of catering brands with a history of more than 100 years, such as Gonghechun. More than 60 culinary masters reside in Yangzhou. In 2018, Yangzhou’s catering industry achieved a revenue of US$6.5 billion and directly created 245,000 jobs. Yangzhou planned to apply for the designation of UNESCO Creative City of Gastronomy in 2013 and officially submitted the application in 2018. On October 30, 2019, the official website of UNESCO announced that 66 cities were approved to join the UNESCO Creative Cities Network (UCCN), and Yangzhou was selected as one of the Cities of Gastronomy.

Figure 5-1 Yangzhou Cuisine

5.1.5 Outlook

As the demonstration city of entrepreneurship and innovation bases for small and micro enterprises in China, Yangzhou views innovation as a primary means of achieving sustainable development. In the future, Yangzhou will further expand and strengthen the creative food industry, meet the citizens' demand for creative delicacies, and use food as a tool to expand its interaction with other cities at home and abroad. Yangzhou will further strengthen international exchange and cooperation on creative Huaiyang cuisine training and research of creative food and culture, accelerate the internationalization of Huaiyang cuisine, support the high-quality development of Yangzhou's service industry, and the city's transformation into an international tourism city.

5.2 Social Governance: Building Regional Medical and Health Center in Rural Areas and Promoting Accessible Public Services for All

5.2.1 Corresponding SDG

Goal 3: Ensure healthy lives and promote well-being for all at all ages

The 2030 Agenda acknowledges the complexity and interdependence of both good health and sustainable development. It takes into account growing economic and social disparities, increased urbanization, climatic and environmental risks, the ongoing impact of HIV and other infectious diseases, as well as emerging problems such as noncommunicable diseases. In order to achieve SDG 3, which calls for eradicating poverty and reducing inequality, universal health care is essential. Action is also required to address new global health priorities, such as antimicrobial resistance, that are not expressly addressed by the SDGs.

However, the world is not on track to meet the SDGs relating to health. There has been uneven development within and between nations. There’ s a 31-year gap between the countries with the shortest and longest life expectancies. National averages conceal the fact that many nations are falling behind, even while some have made impressive achievements. Multisectoral, rights-based and gender-sensitive approaches are essential to address inequalities and to build good health for all.[28]

5.2.2 Background

In recent years, Yangzhou has taken actions to address structural problems. For instance, renowned hospitals are overcrowded while grassroots hospitals receive few patients, and it is more difficult for patients to find a good doctor in grassroots hospitals. Adhering China’ s strategies of rural revitalization and new-type urbanization and in view of people’ s demand for medical care, Yangzhou has taken the lead in the province to make forward-looking plans and constructed 18 high-quality rural regional medical and health centers. By the end of 2017, the 18 health centers have been put into use.

5.2.3 Actions

1. Transforming the rigid mindset and innovating ways to break through the bottleneck. By breaking the constraints of administrative divisions, Yangzhou constructs health centers in locations with convenient transportation, capacities to provide medical services to surrounding areas, and a large demand for medical care. By breaking financial constraints, Yangzhou municipal government invested 320 million CNY directly to townships, encouraging governments at local levels to further invest a total of about 1.133 billion CNY. By breaking resource constraints, regional health centers pooled high-quality medical and health talent resources from surrounding townships to construct regional medical centers, emergency centers, maternity and pediatrics centers, traditional Chinese medicine centers, preventive health care centers and health information centers.

2. Building the capacities of grassroots health workers by providing targeted support. Yangzhou has established a hospital alliance and incorporated all 18 rural regional medical and health centers into the medical association which consists of Subei People's Hospital and the Affiliated Hospital of Yangzhou University, and formulated a "one hospital, one policy" targeted assistance plan. In addition, Yangzhou implemented a project to strengthen the capability of health workers of the 18 health centers, by providing tailored training program for 1,000 selected medical students from colleges and universities. Yangzhou supported each health center to develop specialties by helping them make 2-3 key specialty development plans and selected grassroots specialty department incubation centers in leading hospitals of the alliance to give targeted assistance and guidance to the development of grassroots specialty departments.

28.Sustainable Development Goals | United Nations Development Programme (undp.org)

3. Promoting the healthy and sustainable development of regional health centers to satisfy citizen's demand. Firstly, Yangzhou Municipal People's Government promulgated the Opinions on the Development of Rural Regional Medical and Health Centers to support the construction of rural regional medical and health centers in fields of finance, medical insurance, personnel arrangement, price and informatization. Secondly, Yangzhou strengthened the utilization of information technology, guiding high-quality resources to serve grassroots demand. Yangzhou's newly launched doctor's appointment reservation system allows the citizens to visit doctors at the exact time reserved online. Led by North Jiangsu Hospital and the Affiliated Hospital of Yangzhou University, the telemedicine project was launched. An online consultation center covering 18 regional centers was established. Contracting services were promoted to enhance citizen's satisfaction. Health stations were set up in the 18 health centers to provide one-stop contracting and self-help physical checkup services.

5.2.4 Performance

The completion of the rural regional medical and health centers has shortened the driving time for rural residents from their homes to level II hospitals from 1-2 hours to about 15 minutes. Among the 18 health centers, one is named as the national model community health service center with quality service, 11 as national township health centers with high public satisfaction, and 18 as provincial model township health centers (community health service centers), with 13 of them qualified as level II hospitals. These health centers have 18 provincial specialty departments, and 57 city-level specialty departments. In 2019, the total revenue of the 18 health centers reached 619 million CNY, with 2,502,040 outpatients, 74,175 inpatients and 15,978 surgeries conducted, increasing 102.51%, 39.25%, 114.32% and 94.31% compared with 2015, respectively. These health centers help to cope with growing health care needs and inadequate health services, while realizing the integrated utilization and rational allocation of medical resources.

5.2.5 Outlook

In the future, Yangzhou will further promote the sustainable development of rural regional medical and health centers in following aspects: strengthen policy support and promote the development of regional centers; channel high-quality resources to local concerns and offer more one-stop medical and health services; conduct full-cycle health management of contracted residents through mobile devices and related applications. Yangzhou’ s effort will provide a reference for the health management system of canal cities around the world.

5.3 Social Governance: Promulgating Regulations on Ship Pollution Prevention and Innovating Canal Pollution Prevention Mechanism

5.3.1 Corresponding SDG

Goal 6: Ensure access to water and sanitation for all

The most fundamental human need for health and well-being is access to clean water, proper sanitation, and hygiene. Millions of people globally, particularly those in rural regions, still lack access to clean water and sanitary facilities despite advancements over the previous few decades. Two out of every five people worldwide lack access to securely managed sanitation and hygiene, while a third of the world's population lacks access to clean drinking water. Proper water and sanitation are key foundation for achieving the Sustainable Development Goals, including good health and gender equality. In addition, more than 80% of wastewater generated by human activity is released into the environment untreated, which causes pollution. SDG 6.3 indicates that “by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”.[29]

5.3.2 Background

The Yangzhou section of the Grand Canal stretches around 151 kilometers. As the section with the richest and densest heritage along the Grand Canal, the Yangzhou section includes waterways that were built in the Spring and Autumn period, Ming and Qing Dynasty and modern days. The Yangzhou section of the Grand Canal is an important water channel of the South-North Water Transfer Project, and the city has taken actions to strengthen the ship pollution prevention in order to protect the water environment of the South-North Water Transfer Project. The purpose of the pollution prevention is not only to build a green and charming canal, but also to benefit hundreds of millions of people in North China with clean water, including the capital Beijing and Xiong’ an New Area. In order to promote the prevention and control of ship pollution and the transformation and improvement of canal shipping, while in accordance with national and provincial level policy documents and the actual situation of ship pollution prevention and control in the water sections involved in South-North Water Transfer Project, Yangzhou escalated existing and effective ship pollution prevention and control measures into regulations, and promulgated The Measures for the Prevention and Control of Ship Pollution in the Waters of the South-North Water Transfer Project in Yangzhou.

29.ustainable Development Goals | United Nations Development Programme (undp.org)

5.3.3 Actions

1. Define the responsibilities of governments, government sectors and business owners. Yangzhou clarified that local governments should make overall plans and coordinate all parties; transportation, and ecological environment departments should fulfill their respective duties and strengthen supervision; business owners should take the main responsibility of preventing ship pollution.

2. Implement ship-dock coordination policy and make the disposal of pollutants a closed-loop process. Yangzhou required docks, terminals, locks, water service centers and other functional areas to install ship pollutant disposal facilities that fit their service capacities. Ships' waste is incorporated into the urban household waste treatment and disposal system to realize the integrated management of domestic garbage disposal on the ship and shore. Sewage from the ships is incorporated into the municipal sewage pipe network for disposal through receiving facilities or transferred to the municipal sewage pipe network and sewage treatment units for disposal through tankers. Carry out classified treatment of oily sewage from the ships and send it to enterprises with qualifications or disposal capabilities for treatment. By purchasing services according to the waterway conditions and ship flow, Yangzhou government arranged ships to receive ship pollutants and provided active reception services. Yangzhou also optimized the frequency of ship pollutant delivery, and provided free lead sealing for ships installed with domestic sewage treatment devices or storage facilities.

3. Strictly control ship discharge in waterways of the South-North Water Transfer Project. In the Yangzhou section of the South-North water transfer channels, pollutant discharge is prohibited; ships that transport dangerous chemicals are prohibited from doing tank washing; ships transporting hazardous wastes and dangerous chemicals are prohibited from entering the water channels. At the same time, ships should use fuel that meets the regulations, implement dust pollution prevention and control measures, and promote the use of shore power.

4. Establish a functioning emergency mechanism for ship pollution disposal. The local government shall establish and improve emergency plans for ship pollution incidents, provide sufficient facilities and equipment for ship pollution prevention and control, and strengthen the construction of professional emergency response teams and expert talent pools for ship pollution prevention and control. Ports and docks shall formulate emergency plans and conduct regular

drills. When a ship pollution incident occurs, each unit shall carry out emergency response work according to the division of responsibilities under the unified leadership and command of the local government.

5. Improve the long-term management mechanism. Led by the local government, establish a joint meeting system for ship pollution prevention and control, improve the joint supervision mechanism, organize multi-department joint inspections and joint law enforcement; establish and improve the ship pollution prevention and control credit management system.

6. Create a green modern shipping demonstration area. In 2019, Yangzhou took the lead in building a green and modern shipping demonstration zone in the Yangzhou section of the Beijing-Hangzhou Canal. The construction includes four major projects, including shipping efficiency improvement, green ecological corridor construction, canal culture display, and ship pollution prevention and control.

5.3.4 Performance

1. The responsibilities of all parties are fully consolidated to promote the establishment of a ship pollution prevention accountability system. Local governments strictly fulfill their mandates and have installed pollutant handling facilities at locks and docks. Relevant departments carry out joint inspection and supervise the standardized disposal of ship pollution ashore. Shipping enterprises have established pollution prevention management systems, signed a letter of responsibility with the head of the crew, and carried out trainings as required.

2. Pollution disposal facilities are effective in promoting the standardized disposal of ship pollutants. Yangzhou’s docks and terminals have installed 96 sets of waste handling facilities, 60 sets of domestic sewage handling facilities and 66 sets of oily sewage handling facilities. Waste transfer and disposal agreements have been signed with third-party service providers. Such efforts have helped form a network for effective and standardized disposal of ship waste, sewage and oily sewage.

3. Ship discharge is strictly controlled, making the ships more technically advanced. Yangzhou urges newly built ships to be equipped with anti-pollution equipment and shore power systems, starts the upgrade of ship-to-shore power systems, and promote the construction of 90 sets of ship-to-shore power facilities. Actions have been taken to equip ships with rapid fuel oil detection devices and to upgrade domestic sewage facilities of small tonnage ships. Free lead sealing of domestic sewage disposal facilities has been provided to 306 ships to realize zero discharge. Yangzhou is taking steps to phase out and dismantle 118 single-hull chemical tankers and oil tankers, of which 101 tankers have already been dismantled.

4. Improved infrastructure effectively enhances ship pollution emergency response capabilities. Yangzhou revised and improved the "1+6" plan system including emergency response plans for ship pollution incidents, organized water emergency trainings and cross-departmental ship pollution emergency drills; started the construction of supporting projects for the Yangzhou Inland River Search and Rescue Center, with efforts of strengthening the provincial inland river emergency equipment base through the purchase of services.

5. The construction of green modern shipping demonstration zone has achieved preliminary results. During the construction of the 29.5-kilometer Yangzhou pilot section of the Beijing-Hangzhou Canal, more than 30 old shipyards and docks along the line were demolished, and the newly added green space was about 640,000 square meters.

Yangzhou completed the demolition of 28 illegal docks in the pilot section of the Beijing-Hangzhou Canal, and restored green space. It completed the construction of ship pollutant handling facilities at all ports and docks along the line, and built a total of 12 sets of ship waste handling facilities, 5 sets of domestic sewage handling facilities and 7 sets of oily sewage handling facilities. 9 sets of dust on-line monitoring equipment were installed to monitor the dust level of 4 docks that have dust-prone cargoes. The city rectified 880 ships without ship numbers, ship certificates, and ports of registry. It has successfully created a clean and beautiful water environment in the urban section of the Beijing-Hangzhou Canal.

5.3.5 Outlook

The implementation of the The Measures for the Prevention and Control of Ship Pollution in the Waters of the South-North Water Transfer Project in Yangzhou will effectively resolve the difficulty in receiving, transferring, and disposing ship pollutants, comprehensively improve the handling capacity of domestic garbage, domestic sewage and oily sewage, and use administrative, credit and public supervision to build a long-term supervision mechanism and improve the city's ship pollution control system and governance capacity. Yangzhou’ s experience will be replicable for ship pollution prevention and control.

After the green modern shipping demonstration zone is fully built, the Yangzhou section of the Beijing-Hangzhou Canal will integrate green ecology, low-carbon environmental protection, high efficiency, and humanistic wisdom together, supporting the construction of the Grand Canal Cultural Belt and leaving a valuable ecological legacy for future generations.

5.4 Circular Agriculture: "Growing one season of rice and harvesting three batches of shrimps" to achieve dual use of water and more harvests in one field

5.4.1 Corresponding SDG

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Due to accelerated economic growth and increased agricultural output, the number of undernourished people has decreased by approximately half over the past two decades. Many developing nations that once experienced famine and hunger are now able to achieve their nutritional requirements. Extreme hunger has been largely eradicated in Central and East Asia, Latin America, and the Caribbean. Unfortunately, extreme hunger and malnutrition remain a huge barrier to development in many countries. As of 2017, 821 million people were estimated to be suffering from chronic undernourishment, frequently as a direct result of environmental deterioration, drought, and biodiversity loss. The SDGs aim to end all forms of hunger and malnutrition by 2030, making sure all people–especially children–have sufficient and nutritious food all year. This entails encouraging sustainable agriculture, supporting small-scale farmers,

and ensuring that everyone has access to markets, technology, and land. It also requires international cooperation to ensure investment in infrastructure and technology to improve agricultural productivity.[30]

5.4.2 Background

Light, temperature, water, soil, air and heat are the foundation of human survival. While light, temperature, air, and heat are inexhaustible in nature, water and soil are non-renewable resources. Yet, they are an important material basis to ensure the continuous supply of human food. How to efficiently utilize limited water and soil resources, while ensuring food production, reduce the damage of chemical fertilizers, chemical pesticides and other fossil resources to the soil and water environment of farmland, is an important research topic for the high-quality development and green development of rice fields in the new era.

Integrated rice farming is an organic combination of rice planting and aquatic animal farming. Through the circulation of material and energy in the farmland’ s ecosystem, the mutualistic symbiosis between rice and aquatic animals is fully enhanced, making the rice farmland high-yield and efficient. This modern agricultural production mode is conducive to rice field disease prevention, pest control, intertillage, agricultural pollution reduction and chemical fertilizer and pesticide reduction in agricultural production. Modern agricultural production will ultimately improve the quality and efficiency of agricultural and animal husbandry and fishery products and accelerate rural revitalization

In 2015, Mr. Han Changfu, the Minister of Agriculture emphasized that it is necessary to carry out demonstrations of integrated rice farming technology and promote new models such as aquaponics. In 2016, Jiangsu Province promulgated the technical guidance for rice production and indicated that it is necessary to strengthen the supply-side structural reform of agriculture, accelerate the promotion and application of high-efficiency technology modes, and promote the comprehensive rice farming mode according to local conditions. In 2019, Jiangsu Province issued the Guiding Opinions on Accelerating the Development of Comprehensive Rice Farming and Breeding, further emphasizing that the development of comprehensive rice farming and breeding is an important measure to deepen the supply-side structural reform of agriculture, and it is also an important measure to promote agricultural efficiency and increase farmers' income, contributing to poverty alleviation and rural revitalization.

30.https://www.undp.org/sustainable-development-goals#zero-hunger

5.4.3 Actions

Since 1997, the Institute of Agricultural Sciences in Lixiahe District of Jiangsu Province has been creating an ecological circular agricultural mode that combines farming and breeding, developing relevant technologies and supporting facilities. A series of actions have been carried out in promoting the ecological circular agriculture that allows farmers to "grow one season of rice and harvest three batches of shrimps":

1. Systematically develop the comprehensive farming and breeding standards of rice fields. The city created 17 kinds of farming and breeding model for local enterprise or farmers to choose and apply to rice fields. It built a comprehensive rice farming and breeding technology system, focusing on green planting, green nutrition and green pest control.

2. Technology promotion along the Grand Canal and Yangtze River. The promotion went from Touqiao Town in Yangzhou to Tai'an Town, Shaobo Town, Gaoyou Town, Jieshou Town, Ma Peng Town, Songqiao Town, and Fanguanghu Town in the North, and then to Huai'an, Xuzhou, and then to Weishanhu area in Shandong Province. Another route went from Chuzhou and Anqing in Anhui Province, and then to the middle and upper reaches of the Yangtze River, all the way to the Sichuan Basin. A total of 100,000 farmers have adopted the new rice farming and breeding technology and the promotion area has reached more than 5 million mu.

3. Carry out technology research and development to drive industrial development. On the basis of the technology of "growing one season of rice and harvest three batches of shrimps", the Institute has formulated the only provincial-level standard in China The Operation Rules for Ecologically Growing One Season of Rice and Harvesting Three Batches of Shrimp, and even created a rhymed song to drive the development of the crayfish industry.

5.4.4 Performance

Water saving and land saving was achieved, the comprehensive farming and breeding of rice fields realizes dual use of water, saving water for aquaculture. The reduction of chemical fertilizers and pesticides was realized and the application of "growing one season of rice and harvest three batches of shrimps" efficient green farming and breeding model was promoted. In addition, the "six-in-one" green nutrition measures have reduced 50% of the amount of chemical fertilizer used, while ensuring the amount of rice production. By using the "five-in-one" green prevention and control measures, the use of general chemical pesticides has been reduced by more than 85% compared with sole-cropping rice, and there are more and more successful cases of zero use of chemical pesticides. In recent years, rice fields that applied the "growing one season of rice and harvest three batches of shrimps" efficient green farming and breeding model have produced some award-winning rice brands such as "Yangmeng Agriculture" and "Yuanqinxin". In terms of shrimp harvesting, farmers can harvest on average more than 1,000 catties of rice per mu and more than 500 catties of shrimp per mu, with the net benefit exceeding 6,000 CNY per mu. Mainstream media have repeatedly promoted the contribution of "growing one season of rice and harvest three batches of shrimps" in poverty alleviation and rural revitalization.

5.4.5 Outlook

The comprehensive farming and breeding of rice fields led by the concept of ecological civilization will help to adjust and optimize the agricultural industrial structure, transform the agricultural growth mode, and realize the green, low-carbon and high-quality development of rice agriculture. The "growing one season of rice and harvest three batches of shrimps" rice field comprehensive farming and breeding model will continue shining in the rural revitalization and biodiversity conservation process and benefiting the human society.

5.5 Eco-environmental management: Constructing the Jianghuai Ecological Corridor Along the Canal

5.5.1 Corresponding SDG

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Human life depends on the earth as much as the ocean for our sustenance and livelihoods. Eighty percent of the human diet is made up of plants, and agriculture is a significant source of income for us. Forests cover 30% of the earth's surface and are vital habitats for millions of species, they are sources of clean air and water, and crucial for fighting climate change. Every year, 13 million hectares of forests are lost, while the ongoing degrading of drylands has resulted in the desertification of 3.6 billion hectares, disproportionately harming impoverished populations. Although 15% of the land is protected, biodiversity is still in danger. Animals and plants from close to 7,000 different species have been traded illegally. In addition to destroying biodiversity, wildlife trafficking also fosters instability, war, and corruption. Urgent action must be taken to reduce the loss of natural habitats and biodiversity which are part of our common heritage and support global food and water security, climate change mitigation and adaptation, and peace and security.[31]

5.5.2 Background

The beauty of the canal lies in water. In recent years, with the rapid economic and social development, water environment management has risen to a new strategic height and has become the top priority of ecological civilization construction. In 2016, Yangzhou became the first city in Jiangsu Province that initiated the planning and construction of 1,800 square kilometers of Jianghuai Ecological Great Corridor by focusing on the South-North Water Transfer Project, relying on the lakes, rivers and wetlands around the Grand Canal in China, and improving water quality and ecology. Yangzhou included the Jianghuai Ecological Corridor in its "Ten Priorities" for the next five years, and will build a strong ecological security barrier for the Grand Canal with pilot projects and continuous efforts.

31.UNDP. https://www.undp.org/sustainable-development-goals#life-on-land

5.5.3 Actions

1. The Jianghuai Ecological Corridor (Yangzhou) Plan was formulated and promulgated. The total planned area for the Corridor was 1,800 km2, covering One Belt - an ecological belt formed along the Beijing-Hangzhou Grand Canal, Gaoshui River, Mangdao River, Liaojia Ditch, Jia River and surrounding lake systems and wetlands, and One Corridor - a clear water corridor formed along the Tong River, Sanyang River and Xintongyang Canal. A series of policy documents and plannings were issued, including Yangzhou Water Ecological Civilization Construction Master Plan (2014-2020), Yangzhou Ecological Red Line Protection Plan, Yangzhou Urban Blue Line Planning and Yangzhou Wetland Protection Master Plan (2018-2030).

2. The "Implementation Plan for the Adjustment of Yangzhou’s Urban Water Management Functions" was issued to straighten out the urban flood control, river, and water-saving management systems, eliminate the overlapping management of urban rivers, and form a coordinated system for urban and rural water control. The city strengthened legal protection, promulgated the Resolution on Strengthening Water Environmental Protection and Air Pollution Prevention and Control, and inspected the implementation of resolutions by counties (cities, districts) and relevant departments annually. The Administrative Measures for Urban "Clear Water" Improvement Projects clearly stipulates the diversion of rainwater and sewage, the management of sewage outlets. In addition, the city also formulated and implemented the "Regulations on the Management of Rivers in Yangzhou City".

3. “Eight Major Projects” have been implemented, including the industrial transformation and upgrading project, water cleaning project, lake protection project, park system and ecological center construction project, ecological corridor and ecological safety barrier construction project, rural environment comprehensive improvement project, and environmental infrastructure construction project.

4. The "River Chief System" was implemented to promote long-term management and protection of rivers. The city fully implemented the "River Chief System", managed the reward and assistance funds for the management and protection of backbone rivers and rural rivers, clarified the source of funds, and standardize the use of funds; GPS positioning systems are installed on all river cleaning vessels in the city, and dynamic monitor system is implemented to improve the effectiveness of cleaning.

5. Working with civil society to protect biodiversity. The relevant government departments of Yangzhou have taken effective measures to give wetlands identifications, build an intelligent monitoring system to protect little swans, promote "bird awareness week", and strengthen the habitat construction for Oriental White Stork. Yangzhou Finless Porpoise Conservation Association has publicized the close relationship between the endangered status of finless porpoise and human activities, and conveyed the protection of wildlife to the public through various forms such as launching the "Yangtze River Finless Porpoise Forum", launching a finless porpoise protection summer camp for college students, and developing intangible cultural and creative products with the theme of finless porpoise.

5.5.4 Performance

The water quality of rivers and lakes has been improved gradually. During the "Thirteenth Five-Year Plan" period, the soil erosion control rate in Yangzhou increased from 72% to 88%, and the urban water coverage increased from 9.3% to 10.76%. The Yangzhou section of the Beijing-Hangzhou Grand Canal maintained good water quality, and the water quality of its surrounding key rivers and lakes all met Class III requirements except Gaoyou Lake, which has fluctuating phosphorus factor. Water quality of Baoying Lake has been improved from Class IV to Class III, and the water quality of Shaobo Lake has also been improved from Class V to Class IV, and currently is stable at Class IV. The Yangzhou section of the Beijing-Hangzhou Grand Canal has generally maintained excellent water quality. Water quality of the Yangzhou section of the Yangtze River has been improved from Class III to Class II, and for Xintongyang Canal, the water quality has been improved to Class II since 2019.

The ecological environment has been improved steadily. The construction of ecological and landscape forest along rivers, lakes and roads has been promoted, and the protection rate of natural wetlands has reached 53.9%. The fenced farming area of Gaobao Shaobo Lake in Yangzhou has been reduced from 195,000 mu to 72,700 mu, and the total farming area of giant river prawn has been reduced by 65,500 mu. Since 2016, the water area in this region has increased by 55,300 mu, with an average annual growth rate of 2.26%. The construction of a water ecological civilization city has improved Yangzhou's regional reputation. In 2016, the city received 53,000 inbound overnight tourists, a year-on-year increase of 13.2%, ranking third in the province; tourism revenue increased by 59.1% over 2012.

The living environment has been improved significantly. Comprehensive environmental improvement has been completed in a total of 124 administrative villages, and 6 ecological centers with four-star scenic spot standards have been built in the region. More than 200 river channels at county and township levels were dredged, over 1,500 village rivers and ponds were renovated, 844 livestock and poultry farms in prohibited breeding areas were closed or relocated, and 40 projects for comprehensive utilization of livestock and poultry waste were built. In 2020, the forest coverage rate reached 23.67%.

Regional environmental protection has been improved. Since 2017, the number of chemical industrial companies in Yangzhou has dropped significantly, and the “small, scattered, and chaotic” situation of the chemical industry has been significantly changed. Yangnong Group and Lianhuan Pharmaceuticals stopped production completely. Over 300 fishermen in Jieshou Town of Gaoyou City were successfully relocated, and Yanhu Village in Hanjiang District was recognized by the Ministry of Agriculture and Rural Affairs as the “most beautiful fishing village”. Yangzhou Biodiverse and Sci-Tech City focused on developing a green ecological economy. Its “Seven Rivers and Eight Islands” ecological economy project was selected as one of the “Top Ten Ecological and Environmental Protection Reform and Innovation Cases in 2019”.

5.5.5 Outlook

Yangzhou will continue to consolidate and improve the achievements of the Jianghuai Ecological Corridor, carry out in-depth land greening actions, and promote the construction of ecological green cores, ecological corridors, and ecological areas. Strengthen the ecological restoration and environmental management of important rivers and lakes and wetlands such as the Yangtze River, the Grand Canal, other water channels of the South- North Water Transfer Project, Gaobao Shaobo Lake, Yizheng Mountains, and actively promote the co-construction of woodland, green space and wetlands. Yangzhou will continuously improve the ecological quality and green energy of the Jianghuai ecological corridor, amplify the brand effect of the Corridor, and strive to make the city a model of green development.

5.6 Case of Climate Actions: Achieving the Dual-Carbon Goals Through Low-Carbon Innovation

5.6.1 Corresponding SDG

Goal 13: Take urgent action to combat climate change and its impacts

If we do not act, global warming will continue to alter our climate system, with potentially disastrous results. Disasters caused by climate change cause hundreds of billions of dollars in annual economic losses. Floods, hurricanes, droughts, heatwaves, and other extreme weather occurrences were responsible for 91% of all disasters. Climate-related and geophysical disasters caused 1.3 million fatalities and 4.4 billion injuries between 1998 and 2017. Supporting vulnerable regions will directly contribute not only to Goal 13 but also to the other SDGs. These actions must also go hand in hand with efforts to integrate disaster risk measures, sustainable natural resource management, and human security into national development strategies. With strong political will, greater investment, and use of current technology, it is still possible to keep the rise in the global mean temperature to two degrees Celsius above pre-industrial levels, aiming at 1.5° C, but this calls for swift and ambitious collective action.[32]

5.6.2 Background

Global climate change has a profound impact on the survival and development of humankind and has become a major challenge faced by all countries in the world. On September 22, 2020, President Xi Jinping attended the General Debate of the 76th session of the United Nations General Assembly and delivered an important speech, stating that China will strive to peak carbon dioxide emissions before 2030 and achieve carbon neutrality before 2060. At present, China is less than 10 years away from the target year of the carbon peaking goal in 2030, and less than 40 years away from the target year of carbon neutrality goal. It is urgent to clarify the implementation path and carbon emission statistical standards, and formulate carbon peaking goals and implementation plans for cities and industries. In recent years, Yangzhou is facing economic transformation, the reduced coordination between low-carbon development and social progress, and increased uncertainty, which have brought pressure and challenges to the vision of achieving

32.https://www.undp.org/sustainable-development-goals#climate-action

carbon neutrality. Yangzhou had encountered problems such as insufficient resource endowment, reliance on import of primary energy, limited development of new energy, and adhered to the traditional development concept which fostered high-carbon basic social construction, high-carbon consumption, and high-carbon economy. Thus, it is urgent to reshape the concept of sustainable urban development guided by the vision of carbon neutrality.

Yangzhou Biodiverse and Sci-Tech City promotes ecological industrialization and realizes orderly and high-quality ecological protection, industrial development and urban and rural construction. Yangzhou's construction industry has also taken actions to vigorously promote energy conservation and carbon reduction in the construction sector.

5.6.3 Actions

1. Yangzhou Biodiverse and Sci-Tech City actively explores the path of carbon peaking and carbon neutrality, with following strategies: firstly, it creates sufficient space for the ecological construction by closing the car dismantling market, and relocating the sand and gravel factories and shipyards. Secondly, it develops and expands strategic emerging industries such as new information technology, new energy, and new materials, supports the construction of industrial chains and innovation chains, and creates a number of large-scale green industry groups. Thirdly, it pays attention to the dissemination of green and low-carbon lifestyles, develops and strengthens volunteer service forces in the field of ecological environment protection, and encourages more citizens to participate in low-carbon actions. Fourthly, it utilizes the natural ecological resources of the region to strengthen the carbon sequestration capacity. Also, efforts are made to promote the upgrade of the entire transportation chain in the area, and build a green and low-carbon multi-level transportation system. Lastly, adhering to the priority of energy conservation, Yangzhou Biodiverse and Sci-Tech City optimizes urban design and project layout in accordance with the low-carbon concept, promotes the efficient and economical use of land, and strives to promote the deep integration of green and low-carbon industries and cities.

2. Yangzhou’ s construction industry comprehensively promotes building energy efficiency and promotes green buildings. Yangzhou issued and implemented the 13th Five-Year Plan for Building Energy Efficiency and Green Buildings in Yangzhou City and Yangzhou City Green Building Action Implementation Plan to promote the upgrading of green construction of public buildings and industrial buildings, and the greening and carbon sequestration of public buildings. The industry also conducted in-depth research of energy-saving renovation needs of different types of buildings, defined energy-saving renovation standards, carried out the renovation of existing buildings.

5.6.4 Performance

Yangzhou Biodiverse and Sci-Tech City has established the ecological protection model of "seven rivers and eight islands", focusing on integrating the development of industry, culture and tourism. Ecological tourist attractions such as Phoenix Island National Wetland Park, 78 Avenue, and Jiajiang Scenic Belt were built, gaining popularity among tourists. At present, the green coverage rate in the region has exceeded 45%, improving and stabilizing the regional ecosystem and accelerating the low-carbon economy and tourism economy.

In terms of energy conservation and carbon reduction in the construction industry, Yangzhou fully implemented the green building design standards during the "13th Five-Year Plan" period, and obtained

a total of 98 green building labels, with a project construction area of 11.6664 million square meters. Two provincial-level building energy conservation and green building demonstration zones will be formed: namely Guangling New Town and Lingang New Town. Since 2016, the city's newly built energy-saving buildings have an area of 44.842 million square meters, including 31.8642 million square meters of residential buildings and 12.9778 million square meters of public buildings, saving 583,000 tons of standard coal. In terms of energy-saving renovation of existing buildings, the total renovation area is 2.4933 million square meters, including 1.2317 million square meters of residential buildings and 1.2616 million square meters of public buildings. A group of construction companies represented by Hengtong Group are actively developing green buildings, integrating ecological greening systems, waste classification and treatment system, air quality control system together, making positive contributions to the realization of the "dual-carbon" goals.

5.6.5 Outlook

A low-carbon economy based on low energy consumption, low pollution and low emissions is an important direction for the future industrial development of Yangzhou. In the future, all regions and industries in Yangzhou represented by the Yangzhou Biodiverse and Sci-Tech City and the construction industry will continue to explore innovative methods for green and low-carbon development, promote the upgrading and optimization of the industrial structure and energy structure, and form a distinctive green low-carbon development model, helping to achieve the "dual carbon" goals.

5.7 Case of Cultural Protection and Inheritance: Protecting and Developing Historical and Cultural Blocks for Better Urban Culture

5.7.1 Corresponding SDG

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

More than half of us live in cities. Two-thirds of humanity—6.5 billion people—will live in cities by 2050. It is impossible to achieve sustainable development without fundamentally altering how we design and maintain our cities.

The rapid growth of cities - a result of increasing population and immigration - has led to a boom in megacities, especially in developing countries, where slums are becoming a more important feature of urban life.

Building resilient societies and economies, safe and affordable housing, and career and business opportunities are all necessary components of sustainable city development. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways.[33]

33.UNDP. Sustainable Development Goals | United Nations Development Programme (undp.org)

5.7.2 Background

Being a city with a history of 2,500 years, Yangzhou was one of the first batches of 24 famous historical and cultural cities announced by the State Council in 1982. The ancient city of Yangzhou was built in 486 BC, covering an area of 18.25 square kilometers, including 5.09 square kilometers of the Ming and Qing historical districts (hereinafter referred to as the “Ancient Districts”), and 1.47 square kilometers of undamaged relics including 4 historical and cultural blocks of Dongguan Street, Renfengli, Wanzi Street, Nanhexia and 7 traditional complexes such as Beishi Lane, Niubei Lane, and Mituo Lane. Facing long-standing problems such as narrow roads, inconvenient traffic, inadequate infrastructure, and poor environment, Yangzhou has taken effective measures to protect its historical and cultural resources in recent years, under the guidance of the "Regulations on the Protection of Ancient Yangzhou City", "Yangzhou City Overall Planning" and "Yangzhou Historical and Cultural City Protection Plan".

5.7.3 Actions

1. Yangzhou strengthened overall coordination and scientific planning. Yangzhou improved institutional settings to provide a strong institutional support for the protection of historical and cultural blocks; formulated a special plan to define the scope of protection and clarify specific protection requirements. It deepened the research on famous cities, hosted the "China Famous City Forum", carried out thematic research, and scientifically planned the development blueprint of the ancient city of Yangzhou.

2. Yangzhou improved people’s livelihood and created a beautiful and livable environment. Yangzhou renovated traditional houses, formulated incentive policies, issued technical guidelines, and provided financial subsidies and technical support for maintaining and self-renovating traditional houses. Yangzhou upgraded the infrastructure in historical and cultural blocks by renovating the underground pipe network, power supply facilities, and gas facilities on a yearly basis. Yangzhou strengthened financial support for the protection of ancient cities and historical and cultural blocks by setting up and arranging special funds.

3. Yangzhou promoted its culture and highlighted the city’s characteristics. Yangzhou renovated and repaired cultural relics, and built the Grand Canal Salt Merchant Cultural Exhibition Hall, Yangzhou Cultural History Museum, Yangzhou Family Tradition Exhibition Hall using the renovated Salt Merchant Wang’s Residence, the Salt Inspection Office, and the Ruan Yuan’s Temple. Yangzhou utilized historical buildings that were not used for residential purposes, supported the revitalization of time-honored brands through the establishment of special funds and the introduction of preferential policies, in order to carry on traditional techniques and characteristic products.

5.7.4 Performance

Yangzhou City has established an Ancient City Protection Committee to coordinate, guide, and supervise the protection and utilization of historical and cultural blocks. In accordance with the Protection Plan for Renowned Historical and Cultural Blocks in Yangzhou City, protection plans for four historical and cultural blocks of Dongguan, Nanhexia, Renfengli and Wanzi Street have been compiled. Yangzhou explored and developed three different protection modes: “state-owned enterprises do the work under the leadership of the government” represented by Dongguan, “collaboration between municipal departments and district-level governments” represented by Nanhexia, and the

“voluntary involvement of residents under the guidance of the government” represented by the Renfengli historical and cultural block. Through the renovation of block infrastructure, the living conditions and block environment of residents have been improved. It also attracted a number of traditional skill and intangible cultural heritage projects such as paper-cutting, lacquer ware, and story-telling to set up display and inheritance venues in the blocks, fully demonstrating the cultural appeal of the ancient city of Yangzhou. In 2021, Dongguan and Renfengli historical and cultural blocks were selected as demonstration cases of historical and cultural protection and inheritance by the Ministry of Housing and Urban-Rural Development.

5.7.5 Outlook

Through protecting the traditional features of the ancient city and the improvement of infrastructure, Yangzhou aims to build a beautiful and livable city and promote the protection and utilization of historical and cultural blocks. Yangzhou has accumulated experience in block protection and utilization, and in the future, it will continue the work, fully demonstrate the historical and cultural appeal of the ancient city blocks, and enhance the city's cultural quality.

Figure 5-2 Aerial View of Dongguan Street

5.8 Case of Spatial Optimization: Optimizing Parks and Green Spaces to Improve People’ s Livelihood and Well-being

5.8.1 Corresponding SDG

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

More than half of us live in cities. Two-thirds of humanity—6.5 billion people—will live in cities by 2050. It is impossible to achieve sustainable development without fundamentally altering how we design and maintain our cities.

The rapid growth of cities - a result of increasing population and immigration - has led to a boom in megacities, especially in developing countries, where slums are becoming a more important feature of urban life.

Building resilient societies and economies, safe and affordable housing, and career and business opportunities are all necessary components of sustainable city development. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways[34]

5.8.2 Background

Gardens and parks are the symbols of Yangzhou's ecological beauty, livability and tourism. Over the past 40 years of reform and opening up, Yangzhou has given considerable attention to ecological conservation, protection of urban core resources, citizen exercise and social interaction, disaster prevention, urban development space reservation. In addition, Yangzhou deepened the promotion of the "+ park" project in old districts of Yangzhou and "park +" project in the newly developed districts of Yangzhou, that is to build as many parks as possible in the old districts and improve the quality of parks and green spaces in the new districts. Furthermore, Yangzhou has continuously improved the park system that covers urban and rural areas, with convenient locations and complete functions, and built itself into an attractive and high-quality park city, showing the beauty of Yangzhou to the world.

5.8.3 Actions

1. Yangzhou constructed a park space system with a reasonable layout. Yangzhou connected multi-functional parks and large-scale theme parks together through ecological corridors to build an interconnected and integrated park system. Combined with the main water and green corridors, Yangzhou connected major multi-functional parks together, and formed a large park space structure of "multiple corridors string multiple parks together". There are a total of 321 planned parks in the central urban area of Yangzhou, including 34 multi-functional parks, 184 community parks, 52 pocket parks, and 49 theme parks. The coverage rate of planned multi-functional parks is 85.88% and the coverage rate of community parks is 97.94%.

34.UNDP. Sustainable Development Goals | United Nations Development Programme (undp.org)

2. Yangzhou created a diversified functional system for parks. Yangzhou identifies different functional orientations of different types of parks to adapt to the needs of different groups of people. Yangzhou has carried out an overall ecological protection plan for Zaolin Bay Ecological Park, incorporating 68 square kilometers of natural landscape resources of "three mountains, five lakes, two springs and one river" into the protected area, and determined that "green" is the main theme for the park. The park has successively hosted the 10th Horticultural Exposition of Jiangsu Province and the 2021 World Horticultural Expo. Yangzhou pays attention to the park's functions such as ecology, sports, leisure, tourism, education, and disaster avoidance, taking into account the needs of different groups and individuals, the elderly and the young, and combining existing cultural relics to set up various sculptures, logos and urban historical symbols. Various public cultural and sports activities are held to enhance citizens' accessibility and experience.

3. Yangzhou promoted the implementation of the "Park+" pilot project. The project helps develop commercial complexes and high-quality hotels around large urban parks, neighborhood centers and farmers' markets around small and medium-sized community parks, and garden landscapes and fitness trails inside community parks, establishing a mode of public space + public services + residential housing. Such effort transformed the beauty of parks into the value of the city, attracting a large inflow of enterprises and a net inflow of more than 10,000 talents each year, accelerating the growth of Yangzhou's software and information service industry, the technology R&D industry, and the cultural and creative industry.

4. Yangzhou promulgated and implemented the Yangzhou City Park Regulations, which was the first legislation on open parks in Jiangsu Province. The regulations mainly regulated the government's behaviors in park planning, construction and management, the behaviors of park conservation units, and the behaviors of park users (mainly visitors) from four aspects: promoting park construction, strengthening park management, regulating behaviors, and improving services in a bid to promote the healthy and sustainable development of parks in Yangzhou, and deliver the benefits to Yangzhou citizens.

5.8.4 Performance

With tremendous efforts, Yangzhou has built 306 free urban parks of different sizes covering all districts of the city, resulting in 19.57 square meters of urban green space per capita. To date, average resident is less than 300 meters from a public green space. Visiting the parks has become the most popular activity for citizens, which not only improved their physical health, but also improved their mental health. By developing a park city, Yangzhou has developed into an attractive cultural city, attracted city administrators and researchers from Jiangsu Province and beyond to study and learn Yangzhou's practices, and set a Yangzhou example for other cities.

5.8.5 Outlook

In the future, Yangzhou will carry out planning for areas with relatively concentrated populations but are not yet covered by parks, increase the total number of parks, update park facilities, improve park greening, and continue to improve the urban park system. The city will also strengthen the dynamic management of open parks, organize more park activities, and promote the sustainable development of parks. At the same time, newly built parks will be included

in the list of protected parks in a timely manner, and supervision and management will be strengthened to ensure the safe development of the parks.

5.9 Case of International Cooperation: The 2021 World Horticultural Expo was successfully held, expanding international exchanges

5.9.1 Corresponding SDG

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Only through strong international partnerships and cooperation can the SDGs be achieved. At US$147 billion in 2017, Official Development Assistance (ODA) remained constant but fell short of expectations. While conflict- or disaster-related humanitarian problems continue to necessitate increased funding and assistance, many countries also require ODA to encourage growth and trade.

The world is more interconnected than ever. A key strategy for encouraging innovation and idea exchange is to increase access to knowledge and technology. Sustainable growth and development depend on coordinating policies to aid developing nations in managing their debt and supporting investment for the least developed.

The goals aim to enhance North-South and South-South cooperation by supporting national plans to achieve all the targets. Promoting international trade, and helping developing countries increase their exports is all part of achieving a universal rules-based and equitable trading system that is fair and open and benefits all.[35]

5.9.2 Background

Since establishing the first Friendship City with Karatsu, Japan in 1982, Yangzhou has built a Friendship City network with 23 cities in 15 countries and maintained Friendly Interaction City relations with 50 cities in 30 countries. By increasing the number of Friendship and Friendly Interaction cities and utilizing their resources, Yangzhou has built a multi-level and solid exchange network. This network acts as the main channel for Yangzhou to carry out international exchanges, an effective platform for attracting investment, and an important leverage to promote foreign affairs.

Yangzhou, along with 60 domestic and international canal cities established the World Historic and Cultural Canal Cities Cooperation Organization (WCCO) in 2009, to promote economic and cultural exchanges, share development experiences, promote mutually beneficial cooperation, and encourage the common development and prosperity of canal cities. After the successful inscription of the Grand Canal onto the World Heritage List, the WCCO is committed to serving the world canal cities. By holding the World Canal Cities Forum, it has created the world canal town cooperation mechanism and the world canal cities outstanding tourism attractions cooperation mechanism,

35.Sustainable Development Goals | United Nations Development Programme (undp.org)

strengthened exchanges and cooperation with international social organizations, and launched reports and publications such as A Directory of World Canals, Blue Book of China Grand Canal, and Green Development Report on World Ancient Canal Town. WCCO is also dedicated to building an international canal volunteer system that not only connects canal cities but also international social organizations in China and abroad. WCCO currently has 170 members, comprised of 48 domestic canal cities, 47 foreign canal cities, as well as enterprises and research institutes, covering five continents, including Asia, Europe, North America, Africa and Oceania.

5.9.3 Actions

After nearly five years of preparation and construction, the 2021 World Horticultural Exposition was held in Yangzhou on April 8, 2021. Themed on "Green City, Healthy Life", the Expo was jointly hosted by the National Forestry and Grassland Administration, the China Flower Association, and Jiangsu Provincial People's Government, and supported by the Yangzhou Municipal People’ s Government. The Expo covered a total area of 230 hectares, with an overall layout of "one axis, two veins, five centers, and eight areas". There are 64 outdoor exhibition sections, including 26 exhibition sections for domestic cities and enterprise such as Beijing, Shanghai, Hong Kong, and Macau; 25 exhibition sections for foreign cities or international organization such as Orléans (France), Breda (the Netherlands), San Antonio (the United States), Nara (Japan), the International Bamboo and Rattan Organization, the World Rose Federation; and 13 exhibition sections for cities of Jiangsu province. During the Expo, the international pavilion used horticultural display techniques to create an ecological green planting space, highlighting the theme of the Expo and horticultural culture around the world. The international exhibition section mainly displayed flowers of the five continents, highlighting the diverse ecology of each continent. The Jiangsu Characteristic Horticultural Zone focused on displaying the development achievements of modern horticulture in Jiangsu province, and promoting the achievements of Jiangsu's modern horticultural industry, including the orchid boutique exhibition, the mushroom industry forum, and the tea making professional skills competition.

5.9.4 Performance

A high-level worldwide horticulture event was successfully created at the 2021 World Horticultural Exposition, which featured 1,800 horticultural events and contests and attracted nearly 2.5 million online and offline participants. International and domestic exhibitors used this Expo as a platform to conduct economic, cultural, technological, and academic research exchanges, promote new goods and technologies, and expand green industry cooperation and multicultural exchanges. The influence of the Expo radiates far beyond the exhibition itself. Taking the Expo as an opportunity, Yangzhou has finished a number of infrastructure projects and upgraded sectors including tourism, sports, health, and organic food. The hilly ecological economic belt in the middle of Yizheng had received investments totaling more than 40 billion CNY because of the Expo. Additionally, the Expo included nearby tourist destinations and communities, such as Jiangyang Tianle Lake, Yangzhou Peony Garden, Tongshan Sports Town Water Park, and Youth Outdoor Sports Base, realizing the flourishing development of tourism resorts.

5.9.5 Outlook

The 2021 World Horticultural Expo promoted mutual understanding among world civilizations and harmony between human and nature. Yangzhou has adhered to the principle of thorough planning from the start regarding how to maintain the Expo's effect in the post-Expo era. Yangzhou will make the most of the after-effect of the Expo and work to transform the exhibition site into a top-notch cultural tourist complex that incorporates scenic areas, theme resort hotels, cultural performances, and vacation resort villages. The city of Yangzhou will also fully utilize the Expo's positive economic, social, and environmental effects, invest in environmental protection, secure a healthy environment, and work to make "green city, healthy living" the new standard for Yangzhou's urban growth. At the same time, Yangzhou will continue to cooperate with all relevant parties, establish more exchange platforms, create more cooperation opportunities, and promote economic and trade cooperation among countries.

Voluntary Local Review on the Implementation of UN Sustainable Development Goals in Yangzhou (2022)

The Implementation of 2030 Agenda by Canal Cities