

China's Bureaucracy Hinders Environmental Recovery

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INTRODUCTION

Ecosystem restoration efforts have become a booming business in China. Billions of dollars are being spent annually to restore polluted waterways and ecosystems that have been degraded, fragmented, or paved over (Fu et al. 2007; Wang et al. 2007). However, China's environmental sustainability index remains among the lowest in the world (World Bank 2009; Liu 2010). For all the money spent, there is little evidence of the overall effectiveness of China's efforts to enhance environmental sustainability. For example, soil erosion by water has expanded to cover more than an additional 1,000 km² of land annually over the past 30 years (Wan et al. 2005). More than 60% of China's large lakes are eutrophic, and the water quality has declined in >50% of its rivers (Fu et al. 2007). Recent water assessments suggest that pollution has been increasing in northern China, and a water crisis is, therefore, emerging. Water resource problems alone cost 2.3% of China's GDP in 2008 (World Bank 2009).

It is important to ask why such large costs and efforts are not "turning the tide". Many factors have contributed to the grave challenges facing environmental restoration in China. The burden of a large population, combined with unevenly distributed natural resources and environmental carrying capacity, has severely limited the options for effective environmental management. However, the distribution of the ecological damage is complex, and its driving forces are often unique and vary widely from

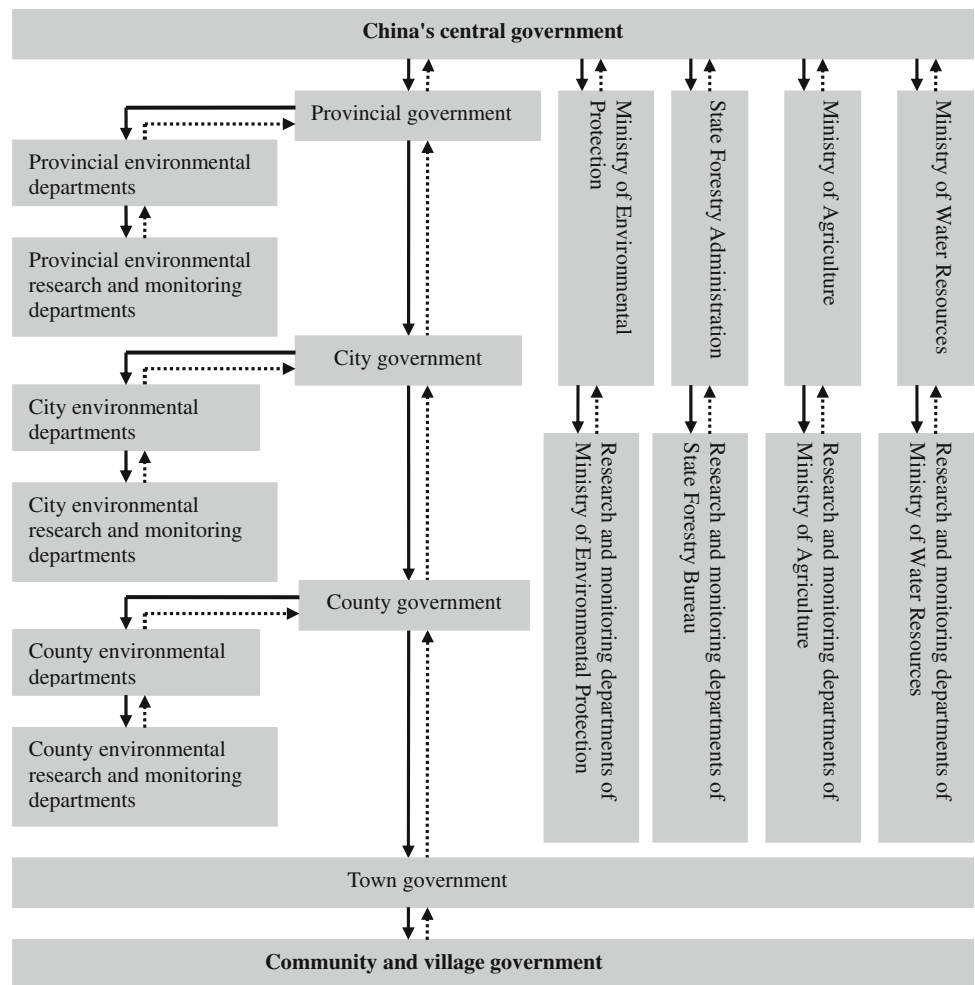
situation to situation. In this article, we have examined a neglected aspect of China's environmental management efforts by analyzing the interactions among government policies related to environmental protection and management. We illustrate how humans create problems when they try to wring more out of an ecosystem than it can sustainably provide. Our examples are relevant to many other countries, and particularly to developing countries that are facing problems similar to those in China.

GOVERNMENTAL STRUCTURES ON POLICY DEVELOPMENT

In China, governments are major actors in environmental protection, thus their decisions shape the country's responses to environmental change. China largely uses a "top down" approach to environmental management (Fig. 1) All departments, both central and local, are controlled by China's central government. News agencies and environmental research departments (including the Chinese Academy of Sciences and Chinese universities) and monitoring departments are controlled by the government or its environmental departments, and have little freedom because all costs (including researcher salaries) are paid by governmental departments at higher levels in the government hierarchy. Excessively strong central control, competition between departments, and short-term thinking have led to suboptimal allocation of the funds available for environmental restoration, compromising China's ability to achieve environmental policy goals.

Although the central and local governments are more willing to listen to other stakeholders than they have been in the past, there are no official monitoring agencies that

Fig. 1 China's bureaucratic system and the associated environmental management structures. To develop an effective policy, managers in the central government might adopt a long-term perspective, with frequent feedback from local departments at lower levels in the hierarchy, thereby incorporating local concerns in policy development and permitting efficient modification of policies based on local feedback



provide feedback and an incentive to change. Unofficial critics such as the news media (and, increasingly, Internet sites) fill this gap, but the central governmental structure remains inflexible and slow to respond. As is the case in other world political systems, views that differ from those of the government are often not welcomed until problems have become extreme, and longstanding policies are difficult to revise quickly. At the same time, local governments have their own bureaucracies that develop and administer local policies; these local agencies have some freedom and power to affect decisions made by the central government, but cannot ignore regulations that have been created at a national level. Even when the central government is willing to listen, local inflexibility or constraints can prevent them from taking advantage of these opportunities for dialog. As a result, most of China's environmental policy is defined centrally, and local governments and other stakeholders have difficulty providing effective feedback on the local impacts of these policies. Unfortunately, bureaucratic inertia in the central government means that this feedback is often ignored or that it cannot be acted upon quickly,

leading to policy compromises and the risk of unforeseen environmental shocks. Delaying action until an ecological "regime shift" or other dramatic change is clearly underway becomes a dangerous but common management strategy.

In China, policymakers responsible for solving environmental problems have often avoided the difficult tasks of deconstructing the economic rationale of a policy and of addressing the environmental consequences of a policy (Shi 2002). Many government officials and scientists, whose advice guides the allocation of governmental funds (Shi and Rao 2010), have advocated ecological protection and conservation, but because of the difficulty of coordinating their efforts with those of researchers in other departments (particularly sociologists and economists), they have often supported shortsighted but attractive solutions that occur on a massive scale, such as the above-mentioned programs. The growing pressure on the Chinese government to respond quickly has often prevented careful and integrated consideration of the scientific and socio-economic foundations of proposed policies, and has made

it impossible to wait for results from long-term field research that would demonstrate whether a policy is effective—or whether it has unforeseen risks.

This context has often led to the wide-scale adoption of expensive activities with unproven results (Xin 2008). Many evaluations of the effectiveness of these activities have relied entirely on qualitative or short-term assessments by scientists and managers from the central government and local governments, who have a vested interest in reporting positive results rather than relying on carefully controlled, long-term field-based monitoring and quantitative studies (Shi and Rao 2010). Thus, the assessments may contain serious bias toward short-term, non-holistic solutions that often favor land managers and local officials, and this raises questions about the validity of the evaluations. An additional problem is that members of the bureaucracy and government researchers have strong incentives to avoid publishing results that are explicitly critical of their employers or that describe errors in policy development and implementation. This is true in any large bureaucracy, not just in China. As a result, criticizing a policy without embarrassing its developers is at best difficult, and in some cases may be impossible (Shi 2002).

DISCUSSION AND RECOMMENDATIONS

As gathering information is costly, and information is not always easily available, self-interested economic agents cannot always behave in an economically rational manner (i.e., because they lack perfect information and lack incentives to disclose their preferences or plans to competing agents). In addition, environmental resources have attributes that can only be learned by means of careful study over a long period of time, even though decisions might be made rapidly to avoid the cost of inaction. As a result, managers might accept that knowledge will always be imperfect and that they might monitor the results of their decisions to detect unexpected interdependencies in time to allow remedial actions (Paavola and Adger 2005). Errors that result from the need to respond immediately, before complete information is available, might be seen as inevitable and as opportunities for learning, not as embarrassing personal failures; changing this perception would encourage decisionmakers to take necessary risks. In addition, decision making and approval chains might be shortened by giving local managers more autonomy and an opportunity to affect centrally developed policies. As is the case for individuals, groups—including national and local government departments and vendors of services—prefer to “ride free”, which increases the costs to others and decreases their willingness to participate in providing public goods. Hence, environmental investment may invite

conflict if greedy vendors seek profitable opportunities at the expense of the public good (Brock and Carpenter 2007). Institutional change often involves interactions within and between groups, thus it is necessary to find ways to make these interactions more effective.

For any proposed institution to succeed, its designers might be able to analyze both the public good and the private good so they can predict the ultimate outcome of any policy. Despite the difficulty of the task, China’s environmental management policies must change direction to encourage a focus on sustainability by balancing socioeconomic development with environmental needs, and by encouraging policy developers and competing departments to work together to produce integrated solutions rather than competing in a way that undermines each stakeholder’s efforts. This will require a careful rebalancing of public and private welfare and the development of government decision structures that favor “coopetition” (a combination of cooperation and competition) among government departments at all levels. One way to achieve this might be to reward managers for their environmental accomplishments and for their efforts to develop policies in cooperation with other departments whose stakeholders would be affected by the policy, not just for their spending and economic achievements. Managers might also find a way to balance the need for a rapid response to urgent problems with a long-term perspective that critically evaluates the initial response to confirm that it will be effective. Managers might also seek to obtain frequent feedback from local residents affected by their policy, thereby incorporating local concerns in policy development and permitting efficient modification of policies based on local feedback. For this to be possible, the current decision process (which is slow and inflexible) might be modified to allow government managers to change policies more rapidly to incorporate local and scientific feedback as new information becomes available.

To improve governance and the ability to meet environmental goals, governments at all levels might understand the problem created by the competition that leads to weak coordination of efforts and might formulate revised policies that encourage sustainability by balancing economic growth with a careful consideration of the need for all groups, whether governmental or private sector, to benefit from these policies. To develop and implement effective socioeconomic policy that also meets environmental needs, independent monitoring, freedom of scientific research, and a willingness to accept and respond to criticism might also be encouraged so that governments can detect and correct their errors. Rather than perceiving criticism as a personal attack, policymakers might see it as a way to improve their decisions and achieve increasingly good results. They might find ways to solve complex

problems based on broad consultation with experts at all levels (including local residents) and in many fields of research, even if those stakeholders provide recommendations that contradict current government policy.

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REFERENCES

- Brock, W.A., and S.R. Carpenter. 2007. Panaceas and diversification of environmental policy. *Proceedings of the National Academy of Sciences of the United States of America* 104: 15206–15211.
- Fu, B., X. Zhuang, G. Jiang, J. Shi, and Y. Lv. 2007. Environmental problems and challenges in China. *Environmental Science and Technology* 41: 7597–7601.
- Liu, J. 2010. China's road to sustainability. *Science* 328: 50.
- Paavola, J., and W.N. Adger. 2005. Institutional ecological economics. *Ecological Economics* 53: 353–368.
- Shi, T. 2002. Ecological economics in China: Origins, dilemmas and prospects. *Ecological Economics* 41: 5–20.
- Shi, Y., and Y. Rao. 2010. China's research culture. *Science* 329: 1128.
- Wan, J., H.Y. Zhang, J.N. Wang, C.Z. Ge, S.T. Gao, and S. Rao. 2005. Policy evaluation and framework discussion of ecological compensation mechanisms in China. *Research of Environmental Sciences* 18(2): 1–8. (in Chinese).
- Wang, G., J.L. Innes, J. Lei, S. Dai, and S.W. Wu. 2007. China's forestry reforms. *Science* 318: 1556–1557.
- World Bank. 2009. *Addressing China's water scarcity. Recommendations for selected water resource management issues*, 198 p. Washington.
- Xin, H. 2008. A green fervor sweeps the Qinghai-Tibetan Plateau. *Science* 321: 633–635.

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