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# China's "Green GDP" Experiment and the Struggle for Ecological Modernisation

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ABSTRACT *The ongoing conflict between the goals of environmental conservation and economic growth in China is partly a conflict between state agencies charged with these contrasting missions. In recent years, state environmental agencies attempted to implement a green national accounting (green GDP) exercise to publicise the extent to which environment-related costs of economic activity reduce actual GDP, and to promote a more comprehensive and realistic accounting of economic development and of GDP growth. Despite the difficulties and controversies associated with this type of accounting elsewhere, particularly in Europe, Chinese agencies implemented this project in 2006 and 2007. But there was widespread resistance from regional and local governments, apparently allied to proponents of economic growth within the central government. Chinese scholars and many officials have embraced the concept of "ecological modernisation," but the Party-State is also bound in many ways to the "treadmill of production." We illustrate this ongoing dynamic conflict through a study of the attempts to implement a green GDP accounting in China.*

KEY WORDS: China, environment, environmental accounting, ecological modernisation, Green GDP

China's rapid and continuing economic growth since the 1980s has lifted hundreds of millions of people out of poverty, and provided a middle-class lifestyle for a growing segment of the population, especially in the cities. But it has also created massive and growing environmental degradation, including serious pollution of air, soil and water (see Economy, 2004), along with continuing and unsustainable depletion of both renewable and non-renewable resources within China and in East and Southeast Asia. In China, the costs of environmental degradation are high, and evidently still rising.

There are many forms of environmentalist research, academic and public discourse, regulations and policy pronouncements on environmental and ecological issues, and environmental issues have received increasing attention in the media and in policy circles. Awareness of and concern about environmental problems is high

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among officials in the most polluted cities, and among other groups such as students (see Stalley and Yang, 2006; Tong, 2007). The central government and many local governments in China have announced environment-conserving measures and policies, and China participates in all significant international environment-related conferences, meetings and exchanges. None of these processes and pronouncements seems to have produced major impacts on the processes of environmental degradation, with the apparent exception of the ban on logging after the 1998 floods (Lang, 2002a). But at the level of national policy pronouncements, the policy rhetoric is often strikingly progressive.

It is easy to be pessimistic, but possible to be optimistic, about the prospects for environmental conservation in China. How can we comprehend and predict the trends within China in regard to ecological degradation? Will environmental degradation continue in step with China's continuing increases in GDP? Are there signs that China's environmental bureaucracies and their policies and regulations are beginning to gain control over environmental impacts?



In most developed countries, the processes of "ecological modernisation" have begun to mitigate some of these processes of environmental degradation, partly through intra-societal ecological modernisation processes, and partly through developments at transnational levels, including scientific exchanges, non-governmental organisation (NGO) collaborations, international conventions and treaties, sharing and copying of environmental laws and regulations, and the reactions of local and transnational corporations to increasing pressures from laws and from public scrutiny (Mol, 2002). These international effects can also be accommodated within the ecological modernisation framework. It proposes that ecological rationality eventually becomes a legitimate arena of analysis and regulation with a steadily increasing salience, and is accommodated by firms and governments as they add ecological calculations into their planning and projects. The perspective provides both a way of analysing ongoing processes which lead to mitigation of environmental degradation, and also a prescription for action (Mol, 2002: 99-102).[1]

The "treadmill of production" model, on the other hand, proposes that capitalist production continuously generates more capital-intensive processes and, thus, both greater withdrawals from nature for production and consumption, and more dumping of waste back into nature from production and consumption wastes. The imperatives of capitalist competition and the links between governments and capitalist enterprises leave economic calculations paramount in the prevailing logic and discourses of the system. With sufficient political pressure from NGOs and consumers, some restraints on the "treadmill" may be noticeable, but firms are expert at avoiding serious constraints on profitability or on extractions from nature. Hence the progress highlighted by the ecological modernisation scholars appears to the "treadmill" scholars to be mostly minimal concessions, which do not seriously transform the underlying environment-despoiling and resource-depleting dynamics of the system (see Schnaiberg et al., 2002).

The ecological modernisation perspective is increasingly popular in China, and has attracted the interest of many scholars and environmental researchers (see Zhang et al., 2007). In 2007, the Chinese Academy of Sciences published a 450-page report titled *China Modernization Report 2007: Study on Ecological Modernization*,

outlining the theory and its implications. The authors liked the idea that ecological modernisation may proceed differently according to the circumstances of each country, and that it can be formulated primarily in terms of scientific and technological innovations which produce ecological and environmental benefits.

However, the framework of ecological modernisation outlines and promotes a number of other processes that are much less relevant in China than in Europe or North America, such as the vigorous monitoring, lobbying and activism of NGOs and other civil society actors, and the reporting of independent media on environmental and political issues. Environmental NGOs and activism are extremely weak in China, and civil society provides few resources and agents for the processes of ecological modernisation which have led to improvements in environmental management in most developed countries. The mass media also have only limited scope to criticise government policies. Thus, some of the actors and processes of ecological modernisation that have led to amelioration of environmental degradation in other countries are less able to perform such roles in China.

Chinese government policy has also favoured economic development, in part because one of the main sources of legitimacy for the regime is that its policies have facilitated a phenomenal period of economic growth, leading to a huge increase in living standards for much of the population within the past two decades. The government is "chained" to the imperative of economic growth for the preservation of political stability, and acts to restrict economic growth only when it appears that there is a risk of inflation, since inflation also brings political risks, or when some ecological catastrophe has occurred or seems imminent. There is some "strong reactive regulation" when crises threaten the state, but apart from such crises, there are only weak proactive policies that do not substantially mitigate the continuing decline of the nation's environment (Lang, 2002b)

Is China bound to the "treadmill of production" so strongly that the counteracting forces prescribed in the ecological modernisation framework are unlikely to have much impact on the continuing environmental and ecological problems produced by rapid economic growth? Or can we perceive in China's environmental policy developments some progress toward the absorption of ecological rationality into the economic framework of development?

One of the most intriguing of the recent developments in environmental discourse and analysis in China was the recent attempt to develop a measure of GDP that included a discount from GDP for the negative environmental impacts or environmental costs of economic activity – or, in other words, a "green GDP." In this paper, we analyse the origins, development and fate of this green GDP exercise between 2004 and 2007, and consider what it tells us about the relative strengths of ecological modernisation and the "treadmill of production" perspectives in contemporary China.

First we briefly review the conceptual basis, and attempts of other countries to implement environmental accounting in order to produce more realistic measures of the ecological impacts and costs of national economies. Then we review China's experience in the green GDP exercise, both its process and the ensuing controversy. We offer a diagnosis of the downfall of the experiment in July 2007, and seek to unveil some of the key drivers swaying the course of ecological modernisation in China.

**Green GDP: The Concept and (Non-)Practice**

Inspired by various international conferences in the early 1990s, such as the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, in June 1992, and the World Commission on Environment and Development in 1993, the concept of sustainable social and economic development was introduced and has received global attention. Agenda 21, endorsed by the UNCED, made explicit that an essential step toward integrating the concept of sustainability and economic management was to establish

> better measurement of the crucial role of the environment as a source of natural capital and as a sink for by-products generated during the production of man-made capital and other human activities ... [and] that national accounting procedures are not restricted to measuring the production of goods and services that are conventionally remunerated (UNCED, 1993, para. 8: 41-2).

The documents also designated the UN Statistics Division as the focal point of action for developing the appropriate methodologies in environmental accounting. To accomplish this task, in 1993, the division introduced the concept Environmentally Adjusted Domestic Product (EDP), known colourfully also as Eco Domestic Product or "green GDP" in the interim version of *Integrated Environmental and Economic Accounting*. EDP was defined as an environmental accounting aggregate obtained by "subtracting the cost of natural resource depletion and environmental degradation from net domestic product (NDP)" (UN Statistics Division, 1993: 98). Yet, in the same publication in 2003, the UN conceded that methodological problems about green GDP remained unresolved, and cautioned,

> ... can we calculate a measure of GDP that adequately accounts for demands placed on the environment? The simplest and most honest answer is that there is no consensus on how green GDP could be calculated and ... still less consensus on whether it should be attempted at all (United Nations et al., 2003: 415).

Green GDP audit, however, should not be confused with other practices of environmental and social accountings, such as those involving a "full set of natural resources and environmental accounts," or a mere "collection, in a more or less *ad hoc* manner, of indicators for a large number of issues and problems *thought to be* of relevance to sustainability of environmental and economic indicators" (Alfsen et al, 2006: 15-16, emphasis added).[2]

Among countries practising these various environmental accounting systems, none has developed a project as ambitious as the nationwide green GDP survey that was eventually attempted in China. Norway had experimented with resources and energy accounting since 1981, but decades of experience has not made Norway the forerunner of green GDP audits. On the contrary, the Norwegian government contended that it is highly problematic to assign numerical values to environmental assets that do not trade in the market, such as air and water, and that proposals to adjust the conventional GDP figure to reflect the problems of pollution and environmental damage are not practical. An official report states:

> A green GDP will in many contexts do more to obscure problems than resolve them ... a one-sided focus on aggregated indicators (for sustainable development or in the green GDP tradition) without a theoretical framework and a solid statistical underpinning is likely to lead to little policy-relevant information (Alfsen et al., 2006: 15).

Similar to such methodological concern, those seeing little contribution of the indicator would argue that the conventional GDP measure already provides the best account of the progress of an economy; revising the system of national accounting is unwarranted unless a solid imperative can be demonstrated. For these reasons, Australia, Italy, Germany, France and UK have chosen to conduct their environmental accountings without trying to come up with a highly aggregated index, such as green GDP. While Indonesia did attempt to calculate the "semi-regional green GDP" in 2002 for Krawang District in West Java Province, it has not continued or expanded the scheme (see Alfsen et al., 2006: 19-32).



## Green GDP in China: Process and Controversy

Despite these enduring controversies about the conceptual and practical aspects of green GDP accounting, China's State Environmental Protection Agency (SEPA) decided to overlook these problems and debates, and conducted a nation-wide pilot green GDP survey between 2004 and 2006. SEPA, in collaboration with the National Bureau of Statistics (NBS), Chinese Academy for Environmental Planning (CAEP) and units from Renmin University, took the lead in the project, and designated ten cities and provinces (Beijing, Tianjin, Chongqing; Heibei, Liaoning, Anhui, Zhejiang, Sichuan, Guangdong and Hainan Provinces) as the pilot sites for experimenting with the implementation of a green GDP audit, seeking their support for the audit.

Calculation of China's green growth figures involves manipulation of different "tiers" of environmental accounting. It started with physical quantification of three major sources of pollution (air, water and solid waste), through which the hypothetical cost of abating their impacts and cost of environmental degradation were calculated. GDP figures of 42 industry sectors and cities or provinces that participated in the project were then adjusted respectively (see Figure 1 for schematic illustrations of the accounting framework). In other words, as an aggregate index representing a difference between GDP and costs resulting from environment impacts along with measures to mitigate them, green GDP denotes the level of economic productivity after taking into account the "negative externality" of the economy.

It should be noted, however, that SEPA's environmental accounting portfolio was deliberately made very selective. It focused exclusively on environmental costs that resulted from air, water and solid waste pollution and ecological damage, whereas resources depletion costs were appraised through estimating the hypothetical amount of investment needed to recover the resources exploited, such as fisheries, forestry, minerals and farmlands. Largely omitted in the accounting portfolios are hard-to-quantify items like the impact of pollution on public heath and workforce productivity, depletion of underground water resources and loss of arable farmland (and agricultural productivity) as a result of soil erosion.

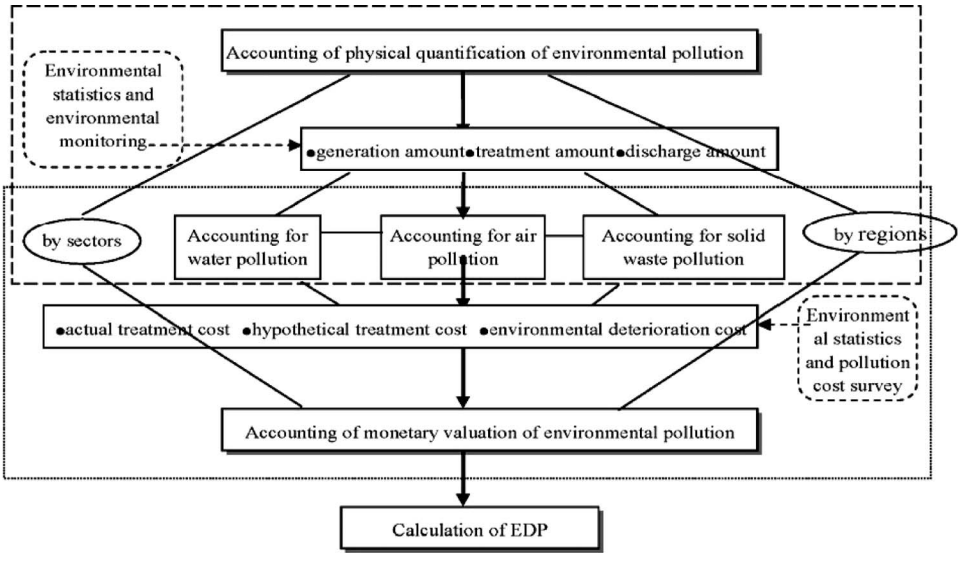


**Figure 1.** Framework for Chinese environmental and economic accounting system.
*Source*: Yu et al. (2006: 5)



*Antecedents of China's Green GDP Survey*

The SEPA's green GDP accounting since 2004, the first of its kind with national coverage, is not the first time such environmental audits were carried out in China. Since the 1980s Chinese academics had begun to study the possibilities of environmental accounting and estimating economic losses from pollution. These early efforts were carried out mostly by individual researchers and did not get much official attention until the 1990s when the theoretical and methodological bases of environmental accounting were further developed and a large-scale study was made possible because of increasing official endorsement and financial support (for details, see Wang et al., 2004: 4-5; see also Chinese Academy for Environmental Planning, 2004). In the ninth five-year planning period (1996-2000), for example, a study assessing the green GDP in Beijing was conducted by city authorities in 1997. The concept was defined in similar fashion to the later definition of green GDP by SEPA and NBS, possibly indicating the influence of the city government on the national agencies, or the common sources of learning from the various United Nations (UN) documents and guidelines.

The 1997 survey suggested that green GDP constituted around 75% of the city's total GDP. Beijing officials acknowledged that the 25% discount from the GDP figure indicated that a large proportion of the economic growth had wasted away as a result of pollution, and yet decided to continue the environmental survey as an effort to gauge the "actual" economic growth and indirectly the performance of officials in promoting sustainable development (Beijing Planning Office of Philosophy and Social Sciences, 2003). Huzhou in Zhejiang Province also launched a green GDP study in 2004, led by a research team from Beijing Normal University, one of the supporting institutes with SEPA and the NBS, and sought to refine the

existing methodologies of measuring green GDP using the city's data (*Xinhua Net*, 21 December 2006).

In interior cities like Datong (Shanxi Province) and Yaan (Sichuan Province), small-scale pilot projects were also carried out by local authorities, often in collaboration with universities and research institutes, to test the feasibility of using green GDP as a reflection of environmental qualities and as a basis for "scientific" development (*kexue fazhan guan*). Results of these studies have been reported almost exclusively in mainland journals. In Yaan, researchers found that green GDP constituted only 80% of the total GDP (Yang and Zhang, 2005). The 2002 study in Datong reported that green or net GDP was only about 60% of total GDP, suggesting that remarkable environmental costs have accrued from its economy (Wang and Ren 2005). In other cases, such as Huludao (Liaoning Province) and Jiaozou (Henan Province), green GDP surveys were conducted in similar fashion (Xue, 2007; Wang et al., 2007). Reports of these local surveys, however, are mostly descriptive and provide few insights relevant to environmental planning and policy making. Most importantly, since they differ in scope and procedures, significant discrepancies of the results are hardly surprising. Indeed, this perhaps drove the central government, and the NBS in particular, to look for ways to standardise the practice of environmental accounting, bringing some degree of consistency in data collection, computation and reporting.

With help from Statistics Norway, NBS developed rudimentary energy accounts documenting China's production and consumption of energy in 1998; forest resources accountings were carried out in Heilongjiang and Hainan Province in 1998 and 2001/2 respectively, both in physical and monetary terms (Alfsen et al., 2006: 32-3). The green GDP study of Chongqing in collaboration with Statistics Norway from 2001 to 2004 also provided important lessons for SEPA and arguably contributed significantly to the later national exercise launched in March 2004 (Chan et al., 2001). Chinese delegates were also involved in some of the international discussions in the so-called London Group of Environmental Accounting, which has met yearly since 1994 to share and develop international best practice on environment-related accounting methods.[3] The early stage of the national green GDP survey project involved extensive preparatory work by SEPA and NBS to draft working plans and divide the tasks.

### *The Green GDP National Survey of 2004*

In a notice dated October 2004, SEPA invited all eligible Environmental Protection Bureaux (EPBs) and statistics bureaux to participate in the green GDP survey. It cited the order by Premier Hu Jintao in a state-level meeting on population and natural resources management that "the country has to develop a green GDP methodology in order to fully grasp the extent of natural resources depletion, environmental damage, and energy efficiency in the course of the country's economic growth" (SEPA, 2004) and planned to develop a comprehensive green GDP audit system within a time span of three to five years. To ensure local cadres have the technical know-how for the undertaking, the CAEP was tasked with the mission to provide technical training and guidance; environmental accounting systems were also crafted to fit each area's specific conditions. Three major rounds of training were

delivered to local cadres from March to September 2005, respectively, in Maanshan, Shenyang and Chongqing. They were conducted in the form of seminars/lectures by SEPA, NBS or CAEP's representatives.

The result of the first green GDP study was released in September 2006 and known officially as "China Green National Accounting Study Report 2004" (SEPA and NBS, 2006). It marked the culmination of the two-year long efforts of the government to understand the environmental impact of economic growth. The estimated cost of containing and managing the environmental impacts (that is, the virtual abatement cost) in 2004 constituted 1.8% of annual GDP (about 287.4 billion yuan) and economic losses from various kinds of pollution totalled an additional 3.05% of GDP (about 511.8 billion yuan). Geographically, the eastern, middle and western parts of the country had 1.13%, 2.17% and 3.12% of GDP adjustment, respectively. Industrial sectors also yield markedly different scores in the green accounting. Primary industry has 1.58% of GDP attributable to pollution and abatement whereas the secondary and tertiary industry have 2.42% and 1.16% of their GDPs deducted. The paper-making and non-ferrous metallurgy sectors have the highest reductions (30.13% and 11.63%) among the 42 industrial sectors surveyed (SEPA and NBS, 2006: 7-10).

The 2005 exercise expanded the coverage of the green GDP audit to 31 provinces and cities. Though the report from this expanded audit was withheld from the public, researchers in the green GDP Group have divulged some figures, providing at least a glimpse of the extent of environmental challenges in the country and some bases for speculating about the divergent attitudes toward the environmental survey within the bureaucracy. According to Lei Ming, a member of the green GDP's Expert Advisory Group and professor at Peking University's Guanghua School of Management, some provinces with double-digit GDP growth in 2005 had produced equally large environmental externalities. Applying the green GDP logic, their economies were therefore not making any progress at all. In a few cases their adjusted growth rates were negative. Nation-wide, two-thirds of the cities and provinces had their GDP reduced by more than 1.8% when these externalities were included. The average adjustment rates for cities in middle and western China are 2.14% and 3.16%, respectively. These seem to reveal that geography and the local underlying industry structures do matter in accounting for the variations in green GDP (*Shanghai Securities News*, 3 August 2007).

Computations of these figures were never easy as there are no universal standards for quantifying and estimating economic costs of air, water and solid waste pollution. The methodology of estimating costs of environmental degradation is highly contestable. Missing from the appraisal are items like costs of underground water pollution, topsoil erosions, desertification and public health expenditures as a result of environmental degradation. In a widely cited article in 2004, Xie An, a professor at Central University of Finance and Economics, questioned the validity of green GDP as an objective measurement of the environmental impacts of the economy. SEPA efforts, he contended, underestimated the challenges and costs of obtaining reliable data and arriving at unbiased assessments. While the term "green GDP" is catchy, making it easier to draw the public's attention and promote environmental awareness, as a composite indicator, critics argued that the concept wrongly blended together various distinct and incommensurable environmental

benchmarks, even though many of these could be understood easily by the public as measures of environmental qualities (Xie, 2004).

Sharing similar concerns, statisticians have also cast doubts on the relevance of green GDP in the national accountings. They argued that although GDP calculation, based largely on the System of National Accounts (SNA) of the UN, needs to be adjusted to provide an updated understanding of the impacts of economic growth on the environment, GDP remains the cornerstone and indispensable element in SNA. Attempts to "loosen" the SNA and replace the conventionality of GDP with its "green" counterpart not only give rise to an inaccurate estimate of the reality, according to critics, but also subvert the lasting and proven paradigm of GDP in understanding a market economy.[4]

In a sense, the SEPA was fighting an uphill battle on different fronts. Throughout the process of the study, cities complained about the validity and soundness of the measuring scheme and threatened to withdraw from the pilot study, and some of them have asked SEPA and NBS not to report their results publicly. In the award presentation ceremony of the "Prominent Figures of Green China" in December 2006, Gao Minxue, an official of the Green GDP's Technical Working Group in SEPA, confessed that cities participating in the green GDP study have been increasingly hesitant in co-operating with the agency. Such a telling remark evidently upset the unit's superior (and leader). Later in the same ceremony, Pan Yue, the Deputy Director of SEPA, trying to downplay Gao's admission that many cities were uncooperative, noted that "even if there is only one province or city staying in the project, the study has to be completed" (*China Youth Daily*, 23 July 2007a; Deng, 2007).[5]

Interestingly, the leader of Inner Mongolia was reported to exalt the green GDP audits publicly, saying that "he welcomes to have a green GDP index for his region" (*Xinhua Net*, 26 July 2007). Yet, according to a commentator, the province is one of the staunch antagonists of green GDP, together with Ningxia, Hebei and Shanxi, whose officials "have been on the record all along as opposing green GDP." And, worse still, according to one analyst, "even those that are fairly cooperative like Jiangsu and Guangdong, won't come to SEPA's support" (Biganzi, 2006). Indeed, the 2004 green GDP report was labelled "Public Version" on its front cover, seemingly suggesting that the result of the national survey had been reported only partially due largely to the opposition by local governments and/or other government agencies.

While one could contend that the adjustments of a few percentage points should not cause much embarrassment or warrant the intense political opposition of local governments, in a national exercise like this, the perceived relative "gain" of others would imply loss in status and achievement for those with the largest deductions from GDP. For that reason, it is not surprising that the results available to the public have left out all the details that would allow comparison across provinces and cities, except the general discussion about the variation between central, western and eastern China. Indeed, an informed source suggested that in the internal edition of the report, a detailed breakdown of green GDP of provinces was included, and the worst was Hebei with discounts from GDP of around 6%, followed by Shanxi (Biganzi, 2006; 2007).

The tension between local governments and the central government's official commitment to a green GDP audit escalated further in the preparatory stage of the

second report, culminating in the central government's decision to postpone its release indefinitely. In May 2007, NBS and SEPA each submitted their position papers to the State Council on how to handle the second report. SEPA restated their recommendation to make the study publicly available; NBS, possibly facing strong pressures from other agencies and doubtful about the relevance and validity of the green GDP exercise, preferred to keep the 2005 report internal as a reference document for the government. In the end, NBS prevailed. In the NBS press conference on 12 July 2007, Xie Fuzhan, Director of NBS, announced the decision and argued that the term "green GDP" represented only shorthand for purposes of public discussion and for the media, and that the Chinese government had never come up with a nationally agreed standard for environmental audits, nor had the UN or other countries proposed one up to that time. Lacking any reliable measures, NBS concluded that it is best to avoid any public environmental audit (or at least not to publicise the 2005 results).

Mainland media reports were vocal in reporting the decision. Some expressed scepticism and speculated about the motivations underlying the decision, arguing that the "green" figures, which in every case discount the conventional GDP indexes, were politically sensitive and produced acute political discomfort in a time when the National People's Congress and senior leaders were scheduled to meet in the autumn of 2007. Challenging the NBS' claim that no country has ever conducted a real green GDP survey, a commentator wrote that such blatant denial showed only the ignorance of the NBS as Norway, Japan and even Mexico have launched their own environmental audit on the basis of the UN's schemes, and their practices have been emulated in Thailand, Indonesia and Papua New Guinea.[6] Other commentators followed the official line, however, and asked for greater acceptance or understanding of the NBS' decision. A columnist wrote:

> In promoting environmental protection, our minds should not be filled with fantasy and captivated by catchy ideas [like green GDP], and become unrealistic. Experiences worldwide show that pollution is inevitable in the course of economic development; in the long run, our environment would be improved ... only if people are fed well; environmental protection would then gain momentum (Shui, 2003).

Some also warned that SEPA's work is not a panacea for environmental problems and is not influential in the decision making of local leaders. The concept of green GDP, they argued, is as illusive as ever, and offers no strong incentive for better environmental performance (Green, 2006). From the "end-user" perspective, Wang Dongjing, an economics professor at Central Party School, doubted the impacts of green GDP survey on local officials. He reasoned:

> ... as long as GDP remains a criterion for assessing the performance of the local cadres, they would be motivated [mainly by this criterion] ... for similar reasons, green GDP has limited utility. [Officials often] look for shining GDP figures and tend to achieve the objective through indiscriminate exploitation of natural resources (citied in *Shanghai Securities News*, 3 August 2007).

In other words, GDP would remain the ultimate concern of local officials. Discounting GDP figures by deducting environmental costs does not have much influence on the mindsets of bureaucrats, and it would be better to abandon the practice of using GDP as an assessment criterion for local officials. Others have suggested that even if green GDP was adopted officially as a revised criterion for officials' performance appraisal, it would become just another incentive for them to pursue "image projects" (*xingxiang gongcheng*) through manipulating the data and inflating the true value of GDP.[7]

Still, some media reports cited evidence of public support for SEPA's initiative. In an opinion poll by *China Youth Daily*, 85.2% of the respondents believed that officials, given the choice between higher GDP or better environment, would mostly prefer the former; and 79.6% saw green GDP as an effective instrument for constraining officials' mania for GDP growth (*China Youth Daily*, 2007b). However, analysts who sympathised with SEPA's efforts gradually became less vocal and appeared to be overwhelmed by the critics of the green GDP audits, after the government's decision to halt the exercise.



## Diagnosing the Green GDP's Downfall

Soon after the NBS' decision, media world-wide began to grasp the nature of the decision and the seemingly inconsistent pose of the Chinese authorities. *Nature*, for example, ran an article in 2007 providing a concise depiction of these developments (Qiu, 2007). Indefinite postponement of the release of the second green GDP report is widely regarded as the latest manifestation of the political weakness and fragility of the SEPA. After the many successive reforms and restructurings, SEPA seemed to be getting more confident of its influence in the everyday bargaining with the myriad of agencies at the central and local level, populated largely by the GDP-manic officials. The fate of the green GDP audit was a substantial setback.

Wang Jinnan, a leading engineer in SEPA and the green GDP Technical Working Group, believed that the reasons for the report's premature death were primarily disagreement between SEPA and NBS over its content and formats and, to a lesser extent, resistance from the local authorities. In his view, "now the covert struggle (*an dou*) [between agencies] has become an overt struggle (*ming dou*)" (Biganzi, 2007; *Shanghai Securities News*, 3 August 2007).

Powerful groupings within the central government have apparently played some role in frustrating SEPA's efforts. It is also likely that local authorities, worrying that their vested and potential interests might be affected, and working through personal connections and through vertical relationships with central government bureaux, have also influenced the decision to downplay and under-report the green GDP results. Discordance over the report's technicalities and content, in a sense, seem to be only a façade, disguising the more fundamental local resistance and their organised lobbying efforts at the central level (Steinhardt and Jiang, 2007).

From an institutional perspective, China's process of political and economic decentralisation since the early 1980s also has contributed in part to the premature demise of environmental audits like green GDP or Environmentally Adjusted Domestic Product (see Vermeer 1998; Wu, 2006). Prior to the 1970s, the monopoly of factors of production by the central government and the Party made it possible for

the authorities to exercise some degree of oversight over local affairs. The penetration of Party instruments at the lowest level allowed for direct control of resource allocations, and regulated the impacts of human activities on the environment.

Of course, the command economy facilitated cheating, exaggeration of economic outcomes and indiscriminate production efforts as an outgrowth of the need to comply with the central government's commands. This was manifested prominently during the Great Leap Forward when local communes, using whatever raw materials they could find nearby, produced inferior or useless steel, causing environmental damage and increasing the rate of deforestation (see Shapiro, 2001). Decentralisation of the regime in the 1980s further exacerbated the locals' penchant to cheat and act without reference to central directives. But there is an important difference: they were no longer running after commands and decrees, but instead, they pursued every opportunity for profit and economic growth, often without regard for how detrimental these activities might be to the environment.

Gradual reform of state-owned and township and village enterprises gave lucrative opportunities for local officials to assume private roles as entrepreneurs, intermediaries and executives. Motivated by economic interests and left unchecked by the central government, local governments find ways to defy the regulations of the State Council and national agencies, often in the belief that the central government has much less capacity than in the past to reach down to the local level. SEPA's statistics on environmental compliance, for example, reveal serious defiance at the local level. In 2006, of all county-level construction projects requiring mandatory environmental assessments, only 30-40% actually carried out the exercises, and cities fared no better: only about 30% have their public works certified by environmental agencies (SEPA, 2006). Interestingly, an analyst has also noted that when the NBS took the lead to collect data from the local governments, the NBS faced challenges and non-cooperation from provincial officials who outranked the NBS authorities, whose director is only at the vice-ministerial and vice-governor level (grade four to five according to the Interim Regulations on State Civil Servants of China) (State Council of China, 1993; Xie, 2007).

In these cases, the NBS might be on a collision course with provincial-level officials largely due to its lower rank in the bureaucracy (a provincial governor has a higher rank than a minister of a national bureau, such as Ministry of Environmental Protection (MEP)); but compromises could be reached, partly due to the similar, if not identical, policy preferences of the statistical bureaux and local elites. Both NBS and provincial-level statistical bureaucracies tend to prefer caution in releasing the data and have no trained familiarity with environmental accounting procedures. NBS has been concerned about the methodological grounding of the procedures (and partly for that reason took the lead to announce the suspension of the green GDP exercise), whereas the locals are wary of providing information that might affect their green GDP standing. In such situations the NBS find themselves sharing a similar position with local officials especially when they see no fundamental tensions between statistical work and elites' interests to shield the data essential for computation of the green GDP.

Compared to the NBS and its local units, the SEPA has experienced even more pervasive tension with the local authorities. Unlike the statistical bureaucrats, SEPA

and its local representatives in the EPBs bureaux face many difficulties at the local level in carrying out their roles in the green GDP audit. Differences in organisational mandates between environmental and statistical bureaux favour the latter in finding a position which is easier to reconcile with the agenda of the local elites and other units involved in economic, investment and planning affairs. The statistical bureaux are comfortable with the current methods of GDP reporting and computation, and have little willingness to venture into the green GDP exercise involving a largely uncertain and controversial methodology. As a result, it is not uncommon for local EPBs and statistical bureaux to find it difficult to co-ordinate their work (Wu, 2005). In other cases, though local elites might have environmental mindsets and awareness, as a recent survey has shown, these are not necessarily translatable into policy preferences leading to observable policy actions and changes (Tong, 2007). After all, the ''weight'' of local environmental performance constitutes only a part of the larger assessment portfolio. Economic performance (level of GDP, foreign direct investment flow, taxation and fiscal capacity, for example) remains the overarching concern of the local cadres (Tsui and Wang, 2004: 77-8); being too proactive in environmental performance at the expense of economic achievement is simply against their own interests. As a result, SEPA and EPBs are often incapable of influencing local elites, or persuading them to follow their suggestions and programmes.[8] In fact, as early as late 2005 when the first green GDP audit was underway, CAEP officials had pinpointed such problems, arguing that the central's government's Technical Working Group seemed incapable of eliciting local's compliance and conformity with the national statistical and reporting standards (Wu, 2005).

Arguably, SEPA's organisational reforms since the 1990s have streamlined the chain of command and extended its reach to the local level, both by increasing its connections and information exchange with the local EPBs, and by elevating the status of its local counterparts in subnational levels of governance (Economy, 2004; Jahiel, 1997; 1998). Administrative measures and decrees, however, often fail to overcome local malpractices and defiance of central commands. While in theory EPBs enjoy equal bureaucratic standing with the local's planning and investment units, local leaders never see all of these local branches of national bureaux as equally important and powerful. Even furnished with expertise and resources from the SEPA, EPBs seldom realise their full potential and seldom have the impact intended by SEPA (Li, 2005; Schwartz, 2003). For example, environmental impact assessments of important construction projects, an indispensable task of any environmental agency, are often obstructed by officials with linkages with the construction companies and by the fact that the projects are believed to give a considerable boost in GDP (Sinkule and Ortolano, 1995: 61-82). Studies to grasp environmental impacts of economic development, such as SEPA's green GDP survey, are therefore irritating to many local officials. At the central government level, though the SEPA has a higher bureaucratic standing relative to the NBS, its outreach has sometimes been circumvented by agencies with a primarily development and economic agenda. During the green GDP venture, it was clear that it had at least some blessing from the central's leaders during its early stage. Yet the rhetorical emphasis on environmental concerns by the leaders would not be sufficient to ensure the success of the project. The multi-level resistance from the local city and

provincial governments either resorting to "scientific" reasoning challenging the technical worthiness of the project, or affirming the priority of political and economic concerns, coupled with the discord between the environmental and statistical bureaucracies, would have been strong enough to compel the central government to reconsider its endorsement of the green GDP project.

In light of these intricate challenges, the fate of the green GDP study, as Chinese commentators have also noted, was almost predestined to failure. The discourse challenging the scientific and technical feasibility of a green GDP also undermined SEPA's project, allowing critics to claim that the project did not really deserve much attention from the government or from the public.

## Conclusion

As a tool for assessing the real consequences of economic growth and, ultimately, for estimating the sustainability of an economy, some form of environmental accounting is essential. Environmental accounting should be a component of ecological modernisation discourse and discussions. In most countries, such national environmental accounts have been used only for particular sectors of the economy. There are many technical problems and challenges in producing an aggregated environmental cost account, such as a green GDP. Some scholars argue that there is no meaningful way to produce such a figure, because there are too many unquantifiable elements of environmental impact. Nevertheless, there are many precedents in other countries for such measures for particular sectors.

The attempt to implement a green GDP in China between 2004 and 2006 indicates how boldly some of the senior officials in the central government have attempted to bring environmental impacts into the middle of policy discussions about economic growth and development. Indeed, this is arguably the most striking attempt to do so among both developed and developing countries in the past decade. It was also an attempt to introduce environmental accounting into the career assessments of officials, and to try to induce ambitious officials to pay as much attention to environmental degradation resulting from economic growth as to the magic GDP growth figures which have been used in the past to assess their performance.

But the tension between ecological modernisation and the imperatives of the treadmill of production is well illustrated by China's green GDP exercise. The ecological modernisers faced determined multi-level resistance from those firmly committed to the treadmill and, up to the present, high economic growth is more closely linked than ecological modernization to regime-legitimacy and the mainstream collective visions of economic prosperity.

The apparent victory of the opponents of green GDP is partly the result of the technical problems with such a measure, as noted in recent comments by Zhu Zhixin, Deputy Director of the National Development and Reform Commission: "We must take into account the environmental and resource depletion costs in computing our GDP ... but it takes time for us to come up with a convincing and internationally recognised method" (CAEP, 2007).

But the retreat of the government from the green GDP exercise also highlighted the politicized nature of environmental accounting. Work on green GDP accounting after 2007 evidently continued within CAEP, although it was not publicised outside

SEPA. The officials and researchers who supported the green GDP exercise pulled this kind of accounting back into the Academy, partly to avoid arousing further political resistance, and partly to feed the results into policy discussions in a much less public manner (CAEP researcher, author's interview, March 2008).

The central government's re-organisation in 2008 elevated the bureaucratic status of SEPA as the new Ministry of Environmental Protection, a "super-ministry" (*dabui*) with portfolios in environmental and natural resource management. This transformation of SEPA into a Ministry has presumably endowed the organisation with higher standing and additional leverage in regard to relations with local officials, and in regard to the implementation of a national system of environmental accounting. It would be premature, however, to foresee a revival of the green GDP project in the short run. More experience from the currently low-profile studies by the CAEP would be needed before the project could regain momentum and political support, and address the critics who challenged its scientific and methodological feasibility.

The green GDP audit signalled the growing interest in environmental accounting in China, and stimulated further public debates about the environmental implications of economic development. But it is clear that economic development, the mainstay of the regime's political legitimacy, still outweighs environmental protection whenever it appears that the two goals are in direct conflict. This was strikingly illustrated again in 2009 as the central government struggled to revive economic growth in the face of the global economic recession and the resulting rise in unemployment in China.

The government announced an economic stimulus package of up to 4 trillion yuan in late 2008, mostly for infrastructure projects. Conservationists expressed concern in the media and in various forums about the environmental impacts of such massive and sudden increases in spending on infrastructure. Officials pledged that the government would not abandon the goal of environmental protection. But meanwhile, the green GDP exercise was again targeted by development-minded leaders as a hindrance to the pursuit of short-term economic growth, and the MEP was evidently instructed that further technical work on and advocacy for green GDP accounting should cease (Shi, 2009). One of the principal supporters of environmental accounting, MEP Vice-Minister Pan Yue, had to announce this result to the media during the Chinese People's Political Consultative Conference meeting in Beijing in March of 2009.

The politically crucial drive for economic development and job creation had once again crowded out more fragile initiatives designed to promote ecological modernization and, among these initiatives, the green GDP method of environmental accounting was the first and easiest victim. But China's bold and unprecedented green GDP exercise stimulated public interest and policy debates throughout the country, and led to an accumulation of political and technical experience with environmental accounting that ensure it will be revived again in the near future.

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## Notes

[1] Ecological modernisation is not synonymous with the notion of sustainable development, which encompasses a broader agenda: "Ecological modernization should be seen as a necessary, but not sufficient, condition for sustainable development" (Langhelle, 2000: 303-22).

[2] These two types of practices, together with the approach to developing aggregated indexes, such as green GDP and lately sustainable development index, constitute the three major categories of work in environmental accounting identified by Alfsen et al. (2006).

[3] The London Group on Environmental Accounting was established with a mandate from the Statistical Commission of the UN to review and develop a "System of Economic Environmental Accounting." The first meeting was in London (hence the name "London Group"). The 2007 meeting was in Johannesburg. Statisticians attending the meetings are drawn from national statistical offices, and there are also representatives on the co-ordinating committee from the Statistical Office of the EU (Eurostat), the Organisation of Economic Co-operation and Development, the UN Statistics Division, and the World Bank. The London Group is widely recognised for the capacity to provide expert input to the UN and other organisations on environmental accounting systems.

[4] Since 1968, SNA, jointly published by UN, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development and World Bank, has been an internationally accepted system of standards and practices for countries with a market economy to understand their economic performances. It has "an integrated set of macroeconomic accounts, balance sheets and tables based on internationally agreed concepts, definitions, classification and accounting rules." For details, see UN Statistics Division (1993). For critical reviews of the green GDP accounting within China, see for example, Yang (2004), Xu (2005) and Wu Xuean (2005).

[5] Gao, Pan and other officials/researchers were recognised in the 2006 ceremony honouring their efforts in the Green GDP Research Group. Citations of the award are available online at http://www.china.org.cn/english/features/cgw2006/198253.htm accessed 15 September 2007.

[6] Citing these examples, however, the writer seemed to have confounded the various environmental accounting practices as discussed earlier, which are typically more focused and specific than an aggregate "green-GDP" (see Alfsen et al., 2006, pp. 15-16).

[7] The term "image project" is used popularly in China to refer to constructions or public campaigns which are, as one newspaper commentary suggested, "highly expensive and ostentatious, but of little or no practical use" (*Jiefang Ribao*, 4 January 2007).

[8] For such tension between vertical and horizontal lines of authority, see Lieberthal (1997). He wrote:

> there is an obvious potential conflict between the "vertical lines (in Chinese *tiao*) of authority (e.g. the EPA at each level of the political system) and the "horizontal" lines (in Chinese, *kuai*) of authority (emanating from the territorial government at the same level as the functional office). The vertical line of authority coordinates according to function (in this example, the environment); the horizontal line of authority coordinates according to the needs of the locality that it governs.

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