

Re-enter the dragon

After furious growth, China is now trying to tackle its stark environmental challenges in a critical face-off with the future. Elius Levin reports.



With a landmass of around 10 million square kilometres, China is the world's third largest country. Despite its size though, only around 13 per cent of the country is arable land – half its people occupy just one-tenth of the land area. But as the world's most populous nation, China's 1.3 billion people represent around one-fifth of globe's entire population.

In the last 20-odd years, furious, single-minded economic development and the drive for increased living standards have come at the heavy expense of China's natural resources, resulting in great degradation and waste. It's no surprise then that the country's sustainability issues are now firmly part of the public discourse, particularly in the lead-up and preparation for the 2008 Olympic Games.

But beyond the media hoopla, and the policy pronouncements of the previous two economic five-year-plans, just how committed is China's leadership to solving their environmental problems and developing sustainably?

Growing pressures

In their report, *'China Human Development 2002'*, the international research organisation Stockholm Environment

Institute (SEI) and the United Nations Development Program (UNDP) indicated that China was required to make some hard choices, between the 'perilous path' of further degradation – ultimately leading to social instability – or that of 'green reform', to pull itself back from a precarious brink. With three years having passed since the report's release, the question arises as to whether there has been any noticeable change in the Chinese government's direction.

'It is very subjective to say whether the situation has improved or not', says SEI Senior Researcher and Communications Director Arno Rosemarin, underlining the many views of those working with sustainability issues. But Guoyi Han, SEI Research Associate, is more pointed, saying, 'The trends remain the same, if not worse'.

Prevarications aside, Rosemarin contends that overall growth 'is increasing the ecological footprint'. Han, though, pragmatically observes that some promising national policy changes are underway. Despite their differences, however, the view is that China's growth is accompanied by considerable potential for new, more environmentally efficient practices alongside its disturbing trends.

Shanghai's night skyline reflects China's massive outward-looking economy. istockphoto

Atmospheric pollution

Home to some of the most polluted cities in Asia, studies by the World Health Organization (WHO) and other international bodies have shown that China has very high morbidity from respiratory diseases linked to concentrations of sulphur dioxide – mainly from coal burning in power stations and domestic use, and carbon dioxide and nitrogen from vehicles.

'As a result, acid rain is a particular problem in China', says Pan Jiahua, Research Fellow at the State Environment Protection Authority (SEPA). In the northern regions, increasing desertification has resulted in dust storms and severe levels of air-borne particulate matter in populated areas. As one of the largest threats to Chinese public health, it is estimated that atmospheric pollution contributes to more than one million deaths annually.

Water pollution

China suffers severe water stress. More than 400 of 669 Chinese cities are facing water shortages. The situation in 110 cities is described as 'serious', adds Pan Jiahua.

Just 38 per cent of China's river water is safely consumable by those agrarian communities reliant on it. Untreated sewage is a significant problem due to a lack of wastewater treatment infrastructure, and the fact that it is often released into rivers and lakes. In turn, high rates of infectious diseases, and stomach and liver cancer have been linked to the levels of waterborne bacteria. Some efforts at a solution, however, are being made. For example, Guoyi Han of the SEI indicates that in one project, a million dry toilets have now been installed in 13 provinces – a very small step forward, however, for a population of 1.3 billion.

Soil pollution

Excessive fertiliser use, and the change from traditional produce such as rice to high, quick-yield crops such as fruit and vegetables, has resulted in the soil becoming more acidic and barren, while nitrogen and phosphorus levels, and fungal epidemics are rising sharply. Sewage irrigation and illegal dumping of industrial and domestic rubbish have also greatly contributed to soil pollution. Overall, about 10 million hectares of China's soil have been contaminated.

Meanwhile growth indices continue upward: urbanisation is increasing at an appreciable one per cent per annum, along with rising consumer demand. Pan adds that the available arable land is under threat from unauthorised appropriation for conversion to non-arable use, under urban and industrial development. This is rapid development that requires energy, and current demand is exceeding production – shown by the increased number of power shortages in recent years.

Policy conflicts

Bitter irony underpins China's development, and the necessity to now provide vast sums to overturn the neglect and damage of previous decades.

China's more progressive leaders and thinkers have sought to modernise since the early 1900s. Motivated to alleviate the poverty of the masses, modernisation was also planned to rectify the 'humiliation' and defeat suffered at the hands of numerous invaders.

Mao Zedong's 1958–1960 'Great Leap Forward' campaign proved an economic and human disaster. The present-day Chinese government's more pragmatic economic thinking was sired in the tumultuous Cultural Revolution, and the bitter



Smog over Beijing's ancient Forbidden City. China has considerable air pollution problems. Ambitious plans have been laid out for Beijing's air and transport services to meet strict European standards in the run up to the 2008 Olympics. istockphoto

internal party ructions between pro- and anti-Mao camps. A chief architect of today's approach, Liu Shaoqi, became a Revolution victim; modernisation was later revived in moderate Premier Zhou Enlai's 'Four Modernisations' policy of 1975, and formally adopted in 1978 by Zhou protégé and two-time Mao victim, the twice-'rehabilitated' Chairman Deng Xiaoping.

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Thirty years hence, China's galloping development is testimony to the success of the 'Four Modernisations' policy. Yet within this relatively short period, the level of concurrent environmental degradation has compelled the administration to re-act on the very forces that have provided their much-sought-after benefits.

The government has moved in a number of ways. Internationally, China has made serious commitments to the Agenda 21 agreement of 1992, through to the 2002 World Summit on Sustainable Development, and beyond. Correspondingly, it has promulgated a raft of relevant laws, regula-

tions and standards; established a vast environment bureaucracy, with jurisdiction handled between the numerous government departments; and continued investment in environmental infrastructure, such as town gas plants and natural gas pipelines.

But, according to the China International Centre for Economic and Technical Exchanges (CICETE), a collaboration between the Chinese government's Ministry of Foreign Trade and Economic Co-operation (MOFTEC), the UNDP and United Nations Industrial Development Organisation (UNIDO), the effectiveness of its range of methods is questionable. Despite government efforts, the CICETE concludes that the 'concentrations of pollutants such as particulate matter and sulphur dioxide continue to exceed national ambient air quality standards in most major cities'. CICETE also notes that 'the level of pollutants such as nitrogen oxide and ozone are increasing'.

However, isolated pockets of change seem to be appearing. Pan Jiahua, from SEPA, states there has been 'some' progress. China's one-child policy has resulted in population growth declining from 2 per cent in the 1960s to the present 0.5 per cent per annum. This, however, has mainly been confined to the cities. SEPA's own 'very effective' Food-for-Cash program provides both money and vegetables to farmers located in mountainous and lake regions. In exchange, farmers are actively discour-

P r o g r e s s



A traditional river-dwelling community. Basic sewage disposal in such communities compromise the viability of the waterways on which they rely. SEPA

aged from farming the arable land, in order to protect the environment in these marginal areas. Encouragingly too, sustainability issues are now discussed in the media. However, with loosening but still tight state control, discussions tend to focus on government actions.

Guoyi Han, from SEI, cites broader, social changes: 'A new dam [Three Gorges] was suspended due to NGO activity', he offers. Certainly regarded as a monumental change within the Government concerning its reactions to the increasing activity of NGO's and grassroots activity, Han adds that such NGOs 'are still far from having an effective role to play in terms of development and the environment'.

Numerous factors have influenced this timely shift. Current Chinese President Hu Jintao seeks to stamp his leadership and to distinguish himself from mentor, and former president, Jiang Zemin. Mindful of international criticism for China's initial poor management of the SARS crisis, and the lead up to the 2008 Olympic Games, Hu appears tolerant and 'embracing' of activity otherwise long perceived by the leadership as 'inciting social instability' – which, not so long ago, would have triggered the government's severest response. Yet, although displaying a move towards more balanced policy at the national level, 'there is as yet no substantial change, as the shift is recent, and varies at the local and provincial level', Han observes.

Modernising traditions

Long an agrarian society, sustainability is not new to China. Traditional

sustainability practices are still observed, particularly in the remote areas where canalled, recycled water, and wastes employed as fertilisers or fuel form the basis of practices borne from necessity.

Modernity has seen some blending of some traditional and contemporary sustainability initiatives. Biogas, a clean, natural cooking fuel derived mainly from animal excreta, was introduced into China in the 1980s, and is used in such northern villages as Liumingying, in Beijing's southern suburbs, and across China's south. Solar heating has also increased.

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But there has not been widespread adoption of these innovations, especially of biogas. 'Biogas involves labour-intensive activity, and is not so popular', says Pan. Similarly, with the vast majority of urban domestic dwellings being quite small, and a sizeable water tank being a major part of each 'unit', the solar heating initiative is currently impractical within many cities. Cost is also likely an inhibiting factor, but despite the introduction of biogas and solar heating, Pan notes with some resigna-

tion that 'the melding of traditional and contemporary sustainability practices has not been so successful'. So far that is.

Where rural or city community infrastructure is already well-established, better opportunities and possibilities are being found in developments which occur 'from the ground up'. This can be seen in the work concerning the design of the city of Ningbo, by Hassell, the Australian international design consultancy.

Directed at Ningbo's 50-year planned expansion, Hassell has incorporated a major 'green belt' system, or Environmental Sustainability Development (ESD) area. Part of the 'core' within a total 17 square kilometre area, it provides a clean energy 'backbone' to the city: 50 per cent of its power will be provided by solar power generators, wind turbines, and methane 'eggs' connected to the sewer system. Conventional generation will provide the remaining 50 per cent of power. Current means of transport such as bicycles and pedestrian strips will be supplemented by a rapid transit link (above ground or underground), minimising the usage of cars and hence air pollution.

The ESD 'belt' comes atop a realigned canal system. As well as supporting the green belt area, the new canal system is designed to clean storm water in lakes and wetlands, and store it for reuse in canals and urban waterways; it also utilises treatment on a third pipe system for recycling. These additionally provide flood control, drainage, and arteries for water transport. 'Water pollution control is provided by naturally occurring plants in 'soft-edged' open canals' which run through residential areas, says Peter Duncan, Managing Director of Hassell Design Consultancy in Shanghai.

The Olympics

Beijing's 2008 Olympics is a showcase for national pride, and preparation has seen much activity. In trumpeting its 'green' credentials to the world, the Municipal Government has set itself a task of epic proportions.

Beijing's Action Plan¹ will turn the capital into a 'green city'. The highly ambitious plans, incorporating and harnessing contemporary technology as well as traditional government legal and legislative measures, include reducing automobile emissions, protecting water resources and improving the city's infrastructure.

1. <http://en.beijing-2008.org/76/29/column211612976.shtml>

In combating its record as one of Asia's most polluted cities, some of the major projects include the following:

Energy – the use of cleaner energy through reduced coal consumption, switching to low sulphur content coal, increased natural gas supply as well as the promotion of renewable energy use.

Air – adoption of WHO guidelines and Euro 3 standards to control emissions of SO₂, NO₂ and O₃. This is to be done in part by introduction of electric vehicles.

Water – increasing the sewage treatment rate to 90 per cent, and the reclamation rate close to 50 per cent; restoring the quality of water reservoirs to drinking-water standard; upgrading of Beijing's infamous public toilets.

Soil – planting hectares of trees and grass in surrounding mountainous and desert areas to control erosion; a 50 per cent coverage of trees and grass within urban Beijing by 2007.

However, there is a fundamental difference in perspective between western and Chinese concepts underlying 'green'. Huang Yong, Senior Business Development Officer, Austrade Beijing, indicates that within China, 'the "green" moniker is concertedly promoted and used by the Chinese authorities in their desire for money to aid Chinese companies and industry, but are as yet not yet sure how to do it'. Western countries' application, on the other hand, is taken 'as a challenge to the market' with the knowledge and technology that they already possess, adds Huang.

Certainly, the current hype gives the



A concept image of Hassell's innovative plans for the new city of Ningbo showing the extensive accommodation of multi-functional waterways, integral for centuries to life in the adjacent older city. Hassell

appearance of significant activity, but this is not the case. 'It is important to remember that quite a few planned projects have not even had their soil turned', Huang points out. Furthermore, he indicates that with the budget reviews announced in late 2004, 'many projects will have their beginning delayed by about one year'.

And the PR machine is yet to confront the looming stark realities likely to puncture Beijing's ambitious plans. Chen Quanshi, Deputy Director of the Institute of Automobiles, Tsinghua University, comments that the Beijing Municipal Government's commitment to alleviate its transportation-related pollution problems needs to address underlying problems.

For example, the implementation of the Euro 3 emissions standard will require all urban buses and cars to be fully converted to clean fuel. Chen points out difficulties. 'By 2008, the urban population is expected to reach 15 million. Correspondingly, there is an expected 25 per cent and 33 per cent increase, respectively, in taxis and buses, and an even greater increase expected for private cars. This is compounded by traffic jams and insufficient parking lots'.

Further, full-scale conversion to either battery-powered or hybrid-powered vehicles will prove problematic. 'Battery-powered vehicles are constrained by current battery storage technology' adds Chen. And, because of the present level of development of the technology, and attendant cost to the consumer, 'it is difficult to see battery-powered electric vehicles quickly becoming popular'.

Chen's solutions include the establishment of a special agency, to study the implementation of the Euro 3 standard. This would comprise stakeholders from the transportation, environmental protection and oil industries, as well as automobile associations. He also proposes holding trials of hybrid electric vehicle technology in buses.

All told, these implied solutions suggest an under appreciation of the challenges involved in addressing even just the most immediately relevant priorities. While efforts are increasingly being made to rectify its environmental problems, China's commitment to sustainability – outside of the more intensely focused media attention provided by the 2008 Olympics – appears to lag.

Driven by historical imperatives, and on opening up, its 'development at all costs' policy and now irrevocable course of action have brought sustainability issues to a point where it must 'make some very hard choices'. Regarded as the latest economic miracle, China will need another spectacular turn around, and international encouragement, to pull it back from engulfing environmental issues.

More information:

China Human Development 2002 Report:

www.sei.se/SEIPubs.html

Hassell's Ningbo masterplan:

www.hassell.com.au/projects/proj208_0.html

Beijing Olympics: <http://en.beijing-2008.org/76/29/column211612976.shtml>

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Roof-top solar panels and water-heating tank atop a home in Kunming, Yunnan Province. Few people have the room or the budget for these systems. SEPA