

The Plight of Green GDP in China

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Abstract

China's decision in 2004 to implement a "Green GDP (Gross Domestic Product)" program to measure societal development created a fury of debate. Although endorsing the adoption of a national Green GDP at the Communist Party plenum reflected a political shift in priority towards a more environmentally sustainable economic model, Green GDP faced many challenges - challenges similar to those faced by other countries in their own pilot studies - that ultimately led to the official demise of Green GDP accounting in China in 2009. This paper explores the challenges inherent in Green GDP implementation, as illustrated by China's experience in trying to implement this metric. Our analysis of the implications of such a framework has led to the proposal of recommendations to increase the robustness of sustainability accounting systems. Though China aborted initial attempts, China can yet revive its development of Green GDP and/or other environmental accounting, increasingly relevant metrics as evidence mounts that nowhere are they needed more than in China.

Keywords: China; Green GDP; National Accounting Frameworks; Environmental Accounting.

1. Introduction

China's rising economic power is one of the great success stories of the latter half of the 20th century. Thirty years of economic reform have produced staggering results, lifting hundreds of millions of Chinese from abject poverty. By the end of 2005 a national economic output of \$2.26 trillion sent China soaring past France, Britain and Italy to become the world's fourth-largest economy (after the United States, Japan, and Germany) and third largest exporting nation (after the United States and Germany).¹ In recent years China's economy, growing at 10% annually², has surpassed the size of Germany's; the global slowdown of 2009 is expected to reduce growth to a still respectable 6-8%.

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¹ Bradsher 2006

² National Bureau of Statistics of China 2006



Figure 1: Locations of the ten pilot regions of Green GDP accounting in China.

While China's economy explodes, its environment is imploding. China's economic expansion has come at the expense of air pollution, surface water and groundwater contamination, land clearing, deforestation, species endangerment, resource depletion, growing rural and industrial wastes, and simmering social unrest. This environmental breakdown over the last three decades is due in part to China's bureaucratic framework, which emphasizes economic growth over other goals. China's Communist Party bureaucracy awards points for an array of targets, which affect the promotion and bonus prospects of an official. In an attempt to meet targets focused solely upon economic growth, resources have been squandered and the environment neglected.

As the Chinese leadership witnessed the degradation and pollution of its natural resources, it became acutely aware of the environmental challenges threatening the current and future wellbeing of the Chinese people. This environmental destruction brought a new urgency to the Chinese government's attempts to redefine "development" to account for these environmental costs. President Hu Jintao first endorsed the Green GDP idea in March 2004 in a speech about the need to foster a "scientific concept of development." In order to achieve its "five-balancing goals,"³ China proposed to develop a new accounting system that would measure not only China's economic growth, but also measure how it had protected and enhanced environmental and social welfare.

Ten regions⁴ in China carried out a pilot project in Green GDP assessment in 2005 (Figure 1). Experience from this project provided for the wider application of

³ Balancing urban and rural development, balancing development among regions, balancing economic and social development, balancing economic growth and ecological conservation, and balancing domestic development and opening wider to the outside world (Wen 2004).

⁴ Beijing, Tianjin, Chongqing, Liaoning, Hebei, Zhejiang, Anhui, Guangdong, Hainan, and Sichuan.

environmental assessment to 31 provinces and municipalities.⁵ Results of this national study were originally due out by the beginning of 2006, but the release of the results was delayed until September 2006. This delay likely resulted from difficulties in collecting and processing data as well as internal debate as to how to value physical assets. The initial report found that losses due to pollution costs accounted for 3% of national economic output in 2004.⁶ While Mr. Pan Yue, Vice Minister of the State Environmental Protection Administration (SEPA),⁷ initially claimed that a framework for a Green GDP accounting system would come into effect within three to six years, becoming the benchmark of government officials' performance, support for the project was withdrawn in 2007. The project was officially cancelled in March 2009.⁸ As past attempts at assessing Green GDP attest, calculating the market value of an extinct species, the cost of soil erosion resulting from felling trees, or the cost of the health damage from pollution was riddled with more complexity than the Chinese appear to have first realized.

So what of sustainable development in China going forward, and the role of Green GDP in defining such development? We explore this question in this paper, beginning with an overview of Green GDP, followed by a description of its aborted application in China. The failure of Green GDP illustrates the challenges implicit in realizing this advanced accounting framework, and we end with recommendations for how a renewed attempt at Green GDP in China might be implemented.

2. Defining Green GDP

Gross Domestic Product is defined as the market value of all final goods and services produced within a country in a given period of time. The most common approach to measuring and understanding GDP is the expenditure method:

$$GDP = Consumption + Investment + Government Spending + (Exports - Imports)$$

GDP took over 300 years to develop, taking its present shape in 1956 when the United Nations (UN) first introduced an international GDP standard, with major revisions following in 1968 and 1993. Despite the strides in developing this indicator and the accounting of its underlying data, economists and environmentalists alike levy heavy criticisms.

From a sustainability perspective, the major weakness of GDP is that it ignores natural resource depletion, environmental pollution, the lost value in material discards, and potential social costs such as poorer health due to occupational

⁵ China was divided into 3 regions (east, central, and west) for statistical reporting. The eastern region includes Beijing and Tianjin (municipalities), Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan (provinces). The central region includes Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan (provinces). The western region includes Inner Mongolia Autonomous Region, Guangxi Zhuang Autonomous Regions, Chongqing (municipality), Sichuan, Guizhou, Yunnan (provinces), Tibet Autonomous Region, Shannxi, Qinghai (provinces), Ningxia and Xinjiang Autonomous Regions.

⁶ TerraDaily 2006

⁷ In March, 2008, SEPA was promoted to the ministry level, and renamed the Ministry of Environmental Protection (MEP)

⁸ China Economic Review 2009

exposure to chemical and radioactive materials. In short, GDP does not measure the *sustainability* of growth. A country may achieve a temporarily high GDP by over-exploiting natural resources. Economies experiencing an asset bubble or a low private-saving rate appear to grow faster due to higher consumption, mortgaging their future development for present growth.

In such places as China, environmental degradation that leads to flooding or poor public health actually increases GDP by triggering growth in wages and economic output from dam construction and medical care. China's massive GDP growth in recent times may not reflect the true sustainable (social, environmental, and economic) wealth of the country. In fact, by some accounts, the environmental and human health cost of damages wrought by China's growth may completely negate its economic growth in GDP.⁹

Thus enters the concept of Green GDP with the attempt to garner a fuller and more accurate account of development. Green GDP is a general concept that refers to a wide array of adjusted GDP metrics that correct for environmental and social costs. Overall, these adjusted GDP metrics value environmental and social commodities that are not traditionally given monetary prices. Such well-being metrics were first developed in the mid-1970s, and though many countries have created pilot studies to analyze how to effectively implement them, they remain predominantly an academic exercise. However, the UN, in 1993, released a conceptual methodology for countries to assess an environmentally adjusted GDP, encompassed in the UN's proposal of a System for Integrated Environmental and Economic Accounting (SEEA). The Dutch have also developed an alternative environmental accounting framework. Building on these frameworks, the Chinese have defined Green GDP as the regular GDP minus the costs of environmental and social damage.

$$\text{Green GDP} = \text{GDP} - \text{Environmental Costs} - \text{Social Costs}$$

3. Environmental Accounting and Valuation

Three stages of developing a Green GDP metric can be roughly defined, beginning with environmental accounting, followed by valuation, and finishing with metric calculation. Environmental accounting quantifies in physical units the amounts of pollution (e.g., tons of CO₂), waste (e.g., tons of sewage sludge), timber (e.g., board feet of sawtimber), and other physical quantities extracted or returned to the environment. Valuation is the process of assigning monetary values to these physical quantities. With the assignment of value, the environmentally (and perhaps socially) adjusted GDP metric, such as Green GDP, can be calculated.

Environmental accounting is at the heart of developing a Green GDP metric. Yet historically, it has often been in environmental accounting where adjusted GDP development fails, as an inadequate system is set in place or an adequate system does not exist. However, the UN's SEEA, previously mentioned, offers guidance in setting up a system of environmental accounting and develops the framework China utilized to develop its Green GDP accounting.

⁹ Economy 2004: 19

No.	SEEA Steps
1	Compilation of the supply and use accounts (GDP accounting)
2	Identification and compilation of environmental protection expenditures
3	Compilation of produced resource asset accounts
4	Compilation of physical resource accounts
5	Valuation of the resource: compiling the monetary accounts
6	Compilation of physical environmental accounts (non-economic assets)
7	Compilation of emissions by economic sector
8	Maintenance costing of environmental degradation

Table 1: SEEA steps to environmental accounting and valuation (UN 2003).

Proposed in 1993 and revised in 2001 and 2003, SEEA delves deeply into how to implement environmental accounting of physical stocks and flows, with some additional guidance on how to value these physical quantities.¹⁰ SEEA combines physical environmental accounting of natural resources, ecosystem services, and residual wastes with more traditional System of National Accounts (SNA) economic data to create an integrated hybrid accounting scheme. By applying various valuation techniques to the physical environmental accounts, these quantities can be converted into monetary values and then incorporated into the standard economic accounts where money is the basic unit of analysis. SEEA classifies these ultimately monetary flows into four components: products, natural resources, ecosystem inputs, and residuals.¹¹ Products are the goods and services in an economy usually assessed in traditional GDP. Natural resources include such stocks and flows as timber, oil, and ore. Ecosystem inputs are such components as air, nutrients, and water required by all living things. “Residuals” is the name given to the discards of the economic system. Note that future revisions of SEEA are possible, as, for instance, it might relate to the conflation of accounting for changes in environmental assets (natural stocks) versus accounting of environmental flows (ecosystem services). GDP is a measure of output, a monetary flow, so a calculation of a Green GDP metric should arguably focus upon the value provided only by the flow from ecosystem services, without regard to natural stocks.¹²

Environmental valuation has some explicit economic parts (taxes, property values, environmental protection expenditures, etc.) and some non-explicit economic parts (the value of such ecosystem services as rainfall, oxygen generation, coastal wetland storm protection, etc.). The *UN SEEA Handbook* describes in practical terms the process by which a country can implement accounting and environmental valuation for a resource asset class. Table 1 presents the *Handbook*'s proposed step-by-step approach.

Given that a country can set up and maintain a robust physical accounting system, the stage is set to attempt to value these physical resource assets. Part of environmental valuation is straightforward, as it merely reflects the explicit economic costs of money actually spent for ecosystem services (water prices, pollution taxes, costs for environmental clean-up, etc.). Market transactions are the preferred method

¹⁰ Denes 2004

¹¹ UN 2003

¹² Boyd 2007

Country	Discount Rate (Real)
Australia	8.6% to 13.1%
Canada	4%
Netherlands	4%
Norway	7%
United Kingdom	3% to 6%
United States	3% to 10%

Table 2: Various discount rates utilized by different nations (UN 2000).

for environmental valuation, for obvious reasons.¹³ If market transactions are non-existent (non-explicit), the next option is to value the resource based upon the present value of the expected net returns from future commercial use. As illustrated in equation (1), the sum of present values for future expected income minus expected future expenditures (the cash flow, CF), for each future time point (t) is termed the net present value (NPV).

$$NPV = \sum_{t=0 \rightarrow t=n} CF / (1+i)^t \quad (1)$$

While projecting future cash flows can be difficult enough, the estimate can vary widely depending upon the discount rate (i) applied to estimate NPV. The discount rate reduces (“discounts”) future cash flows; the underlying assumption is that a quantity of money earned today is more valuable than the same quantity of money earned in the future. The NPV can be quite different even with a 1% difference in the discount rate used. With estimates worldwide ranging from 3-13%, there is no agreement on the appropriate discount rate to use for physical resources, as illustrated in Table 2.

Once the environmental costs, and perhaps benefits, have been valued, the third and final step can be undertaken: adjusted GDP index calculation. As mentioned previously, the term Green GDP is often used more casually to refer to any welfare metric that incorporates the costs of environmental and social damages. The use of such a term can lead to confusion, as there are different methods by which a Green GDP metric may be assessed going by various appellations, including Green Net National Product,¹⁴ Measure of Economic Welfare,¹⁵ Index of Sustainable Economic Welfare,¹⁶ and Hicks Income #1.¹⁷ These and other adjusted GDP metrics have different methods of calculation, and social costs may or may not be included. For instance, China appears to include social and public health costs in its calculation of Green GDP. The extent to which certain costs and benefits are included also varies, as one metric may, for instance, include the beneficial value of leisure time, while another may forgo this particular assessment due to the difficulty in estimating it accurately.

¹³ UN 2000

¹⁴ Anonymous 1998

¹⁵ Nordhaus and Tobin 1972

¹⁶ Hamilton and Lutz 1996

¹⁷ *Ibid*

An example illustrates the vagaries and potential inaccuracies in Green GDP calculations. A study to calculate net domestic product (yet another Green GDP metric) subdivided environmental costs into three categories: 1) natural resource degradation due to residuals (discards), 2) ecosystem destruction, and 3) resource depletion.¹⁸ When calculating the costs of ecosystem destruction, the study only included forest damage. Yet damage to ecosystems can also occur in natural plains and savannas, as these are developed upon or polluted, yet no trees are felled and forests destroyed. Such calculations also do not recognize the overlap between categories that may exist, as, for instance, aquatic ecosystems can be destroyed due to pollution, not just due to the dredging and/or water diversion costs utilized in the calculation.

4. Challenges of Green GDP Implementation in China

Key problems in policing a shift towards a greener economy in China are highlighted in the experiences and failure of its Green GDP project. China's governance structure for environmental management, the degree of additional data collection required, and the lack of consistent rules for environment valuation all contributed to the failure of the use of Green GDP in China.

4.1 Governance

The governance bodies that were charged with implementing Green GDP remain insufficient and fragmented. While SEPA fully endorsed Green GDP, the cooperating agency, the National Bureau of Statistics of China expressed skepticism about the ability to accurately calculate Green GDP.¹⁹ Despite recent government attempts to boost the authority of SEPA, promoted as of 2008 to the ministry level as the Ministry of Environmental Protection (MEP), it has gained only marginally more influence than it had in the past and must compete with a number of other ministries—from the National Reform and Development Commission to the State Forestry Administration to the National Bureau of Statistics—in formulating and enforcing environmental rules.

In addition, the gradual devolution of power from Beijing to the provinces that has taken place since the early 1990s has not helped the environmental cause. Central authorities may have a good understanding of how China would benefit from cleaner or more efficient production, but provincial leaders have rather different priorities and often remain reluctant to follow Beijing's lead. Resistance stems from the fact that the performances of local officials have traditionally been assessed according to the economic success of the areas they administer. The stronger the local economic growth, the better they score, irrespective of pollution. With many local officials having direct stakes in local businesses, they are reluctant to handicap companies with stringent environmental rules. These problems are compounded by the fact that local Environmental Protection Bureaus are subject more to the authority of local governments, which fund their budgets and pay their wages, than they are to the

¹⁸ Cooray 2001

¹⁹ Huà 2005

MEP, to which they nominally report. Hence there is a constant tension between provincial and central authorities over pollution issues, which more often than not plays out in favor of local interests.

With the lack of a checks-and-balances system, the Chinese government risks producing “official” statistics that may not be rigorously scrutinized. This lack of an ombudsman system creates a situation where the inaccuracies inherent in Green GDP can potentially be implicitly or explicitly skewed to choose statistics that best reflect a “green” picture of progress. A Green GDP metric so abused would be difficult to discredit outright, given the range of answers that can be produced based on various methodologies. Internal social unrest has the potential to arise if localities feel the chosen national methodology favors certain regions in China (e.g., the market-based economies in the cities where environmental costs are implicit in the costs of waste management) versus other regions of China (e.g., the rural poor where more non-market-based activities occur and the environmental costs are more subject to variation and interpretation due to different possible methodologies).

4.2 Accounting

After decades of research, the challenges to developing a statistically accurate Green GDP have led countries like Norway and Germany to resist the official use of a Green GDP calculation.^{20,21} Their own pilot studies found that a Green GDP metric was so fraught with uncertainty that it could not be reliably used as an official government statistic. As such, these countries took steps to increase the accuracy of their environmental accounting systems, while relegating the development of environmental valuation techniques mainly to academia. China had relatively little experience when it began in 1997 to work closely with Norway to implement systematic environmental accounting and to apply the UN SEEA. China implemented its own pilot studies, focused primarily upon pollution emission accounting, including the Establishment of Green Accounting System of Beijing in 1998, the Sustainable Development Indicator System Project with pilot studies in Sanming City and Yantai City in 1999, and the Environmental Domestic Products (EDP) case study in Jiangsu Province.²² Until 2004 work continued to focus primarily upon monitoring pollution emissions, when the leap to a Green GDP metric was proposed. It is not a surprise that Green GDP failed in China if such environmentally-pioneering countries as Norway and Germany have not yet found the use of a Green GDP metric tenable.

A very practical but very real challenge is the cost of data collection. It takes both time and financial resources not only to collect the data, but also to process it into a database. Norway’s efforts in environmental accounting declined in the 1980s due in part to the high cost associated with ongoing data collection. The government felt the benefits did not outweigh the costs of data collection.²³ The US aborted its project on national material accounting of environmental resources after just one year for similar reasons. The government was unsure about the true utility in policy

²⁰ Sørensen 2000

²¹ Oberheitmann 2005

²² Liú and Guō 2005

²³ Sørensen 2000

Medium	Water			Air				Land	
	<i>waste water</i>	<i>organic carbon</i>	<i>nitrate</i>	<i>SO₂</i>	<i>soot</i>	<i>dust</i>	<i>NO_x</i>	<i>industrial solid waste</i>	<i>domestic solid waste</i>
Quantity (million tonnes)	60,7 20	21	2	25	11	9	16	18	67

Table 3: National 2004 pollution emission quantities in China utilized for environmental cost assessment

making of the data being collected and evaluated. While advances in information technology have the potential to vastly reduce data collection costs, China's developing country status, combined with its sheer size, makes the cost of gathering and processing the requisite data needed for Green GDP prohibitive in the near future. The MEP in particular suffers from under-funding and under-staffing, exacerbating the cost issue and leading to delayed release of the national Green GDP results for 2004, incorporating 31 municipalities and provinces, from the beginning of 2006 until September 9, 2006. The report found the costs of environmental pollution equaled 3% of national GDP.²⁴

This initial release of Green GDP accounting was far from the comprehensive accounting suggested by the SEEA framework, however. Only nine emission categories were quantified (Table 3).²⁵ No social costs were accounted for, nor was natural resource depletion or ecological damages assessed. Only a subset of pollution/emission costs (air emissions, surface water pollution, discards to land, and environmental accidents) was reported, with no assessment of groundwater or soil pollution costs.²⁶ With such a small subset of environmental costs assessed, but with these costs already equivalent to 3% of national GDP, the prospect of a full cost accounting revealing *negative* adjusted growth may have been too forbidding. Combining the challenges of Green GDP data collection and calculation with resistance by local officials to the use of Green GDP as a performance metric²⁷ makes it quite easy to understand the failure of Green GDP implementation in China.

4.3 Valuation

Environmental valuation, the intermediary step towards calculating Green GDP, though prevalent in academic studies, still appears immature for real-world statistical and policy purposes. Green GDP has no internationally accepted method of calculation, as no internationally accepted method of valuing non-market environmental and social goods and services has been created.²⁸ The UN SEEA offers an international consensus for integrating environmental and economic accounting, but this was only first proposed in 1993, with periodic updates and modifications continuing to the present time. Not until physical environmental accounting can be accurately assessed will reliable environmental valuation occur.

²⁴ CAEP 2006

²⁵ Wang et al. 2006

²⁶ *Ibid*

²⁷ Qiu 2007

²⁸ Boyd 2007: 716-723

The varying approaches and results of academic studies of Green GDP in China highlight this inconsistency. One analysis resulted in the estimate that in 1992 environmental costs were 5.6% of the Net Domestic Product,²⁹ while another study calculated “comparable” Green GDP in western China between 1998 and 2003,³⁰ estimating a reduction in GDP between 1-3% depending upon the region and the year. Simplifying much of the environmental accounting, this latter study creates a “comparable” Green GDP using formulated assumptions that approximate the components of Green GDP, including costs of resource depletion, environmental degradation, and environmental protection regulations. The only natural resource depletion data included in the analysis are that of fossil fuels (coal, petroleum, and natural gas), as other natural resources, such as fisheries and forests, lacked sufficient data. The costs of environmental damage only included actual pollution accident costs and the costs for air, water, and solid waste treatment. And the air, water, and solid wastes accounted for include only those discharges from industries and urban residents. These assumptions appear to have grossly oversimplified the problem, and certainly came up with a number that underestimated the true costs of environmental damage and resource depletion.

Statistics Norway comes down quite heavily against Green GDP metrics due to the present inherent difficulties and subjective assumptions associated with environmental valuation. Criticisms levied against Green GDP state that valuing environment and human “wellness” monetarily is inherently fraught with inconsistency. For instance, valuing leisure time, wherein a person is most likely adding to personal welfare, is difficult for those leisure time activities that do not contain a market transaction.³¹ Such valuations can be imputed, but it is a long, difficult, and complex process. Furthermore, valuing more straightforward assets as subsoil assets (ores and fossil fuels) is still full of uncertainty. Estimates of Norway’s wealth of oil reserves (a stock) can fluctuate year-to-year as much as Norway’s entire GDP. The US Bureau of Economic Analysis found that difficulties arise in 1) choosing the appropriate prices to value the additions, subtractions, and existing stock of subsoil assets; and 2) choosing the appropriate quantities of natural stock by which to multiply the chosen prices.³² When combined efforts of European and US governmental statisticians are unequal to the task, the inability of a developing country like China to solve such a complex problems is hardly surprising.

Calculating Green GDP based upon past expenditures and costs is also not necessarily predictive, as it assumes a reactive stance, assessing harm after it is done. This observation raises the question about what a Green GDP metric really indicates about sustainability. Statistics Norway asserts that a sustainable economy could look far different from today’s economy, so simple net deductions for environmental and social costs may not really indicate a state of sustainability.³³ What even constitutes an increase in welfare remains debatable; putting a monetary value on welfare may oversimplify the issue. The actual environmental accounting data can provide significant information on their own, and converting these physical assets to

²⁹ Akita and Nakamura 2000

³⁰ Liú and Guō 2005

³¹ Darmstadter 2000: 11-14

³² *Ibid*

³³ Sørensen 2000

monetary units may either not be needed or even obscure the underlying data, which may describe the state of economic sustainability far more accurately.

5. Recommendations for Sustainable Accounting Practices in China

Given the challenges facing China that thwarted their desire to develop a Green GDP metric, we offer our recommendations as to how China should proceed in their pursuit of sustainable development. Our recommendations are particularly tied to the issues regarding environmental accounting and valuation, Green GDP, and data transparency.

5.1 Develop an accurate and robust environmental accounting system

Rather than overreach for a Green GDP metric, China can place its efforts into becoming a world leader in environmental and social accounting. Such effort would lay the foundations for future valuation techniques and/or a Green GDP metric calculation. The accounting scheme should be deployed nationwide by the government. Rather than calculating a monetary development metric, China can use the physical accounting data on its own to assess government officials' performance. For instance, accurate and detailed physical accounts of atmospheric pollution like greenhouse gases and sulfur dioxide could be used to create target emission levels for government municipalities. Further target levels for the myriad of other environmental impacts accounted for by an improved and expanded physical accounting system would create a score sheet of sorts. By eliminating the subjective valuation step, physical targets are easier to set and simpler to use as performance indicators. Physical targets also have the strength of providing more specific information as to which aspects of the environment or social welfare are being improved (or eroded).

5.2 Utilize knowledge resources to develop more reliable and standardized valuation techniques

Funding research and development in this area would result in potentially lucrative policy tools. Valuation techniques would enter an accelerated maturation path, and may become statistically reliable enough in the near future so that a Green GDP metric could be accurately calculated (if so desired). However, an alternative approach is to utilize these robustly developed valuation techniques to create effective government policies that internalize costs and benefits of non-market goods and services into the market. A Green GDP metric is GDP adjusted for environmental and social costs and benefits not fully included in market transactions, hence requiring valuation techniques. These "external" costs and benefits, or externalities, can be "internalized" into the market through such tools and mechanisms as classic tax and subsidy policies, tradable permits, and other creative policies like extended producer responsibility. The systematic market effects of

internalizing externalities would ultimately lead the measured GDP to reflect sustainable development, making a Green GDP metric only a redundant calculation. The exact values used in these policies, or the policies themselves, should be based upon developed academic valuation techniques and ideas. This alternative approach to creating a sustainable economy has the added strength of being an iterative process, wherein every year additional externalities can be internalized and existing internalization policies refined based upon new knowledge.

5.3 Improve data transparency

Underlying all potential improvements in environmental accounting and valuation is data transparency. The interests of local government officials, MEP, and the Chinese people can be equally served by establishing transparent public reporting of the raw data, statistical methods, and calculations. Necessary experience and expertise on data transparency could be provided, for instance, by the United Nations Statistical Commission. With data, methodologies, and calculations published for all stakeholders to scrutinize, mistakes and inaccuracies can be quickly and equitably identified and fixed. While public transparency addresses the bulk of the environmental accounting and valuation analyses, all methods and calculations hinge on accurate collection and reporting of the underlying data by local officials to MEP. The fear, largely by local government officials, of accurately reported data on environmental accounts of potentially significant environmental impact should not be a reason to manipulate, suppress, or abandon the collection of such data.³⁴ While we suggest most of this raw data also be made available for public scrutiny, we acknowledge that some data are necessarily proprietary. However, this condition does not preclude all data, proprietary or not, to be accurately reported within the Chinese government system. Further checks and balances, or ombudsman systems, could be implemented such that the credibility of data collection, analysis, and policy development are continually examined and revised. Arguably an historic originator of the ombudsman concept, the Chinese government already has its own Ministry of Supervision, which is positioned to play this role in enforcing intra-government data transparency.

6. Conclusion

While Green GDP may never materialize as a metric of sustainable development, the environmental accounting advances that would result in China as a by-product of pursuing such a metric would certainly provide useful information to those making environmental and social policy decisions. Positive impacts could be made on policy-making, macroeconomic understanding, improving knowledge of known environmental problems, measuring the impact of environmental regulations and taxes, and assessing resource use efficiencies.³⁵ Norway has for 30 years pioneered national material accounting. Such long-term commitment to environmental

³⁴ Qiu 2007

³⁵ Hamilton and Lutz 1996

accounting, despite the challenges, has contributed to Norway's status as a leader in sustainable development. Rather than pursuing a Green GDP metric at this time, China can take a leadership role alongside Norway by developing its own reliable, comprehensive, and transparent environmental and social accounting system, also working to develop economic valuations that can be utilized to create effective economic policies that internalize externalities. With such efforts, multiple sustainability indicators based upon physical accounts will give a more detailed, accurate story than a single number like Green GDP, while other already established and accepted unitary index metrics like the Environmental Performance Index can be utilized as the easily accessible policy tool for benchmarking progress over time and relative to other countries.

China has taken a bold step to be a global leader in sustainable development in calling for a Green GDP metric. The willingness to take this risk should not be dismissed lightly. While other countries have piloted analyses, all have fallen back to the first stage of Green GDP metric development, environmental accounting, without ever claiming so centrally the need for incorporating environmental valuations as a performance measure. For the sake of China and the global community, we hope that abandoning the nationwide implementation and use of Green GDP is a step forward that focuses efforts upon more accurate and comprehensive environmental data collection and accounting, and additional environmental valuation research, as opposed to a step back towards the limited vantage of economic development so prevalent in the environmentally damaging 20th century.

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