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BOOK REVIEW

The China Environment Yearbook (2005)

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Cornelis Johannes (Kees) van Leeuwen

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My daughter went to China in 2006 to stay there for just 1 month. She was so impressed by the country that she decided to intensify her study in Mandarin and to return to China in 2008. However, she also expressed some serious concerns: water and air pollution. She was wondering as to whether the severe air pollution would negatively influence the upcoming Olympic Games in Beijing.

In Beijing, smog prevented her to see the sun for several days, and so she preferred to stay in Shanghai where the wind from the sea improved the air quality and hence the visibility. As toxicologists, we know this phenomenon: dilution is often the solution for pollution.

The China Environment Yearbook (2005) is also known as the "Green Book of Environment 2005" in the original Chinese version. It describes the crisis of China's Environment and the perception of this crisis. The book of about 500 pages is an attempt by NGOs to review the records and consider the process of environmental protection in China from the public view. The book, written by 37 authors, contains 28 chapters organized in three parts: Focal issues, Special reports, and Case studies. These three parts are preceded by a chapter entitled "China's environmental protection at the crossroads". This chapter is in fact an executive summary of the book.

In the preface, the editors admit that "access to information is limited; the expertise we rely on is comparatively weak; the human resources, financial resources and time that we have devoted to the compilation are all inadequate". Yes, the book does not contain lots of tables (only 13) or figures (only two) and there is certainly some overlap between the chapters—but it provides a very good reading and attracts the audience from the first page to the last. The reason is that it confronts the reader with the serious environmental and health challenges in China. Both the levels as well as the scales are worrying. China is now at the early stage of pollution control in facing the legacies of the past (sanitation of pollution), controlling the currently known problems (implementation of pollution control strategies), and anticipating future problems (sustainable resources management and advanced pollution prevention). Solutions such as cradle to cradle (C2C) approaches are needed, because the economic growth will probably remain very high and basic resources scarce, not only now (healthy air, water, fertile land, minerals, energy, and biodiversity), but certainly in the years ahead.

Support comes from a communiqué by the government of China in that the central government shall "step up its efforts in building a society that conserves resources and is environmental friendly. It shall develop a circular economy. It shall strengthen environmental and ecological protection, and solve environmental pollution problems that seriously affect the social–economic development and, in particular, the health of the people. The goal is to achieve economic growth and the consumption model will be characterized by resource-conservation". As biologists, we know this as basic r/K selection and environmental stability theory. The ability to successfully compete for limited resources becomes crucial.

The authors attempted to describe this process of "talking the talk and walking the walk" in an honest, open, informative, and illustrative manner and covered a lot of topics such as: the implementation of the Environmental Impact Assessment Law, the role of the State Environ-

Responsible editor: Congjie Liang and Dongping Yang

C. J. van Leeuwen (✉)
Food and Chemical Risk Analysis, TNO Quality of Life,
3700 AJ Zeist, The Netherlands
e-mail: k.vanleeuwen@tno.nl

mental Protection Administration (SEPA), water, air, and soil pollution, toxic spills (e.g., the benzene spill in the Songhua River), forest destruction as a result of non-sustainable logging (and introduction of fast-growing *Eucalyptus*), erosion and desertification as a result of non-sustainable land use, hydropower, energy production and conservation, water resources management, biodiversity, GMOs, avian influenza (and its effects on global GDP), environmental management approaches such as legislation, desulfurization programs, environmental impact assessments, saving energy campaigns, new technologies and C2C, and multi-stakeholder approaches, (risk) communication, and the global impact of China's environmental problems and challenges. Of course, the important role of NGOs has been illustrated as well. The examples given and the cases described are overwhelming and did not leave me untouched:

- China with its 1.3 billion people experienced a seven-fold increase in GDP in the past 20 years, whereas many developing countries required a century or more to achieve such a growth. Within the coming 15 years, China's population will reach 1.46 billion and the GDP will quadruple. At the present level of resource consumption and pollution control, the pollution load will further increase by four to five times.
- China's cities produced 35.5 billion tons of sewage, but in 2003, only 46% were treated in municipal waste water treatment plants. In the rural China, some 600 million people have no access to safe drinking water. Currently, 25% of China's groundwater aquifers are polluted and 35% of the groundwater sources below the national standard.
- Discharge of industrial pollution has risen sharply, while the pace of pollution control and pollution prevention has been extremely slow. The completion rate of pollution prevention projects detailed in the Tenth Five-Year Plan is only between 36% and 50%. China has entered an era of frequent environmental accidents attributed to long-term negligence in environmental protection and the inadequacy in environmental management and supervision.
- In 2004, China produced 1.2 billion tons of industrial solid waste of which only 56% was subject to comprehensive utilization. The country discharged 17,920 million tons of other waste and 9,630 million tons of hazardous waste.
- China has a water crisis. It is estimated that the water shortage in China may decrease the economic growth by 1.5% to 1.9%.
- Statistics from the Ministry of Water Resources indicate that the area affected by soil erosion amounts to 48,253 million km^2, or over the half of China's entire territory. China is the world's largest pesticide producer, and pesticide abuse is still very common in the country.
- China is one of the few countries in the world whose energy needs depend on coal. The Eleventh Five-Year Plan (2006–2010) sets an ambitious goal in reducing energy intensity by 20% in 2010 compared to 2005. Between 2001 and 2004, coal production doubled and exceeded the GDP. Currently, China emits more SO_2 than any other nation. Recently, energy consumption grew by 18.5% compared to the planned 3.23% per year. In 60% of the cities, air quality belongs to Grade III or below, where citizens cannot breathe in clean air. Among the top-twenty most polluted cities in the 'World Bank's report of 2001', 16 were Chinese cities. In many large cities, the number of people who died from lung cancer has increased to 8–10 times. The World Bank estimates that, by the year 2020, diseases caused by burning coal will cost China 390 billion USD, or roughly 13% of projected GDP. Hydropower projects have resulted in serious environmental problems and also in a significant number of "reservoir" and "ecological" evacuees.
- China is the second largest emitter of greenhouse gases, just behind the USA. The frequency of natural disasters as a result of global change has been rising. China's disaster-affected population has reached 370 million, the area of affected crops around 122 million acres, and the direct economic loss amounts to RMB 100 billion per year.
- The shortage of key mineral resources will intensify. The domestic supply of major resources necessary for the national economy, such as electricity, oil, iron, copper, aluminum, and potassium, cannot meet the demand. The existing resources of copper, lead, zinc, and aluminum can only sustain China's demand for some 10 years and those for iron ore only for 30 years. It is estimated that for the coming 20 years, China will demand 60 million tons of copper, three times more than the existing resources. China is the largest importer of tropical wood products, with a market share of around 50%.
- China is one of the countries in the world with the richest biodiversity. However, as a result of population growth and overexploitation, 20–40% of the biological species in China are threatened.
- China has a large poultry-rearing industry and produces 14.2 billion birds annually, of which 60% are reared in farms (see also Gu et al. 2008). According to the Singapore City Bank, a single outbreak of avian influenza could reduce Asia's GDP by 5%. It could be significantly worse than the Severe Acute Respiratory Syndrome. Avian flu also poses a serious threat to

wildlife. China has more than 1,300 indigenous bird species.
- Defending environmental rights has become an important issue of public concern.

After these facts, the reader cannot escape from three major conclusions:

1. China has reached the maximum carrying capacity of population growth. Sustainable growth (K-strategy) is the only option available.
2. China's actual GDP and economic growth is much lower. The actual GDP has not taken into account the past and current losses, debts and damages, the future costs in terms of natural resources, and the environmental as well as human life quality. In considering the overall debts and costs, the economic picture is less impressive.
3. As mentioned above, China is now at the early stage of pollution control, and an old Chinese saying is clearly applicable here: "Every long journey starts with the first step".

From a number of cases described in this book, it can be concluded that scientific and democratic decision-making and law-based administration are no longer empty slogans. Conservation needs to become a way of life. SEPA's vice Minister Pan Yue has put it as follows: "Economic crises may be remedied through macro-control measures: social crises may be solved by investing huge political capital; but an environmental crisis will end up in an irreversible disaster for the entire population."

The publication of this work and its translation into English can be compared to a paradigm shift. The fact that the Chinese government is currently discussing the translation of our recently published book on "Risk Assessment of Chemicals" (Van Leeuwen and Vermeire (eds)[1]) into Chinese shows their willingness to implementing pollution reduction strategies and investing in adequate human resources by "training the trainers".

I sincerely hope that China will be able to adequately deal with these challenges in order to achieve a sustainable development. The outcome will affect not only China but the entire world. I want to congratulate the authors and editors on this "China Environment Yearbook (2005)". It is an important work for the future of China and the rest of the world.

References

Gu P, Shen RF, Chen YD (2008) Diffusion pollution from livestock and poultry rearing in the Yangtze Delta, China. Environ Sci Pollut Res 15(3):273–277

[1] Book review follows in a forthcoming issue of this journal.