

Application for UN-HABITAT Scroll of Honor 2009  
by Rizhao Municipality, China

## Planning an Ecological City and Building a Livable Home

—The practice of Rizhao to explore sustainable development



Rizhao Municipal People's Government  
August, 2009

## ABSTRACT

“The first city to enjoy the sunshine with the sunrise”, hence the name Rizhao. Located in the southern end of Shandong Peninsula, neighbouring Qingdao in the north, and facing Japan and Korea across the Yellow Sea in the east, Rizhao is a rising city with unique oceanic features. It covers a total area of 5,310 square kilometers with a population of 2.84 million of which 560,000 live in urban areas. Rizhao possesses the clearest blue sky, blue sea and golden sand beach in China’s eastern coastal areas.

Rizhao was upgraded from a county to a city in 1989. At the beginning, the city faced many problems such as weak comprehensive strength, lagged planning, insufficient infrastructure facilities, inappropriate ecological protection in the coastal areas and poor living conditions of the residents. Accelerating urbanization and industrialization intensely competed with the protection of the ecological environment.

After the city was upgraded, starting from the view of sustainable development for a future city and aiming at the goal of building an ecological and livable city, we worked out the strategy of “Building an Eco-City” and a series of planning including the Eco-City Building Plan of Rizhao and General Plan for Developing Circular Economy in Rizhao. We began to vigorously carry out practices on eco-city building; improve urban infrastructure; restore damaged ecological area; actively develop circular economy; popularize the utilization of cleaning energies; set up a multi-level housing security system so as to maintain the environmental advantages of “blue sky, blue sea and golden beach” and realize the balanced development between economy, society and ecological environment. The City of Rizhao is praised as the most livable sunshine city and won the China Habitat Award in 2008.

The implementation of the strategy of “Building an Eco-City of Rizhao” has thoroughly upgraded the urban ecological environment, expanded the development space, promoted the economic development, improved the quality of life of the people, and raised the overall competitiveness of the city. Rizhao has achieved sustainable development with its own characteristics, which offers significant evidence of experience for cities in developing countries to learn from.

Our concepts are as follows:

First, the protection of ecological environment shall be stressed. In order to achieve the harmony between human and the nature as well as the one between urban development and ecological protection, the relation between immediate and long-term interests as well as the one between social and economic benefits shall be soundly kept.

Second, the principle of putting people first shall be upheld. Taken the goal of meeting the needs of the people as the starting point, the people shall be made to furthest enjoy the achievements of development.

Third, multi-channel cooperations shall be enhanced. The ecological and livable city shall be jointly planned and built in an effective manner which is through government leadership, policy guidance, experts' consultation, international collaboration, public participation and multi-channel financing.

Our experiences are as follows:

First, the golden coastline of nearly 100km is strictly protected and developed in accordance with planning, which not only meets the needs of production and life but also offers the beautiful ecological leisure space for the public for free.

Second, the discard-quarries in the urban area were built into gardens of rainwater by treating and using rainwater in an environmentally friendly way.

Third, the circular economy is developed by utilizing clean energies.

Fourth, the city brands including the city of water sports are developed to enhance the competitiveness of the city.

# Planning an Ecological City and Building a Livable Home

— The practice of Rizhao to explore sustainable development

## 1. Background

“The first city to enjoy the sunshine with the sunrise”, hence the name Rizhao. Located in the southern end of Shandong Peninsula, neighbouring Qingdao in the north, and facing Japan and Korea across the Yellow Sea in the east, Rizhao is a rising city with unique oceanic features. It covers a total area of 5,310 square kilometers with a population of 2.84 million of which 560,000 live in urban areas.

Rizhao was upgraded from a county to a city in 1989. At the beginning, the city faced many problems such as insufficient infrastructure facilities, weak comprehensive strength and poor living conditions of the residents. Accelerating urbanization and industrialization intensely competed with the protection of the ecological environment.

After the city was upgraded, starting from the view of sustainable development for a future city and aiming at the goal of building an ecological and livable city, we worked out and implemented the strategy of “Building an Eco-City”. Through the hard work of two decades, especially the efforts of recent 10 years, Rizhao realized the balanced development between economy, society and ecological environment by maintaining the environmental advantages of “blue sky, blue sea and golden beach”. The City of Rizhao is praised as the most livable sunshine city and won the China Habitat Award in 2008. Now, Rizhao is speeding up its steps towards a modern and ecologically livable coastal city.

## 2. Project Description

### I. Problems

●Lagged Planning: The planning system seriously needed to be improved since the features of the city were not clearly identified, the industrial structure and functional division for the city were not scientifically and reasonably laid out. Over 100 enterprises were distributed in the urban area which seriously affected people's lives and the natural environment.

●Insufficient Infrastructure Facilities: The building of infrastructure with a strong bearing on people's lives lagged seriously behind. The length of hard-surfaced roads in the whole city was only 49 kilometers. The total area of park and green space was only 12 hectares, with per capita public green space less than 3 square meters, so we were far short of public leisure space. The city had almost no garbage disposal facilities, nor a sewage system with a treatment complex.

●**Ineffective Eco-environment Protection in the Coastal Areas:** The development of city's waterfront was in serious disorder. The Wanpingkou coastal region adjacent to urban area was in chaos with polluted water and damaged wetlands. The reef cluster in the lighthouse region was occupied by the oil tanks of Sinopec. There were over 20 discard quarries totaling more than 200 hectares in the urban area. Garbage and rainwater in the quarries resulted in mosquitos and flies as well as foul odors and unsanitary conditions.

●**Poor Living Conditions:** The annual average income of a citizen was only 65 USD. The residential buildings were in low quality and lacked supporting facilities including street lights, drainage and sanitary. With a large density of registered inhabitants, the per capita housing area was less than 12 square meters. There were 89 “villages in town” in the urban area. Some of the villages were in low elevations and vulnerable to floods in flood season, which posed security and safety hazards to people's life and property.

## **II. Objectives**

The project aims at trying to build Rizhao into a livable, coastal city with “complete function, sound ecology, beautiful environment and rich vitality” through scientific, reasonable planning and effective practices.

## **III. Measures Taken**

●**Developing a High-Quaility City Planning and Identifying Development Goals for the City**

The leading position of planning is highlighted and its function of macro-control is brought into full play. Moreover, promoting both the environment construction and the sustainable development is made as primary goals and ultimate values for the city. We invited high-level planning and design institutes including the China Academy of Urban Planning and Design as well as Peking University to develop the concept planning of Southern Shandong Coastal Industries Area, the sustainable development planning of Rizhao, the construction planning of an eco-city, the planning on circular economy development, the master plan of the city of Rizhao and the integrated development planning between urban and rural areas. These plannings formed a multi-level planning system and set out the spatial form for long-term development of the city and the basic thoughts and goals for its industrial layout and eco-city building. They have also helped to divide scientifically the functional divisions, demarcate the areas that are forbidden absolutely and partly to develop, and strengthen the protection of the important ecological sensitive areas such as water source, rivers, wetlands, shallow waters and ecological environment resources including and mountains, green land, forests, coastline and sea areas.

The public hearing system on planning has been set up. We collect all the suggestions

and comments from experts and all circles of life on planning and make decisions scientifically and democratically. We carry out the centralized and unified management and control on planning and gradually regulate the urban construction and sustainable development of ecology.

● Improving Urban Infrastructure to Facilitating the People's lives

Adhering to the principle of moderated changes, we strengthened the building of infrastructure such as roads, parks, squares, water supply and drainage, sewage treatment and garbage disposal facilities and enhanced the service functions of our city. The handling capacity of Rizhao Port and Lanshan Port reached 151 million tons in 2008, ranking the eighth largest among China's coastal ports. The Heze-Rizhao Railway was double-tracked, and Jiaozhou-Xinyi Railway, Tongjiang-Sanya Expressway and Rizhao-Dongming Expressway were successively completed and open to public. Over 50 highways with a total length of 1,187 kilometers were built. Eight water plants were constructed with daily water supply capacity of 322,000 tons. 98.6 % and 65% households have access to fuel gas central heating service. The sewage treatment facilities, sewage interception and recycling projects were built, with sewage treatment rate above 87% and wastewater reuse rate up to 22%. Harmless garbage treatment plants were built. We set up a garbage treatment mode that collection is done by villages, transportation by townships and disposal by counties. The garbage is classified and comprehensively used, with harmless treatment ratio up to 95.4%. Putting public transportation as the priority choice, 61% of the residents go out on foot, or by "cycles" and buses.

Emphasis is given to the greening recovery of mountains, coastal areas, riversides and roadsides; priority arrangement is given to the use of land for greening and strict control is exercised in this field. We preserved 620,000 square meters of land in the urban area for the future use as greening land and 820, 000 square meters of orchards as future city gardens. We have successively built ecological landscape avenues and more than 80 park green lands such as the People's Square. Parks of over 600 hectares in the urban area are now reconstructed and open to the public for free. The urban green coverage area reaches 2,160 hectares with per capita green land area of 19.2 square meters.

● Restoring Ecologically Damaged Areas and Developing Urban Leisure Spaces

To protect and restore the natural ecological features such as sand beaches, reefs, wetlands and protection forests, we implemented comprehensive rehabilitation projects along the coastal areas. Reefs occupied before are now restored to natural forces, the 22 oil storage tanks of Sinopec with a total storage of 120,000 cubic meters have been moved out. Nearly 100 kilometers coastal line was effectively protected and renovated, buildings like hotels and

fresh water shower rooms of poor standards were removed. We built belt-like gardens on both sides of the roads, thus, greenland, pine forest, sea and sand beaches are combined together to form a clear and beautiful ecological landscape being praised as golden coast .

In the Wanpingkou area there are nearly 10 square kilometers golden land, rather than used as real estate development, we invited famous planning institutions both home and abroad to plan and design, and the area was designated as a comprehensive coastal park combining tourism, water sports, leisure and bodybuilding. 290 million USD were invested for protective development, we built the Olympic Water Park consisting of International Sailing Base, Water Sports Base, Wanpinkou Ecological Park and Lighthouse Square. Not only can it hold all kinds of water sports, but also it serves as a coastal tourism and leisure attraction of international standards. Forty major sports events such as the 2007 China Water Games, World Sailing Classic Event were successfully held here. The Olympic Water Park combines green space building and wetland protection with sports events. It has won “China Award for Best Practices to Improve the Living Environment ” and “Luban Award” that is a national level award for best construction projects in China.

We invested 70 million USD to reconstruct the discard quarries in the urban area and built 320 hectares of green space parks such as Qicai Lake and Ziyang Lake. The pipe network of the lakes collects rain in the surrounding area, restoring natural water cycling system. Treating with rainwater by environmental friendly ways is not only effective for flood control and disaster relief, but also providing source of irrigation. It forms a water cycling system both increasing ground water and preventing sea water encroachment. Meanwhile these lake parks improved the ecological environment and provide new leisure and exercising places for urban residents. Rain collecting ponds were built into rain parks on roadsides and in residential areas.

We have comprehensively improved the five rivers including Shadun River running through the urban areas, which have a total length of 120 kilometers. The rivers have been widened, silt has been dredged and street drainage sewerage systems were rebuilt. Following the four principles of “ecology, flood control, aesthetics and functionality” and using modern garden landscape elements, we continue to build landscape green belts along the rivers and create urban riverbank ecological sceneries.

#### ●Developing Circular Economy and Promoting the Use of Clean Energies

To fundamentally change the economic growth mode from single and irreversible development to sustainable and circular development, we support development of circular economy and built cyclic circles at each level - city, industrial park and enterprise. Each of the three circles should conduct a circulation by itself, discharge no waste and realize zero

pollutant emission to the environment. Under the support of EMCP (EU-China Environmental Management Cooperation Programme), the Ecological Industrial Park of Rizhao Economic Development Area first finished its planning and set up a Waste Minimization Club within the park. Thus, the enterprises are linked ecologically. They use each other's surplus energy and waste to realize circular use of resources among enterprises and zero emission of waste within the park, which generates favorable results and receives high recognition from the EU. We encourage all the units and citizens to recycle the renewable resources in the whole society, and the citizens have been accustomed to use recycled products including degradable plastics. At present, there are over 40 enterprises involved in comprehensive use of renewable resources with an annual production value of 66 million USD.

We vigorously promote the use of solar energy, methane, wind power and other clean energies. Now the utilization rate of solar energy in Rizhao is up to 99%, and the number of solar cooker is over 6,000. There are 60,000 winter green houses covering an area of 38.66 million square meters, and plastic mulching area of 470 million square meters. 45,000 people are using methane. Methane electricity generator sets are installed in industrial enterprises with a total installed capacity from the 32 sets up to 13,500 kwh. There are 28 water-lifting devices and electricity generating devices by wind power. It is estimated that, thanks to the promotion and use of solar energy, methane and other clean energies, we save 3.8 billion kwh of electricity every year in the whole city, which substitute 1.44 million tons of standard coal; and reduce CO<sub>2</sub> emission of 3.25 million tons, SO<sub>2</sub> of 22000 tons and dust of 20,000 tons. In 2007, Rizhao won the first “World Clean Energy Award” and is the only city in China winning this award.

● Setting up a Multi-level Housing Security System and Improving the Living Conditions of Families with Medium and Low Income

With emphasis upon solving the housing problem of families with medium and low income, we set up a multi-level house supply system by means of providing housing allowances and building low rental houses, it is named as “Rizhao Model” by relevant experts and media. According to the principles of unified planning, implementation in stages and providing complete facilities, the reconstruction of “villages in town” was successively began in those which are most vulnerable to flooding. We issued special supporting policies and worked out the scientific planning such as effectively integrating the available resources, appropriately relocating villages and incorporating habitation parts, reducing tax and fees and equipping with necessary service facilities including schools, clinics and culture centers. We also reformed the management and public security system of the community, and increase employment rate through developing service industries. “Villages in town” have been turned



into urban communities with distinctive features. Combined with the reconstruction of “villages in town”, we built low rental houses and provide them directly to qualified families to solve the housing problems of special families with orphaned, old, sick, and disabled members. At present, per capita building area in the city reaches 30.25 square meters, basically attaining the goal of “adequate shelter for all”.

#### **IV. Achievements**

●At the economic aspect: The economy has achieved sustainable, fast and balanced development with great improvement in quality and benefits. In 2008, the GDP of Rizhao City reached 9.66 billion USD, per capita GDP 3,540 USD and local fiscal revenue 454 million USD, which increased by 26.9 %, 24.9 % and 47.5 % respectively , comparing to 1989.

●At the social aspect: The function of city services has been visibly improved. People's living conditions, both in the environment and with services, are improved in an all-round way with facilities concerning community life, culture, sanitation and education well provided; social order is good while people live in peace and happiness with their quality of life markedly enhanced. The environments for investment, living and consumption in the city are greatly improved. In 2008, urban registered unemployment rate was 2.9%; 1.212 million USD was allocated for disaster relief and poverty alleviation. Minimum living allowance protected 13.3 thousand urban citizens. Rizhao has become one of the most comfortable cities in China with the best city services delivery and reliability along with the lowest crime rate.

●At the ecological aspect: While achieving sound economic development, Rizhao preserves its primitive ecological environment featuring a blue sky, a blue sea and golden beaches. Urban noise is effectively controlled. The quality of our urban water system was remarkably improved. The quality of air, drinking water and sea water keeps the national Standard Class I. The air quality in Rizhao ranks top among the first 113 key cities famous for environmental protection at national level. In Shandong province, Rizhao ranks top among prefecture-level cities for eight consecutive years in the quota-based evaluation on the comprehensive rehabilitation of urban environment.

#### **V. Prospects of Development**

In the practice of exploring the way to sustainable development, with the proper implementation of the strategy of “Building an Eco-city” day by day, Rizhao is holding great development prospect. Thanks to the scientific layout, reasonable functional distribution, and standardized urban management, Rizhao enjoys abundant opportunities for future development. Energy conserving ideology and innovative awareness are more accepted. The perfect combination between natural ecology and urban civilization, rapid development of university economy and technology guarantee the sound development of Rizhao. Favorable

ecological environment, complete infrastructure, multi-level housing guarantee makes Rizhao the most livable place in the world. In the future, Rizhao will be built into a harmonious sunshine city with strong economy, scientific industrial distribution, and coordinated development between society, economy, culture and ecology.

### 3. Main Partners

● **Public Participation:** Citizens can make suggestions to the government by means of newspaper, TV, radio, internet, etc. People living in communities consciously save energy by reducing garbage, classifying garbage, and planting trees, grass and flowers. We attached great importance to the participation of women, children and young people in many activities, for instance, 36 forestry bases were developed with their involvement and some woods were named the woods of women, growing-up and youth. Community volunteer teams were organized to get involved in various possible fields of improving human settlement environment in both urban and rural areas.

● **International Cooperation:** EU assists the project of ecological industrial park in Rizhao through the EMCP (EU-China Environmental Management Cooperation Programme). Overseas planning and design institutions such as American Institute of Certified Planners, American EDSA Design Company and German TZ Design Company all participated in the planning of Rizhao. A loan of 15 million USD was got from the World Bank to build Rizhao's wastewater and solid waste treatment plants. A British loan of 10 million USD is being used to build waterworks for a daily water supply capacity of 100,000 tons.

● **Experts Consultation:** The well-known experts and professors from China Academy of Urban Planning and Design, Tongji University, Tsinghua University, Beijing Forest University were invited to Rizhao to formulate urban planning and give guidance and suggestions on urban development. We carried out international consultation activities on urban design and continue to invite experts and overseas planning and design institutions such as German ASA Architects, Austrian Rpx and British Atkins Consultants Co., Ltd. to participate in the planning, design, consulting, verification and evaluation.

### 4. Impacts

● **Improvement of Life Quality:** The quality of living of the people has been gradually improved. The per capita disposable income of urban residents has reached over 2,088 USD and per capita consumption expenditure is around 1,466 USD. One green space garden is available every 500 meters in the urban area. According to survey results, the satisfaction rate of citizens with government work is up to 98.9%; their positive recognition rate of the

environmental improvement is up to 99.6%; the happiness index of the people reaches 95.7%.

- **Enhancement of Comprehensive Strength of the City:** The comprehensive competitiveness of Rizhao ranks the 98th among China's 294 cities in 2009 and the economic growth of Rizhao ranks the 15th among the 500 cities in the world. The favorable ecological environment of Rizhao attracts over 6,000 talented people from both home and abroad to come and start business. Over 300 respected professors from Peking University, the most famous university in China, have come to Rizhao for living, leisure, vacation and academic seminars. There are now 7 higher educational institutions in Rizhao with nearly 60,000 students. The gathering of all kinds of talents promotes the development of different industries and enhances the comprehensive strength of the city as well.

- **Upgrading of Investment Value of the City:** Good environment for human habitat and business has been attracting more and more attention both from foreign and domestic entrepreneurs. Many business people have come to Rizhao for investment and business opportunities. Up to now, there were 303 foreign enterprises in Rizhao. The foreign capital utilized totals almost 6.87 billion USD. In 2008, the number of tourists received by Rizhao reached 14.66 million person times, with total tourism revenue of 1.03 billion USD.

## 5. Sustainability

- **Government Support:** The Municipal Government set up a leading group for eco-city building. With experts and government officials as members, the group is in charge of examining the planning; researching on measures; and summarizing the experience to enable and ensure the scientific implementation of the strategy of “building an eco-city”.

- **Legal Support:** A series of plannings were formulated such as plannings on sustainable development, eco-city building, circular economy development, development strategy and overall development for Rizhao. Regulatory documents were issued such as Management Methods for Urban Greening in Rizhao, Management Methods for Protection of Surface Water Source for Drinking Water, Management Methods for Coastal Protection Forests, Management Methods for Urban Garbage and Promotion Methods for Circular Economy in Rizhao.

- **Fiscal Support:** In the past three years, the government invested 83 million USD for coastal ecological protection; 20 million USD for treatment of water resources; 50 million USD for enterprises' ecological reconstruction and circular economy promotion; and, 12 million USD for the development and utilization of new energies.

- **Public Support:** Citizens in all walks of life take protecting eco-environment and building a livable city as their responsibility and obligation. They have become volunteers

participating in the project.

## 6. Popularization

### ● Experiences that can be popularized:

First, protect and construct the golden coastline of nearly 100km in accordance with planning strictly to meet the needs of production and life and provide beautiful ecological leisure space for the public. Second, build the discard-quarries in the urban area into gardens of rainwater so as to make treatment and use of rainwater by environment friendly ways. Third, develop circular economy and utilize clean energy. Fourth, build city brands such as city of water sports to enhance competitiveness of the city.

### ● Our experience has been popularized to other cities:

The experience of Rizhao in building a coastal, ecological and livable city is recognized and popularized by cities from home and abroad. Over 30 cities have come to learn our experiences including Coatzacoalcos of Mexico, Blagoveschensk of Russia, Gisborne District of New Zealand, Qingdao, Lianyungang and Zhengzhou of China, etc. .

### ● Our experience can be popularized to the whole world:

In the world, especially in developing countries, the balance between economic development and environment protection in the modernization process has always been the problem. Rizhao, as a medium-sized city, is committed to building the eco-environment, enhancing the quality of people's habitat environment and has achieved visible, tangible and measurable results during its practice. Its experiences and model are of popularization value and have significant ideas for possible adoptions for the developing countries.

### ● Recognition of Popularization by Experts:

Mr. Zhao Baojiang, former deputy minister of Ministry of Housing and Urban-Rural Development of China (MOHURD), Chairman of China Association of City Planning: Rizhao attaches great importance to human habitat environment. The good experience they create in this field is worth learning.

Ms Chen Xiaoli, former chief planner of MOHURD: The urban planning of Rizhao enjoys its unique features and is an excellent planning project among coastal cities. It can be used as an example in the textbook.

## 7. Innovations

● Innovative Concepts: During the process, we considered the economic environment, social environment and natural environment in a balanced way according to sound ecological theories; thus we reduced the negative impacts resulted from human production activities and

life requirements to the minimum and ensured the sustainable development of the city to realize an ongoing harmony among the economy, society and nature.

- Innovative Financing approaches: We have adopted a government-led multi-channel financing mechanism including financial investment, social capital investment and donations from individuals, non-governmental organizations and other donors.

- Innovative Management Systems: The project adopts a new management mechanism featuring the integration and participation of government departments, social organizations, community neighboring committees and individual citizens.

## 8. Recognition of the Initiative

- Honorary Awards of China:

Rizhao has won many honorary titles such as the National Garden City, National Water Saving City, National Model City for Environmental Protection, National Clean City, National Demonstration City for Circular Economy, National Pilot City for Building of Ecological Demonstration Zone, National Demonstration Zone for Sustainable Development, China Top Tourist City and China Habitat Award.

- Recognition from International Organizations:

In 2007, Rizhao won the “World Clean Energy Award” at the 10th Basel Energy Summit in Switzerland. This award was initiated at that summit and Rizhao is the only city in China winning it. In the report, State of the World 2007: Our Urban Future jointly issued by World Watch Institute and Global Environmental Institute, the organizations cite Rizhao as a successful case in solar energy popularization and utilization, CO<sub>2</sub> emission reduction and treatment of urban pollution. Some media including American ABC, Washington Post had special reports on the practice of Rizhao. Media from Japan, Singapore, and Germany will also come to Rizhao for interview.

- Recognition from Experts:

Dr. Samuel C.C. Ting, world-famous experimental physicist and Nobel Prize winner: Rizhao can be called “Oriental Hawaii”.

Mr. Gerhard Schroeder, former German Chancellor: The beautiful urban environment and exterior design tell us that Rizhao is a prosperous city with sound development.



Rizhao · China