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## 《产业生态学报》

2007年冬, 第11卷第2期, 15-30页

题目: 在城市管理中考虑全球环境问题: 规模与准备方面的争议

作者: Xuemei Bai

关键字: 碳管理, 发展中国家, 产业生态学, 准备, 规模, 可持续城市

**摘要:** 随着城市数量与居住人口的增长, 其对全球环境的影响也越来越大, 城市的管理水平甚至对全球问题的解决举足轻重。但对大多数城市而言, 在地区性的管理中充分考虑全球性的问题颇为不易。本文在现有的理论与实践研究的基础上, 分析了阻碍从城市层面上解决全球性问题的障碍所在; 并探讨了如何将全球性问题具体化从而克服上述障碍的策略。以上障碍多源于观念、利益的冲突以及对问题优先程度认识的不统一, 本文将其概括为两方面——即规模与准备方面的争议。全球与地区性环境问题与经济利益息息相关, 在地区的尺度上考虑并解决全球性环境问题能够为城市发展提供一定的先发优势。尽管发达城市的实践经验表明, 要使城市政府插手全球性问题恰恰应避免谈及全球化, 但本文认为过于地区化的政策同样有损城市包括发展中城市的利益。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 15-30

**Integrating Global Environmental Concerns into Urban Management: The Scale and the Readiness Arguments**

Xuemei Bai

**KEYWORDS:**

carbon management, developing countries, industrial ecology, readiness, scale, sustainable cities

**SUMMARY:**

Due to the growing numbers of cities and urban residents, cities have increasingly contributed to global environmental issues. Many studies have pointed out that the city administrative level is a crucial level at which to address global issues. Nevertheless, integrating global concerns into local management remains a difficult task for the majority of cities. Building on existing theoretical and empirical studies, this article explores the obstacles that impede cities from addressing global environmental concerns, the opportunities for removing the obstacles, and strategies to bring global issues onto the local level. Many of the obstacles are reflections of contradictory perceptions, concerns, interests, and priorities, which are presented in the form of two arguments, namely the scale argument and readiness argument, in this article. The close linkages between global and local environmental issues and the potential economic benefits arising from addressing global concerns at the local level may provide opportunities and incentives for cities to take action earlier. The author further argues that although empirical studies in developed cities suggest that the most effective way to get municipal governments to address global concerns is by not talking about the "global," an overly localized policy might not always result in a net gain in a developing city setting.

## 《产业生态学报》

2007年冬, 第11卷第2期, 31-42页

**题目: 东南亚的城市化: 政策过程与可持续发展的评价**

作者: Giok Ling Ooi

**关键字:** 经济发展, 环境指标, 产业生态学, 公众参与, 可持续城市, 城市环境管理**摘要:** 在研究发展中国家城市化与城市可持续性关系之时, 多数研究者将收入视为环境改善的动力, 他们的城市环境发展模型指出, 随着城市人均收入的提高, 当地的环境问题将逐步减少。本文对这一观点进行了挑战, 指出上述结论的前提在于: 随着收入的改善, 公众必须日益关注并参与城市可持续目标的制定及目标完成情况的评价。

如何选取适当的指标分析这一过程, 对实现城市的可持续发展至关重要但又殊为不易, 因为可持续性这一概念本身还众说纷纭, 既有的工作又多侧重于国家尺度及跨国间的比较。通过分析健康、城市交通、空气质量、排污系统等相关指标可发现人均收入的增长并非城市可持续发展的必要条件。东南亚的一些低收入城市尽管经济与人口指标并不亮丽, 但可持续发展方面却做的不错。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 31-42

**Urbanization in Southeast Asia: Assessing Policy Process and Progress toward Sustainability**

Giok Ling Ooi

**KEYWORDS:**

economic development, environmental indicators, industrial ecology, public participation, sustainable cities, urban environmental management

**SUMMARY:**

In investigating the relationship between urbanization and sustainability in cities of developing countries, many researchers have looked to rising incomes as a driver for environmental improvement. This article challenges the transition and evolutionary models of urban environmental development that suggest that as cities grow in per capita income, their local environmental problems will diminish. The transition model is outcomes based and a competing model based on greater attention to participation in setting sustainability goals and assessing the progress toward those goals is presented.

Consensus on appropriate indicators is a key element, albeit a challenging one, of the task of pursuing urban sustainability, because of the contested nature of the concept of sustainability and the fact that much of the work done on sustainability has been conducted among countries or on a the national scale. A brief review of health, urban transport, air quality, and sewerage indicators suggests that cities do not necessarily see more progress as the per capita income increases. Low-income cities in Southeast Asia that are performing well are likely to see deterioration in standards with rapid economic and population growth.

## 《产业生态学报》

2007年冬, 第11卷第2期, 43-60页

题目: 动态化的城市代谢

作者: Christopher Kennedy, John Cuddihy, Joshua Engel-Yan

关键字: 全球级城市, 产业生态学, 物料流分析(MFA), 可持续城市, 城市环境, 城市代谢

**摘要:** 本文收集整理了 1965 年以来有关五大洲八大都市的代谢数据, 并与其它城市的水、物料、能量及营养物流研究作了比较, 从而深入揭示了城市代谢的变化。研究显示 1990 年代以来只有一个城市的水耗及能耗效率有了积极的变化, 多数城市的人均新鲜水、废水、能量及物料的用量日益增大。固体废物及废气排放方面则增降不一, 取决于具体的污染物类型。

研究指出了威胁城市可持续发展的关键代谢过程及问题, 如地下水位的上升、局域尺度上物料的过渡消耗、有毒物质的积累、夏季热岛效应及营养物的不规则集中等。各类资源正大量快速地流入城市, 理解城市代谢的关键在于认识这一资源集聚过程。城市代谢目前主要表现为规模的扩张, 从而引起了城市含水层水量、建筑物的物料存量、城区废热、垃圾中的营养物含量等一系列指标的变化。

城市代谢研究同样受一些现实因素的驱动。一个城市的活力取决于其与周边地域乃至全球资源网络的联系, 城市代谢的增加将导致更多耕地、森林乃至物种多样性的丧失, 造成更严重的交通拥堵与环境污染。城市决策者必须认真考虑城市周边资源的衰竭程度, 并采取一定的措施延缓衰竭。本文仅涵盖了世界范围内有限的几个城市, 研究尚有待拓展, 以达成广泛的共识。

## Journal of Industrial Ecology

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## The Changing Metabolism of Cities

Christopher Kennedy, John Cuddihy, and Joshua Engel-Yan

**KEYWORDS:**

global cities, industrial ecology, materials flow analysis (MFA), sustainable cities, urban environment, urban metabolism

**SUMMARY:**

Data from urban metabolism studies from eight metropolitan regions in five continents, conducted in various years since 1965, are assembled in consistent units and compared. Together with studies of water, materials, energy, and nutrient flows from additional cities, the comparison provides insights into the changing metabolism of cities. Most cities studied exhibit increasing per capita metabolism with respect to water, wastewater, energy, and materials, although one city showed increasing efficiency for energy and water over the 1990s. Changes in solid waste streams and air pollutant emissions are mixed.

The review also identifies metabolic processes that threaten the sustainability of cities. These include rising ground water levels, exhaustion of local materials, accumulation of toxic materials, summer heat islands, and irregular accumulation of nutrients. Beyond concerns over the sheer magnitudes of resource flows into cities, understanding of these accumulation or storage processes in the urban metabolism is critical. Growth, which is inherently part of metabolism, causes changes in water stored in urban aquifers, materials in the building stock, heat stored in the urban canopy layer, and potentially useful nutrients in urban waste dumps.

Practical reasons exist for understanding urban metabolism. The vitality of cities depends on spatial relationships with surrounding hinterlands and global resource webs. Increasing metabolism implies greater loss of farmland, forests, and species diversity; plus more traffic and more pollution. Urban policy makers should consider to what extent their nearest resources are close to exhaustion and, if necessary, appropriate strategies to slow exploitation. It is apparent from this review that metabolism data have been established for only a few cities worldwide, and interpretation issues exist due to lack of common conventions. Further urban metabolism studies are required.

## 《产业生态学报》

2007年冬, 第11卷第2期, 61-81页

**题目:** 碳管理与亚洲的城市化: 在确定城市功能、形态与职责, 制定区域发展战略时的结合碳管理

**作者:** Louis Lebel, Po Garden, Ma. Regina N. Banaticla, Rodel D. Lasco, Antonio Contreras, A. P. Mitra, Chhemendra Sharma, Hoang Tri Nguyen, Giok-Ling Ooi, Agus Sari

**关键字:** 气候变化, 互益, 全球暖化, 产业生态学, 可持续城市

**摘要:** 亚洲发展中国家过去数十年的城市化历程已为人类社会的长期可持续发展带来了深刻的启示, 目前更为重要的是如何对城市化加以有效的引导, 在不断改进社会福利的同时减缓能耗的增长。交通、建筑、采暖制冷及工业生产过程中能耗的不断上升, 大气污染的日趋严重, 造成了一系列的健康、生态与气候问题。此外, 农林牧副等行业同样导致了二氧化碳、甲烷、黑碳气溶胶等污染物存量与流量的大幅变化。本文旨在阐述如何在制定城市化与区域发展战略时有效地结合碳管理。城市形态、功能、职责等方面的改变会引起的碳排放时间、组成与分布的变化, 文章对此作了特别关注, 并指出了一些关键的联系与作用环节。在综合分析马尼拉、雅加达、胡志明市、新德里、清迈等城市的区域发展与污染排放数据的基础上, 研究发现城市形态与职责定位对具体的城市功能有着特别的影响, 而衣食住行等具体的城市功能又在很大程度上决定着一个城市的碳排放。为此, 有必要在特定的时刻对城市的政策作出大幅的调整。文章还指出了一些举世有益的城市可持续发展战略与策略。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 61-81

**Integrating Carbon Management into the Development Strategies of Urbanizing Regions in Asia: Implications of Urban Function, Form and Role**

Louis Lebel, Po Garden, Ma. Regina N. Banaticla, Rodel D. Lasco, Antonio Contreras, A. P. Mitra, Chhemendra Sharma, Hoang Tri Nguyen, Giok-Ling Ooi, and Agus Sari

**KEYWORDS:**

climate change, co-benefits, global warming, industrial ecology, sustainable cities

**SUMMARY:**

The way urbanization unfolds over the next few decades in the developing countries of Asia will have profound implications for sustainability. One of the more important opportunities is to guide urbanization along pathways that, although continuing to yield improvements in well-being, begin to uncouple these gains from rising levels of energy use. Increasing energy use for transport, construction, climate control in houses and offices, and industrial processes is often accompanied by increasing levels of atmospheric emissions that impact human health, ecosystem functions, and the climate system. Agriculture, forestry, and animal husbandry alter carbon stocks and fluxes as carbon dioxide, methane, and black carbon. In this article we explore how carbon management could be integrated into the development strategies of cities and urbanizing regions. In particular, we explore how changes in urban form, functions, and roles might alter the timing, aggregation, spatial distribution, and composition of carbon emissions. Our emphasis is on identifying system linkages and points of leverage. The study draws primarily on emission inventories and regional development histories carried out in the regions around the cities of Manila, Jakarta, Ho Chi Minh City, New Delhi, and Chiang Mai. The main finding is not only that how urban functions, such as mobility, shelter, and food, are provided has major implications for carbon emissions, but that each function is influenced by urban form and role in distinct ways. Our case studies from East and South Asia highlight the need for major redirections or "U-turns" in urban policy, as well as offering insights into strategies that have been fairly effective and may be helpful in other parts of the world.

## 《产业生态学报》

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**题目:** 服务产业的代谢: 巴塞罗那 Montjuïc 城市园区的能量影响核算

**作者:** Jordi Oliver-Solà, Montserrat Núñez, Xavier Gabarrell, Martí Boada, Joan Rieradevall

**关键字:** 能量足迹, 能源使用, 产业生态学, 综合环境评价, 可持续城市, 城市生态系统

**摘要:** 本文从产业生态学的角度对城市服务部门的能耗表现及全球环境影响进行了评价分析, 并确定了能耗最高的服务部门及其单位访客和单位面积的能耗效率。

研究所选的案例为西班牙巴塞罗那的 Montjuïc 园区——一个以服务业为主的市内小区。通过区分不同服务地段的不同消费方式, 文章计算了单位访客及单位平米的能耗, 从而确定了能效最高的机构及影响最大的服务部门。上述研究主要使用了能量流核算、生命周期分析及能量足迹等分析方法。

Montjuïc 园区服务业约 70% 的能耗为电耗。全生命周期过程的能耗极为可观, 且导致了大量的温室气体排放, 吸收这些温室气体所需的森林面积为园区占地面积的 12.2 倍。对文章所述的包含多个服务行业的园区, 综合运用各种产业生态学的分析方法, 十分有助于园区的能量管理及全球环境表现的改善。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 83-98

**Service Sector Metabolism: Accounting for Energy Impacts of the Montjuïc Urban Park in Barcelona**

Jordi Oliver-Solà, Montserrat Núñez, Xavier Gabarrell, Martí Boada, and Joan Rieradevall

**KEYWORDS:**

energy footprint, energy use, industrial ecology, integrated environmental assessment, sustainable city, urban ecosystem

**SUMMARY:**

This article focuses, from an industrial ecology (IE) perspective, on evaluating the energy performance of the services inside an urban system and on determining their global environmental impact. Additionally, this study determines which are the most energy demanding services and their efficiency of energy use per visitor and per surface area unit.

The urban system under study is the Montjuïc urban park in Barcelona, Catalonia, Spain, which can be considered a services system. In this case study we distinguished the different patterns of consumption among the service fields and, by studying each field individually, found the most efficient facilities and identified the most critical services based on energy use per visitor or per square meter. These findings are based on the use of energy flow accounting (EFA), life-cycle assessment (LCA), and the energy footprint to analyze the Park's technical energy consumption.

Electricity consumption represents nearly 70% of the total energy consumed by the services at Montjuïc Park. The forest surface area required to absorb the CO<sub>2</sub>-equivalent emissions produced by the life cycle of the energy consumed at Montjuïc Park represents 12.2 times the Park's surface area. We conclude this article by proposing the incorporation of the methods of IE within the study of parks containing multiple services to improve energy management, and as a result, to raise the global environmental performance of the service sector.

## 《产业生态学报》

2007 年冬, 第 11 卷第 2 期, 99-116 页

**题目:** 中国新城市建设的资源消耗**作者:** John E. Fernández**关键字:** 建筑类型, 循环经济, 经济增长, 产业生态学, 物流强度, 可持续城市

**摘要:** 中国城市新建的建筑面积已占全世界的一半, 如此巨大的建设规模史无前例。这一城市建设快速扩张与国民经济高速增长浪潮有望持续到 2030 年。大量的农业与轻工用地不断转变为高密度的商业区与居民区, 在不断消耗本土与进口资源的同时, 也不可逆转地改变了中国的地貌。本文分析了三种不同建筑的建材密度, 并研究了中国房屋建筑业的物质资源消费问题, 为研究建筑环境、开展持续建设的生命周期评价打下了基础。研究的成果有助于从产业生态的角度制定中国的循环经济政策, 提高城市发展的资源效率。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 99-116

**Resource Consumption of New Urban Construction in China**

John E. Fernández

**KEYWORDS:**

building type, circular economy, economic growth, industrial ecology, material intensity, sustainable cities

**SUMMARY:**

The volume of China's recent additions to its urban-built environment is unprecedented. China now accounts for half of all new building area in the world. Increases in building stocks of all types have occurred during an extended period of accelerating growth of the national economy. This expansion promises to continue through 2030. As a result, the rapid conversion of land from low-density agricultural and light-manufacturing to new urban zones of high density and material intensive commercial and residential buildings has consumed enormous quantities of domestic and imported resources and irreversibly altered the Chinese landscape. This article examines the consumption of material resources dedicated to Chinese building construction through a survey and analysis of the material intensity of three major building types. This provides a basis for outlining the emerging life-cycle issues of recent additions to the built environment and continued construction. The field of industrial ecology can then assist in formulating strategies for a circular economy that includes a resource-efficient urban China.

## 《产业生态学报》

2007 年冬, 第 11 卷第 2 期, 117-132 页

题目: 新加坡发展史上的直接物料投入

作者: Niels B. Schulz

**关键字:** 国内物料消耗 (DMC), 全球化, 产业生态学, 物流分析 (MFA), 贸易, 城市化

**摘要:** 随着人口与社会经济活动向城市的不断集中, 有必要对城市化过程的环境影响进行深入的理解。本文以新加坡这一快速的出口导向型的工业化城市为例, 分析了其 41 年来的直接物流变化情况, 发现在新加坡经济规模扩张 20 倍的同时, 国内物料消耗 (DMC) 也保持了相应的增长, 从 1962 年的每年人均 4 吨以下增至 2000 年的人均 50 吨以上。尽管新加坡的经济结构发生了很大变化, 服务业不断扩张, 但物流效率的改善并不明显。

## Journal of Industrial Ecology

2007, Vol. 11, Issue 2, pp. 117-132

The Direct Material Inputs into Singapore's Development

Niels B. Schulz

**KEYWORDS:**

domestic material consumption (DMC), globalization, industrial ecology, materials flow analysis (MFA), trade, urbanization

**SUMMARY:**

Because human population and socioeconomic activity are both increasingly concentrated in cities, an improved understanding of the environmental consequences of urbanization is needed. A 41-year annual time series of direct material flows was compiled for Singapore, representing a case of fast, export-driven industrialization. Results show that the spectacular economic growth of Singapore by a factor of 20 was associated with a similar expansion of domestic material consumption (DMC). DMC remained closely coupled to economic activity, increasing from below 4 tonnes per capita annually in 1962 to more than 50 tonnes annually in 2000. Despite economic structural changes and a growing service sector, no significant improvements in material productivity have been observed.



## 《产业生态学报》

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**题目:** 多伦多人口普查区居民温室气体排放的空间分布分析**作者:** Jared R. VandeWeghe, Christopher Kennedy**关键字:** 建筑能耗, 产业生态学, 可持续城市, 交通, 城市生态系统, 城市代谢**摘要:** 本文研究了多伦多人口普查区居民温室气体排放的空间分布情况, 确定了城市形态对排放活动的影响。研究发现在全区尺度上, 私人汽车所导致的温室气体排放与采用燃料取暖的住宅的排放相当; 但在交通密集的核心区之外, 私人交通的排放要超过住宅的排放。不同普查区域的包括汽车与住宅排放在内的总排放量相差很大, 其二氧化碳当量为人均每年 3.1 到 13.1 吨。温室气体排放强度最大的十个普查区域都位于市郊, 这主要源于私人汽车的高使用率。

## Journal of Industrial Ecology

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**A Spatial Analysis of Residential Greenhouse Gas Emissions in the Toronto Census Metropolitan Area**

Jared R. VandeWeghe and Christopher Kennedy

**KEYWORDS:**

building energy use, industrial ecology, sustainable cities, transportation, urban ecosystems, urban metabolism

**SUMMARY:**

Residential greenhouse gas (GHG) emissions in the Toronto Census Metropolitan Area are spatially analyzed to determine the impact of urban form on emission-causing activities. The key finding is that over the entire region, emissions from private auto use are on par with those from fuel use for building heating. Once beyond the transit-intensive central core, private auto emissions surpass the emissions from building operations. Variation in total auto- and building-related emissions is quite significant between census tracts, ranging from 3.1 to 13.1 tonnes of carbon dioxide equivalents per year. Of all tracts, the top ten in terms of GHG emission are located in the lower-density suburbs, and their high emissions were largely due to private auto use.