Archive of the Population-Environment Research Network (PERN) Cyberseminar Discussions on Urban Expansion: The Environmental and Health Dimensions[1] 29 November-15 December 2004

To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Welcome Message
Sender: owner-pern@listhost.ciesin.org
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Reply-To: pernseminars@ciesin.columbia.edu

"Nowhere are the opportunities more promising or challenges to sustainability more daunting than in the rapidly urbanizing regions of the world."

- Redman & Jones, cyberseminar background paper

Dear Colleagues,

Welcome to this, the eighth of PERN's cyberseminars on important population-environment research topics. From now until December 15 we will be discussing the environmental and health dimensions of urban demographic and spatial expansion. The seminar will seek to increase understanding of how expansion processes in developing and developed countries are similar and how they differ, with an emphasis on the different underlying contexts (e.g. differences in policy, demographic behavior, socioeconomic conditions, transportation systems, and markets) as well as the environmental and health outcomes. To the extent possible, we'd like to keep the discussion focused on the expansion aspects, but we recognize that discussion will inevitably touch on broader urban environmental and health issues such urban air and water pollution, solid waste disposal, and the "footprint" of urban areas with or without reference to spatial expansion.

A starting point for our discussion can be found in Charles Redman's and Nancy Jones' excellent background paper. In it they list five key research domains that will guide our discussions. It is not required reading for the seminar, but highly recommended. To obtain the paper (PDF 108 KB), please download it from the Cyberseminars page http://www.populationenvironmentresearch.org/seminars.jsp or send a message to pernadmin@ciesin.columbia.edu and we'll send it to you via email.

This dialogue will help to shape the urban research agendas of PERN's two scientific sponsors – the International Union for the Scientific

[1] See http://www.populationenvironmentresearch.org/seminars.jsp

Study of Population (IUSSP) and the International Human Dimensions Programme on Global Environmental Change (IHDP). To that end, we are grateful to have expert contributions from the coordinators of their respective research teams: Mark Montgomery of the IUSSP Scientific Panel on Urbanization and Roberto Sanchez-Rodriguez of the IHDP Urbanization Science Project. In addition, I would like to thank several other experts who have agreed to make contributions to the seminar. These include Deborah Balk (CIESIN), Tony Champion (Newcastle U.), Alonso Aguire and Mary Pearl (Wildlife Trust International), John Hasse (Rowan State U.), Elena Irwin (Ohio State U.), Shuaib Lwasa (Makerere U.), Gordon McGranahan and David Satterthwaite (IIED), Roberto Luís Monte-Mór (U. of Minas Gerais), Eduardo Moreno (UN HABITAT), Kwasi Nsiah-Gyabaah (Sunyani Polytechnic), Diane Pataki (U. of Utah), Sureeporn Punpuing (Mahidol U.), John Weeks (San Diego State U.), and Hanqiu Xu (Fuzhou U.).

For those who are new to PERN cyberseminars, we ask that you review the standards of conduct at the bottom of the Cyberseminars page of the PERN website. Note that attachments are not permitted on this discussion list, but if you have a document you would like to share you may send it to us at the email address below and we will ensure that it is sent to all participants.

Hispano parlantes: La discusión es en ingles; pero puede enviar sus contribuciones de 4 párrafos o menos a la email abajo y lo traduciremos. Por favor, ponga su nombre y titulo.

Francophones: La discussion est en anglais, mais vous pouvez envoyer votre contribution de 4 paragraphes ou moins a la adresse électronique en bas et nous allons faire une traduction. Mettez votre nom et titre, svp.

We encourage you to participate actively, and look forward to a lively discussion!

Sincerely,
Alex de Sherbinin
PERN Coordinator
E-mail: pernadmin@populationenvironmentresearch.org

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To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] posting by Mr. George Martine
Sender: owner-pern@listhost.ciesin.org
Reply-To: pernseminars@ciesin.columbia.edu

(Message posting by Mr. George Martine)

First, effusive congratulations to PERN are in order for having selected what I personally consider to be THE main population/environment issue of the 21st century, namely unprecedented urban expansion. All the city growth that has occurred in human history to this day stands to be duplicated in little more than a generation. That, in itself, is mind-boggling. However, the fact that cities are already the locus of major environmental issues, as well as the site of future demographic growth and development efforts, makes the manner of their extraordinary expansion a critical challenge for the future of mankind. Hence - great choice of subject matter!

That being said, as somebody concerned with the enormous policy challenges of this transformation, I can´t help but lament the wide-ranging nature of the proposed debate. The background paper chose to open up the entire spectrum of urban-related issues, for both developed and developing countries. It did not purport to establish priorities nor to focus on issues that need the most urgent policy attention. This will inevitably lead to a far-ranging discussion. I realize that the PERN debate is primarily academic, and we academicians don´t like unlit corners. Nevertheless, the doubling of the urban population will occur almost exclusively in developing countries, where the course of developmental and environmental challenges is still uncharted; this would seem to make those regions and those problems a burning priority.

The environmental implications of the current urban transformation are staggering yet, unfortunately, the world has not taken due note of it. The time and opportunity to act would be now. Cities are already the locus of the critical environmental problems generated by the production and consumption patterns of modern civilization. Doubling the size of all previous urban growth in little more than a generation, and in the context of reduced resources in developing countries, could have disastrous consequences, especially if the mistakes of the past are repeated.

For instance, if current urban land-population ratios are maintained, twice the Earth's land area will be occupied by cities in 35 years, thereby encroaching significantly on the most ecologically fragile areas as well as on prime agricultural land. More generally, a

number of related urban management issues in these growing cities will all have an enormous impact on long-term sustainability. These include: geographic location of urban growth, settlement patterns of the growing urban population, type of land occupied, income, type of housing, occupational composition, density/sprawl of settlement, organization of transport, use of energy, waste disposal, situation of the city with respect to climate, topography, natural boundaries, water supply, effluents, wind currents, etc. In short, where and how cities grow in developing countries will determine our environmental future.

These issues have not been given nearly the amount of attention that they deserve in the international development agenda. The current PERN discussion will unquestionably stimulate important advances and interchanges on many subjects, including those mentioned here. My regret is that, because of its ambitious scope, it may not realize its full potential for awareness-creation and advocacy regarding the urgent need to take effective policy stands with respect to critical aspects of inevitable urban growth.

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From: Kai Lee <Kai.N.Lee@williams.edu>
Subject: [PERNSeminar_UrbanExpansion] an unlit corner
To: pernseminars@ciesin.columbia.edu

All,

I agree with Martine's call to focus on urban expansion in poor countries, but I shall not follow his desire to narrow our focus, I'm afraid, in this posting. Martine declares, "where and how our cities grow in developing countries will determine our environmental future." I agree (with the caveat that climate change and its wide-ranging consequences may have an even larger determinative effect).

A central issue, to me, is the informal economy of poor countries, especially urban informal economies. I have so far found little on this subject but I am influenced by the ardent prose of Mike Davis. (Davis, Mike 2004. Planet of Slums. Urban involution and the informal proletariat. New Left Review 26 (March-April) 5-34. Available, http://www.newleftreview.net/NLR26001.shtml, visited 6/04.)

Davis makes the point that urban expansion is occurring in places with economic growth rates far below their urbanization rates — i.e., that per capita economic product is _declining_ in these areas. While there can be little doubt of the economic significance of this phenomenon, it is also the case that official statistics underestimate levels of activity in the informal economy. That is where I have found little that looks helpful. So I am writing to ask participants for references and estimates that, while rough, provide an idea of how much income might be in these undocumented flows.

This phenomenon is significant for environmental conditions because people who are so poor cannot afford to pay taxes and they avoid doing so. This makes it hard to finance, build, and maintain water pipes, sewers, and public health assistance. Even with large donor infusions, it is hard for me to see how to create a sustainable situation.

I hope this is an over-pessimistic reading. So I ask to be enlightened.

Kai Lee

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Subject: RE: [PERNSeminar_UrbanExpansion] an unlit corner
Date: Mon, 29 Nov 2004 14:26:53 -0500
From: "MONTGOMERY, MARK" <MMONTGOMERY@popcouncil.org>
To: <pernseminars@ciesin.columbia.edu>

I would also agree in general with Martine's warning that our discussion should not become diffuse. In my own experience with such conversations, however, it has turned out to be useful to involve both poor country and rich country researchers and perspectives. Our literatures are still surprisingly compartmentalized, and it is remarkable how often one finds methodological tools (and even conceptual tools) being vigorously applied in one setting but hardly examined at all in the other. One example: the rapidly expanding empirical literature on household poverty, neighborhood effects (e.g., local poverty, local inequality, social capital) and health in the cities of the U.S. and

Europe (involving a host of tools from social epidemiology), which has no real counterpart in the urban literature for poor countries. In cases such as this, there is a lot to be gleaned from a broad conversation.

Kai Lee asks about studies of the contribution of the informal sector. In Chapter 8 of our 2003 National Research Council volume, Cities Transformed, we cited a paper by J.-M. Cour (1994) titled "West Africa Long Term Perspective Study" carried out for the African Development Bank that attempted to construct GDP estimates incorporating the informal sector. (I believe it was a national-level study, not specifically urban.) Alain Dubresson would know more of the details here. There is also an enlightening literature on sustainability, with a focus on how the urban poor in low-income countries can mobilize their social and economic resources to put community services such as solid waste collection into place---the journal Environment and Urbanization has numerous excellent case studies on this theme, as I'm sure David Satterthwaite will mention during our discussion.

Mark Montgomery

Date: Mon, 29 Nov 2004 14:18:45 -0500
From: "Susana B. Adamo" <sbadamo@email.unc.edu>
To: pernseminars@ciesin.columbia.edu
Subject: Re: [PERNSeminar_UrbanExpansion] an unlit corner
Sender: owner-pern@listhost.ciesin.org

Hi Kai Lee,
I agree with you that the issues of poverty and social vulnerability are key when considering urban environments, particularly in those cases in which the expansion of cities consist mostly of shantytowns ('villas miserias'). However, urban informal economies have many faces, and not all are so closely related to extreme poverty as it may seems, at least in the case of Latin America, which I know better.
There a number of sources about the topic of informal economies. About Latin America (and from the top of my head), you can check the ECLAC website (http://www.eclac.org) and also http://www.prc.utexas.edu/urbancenter/working_papers.htm (sesion 4).
I hope this helps,
Susana Adamo

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Date: Mon, 29 Nov 2004 15:00:39 -0500
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Urbanization Processes - Environmental and Health Effects in Africa

Urbanization Processes - Environmental and Health effects in Africa

Panel contribution by Kwasi Nsiah-Gyabaah, PERN Steering Committee member and Principal, Sunyani Polytechnic, Sunyani, BA, Ghana, E-mail: spolytec @yahoo.com

PERN Coordinator's note: The seminar began with an early posting by George Martine pleading for urgent attention to urban expansion in developing countries where the majority of urban growth will take place. This statement by Kwasi Nsiah-Gyabaah addresses the situation in Africa, and makes some excellent points with regards to the horizontal (as opposed to vertical) growth of African cities, the development of market agriculture in areas surrounding cities, and the need for rural development to stem unchecked urban growth. He also makes some valuable points concerning the health and sanitation aspects of peri-urban squatter settlements, touching not only on physical health impacts in terms of disease transmission but also the psychological pressures of crowding.

Introduction

Urbanization is increasing in both the developed and developing countries. However, rapid urbanization, particularly the growth of large cities, and the associated problems of unemployment, poverty, inadequate health, poor sanitation, urban slums and environmental degradation pose a formidable challenge in many developing countries. Available statistics show that more than half of the world's 6.6 billion people live in urban areas, crowded into 3 percent of the earth's land area (Angotti, 1993; UNFPA, 1993). The proportion of the world's population living in urban areas, which was less than 5 percent in 1800 increased to 47 percent in 2000 and is expected to reach 65 percent in 2030

(United Nations, 1990; 1991). However, more than 90 percent of future population growth will be concentrated in cities in developing countries and a large percentage of this population will be poor. In Africa and Asia where urbanization is still considerably lower (40 percent), both are expected to be 54 percent urban by 2025 (UN 1995; 2002).

Although urbanization is the driving force for modernization, economic growth and development, there is increasing concern about the effects of expanding cities, principally on human health, livelihoods and the environment. The implications of rapid urbanization and demographic trends for employment, food security, water supply, shelter and sanitation, especially the disposal of wastes (solid and liquid) that the cities produce are staggering (UNCED, 1992). The question that arises is whether the current trend in urban growth is sustainable considering the accompanying urban challenges such as unemployment, slum development, poverty and environmental degradation, especially in the developing countries.

Urbanization defined

Urbanization, simply defined, is the shift from a rural to an urban society, and involves an increase in the number of people in urban areas during a particular year. Urbanization is the outcome of social, economic and political developments that lead to urban concentration and growth of large cities, changes in land use and transformation from rural to metropolitan pattern of organization and governance.

Major causes of urbanization in Africa

Natural population increase (high births than death) and migration are significant factors in the growth of cities in the developing countries. The natural increase is fuelled by improved medical care, better sanitation and improved food supplies, which reduce death rates and cause populations to grow. In many developing countries, it is rural poverty that drives people from the rural areas into the city in search of employment, food, shelter and education. In Africa, most people move into the urban areas because they are 'pushed' out by factors such as poverty, environmental degradation, religious strife, political persecution, food insecurity and lack of basic infrastructure and services in the rural areas or because they are 'pulled' into the urban areas by the advantages and opportunities of the city including education, electricity, water etc. Even though in many African countries the urban areas offer few jobs for the youth, they are often attracted there by the amenities of urban life (Tarver, 1996).

Processes of urbanization

One significant feature of the urbanization process in Africa is that, unlike Asia and Europe, much of the growth is taking place in the absence of significant industrial expansion. Although, Africa is fast urbanizing, mega-cities defined as cities with 10 million inhabitants or more are few. Urbanization also finds expression principally in outward expansion of the built-up area and conversion of prime agricultural lands into residential and industrial uses. An alternative to the present expansion of the urban population across a wide area of the country in order to save prime land for agriculture is to construct high-rise buildings and promote commercial development in specific zones, which would depend on effective, appropriate technology and resources.

The urbanization processes are largely driven by market forces and government policies that lead to simultaneous processes of change in livelihoods, land use, health and natural resources management including water, soil and forests and often reactive changes in local governance. Government development policies and budget allocations, which often favour urban residents over rural areas, tend to pull people into the urban areas. In the cities, public investment, which often misses the urban poor, with expenditures biased towards the higher-income classes and poverty among vulnerable groups such as new migrants force them into slums and squatter settlements.

The market forces result in a series of changes in employment, urban agriculture and peri-urban production systems. Ready market leads to an increase in production of horticultural crops and perishables such as vegetables given the high demand and proximity to urban consumers. These factors therefore, act as a great centripetal force in favour of urbanization.

Current urban challenges

In Africa, the dramatic effects of rapid urbanization are very clear in the cities and peri-urban areas. As the cities expand, the main zone of direct impact is the peri-urban area, and those living in the peri-urban interface face many new challenges and opportunities in meeting their needs and accommodating the by-products of the urban populations. Although, cities serve as 'engines' of growth in most developing countries by providing opportunities for employment, education, knowledge and technology transfer and ready markets for industrial and agricultural products, high urban populations place enormous stress on natural resources and imposes 'ecological footprints' on the peri-urban areas (Rees, 1992; Rees and Wackernagel, 1994). For example,

urbanization leads to the outward expansion of cities and results in changes in land use whereby urban residents buy up prime agricultural land for residential or commercial purposes. The conversion of farm lands and watersheds for residential purposes have negative consequences on food security, water supply as well as the health of the people, both in the cities and in the peri-urban areas.

Cities impact on health in many ways. In the areas of the environment and health, problems of emission reduction, supply of clean drinking water, sewage and rubbish disposal, food security and poverty reduction are the most important. Vulnerability of the urban population to natural disasters and diseases, especially HIV/AIDS and atmospheric pollution has also been recognized. Although, data about pollution levels are fragmentary, the air and water quality in many cities threatens the health of millions of city residents (UNEP, 1994). Although, a significant positive impact of urbanization is promotion of urban agriculture and the cultivation of staple crops, vegetables, poultry and dairying, which are demanded by urban consumers, cultivation of vegetables through sewage irrigation and the use of chemical pesticides affect the health of consumers who are not notified of the circumstances of cultivation of these products.

A large proportion of the urban population is also affected by poor sanitation that threatens their health. River pollution is particularly found to be worse where rivers pass through cities and the most widespread is contamination from human excreta, sewage and oxygen loss (UNEP 986). It is estimated that about 400 million people or about one-third of the population in the developing countries do not have safe drinking water (World Bank, 1990). In many cities such as Kumasi (Ghana) and Lagos (Nigeria), there is limited access to clean drinking water. The quality of several watercourses is poor, with pollutant levels higher than the WHO's standards. Pesticide contamination from urban agriculture, residues from sawmills and manufacturing industries, wastewater from urban drains and municipal dumping of waste especially human excreta pollute drinking water sources that affect the health of the urban and peri-urban populations. In the long-term, treatment of sewage would be required for safer vegetable production and to reduce water pollution.

Urban populations are also vulnerable to diseases such as malaria or those associated with air pollution. Other malfunctions that are associated with industrial and traffic injuries and psychological disorders, especially in low-income urban and peri-urban area are also disturbing. The unhealthy environment and overcrowded housing in the slums expose the urban poor to high rates of infectious diseases such as pneumonia, tuberculosis and diarrhoea. Although it is clear that cities

in the developing countries act as nodes through which development occur, it is important to note that rapid urbanization poses particular risks that affect sustainable livelihoods of millions of people. The wide range of effects includes degradation of the environment (soil erosion, deforestation), destruction of watersheds and wetlands, traffic congestion, contamination/pollution of water, and environmental risks associated with low-income housing areas.

Conclusion

Around the world, especially in Africa and Asia, cities are expanding rapidly. For the majority of urban dwellers, especially the poor, finding potable water supply, affordable shelter, accessible and secure urban land for agriculture to ensure food security, securing gainful employment and improvement in health facilities would continue to remain a priority. Since restrictive urban growth policies, especially population distribution designed to reduce the rate of rural-urban migration appear to have had limited success in many developing countries, policies must be directed at transforming the rural economy in order to slow the rate of urban sprawl. Comprehensive land use planning and revision of planning standards and administrative procedures would, go a long way to, reduce many of the problems that face urban populations in the developing areas, especially Africa.

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Date: Mon, 29 Nov 2004 15:32:56 -0500
From: Kai Lee <Kai.N.Lee@williams.edu>
Subject: [PERNSeminar_UrbanExpansion] a corner being illuminated

Thanks, Dr. Adamo: I take your point. The gradual regularization of communities founded via invasion is something I have seen in Colombia and Mexico.

My question really had to do with situations in which urbanization is proceeding rapidly _without_ proportional economic growth over decadal time scales. I am not sure, but I think that hasn't happened in Latin America.

Meanwhile, thanks to Mark Montgomery for the pointer to Environment and Urbanization. A quick browse turns up cases that look promising.

Cheers,
Kai

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On Nov 29, 2004, at 2:18 PM, Susana B. Adamo wrote:

> urban informal economies have many faces, and not
> all are so closely related to extreme poverty as it may seems, at least
> in the case of Latin America

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From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: FW: [PERNSeminar_UrbanExpansion] Urbanization Processes - Environ mental and Health Effects in Africa
Date: Mon, 29 Nov 2004 16:12:53 -0500

Kwasi Nsiah-Gyabaah asks" "whether the current trend in urban growth is Sustainable considering the accompanying urban challenges such as unemployment, slum development, poverty and environmental degradation, especially in the developing countries."

The "natural [population]increase [that]is fuelled by improved medical care, Better sanitation and improved food supplies, which reduce death rates and cause populations to grow" is seen to be a significant factor "in the growth of cities in the developing countries".

Given that "improved medical care","better sanitation", and "improved food supplies" are a direct result of humanity's access to vast amounts of cheap and abundant non renewable geological energy (coal, oil, gas and nuclear fission)-- those people predicting that "the world's population, living in urban areas ..... is expected to reach 65 percent in 2030" may not have noticed that non renewable geological energy sources are entering a decline toward ECONOMIC exhaustion.

This decline in energy availability will test predictions about population numbers and behaviour that are based on extrapolation of current trends, established in the recent two centuries during which there has been unprecedented access to unsustainable supplies of non solar energy.

Peter Salonius

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From: "David Pepper" <drpepper@ucsfresno.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] an unlit corner
Date: Mon, 29 Nov 2004 13:17:19 -0800

Fresno California has both American and Third world problems - with the urban sprawl encroaching on farm land, and Hwy 99 through town with the highest diesel turck traffic in the Country. The city has sprawled North and white flight has followed. Things have gone "out" not up, as economics of cheap land dictate. Our unemployment approaches 20% - more in keeping again with the third world. Ethnically we are 45% latino, 35% white, 10% Black and 10% Asian.

Perhaps surprisingly, our "north end' (eg the moneyed folks) have higher asthma rates than the poor folks - raising the etiology issues, and the links to pesticides (seen North of town mostly) as a possible source (not the lack of cockroaches).

Are there other US models of such incursion of urban centers into farmland? What can we learn (and apply) here that could help the rest of the world?

David Pepper MD MS
UCSF-Fresno

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From: David Satterthwaite <David.Satterthwaite@iied.org>
To: "'Kai Lee '" <Kai.N.Lee@williams.edu>,
"'pernseminars@ciesin.columbia.edu '" <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] a corner being illuminated
Date: Mon, 29 Nov 2004 21:54:13 -0000

A comment from David Satterthwaite (International Institute for Environment and Development) on is urbanization proceeding without proportional economic growth?

There are various papers that have claimed that sub-Saharan Africa is unusual in that it urbanized rapidly without economic growth (especially

during the 1990s) but these are not based on census data for 2000 but on UN projections made before census data became available. There are still various sub-Saharan African nations for which no census data are available in the last fifteen years so we really do not know how much their level of urbanization increased. Various African scholars (Deborah Bryceson, Debbie Potts for instance) suggest that increases in urbanization levels are likely to have slowed or even in some instances stopped - and have some data that support this. The latest UN Population Division dataset on urban populations (the 2003 revision) also shows many sub-Saharan African nations less urbanized in 2000 than had previously been thought. I suspect that changes in urbanization levels are now more closely tied to economic performance than in the 1950s-1970s in Asia and Africa. The break up of colonial empires, setting up the institutions of independent nation states and, in many former colonies, the removal of apartheid like controls on population movements all meant that political change had a major influence on urbanization levels. I doubt whether this is so any more.

I also did an analysis on the distribution of the world's largest cities in the world's largest economies - and not surprisingly a high proportion of the world's 387 largest cities are clustered in the largest economies. (This paper is in draft, I am happy for forward copies to anyone who is interested).

Best wishes

David Satterthwaite

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Date: Mon, 29 Nov 2004 15:02:00 -0800 (PST)
From: spolytec sunyani <spolytec@yahoo.com>
Subject: RE: [PERNSeminar_UrbanExpansion] a corner being illuminated
To: David@iied.org, pernseminars@ciesin.columbia.edu

David

I would like to read your research paper on the world's largest cities in the world's largest economies.Please, send me a copy when the paper is finalised.

You will undoubtedly agree with me that in spite of the paucity of census data, the population in Sub-Saharan African (SSA) is increasing rapidly as a result of improvements in medical care and sanitation, high birth rate, reduced mortality rate and rural-urban migration. Although the world's largest economies such as the USA and the UK have far larger cities and a higher urbanization level compared to SSA, the majority of the people who live in the rural areas in SSA are moving to the urban areas for several reasons. In the world's largest economies, the movement is from Urban to rural areas to avoid urban pollution and psychological stress in urban areas. Moreover, there are fewer rural settlements and the population in the rural areas in the world's largest economies is small.

Given the high level of poverty, the range and magnitude of the socio-economic, political, religious and environmental facing many countries in SSA, as well as the overall capacity of the people and their governments to adapt to the impacts of rapid urbanization, there is uncertainty about what the future holds under current growth trends. Except in the war ravaged countries such as Angola, Congo, Rwanda, Burundi, Sierraleone, Liberia etc, where the devastating effects of war may have slowed down or

stopped the urbanization process, the same cannot be said about countries such as Ghana, Nigeria, South Africa which have stable political systems.
Thank you
Kwasi Nsiah-Gyabaah

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Urbanization Processes - Environmental and Health Effects in Africa
Date: Mon, 29 Nov 2004 18:45:16 -0500

Hello,

I do not think that exhaustion of energy resources is going to directly threaten urban growth in any part of the world. Perhaps surprisingly, non-renewable resources are quite abundant and can be expected to remain abundant even in an increasingly affluent world.

However, the world relies heavily on conventional sources of oil, and these are reaching their half-way point. The half-way point is likely to be reached in the next couple of decades. Those who are convinced by the "Hubbert's Peak" hypothesis expect that the half-way point (the peak) marks the transition between easy availability and scarcity. If this holds, we can expect to see prices become significantly more volatile within the next few decades. Whether this is what is driving the current rise in oil prices remains to be seen. (Certainly other, more short-term, factors are making a contribution.)

Also, countering the trend towards rising consumption levels is the possibility of more efficient ways of meeting that consumption -- the "T" in the classic IPAT equation.

I find the "GDP/Urban population" indicator to be a very interesting one -- it neatly summarizes the potential for countries to match infrastructure expansion against urban population growth. The observation by David Satterthwaite that in Africa, at least, these may not actually be much out of alignment is a very interesting one, as it contradicts what I have believed to be the case. Perhaps the GDP/UrbanPop indicator could be combined with an "environmental impact index", calculated using a

straightforward IPAT equation, just to see how the relationship between GDP growth, urban expansion and environmental pressures plays out in a very simple, IPAT-like analysis.

For those who are interested, I have made a small program that lets you explore these issues. It's in the IPAT-S scenario scripting language. I'm attaching the script to this e-mail. To run it, use the (free and open source) program IPAT SN (an interactive script browser) or IPAT Studio (a full-fledged script editing program). Both are available from: http://ipat-s.kb-creative.net/

Eric

_____
Eric Kemp-Benedict, Ph.D.
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Content-Type: application/octet-stream;
name="UrbanIPAT.ips"
Content-Transfer-Encoding: quoted-printable
Content-Disposition: attachment;
filename="UrbanIPAT.ips"

```
base year 2000
scenario years 2005 to 2025 by 5

ratio GDP pop T C
var Urb I Resources

# Get user input
GDP =3D gr(<3.0>/100) #SPINNER -group "National Trends" -labelanchor e =
-labelwidth 30 -min -5.0 -max 10.0 -increment 0.5 -width 5 -labeltext =
"GDP growth (%/yr)"
pop =3D gr(<2.0>/100) #SPINNER -group "National Trends" -labelanchor e =
-labelwidth 30 -min -1.0 -max 10.0 -increment 0.5 -width 5 -labeltext =
"Population growth (%/yr)"

Urb.by =3D <30>/100 #SPINNER -group "Urbanization" -labelanchor e =
-labelwidth 30 -min 0 -max 100 -increment 1 -width 4 -labeltext =
"Urbanization in 2000 (%)"
Urb.fin =3D <50>/100 #SPINNER -group "Urbanization" -labelanchor e =
-labelwidth 30 -min 0 -max 100 -increment 1 -width 4 -labeltext =
"Urbanization in 2025 (%)"
```

C =3D gr(<0.5>/100) #SPINNER -group "Impact" -labelanchor e -labelwidth =
30 -min -10.0 -max 10.0 -increment 0.5 -width 5 -labeltext "Consumption =
as %GDP (% growth/yr)"
T =3D gr(<7.0>/100) #SPINNER -group "Impact" -labelanchor e -labelwidth =
30 -min -5.0 -max 10.0 -increment 0.5 -width 5 -labeltext "Efficiency (% =
improvement/yr)"

Linearly interpolate between base year and final year urbanization =
values
:: Urb.by + (Urb.fin - Urb.by) * (y - y.by)/(y.fin - y.by) -> Urb

# Calculate main indicators
Resources.0 =3D 100
I.0 =3D 100

:: >> GDP / (pop * Urb) -> Resources
:: >> GDP * pop * Urb * C / T -> I

report Resources as "GDP/Urban population (2000 =3D 100)"
report I as "Environmental impact (2000 =3D 100)"

------=_NextPart_000_00CF_01C4D643.9157F4B0--

Date: Tue, 30 Nov 2004 00:31:38 -0800 (PST)
From: Landis MacKellar <landismac@yahoo.com>
Subject: Re: [PERNSeminar_UrbanExpansion] an unlit corner
To: pernseminars@ciesin.columbia.edu

Dear PERN seminar,

Two points:

First, there is an enormous development economics
literature on the urban informal sector, going back to
Michael Todaro's migation work at least, which was
motivated by how to explain rapid rural-urban
migration even when unemployment was high and living
conditions low in the city.

Much as I respect New Left Review and its erudite editor Tariq Ali (whose latest book "Fundamentalisms" I can recommend as a tour de force), there is no need to go so far afield to find material. There are plenty of World Bank and ILO reports (although probably not nearly as incisive as the cited piece, I grant you). A recent World Bank World Development Report focused on infrastructure for the poor. ILO work on the informal labour market goes bavk to the seventies.

Second, urbanisation is, in theory, driven by efficiencies, in particular economies of scale and agglomeration economies. I admit it is hard to remember the economic basis for urbanisation when you are stuck in a traffic jam in Manila (where international experts are now advised to make no more than one appointment in the morning and one in the afternoon). And there is some evidence from Mexico and Thailand that environmental externalities (particularly those mediated through health) have become so negative that population is starting to leave primate cities. But where urban growth continues to outpace national growth, particularly through migration, I have to assume that there's some economic basis for the underlying re-distribution of resources, especially labour.

Best,
Landis (Hanoi)

****

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'" <pernseminars@ciesin.columbia.edu>
Cc: "'eric@kb-creative.net'" <eric@kb-creative.net>
Subject: RE: [PERNSeminar_UrbanExpansion] Urbanization Processes - Environmental and Health Effects in Africa
Date: Tue, 30 Nov 2004 08:18:51 -0500

It is astouding that Kemp-Benedict appears to understand the coming transition between "easy availability and scarcity" of the major energy supply on the planet --------- BUT at the same time he states that "non-renewable resources are quite abundant and can be expected to remain abundant even in an increasingly affluent world."

It is impossible to have 'energy abundance' and 'energy scarcity' at the same time.

As concerns Kemp-Benedict's apparent assumption of "an increasingly affluent world" in the future, the connection between the increasing 'affluence' trend during the last 200 years(which Kemp-Benedict appears to extrapolate into the future) and access to cheap and abundant /but exhaustible/ geological energy deposits, has not been understood.

Albert Bartlett has said that "MODERN AGRICULTURE IS A METHOD OF USING LAND
TO CONVERT PETROLEUM INTO FOOD". As future food production (shared by more
than 6 billion people)returns toward production levels(that supported ONLY 1 billion people)based on solar energy in 1800 -- then global population numbers will shrink, either by planning or by the imposition of the limits associated with energy availability.

If global population numbers must decrease in the face of a return to the energy availability (SOLAR) of 1800 then "exhaustion of energy resources is going to directly threaten urban growth" which is driven in large measure by rural population growth.

Humanity and the academics who are participating in this discussion, have not come to grips with the concepts of the LIMITS TO GROWTH and THE FINITE CARRYING CAPACITY OF THE EARTH.

Peter Salonius
Natural Resources Canada
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Canada

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****

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
"'landismac@yahoo.com'"
Subject: RE: [PERNSeminar_UrbanExpansion] an unlit corner
Date: Tue, 30 Nov 2004 08:45:42 -0500

Landis MacKellar suggests that "urbanisation is, in theory, driven by efficiencies, in particular economies of scale and agglomeration economies".

It is clear that the "efficiences", "economies of scale" and "agglomeration", that allow rural populations to be drawn to urban areas, are ONLY possible in the context of the TEMPORARY access to cheap and abundant non renewable energy subsidies from geological exhaustible deposits.

As access, to cheap and abundant non renewable energy subsidies from geological exhaustible deposits, dwindles when expanding demand (driven by continuing population growth and mindless expansion of energy demanding global trade) meets decreasing production from finite deposits -- then the increasing "efficiences", "economies of scale" and "agglomeration", to which we have become accustomed during the short 'Petroleum Interval' will wither.

As "efficiences", "economies of scale" and "agglomeration" wither, so must the trajectory of increasing urbanization that was fuelled by the historically unprecedented access to exogenous energy deposits during the last two centuries.

It is time to begin to contemplate what will happen to the "traffic jam[s] in Manila" or anywhere else on Earth as we confront the reality that the non renewable energy 'party' must end, forcing humanity back to the [SOLAR] energy availability of the enirety of human history (before 1800).

Peter Salonius
Natural Resources Canada
Fredericton, NB

(506) 452-3548

From: "Swaib Lwasa" <lwasa_s@arts.mak.ac.ug>
To: pernseminars@ciesin.columbia.edu
Subject: [PERNSeminar_UrbanExpansion] Re: a corner being illuminated
Date: Tue, 30 Nov 2004 19:41:47 +0300

David

Thanks for the comment on urbanization and proportional economic growth. I agree with the point that urbanization levels in developing countries can now tied to performance of economies especially taking into consideration of the urban informal sector which is absorbing most of the rural-migrant labor force. For example here in Kampala, the urban informal economy is contributing greatly to economic performance of the city and the national economy. But I think that beyond economic growth there is need to consider the 'socio-economic transformation' or call it development that is sometimes assumed and tied to economic growth. There is more evidence of a disjunture between economic growth and socio-economic transformation manifest in increasing social inequality and persistent but dynamic poverty conditions in urban areas.

I note that national or regional level data tends to obscure these aspects of the urbanizing regions in developing countries and thus it would be useful not only to disaggregate such data but transcend economic growth and focus on 'soci-economic transformation' of the urban poor.

NB I am intersted in getting a copy of your paper.

Shuaib Lwasa

Date: Tue, 30 Nov 2004 09:07:20 -0800
To: pernseminars@ciesin.columbia.edu,
"'pernseminars@ciesin.columbia.edu'" <pernseminars@ciesin.columbia.edu>,
"'landismac@yahoo.com'" <landismac@yahoo.com>
From: Sanchez <roberto.sanchez-rodriguez@ucr.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] an unlit corner

This is a very interesting discussion. However, I would like to suggest maintaining some order in the discussion during this cyber conference in

order to maximize the benefits that we all can obtain from it. Urbanization is a broad topic and we run the risk of having a discussion that touches on a wide range of issues but without a structure that will allow us to draw useful conclusions. The early postings (George Matine and Kai Lee) began to focus the discussion on concrete issues from the background paper. I would like to suggest that we go back to that early discussion and focus on specific issues one at a time during on or two days for each issue. The background paper suggests 5 key research domains. The first two are broad domains (conceptual frameworks and methods for investigation) and the last three are issue specific (urban economy and poverty, health, and governance). Let us begging by focusing on the first two domains during the first part of this cyber conference and incorporate issue specific topics when appropriated to illustrate points of the discussion. We can later focus on more topic specific issues. I suggest that we begin by focusing on the challenge of building conceptual frameworks that help us understand the dynamics of complex urban systems.

Roberto Sanchez

From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Shift in Paradigm Needed for Urban Spatial-Temporal Analysis and Modeling
Date: Tue, 30 Nov 2004 12:59:52 -0500

I concur with Roberto Sanchez's suggestion. If we try to tackle the whole agenda at once without some order, we are unlikely to come up with much that is meaningful. {By the same token, if participants feel that there are issues that are not addressed properly in the background paper, they should feel free to raise them.)

I have posted below a statement by John Hasse that addresses the need identified in the Redman & Jones background paper for new urban models that relate the complexity of economic, social and environmental factors (Research Domain I.D), and the need for new approaches to collecting consistently defined data over wide geographic areas on urban form, size and population (Research Domain II.B). The statement suggests a shift from traditional raster and vector approaches to modeling urban growth to cellular automata models based on the most fundamental building block of urban areas, building units. He also addresses the data requirements for

such models, which are more easily met in developed than developing countries.

-Alex de Sherbinin, PERN Coordinator

"Shift in Paradigm Needed for Urban Spatial-Temporal Analysis and Modeling"

Panel contribution by John Hasse, Department of Geography, Rowan University, Email: hasse @rowan.edu

Over the last three decades there has been extraordinary research progress in the spatial analysis and modeling of the human urbanization process. The sister technologies of remote sensing and geographic information systems (GIS) have been foundational tools of urban research since their infancy in the 1960's. Techniques and methodologies for utilizing remote sensing and GIS technologies for urban analysis have also evolved and developed in tandem with the advances made in their technological capabilities. Over the past few years a number of research journals and conferences have focused specifically on modeling urban process, techniques and methods summarizing the state of the art in urban geospatial research. A variety of approaches to current trends in urban research have been highlighted as well as methodological advances such as the use of neural networks, automated pattern recognition and hyperspectral analysis to name a few.

However, while the progress of urban research has been remarkable, there still remains a number of technical challenges and limitations that have yet to be adequately handled within this line of research such as the meaningful integration of remote sensing data with socioeconomic/demographic data as well as the spatial/temporal landscape modeling of urban process. Furthermore, the utility of the information provided by the current state-of-the-art urban analysis to meaningfully inform sound policy making has arguably lagged well behind the advances in the technologies and techniques. What do we really know about fundamental patterns and processes underlying urbanization? How well do we really understand the impacts and efficiencies of various spatial forms of urbanization? How do we meaningfully analyze and compare urbanization processes from one neighborhood to the next, let alone from one city to another, when there are vast differences in the cultural and physical landscape matrixes in which each city exists?

We are challenged to have urban analysis and modeling provide a better understanding of the environmental, social and health-related implications of various patterns of urbanization so that the information leads to substantial improvements in policy and management. Urban researchers need to produce better information that is more valuable to and usable in the

planning office, health ministry and environmental regulatory agency, than is currently occurring.

Quantifying Urban Form at its Atomic Level

One direction of research that holds promise for moving beyond the research and policy limitations of many current urban modeling approaches is redesigning the urban model so that it more robustly and eloquently represents the underlying patterns and processes of urbanization. To date, urban analysis has relied on the two main spatial modeling GIS data platforms of raster and vector. Raster-based modeling approaches have been widely utilized for remote sensing/environmental/land use/land cover lines of analysis while vector-based models have been more widely utilized for socio/demographic approaches to urban analysis. While each platform has its advantages and disadvantages for modeling urban structure, there are nevertheless still many limitations with current raster/vector urban analytical approaches related to problematic issues of appropriate data scaling, modeling urban temporal change, ecological fallacy/ MAUP, among many others. It can just be clunky to represent many aspects of urban process in either a raster or vector data platform. In order to move beyond these limitations urban geospatial modeling may need to reconceptualize the way it represents urban phenomena by reducing urban structure down to the smallest building blocks.

To do this we must shift our approach to urban modeling away from trying to fit the urban process into raster cells or polygons. Instead we must first begin with the urban process itself and then ask how to best model that within a state-of-the-art geospatial digital environment. If the human urbanization process consists of the nexus between the physical built environment and social process, we must ask the question of what is the appropriate fundamental unit or smallest 'cell' by which the urbanization process functions. Is it the neighborhood, the census block, or the zip code area? These are often the spatial units by which demographic data are made available to researchers. Is the smallest fundamental urban spatial unit the individual person living within the city, the family, or the household? These are often the units by which demographic data are collected but by which are protected from public disclosure for issues of privacy.

It can be argued that building units emerge as the logical atom or smallest cell of urban spatial structure. By modeling urban spatial structure as elemental building units that exist at a particular time and location in space, building units become the 'urban atomic components' or 'urban cells' that can then be organized and combined into a nested hierarchy of functional entities at the appropriate scale of the phenomenon of interest. Continuing the analogy of urban form as living organism, neighborhoods can be seen as a collection of building unit cells grouped into discrete

functional areas or the organs of the urban organism. Neighborhoods linked together through transportation and infrastructure networks become the functional urban systems and the city itself combines the various neighborhoods and systems into the complete functioning (or sometimes dysfunctioning) urban organism.

While the analogy of urban process as atomic structure or biological organism can only go so far, many research advances can potentially be made by modeling the urban process within just such an atomic/hierarchal framework. Individual components of the atomic urban data model can be modular and object-oriented so that each building unit can "know" its own location, statistical summaries of the people living/employed in the building, the land area occupied and the building floor area, available social and health-related data, etc. Object-oriented building units could know their own date of creation and thus be incorporated into temporal modeling of urbanization. Building units could also know their proximity to sources of environmental contamination as well as their proximity to crime scenes, accidents, and a potentially limitless amount of socioeconomic data. Urban data collected, organized and analyzed at the urban atomic level of the building unit allows for robust analytical approaches to reveal patterns, correlations and functional relationships between the full arrays of collected data items utilizing various statistical analytical methods.

Developing such an atomic model of urbanization with so much information collected for each building unit sounds daunting and perhaps attainable only after years of expensive data development. However, much of the data and capabilities already exist. Geocoding of addresses makes the locating of building units with a known street address easily accomplished. County tax records describing property parcels and dwellings are accessible public information and regional phone directories including address are already widely available via the internet. Private industry has already developed vast databases of information that include easily geocodable address information. In some European countries the postal service agency collects and updates delivery address locations four times a year making access to current building location data remarkably up to date. On the other hand, in developing countries and particularly in impoverished areas, building unit locations as well as socioeconomic and environmental data may be more difficult to acquire and compile thus making it more difficult to provide comparisons and other useful information. Nevertheless, data collection and development in these developing areas can potentially leapfrog ahead of currently available methods by taking advantage of GPS technology, on-screen delineations of building locations through new generations of remotely sensed imagery as well as other technical advances. Analysis and comparison of cities utilizing an urban atomic data modeling approach would allow better understanding of the differences between urban process in developed and developing countries as well as provide potentially more useful

information to land managers and stakeholders. Even when limited additional socioeconomic data exist, the spatial location of building units alone can provide a wealth of information on the spatial patterns of urbanization and associated factors and consequences.

Conclusion

Urbanization is a major factor in anthropogenic environmental impact and intricately interrelated to socioeconomic conditions within the regions in which it occurs and yet we still know relatively little about the socioeconomic/ecological processes, patterns and impacts underlying the urbanization process. While there has been substantial progress in recent decades, to date there still remains significant limitations to current approaches of urban analysis and modeling that has restricted scholarly characterizations of urban form and process as well as hindered meaningful urban comparisons between cities. Furthermore, current approaches to urban analysis and modeling have been limited in providing policy makers and land management stakeholders with substantially useful information.

This short position paper proposes a possible direction for future research in urban analysis that can move beyond some of these limitations by developing an urban atomization research approach. In order to make progress on such a line of research an agenda should be developed to support and foster urban atomization research between different institutions in different parts of the world. Initial work has begun in exploring urban atomization modeling (See Hasse 2004, Hasse and Lathrop 2003,) but this is only a beginning for what has the potential to be an important shift in paradigm for urban spatial-temporal modeling and analysis. The author welcomes feedback and collaboration in progressing this line of research.

References

Hasse, John E., 2004, A Geospatial Approach to Measuring New Development Tracts for Characteristics of Rural Sprawl, Landscape Journal: Design, Planning and Management of the Land 23:1-04

Hasse, John E. and Richard G. Lathrop, 2003, A Housing Unit Approach to Characterizing Residential Sprawl, Photogrammetric Engineering and Remote Sensing, Vol. 69, No 9 p.1021 - 1029

Date: Tue, 30 Nov 2004 13:38:39 -0500
From: "Kai N. Lee" <Kai.N.Lee@williams.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Shift in Paradigm Needed for Urban
Spatial-Temporal Analysis and Modeling

Hasse's proposal is a stimulating one (to someone who is illiterate in GIS/RS). I wondered:

1) What are the resolution requirements to implement such an idea in remote sensing? The 30 m scale of the 1st generation satellite images would seem far too coarse, but isn't that where most time-series samples would need to be drawn from?

2) A related concept, perhaps, is to think at the "molecular" level of neighborhoods or census tracts or streetlight clusters. Chemistry started with molecules and made inferences about atoms long before atoms were available for manipulation. What is really useful, as I see it, is the shift to an object-oriented perspective, which would seem to fit more naturally into discussions of agglomeration and (partially endogenous) change.

3) The organic analogies also raise the question of how to think about hinterlands, a subject so far all but ignored in this seminar. A chemical analogy leads me to think of hinterlands like a fluid, homogeneous beyond some membrane defining the edge of a city. A biological analogy might lead one to think of hinterlands as a source of nutrients that "the city" (an emergent property of the cells and organs?) might seek to prey upon. The chemical image might fit a market more naturally, while the biological one might fit notions of urban dominance and vulnerability better.

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Subject: [PERNSeminar_UrbanExpansion] Urban definitions
To: pernseminars@ciesin.columbia.edu
From: re@popact.org
Date: Tue, 30 Nov 2004 15:52:23 -0500

I hope I haven't missed this in my skimming of the background paper and subsequents postings, but I believe one problem at the root of most discussion of urban population and environment issues is the lack of uniform definitions of the terms "urban area" and "city."

As I understand the UN statistics on urban population and urbanization, lack of uniform definition undermines almost all blanket statements. The authors of the UN reports on urban population state that they rely on each national government's definitions of "urban area" and "city" when compiling demographic data for each country and "urban area." There appears to be considerable diversity in these national definitions, stated mostly relative to population size and perhaps also to population density, or geographic proximity of people or habitations, or political entities involved. Thus the idea that soon half of human population will live in urban areas appears to need the qualifier "as these areas are defined by each national government." I'd be interested in whether these definitional issues are perceived as a problem or not in this discussion. In particular, are urban researchers converging on a globally uniform definition of the key two urban terms? This is essential, I would imagine, for precise global urban analysis using GIS and other data-dependent methods.

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Date: Tue, 30 Nov 2004 21:26:12 -0500
From: "Kai N. Lee" <Kai.N.Lee@williams.edu>
Subject: [PERNSeminar_UrbanExpansion] urbanization without economic growth
To: pernseminars@ciesin.columbia.edu

I should like to return to an issue that David Satterthwaite and Kwasi Nsiah-Gyabaah have both commented on. Nsiah-Gyabaah's statement says that much growth in Africa "is taking place in the absence of significant industrial expansion." Satterthwaite points out uncertainties in estimates of urbanization in Africa, and suggests that growth has, in fact, paralleled economic growth over the past several years.

Does this mean that Nsiah-Gyabaah's statement applies to the past but not to the period since the mid-90s?

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Date: Wed, 01 Dec 2004 08:37:51 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] posting by M.S.R.Murthy

(Message posting by M.S.R.Murthy)

Dear Sir

Urban expansion in developing countries has mostly economic dimension. In drought prone areas people migrate to nearby towns. A few years later they are found migrating to other urabn areas owing to lack of economic opportunities. In fact all urban areas are not conducive for economic development.

Further most of the lands adjacent to urban areas have been turned into real estate business in India. Poor farmers who could not produce a quintal of food grains owing to lack of irrigation and water facility have now become rich due to real estates. Some salaried employees and busniess people are purchasing the land from real estate managers as an

investment. Now Banks and business establsihments are not profitable therfore people are investing in real estates and apartments.

In fact many people are getting employment in real estate and apartments. Several employees took voluntary retirement and involving in real estate business.

In contrast Indian and provincial governements are unable raise income of the state exchecker due to several subsidies and failure of agriculture and lack of initiative to collect taxes from the business firms.

Governements are tumbling unable to impose taxes at various levels. This is sorry state of affiars of urban expansion and failure of agriculture.

Yours sincerely

M.S.R.Murthy
Professor of Population Studies
Sri Venkateswara University
Tirupati-517502, India

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From: "Deborah Balk" <balk@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Urban definitions
Date: Tue, 30 Nov 2004 17:47:51 -0500

There have been several recent initatives on the definition and measurement of urban areas. I'm hoping that Tony Champion and Eduardo Moreno will chime in on activities recently undertaken or underway with the IUSSP and UN-Habitat, respectively.

Over the past three years, we've undertaken a massive project (the Global Rural Urban Mapping Project, GRUMP) to georeference population estimates of settlements, first by finding their location, then by further assignment of these settlements to a globally consistent measure of urban extent (mostly the stable-city lights product from NOAA's night-time lights satellite data). This approach to detecting urban areas is more or less agnostic--it

is not dependent on population density, population size, or economic activity type criteria--though it does rely on detectable permanent light sources, which we know are less common in Africa. (Further versions of this data base will attempt to correct for this.)

This approach has resulted in a database of 25,000 urban extents. So far, we've encouraged by an ability to start asking spatially explicit questions about urban areas, and their densities, including urban places that are much below the population-size thresholds commonly reported. As David Satterthwaite pointed out that largest urban areas exist in the world's largest economies. Analysis of our new data, indicate that coastal zones also tend to be disproportionately urban: 65% of population of coastal zones reside in urban areas, occupying some 10% of the available land area in comparison to global averages of 47% of the total population (2000) and 2.8% of the land area. Coastal systems also have much higher average urban population densities. Rural areas in coastal zones, as well, are also much more dense than average (this is also the case in cultivated areas) which may have implication for future urban growth in coastal regions.

How well this approach will do in the future to examine changes in urban extents or intra-urban characteristics are still open questions, but I'm convinced that's its just a matter of interdisciplinary effort and dialogue to make sure we get the right methods. Having said all this, the many ways of defining urban by any given national statistical office is still useful information (probably prefered in many applications), and while revisions to these may be necessary in many places, it's having an ability to equate those defintions with something more "neutral" that's needed for global work.

I can make links to a working paper describing the data, and to the data, available to anyone who wishes, though they'll be publicly available within a few weeks at http://sedac.ciesin.columbia.edu/gpw.

Deborah Balk

Date: Wed, 01 Dec 2004 09:29:57 -0500

From: "Susana B. Adamo" <sbadamo@email.unc.edu>
To: pernseminars@ciesin.columbia.edu
Subject: Re: [PERNSeminar_UrbanExpansion] Urban definitions

The research domains listed in the background paper include conceptual frameworks and operational models, including the state-of-knowledge in the disciplines, and issues in data acquisition.
I would like to mention here a recent paper by Hugo, Champion and Lattes (2003(2):277-97 in Population and Development Review), "Toward a new conceptualization of settlement for demography", which discusses old, new and alternatives approaches to definitions within the rural-urban continuum.
Susana Adamo

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Date: Wed, 01 Dec 2004 13:09:27 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Market Forces, Globalization and Urban Expansion

Market Forces, Globalization and Urban Expansion

Panel statement by Elena Irwin, Department of Agricultural, Environmental and Development Economics Ohio State University, E-mail: irwin.78 @osu.edu

PERN Coordinator's note: The discussion to date has touched on the importance of economic forces in shaping urban demographic and spatial expansion. Clearly changes in rents affect the likelihood that land in agriculture or natural states will be built up. Elena Irwin discusses market forces in the context of economic globalization, and also addresses other strands of our discussions to date, such as the possibility for urbanization to occur absent economic growth. She notes that "common urbanization trends have been documented in many developed and developing countries, including urban deconcentration, peri-urban development and the emergence of a polycentric urban spatial structure." Such low density, polycentric and "leap frog" forms of development have direct impacts on public finances (both for revenue generation and costs of service provision), environmental goods and social structures.

Economic growth and urbanization are inextricably linked. Economic growth often implies the conversion of rural land to urban uses (residential, commercial and industrial) as regional economies transition from an agrarian-based economy to an urban economy based on industry and services.This process occurs in urban areas of developing countries undergoing structural economic changes as well as in exurban (or peri-urban) regions of developed countries that are impacted by economic growth of proximate urban areas.

On a global scale, changes in information, production and transportation technologies have had profound effects on urbanization. To the extent that these changes substitute for geographic proximity, they have vastly reduced the need for face-to-face communications and have greatly increased the mobility of goods, services, labor, technology and capital throughout the world. This marked increase in the pace of globalization has spurred rapid economic growth in many developing countries. Institutional changes, including the transition of socialist regimes to more market-based economies, have also fostered rapid economic development in these countries.

Massive inflows of capital and foreign direct investment (FDI) have transformed urban and rural areas in many developing countries. For example, FDI in the Pearl River Delta region of China has resulted in the transformation of a rural-based economy into an industry-based export economy that is characterized by labor-intensive production processes that consume large tracts of land and that has spurred substantial rural-urban migration. Spatially, this production has favored smaller urban places and their proximate rural regions and thus the predominant growth pattern has been a more equal level of urbanization across the region coupled with a declining importance of the primate regional city (Sit and Yang, 1997). Other determinants of growth in peri-urban areas of China include the rising incomes of a growing class of suburban professionals that seek to escape urban congestion as well as the economic reforms that have allowed rural residents to be more responsive to market forces when making land use decisions (Leaf, 2002). The extension of cities into larger exurban regions has been documented in other parts of Asia as well (e.g., McGee and Robinson, 1995). The trend in the growth of smaller urban centers and the emergence of a polycentric urban structure is typical of urbanization patterns in many Latin American regions (Gilbert, 1993). Other empirical evidence of globalization effects on urbanization include the increasing economic segregation among households (e.g., Calderia, 2000 in Sao Paulo, Brazil) and the increasing spatial differentiation of land uses (e.g., Leaf, 2002 in peri-urban areas of China and Vietnam).

Globalization has spurred urban economies in developed countries to become increasingly service-based with an emphasis on knowledge creation. Former urban industrial centers as well as rural manufacturing-based economies have

faced tough transitions as transnational corporations have relocated production and capital investments to developing countries. Some rural areas have established themselves as recreation-based, amenity-rich economies in which high value environmental amenities serve as an attractor of new population growth and economic development (e.g., Shumway and Otterstron, 2001). Examples in the U.S. include Taos, New Mexico and Aspen, Colorado. Given their emphasis on maintaining high valued environmental amenities, the resulting urbanization of these areas presents a challenge for sustainable economic development.

Although increased globalization has clearly had very different effects on urbanization patterns in developed vs. developing countries, the regional effects of some of the main underlying factors (advances in telecommunications, transportation and production technologies) are similar. In both developed and developing countries, there is much evidence to suggest that substantial decentralization of urban areas has occurred (Mieszkowski and Mills, 1993; Irwin and Bockstael, 2004). The benefits of agglomeration have been substantially eroded by information technologies that provide a substitute for face-to-face interactions and by transportation networks that make outlying areas easily accessible. Such changes have also fostered economies of scale in production and distribution networks, which favor large facilities that consume large tracts of land. All of these factors have resulted in a deconcentration of firms away from the central city. Households have also taken advantage of lower transportation costs by moving outward and consuming more land in outer suburban and exurban areas. In addition, urban ills (such as declining schools and public services and rising crime rates) have pushed higher-income households away from central cities into more homogeneous outer suburban and exurban locales, resulting in increased economic segregation and higher rates of per capita urban land consumption. In the U.S., the system of local public financing, which is based on local property taxes, has greatly exacerbated this pattern of household sorting and suburbanization (Brueckner, 2000).

While urbanization is very often the result of economic growth, it also occurs in the absence of economic growth. For example, many metropolitan areas of the U.S. are still urbanizing land despite little or no population growth in recent decades (Fulton, et al. 2001). This is largely the result of the same urban deconcentration forces discussed above, many of which can occur independent of regional economic growth. In the developing world context, some scholars have suggested that sub-Saharan Africa is a continent in which urbanization has occurred to a large extent independent of economic development. For example, some evidence indicates that urbanization in sub-Saharan African cities occurs largely in peri-urban regions, is mainly residential rather than production-based and is driven by domestic investment and migrant's remittances (Briggs and Yeboah, 2001).

It is interesting to note the common urbanization trends that have been documented in many developed and developing countries, including urban deconcentration, peri-urban development and the emergence of a polycentric urban spatial structure. Of course, these processes are also differentiated by their institutional settings and a myriad of policies that cause urbanization patterns to differ from country to country and region to region. Nonetheless, it is clear that the same underlying forces that have accelerated the pace of globalization (in particular, information technologies and transportation changes) are also contributing to fundamental changes in urban spatial structure at regional levels within many countries, both developed and developing. In addition, some similarities among household location decisions are apparent: as incomes rise, households often move outward to escape congested urban areas and to consume larger tracts of land. There is some evidence to suggest that these processes have led to increased economic segregation within metropolitan areas in both developed and developing countries while simultaneously leading to a greater integration of urban and rural areas.

These new forms of urban spatial structure that are typified by lower densities, polycentric cities and, in some cases, "leapfrog" patterns of development have substantial impacts on local public finances, environmental goods and social structures. Studies from the U.S. on the "costs of sprawl" provide evidence that the public service costs associated with current sprawl patterns of development vs. more compact development patterns are substantially more (e.g., up to 250% of the costs associated with more compact forms). In addition to higher rates of natural and rural land conversion, low density, non-contiguous development patterns can erode local economies of scale in rural economic activities, e.g., agriculture, and have negative impacts on many (although not all) wildlife habitats. Counterarguments in support of sprawl point out that lower density development promotes more affordable housing and that low density, polycentric urban structures have allowed for the growth of urban areas without significant increases in commuting times.

Finally, it is interesting to note that urbanization patterns also influence economic growth. While a variety of factors influence economic growth, a commonly held view is that it results from productivity gains due to technological innovations and investments in human capital. Endogenous growth theory (e.g., Romer, 1986; Lucas, 1988) argues that the accumulation of knowledge is the key determinant of economic growth and that knowledge spillovers, e.g., in the form of information exchange among firms, create positive externalities that generate growth among all firms. Because such spillovers (or more generally, agglomeration economies) are often a function of spatial proximity, the geographic distribution of firms influences economic growth. Likewise, negative spillovers from urbanization, including

congestion and high land rents, may deter firms from locating in larger cities and thus have a dampening effect on economic growth in these places.

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From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'" <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Market Forces, Globalization and Urban Expansion
Date: Wed, 1 Dec 2004 14:05:45 -0500

The commonly held view (Irwin's last paragraph below) that "economic growth ..... results from productivity gains due to technological innovations" has be understood in the context of the fact that 'technological innovations' are largely improvements in the efficiency with which energy is used as a substitute for human muscle power.

The "endogenous growth theory" (e.g., Romer, 1986; Lucas, 1988) that "argues that the accumulation of knowledge is the key determinant of economic growth and that knowledge spillovers, e.g., in the form of information exchange among firms, create positive externalities that generate growth among all firms" is dealing also with "knowledge", "knowledge spillovers" and "information exchange" about 'improvements in the efficiency with which energy is used as a substitute for human muscle power'.

When the readily available and cheap, temporary geological energy subsidy (which has fuelled the historically unprecedented exponential growth of economies and human numbers during the last two centuries) begins to dry up as the Earth's reservoirs reach their 'half empty' status, we can anticipate a reversal of the trend that has incrementally replaced muscle power with energy hungry machines and a reversal of the economic and population growth whose 200 year long trajectories have driven the "Market Forces, Globalization and Urban Expansion" that are the subject of this cyberseminar.

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From: "Steve Hoffman" <shoffman@hoffman-and-associates.com>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 12:22:03 -0800

The debate rages. For how long will oil be as "cheap" as it is today? I recall that Daniel Yergin (author of The Prize) estimates that we could hit a crunch somewhere around 2030, if geopolitical factors don't destabilize supply much more seriously than they do today. But I haven't seen him support that figure well. The www.peakoil.net analysts estimate 2008 or sooner, and they provide more data...which I have not had time to crunch, myself. None of us knows precisely how this will play out.

But it is absolutely clear that global demand for oil, natural gas, and other forms of energy is growing dramatically. It is also quite clear (e.g., Princeton's Deffeyes, an oil geologist, has documented this well) that very large new supplies are simply not going to be found.

Yes, new technologies will continue to come on board -- the hybrid car, perhaps the hydrogen fuel cell vehicle will spread, wind and solar energy will continue their significant upticks, etc. China appears to be moving toward increased energy efficiency, but also to tens of new pebble-bed nuclear reactors. Many nations have had it with nuclear energy, and it does not seem that they will return to it. This is another major question mark.

Even if the world becomes much more energy-efficient, and even if we develop hybrids, hydrogen fuel cells, wind, and solar, the fact remains that we may have to cut our total energy use enormously, by as much as 75%, as oil and other natural gas supplies dwindle, and as prices rise far more than they have to date.

When will this happen? 2005? 2008? 2010? Very hard to predict, due to uncertainties such as those above.

While Mr. Salonious may at times harshly state his case, his main point is valid: much theory of urbanization appears to incorporate an assumption of continued cheap and super-plentiful oil, natural gas, and electricity. That assumption should be called into serious question. Energy is at the core of

the global economy -- it is the lifeblood. It is a suite of resources in great flux and uncertainty at this stage in history. Again, this is a topic worth considering extremely seriously, and worth incorporating as much as possible in this interdisciplinary discussion.

Steven Hoffman

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
References: <41AE08D7.4000006@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Market Forces, Globalization and Urban Expansion
Date: Wed, 1 Dec 2004 15:50:20 -0500

Hi,

A couple of thoughts about this and some earlier e-mails.

First, although the broad patterns may be similar in industrialized and developing countries, suggesting similar underlying dynamics, the environmental burden of that growth is quite different (e.g., from sewage

treatment levels, dust and exhaust). Could these outcomes be tied reliably to the broad GDP/UrbanPopulation indicator that has been suggested in previous e-mails?

Second, it is interesting that one driver of similar patterns (externalities) is a self-reinforcing one, in that some aggregation encourages more aggregation. This suggests that historical accident can be a determinant of later growth. So, although the causes for the city structures that emerge may be similar (polycentric, peri-urban areas, etc.), the causes for the location of cities is less certain.

But then as Deborah Balk pointed out, most urban development is in coastal areas. This is interesting, because coastal areas are often environmentally sensitive. For example, coastal zones are likely to be impacted by rising sea levels and water pollution from urban areas is likely to impact near-coastal fisheries, mangroves and other ecosystems.

This suggests some potentially interesting broad patterns:

- Urban areas are disproportionately likely to arise in coastal areas
- Spatial patterns of urban areas follow a few common patterns, in both industrialized and developing countries
- Environmental impacts differ (but might correlate with some relatively simple indicators?)
- Coastal zones are particularly vulnerable to climate change and are often ecologically fragile

Could this form a part of a broad framework for looking at urban/environmental links?

Eric

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Subject: RE: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 15:52:45 -0500
From: "MONTGOMERY, MARK" <MMONTGOMERY@popcouncil.org>
To: <pernseminars@ciesin.columbia.edu>

An early but still thought-provoking contribution to this urbanization-energy prices debate was that of Allen Kelley and Jeffrey Williamson (1983), What Drives Third World City Growth? A main theme in this book was the effect of oil prices on

urbanization, as revealed in simulations of a general equilibrium economic model. (The model was constructed in the years just following the first of the OPEC oil "crises.") The Kelley-Williamson model predicted that high or rising energy prices would produce a substantial slow-down of the pace of urbanization in poor countries. Although there is much to criticize in this form of analysis, and a shift of urban economies toward less energy-intensive services might mitigate some of the effects, the general thrust of this argument still seems valid to me.

I'm not aware of later attempts to quantify this relationship for developing countries. Is anyone else?

Mark Montgomery

From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 15:56:28 -0500

Hello,

Agreed! My own conclusion from reviewing the literature that Steve Hoffman refers to is that the first indication of impending shortage is going to be volatile prices for major fuels.

An interesting thing about volatile prices is that while you're living through it, it's hard to be sure of what is going on. For example, are we observing the first stages of long-term volatility in fuel prices right now, driven, for example, by rapid development in China? Or the short-term effects of a war? At any given time, some fluctuating events can be identified that might be causing the most recent fluctuation in price.

Also, volatility affects those with the least resources most. So, my second conclusion is that as volatility rises, distributional effects are going to be most important. How is that going to affect development (urban or otherwise)?

Eric

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From: "Steve Hoffman" <steve.hoffman@iere.org>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 13:25:59 -0800

This is interesting. It reminds me of another important point. It is certainly true that predictions of oil depletion have been made for decades. Some have come to pass, and some have not. (E.g., predictions of peaking U.S. oil production were much on target). The fact that some fears of oil depletion have not come to pass, to date, clearly does not mean that current predictions are flawed and current concerns unfounded.

And a clarification: I'm suggesting that "peak oil" may be hit in 2005, 2008, or 2010... a 75% reduction in world energy use, if it comes to pass, would presumably occur considerably later than that. The 75% figure comes from informal discussions with energy colleagues/experts; it is stated to help us envision the potential seriousness of these issues.

Steve Hoffman

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From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
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Subject: RE: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 20:55:49 -0500

Regarding the " potential seriousness of these issues" the observations of Virginia Abernethy concerning the decrease in birth rates in response to decreasing affluence (starting at any base level) are relevant here because a "a 75% reduction in world energy use" would have a profound influence on

the economic wellbeing of almost every person on the planet.

There are many examples of this phenomenon. The example that is most pertinent to North Americans is the plummeting birth rate during the Great Depression.

Abernethy documents many examples of increasing birth rates in response to increasing affluence. The example that is most pertinent to North Americans is the tremendous increase in the birth rate as the Great Depression was ended by the economic expansion ocassioned by the beginning of World War II.

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Wed, 1 Dec 2004 22:35:26 -0500

Hello,

Having said "agreed" to the message below (which I still do, to the main thrust of the message), I must say that I seriously question a 75% drop in energy consumption by 2005, or even by 2010. Short-term price elasticities for energy (in industrialized countries, at least) are just not that high, and reserves are still ample. Even if prices were to rise dramatically, the response, I think, would be to change the composition of consumption in general, rather than a 75% drop in energy use.

Also, in the medium term, it is likely that unconventional oil supplies will emerge as serious competitors with conventional petroleum supplies. That is, one response to higher prices will be diversification (but in the first instance, I suspect, not into renewable alternatives). The problem with this outcome is that extraction of unconventional petroleum supplies tends to be even more environmentally damaging than conventional extraction.

Finally, natural gas supplies are not, I think, particularly scarce in the

medium term (although I didn't check this statistic). The problem is that they are supplied by pipeline. My understanding is that it's the current state of the distribution network that leads to local scarcity, which leads to higher prices. As the distribution network is expanded, prices can be expected to fall.

Eric

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
"'eric@kb-creative.net'"
Subject: RE: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Thu, 2 Dec 2004 06:13:12 -0500

The validity of Kemp-Benedict's assumptions that "[petroleum]reserves are still ample", that "unconventional [tar sands etc.] oil supplies will emerge as serious competitors with conventional petroleum supplies" and that "natural gas supplies are not..... particularly scarce" should be assessed only after reading at least the last few issues of THE ASSOCIATION FOR THE STUDY OF PEAK OIL AND GAS (ASPO) NEWSLETTER, all of which are available at:

http://www.asponews.org

Concentration on interim parameters like "Short-term price elasticities" avoids the problem of constantly diminishing 'energy return on energy invested (EROI)':

During the 1950s:
50 barrels of oil were extracted and brought to market per barrel needed for these processes
During the 1990s:
5 barrels of oil were extracted and brought to market per barrel needed for these processes

When finite reserves are depleted such that 1 barrel of oil must be used (invested) to extract and bring to market 1 barrel ---------- then the game is over.

The problem with "serious competitors with conventional petroleum supplies" such as heavy oil, tar sands oil, coal and fissionable nuclear fuel is that their extraction depends upon petroleum and as the EROI approaches unity they will cease to be options.

The ultimate (magical) solution to the energy dilemma envisioned by most policy makers is that "you scientists will think of something" like nuclear fusion just in time to avoid the population and economic collapse that would be occasioned by the beginning of the end of the 'Petroleum Interval'.

A reading of http://www.dieoff.com/page175.htm may be helpful for those who wish to pursue the phenomenon of global energy futures further.

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Thu, 2 Dec 2004 06:55:47 -0500

Hi,

In all this it's important to keep the frame of reference. I was objecting to the idea that energy consumption could drop by 75% in the next 1-6 years (2005-2010). I'm pretty sure I'm right about 2005. By 2010 something catastrophic could happen, but a 75% drop over 6 years doesn't seem likely, for the reasons I mentioned.

I agree that it's unwise to base our hopes for the future of the world's urban areas on the vague idea that "something will be done," but to make the argument at the opposite extreme that energy companies will do nothing in

the face of rising oil prices seems far-fetched.

Eric

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From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Caveats for Remote Sensing of Urban Areas
Date: Thu, 2 Dec 2004 09:53:47 -0500

The issue of how to define urban areas has been raised in postings by Bob Engleman and Deborah Balk. Given its globally consistent coverage and the potential (at least in theory) to use a single definition of what constitutes urban built up areas, remote sensing has sometimes been seen as the 'answer' for global mapping of urban areas. In this statement, Christopher Small provides a more cautious assessment of the potential for remote sensing in measuring urban/built-up areas. Those wishing to learn more on the application of remote sensing to urban studies may wish to consult CIESIN's Thematic Guide to Social Science Applications of Remote Sensing, Section 5.6 (see http://sedac.ciesin.columbia.edu/tg/guide_frame.jsp?rd=RS&ds=1).

-Alex de Sherbinin, PERN Coordinator

"Caveats for Remote Sensing of Urban Areas"

Panel contribution by Christopher Small, Associate Research Scientist, Lamont Doherty Earth Observatory, Columbia University, Email: small @ldeo.columbia.edu

In the study of urban systems it may be useful to consider some of the dualities we must contend with. Specifically:

Duality of Process:
- Physical: processes that can be described by relatively simple physical laws.
- Socioeconomic: processes involving collective and individual human actions.

Duality of Inquiry:
- Observation: data collection and analysis
- Theory: development of theory and implementation of models

Duality of Representation:
- Cellular: representing actions and physical states of individual components
- Aggregate: representing measurable consequences of aggregations of individuals

Keeping in mind the distinctions and continua between the poles of each duality can simplify some problems. The distinctions are especially important when using physical measurements to address non-physical questions. John Hasse provided an excellent discussion of some of the issues related to representation. I have been asked to comment on some of the methodological and measurement issues, specifically related to remote sensing of urban areas.

Focusing on observation by remote sensing (as opposed to in situ measurement), it is important to consider some of the inherent caveats of the tools. The benefits of remote sensing are well known: consistent, synoptic, global coverage at multiple spatial and temporal resolutions. The caveats are less well known and this often leads to serious inaccuracies and misinterpretations. These caveats are related to the physical processes involved in making the measurements. Rather than launching into a discussion of orbital dynamics, radiative transfer and spatial analysis, I will try to briefly summarize a few concepts worth considering when trying to extract information from remotely sensed measurements.

1) Physical properties and non-physical characteristics. Remotely sensed information is derived from measurements of physical quantities (e.g. color, roughness, height, temperature) - generally using electromagnetic radiation. Some physical properties can be inferred from these measurements (to varying degrees of accuracy), others cannot. When attempting to quantify non-physical characteristics with indirect physical measurements it is worth asking whether or not the characteristic has unique physical properties. In many cases, they do not. For example, population density cannot generally be measured with electromagnetic radiation. Some proxies for population density (e.g. land cover change) can be inferred from remotely sensed measurements but not always uniquely. The distinction is important.

2) Scale-dependent heterogeneity. By necessity, an individual image pixel represents a single measurement of some physical quantity. However, a pixel corresponds to a finite area (generally elliptical - never actually

square) on the ground. The surface within that finite area is rarely compositionally homogeneous. The measurement associated with a single pixel is generally an unevenly weighted average of heterogeneous properties within the pixel footprint. Most pixels are "mixed pixels" but most thematic classification algorithms that produce maps from images are predicated on the assumption of homogeneity. This is why most of these algorithms produce notoriously inaccurate results when used to classify urban areas. Most urban areas are compositionally and spectrally heterogeneous at different spatial scales. In fact, comparative analyses of urban reflectance suggest that heterogeneity is the only spectral property common to many urban areas. Mixture models can represent the land surface as continuous fields of endmember fractions (e.g 40% vegetation, 40% soil, 20% water) more accurately than thematic classifications in which each pixel is a member of one, and only one, class. It is necessary to consider scale and heterogeneity in physical delineation of urban areas.

3) Spectral and textural information. Urban areas can often be recognized visually in remotely sensed imagery because of differences in reflectance (color) and spatial patterns (texture). Another reason why thematic classifications often fail to discriminate features that can be detected visually is because most thematic classification algorithms consider each pixel in isolation from its neighbors. Images also contain textural information related to the spatial variability in pixel brightness. The eye/brain system relies on both color and texture to discriminate objects. Analyses that combine spectral and textural information make better use of the available information. The tools are available but rarely used together.

4) Combined properties from different measurements. Because of their compositional heterogeneity at different spatial scales, urban areas have few unique physical properties that can be measured remotely. However, the combination of multiple non-unique properties can sometimes be unique, or nearly so. Combining remotely sensed measurements of different quantities from different sensors can provide a more accurate map than could be derived from any of the measurements alone

More detailed discussions and graphic examples of these points are available online at www.LDEO.columbia.edu/~small under the Research link.

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From: David Satterthwaite <David.Satterthwaite@iied.org>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Thu, 2 Dec 2004 13:24:57 -0000

Some points relating to the discussions over the last two days.

Urban populations and coasts. I wonder if the tendency for urban populations to concentrate on coasts is continuing. Certainly in many of the larger economies in Africa, Asia and Latin America, there are many important, large successful cities that are not on the coast - in Brazil, Mexico, China, India..... Nigeria, South Africa... In USA too over the last 100 years? (some very successful coastal cities, some very successful non coastal cities). Of course ports had particular importance under most colonial systems but perhaps less so now among many of the larger more successful economies? Many aspects of 'comparative advantage' no longer needing ports (financial services, call centres.....)....

Rapid urbanization has occurred in particular countries without 'cheap energy'. Some drivers of rapid growth for cities has little to do with energy prices (eg much expanded centralized government bureaucracies). If energy prices rise, their primary impact on urbanization will surely be through their impact on urban economies.

I think there is less commonality than we sometimes assume in the spatial distribution of urban populations in nations and how these are changing. We sometimes see commonalities in urban trends when comparing nations because we are looking for them and not seeing the dissimilarities (or our analysis is too aggregated). I also think that more attention needs to be paid to the social, economic, political and demographic underpinnings of changes in the spatial distribution of urban populations (which often show the dissimilarities and also very different implications for the future).

David Satterthwaite

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
References: <200412021725.MAA15084@listhost.ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Re: Energy and the PERN Seminar
Date: Thu, 2 Dec 2004 12:37:29 -0500

I would ask, as a practical matter, if aggregate indicators can be of any use at all. The answer might well be "no", if the major determinants of change and the major outcomes can only be understood and tracked with a fine-grained view. However, my fond hope is that the answer might be "yes," mainly because the studies I'm involved in (long-range environmental and social scenarios) make use of aggregate indicators and broad trends as a matter of necessity. A related question is, are there any useful "stylized facts" about urban areas that can guide broad-level thinking?

In many cases, even when studying contemporary issues, let alone long-range scenarios, aggregate indicators are all that is available (for example, the many interesting statistics collected by UN Habitat). The question is, is the use of such indicators and "stylized facts" almost always misleading, or can they be applied meaningfully for some purposes and some contexts? If they can, what information could they convey?

If it seems that broad indicators cannot be used, then for my own purposes what that would tell me is that a long-range scenario analysis that involves urban areas must include complimentary detailed studies of the urban areas in question in order to say something meaningful. That seems to be the case for some ecological systems, so it would not be unprecedented. Ideally, such studies would always be carried out, but that is rarely feasible.

In any case, aggregate indicators can never replace the information coming from detailed study. Their main role (in my view) is to extend the insights

coming from detailed studies into regions where such studies have not been carried out.

Eric

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From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Are 'urban' and 'rural' outmoded terms?
Date: Thu, 2 Dec 2004 17:07:17 -0500

Are 'urban' and 'rural' outmoded terms?

Panel statement by Tony Champion, Professor, School of Geography, Politics & Sociology University of Newcastle Newcastle upon Tyne, Email: tony.champion @ncl.ac.uk

Two days ago Robert Engelman raised the issue of urban definitions, Alex circulated John Hasse's statement that discussed quantifying urban form, Deborah Balk hoped that I would chime in on relevant activities undertaken with IUSSP, and mention was made of the article that Graeme Hugo, Alfredo Lattes and I published in Population & Development Review (PDR) last year. What I thought I would do at this stage is to present the main conclusions of the Working Group on Urbanization (WGP), which was the precursor of the IUSSP's Scientific Panel on Urbanization and Health that is the co-sponsor of this cyberseminar. Then participants can follow up in more detailed discussion if they wish.

In fact, the PDR article formed our initial position statement, raising the issues tackled by the WGU. Its working papers and conclusions have subsequently been published in an edited book: Tony Champion and Graeme Hugo (eds) New Forms of Urbanization: Beyond the Urban-Rural Dichotomy, Aldershot: Ashgate Publishing Company for IUSSP, 2004, ISBN 0 7546 3588 0. So the following represents a brief summary of that book, and especially its concluding chapter.

The point of departure of the book is that where people live has an extremely important effect on the type and quality of the lives that they

lead, on their life chances, and so on. Traditionally, the single most important dimension - after country of residence - is whether people live in an urban or a rural area. This is a major reason why so much effort has been put into measuring the proportion of national populations that reside in urban areas. Time and again, when demographic, economic and social variables of urban and rural areas are compared, there are big differences. Plenty of examples are presented in our book, including many relating to fertility, life expectancy and health.

But there are two problems with this approach. Firstly, this two-way urban-rural split is an extremely crude way of classifying places in a country. Secondly, it is becoming increasingly difficult to classify each part of national territory as definitely urban and definitely rural. Indeed, these two problems work together to render the basic dichotomy increasingly obsolete. As has been mentioned by previous contributions to this seminar, the urban-rural distinctions are becoming increasingly blurred. Around individual cities, for instance, suburbanization and urban sprawl are giving rise to partially built-up areas, called various terms like 'semi-urban' and 'transitional'. Comparing individual settlements, no single threshold of population size or density clearly separates urban from rural ones, even within one society. And new forms of urbanization have been evolving, such as 'edge cities', 'exurbia', 'polycentric urban configurations', 'extended metropolitan regions' and 'desakota' (literally village city).

Perhaps equally important, the demand for better intelligence about where people live has been growing steadily. The result is that we are now faced with an extremely wide range of users. This adds up to a great variety of data needs, because the majority of users are not satisfied with a general-purpose delineation and classification of where people live, least of all just a two-way split between urban and rural. They want something customized for their own purposes; e.g. for physical planning, transport planning, economic development policy, health care delivery.

At the same time, as Hasse has outlined so clearly, the technical possibilities for providing that information in our computerized and satellite age are enormously greater than in the past. Data can be compiled and released (subject to confidentiality and cost restrictions) at a very fine-grained spatial scale and then these small building-block areas can be aggregated into whatever larger reporting zones are wanted by individual users. Moreover, this data does not just relate to the internal characteristics of these blocks and the zones built from them, but can also be in the form of 'contextual variables' that use GIS-type methodology to measure aspects of surrounding areas. For instance, data for a neighbourhood can include information on its residents' proximity to hospitals, jobs or pollution sources and on the types of areas that surround it.

All these considerations prompted WGU members to consider whether the urban-rural dichotomy - already a well-established idea when it was adopted for UN's reporting on population over half a century ago - is past its sell-by date. Basically, 'a no-brainer' was the general consensus. But then comes the challenge of finding ways of improving on it, replacing it or side-stepping the issue completely. Put bluntly, would it be possible to manage without ever mentioning the terms 'urban' and 'rural' ever again? If use of these two words were banned today, how would researchers and their customers go about identifying the places where people live, and then, if necessary, proceed to classify them?

This question, posed to WGU members, not surprisingly provoked a flurry of ideas. And the most common theme was that settlements cannot readily be reduced to a single dimension. The multi-dimensional nature of settlements was seen to take three main forms, partly related to each other. One concerns the element of a settlement system being examined; for instance, the size of settlements, or the degree of concentration or dispersal of the settlement pattern, or the accessibility of settlements to services. A second concerns the aspect of primary interest; for instance, the ecological (like size, density, accessibility), or the economic (like the diversity or autonomy of the local economy), or the institutional (local choice, public sector capacity), or the socio-cultural (like beliefs, ethnic diversity). Yet a third set of multiple dimensions concerns the spatial 'architecture', meaning layers of spatial organization which are normally thought of in hierarchical terms moving from individual people and households through local neighbourhoods, localities, cities, city regions and macro-economic regions up to the national level.

Ideally, we would like to label all individual persons and/or households on the basis of the 'place' where they live. But just as people have multiple identities, so too do the places, and to some extent these are linked because people 'belong' to a variety of places according to particular aspects of their lives such as home, school, church, job, recreation. Thus, in order to assess the effect of 'environment' on aspects of people's lives, it is helpful to have measures of the environment that relate directly to each aspect, e.g. standard of school, strength of local labour market. And those measures are normally produced by defining the relevant 'catchment area', summing the appropriate ingredients of it (often based on all or some of its residents) and producing an average score. In sum, this approach involves finding the relevant spatial 'container' for each aspect.

Perhaps it is rather an anticlimax to admit that, when faced by the challenge of improving on the UN's statistical reporting on urbanization, it seems that a two-dimensional approach is able to capture a great deal of the variety in people's circumstances. One dimension refers to the physically built-up area that people live in, basically what is traditionally referred

to by the UN as an 'agglomeration'. The other refers to the functionally defined region that surrounds a significantly-sized agglomeration and represents a relatively self-contained area in terms of daily mobility, especially journey to work. This is equivalent to the 'metropolitan area', for which the UN tries to collect population data from countries that do not recognize agglomerations, but it is a substantially different concept from the agglomeration. Most notably, a metropolitan area is likely to contain a number of agglomerations of various sizes. This two-dimension distinction is vital in that people living in an agglomeration of 10,000 people situated within the metropolitan area of a million city are likely to face a very different set of opportunities from people living in a 10,000-people agglomeration that does not have a larger centre close by.

Of course, it could perhaps be argued that the collection and publication of national population data in the manner carried out by the UN for over 50 years is no longer the most important reason for measuring urbanization in countries round the world. Indeed, the range of applications for these sorts of data is now much greater than the use made by the UN itself. Nevertheless, even for single-country applications let alone cross-national comparisons, the task of delineating the individual components of a settlement system on a consistent basis - so that like can be compared with like - is still a very challenging one. The WGU recommended that advantage should be taken of the 2000 round of population censuses to examine the changing nature of settlement systems in a sample of countries, with statistical agencies, researchers and data users getting together to examine what sort of 'containers' best represent the settlement system for the presentation and analysis of population-related data. In the UK at least, helped by the present government's increasingly interventionist stance, this has now become a big political issue.

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From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
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Subject: [PERNSeminar_UrbanExpansion] Article: Why Manhattan-Living Is Greener Than Country-Living
Date: Thu, 2 Dec 2004 17:12:29 -0500

This article was forwarded to me by a colleague. It delves into the myth (that most of us are probably aware of but may still carry around) that rural life in developed countries is some how "greener" than life in the

cities. Sixty percent of US public transportation use for daily commuting takes place in the New York metro area. The article is a bit long but worth a skim.

-Alex de Sherbinin

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http://www.greenbelt.org/downloads/resources/Green_Manhattan.pdf

GREEN MANHATTAN
Why New York is the greenest city in the U.S.

By David Owen
Published in The New Yorker
10/18/04

My wife and I got married right out of college, in 1978. We were young and naïve and unashamedly idealistic, and we decided to make our first home in a utopian environmentalist community in New York State. For seven years, we lived, quite contentedly, in circumstances that would strike most Americans as austere in the extreme: our living space measured just seven hundred square feet, and we didn't have a dishwasher, a garbage disposal, a lawn, or a car. We did our grocery shopping on foot, and when we needed to travel longer distances we used public transportation. Because space at home was scarce, we seldom acquired new possessions of significant size. Our electric bills worked out to about a dollar a day.

The utopian community was Manhattan. (Our apartment was on Sixty-ninth Street, between Second and Third.) Most Americans, including most New Yorkers, think of New York City as an ecological nightmare, a wasteland of concrete and garbage and diesel fumes and traffic jams, but in comparison with the rest of America it's a model of environmental responsibility. By the most significant measures, New York is the greenest community in the United States, and one of the greenest cities in the world. The most devastating damage humans have done to the environment has arisen from the heedless burning of fossil fuels, a category in which New Yorkers are practically prehistoric. The average Manhattanite consumes gasoline at a rate that the country as a whole hasn't matched since the mid-nineteen-twenties, when the most widely owned car in the United States was the Ford Model T. Eighty-two per cent of Manhattan residents travel to work by public transit, by bicycle, or on foot. That's ten times the rate for Americans in general, and eight times the rate for residents of Los Angeles County. New York City is more populous than all but eleven states; if it were granted statehood, it would rank fifty-first in per-capita energy use.

"Anyplace that has such tall buildings and heavy traffic is obviously an environmental disaster-except that it isn't," John Holtzclaw, a transportation consultant for the Sierra Club and the Natural Resources Defense Council, told me. "If New Yorkers lived at the typical American sprawl density of three households per residential acre, they would require many times as much land. They'd be driving cars, and they'd have huge lawns and be using pesticides and fertilizers on them, and then they'd be over-watering their lawns, so that runoff would go into streams." The key to New York's relative environmental benignity is its extreme compactness. Manhattan's population density is more than eight hundred times that of the nation as a whole. Placing one and a half million people on a twenty-three-square-mile island sharply reduces their opportunities to be wasteful, and forces the majority to live in some of the most inherently energy-efficient residential structures in the world: apartment buildings. It also frees huge tracts of land for the rest of America to sprawl into.

My wife and I had our first child in 1984. We had both grown up in suburbs, and we decided that we didn't want to raise our tiny daughter in a huge city. Shortly after she learned to walk, we moved to a small town in northwestern Connecticut, about ninety miles north of midtown Manhattan. Our house, which was built in the late seventeen-hundreds, is across a dirt road from a nature preserve and is shaded by tall white-pine trees. After big rains, we can hear a swollen creek rushing by at the bottom of the hill.

Deer, wild turkeys, and the occasional black bear feed themselves in our yard. From the end of our driveway, I can walk several miles through woods to an abandoned nineteenth-century railway tunnel, while crossing only one paved road.

Yet our move was an ecological catastrophe. Our consumption of electricity went from roughly four thousand kilowatt-hours a year, toward the end of our time in New York, to almost thirty thousand kilowatt-hours in 2003-and our house doesn't even have central air-conditioning. We bought a car shortly before we moved, and another one soon after we arrived, and a third one ten years later. (If you live in the country and don't have a second car, you can't retrieve your first car from the mechanic after it's been repaired; the third car was the product of a mild mid-life crisis, but soon evolved into a necessity.)

My wife and I both work at home, but we manage to drive thirty thousand miles a year between us, mostly doing ordinary errands. Nearly everything we do away from our house requires a car trip. Renting a movie and later returning it, for example, consumes almost two gallons of gasoline, since the nearest Blockbuster is ten miles away and each transaction involves two round trips. When we lived in New York, heat escaping from our apartment

helped to heat the apartment above ours; nowadays, many of the Btus produced by our brand-new, extremely efficient oil-burning furnace leak through our two-hundred-year-old roof and into the dazzling star-filled winter sky above.

When most Americans think about environmentalism, they picture wild, unspoiled landscapes-the earth before it was transmogrified by human habitation. New York City is one of the most thoroughly altered landscapes imaginable, an almost wholly artificial environment, in which the terrain's primeval contours have long since been obliterated and most of the parts that resemble nature (the trees on side streets, the rock Park) are essentially decorations. Ecology-minded discussions of New York City often have a hopeless tone, and focus on ways in which the city might be made to seem somewhat less oppressively man-made: by increasing the area devoted to parks and greenery, by incorporating vegetation into buildings themselves, by reducing traffic congestion, by easing the intensity of development, by creating open space around structures. But most such changes would actually undermine the city's extraordinary energy efficiency, which arises from the characteristics that make it surreally synthetic.

Because densely populated urban centers concentrate human activity, we think of them as pollution crisis zones. Calculated by the square foot, New York City generates more greenhouse gases, uses more energy, and produces more solid waste than most other American regions of comparable size. On a map depicting negative environmental impacts in relation to surface area, therefore, Manhattan would look like an intense hot spot, surrounded, at varying distances, by belts of deepening green.

If you plotted the same negative impacts by resident or by household, however, the color scheme would be reversed. My little town has about four thousand residents, spread over 38.7 thickly wooded square miles, and there are many places within our town limits from which no sign of settlement is visible in any direction. But if you moved eight million people like us, along with our dwellings and possessions and current rates of energy use, into a space the size of New York City, our profligacy would be impossible to miss, because you'd have to stack our houses and cars and garages and lawn tractors and swimming pools and septic tanks higher than skyscrapers. (Conversely, if you made all eight million New Yorkers live at the density of my town, they would require a space equivalent to the land area of the six New England states plus Delaware and New Jersey.) Spreading people out increases the damage they do to the environment, while making the problems harder to see and to address.

Of course, living in densely populated urban centers has many drawbacks. Even wealthy New Yorkers live in spaces that would seem cramped to Americans living almost anywhere else. A well-to-do friend of mine who grew up in a

town house in Greenwich Village thought of his upbringing as privileged until, in prep school, he visited a classmate from the suburbs and was staggered by the house, the lawn, the cars, and the swimming pool, and thought, with despair, You mean I could live like this?

Manhattan is loud and dirty, and the subway is depressing, and the fumes from the cars and cabs and buses can make people sick. Presumably for environmental reasons, New York City has one of the highest childhood-asthma rates in the country, with an especially alarming concentration in East Harlem.

Nevertheless, barring an almost inconceivable reduction in the earth's population, dense urban centers offer one of the few plausible remedies for some of the world's most discouraging environmental ills. To borrow a term from the jargon of computer systems, dense cities are scalable, while sprawling suburbs are not. The environmental challenge we face, at the current stage of our assault on the world's non-renewable resources, is not how to make our teeming cities more like the pristine countryside. The true challenge is how to make other settled places more like Manhattan. This notion has yet to be widely embraced, partly because it is counterintuitive, and partly because most Americans, including most environmentalists, tend to view cities the way Thomas Jefferson did, as "pestilential to the morals, the health, and the liberties of man." New York is the place that's fun to visit but you wouldn't want to live there. What could it possibly teach anyone about being green?

New York's example, admittedly, is difficult for others to imitate, because the city's remarkable population density is the result not of conscientious planning but of a succession of serendipitous historical accidents. The most important of those accidents was geographic: New York arose on a smallish island rather than on the mainland edge of a river or a bay, and the surrounding water served as a physical constraint to outward expansion. Manhattan is like a typical seaport turned inside out-a city with a harbor around it, rather than a harbor with a city along its edge. Insularity gave Manhattan more shoreline per square mile than other ports, a major advantage in the days when one of the world's main commercial activities was moving cargoes between ships. It also drove early development inward and upward.

A second lucky accident was that Manhattan's street plan was created by merchants who were more interested in economic efficiency than in boulevards, parks, or empty spaces between buildings. The resulting crush of architecture is actually humanizing, because it brings the city's commercial, cultural, and other offerings closer together, thereby increasing their accessibility-a point made forty-three years ago by the brilliantly iconoclastic urban thinker Jane Jacobs, in her landmark book "The Death and Life of Great American Cities."

A third accident was the fact that by the early nineteen-hundreds most of Manhattan's lines had been filled in to the point where not even Robert Moses could easily redraw them to accommodate the great destroyer of American urban life, the automobile. Henry Ford thought of cars as tools for liberating humanity from the wretchedness of cities, which he viewed with as much distaste as Jefferson did. In 1932, John Nolen, a prominent Harvard-educated urban planner and landscape architect, said, "The future city will be spread out, it will be regional, it will be the natural product of the automobile, the good road, electricity, the telephone, and the radio, combined with the growing desire to live a more natural, biological life under pleasanter and more natural conditions." This is the idea behind suburbs, and it's still seductive. But it's also a prescription for sprawl and expressways and tremendous waste.

New York City's obvious urban antithesis, in terms of density and automobile use, is metropolitan Los Angeles, whose metastatic outward growth has been virtually unimpeded by the lay of the land, whose early settlers came to the area partly out of a desire to create space between themselves and others, and whose main development began late enough to be shaped by the needs of cars. But a more telling counterexample is Washington, D.C., whose basic layout was conceived at roughly the same time as Manhattan's, around the turn of the nineteenth century. The District of Columbia's original plan was created by an eccentric French-born engineer and architect named Pierre-Charles L'Enfant, who befriended General Washington during the Revolutionary War and asked to be allowed to design the capital. Many of modern Washington's most striking features are his: the broad, radial avenues; the hub-like traffic circles; the sweeping public lawns and ceremonial spaces.

Washington is commonly viewed as the most intelligently beautiful-the most European-of large American cities. Ecologically, though, it's a mess. L'Enfant's expansive avenues were easily adapted to automobiles, and the low, widely separated buildings (whose height is limited by law) stretched the distance between destinations.

There are many pleasant places in Washington to go for a walk, but the city is difficult to get around on foot: the wide avenues are hard to cross, the traffic circles are like obstacle courses, and the grandiloquent empty spaces thwart pedestrians, by acting as what Jane Jacobs calls "border vacuums." (One of Jacobs's many arresting observations is that parks and other open spaces can reduce urban vitality, by creating dead ends that prevent people from moving freely between neighborhoods and by decreasing activity along their edges.) Many parts of Washington, furthermore, are relentlessly homogeneous. There are plenty of dignified public buildings on Constitution Avenue, for example, but good luck finding a dry cleaner, a

Chinese restaurant, or a grocery store. The city's horizontal, airy design has also pushed development into the surrounding countryside. The fastest-growing county in the United States is Loudoun County, Virginia, at the rapidly receding western edge of the Washington metropolitan area.

The Sierra Club, an environmental organization that advocates the preservation of wilderness and wildlife, has a national campaign called Challenge to Sprawl. The aim of the program is to arrest the mindless conversion of undeveloped countryside into subdivisions, strip malls, and S.U.V.-clogged expressways. The Sierra Club's Web site features a slide-show-like demonstration that illustrates how various sprawling suburban intersections could be transformed into far more appealing and energy-efficient developments by implementing a few modifications, among them widening the sidewalks and narrowing the streets, mixing residential and commercial uses, moving buildings closer together and closer to the edges of sidewalks (to make them more accessible to pedestrians and to increase local density), and adding public transportation-all fundamental elements of the widely touted anti-sprawl strategy known as Smart Growth.

In a recent telephone conversation with a Sierra Club representative involved in Challenge to Sprawl, I said that the organization's anti-sprawl suggestions and the modified street-scapes in the slide show shared many significant features with Manhattan-whose most salient characteristics include wide sidewalks, narrow streets, mixed uses, densely packed buildings, and an extensive network of subways and buses.

The representative hesitated, then said that I was essentially correct, although he would prefer that the program not be described in such terms, since emulating New York City would not be considered an appealing goal by most of the people whom the Sierra Club is trying to persuade.

An obvious way to reduce consumption of fossil fuels is to shift more people out of cars and into public transit. In many parts of the country, though, public transit has been stagnant or in decline for years. New York City's Metropolitan Transportation Authority and Department of Transportation account for nearly a third of all the transit passenger miles travelled in the United States and for nearly four times as many passenger miles as the Washington Metropolitan Area Transit Authority and the Los Angeles County Metropolitan Transportation Authority combined.

New York City looks so little like other parts of America that urban planners and environmentalists tend to treat it as an exception rather than an example, and to act as though Manhattan occupied an idiosyncratic universe of its own. But the underlying principles apply everywhere. "The basic point," Jeffrey Zupan, an economist with the Regional Planning Association, told me, "is that you need density to support public transit.

In all cities, not just in New York, once you get above a certain density two things happen. First, you get less travel by mechanical means, which is another way of saying you get more people walking or biking; and, second, you get a decrease in the trips by auto and an increase in the trips by transit. That threshold tends to be around seven dwellings per acre. Once you cross that line, a bus company can put buses out there, because they know they're going to have enough passengers to support a reasonable frequency of service."

Phoenix is the sixth-largest city in the United States and one of the fastest-growing among the top ten, yet its public transit system accounts for just one per cent of the passenger miles that New York City's does. The reason is that Phoenix's burgeoning population has spread so far across the desert-greater Phoenix, whose population is a little more than twice that of Manhattan, covers more than two hundred times as much land-that no transit system could conceivably serve it.
And no amount of browbeating, public-service advertising, or federal spending can change that.

Cities, states, and the federal government often negate their own efforts to nurture public transit by simultaneously spending huge sums to make it easier for people to get around in cars. When a city's automobile traffic becomes congested, the standard response has long been to provide additional capacity by building new roads or widening existing ones. This approach eventually makes the original problem worse, by generating what transportation planners call "induced
traffic": every mile of new highway lures passengers from public transit and other more efficient modes of travel, and makes it possible for residential and commercial development to spread even farther from urban centers. And adding public transit in the hope of reducing automobile congestion is as self-defeating as building new highways, because unclogging roads, if successful, just makes driving seem more attractive, and the roads fill up again. A better strategy would be to eliminate existing traffic lanes and parking spaces gradually, thereby forcing more drivers to use less environmentally damaging alternatives-in effect, "induced transit."

One reason New Yorkers are the most dedicated transit users in America is that congestion on the city's streets makes driving extraordinarily disagreeable. The average speed of crosstown traffic in Manhattan is little more than that of a brisk walker, and in midtown at certain times of the day the cars on the side streets move so slowly that they appear almost to be parked. Congestion like that urges drivers into the subways, and it makes life easier for pedestrians and bicycle riders by slowing cars to a point where they constitute less of a physical threat.

Even in New York City, the relationship between traffic and transit is not

well understood. A number of the city's most popular recent transportation-related projects and policy decisions may in the long run make the city a worse place to live in by luring passengers back into their cars and away from public transportation: the rebuilding and widening of the West Side Highway, the implementation of EZ-Pass on the city's toll bridges, the decision not to impose tolls on the East River bridges, and the current renovation of the F.D.R. Drive (along with the federally funded hundred-and-thirty-nine-million- dollar Outboard Detour Roadway, which is intended to prevent users of the F.D.R. from being inconvenienced while the work is under way).

Public transit itself can be bad for the environment if it facilitates rather than discourages sprawl. The Washington Metropolitan Area Transit Authority is considering extensions to some of the most distant branches of its system, and those extensions, if built, will allow people to live even farther from the city's center, creating new, non-dense suburbs where all other travel will be by automobile, much of it to malls and schools and gas stations that will be built to accommodate them. Transit is best for the environment when it helps to concentrate people in dense urban cores. Building the proposed Second Avenue subway line would be environmentally sound, because it would increase New Yorkers' ability to live without cars; building a bullet train between Penn Station and the Catskills (for example) would not be sound, because it would enable the vast, fuel-squandering apparatus of suburbia to establish itself in a region that couldn't support it otherwise.

On the afternoon of August 14, 2003, I was working in my office, on the third floor of my house, when the lights blinked, my window air-conditioner sputtered, and my computer's backup battery kicked in briefly. This was the beginning of the great blackout of 2003, which halted electric service in parts of eight Northeastern and Midwestern states and in southeastern Canada. The immediate cause was eventually traced to Ohio, but public attention often focussed on New York City, which had the largest concentration of affected power customers.
Richard B. Miller, who resigned as the senior energy adviser for the city of New York six weeks before the blackout, reportedly over deep disagreements with the city's energy policy, told me, "When I was with the city, I attended a conference on global warming where somebody said, 'We really need to raise energy and electricity prices in New York City, so that people will consume less.' And my response at that conference was 'You know, if you're talking about raising energy prices in New York City only, then you're talking about something that's really bad for the environment. If you make energy prices so expensive in the city that a business relocates from Manhattan to New Jersey, what you're really talking about, in the simplest terms, is a business that's moving from a subway stop to a parking lot. And which of those do you think is worse for the environment?' "

People who live in cities use only about half as much electricity as people who don't, and people who live in New York City generally use less than the urban average. A truly enlightened energy policy would reward city dwellers and encourage others to follow their good example. Yet New York City residents pay more per kilowatt-hour than almost any other American electricity customers; taxes and other government charges, most of which are not enumerated on electricity bills, can constitute close to twenty per cent of the cost of power for residential and commercial users in New York. Richard Miller, after leaving his job with New York City, went to work as a lawyer in Consolidated Edison's regulatory affairs department, spurred by his thinking about the environment. He believes that state and local officials have historically taken unfair advantage of the fact that there is no political cost to attacking a big utility. Con Ed pays more than six hundred million dollars a year in property taxes, making it by far the city's largest property-tax payer, and those charges inflate electric bills. Meanwhile, the cost of driving is kept artificially low. (Fifth Avenue and the West Side Highway don't pay property taxes, for example.) "In addition," Miller said, "the burden of improving the city's air has fallen far more heavily on power plants, which contribute only a small percentage of New York City's air pollution, than it has on cars-even though motor vehicles are a much bigger source."

Last year, the National Building Museum, in Washington, D.C., held a show called "Big & Green: Toward Sustainable Architecture in the 21st Century." A book of the same name was published in conjunction with the show, and on the book's dust jacket was a photograph of 4 Times Square, also known as the Condé Nast Building, a forty-eight-story glass-and-steel tower between Forty-second and Forty-third Streets, a few blocks west of Grand Central Terminal. (The New Yorker's offices occupy two floors in the building.) When 4 Times Square was built, in 1999, it was considered a major breakthrough in urban development. As Daniel Kaplan, a principal of Fox & Fowle Architects, the firm that designed it, wrote in an article in Environmental Design & Construction in 1997, "When thinking of green architecture, one usually associates smaller scale," and he cited as an example the headquarters of the Rocky Mountain Institute, a nonprofit environmental research and consulting firm based in Snowmass, Colorado. The R.M.I. building is a four-thousand-square-foot, super-insulated, passive-solar structure with curving sixteen-inch-thick walls, set into a hillside about fifteen miles north of Aspen. It was erected in the early eighties and serves partly as a showcase for green construction technology. (It is also the home of Amory Lovins, who is R.M.I.'s cofounder and chief executive officer.) R.M.I. contributed to the design of 4 Times Square, which has many innovative features, among them collection chutes for recyclable materials, photovoltaic panels incorporated into parts of its skin, and curtain-wall construction with exceptional shading and insulating properties.

These are all important innovations. In terms of the building's true ecological impact, though, they are distinctly secondary. (The power generated by the photovoltaic panels supplies less than one per cent of the building's requirements.) The two greenest features of 4 Times Square are ones that most people never even mention: it is big, and it is situated in Manhattan.

Environmentalists have tended to treat big buildings as intrinsically wasteful, because large amounts of energy are expended in their construction, and because the buildings place intensely localized stresses on sewers, power lines, and water systems.

But density can create the same kinds of ecological benefits in individual structures that it does in entire communities. Tall buildings have much less exposed exterior surface per square foot of interior space than smaller buildings do, and that means they present relatively less of themselves to the elements, and their small roofs absorb less heat from the sun during cooling season and radiate less heat from inside during heating season.

(The beneficial effects are greater still in Manhattan, where one building often directly abuts another.) A study by Michael Phillips and Robert Gnaizda, published in CoEvolution Quarterly in 1980, found that an ordinary apartment in a typical building near downtown San Francisco used just a fifth as much heating fuel as a new tract house in Davis, a little more than seventy miles away. Occupants of tall buildings also do a significant part of their daily coming and going in elevators, which, because they are counterweighted and thus require less motor horsepower, are among the most energy-efficient passenger vehicles in the world.

Bruce Fowle, a founder of Fox & Fowle, told me, "The Condé Nast Building contains 1.6 million square feet of floor space, and it sits on one acre of land. If you divided it into forty-eight one-story suburban office buildings, each averaging thirty-three thousand square feet, and spread those one-story buildings around the countryside, and then added parking and some green space around each one, you'd end up consuming at least a hundred and fifty acres of land. And then you'd have to provide infrastructure, the highways and everything else." Like many other buildings in Manhattan, 4 Times Square doesn't even have a parking lot, because the vast majority of the six thousand people who work inside it don't need one. In most other parts of the country, big parking lots are not only necessary but are required by law. If my town's zoning regulations applied in Manhattan, 4 Times Square would have needed sixteen thousand parking spaces, one for every hundred square feet of office floor space. The Rocky Mountain Institute's showcase headquarters has double-paned krypton-filled windows, which admit seventy-five per cent as much light as ordinary windows while

allowing just ten per cent as much heat to escape in cold weather. That's a wonderful feature, and one of many in the building which people ought to copy. In other ways, though, the R.M.I. building sets a very poor environmental example. It was built in a fragile location, on virgin land more than seven thousand feet above sea level. With just four thousand square feet of interior space, it can hold only six of R.M.I.'s eighteen full-time employees; the rest of them work in a larger building a mile away. Because the two buildings are in a thinly populated area, they force most employees to drive many miles-including trips between the two buildings-and they necessitate extra fuel consumption by delivery trucks, snowplows, and other vehicles. If R.M.I.'s employees worked on a single floor of a big building in Manhattan (or in downtown Denver) and lived in apartments nearby, many of them would be able to give up their cars, and the thousands of visitors who drive to Snowmass each year to learn about environmentally responsible construction could travel by public transit instead.

Picking on R.M.I.-which is one of the world's most farsighted environmental organizations-may seem unfair, but R.M.I., along with many other farsighted environmental organizations, shares responsibility for perpetuating the powerful anti-city bias of American environmentalism. That bias is evident in the technical term that is widely used for sprawl: "urbanization." Thinking of freeways and strip malls as "urban" phenomena obscures the ecologically monumental difference between Phoenix and Manhattan, and fortifies the perception that population density is an environmental ill. It also prevents most people from recognizing that R.M.I.'s famous headquarters-which sits on an isolated parcel more than a hundred and eighty miles from the nearest significant public transit system-is sprawl.

When I told a friend recently that I thought New York City should be considered the greenest community in America, she looked puzzled, then asked, "Is it because they've started recycling again?" Her question reflected a central failure of the American environmental movement: that too many of us have been made to believe that the most important thing we can do to save the earth and ourselves is to remember each week to set our cans and bottles and newspapers on the curb. Recycling is popular because it enables people to relieve their gathering anxieties about the future without altering the way they live. But most current recycling has, at best, a neutral effect on the environment, and much of it is demonstrably harmful. As William McDonough and Michael Braungart point out in "Cradle to Cradle: Remaking the Way We Make Things," most of the materials we place on our curbs are merely "down-cycled"-converted to a lower use, providing a pause in their inevitable journey to a landfill or an incinerator-often with a release of toxins and a net loss of fuel, among other undesirable effects.

By far the worst damage we Americans do to the planet arises not from the newspapers we throw away but from the eight hundred and fifty million or so

gallons of oil we consume every day. We all know this at some level, yet we live like alcoholics in denial. How else can we explain that our cars have grown bigger, heavier, and less fuel-efficient at the same time that scientists have become more certain and more specific about the consequences of our addiction to gasoline?

On a shelf in my office is a small pile of recent books about the environment which I plan to reread obsessively if I'm found to have a terminal illness, because they're so unsettling that they may make me less upset about being snatched from life in my prime. At the top of the pile is "Out of Gas: The End of the Age of Oil," by David Goodstein, a professor at the California Institute of Technology, which was published earlier this year. "The world will soon start to run out of conventionally produced, cheap oil," Goodstein begins. In succeeding pages, he lucidly explains that humans have consumed almost a trillion barrels of oil (that's forty-two trillion gallons), or about half of the earth's total supply; that a devastating global petroleum crisis will begin not when we have pumped the last barrel out of the ground but when we have reached the halfway point, because at that moment, for the first time in history, the line representing supply will fall through the line representing demand; that we will probably pass that point within the current decade, if we haven't passed it already; that various well-established laws of economics are about to assert themselves, with disastrous repercussions for almost everything; and that "civilization as we know it will come to an end sometime in this century unless we can find a way to live without fossil fuels."

Standing between us and any conceivable solution to our energy nightmare are our cars and the asphalt-latticed country we have built to oblige them. Those cars have defined our culture and our lives. A car is speed and sex and power and emancipation. It makes its driver a self-sufficient nation of one. It is everything a city is not.

Most of the car's most tantalizing charms are illusory, though. By helping us to live at greater distances from one another, driving has undermined the very benefits that it was meant to bestow. Ignacio San Martín, an architecture professor and the head of the graduate urban-design program at the University of Arizona, told me, "If you go out to the streets of Phoenix and are able to see anybody walking-which you likely won't-they are going to tell you that they love living in Phoenix because they have a beautiful house and three cars. In reality, though, once the conversation goes a little bit further, they are going to say that they spend most of their time at home watching TV, because there is absolutely nothing to do." One of the main attractions of moving to the suburbs is acquiring ground of your own, yet you can travel for miles through suburbia and see no one doing anything in a yard other than working on the yard itself (often with the help of a riding lawn-mower, one of the few four-wheeled passenger vehicles that get

worse gas mileage than a Hummer). The modern suburban yard is perfectly, perversely self-justifying: its purpose is to be taken care of.

In 1801, in his first Inaugural address, Thomas Jefferson said that the American wilderness would provide growing room for democracy-sustaining agrarian patriots "to the thousandth and thousandth generation." Jefferson didn't foresee the interstate highway system, and his arithmetic was off, in any case, but he nevertheless anticipated (and, in many ways, embodied) the ethos of suburbia, of anti-urbanism, of sprawl. The standard object of the modern American dream, the single-family home surrounded by grass, is a mini-Monticello. It was the car that put it within our reach. But what a terrible price we have paid-and have yet to pay-for our liberation from the city.

Date: Fri, 03 Dec 2004 15:52:39 -0500
From: "Susana B. Adamo" <sbadamo@email.unc.edu>
To: pernseminars@ciesin.columbia.edu
Subject: Re: [PERNSeminar_UrbanExpansion]

Below is the abstract of a paper by Susana Kralich, researcher of the University of Buenos Aires, proposing a new methodology for delimiting metropolitan areas.
For those interested, the article (in Spanish) may be requested to skralich@fadu.uba.ar

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THE PUBLIC URBAN TRANSPORTATION NETWORK AS A TOOL FOR DELIMITING
METROPOLITAN AREAS

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Abstract

Cities are complex socio-spatial phenomena, which is evident in the numerous and varied concepts and criteria that have been used to define them. The terms great city, metropolitan area, metropolis and agglomeration are frequently used when analyzing the expansion of urban areas, for suggesting something that is larger that a city. However, there is not consensus about their conceptual content or their territorial boundaries.

Taking in account this complexity, the establishment of boundaries when urban growth goes beyond the limits of a particular city, needs to contemplate more that the mere morphologic continuity of the urban sprawl. The consideration of the web of relationships that the city establishes with its surroundings appears as a possible option, particularly those related to daily commuting, generally represented by the transportation system.

The Metropolitan Area of Buenos Aires is a good example of urban sprawl, new boundaries and multiple criteria. This area currently includes a confusing ensemble of several administrative units: the city of Buenos Aires plus a number of counties (‘partidos’ in the local slang) of the neighboring state -provincia- of Buenos Aires), consequence of both the process of urban expansion and the subdivision of previously existing units. In addition to this, the criteria used for including or excluding units in the Metropolitan Area are generally not explicit. This paper offers some clarifications about the aforementioned issues, presents the results of the survey, and includes a methodological proposal for delimiting local metropolitan areas, based on transportation networks.

(Translated by Susana Adamo)

From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Extended Urbanization in the Brazilian Amazonia
Date: Sat, 4 Dec 2004 12:34:39 -0500

In Thursday's posting, Tony Champion wrote that the "two-way urban-rural split is an extremely crude way of classifying places in a country.... [I]t is becoming increasingly difficult to classify each part of national territory as definitely urban and definitely rural. Indeed, these two problems work together to render the basic dichotomy increasingly obsolete." The contribution by Roberto Monte-Mór (below) echoes this observation in the context of the Brazilian Amazon. He introduces the concept of "extended urbanization," which is the "extension of contemporary socio-spatial relations—urban-industrial forms and processes—formerly restricted to cities and towns onto regional, national, and global scales."

One question I would pose to the group: Is this so new? Have not rural areas in the "periphery" always been tied in some form to the urban "core" through economic linkages? Roberto writes further, "The implications of such an understanding of extended urbanization and production of social space for environmental and health conditions are manifold if we consider that politics and citizenship are extended onto social space as a whole along with the urban tissue." If I could prevail on you Roberto, would you mind unpacking that a bit further?

-Alex de Sherbinin, PERN Coordinator

"Extended Urbanization in the Brazilian Amazonia"

Panel contribution by Roberto L. Monte-Mór, Professor, Federal University of Minas Gerais, Brazil, Email: montemor @cedeplar.ufmg.br)

The Brazilian Amazonia [1] is being socio-economically, spatially, and ecologically restructured as bulldozers, chainsaws, and axes combine to destroy the tropical rainforest and replace it with agricultural and grass lands, mining camps, and towns and hamlets of various sorts. In the southern part where upper lands predominate, highways and roads connect urban centers, rural areas, and mining sites cutting across the forest, fields and savannas attracting several economic activities and millions of migrants that come from all over the country in search of profits or a better life.

Amazonia is still largely perceived as a rural region, if not a pristine jungle. The regional economies that have produced it—mining, agriculture, and cattle ranching, not to speak of forest extraction—are commonly identified as rural activities. Although state city-capitals and middle-size commercial towns grew intensively in population in the past decades, they are still questioned in their urbanity in the face of their unstable mobile migrant populations and precarious urban (infra) structures. Small towns marked by muddy roads and palm-tree huts popping along farming and mining areas amidst the exuberant tropical forest do not easily suggest a steady

urbanization process.

Amazonian urban growth has thus many times been understood as a temporary feature due to the inefficiency of institutions in distributing rural land. Towns are often seen as doomed to shrink or disappear as rural occupation intensifies leaving only central places to support country life. Therefore, most attempts to occupy Amazonia were—and still are—thought of on the basis of its alleged rural, if not peasant, regional vocation.

I argue, instead, that the urban phenomenon is not only present in Amazonian cities and towns but also in various other socio-spatial forms such as mining areas, settlement and/or colonization projects, timber industries, cattle-ranching and farm enterprises, in addition to urban concentrations of commerce and services spread throughout the region [2]. The urban phenomenon has reached Brazil's farthest and wildest frontier, gone into forested areas and produced a variety of social processes and spatial forms. The new socio-spatial relations thus produced combine apparently oppositional spaces—the jungle and the urban tissue—and are currently being (re)construed in everyday socio-spatial practices under the hegemonic logic that emanates from Brazil's urban-industrial forces centered in its metropolitan areas.

The intense process of urbanization in the past decades produced a myriad of urban forms beyond cities and towns that have required new definitions beyond the traditional categories of city/country and urban/rural. The expansion of metropolitan areas upon their hinterlands, new municipal associations involving middle-size cities and towns, and the extension of urban infrastructure and social services onto rural areas, both extensively and in concentrated nuclei, produced micro-regional organizations and hybrid city-country socio-spatial relations that do not fit the traditional classifications. New residential developments, resort and (eco)tourism areas, services/commercial centers in the countryside, agro-industrial complexes, isolated power and industrial plants (particularly of intermediate goods such as mineral extraction, steel, cellulose, cement, among others) have produced new socio-spatial configurations that cannot be easily defined as urban or rural. Sub-categories are being created within the broad urban-rural dichotomy in an attempt to deal with the variety of new urban-rural forms, such as: isolated urban areas, areas of urban expansion, agglomerations from urban extension, rural nuclei, and rural settlements, among others [3].

The complexity that characterizes current urbanization in Amazonia (and in Brazil as a whole) thus requires new approaches and ways of inquiring and understanding the diverse socio- spatial forms and processes that are being created throughout the territory beyond the city-country dichotomy. Urban-industrial capitalism, once concentrated only in metropolitan regions and in a few other urban areas has, in the past decades, been extended onto

the countryside along roads and highways, electric power lines, communication infrastructure and services, urban, social, financial services and legal requirements, the State apparatus at its various levels (including the new municipalities), labor legislation, organization, control and social benefits, carrying beyond cities and towns those and other socio-spatial aspects of contemporary urban-industrial life.

The urban tissue that extended from metropolises and large cities onto their rural hinterlands reached regional space in a variety of urban-rural forms, more or less dense, more or less equipped with infrastructure and services, and more or less economically, politically, and culturally linked to the national core(s). The result has been the extension of socio-spatial relations that were proper and limited to cities and urban centers to rural and regional space. This extension of the urban-industrial process allows us to speak of an urbanization that has been—or is being, in the case of developing regions—virtually extended upon social space as a whole. Therefore, the concept of extended urbanization [4] expresses a particular social spatiality brought about by late capitalism and extended onto isolated areas reaching unprecedented levels of time/space/societal (re)articulation.

Extended urbanization refers thus to the extension of contemporary socio-spatial relations—urban-industrial forms and processes—formerly restricted to cities and towns onto regional, national, and global scales. It encompasses the socio-spatial fabric that stems from the dialectical unity of dense urban centralities consolidated what as command centers and the urban tissue that extends the variety urban-industrial forms and processes onto the countryside and social space. Extended urbanization carries within it urban praxis as a characteristic of its urban character, bringing thus politics along with it and producing the politicization of social space as a whole. The resulting socio-spatial fabric is therefore not only material or territorial, but it brings within it the extension or urban praxis in a symbolic way, extending the meaning and the scope of urban life to spaces and territories never before touched by the sense of pertinence and integration to the command centers.

Through extended urbanization multiple urban centralities, from cities and towns to commercial and service centers, industrial plants, large ranches, local communities, rubber estates, and even(tually) indigenous areas combine to connect and (re)articulate local, regional, national and global forces and thus produce a variety of locales and populations more or less linked to urban-industrial capitalism. Extended urbanization carries within it the socio-spatial processes and forms that are proper to industrial capitalism, manifested both in its early expression—the industrial city—and its contemporary globalized urban-industrial manifestations.

The implications of such an understanding of extended urbanization and production of social space for environmental and health conditions are manifold if we consider that politics and citizenship are extended onto social space as a whole along with the urban tissue. The proliferation of socio-political organization groups in Amazonia (and in Brazil), from native populations to migrant workers of all sorts, brings about new possibilities of social control over everyday spaces of reproduction and local environmental and health conditions.

End Notes

[1] The Amazon River Basin—Amazonia—extends from the Atlantic Coast to the Andean Mountains comprising areas in nine countries: Brazil, Bolivia, Colombia, Ecuador, French Guyana, Guyana, Peru, Suriname and Venezuela. Brazilian Amazonia encompasses the Amazon's low lands and slopes of the Central Plateau and Guyana Shield. Amazonia Legal, a planning region encompassing nine states in Brazil, has circa five million square kilometers, over half of the national territory.

[2] I draw the concept of urban phenomenon from Henri Lefebvre's neo-Marxist interpretation of contemporary urbanization, referring to the specific spatiality of capitalist societies; urbanization, urbanity, urban tissue, urban nucleus-i, urban center, urban process, urban-industrial, and finally, urban, all are used within the same theoretical Lefebvrian perspective.

[3] The legal definition of urban in Brazil included, until 1988, only the area (and population) contained within a perimeter around municipal headquarter—cidades—and municipal district headquarters—vilas.

[4] Extended urbanization is inspired on Henri Lefèbvre's urban tissue and urban revolution.

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Date: Sat, 4 Dec 2004 21:47:41 -0800 (PST)
From: ALHAJ HAJHAMAD <sahdcg@yahoo.com>
Subject: [PERNSeminar_UrbanExpansion] contribution-history develops unevenly
To: pernseminars@ciesin.columbia.edu

dear all,

I am sorry for the late entry. However ,I was in atrip that took me to three "urban" centers in the oil rich tropical forests of sudan.These are Mujlad,Debbab,And Abei.When the un plane landed at Abei ,a tiny rural/urban settelement with 5ooo inhabitants,My feeling iam in anafrican medeaval village,with one exception that people are dhaving clothes rather than kirn of leather or reads,as u observe from travelers narrative.This gives me aflash back to city states that flourished in the 17th-19th century on the red sea coast.These were depots for luxury goods brought to the aficansfrom india by arab boats and exchanged by african slaves,ivory and ostrich feathers.when the main raw material needed by oreintal markets ,under the impact of colonisation by the british,these cities disappeared ,Ayghab,Sawakin,Musawa,Kilwa.Those ports that are useful to the new masters continued but their hinterland capital cities also dewndilled.This process of fake ,short lived urbanisation,Changing tastes of local groups and define certain consumables as related to asociological category,Must end interms of impericism versus political economy.the rights based approach may help students of urban studies to look at methods that help verify,the reality of imperialisms viscous,profit making processesand the level of urban development sustainability as abasic human right.In such acontext we can see how the chines ,indianand malysian imperialism is under developing the area which i visited .They extract oil with out giving people a chanece to move from the centuries long underdevelopment of their resources,So inconclusion it is clear ,using the political economy approach(comprehsive approach) we can see issues of sustainability,continuity,cuts and change asaprocess of human urban development.This need huge army of reseachers and along time to reach apoint of fruition
Hajhamad(ph.d)historical demography-sudan

Date: Sun, 05 Dec 2004 18:00:38 -0500
From: Kai Lee <Kai.N.Lee@williams.edu>
Subject: Re: [PERNSeminar_UrbanExpansion]

Professor Monte-Mor and Professor Champion both comment on the erosion of simple spatial distinctions between urban and rural. Their observations and suggestions enter this seminar on the heels of questions and discussion of how to identify a land use as urban, particularly given the availability of remote sensing data

Champion proposes the idea of "spatial container" for different dimensions of the life of residents in a place, so that one could distinguish among, say, income-earning opportunities and access to recreation in a settlement. From that perspective a "city" is an accretion of different containers, related to one another through physical processes (a watershed provides for municipal and industrial demand, but that demand in turn imposes water pollution burdens which may or may not be handled well over time) and market interactions (high income may stimulate growth of cultural innovations such as theaters, which in turn reach out to find spatial containers for their customers).

As the cost of energy for transporting goods and people has fallen, and as the cost of disseminating information fell through the 20th century, the shapes of many spatial containers expanded -- perhaps in unprecedented ways. The trade in ivory and ostrich feathers that Professor Hajhamad describes became global in reach; that isn't new but rather reflects a pattern that drove mercantilism and colonialism. What is important is not novelty but rather the continued maintenance of effective control by elites in "global" cities (Sassen), even as measures of human well-being were improving while population was growing sixfold -- a historically unprecedented performance.

(Salonius and others have commented on the possibility that energy costs will rise again. The implicit warning is that urbanization choices made now may be creating settlements and economies that are dysfunctional in such a world, like the African ports that shriveled once trade patterns changed.)

The dynamism that Monte-Mor summarizes as "urban tissue" seems very complicated, and David Satterthwaite's skepticism about large-scale patterns and trends is important to bear in mind. The dimensions along which to look for spatial containers may not be universal in their significance. In thinking about the environmental implications of rapid urbanization, the most helpful ideas lie in a middle range of generalization, not in abstract reformulations of social theory nor in

the particularities of case histories.

Gordon McGranahan and colleagues at the International Institute for Environment and Development have been using a helpful mid-range distinction. They observe that the environmental challenges facing people in human settlements vary systematically and in spatial scope by income level.

Poor cities wrestle with unsafe water and waterborne illnesses spread by deficient sanitation. The natural scale of this problem is the neighborhood, within which one can build water pipes and sewers.

Industrializing cities face region-scale problems from air pollution and insecurity of water supply. Watershed and airshed, affected by action at metropolitan or provincial levels of governance are commonly important.

Cities in wealthy countries (including global cities) have largely solved local and regional environmental problems. Their environmental challenges are large scale, often global, as is the case with greenhouse gases. Those challenges are mediated by global markets, driving behaviors in industrializing cities' factories and in poor countries' commodity markets. As Monte-Mor's comment makes clear, political representation has yet to follow the expansion of influence via markets. That means, in particular, that the shifting of environmental pressures across jurisdictional boundaries is so common as to be inescapable.

(I have taken liberties in paraphrasing McGranahan. See The Citizens at Risk (2003) for a proper discussion.)

This suggests that the spatial containers of environmental concern vary systematically by income, and that this simple taxonomy captures enough to be useful. What do others think about that approach?

Kai N. Lee, Rosenburg Professor of Environmental Studies, Williams College, Center for Environmental Studies, Kellogg House, P.O. Box 632, Williamstown MA 01267 USA. 01+413-597-2358 (voice), 01+413-597-3489 (fax), Kai.N.Lee@williams.edu, http://www.williams.edu/CES/ces/people/klee/klee.htm

From: "David Pepper" <drpepper@ucsfresno.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] RE: GIS Urban "objects" and layers
Date: Mon, 6 Dec 2004 10:01:59 -0800

Kai,

Excellent description and discourse on spatial containers -thank you.

Might I suggest - that in today's GIS information culture we might want to think in terms of Objects and layers.....instead of "spatial containers"? And that such an object as a GIS "layer" - of Air, water, recreation, population, SES, income, etc has defined parameters (housing density, air pollution burden, health parameters) that we can Map.

As a physician, I'm more interested in the human condition from a health point of view, but if we "layer" on various objects/burdens/resources perhaps we can find common patterns of "successful" and "problematic" areas? Yes knowledge sharing has increased and become cheaper - but are we using it to its fullest advantage? There are many in the public health realm interested in the "built environment" - are we defining it here in social terms?

Additionally, the "boundary issues" inherent in GIS may help us to think in terms of what we are defining and where its edges are for each layer. How sharp are the edges of urban sprawl? Clearly in some situations like New York or San Francisco they have defined edges - water, while in other areas they are much less constrained - and politics and infrastructure may be more limiting.

Might tt also may be helpful to think in terms of Output? - both what an area literally outputs (makes, industry, agriculture, etc), and also its waste/trash/etc, since ultimately the globe is a zero sum game in terms of Air Pollution, human waste, etc....

David Pepper MD, MS
Assoc Clinical Professor - Family and Community Medicine
UCSF-Fresno

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Date: Mon, 06 Dec 2004 11:52:51 -0800
To: pernseminars@ciesin.columbia.edu
From: "John R. Weeks" <john.weeks@sdsu.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] RE: GIS Urban "objects" and layers

David and Kai,

The discussion about using remotely sensed imagery to help us better understand intra-urban variability in health is exactly the goal of a recently funded NIH project that my colleagues and I are working on in Accra, Ghana. We are using high resolution imagery to quantify aspects of the built environment, building on urban ecological models that suggest that the built environment influences and in turn is influenced by the social environment. We layer our imagery-derived measures over census, survey, and vital statistics data to create a model of intra-urban patterns of health so that we can try to sort out both the proximate and distal causes of that variability. Ultimately, the results of such analyses should have policy implications in terms of helping to direct or redirect scarce resources toward those neighborhoods that are in the greatest need.

I hope to be able to put together a short summary of the project to be made available to the discussion during the week.

Thanks,

John Weeks

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From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Mon, 6 Dec 2004 20:10:00 -0500

We've had some good discussions addressing a range of issues such as urban form, how to measure urban areas, the usefulness of urban/rural distinctions, and on the impacts of economic globalization on urban growth. In the remaining week and a half of this seminar we of course welcome further contributions on those themes, but it would also be good if we could begin to hone in on the impacts of urban spatial expansion on the environment (locally or globally) and on human health.

Alonso Aguirre, Mary Pearl and Jonathan Patz provide our first panel contribution that focuses on the health dimension of urban expansion. It is an excellent summary of the issues - focusing on the impacts of urban land-use and land-cover change on ecosystems, and how changes in ecosystems in turn affect disease emergence and transmission. Is it possible that on of the biggest health effects of the urban age, with its characteristic of rapid transportation between urban centers (compared to slower transport to the hinterlands), will be the rapid transmission of diseases that in previous eras might have had only localized outbreaks?

-Alex de Sherbinin, PERN Coordinator

"Urban expansion impacts on the health of ecosystems, wildlife and humans"

Panel statement by A. Alonso Aguirre and Mary C. Pearl, Wildlife Trust, 61 Route 9W, Palisades, NY, and Jonathan Patz, Center for Sustainability and the Global Environment, University of Wisconsin, Madison, WI

On a global basis, it is estimated that the proportion of persons living in urban centers will increase to an unprecedented 65% by the year 2030. The 2000 census shows that 80% of the US population now lives in metropolitan areas, with 30% in cities of 5 million or more. The environmental issues posed by such large population centers have profound impacts on public health beyond the city limits. The United Nations has estimated that by year 2015 there will be 26 “megacities” (urban areas of 10 million inhabitants or more), most of them located in less industrialized nations. The factors causing the migration of masses of people from rural to urban

areas are linked to environmental degradation. For example, desertification, deforestation, drought and salination of soils are common causes of human migration to cities in Asia and Africa. Deteriorating conditions are also linked to high human growth rates and the inability of local environmental systems to sustain them. However, the prevalence of pollution, together with inadequate sewer and sanitation infrastructure in urban areas, has led to environmental crises at a global scale.

These changes in turn cause a cascade of factors that exacerbate disease emergence such as forest fragmentation, disease introduction, pollution and poverty. For example, recent research has shown that suburban sprawl, forest fragmentation and biodiversity loss are linked to Lyme disease risk in the Northeastern USA. Expansion and changes to agricultural practices are intimately associated with the emergence of Nipah virus in Malaysia, cryptosporidiosis in Europe and North America, and a range of food-borne illnesses globally. Road-building is linked to the expansion of bushmeat consumption and that may have played a key role in the early emergence of HIV-1 and –2.

Global urbanization linked to human migrations may drive disease emergence. For example, in Yunnan province, China, an increase in livestock populations and human migration has lead to an increase in the incidence of schistosomiasis. Human movement also has significant implications for public health. Travelers are not only at risk for contracting communicable diseases when visiting developing countries, but they also act as vectors for delivering infectious diseases to a region. Refugees account for a significant number of human migrants, carrying diseases such as hepatitis B and tuberculosis, as well as various parasites. Zoonotic pathogens are the most significant cause of emerging infectious diseases (EIDs) affecting humans, both in the proportion of EIDs they cause and in the impact they have. Some 1415 species of infectious organisms are known to be pathogenic to humans, with 61% being zoonotic. Seventy-five percent of "emerging pathogens" are zoonotic.

Stressors (e.g. microclimates, habitat alteration/destruction leading to both physical and psychological stress of humans and animals, air and water quality degradation) contribute to the development and spread of infectious disease agents as well as impact the susceptibility that increases prevalence of infectious disease. Human encroachment on wildlife habitat has broadened the interface between wildlife and humans – resulting in increased opportunities for both the emergence of novel diseases in wildlife, and their transmission to people. Rabies is an example of a zoonotic disease carried by animals that have become habituated to urban environments. Bats colonize buildings, skunks and raccoons scavenge human refuse, and in many countries feral dogs in the streets are as common as squirrels and are a major source of human infection.

It is important to note that despite much anecdotal evidence, we still do not understand many of the potential effects that urbanization and land use change might have on disease emergence. In order to be able to better predict disease emergence in the wake of urbanization, and thus make informed health-relevant policies, we need far more ecology and health analyses.

With such understanding, it will be easier to prevent new disease emergence. Yet since these episodes are often rare events, accurate predictions will remain daunting. It is already evident that inserting humans into complex ecosystems can lead to a variety of emerging diseases. But health outcomes depend on the economic circumstances of the human population. In poor and tropical communities, landscape change can lead to major shifts in disease patterns, such as, for example, dysentery, cholera and other sequelae after forest clearing results in flooding. Habitat fragmentation has been linked also to an increase of dengue, yellow fever and recent work has implicated AIDS, Ebola and Marburg linked to environmental changes. For these situations, many conventional public health interventions can prevent several diseases at relatively low cost. As for rich and temperate communities, the infectious disease shifts tend to be more disease specific, e.g., as in the case of habitat fragmentation and Lyme disease.

For sound health policy, we must shift away from dealing primarily with specific risk factors and look "upstream" to underlying landscape determinants of disease, and ultimately the human behavior and established institutions that are detrimental to sustainable population health. Infectious diseases in the urban environment are affected by a multitude of environmental and anthropogenic factors. Among these are pollution, water management, putrescible waste management, vector ecology, urban microclimates, and human encroachment on wildlife habitats. These fields are understudied and need to be researched in conjunction with how they impact population health. The impact of urbanization on ecosystem health is multi-faceted, and therefore we need to implement an interdisciplinary research program addressing such issues. Such a program will result in a better understanding of the effect of urban stressors on the susceptibility of human populations and sensitive subpopulations to infectious disease.

For the development of policy based on research results, a trans-disciplinary coalition is necessary to identify and address health issues at the local level. This coalition should be composed of local politicians, community representatives, economists, ecologists, public health workers, city planners (engineers and architects), social scientists and educators.

This manuscript was based on a larger paper recently published by Patz et

al. 2004

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Mon, 6 Dec 2004 21:34:26 -0500

One quick comment on this very interesting paper: The animals listed as hosts of zoonotic diseases in urban areas are all wild (bats, feral dogs, etc.). However, in some urban areas small livestock and fowl are kept by significant numbers of households for food and income. The implications for disease control are quite different in the two cases -- controlling wild populations might be difficult, but acceptable, while controlling a food source might be much trickier.

Eric

From: Gordon McGranahan <Gordon.McGranahan@iied.org>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Tue, 7 Dec 2004 09:31:36 -0000

This paper raises some critical issues, including the uncertainties and risks surrounding urbanization, changing mobility and the ecology of infectious diseases. The comment about domesticated animals is also pertinent, as it has been proposed that one of the reasons New World inhabitants came to be decimated by Old World diseases when the two populations came into contact was that only in the Old World had people shared their settlements with the domesticated animals the diseases had originated from (I am not sure whether this is widely accepted, or a minority view, and would appreciate some clarification on this). The strength of the paper is somewhat reduced by the tendency to focus exclusively on the negatives: environmental degradation is not a particularly important factor in urbanization, and urbanization brings health benefits and opportunities as well as risks. But I have a slightly different point to make about the spatial expansion of cities - which as I understand it is meant to be the central theme of this discussion.

The point is that managing urban development is a bigger challenge in low income countries (as various contributors have noted), but that among urban management challenges avoiding the spatial over-expansion of urban areas is a far higher priority in North America (where this topic was presumably selected).

Urban densities are already much lower in North America than elsewhere. Urban settlements in North America are more likely to encroach on agricultural land - judging from CIESEN's rural-urban mapping overlaid on the agro-ecosystem zones employed in the Millennium Ecosystems Assessment. I suspect it is also in North America that urban expansion is predominantly spatial - declining household size and increasing residential land use per capita are still driving rapid urban expansion, despite comparatively low population growth rates. Moreover, recent work on urban sprawl in the United States indicates that it is not just a major factor in driving petroleum

consumption, but also has a number of potentially negative effects on human health (Frumkin, Frank, and Jackson 2004).

Urban expansion is also an issue in the rest of the world of course. But in most of the world, urban sprawl is much less extreme. Particularly in low-income countries, where urban management problems are especially severe, it would be a big mistake to design policies with the primary aim of preventing urban expansion. One of the reasons informal settlements are already so pervasive in many countries is that land use regulations are unenforceable - and often with good reason. If strict regulations were enforced, we can be pretty sure it would be the poorest households who would suffer, and find they would find it far harder to find acceptable places to live. (More unenforced regulations, on the other hand, are clearly not needed.)

Of course, urban expansion is more than just a problem - it is a process. How the process unfolds matters to urban and rural dwellers everywhere. This is clear in relation to health, but also for many other issues. But it is still important that we distinguish between urban expansion as a problem (this is likely to apply particularly to North America) and urban expansion as an important process to understand (this applies everywhere, and nowhere more so than in some of the poorest countries in the world). In particular, it is important not to transpose affluent country priorities onto low-income settings, where environmental problems are often even more severe but involve different priorities. In short, it is probably for the best that contributors have not stuck too closely to the issues of spatial expansion when describing the challenges of urbanization in other parts of the world.

Gordon McGranahan.

Reference:
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Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Tue, 7 Dec 2004 21:03:53 +1100
From: "Colin Butler" <Colin.Butler@anu.edu.au>
To: <pernseminars@ciesin.columbia.edu>

Gordon

I have not heard this hypothesis about old world new world diseases before, as you explain it below, but even if this is a factor I would be a little sceptical of its importance. Take malaria and yellow fever - both were thought to have been taken to the New World through the early slave trade (eg William McNeill: Plagues and Peoples). There is some evidence that malaria in association with early rice farming, and rice was absent in the New World at that time, but this had nothing to do with domesticated animals. Ditto Yellow fever, which if my memory serves me correctly has a transmission cycle that involves mosquitoes, man and monkeys.

I also vaguely recall claims that there is evidence of TB in pre-Columbian skeletons, if true it might have crossed the Bering Strait. I guess this leaves smallpox, measles and lesser scourges. I think measles might have crossed into humans from dogs, so that might support your argument .. a bit. Also, I am unaware of important diseases crossing to humans from the more limited range of domesticated animals in the New World, eg turkeys and llamas.

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From: Gordon McGranahan <Gordon.McGranahan@iied.org>
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Date: Tue, 7 Dec 2004 11:44:57 -0000

Colin,

Thank you. As Sheldon Watts (below) presents it, the hypothesis (actually, in his presentation it is rather more than a hypothesis) involves influenza, smallpox, measles and malaria, with influenza as the only one directly linked to domesticated animals at the time of contact, but the three others linked in the more distant past. This would then cover four of the five

major and new infectious disease killers in the New World. Cohen (also below) makes similar claims about the role of domestication of animals in the history of disease. From what you say, I gather that this may be a minority view. The claims are more sophisticated than I could capture in a sentence. But in the end I guess they are also rather distant from the theme of this seminar - even if it could be linked to urban fowl markets in Asia via aviary flu.

Gordon

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Watts, S. J. 2003. Disease and medicine in world history. New York, NY ; London: Routledge.

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Date: Tue, 7 Dec 2004 23:20:52 +1100
From: "Colin Butler" <Colin.Butler@anu.edu.au>
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Gordon,

Yes, I forgot about flu, which probably does derive from birds and maybe is amplified by pigs. I'm not sure how big a killer this was back then - I am not an expert on this, and this all off the top of my head late at night. TB is also thought to have crossed from

domesticated animals, I think cattle - but as I mentioned may have been present in New World pre-Columbus. I remain sceptical re malaria and domesticated animals, and Watts may have omitted Yellow Fever, which I would have thought was at least as important as flu (at least until post WWI epidemic, and then it struck everyone, in the old as well as the new world. Anyway thanks for alerting me to Watts's book, and I'll try to read it.

There's a great paper about chickens, pigs and the possible generation of the 1919 flu strain that caused the deadly epidemic in the chaos of WWI, by Oxford et al, in Lancet Infectious Diseases, about 2-3 years ago.

Yes, discussion perhaps peripheral to main theme of this seminar.

Colin

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From: "Mary Pearl" <mcp14@columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Tue, 7 Dec 2004 16:19:27 -0500

A comment on Eric's response: wild and domesticated animals do share pathogens, so control strategies must incorporate both sets of populations -- so, for example, the H5N1 avian flu moves among wild birds, chickens, and ducks, and the Nipah virus recently spread from fruit bats to pigs following the incursion of pig farms into formerly forested areas in Malaysia. Nipah virus is a case of a wildlife disease that required a domestic animal to bridge from wildlife to humans. Live animal food markets are urban features that are effective for providing opportunities for pathogens to move among wildlife, domesticated animal, and human hosts...as the SARS epidemic showed us.

Controlling animals that are income or food sources is difficult, as you point out. I have heard anecdotally that given the slaughter of whole flocks when H5N1 - the is discovered an a farm, Thai farmers are now reluctant to report any disease. Controlling wild populations may be more acceptable, but more difficult -- not the least of which is identifying the true reservoir for a disease. Despite the magnitude of the SARS event, we still do not know if the civet cat is the reservoir in the wild or an accidental host that brought the SARS virus to humans via live food markets.

Mary

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Date: Tue, 07 Dec 2004 21:54:44 -0500
From: Kai Lee <Kai.N.Lee@williams.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the h ealth of ecosystems, wildlife and humans

On Dec 7, 2004, at 4:31 AM, Gordon McGranahan wrote:

> ... in
> most of the world, urban sprawl is much less extreme. Particularly in
> low-income countries, where urban management problems are especially
> severe,
> it would be a big mistake to design policies with the primary aim of
> preventing urban expansion. One of the reasons informal settlements are
> already so pervasive in many countries is that land use regulations are
> unenforceable - and often with good reason. If strict regulations were
> enforced, we can be pretty sure it would be the poorest households who
> would
> suffer, and find they would find it far harder to find acceptable
> places to
> live. (More unenforced regulations, on the other hand, are clearly not
> needed.)

I want to engage with these points. Surely Gordon is right that merely transferring developed-world concerns to poor countries in vastly different circumstances is dysfunctional, infeasible, and counterproductive.

Yet building spatially extensive cities does not make sense either. First, there is the obvious energy burden of transporting people and the food, water, sewage and other ecosystem services that must be domesticated in an settlement. Second, there is the energy and pollution burden of building factories and other production infrastructure around mistaken estimates of the (discounted future) price of energy. Third, there is the loss of the land in the periurban area, which is often highly productive cropland or coastal zone.

So we come around to the problem of "unenforced regulations." For, supposing there to be a sensible long-term settlement plan, how would it be implemented? It's worth remembering that, in developed countries, urban governments were led by high-minded reformers and corrupt political machines, and that both kinds of governance led to errors of long-term significance. But, from what I know, outside of a few places like Singapore, the institutional capacity to make use of planning information — either top-down or on a decentralized basis — is sparse.

Absent the capacity to utilize ecological, engineering, and social knowledge, one might expect cities to grow in a fashion that would lock in disadvantages and punish those least able to resist, whether they are ecosystems or human communities.

Might we be able, with notions like the spatial containers, to organize the information available to outline dystopic futures for some cities, so that it might be possible to catch some problems while they are still only patterns of pixels?

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Date: Wed, 8 Dec 2004 14:03:36 +0100 (GMT+01:00)
From: alaguirre@mindspring.com
To: pernseminars@ciesin.columbia.edu
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans

My 2 cents:

Controlling wildlife diseases for the most part has proven to be practically impossible. Large dieoffs of waterfowl in North America are dealt by picking up carcasses and burning them, by draining or overflowing a wetland or in some peculiar cases by developing a vaccine to avoid mortality as in the case of Aleutian Canada geese and avian cholera. Throughout time, the history repeats itself, in Africa millions of buffalo

and other ungulates were slaughtered to control rinderpest, a disease that kills cattle and that was introduced by cattle in the first place. Habitat and wildlife destruction occurred also in Africa to control tse tse flies the vector of sleeping sickness, yet today we don´t have the tools or understanding on how to control a wildlife disease outbreak.

A method used to control duck virus enteritis (a disease caused by a herpesvirus that killed over 50,000 wild mallards back in the 70s and introduced by domestic ducks in the USA) is euthanasia (humane killing) of all resident waterfowl in a city park. This method is controversial and inefective in large cities. As Mary points out, it has been easier to kill millions of chickens (avian flu in Thailand), over a million of pigs (Nipah in Malaysia), or in fact over 4 million livestock heads in England to control foot and mouth. At the end these are decisions based on economics and politics of each country. We could vaccinate cattle in England, instead slaughtering was the choice so the country would not loose its foot and mouth free status. To conclude, our understanding on the ecology of wildlife-domestic animal-human disease interactions is so poor, however, we relay in methods developed 500 years ago!?
Alonso

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Gordon's points are well taken, and they speak to one of the cyberseminar's themes, which is that patterns and processes of spatial expansion are different on the different continents. They echo what David Satterthwaite wrote, that we tend to see similarities in patterns because we're looking for them, rather than considering the very real differences.

We all agree that urban spatial expansion is a process. Labeling something as a problem assumes a unified view, but obviously what is a problem for one person (the planner or the environmentalist) may be a boon for someone else (the real estate speculator or the squatter who needs a cheap piece of land on which to erect a shack). Nevertheless, if we take as a point of departure that we want to improve the lot of the squatter while also creating liveable environments, I think that it is possible to identify some very real problems that are created by unfettered urban expansion across all the continents.

LACK OF ATTENTION TO KEY ECOSYSTEM SERVICES
- "hardening" of watersheds through pavement/housing leading to flooding
- progressive absorption of water supply areas into the urban agglomeration
- fragmentation or removal of natural land covers leading to biodiversity loss
- road corridors and developed strips creating islands of biodiversity with no corridors for migration

PRIVATE TRANSPORTATION & AIR POLLUTION
- progressively longer commuting times (in automobiles) with resulting air pollution
- energy burden imposed by such commuting
- even European cities are facing the reality that there are too many cars on the road owing to commuters entering crowded city centers that were not designed in the automobile era. (An evidence-based study in Milan confirmed the "wasteful" character of sprawling development patterns in terms of land consumpiton and environmental impacts from longer commutes in personal automobiles (Camagni et al. 2002).)

HAZARDS VULNERABILITY
- soil erosion/slumping due to settlement on hillsides
- development in wetland/low lying areas (e.g. Kampala - forthcoming post)

MENTAL/SPIRITUAL HEALTH
- lack of appreciation of nature as the urban area extends further and further out, rendering short trips to nature reserves largely unfeasable (I recently left Bangkok on a bus that spent 2.5 hours snaking through traffic until it reached an even remotely untrammeled area). (See Turner et al. 2004)
- mental health ailments resulting from cramped quarters/substandard housing in squatter areas (see Nsiah-Gyaabah posting this seminar)
- mental/social health problems resulting from time spent commuting rather than with the family

Now, the issue of how to "fetter" urban expansion is not an easy one to

address. My reading of US-based regional planning and other centralized models (e.g. "Smart Growth") for determining where to grow and where not to grow is that they have largely failed. A recent New York Times Magazine article sang the praises of sprawl, stating that in the US this what people want - a house in the suburbs or exurbs, personal mobility, and better schools and amenities (Tierney 2004). In developing countries some of the same forces are in operation among the middle and upper classes, and among the poor (as Gordon suggests) there may be few options but to find a distant parcel of land that is presently unoccupied.

In the Redman & Jones background paper Research Challenge 5 is "effective governance." Do any political scientists, economists or others have any opinions on the different formulations put forward by the US National Academies, the World Development Report and the Resilience Alliance? Have there been any successes out there with regards to constraining, redirecting or guiding growth?

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-Alex de Sherbinin, PERN Coordinator

From: pern-m <pern-m@ciesin.columbia.edu>
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Subject: [PERNSeminar_UrbanExpansion] Urban Expansion Processes of Kampala, Uganda

Urban Expansion Processes of Kampala, Uganda: Perspectives on contrasts with cities of developed countries

Panel Contribution by Shuaib Lwasa, Department of Geography, Makerere University, Email: Lwasa_s @arts.mak.ac.ug

PERN Coordinator's note: In this excellent contribution, Shuaib Lwasa makes some useful (and potentially novel) observations about urbanization in the medium-sized city of Kampala. He notes, for instance, the existence of "urbanized rural life" in the peri-urban areas which is dependent on urban farming, livestock rearing, or brick making and quarrying. To absorb shocks associated with urban life, such as inflation, this has led to extensive social networks connecting urban and rural areas. He also mentions that although spatial planning exists for Kampala, the plans have little impact on the ground. He closes with a request, "I would like to note that its also important during this seminar to exchange ideas on how governance issues, development planning and institutional arrangements can be transformed to improve the environmental, health and well-being of the urban areas, especially medium sized urban centers such Kampala that are growing and expanding very fast."

As noted by Charles Redman and Nancy Jones in the background paper, rapid urbanization brings opportunities to new urban developments. But urbanization also comes with serious loss of arable land, degradation of ecosystems as well as social and environmental changes to the urban populations. The current urbanization process in developing countries is indicative of a process that needs considerable attention not only as a basis for transformation of societies in the developing countries but also for sustainable development. As cities grow and expand it is expected that economic growth and development will progress and act as a driver for social transformation and improvement of not only in urban areas but the greater rural hinterland served by the urbanized region. Experiences in developing countries show a disjuncture between urbanization and the envisaged socio-economic transformation. Increased and persistent urban poverty, environmental sanitation issues, urban food issues, housing, transportation and pollution problems are prevalent in cities of developing countries with the most vulnerable being areas of recent urban expansion and settlements of the urban poor.

In this paper, I put some thoughts to the many features and characteristics of urban expansion in developing countries focusing on the local processes underlying urbanization in Kampala. I also endeavor to highlight how such features differ from or are congruent with the experiences in developed countries. As challenged by Redman and Jones, I present some findings on several urban thematic areas on which we have undertaken research in Kampala

with the intent to stimulate further thoughts and debate during the cyberseminar. Experiences brought forth by the paper are intended to provide a perspective of urban expansion processes from developing countries and act as an impetus for discussion about contrasting processes with developed countries. The paper is structured to initially give a brief on driving forces of urbanization in Kampala, followed by processes of expansion in Kampala similar to developed countries before summarizing the main contrasting features of urban expansion in Kampala. A concluding remark with some pointers to the urban research agenda are also given.

Background

Urbanization in Uganda is currently estimated at 12% of the population which proportion considers only the major urban areas in the country among which is Kampala city, which is expanding faster than any other urban area in the country. From a small Kibuga (Buganda Kingdom headquarters) and a township established for administrative purposes, the city has expanded from 170 acres gazetted in 1902, 3200 acres by 1929 and 195 sq km by 1968(Norstrand, Development et al. 1994). The expansion has been mainly through annexing adjacent townships and rural areas to the kibuga and Kampala Township. As the city boundaries were extended the population in Kampala also increased from 2,850 in 1912, 24,100 in 1948 to 458,503 by 1980, 774,241 in 1991 and 1,208,544 in 2002 at average annual growth rates ranging between 3.14% to 5.61% (UBOS 2002). Spreading over an area of up to 839 sq km the Metropolitan Kampala has expanded engulfing the urban centers around the city and continuously converting the rural landscape (Nyakaana, Sengendo et al. 2004) into urban uses.

Although there are some similar expansion processes of Kampala to those of developed countries, the processes in Kampala are largely dissimilar due to the nature of and the product of the expansion. Whereas urban expansion in developed countries is driven by private development interests, globalization, deregulation and a tax system forcing municipalities into competition against each other for tax-paying residents and businesses (Wegener 2001) - urban expansion of Kampala, is driven by demographic shifts in the form of rural-urban migration that has led to creation of unplanned settlements within the city and at its periphery (Wegener 2001; Lwasa 2002). The expansion processes of Kampala have created an imprint of unplanned settlements with inadequate services and infrastructure as well as environmental sanitation problems. The next section of the paper provides a brief on the driving forces of urbanization in Kampala after which a summary of the contrasting processes of urbanization in Kampala are presented for further discussion during the seminar.

Driving forces of Kampala's urbanization

Several drivers of urbanization are responsible for the fast growth of the city which are summarized in this section. In the first instance population dynamics manifested in urban population growth and rural to urban migration are by far the most significant driving forces of urban expansion of Kampala. Through natural increase (due to high fertility rate 7.1 decline in mortality, internal migration and international migration(Nyakaana, Sengendo et al. 2004) the population of Kampala has steadily grown in the last three decades faster than the pace at which urban services and housing are provided. Secondly policies for the economic transformation of Uganda which have mainly been pursued from and around the city through industrialization are also responsible for the urban expansion of Kampala. As a primate city, Kampala has continued to absorb 40% of the total country's' urban population. This is because the city acts as the major industrial and commercial center in the country.

But the unique feature of urbanization due to economic transformations is the informal sector proliferation which is dissimilar from developed countries and significant in employment generation within the city. Although the informal sector is considered an expression of the need and provider for employment in Kampala, it has also come with serious environmental and health implications in Kampala since many of the activities occur in residential neighborhoods. Associated with economic transformations are the market forces of consumption derived from the population. Market forces are influencing urbanization of the city in two distinctive ways. First the consumption by the urban population for products produced both within the city and in the country. In this respect the high consumption of Kampala's population is further driving the expansion of the city through establishment of numerous industrial establishments, commercial centers and general urban developments within the city (Lwasa and Nyakaana 2004). Secondly through exchange of land for development in the city, which has intensified recently leading to commodification of land and informalization of the land acquisition processes.

The consequence of informalization and comodification has been the conversion of environmentally sensitive land to urban uses with serious social and health consequences mainly at the fringes of the city. Due to these factors, the expansion in Kampala is steadily advancing at fast pace leading to engulfing of adjacent rural landscape and urban centers. In the next section of the paper I present some thoughts on the similarities between the urban expansion processes of Kampala and experiences in developed countries after which a summary of the contrasting features with the developed countries is presented.

Congruence of Urban Expansion Processes of Kampala with developed countries

Urbanization in developed and developing countries though often

distinguished does have similarities. First globalization, market forces and regulation of cities is not peculiar to developed countries as drivers for urbanization but are also evident in developing countries. Thus we are increasingly experiencing developments driven by private interests and competition between municipalities as they attract investments by targeting similar private entities to bring urban developments in their own areas(Ingram 1998). Secondly the primary driver for urbanization is population increase and though differences exist between population increase in developed and developing countries, in both cases densities in urban areas are increasing. A summary of some of the similar features of urbanization is given below;

. dispersal processes from the centre to the periphery of both population and employment, with the largest metropolitan areas converging to decentralized and multiple sub-centered areas, (in Kampala, office space and institutional use are shifting to hitherto residential areas and at the periphery of the city);
. highly decentralized manufacturing, employment and emerging specialization of the central business district in service employment;
. increased reliance on road-based transport for both passengers and freight (some industrial countries have experienced decreases in public transit usage as automobile ownership rises; in Kampala we have higher transit-ridership levels and a mix of options in terms of vehicle and levels of services)
. land-markets are strong determinants of this outward movement, land rents being closely related to development densities; (in Kampala the intensification of land markets has recently influenced the rapid expansion of the city to the periphery)
. urban housing demand patterns are similar across cities in industrial and developing countries, but the supply side varies, as does the efficiency of the public infrastructures provision (Ingram 1998).

Thus the above issues give us insight into some of the similarities between developing and developed countries in urban expansion processes. It's interesting to note that the differences are along these above issues but occur mainly in terms of the nature and the outcome of such processes.

Contrasting Processes and Features

Providing Urban Services and Infrastructure

In Kampala services and infrastructure including water supply, transportation, energy, health services, education services and recreation are inadequately provided and poorly planned in the city. This is true especially in unplanned neighborhoods and responsible for the increasing environmental and health problems in the settlements of the urban poor where

individual ingenuity has shown that the problems of no paved roads, water supply, drainage and solid waste management seems far from being addressed(Lwasa 1999). There is a mixture of providers and actors in providing urban services including 'self' provisioning, private institutions while public provision is going down. The subsequent deterioration of the urban environment is manifest in problems of flooding; un collected garbage, poor housing due to flooding, health problems of the people and reduced economic productivity of households as well as loss of community amenities.

Urban land markets and peri-urban developments

Another peculiar process of urban expansion involves the Peri-urban developments that are becoming significant features of the urban expansion processes in Kampala. With the different interpretations notwithstanding, peri-urban areas of Kampala have undergone environmental and social changes caused by the extension and urban uses in hitherto rural landscapes. In Kampala these areas have characteristics of spontaneous developments, reliance on largely 'rural based' livelihoods, activated land markets that are converting environmentally sensitive areas to urban uses as well as emergence of social safety nets that connect peri-urban people with both people in rural areas and the core urban areas. Through land speculation, land markets have significantly contributed to the environmental and social changes in Kampala. For example the environmental costs of land speculation especially in peri-urban areas of Kampala are far reaching(Lwasa 2004). Rather than develop existing vacant land within the city land developers have found it more profitable and perhaps convenient to develop vacant land along transport arteries at the periphery, often by converting agricultural land or land earmarked as environmental. This type of development has in the end put greater pressure on natural resources, particularly wetlands and forests that line the boundaries of the administrative Kampala(Nyakaana, Sengendo et al. 2004). It has also increased the costs of waste disposal since settlements have developed expanding towards the current landfill. Because of greater commuting distances and lack of an adequate transport infrastructure has also increased air pollution(Matagi 2001).

Urban-rural linkages and social networks

This feature gives an explanation of the social implications of urban expansion on the persistence of 'urbanized poverty' in peri-urban areas of Kampala. By maintaining rural linkages, peri-urban people persistently reproduce rural life which is 'urbanized'. Examples of urbanized rural life is manifest in the nature of urban farming and other natural resource based forms of livelihood such as brick making and quarry mining. The consequence, has been increased vulnerability to shocks that emanate from urban life driven forces such as inflation, limited jobs due to retrenchment and public policy for housing(Lwasa 2002). To provide mechanisms of absorbing the

shocks of urban life, sets of linkages between individuals and families have emerged in form of social networks. These social networks have become significant for the urban people in the quest to improve their livelihoods. This issue in my opinion deserves greater analysis and critical examination for our understanding of social conditions of the population in peri-urban areas.

Environmental consequences of urban expansion

The expansion of Kampala is occurring at the expense of the environment in and around the city. The city is surrounded by a ribbon of wide green valleys with swamps and low land forests extending into the rural hinterland of the city. However the green environment with associated natural resource components is under threat from the fast expanding city. Threat for the environment is manifest in destruction of vital environmental components such as wetlands, forests, water resources and the natural landscape of Kampala(NEMA 2000). Proliferation of informal settlements has taken a toll on the wetlands and low land forests in and around the city. For example an analysis of land use land cover change in Kampala reveals that agriculture decreased from 62% to 45% of total land area mainly to housing and industrial establishments. Low land forests also changed form 7.6% to 0.4% of the total land area. This change implies loss of swamp forests to land uses including industrial and residential developments(Nyakaana, Sengendo et al. 2004). Similarly swamps which are mainly covered by papyrus also reduced over the period of 11 years from 20.6% to 1.9% occupancy of the land area. Change rates indicate that industrial land use and built up cover changed at annual estimates of 8.9% and 15.7% respectively. This speed of change shows the environmental degradation driven by urban expansion which raises concerns for the environmental conservation and restoration.

Urban Expansion and health

The relationship between urban environmental conditions and health is well established(Leo 1999; Lwasa 1999; NEMA 2002). Infectious diseases especially water-related and air-borne are prevalent in many of the neighborhoods of Kampala while outbreaks of cholera have been recorded in 1997 and reoccurring in 1999. The health conditions of the city are attributed to the sanitation conditions, waste management and prevalence of pollutants in ambient air of the city due to high energy consumption and existence of a dense network of dusty roads. A study carried out in one of the unplanned high-density settlements, stagnant pools of water create conditions of breeding of mosquitoes and flooding which are responsible for transmission of vectors and pathogens. Over 50% of household occupants in Kampala are hospitalized in every three months due to malaria while contamination of water by prevalence of micro-organisms is evident in the water sources of the city.(Matagi 2001; NEMA 2002) Experiences in Kampala further indicate

that health is an indicator of the environment in which people live and associated with a poor living environment is high expenditure on health and reduction in economic productivity of the urban population due to ill-health. Both of these issues are very significant since labor days lost due to poor health have serious implications on persistence of urban poverty. For social sustainability of Kampala, it is important that urban health is attended to.

Urban Planning and Development

Having summarized the major contrasting processes of Kampala's expansion, I would like to raise the issue of planning more so urban planning since I have found it crucial as an intervening factor to the development and expansion of the city. Urban planning in Kampala is one of the many factors responsible for the contrasting processes of urban expansion in Kampala. Although spatial planning exists, experience shows very limited account of such planning and planning outputs on the ground. Implementation of spatial plans has largely failed due to institutional weaknesses, financial constraints, political interference and lack of appreciation of planning by society. What is under practice is piece-meal planning that is not necessarily guided by a comprehensive development plan for Kampala. The uncontrolled developments, inadequate services and infrastructure are partly explained by failure to implement the development plan for Kampala although some environmental concerns such as conversion of wetlands are rooted in the previous spatial plans which allocated wetlands to industrial use. But the recent intensification of the urban land market especially in the peri-urban areas of Kampala has also had far reaching implications on social changes, environment and sustainable development of the city. As noted by Charles Redman and Nancy Jones in the background paper, the urban expansion process in Kampala presents opportunities and challenges to the sustainable development of the city. But I consider the challenge of ensuring guided developments and making livable neighborhoods in Kampala more daunting. I would like note that its also important during this seminar to exchange ideas on how governance issues, development planning and institutional arrangements can be transformed to improve the environmental, health and well-being of the urban areas especially medium sized urban centers such Kampala that are growing and expanding very fast.

Conclusion

Kampala's experiences provide evidence that medium sized cities are growing and expanding faster than probably mega cities and the conditions so created by the fast paced change have had consequences in terms of poor environment, ill-health and social distress. Development is occurring well ahead of planning resulting in settlements that have inadequate services and infrastructure. The fast paced developments have also in turn made it

difficult to implement the spatial plans that would otherwise guide the expansion of the city. The nature of Kampala's expansion raises concern on the sustainability of urban development due to the socio -economic and environmental problems created by its nature. Unplanned settlements with characteristics of poor and inadequate infrastructure, social services and haphazard development are evident within and at the fringes of Kampala and have led to persistence poverty and suffering to a sizeable proportion of Kampala's population. Similarly the environment has not been spared through the spatial developments with Valued Environmental components of wetlands, water resources, forests degraded by the uncontrolled developments.

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Date: Wed, 08 Dec 2004 11:27:51 -0500
From: "Kai N. Lee" <Kai.N.Lee@williams.edu>
Subject: Re: [PERNSeminar_UrbanExpansion]
To: pernseminars@ciesin.columbia.edu

To Alex's helpful and clear summary should be added the central question of infrastructure. Consider the role of electricity supply and sewers in the course of affairs in Iraq.

Infrastructure shapes how ecosystem services are captured, reshaped, transported, and (often) sold to inhabitants of urbanized places. Infrastructure in turn drastically alters the cost of further development and the value of land served or not served by infrastructure networks. Water pipes and sewer lines, roads, and, more recently, power grids, gas distribution pipelines, bus networks, telephone and data networks, and cellphone networks exert major influence on property values, and many of these infrastructure systems connect humans to nature in the most quotidian ways. Paradoxically, the mundane character of these connections alienates humans from nature

by fostering the illusion of independence from natural constraints, even as we become more dependent upon human institutions to build and maintain infrastructure.

With respect to governance, then, influence over infrastructure choices, together with the burdens of maintaining infrastructure after it is built, are of strategic importance in the urbanization process. This is also where a lot of the public money and international assistance is to be found.

Do the sources cited by Alex illuminate the shaping of infrastructure?

Kai N. Lee, Rosenburg Professor of Environmental Studies, Williams College, Center for Environmental Studies, Kellogg House, P.O. Box 632, Williamstown MA 01267 USA. 01+413-597-2358 (voice), 01+413-597-3489 (fax), Kai.N.Lee@williams.edu, http://www.williams.edu/CES/ces/people/klee/klee.htm

On Dec 8, 2004, at 10:31 AM, Alex de Sherbinin wrote:
>
> In the Redman & Jones background paper Research Challenge 5 is
> "effective
> governance." Do any political scientists, economists or others have any
> opinions on the different formulations put forward by the US National
> Academies, the World Development Report and the Resilience Alliance?
> Have
> there been any successes out there with regards to constraining,
> redirecting
> or guiding growth?

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the h ealth of ecosystems, wildlife and humans
Date: Wed, 8 Dec 2004 11:51:39 -0500

Regarding the question at the end of the posting (below):

"Have there been any successes out there with regards to constraining, redirecting or guiding growth?":

There are communities in middle Finland with populations below 20,000 whose cityscapes are shaped by building up (multi story condominiums and apartments) rather than out (sprawl with individual housing and grassed lawns).
NOTE: It has been calculated that there is more land in residential lawns in the United States than in any other crop.

To reiterate what I have written about dwindling global energy supplies:

Future shifts toward dependence upon expensive and much less abundant solar based renewable energy will preclude access to " what people want - a house in the suburbs or exurbs, personal mobility, and better schools and amenities"

The failure of ""Smart Growth" for determining where to grow and where not to grow" is largely the result of an economic philosophy that has been foisted upon the citizenry by governments and the academics who advise them. This philosphy states (without any experimentally determined proof) that open-ended growth is necessary for economic survival as it lauds, encourages and seeks the exponential expansion of the total human enterprise at the expense of the natural ecosystems and the processes harboured in those ecosystems upon which the total human enerprise is completely dependent.

The termination of the 200 year geological energy subsidy, that has facilitated current settlement trends, will alleviate some of the the "very real problems that are created by unfettered [exogenous energy dependent] urban expansion across all the continents." while forcing very painful behavioural and philosophic adjustments required by a return to a reliance upon the sustainable energy that was available prior to 1800.

Peter Salonius

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From: "Roberto Luis de Melo Monte-Mor" <montemor@cedeplar.ufmg.br>
To: pernseminars@ciesin.columbia.edu
Subject: Re: [PERNSeminar_UrbanExpansion] Extended Urbanization in the Brazilian Amazonia
Date: Thu, 9 Dec 2004 00:23:39 -0300

Alex,

I apologize for taking so long to answer, but I was on a field trip with no access to the web. I'll try to work a bit on my argument.

In the 1970s, we experienced a repoliticization of cities and urban areas with the emergence of the so-called Urban Social Movements. Political struggles shifted from their concentrated focus on labor/capital confrontations in work spaces (factories and others) to the built environment. In other works, politics shifted from production into reproduction, from work conditions to everyday life conditions, from salaries to life quality and access to urban services.

In the mean time, the conditions of production required by fordist production and consumption were extended onto rural and regional areas as a necessity posed by the economic system itself. The 'urban tissue' extended along highways and soon also did communication lines as later did web connections. By the mid-1980s social movements were no longer qualified as 'urban', for they now included the Indians, rubber-tappers, miners, landless peasants, forest extractive populations, rural workers, and several other social groups, all of them organized in local, regional and national institutions of various kinds. In fact, the extension of urban-industrial processes and forms from cities and metropolitan areas onto the countryside carried along with it the 'germs' of citizenship and politics and along such a process social space as a whole was politicized, was potentially equalized to city areas.

I assume that this process occurred much earlier in central industrialized countries, but it is contemporary in industrializing countries like Brazil. The socio-spatial integration achieved by and through the process of extended urbanization, reaching beyond city areas and carrying urban-industrial forms of consumption and production, brought along with it social and political relations that were proper, and restricted, to cities and towns. Instead, citizenship and politics are now a question that encompasses the whole Brazilian territory, from the Amazon indians and landless peasants to southern rural peoples dislodged by electric dams and fishermen in interior riverines areas, as well as slums in metropolitan peripheries and workers in small towns, among others.

The emphasis on urbanization as opposed to industrialization (collective reproduction versus industrial production) certainly also closely connects to environmental questions as it extends throughout the territory an 'urban' politicized logic that strengthens local forms of community resistance while at the same time connects them to distant equivalent groups. The multi-scale organization of world civil society can only be understood within the context of extended urbanization, I understand.

I'll try to keep in closer connection to the discussions from now on.

My best, Roberto Monte-Mór

From: Gordon McGranahan <Gordon.McGranahan@iied.org>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: RE: [PERNSeminar_UrbanExpansion]
Date: Thu, 9 Dec 2004 10:27:38 -0000

A quick follow up on a couple of Kai Lee's points:

Infrastructure investement is indeed often used in an attempt to guide urban development, and to prevent expansion into unsuitable areas. But this also provides examples of how an excessive focus on expansion can go wrong. Low-income settlements can end up without basic services because they are located in areas where development is considered undesirable (and quite possibly illegal). More affluent neighbourhoods end up receiving both the infrastructure services and the subsidies that go along with them. As Shuaib Lwasa indicates, a central issue for improving environmental health conditions in many urban areas is how to improve governance and develop institutional arrangements that will give deprived groups a more constructive influence over government policy, and also over 'development' initiatives in their own neighbourhoods, including for example the building of their own homes. (A number of successful examples are summarized in the 2004 Earthscan book edited by two colleagues of mine, David Satterthwaite and Diana Mitlin, and entitled Empowering Squatter Citizen: Local Government, Civil Society and Urban Poverty Reduction.) Whether or not this will curb urban expansion, it should at least help provide the basis for better negotiations, including in some cases negotiations over relocation. Of course, some argue that improvements to low income settlements just encourage rural migrants - and hence urban over-expansion. But this link is dubious, and in any case does not justify letting conditions deteriorate in deprived urban settlements.

Perhaps a focus on urban spatial expansion as a means of articulating an urban policy goal (e.g. to avoid overexpansion) is analogous to a focus on urban versus rural as a means of describing settlement patterns; it can obscure as much as it reveals. Indeed, a better conceptual basis for understanding the spatial aspects of settlement patterns should, ideally, provide a better basis for understanding what the alternatives are.

Gordon McGranahan.

Date: Thu, 09 Dec 2004 10:55:42 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] posting by M.S.R.Murthy

(Message posting by M.S.R.Murthy)

Dear sir

The urban expansion has become painful to rural life. Most of the water requirments of urban people are met at the expense of rural population. Most of the agriculture in drought prone areas is rain dependant and
ground water dependent. Water flowing from hills and mountains were the major sources in rural areas as they replenish the ground water levels. Dams developed over the hills to tap water has made the ground water scarce in rural areas. Now rural populace are depnding on dairy farming. Dam waters are now supplied to urban settlers.

This has been attracted the attention several environmentalists in India. But Governments do not heed to this problems. The elected representatives want fast buck which is provided by the construction of dams.
They take a share from the contractors.

Yours sincerely
Prof. M.S.R. MURTHY
Department of Population Studies
Sri Venkateswara University
Tirupati-517502, India

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Date: Thu, 09 Dec 2004 11:10:23 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Lessons Learned - posting by George Martine

(Message posting by George Martine)

The recent comments by Satterthwaite, McGranahan and de Sherbinin fittingly emphasize the differences between patterns and processes of urbanization on different continents. Nevertheless, I would argue that, if we are interested in deriving policy implications from our discussion, there are critical similarities between ongoing processes in developing countries that can provide some guidance for building up "useful mid-range generalizations" (Kai Lee honoring Merton).

In a process analogous to the "demographic transition" (wherein developing countries went from high to low fertility and mortality rates in one-fifth the time that it took the now-industrialized countries), the "urban transition" in some developing countries is also condensing history. Latin America is far ahead in this transition, having gone from 42% urban in 1950 to 75% in 2000. This rapid transformation did not occur without considerable human suffering and societal stress. Nevertheless, the current situation in this region can now be viewed optimistically, by comparison to that in Asia or Africa, where globalization will inevitably catalyze the urban transition. More importantly, several practical lessons from the Latin American experience could inform researchers and policymakers elsewhere.

I would venture that the most valuable lesson learned is the need to explicitly embrace urban growth as a potential ally in socio-economic development and in the fight for sustainability. Over the last 50 years, all Latin American countries tried to resist rural-urban migration and urban growth - to no avail. Now that the region's urban transition is well advanced, it is clear that migrants acted rationally in their decisions to move to cities. If urban conditions were difficult, those in rural areas were deplorable. In retrospect, the rapid urban transition has facilitated: a) economic growth (90% of GDP is spawned in cities); b) improvement of social conditions (which are systematically superior in cities for obvious reasons of scale and income); c) fertility decline (urban dwellers have a stronger motivation to regulate family size); and, d) environmental prospects (due to the now well-documented advantages of density. The most important deterrent to Amazonian devastation was intense migration to São Paulo and other large cities). In short, urbanization can be a critical prop to modernization, poverty reduction and sustainability.

If we accept the basic premise that urbanization is both inevitable and positive, then a pro-active stance is in order. In order to fulfill a positive environmental function, city growth has to be oriented with respect to location, form and organization. Several steps can be taken to highlight those advantages and reduce the negative impacts of the upcoming doubling of the world's urban population. Alex recently mentioned a few, including greater attention to key ecosystem services, reducing private transport, air pollution and "hazards vulnerability". I would highlight others, related specifically to interventions about location, concentration and spatial utilization, such as:

- Orient the direction of new growth, to counteract the market's haphazard invasion of fragile lands and its total disregard for environmental consequences. This evidently requires considerable knowledge about ecological properties, climate, topography, natural boundaries, water supply, effluents, wind currents, etc.

- Promote density and verticalization, avoid urban sprawl; no explanation required!

- Accept continued migration and internal growth as both inevitable as well a potential ally for sustainability. Realize, however, that both are powered mostly by poor people. This has two practical implications:

* Prioritize the land needs of the poor. Their most urgent need, and one that conditions much of their adaptation process is access to a piece of land on which to build their homes. Without help, they end up on the worst possible sites, endangering themselves and their city. Hardoy and Satterthwaite (1989), for instance, reviewed the history of squatter settlements in Latin America. Their research shows that, as a result of government resistance to rural-urban migration and urbanization, migrants were forced to occupy marginal, ecologically-fragile or dangerous lands such as riverbanks or steep slopes. This has contributed enormously to the squalor and misery of the new urban population. In Caracas, 67% of the land occupied by barrios is unsuitable for housing because of geological instability and frequent landslides. (WRI 1997:69) How to deal with this? Here I would take a different slant from McGranahan, although I understand his concern about imposing more (and useless) regulations. Since land markets will not solve this problem, nor will politicians (given their short time horizon), other ingenuous solutions will have to be found (for instance, land banks for the poor set up by donor and development agencies). Laissez-faire has proven to be an inadequate approach.

* Plan ahead for the needs of the poor, not only in terms of land but

also infrastructure and services. Again, Hardoy and Satterthwaite made the eminently useful observation that a posteriori attempts to provide squatters with basic services is much more costly, in economic, social and environmental terms, than planning ahead: it requires ripping up homes and neighborhoods in order to set up public transport, water pipes, sewage, telephone lines, etc.

Implementing such an agenda would evidently require considerable political mobilization. Having the scientific community put together a credible set of evidence-based policy arguments that public opinion and the political community can relate to would be a critical first step in this direction.

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Date: Mon, 13 Dec 2004 02:14:38 -0800 (PST)
From: spolytec sunyani <spolytec@yahoo.com>
Subject: Re: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
To: pernseminars@ciesin.columbia.edu

Dear Alex

It is now clear that in the developing countries, towns and cities are expanding rapidly. Urbanization is therefore inevitable. On the one hand, mass migration from the rural to

urban areas must be seen as a sign of failure of Governments and development agencies to promote rural development through provision of jobs, basic infrastructure and services (e.g.education, health, electricty, water etc) in the rural areas. On the other hand, rural-urban migration is a sign of urban success because cities are drivers of national and regional economic growth and centres of innovation and excellence.

However, one of the major research themes that has not featured in the cyberseminar is Urbanization and Conflict. In the developing countries, especially Sub-Saharan Africa, most conflicts can be traced to land disputes. As a result of rapid urbanization, there are continuing pressures on land. Progressively, land quality is deteriorating especially in the urban and peri-urban areas due to intensification of agriculture and increasing pollution from urban activities (e.g. sewage, market and sawmill wastes) which are often dumped on peri-urban areas. The conversion of prime agricultural lands into residential accomodation as a result of urban sprawl and increasing competion for urban land have led to violent land use conflicts in many areas. In Ghana, for example, double sale of urban land by land owners to estate developers and insecurity of tenure have resulted in many land disputes and the emergence of land guards particularly in Accra and Kumasi, the largest cities in the country.

In Sub-Saharan Africa, rapid urbanization and concentration of population in few urban areas have increased competition for land and increased land use conflicts. Urban sprawl and the accompanying scarcity of land in the urban areas have meant that the potential for land conflict is an issue that requires urgent attention. For Sub-Saharan Africa, land provides the greatest potential for conflict because it is the main source of employment, income and livelihoods. However, at the institutional level, development planning controls are weak, traditional tenure systems discriminate between gender, and integration of land use strategies are limited. Tenure insecurity, particularly in the urban areas, has compounded the problem by forcing the poor who cannot afford the high prices of land in the cities and urban areas to live in slums and shanty towns.Experience shows that, if poor urban residents fell secure and safe from eviction, they do overtime improve their neibourhood. Land security therefore provides an incentive for the urban poor to invest their resopurces in upgrading their housing and the environment. At the same time, the land crisis in many urban areas which has led to more and more violent land use conflicts would be reduced through policy measures that provide urban land security.
Please, let me have your comments.
Kwasi

From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
Date: Mon, 13 Dec 2004 11:39:36 -0500

Dear Kwasi,

Thanks for your thoughts on urban expansion and conflict. Clearly one of the things we have heard repeatedly during this seminar is that there is a lack of clarity on land tenure in many peri-urban areas of developing countries. If the land was at one time under traditional forms of tenure (as in much of Africa), then it is even more likely that disputes will arise. I guess one potential solution is to try to do cadastral survey, though this requires significant resources and could open up a "can of worms" that governments prefer to leave closed. I know that efforts to "regularize" squatter rights to their land in Rio de Janeiro, Brazil, have resulted in improvements in sanitation and security in slum areas. Are there other success stories out there?

As a general reminder to participants, the seminar will end effective Thursday morning at 9 a.m. (New York time). If there is anyone who feels that an extension would be beneficial (particularly for those on the North American academic calendar who are in the vice grip of end-of-semester exams and grading), please let us know and we will extend it a few days.

Cheers,
Alex

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Date: Tue, 14 Dec 2004 14:56:03 -0700
From: Charles Redman <CHARLES.REDMAN@asu.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health
of ecosystems, wildlife and humans
To: pernseminars@ciesin.columbia.edu

Alex:

If you could extend the seminar until the end of the week, it would be good. I will get something together by the end of tomorrow, but there is so much material to review that I certainly won't do it justice.

Chuck

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Subject: Re: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the health of ecosystems, wildlife and humans
To: pernseminars@ciesin.columbia.edu
From: re@popact.org
Date: Wed, 15 Dec 2004 16:22:12 -0500

Perhaps pertinent (or PERNitent?) to this comment of Kwasi on urbanization and conflict, below, is the finding or Dr. Richard P. Cincotta, Daniele Anastasion and myself that countries with urban population growth rates exceeding 4 percent annually were roughly twice as likely to have experienced new civil conflicts in the 1990s as those with lower rates. The probabilities were roughly similar in the 1970s and 1980s. This was based on our comparison of conflict data compiled by the Uppsala (University) Conflict Data Project and United Nations Population Division population data for the decades involved.

We found urban population growth rates to be second only to age structure (high proportions of 15-29 year olds in the adult population) as a predictive demographic factor in late 20th-century emerging civil conflicts. In general, urban population growth rates, we found, were roughly 1.5 times that of nations as a whole. As global population growth rates have slowed, so have urban population growth rates. (Note that these are not "urbanization rates" but rather raw population growth rates in

urban areas, as defined by individual governments.) If the associations we found prove to be robust in the current and future decades, this slowdown in urban population growth could be a hopeful factor as far as civil conflict is concerned.

The full report, The Security Demographic: Population and Civil Conflict After the Cold War, is available for HTML perusal or PDF download at:

http://www.populationaction.org/resources/publications/securitydemographic/index.html

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From: David Satterthwaite <David.Satterthwaite@iied.org>
To: "'re@popact.org '" <re@popact.org>,
"'pernseminars@ciesin.columbia.edu '" <pernseminars@ciesin.columbia.edu>
Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the h ealth of ecosystems, wildlife and humans
Date: Thu, 16 Dec 2004 05:56:05 -0000

Robert Engelman's comment was interesting - but I could not access the web page he gave to look at the report he cited. However, I do wonder how it is possible to look at associations between 'raw population growth rates in urban areas' and civil conflict in that in many nations where there is or has been civil conflict, there is no census data available for the last 10-20 years. What the UN Population Division does in such circumstances is to project from older data - but being clear in their reports that these are estimates and projections. Data for these nations has to be left out of analyses. But this means having to leave out much of sub-Saharan Africa. When the World Bank came up with the fact that 'africa was urbanizing without economic growth' in 2000, this was a good example of the inappropriate use of the UN Population Division's data. At that time, there was no census data available for virtually all sub-Saharan African nations

that allowed an examination of urbanization trends during the 1990s - so the only association was between 'economic performance' and the assumptions made in the UN projections. Most of the census data that has become available since then has shown much less rapid urbanization and even several nations de-urbanizing.

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The Population-Environment Research Network Cyberseminar Discussion List
For postings and replies send messages to pernseminars@ciesin.columbia.edu.
To remove yourself from this list, e-mail the body text 'unsubscribe pernseminars' to: majordomo@ciesin.columbia.edu

Subject: RE: [PERNSeminar_UrbanExpansion] Urban expansion impacts on the h ealth of ecosystems, wildlife and humans
To: pernseminars@ciesin.columbia.edu
From: re@popact.org
Date: Thu, 16 Dec 2004 10:25:28 -0500

David, and anyone else who had trouble with the URL for our report:

The breakup of the Web address into two lines may have caused problems. Try this "tiny URL," and if it still doesn't work -- or regardless -- please send me your mailing address off-list and I'll see that the report is mailed to you.

http://tinyurl.com/3ho99

Thanks to David for his considered response. The concerns he expresses about United Nations urban population data are reasonable. We have a higher opinion of the data, and in any event we could find no more reliable urban demographic data for our specific analysis. His final comment about possible "de-urbanization" in sub-Saharan Africa does not necessarily conflict with high urban population growth rates where national growth rates are quite high. Real de-urbanization would, of course, conflict in any specific country with the idea that the urban population growth rate is higher than the national growth rate, although here again I would note the continuing data problem of varying national definitions of "urban."

The most recent UN urban population datas we used was for a period nearly a decade in the past (the 1990-95 period), and others went back to the 1970s and '80s, so there has been some time for national and UN demographers to correct obvious errors in urban population growth rates. The associations

we found occurred, with some variation, in all three decades. Moreover, I believe David's description as to the UN's methodology for urban growth rates is somewhat incomplete. It's true that all population estimates are subject to considerable uncertainty -- and projections are merely conditional forecasts of the future, i.e. "if these specific assumptions pan out, then these numbers will result." Paradoxically, there's a lot of projection going on even in some population "estimates" of the recent past, for the reasons David mentions among others. Nonetheless, the UN Population Division projection demographers do more than simply extrapolate old census data when estimating and projecting more recent urban populations. Among other things they use more recent national data from population registers and administrative statistics. Their methodology is described in World Urban Population Prospects: The 2001 Revision, United Nations, 2002, p. 1 and Chapter VII, pp. 106-114.

Overall, our methodology at PAI involves using the best available data for our analyses, with a strong bias toward the UN Population Division's demographic data because it is the most easily available and generally used worldwide. But, as we state in our publications, we are anxious to see improvements in this data and to reassess our findings when better data becomes available. We would certainly be interested in new data not yet considered in the UN estimates and projections. We look forward to learning more in general about urban population data, and to a continuing effort to see whether our findings on associations between urban population growth rates and vulnerability to emerging civil conflict maintain, gain or lose robustness as better data becomes available and as time moves on.

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Date: Thu, 16 Dec 2004 11:10:44 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: "Pernseminars" <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Variability in Health within Urban Places

Variability in Health within Urban Places

Panel Contribution to the PERN Cyberseminar on Urban Spatial Expansion by John R. Weeks, International Population Center & Dept of Geography, San Diego State University, USA, Email: john.weeks @sdsu.edu

PERN Coordinator's note: In this statement John Weeks makes a number of important points. Firstly, he notes the crucial role that technology has played in facilitating urban growth. Secondly he suggests that the predominance of rural life over most of human history has led people to have an innate discomfort with urban life, and that the compromise people have reached is suburban life - combining the best of both worlds but leading to the consumption of more land at lower population densities. Both developed and developing countries face challenges with rapid suburbanization. Finally, he emphasizes that good health in developing country urban areas is vital if they are to play the role of engine for economic development. His own research in Accra, Ghana is exploring the interaction of the built and social environments as factors that influence each other and in turn affect the health of inhabitants particularly in slums and informal settlements.

Tony Champion, drawing especially from his new volume "New Forms of Urbanization," (Champion and Hugo 2004) has already made the case very well that we can no longer afford to view urban places as somehow being dichotomously different from rural places. Urban and rural places are changing their character dramatically as the world's population surges from 3 billion in the middle of the 20th century to 9 billion by the middle of this century. Most of that increase has been and will continue to be sopped up by cities, even though much of it has originated in the countryside. This massive urban transformation has had the somewhat unexpected effect of making many rural places more urban, while at the same time urban places are becoming less urban, as cities lose density in the old center and absorb population in the suburbs. These are processes that are occurring across the globe, and several contributors have noted correctly that suburban sprawl is not unique to the developed world.

The overall pattern of urban evolution that has been occurring inexorably around the globe has been fueled especially by the technological innovations of the past two hundred years. Cities have been around for a long time, but technology has permitted an increase in agricultural output per worker that, paradoxically, has permitted more people to be freed from agricultural

activity and, thus, available to move to jobs being created in cities. At the same time, technology (including that which created better food supplies and the ability to store them for longer) has helped to improve the health of the population, which has led to cities becoming demographically self-sustaining (i.e., having a positive rate of natural increase and thus not being completely dependent upon migration for population increase). Concurrent with that are the advances in engineering technology that have allowed for an expansion of the possibilities for city size and structure because they have permitted an increase in the size of buildings, improvements in systems of transportation and communication, and more effective and stable supplies of clean water and proper sewerage.

Technology has also led to a larger population worldwide through its impact on controlling mortality, and that has led to the need for populations to be increasingly urban-to get out of the way of the mechanization of agriculture which is required to feed the larger population. Thus, only in modern times has it been not only possible but also necessary for a large fraction of the population to live in cities. More importantly, the future will virtually demand that most people live in urban places because, ironically, that is the only way that we will be able to sustain the 9 billion people that are expected on the planet by the middle of this century. Sustainability of urban and suburban places thus becomes more generally an issue of the sustainability of the human population. Cities are attractive to humans for a variety of reasons, but millions of years of rural life still leaves many humans with an innate discomfort at the high density of central cities. Everywhere in the world the suburb has been the compromise--close to the city, but not completely enveloped by it. The challenges of a suburbanizing society are, in my opinion, among the central issues that all nations will be dealing with in this century.

These challenges are especially overwhelming in developing countries because the infrastructure required to keep an urban population healthy are harder to come by in resource-poor nations. When people are scattered in rural areas, their access to clean water, adequate sewerage, and proper nutrition are hidden from sight and thus simultaneously hard to deal with but easy to ignore. When these same people show up in urban places, their plight is more obvious, and one of the biggest issues facing the city population relates to health. Throughout most of human history, until approximately the beginning of the twentieth century, cities were less healthy places in which to live than were rural areas. However, increasing human control over disease benefited city dwellers far more than the rural population for most of the twentieth century. Yet, early in the twenty-first century there is concern that rapid population growth in the cities especially of developing countries has resulted in a new set of health inequalities. There is increasing evidence of growing disparities in morbidity and mortality within city populations, as Mark Montgomery and his colleagues have shown in the

volume "Cities Transformed" (Montgomery et al. 2003), the urban elite may still have superior health levels relative to others in a country, but many urban residents probably live in less healthy environments than people in the countryside.

This intra-urban variability in health has important implications not just from a human rights perspective, but from an economic perspective as well. Sustainable economic growth is a cornerstone of global policy to reduce levels of poverty worldwide and simultaneously increase the well-being of populations and reduce the pressure on the natural environment that poverty tends to produce. It is urban economies that almost always lead the way in development, and it is in the urban areas of developing nations where the highest rates of population growth are being experienced. Since population growth is now essentially an urban phenomenon, the health of that population is a key ingredient in the sustainability of economies. To the extent that an understanding of the patterns of intra-urban health can lead to policy directed to mitigate and ameliorate inequalities, it will increase the chance that urban residents and the urban economy will be healthier in the future.

For these reasons my colleagues (Allan Hill at Harvard, Arthur Getis, Douglas Stow, and Stephanie Brodine at San Diego State University) and I have embarked on a study of intra-urban variability in health in Accra, Ghana, collaborating with researchers at the University of Ghana. We hope that our research will allow us to test many of the propositions that have emerged over the past few days in this internet exchange. We have adopted a model that derives from a social ecological/epidemiological perspective that we describe in a recent paper (Weeks et al. 2004). One of our contributions is to emphasize the interaction of the built and social environments as factors that influence each other and in turn affect the health of inhabitants at the local, neighborhood level. We use remotely sensed imagery to quantify aspects of the built environment, extending the data about housing characteristics that are captured in census and survey data. We then overlay those data with a variety of health measures derived from census, vital statistics, and survey sources, and apply newly emerging spatial statistical procedures to model the spatial variability in health levels and the predictors of those health levels.

It should be noted that we are not suggesting that the rural population should be ignored, just because the urban population is "where the action is." Rather, it seems that the challenges to health in urban places are so overwhelming, and so overwhelmingly important to the future of developing nations, that we must rapidly improve our understanding of this variability in order to pinpoint those places where changes in policy are required and where scarce resources must be applied.

Literature Cited:

Champion, Anthony G. and Graeme Hugo. 2004. "New Forms of Urbanization: Beyond the Urban-Rural Dichotomy." London: Ashgate.

Montgomery, Mark R., Richard Stren, Barney Cohen, and Holly Reed. 2003. "Cities Transformed: Demographic Change and Its Implications in the Developing World." Washington, DC: National Research Council.

Weeks, John R., Arthur Getis, Allan G. Hill, M. Saad Gadalla, and Tarek Rashed. 2004. "The Fertility Transition in Egypt: Intra-Urban Patterns in Cairo." Annals of the Association of American Geographers 94:74-93.

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Subject: [PERNSeminar_UrbanExpansion] Local news story on Philippine urban population
From: re@popact.org
Date: Thu, 16 Dec 2004 15:38:46 -0500

Hot off the presses, this article from a Philippine business publication seems germane to this discussion. It can be interesting, I believe, to see how news media present these issues to the public -- or, in this case, business people.

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BusinessWorld (Philippines), December 16, 2004
Six Cities Seen to Suffer Social Ills from Population Boom
BYLINE: Kristine L. Alave

The United Nations Population Fund (UNFPA) and the Commission on Population (Popcom) have identified six cities that will face strained resources in the future if their population growth remains unchecked.

In their State of the Philippine Population Report 2004 released yesterday, UNFPA and Popcom said rapid economic development in Zamboanga, Iloilo, and Cebu cities and their adjacent municipalities were proving to be a mixed bag of blessing.

The same goes for "emerging cities" such as Lipa in Batangas, Tagbilaran in Bohol, and Tagum in Davao.

"With rapid urban growth outpacing economic progress that usually accompanies urbanization, national and local governments are hard put in providing even the most basic of services such as water, electricity, education, health care, transportation, and sanitation," said UNFPA country representative Zahidul Huque in his speech at the report's launch.

Citing the example of Metro Manila, which is home to 13 million Filipinos, Popcom Director Tomas M. Osias said the metropolis has been suffering from the effects of unchecked urbanization for a long time, as could be seen by the shortage in housing and inefficient delivery of health services.

This is also now occurring in the provinces, with traffic jams, poor waste disposal management, and decreased air and water quality now plaguing Cebu and Zamboanga, the population study said.

Areas surrounding megacities - those that have 10 million or more residents - will soon also feel the adverse results of the frenetic pace of population growth, it added.

These increasingly urbanized areas such as Lipa, Tagbilaran, and Tagum act as "catch basin" for megacities, and thus experience "rapid spillover population growth."

"Managing urban growth is a major concern that Lipa needs to confront. Although the city government is exerting efforts to address issues such as waste management, pollution, traffic, and informal settlement, more needs to be done, especially about the growing population of squatters, influx of migrant workers, continued urban growth and expansion, and inadequate drainage system," the study said.

Meanwhile, Tagbilaran's tourism industry, its main source of income, is also putting pressure on the city's infrastructure and demands particular considerations for the city's urbanization.

The population study notes that Tagbilaran City, which poses itself as an alternative to bustling Metro Cebu, must have first-world amenities and "pristine condition" so it can attract tourists.

But the report reminded Tagbilaran city officials that "this will not be possible with uncontrolled population growth since it puts pressure on limited resources such as employment, housing, safe water supply, and results in congestion, proliferation of informal settlers, and rising crime rates."

The study also said that the country's urban population was "rushing along with all the flamboyance of a Sarao jeepney, with engines thrumming and lights flashing."

The population study also predicted that by 2020, 65% of the total Philippine population would be living in urban areas. The three main reasons for this phenomenon, it said, were rising fertility rate, migration incidence, and reclassification of previously rural to urban areas.

In order to match its resources to its people, local governments must learn to manage their population and create long-term urban plans.

But development experts like Mario B. Lamberte, president of state-run Philippine Institute for Development Studies, fear that giving that responsibility to local governments will be ineffective "since the amount of attention and approach being used to manage population growth vary considerably among [them]."

He said the national government should aid cities by allocating more resources and by advocating the use of contraceptives.

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
<pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Re: Statement by John Weeks, 16/12/04
Date: Fri, 17 Dec 2004 08:54:02 -0500

John Weeks suggests (below) that the pattern of urban evolution has been "

fueled especially by the technological innovations of the past two hundred years".

If we do not promote the generally misunderstood connection between "technological innovation" and constantly increasing utilization of SOON TO BE EXHAUSTED non renewable energy, then we will have done a great disservice to the understanding of the human condition.

Weeks says that " Urban and rural places are changing their character dramatically as the world's population surges from 3 billion in the middle of the 20th century to 9 billion by the middle of this century."

The unsustainable and increasingly intense reliance on finite supplies of geologically stored exogenous energy has made this "population surge" possible. Absent this temporarily available energy subsidy, 6 billion humans (and counting) will again have to get along on the same sustainable and renewable energy from the sun that was available 200 years ago.

The "technology" that Weeks suggests "has permitted an increase in agricultural output per worker" and "permitted more people to be freed from agricultural activity and, thus, available to move to jobs being created in cities" requires a constant flow of cheap and readily available energy for its continued existence.

Weeks and others may believe that "the future will virtually demand that most people live in urban places because, ironically, that is the only way that we will be able to sustain the 9 billion people that are expected on the planet by the middle of this century".
However it is becoming apparent that the continued flow of cheap end readily abundant energy, required to continue population growth toward the 9 billion level, is simply not available.
It is also becoming painfully obvious that the "urban places" that Weeks projects as the domicile for the bulk of humanity will become resource starved death traps as the energy, required for their continued viability, dwindles.

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Phone (506) 452-3548

Date: Fri, 17 Dec 2004 09:03:25 -0500
From: pern-m <pern-m@ciesin.columbia.edu>
To: Pernseminars <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Posting by Charles Redman

Dear PERN seminar participants:

I am very thankful for the range and richness of the position papers and participant comments that have characterized this seminar. Although we may not have reached a focused consensus on an urban research agenda, the exchange has enriched my understanding of many of the challenges facing urbanizing regions. Unfortunately, because I was out of the country, and out of internet contact, for much of the seminar I have just now joined in and hence have confronted the hundreds of pages all at once. This is both daunting and exhilarating. Clearly, each participant has conveyed a focus that they want to pursue and this does divide into small groups of shared interests and some regional similarities. Despite some calls to focus the discussion, perhaps in an effort to reach some limited set of priorities, the discussion has remained far-reaching. This may be in part in response to the rather unfocused (I would rather you use the word comprehensive) background paper that Nancy and I presented or to the span of working papers that followed, but I actually think it accurately represents the diversity and complexity of the urban research and development landscape. Each of our foci are very much contextualized to the cities we study, the point they are in their developmental trajectory, the disciplines and organizations we represent, and the pressing needs that seem so obvious to each of us, but sometimes appear to be overlooked by our colleagues.

The very enormity and diversity of urban challenges as reflected in the several relatively independent streams of our seminar has led to an institutional structure that is comprised of sets of relatively sovereign funding agencies, management units, and research groups. Up to a point this has worked very well, but I would guess that virtually every participant in this seminar, although they have their "favorite" domain of inquiry and action, would also emphasize the interdependence of these phenomena in the urban milieu. Funding research on urban problems, strategizing for effective solutions, and managing for efficient implementation can all be done from independent "silos", but wouldn't it be a more wonderful world if there were an integrated mechanism that felt responsible for urban centers and urbanizing regions in all their diversity with all of their components? I am speaking from the perspective of the US, but what I am advocating is that some inter-agency mechanism be set up that would allow urban issues to be addressed (and funded) more comprehensively. We may now get some of the

picture right, but if we want to address this in a sustainable, equitable, effective manner we need to think about a new or at least refined institutional structure. I am sure I am not the first to recommend this and their may be insurmountable barriers, but I wanted to bring it before this group in hopes of partnering with some like-minded folks to pursue this direction.

A PowerPoint of the presentation I gave last week (while I was missing this seminar) is available at http://www.populationenvironmentresearch.org/papers/Redman_presentation.pdf. I don't have this written out yet, but fewer words and a few pictures may be a relief. The underlying point of the presentation, that may be relevant in this seminar, is that what we have been citing as some of our biggest problems may also contain the kernel of their own solution.

Once again, it has been a pleasure to be part of this interchange and I hope it continues in a variety of media and venues.

Chuck Redman

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Date: Fri, 17 Dec 2004 09:58:36 -0500 (EST)
From: george martine <georgermartine@yahoo.com>
Subject: Re: [PERNSeminar_UrbanExpansion] Posting by Charles Redman
To: pernseminars@ciesin.columbia.edu

As it comes to a close, it is clear that this far-ranging debate has been generally been enlightening, and at times, entertaining. The delightful piece by David Owen (from the New Yorker) alone would have been worth the price of admission.

As a non-expert on the energy issue, I am intrigued by all the commotion about the impact of ongoing urban growth on energy depletion. After all, industrialized countries are the ones who are eating up the lion's share of energy, while practically all future city growth will occur in developing countries. Urban growth is already occurring almost exclusively in countries that consume only 20% of energy. We developing countries will only become a major factor in energy consumption IF we manage to consume at comparable levels i.e. – achieve "development". In other words, is the problem urbanization or is it the prevailing pattern of civilization being spread by globalization?

By the same token, much as I appreciated Irwin´s summary of "market forces, globalization and urban expansion" I feel that a key dimension has been left out – inequality. The playing field on which economies compete on the global market is anything but equal. In addition, the literature shows pretty conclusively that the global market further enhances this inequality between and within countries. So, although I agree with several of you that it is useful to study urban patterns in both developing and developed regions, the current determinants of such patterns would seem to be increasingly divergent.

George Martine

From: "Salonius, Peter" <psaloniu@nrcan.gc.ca>
To: "'pernseminars@ciesin.columbia.edu'"
Subject: [PERNSeminar_UrbanExpansion] Re: Relationship between Urban Growth and Energy
Date: Fri, 17 Dec 2004 10:03:09 -0500

George Martine says (below) that he is intrigued by all the commotion about "the impact of ongoing urban growth on energy depletion" ---- HOWEVER the "commotion" has been about the impact of ENERGY AVAILABILITY on "ongoing urban growth" and the impossibility of continuing that "growth" as the 200 year dependence on non renewable energy is ended by geological reality.

There is a world of difference between the two "commotions"!

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Date: Fri, 17 Dec 2004 16:12:26 -0500
To: Pernseminars <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] (no subject)
From: Sanchez <roberto.sanchez-rodriguez@ucr.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Posting by Charles Redman

Dear all,

This has been an interesting discussion and it is worth seeking to extract at least one lesson from it. The discussion has indeed been far-reaching. We all have our "favorite" domain of inquire and action as Charles Redman mentions in his last note. But I think the discussion in the seminar illustrates how difficult it is to overcome our fragmented perspectives of urban issues. We do recognize some interdependence of the phenomena in the urban miliu, but it is difficult to say how far that recognition is leading us to integrated perspectives of the complex realities in urban areas. How can we build better conceptual and methodological frameworks to understand those urban areas? One problem is the complex nature of urban issues and the trend to simplify them. Sectoral approaches (energy, transport, the environment, health, the role of the market, etc.) are often presented as a representation of a much more complex system. The discussion in this seminar is a good illustration of this. While the contributions from sectoral studies are fundamental to build a broader understanding of urban issues, we still need conceptual frameworks to create coherent structures where these contributions will help us construct integrated perspectives of urban areas.

Perhaps it is time to reflect what steps we need to take to move in this direction. One point of reflection is how far our disciplinary cultures are helping us to look beyond our immediate domain of inquiry, and how far are they helping us or not to reach out to other disciplines? A second point is the nature of urban studies. The urban space results from the modification of the landscape by social action and therefore reflects the contradictions and conflicts inherent within and between our societies. This is why urban areas in poor and rich countries share common elements but they result and are the locus of different social processes. I believe we need a better

understanding of the heterogeneity of urban processes in both poor and rich countries. I also find interesting how often we disassociate the physical dimension of urban areas from their social, economic, cultural and political dimensions. All these dimensions interact dynamically but we seem to limit the scope of our attention to just some of them. George Martin's point on inequality is a good illustration of how these interactions tend to be neglected in our discussions. Building an integrated and dynamic perspective of these processes and their dimensions is a complex task, but perhaps our best opportunity to understand and make a difference in our societies. I hope we will be able to engage in a discussion that will help us move in this direction in the near future.

Best regards,

Roberto Sanchez

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From: "Eric Kemp-Benedict" <eric@kb-creative.net>
To: <pernseminars@ciesin.columbia.edu>
References: <200412171458.JAA18308@listhost.ciesin.columbia.edu>
Subject: Re: [PERNSeminar_UrbanExpansion] Posting by Charles Redman
Date: Fri, 17 Dec 2004 20:11:20 -0500

Regarding George Martine's e-mail, below, I have also been thinking about the role of inequality, in connection with the notion of "spatial containers," an idea I have been trying to get my head around.

It seems to me that the spatial containers in which different activities occur are stratified by income (maybe "class" would be better?). To the extent that the concept of spatial containers can help organize information

and analyses on urban areas and contribute to understanding their impact on land use, resource flows and pollution flows, it might be important to take this stratification into account.

There are perhaps four different levels of inequality that might be relevant: inequality between different countries, between urban areas within the same country, between households within an urban area, and between individuals within households.

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From: "Alex de Sherbinin" <adesherbinin@ciesin.columbia.edu>
To: <pernseminars@ciesin.columbia.edu>
Subject: [PERNSeminar_UrbanExpansion] Conclusion of the cyberseminar
Date: Sat, 18 Dec 2004 13:27:48 -0500

Dear colleagues,

This brings to a close the 8th PERN Cyberseminar. I want to thank all of you for participating actively, and especially Chuck Redman and Nancy Jones for a thought-provoking background paper and the invited experts who contributed their time and intellect to enrich the discussion. There were a total of 80 separate postings, which is slightly higher then previous seminars, and there were many different perspectives shared - reflecting, as Chuck Redman mentioned, a great diversity of disciplinary perspectives.

If you have thoughts on the cyberseminar format, future topics, or ideas for how to make these seminars most useful, please email me at pernadmin@ciesin.columbia.edu. We are always eager to receive input from participants.

Wishing you all season's greetings.

Alex

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