

# Baiyangdian Wetland Planning in Xiong'an New Area-- A Resilient City Perspective

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**Abstract :** In the context of the country's energetic merchandising of the development of ecological civilization, the building of Xiong'an New Area ought to spotlight the theme of ecological precedence and inexperienced development. In the planning of constructing an inexperienced ecological city, wetland sources are without doubt the most valuable. Wetland parks can successfully enhance the nearby regional climate, alter floor runoff, make sure biodiversity, etc., on this basis, the people's nice of existence and happiness will additionally be noticeably improved. At the equal time, the development of wetland parks can obtain harmonious coexistence between city humans and nature and decorate city resilience. From the point of view of city resilience, mixed with the profitable instances of present wetland development in China, this paper will behavior a comparative evaluation with the Baiyangdian Wetland in Xiong'an New Area, summarize the benefits and dangers of the Baiyangdian Wetland and make pointers for its future planning and development.

**Keywords :** Xiong'an New Area; Resilient City; Wetland Park

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## 1. Introduction

At present, there are obstacles in the improvement of wetland sources in China. As a profitable mannequin for wetland safety and rational utilization, wetland parks can exert the ecological advantages of wetlands and alleviate the effect of urbanization on the surrounding environment, so nearby governments have a tendency to default to the improvement of wetland initiatives as wetland park construction, and the decorative cost of wetlands is larger than the realistic value, which is no longer advisable. However, in the system of inexperienced town improvement in the future, we ought to ruin the inherent mindset, regard wetlands as section of city inexperienced infrastructure, hyperlink it with the enhancement of city resilience, and provide full play to the results of wetlands in purifying water sources and regulating local weather whilst serving the lives of city people. This requires us to advance and defend wetland ecology on the groundwork of the principle of resilient cities in accordance to neighborhood conditions. At a time when the world is dealing with serious threats of resource shortages, local weather trade and the unfold of diseases, cutting-edge cities are commonly going through uncertainties. For these goal legal guidelines of social and herbal improvement that we can't avoid, it is specifically necessary to use city resilience idea to discover adjustment approaches to deal with crises. As a revolutionary development demonstration vicinity and a new vicinity of country wide significance, Xiong'an New Area will shoulder principal country wide strategic duties and discover a town mannequin that integrates science and technology, ecology, livability and intelligence.

## 2. The concept of urban resilience

Urban resilience is described as the potential of structures and areas to attain regular operations such as public safety, social order, and monetary development via fairly preparing, buffering, and responding to unsure disturbances. Godschalk (2003) believes that resilient cities have to be an aggregate of sustainable bodily structures and human communities, and the planning of bodily structures ought to play a position in the development of human communities. In the method of ecological civilization building in Xiongan New Area, this precept must additionally be followed, that is, to hyperlink wetland useful resource safety with neighborhood planning, so that wetlands need to no longer solely furnish safety for city health, however additionally enable city improvement to lay a monetary basis for wetland protection.

Ahern (2011) referred to in his lookup that resilient cities objectively well known the terrible effect of unsure disturbances on cities, however emphasize the integrity of the average city sample and the continuity of practical operations. This coincides with Yiwen Shao's (2015) declare that city resilience is definitely specific from the preceding single purpose of relying on the reconstruction of the bodily environment, however particularly emphasizes that when the city, a massive social-ecological system, faces uncertainty, the social machine building and maintenance, and their potential to reply and coordinate. The development of Baiyang Lake Wetland ought to be guided with the aid of the anti-interference capacity of Xiongan new area. When going through herbal mess ups or surprising situations, the wetland ought to play a coordinating and buffering role, and that capacity to restore itself must put the whole city's ecology in Dynamic equilibrium. On this point, there is a greater complete interpretation in the learn about of city resilience.

Six fundamental traits of a resilient device proposed through Wildavsky (1988). First, homeostasis implies sturdy linkages and feedbacks between the a number aspects that make up the system; second, omnivory refers to exterior shocks that can be attenuated by means of the selectivity introduced about by means of more than one machine components; third, excessive flux refers to The cause is to fill the most wished hole thru the well-timed mobilization and replenishment of sources in the system; fourth, flatness ability that it is greater bendy and adaptable than a gadget with strict levels; fifth, buffering requires the machine to have a sure quantity of extra capacity. capacity to put together for emergencies; finally, redundancy thru a positive diploma of purposeful overlap to forestall the standard failure of the system.

### **3. Main functions of Baiyangdian wetland**

In the system of future development, Xiongan New Area is sure to usher in populace agglomeration and excessive urbanization, which brings greater necessities to the carrying potential of neighborhood assets and environment. The aid and environmental carrying potential refer to the populace and monetary scale that can be carried by way of the useful resource endowment and environmental ability of a sure geographical house below the premise that the herbal ecological surroundings is no longer harmed and a proper ecosystem is maintained. Therefore, balancing the relationship between human and water, enhancing the carrying ability of water resources, and making sure the coordinated improvement of populace and sources and surroundings are the important duties for growing Baiyangdian wetland resources.

Allan and Bryant (2011) accept as true with that resilient cities have to possess seven principal characteristics, specifically diversity, adaptability to change, modularity, innovation, speedy comments capability, storage of social capital, and ecosystem carrier capability. As the most necessary ecosystem in Xiongan New Area, Baiyangdian Wetland can be used as an essential step forward to construct a resilient metropolis and enhance the ecological steadiness of Xiongan New Area.

#### **3.1. Purification function**

Wetlands first play the function of water purification. The case of Fengxiang Wetland Park in Meishe River in Haikou can carry concept to the improvement of Baiyangdian wetland.

The principal air pollution sources of the Meishe River are divided into factor supply pollution, non-point supply air pollution and endogenous pollution. Among them, factor supply air pollution is the air pollution generated by means of the straight sewage stores alongside the line, and non-point supply air pollution is the confluence gadget overflow air pollution in the wet season and the preliminary rainwater pollution. Endogenous air pollution is the air pollution precipitated by means of river sediment and garbage. At the equal time, due to the siltation and blockage of the river course, the water passage is insufficient, ensuing in serious water security issues of waterlogging in low-lying areas alongside the coast; due to the serious exterior and interior air pollution of the river course, the pollution are severely exceeding the standard, ensuing in the water surroundings hassle of black and odorous water. ; Due to the channelization of the river, the ecological surroundings of the river is destroyed, ensuing in the loss of the self-purification capacity of the water body. These troubles additionally exist in the water gadget of Xiongan New Area. Industrial wastewater and home sewage have prompted Baiyangdian water air pollution and eutrophication. The river community and ditches in the Baiyangdian River Basin are vertical and horizontal, and the shallow groundwater aquifer has unfastened lithology and sturdy permeability, and is intently associated to the floor water in lakes and ditches, aquifers and shallow groundwater are additionally problem to distinct tiers of pollution.

I assume the most modern transformation of the Meishe River Wetland is to enhance the self-purification capacity of the river with the aid of growing a water ecosystem with whole features and balanced shape on the groundwork of controlling the supply and intercepting pollution. The roots and whole leaves of submerged vegetation at once soak up vitamins in water and silt, whilst aquatic animals and flowers assist to easy up suspended count number on the floor of aquatic flowers and switch nitrogen and phosphorus vitamins in water. The success of the Meishe River governance lies in making full use of the superior thought of sponge town to create an ecological river.

### **3.2. Flood control and water storage function**

Due to the low-lying terrain of the Xiongan New Area, if the surrounding areas come upon non-stop rainfall that has now not been considered in a century, the surrounding floods may additionally submerge the town in a brief length of time. This places ahead greater necessities for the planning of water storage and drainage in the new district, and the thinking of sponge metropolis is even greater important.

Sponge city, with the building of parks, inexperienced spaces, lakes and water structures as the carrier, realizes the herbal accumulation, herbal infiltration and herbal purification of rainwater. Sponge cities completely soak up rainwater when it rains, and understand infiltration storage to keep away from city waterlogging and make certain the regular operation of city drainage systems. When the city humidity decreases and wants to be adjusted, the saved rainwater can be thoroughly utilized to hold the city water assets in a balanced and steady state. For Xiongan New Area, Baiyangdian Wetland is the key to constructing a sponge town and enhancing city ecological resilience.

Starting from ecosystem services, developing water ecological infrastructure throughout scales and combining a number of sorts of precise applied sciences to construct water ecological infrastructure is the core of sponge cities.

Baiyangdian Lake is the greatest lake in Hebei Province. The Yongding River and the Hutuo River in the front of the Taihang Mountains meet to structure an alluvial fan, and the despair at the part of the fan is the Baiyangdian Wetland. From the north, west, and south, there are 9 giant rivers consisting of Puhe, Tanghe, Caohe, and Zunlonghe that go with the flow into Baiyangdian Lake, pass by via the flood gates and overflow weirs in the northeast of the lake. The flood gate and overflow weir go with the flow into the Daqing River via the Zhaowangxin River. Through the easy implementation of cross-basin water switch initiatives such as the South-to-North Water Transfer Project and the Yellow River Water Diversion into Baiyangdian, the water assets carrying potential of the Baiyangdian River Basin and the water safety of the Xiongan New Area have been drastically enhanced.

Baiyangdian wetland can play the position of water conservation and supply assist for nearby residents' dwelling and manufacturing water. Based on the lookup of Bing Liu (2020), the inner aquifers in the Xiongan New Area are all unfastened rock deposits such as Quaternary fluvial and lacustrine facies, lacustrine facies silt, and silt exceptional sand. It has properly permeability and robust permeability, and has a very shut hydraulic connection with floor water. That is to say, the lake water can be modified into submersion via a massive quantity of seepage at the backside of the lake and a massive vicinity of lateral seepage round the lake to complement and preserve the groundwater supply in the area; the groundwater in the western and northern areas additionally replenishes the groundwater in the place laterally. Therefore, the groundwater recharge supply in Xiongan New Area is pretty sufficient, and the groundwater sources are noticeably abundant.

## **4. The current predicament of Baiyangdian wetland**

From the point of view of a resilient city, a right appreciation of the dangers confronted by using the metropolis is very essential for the success of resilience goals. Therefore, a complete appreciation of the uncertainty of Baiyangdian wetland improvement is of extremely good importance to the ecological device planning of Xiongan New Area.

Although the South-to-North Water Diversion Project and environmental governance have added preliminary success to Baiyangdian's ecological restoration, some unavoidable environmental elements nevertheless pose challenges to the renovation of Baiyangdian's ecological environment.

Baiyang Lake is essentially a semi-closed kind of lake. If it can't be cycled and changed in a well-timed and tremendous manner, greater pollution will enter and exit much less or solely enter no more, ensuing in a sharp decline in the

self-purification ability of the water body, ensuing in a massive vicinity of endogenous air pollution in the lake. The secondary air pollution triggered serious air pollution of floor water, floor soil layer, aquifer rock layer and shallow groundwater in Dian District. When the wet season comes, the upstream wishes to launch floods, and the water degree of Baiyangdian itself is additionally high. However, in order to make certain the security of the Beijing-Tianjin area, Baiyangdian ought to acquire water from the upstream. In this way, there is a threat of flooding, which is extraordinarily unfavorable to the ecological stability of the complete region. Generally speaking, Baiyangdian is placed in the arid and drier North China region. The wet season is short, and the evaporation of the lake floor is strong, which skill that Baiyangdian is convenient to enter the dry season. In particular, the lack of administration of farmers' farming and the flooding of the land have resulted in a disordered state of affairs of uncontrolled over-exploitation and indiscriminate exploitation of groundwater, ensuing in a fantastic waste of water sources in the region.

## **5. Wetland Planning Recommendations**

On the foundation of acknowledging the uncertainty of the surroundings and the quandary of one's very own capabilities, it respects the fundamental legal guidelines of the social-ecological machine from the standpoint of evolutionary resilience. Manyena (2006) argues, city resilience must no longer be viewed as an outcome-oriented action, however a process-oriented behavior. Urban resilience no longer solely depends on the reconstruction of the bodily environment, however additionally emphasizes the development and renovation of social structures and their capacity to reply and coordinate in the face of city uncertainty. We need to now not solely lift out the wetland water replenishment task to make sure the fabric groundwork of the ecological surroundings of the new area, however additionally structure a set of realistic administration insurance policies to remedy the immediately troubles of water waste and pollution.

### **5.1. Promote water circulation**

Relying on the South-to-North Water Transfer Project, the Yellow River water diversion mission into Baiyangdian will set up a multi-source normalized water furnish mechanism to make certain non-stop water grant and the cyclic connection between Baiyangdian water physique and the outdoor world, rationally make use of upstream water, neighborhood water and reclaimed water, and enhance the water provide and water provide community in the new area. The most essential aspect is to enhance the alternate and interconnection mechanism of water sources, and structure a new sample of water provide with more than one and complementary water sources. There are more than one reservoir in the top reaches of Baiyangdian Lake and its surrounding areas, and a water device connection task have to be built. Jointly dispatching surrounding water assets can now not solely promote the circulation of water our bodies round the Xiongan New Area, enhance the self-purification capability of water bodies, however additionally minimize large-scale cross-basin water switch initiatives such as the South-to-North Water Diversion Project. economic pressure. Promoting the complete utilization of all kinds of unconventional water assets such as precipitation and reclaimed water in accordance to nearby prerequisites is a sustainable skill to obtain long-term water replenishment in Baiyangdian wetland.

### **5.2. Avoid water waste**

Adjusting the crop planting shape in accordance to the soil stipulations and water graph of the Xiongan New Area can minimize water costs. Under the practise of an expert team, popularize environment friendly water-saving agriculture and promote smart water-saving irrigation. In phrases of management, Xiong'an New Area wishes to set up a strict water consumption and water use system, so that a number of planting plots can achieve water on demand, and trade the disordered scenario of uncontrolled over-exploitation and indiscriminate use of groundwater.

### 5.3. Raise the profile

The improvement of the Chengmai Mangrove Bay wetland venture can additionally furnish new thoughts for the improvement of the Baiyang Lake Wetland. The mission offers full play to the advantages of the mangrove bay wetland in phrases of ecological surroundings and location, takes healthful dwelling as the theme of Urban Development, propagandizes neighborhood specialties, wholesome fruits and vegetables, and takes selenium-rich meals as the attribute brand, it can no longer solely promote the safety of wetland ecosystem and the building of ecological civilization, however additionally enhance the monetary advantage of wetland.

## 6. Conclusion

Davoudi (2012) argues that the Charter of Athens is a traditional case of ecological resilience, due to the fact the Charter, thru the pursuit of spatial and temporal order, embodies the electricity of planning to comprehend the failure of one consistent nation to gain some other Steady-state thinking. That is, resilience may additionally now not solely repair the gadget to its authentic country of equilibrium, however additionally on the spot the device to structure a new kingdom of equilibrium (bouncing forth). During the development of the Xiongan New Area, new disturbance elements and derived troubles proceed to emerge. Solving these issues and enhancing city resilience to structure a constant kingdom is the focal point of the new region planning. The Baiyangdian wetland improvement thoughts mentioned in this paper are solely from the point of view of city resilience. Thinking about ecological resilience. The matters supported via the Resilient Cities Research System are very broad. Looking at the ecological device planning of Xiongan New Area from the standpoint of a resilient town will grant us with new thoughts for growing Baiyangdian wetland and getting out of the predicament.

The ecological and geological surroundings issues of Xiongan New Area have existed for a lengthy time. It is a systematic and complete social problem. The implementation of environmental governance and ecological restoration in this place requires systematic engineering of scientific and fantastic governance fashions and standardized administration procedures. Baiyangdian wetlands play a very essential position in retaining ecological balance, retaining biodiversity and uncommon species resources, degrading pollution, conserving water sources, storing floods and droughts, regulating climate, and controlling soil erosion. The center of attention of ecosystem planning in Xiongan New Area. The formation of a secure water switch and water distribution design in Xiongan New Area, and the institution of a sensible and unified water distribution and water switch mechanism internal and outdoor the place can efficaciously beautify the water sources carrying potential of the Baiyangdian River Basin and make certain the security of water assets in Xiongan New Area.

## References

- [1] Ahern, J. (2011) From fail-safe to safe-to-fail: Sustainability and resilience in the new urban world. *Landscape and urban planning*. [Online] 100(4), 341–343.
- [2] Allan, P. , Bryant, M.(2011) Resilience as a Framework for Urbanism and Recovery[J]. *Journal of Landscape Architecture*. 6(2), 34-45.
- [3] Davoudi, S.(2012) Resilience: A Bridging Concept or a Dead End?[J]. *Planning Theory and Practice*. 13(2), 299-333.
- [4] Godschalk, D. R. (2003) Urban Hazard Mitigation: Creating Resilient Cities[J]. *Natural Hazards Review*. 4(3), 136-143.
- [5] Liu, B., Wen, X.R., & Yang, L. (2020) Eco-geological environment problems and governance progress in Xiongan New Area. *Groundwater*. 42(06), 122-126+154. doi:10.19807/j.cnki.DXS.2020-06 -041.
- [6] Manyena, S. B. (2006) The Concept of Resilience Revisited[J]. *Disasters*. 30(4), 434-450.
- [7] Shao, Y. W. (2015) Urban Resilience: A Conceptual Analysis Based on an International Literature Review. *International Urban Planning*. 30(02), 48-54.
- [8] Wildavsky, A. B. (1988) Searching for safety. New Brunswick, USA: Transaction Books.