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How China's Smart City AI Is Moving Into Environmental Control

AI infrastructure is being repurposed to provide real-time ecological data – and changing the structure of urban environmental management.

By Peter Bo Zhang
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Credit: Depositphotos

[Hangzhou](#) has become one of China's most active test sites for integrating artificial intelligence into public administration. The city, home to West Lake and the tech giant Alibaba, now ranks among China's top innovation hubs and attracts significant [AI investment and talent](#). In the nearby Xixi Wetlands, conference halls sit beside canals and protected reed beds. When Alibaba built its global headquarter there, the company promoted the site as proof that rapid technological growth could coexist with [ecological harmony](#).

A more consequential experiment is underway in the city's digital infrastructure.

[ET City Brain](#), launched by Alibaba in 2016, was originally designed to coordinate traffic lights in Hangzhou's Xiaoshan district. Officials state that the system increased [incident-detection accuracy](#) to more than 92 percent and raised average driving speeds by about 15 percent. The platform later expanded to emergency response, delivery routing and power management, and was exported to [Kuala Lumpur](#).

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In recent years, the same system has been adapted to monitor wetlands and waterways. Local authorities now feed drone video, bank cameras, and environmental sensors into the City Brain platform. The system flags unusual vessel activity, late-night dredging, and changes in water color along urban canals. In effect, the technology used to track traffic congestion is being repurposed to observe ecological changes.

Across China, similar pilots are emerging. In Xiamen Bay, Huawei's [TECH4ALL](#) initiative and research partners use AI to identify individual [Chinese white dolphins](#), a protected species that travels through busy shipping routes. Automated image recognition helps guide patrols and document risky vessel behavior. Other projects use computer vision to monitor bird migration corridors, grassland conditions, or potential wildfire zones. These initiatives reflect an effort to build a digital layer of environmental governance.

National policy supports this shift. Under the concept of “ecological civilization,” Beijing has tied environmental objectives to digital governance and green industry. [The 14th Five Year Plan](#) calls for smart and precise ecological monitoring. In daily life, [Ant Forest](#), a feature inside Alipay, encourages low-carbon habits by rewarding users with virtual points that fund tree planting. Hundreds of millions have participated. The program frames sustainability as something measurable and interactive.

This approach is changing the structure of urban environmental management. For decades, enforcement relied on [grid management systems](#) with inspectors, neighborhood committees, and enterprise managers who were responsible for defined areas. When pollution occurred, accountability followed those lines.

The platform model shifts responsibility. [Sensors](#) now supply most of the information, and dashboards guide most decisions. When the system flags dredging in a wetland or discoloration in a canal, it is not immediately clear who is responsible for acting on the alert. The chain may involve the software vendor, the municipal bureau that set thresholds, or the company or resident whose behavior triggered the event.

This raises questions about [accountability](#). If a spill is missed, is the failure technical or administrative? If a false alarm triggers an unnecessary shutdown, who covers the loss? As municipal governments rely more on algorithmic indicators, it becomes harder for outsiders to evaluate or contest the decisions they produce.

The issue extends beyond China. [Singapore's Smart Nation](#) program and [Seoul's Digital-Twin City](#) initiative present similar visions of governing through information. These systems promise efficiency and predictability. They also concentrate

data and decision-making inside proprietary platforms that are rarely open to public scrutiny. Hangzhou promotes coexistence with nature as part of its urban identity, yet the algorithms that define acceptable environmental conditions are largely invisible.

Despite these concerns, the city is in a position to set standards for how environmental AI should be managed. Treating ecological AI as public infrastructure would be one step. Model performance should be published, including accuracy rates, false positives, missed detections, and the practical consequences of those errors. Transparency would allow researchers and independent institutions to verify whether these systems work as intended.

Separating technical vendors from regulatory authorities is also necessary. The companies that supply sensors or cloud infrastructure should not be responsible for setting ecological thresholds. Clear division prevents conflicts of interest and preserves the independence of environmental oversight.

Access to ecological data is equally important. Regulators, researchers and affected communities should have the ability to [audit data](#) and review how models reach their conclusions. Without that access, environmental enforcement risks becoming a sealed process that cannot be questioned or improved.

These principles can also guide China's smart-city exports. City Brain style systems are being [promoted internationally](#) alongside digital infrastructure and cloud services. As more countries adopt Chinese environmental AI tools, contracts can incorporate minimum standards on transparency, data rights and participatory oversight. Biodiversity data generated under public concessions can be treated as a public good rather than a proprietary asset.

East Asia is [moving quickly](#) to digitize both cities and ecological systems. Hangzhou offers an early view of what this approach can deliver and what it can obscure. The fusion of digital infrastructure with environmental management can produce real gains in enforcement and monitoring. It can also centralize ecological authority inside systems that are difficult to examine or contest.

As AI takes on a larger role in protecting rivers, wetlands, and wildlife, the crucial question is how responsibility is assigned. Hangzhou has begun to write the code that governs these systems. Writing the rules that govern the code will determine whether the region's environmental digitization becomes a competitive data market or a more accountable form of stewardship.

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Peter Bo Zhang is a researcher and Juris Doctor candidate in Toronto. His work focuses on science, technology, and the environment in East Asia. His writing and research have appeared or are forthcoming with Columbia University Press, Brill and Springer Nature.

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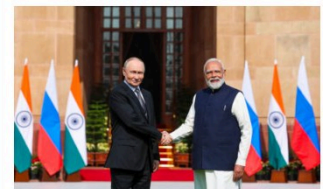
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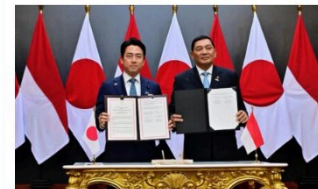
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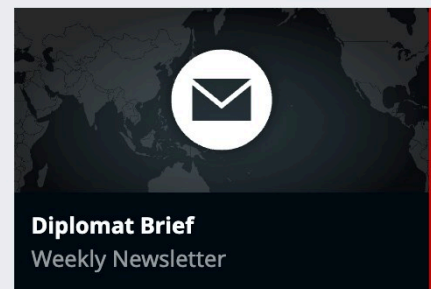
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