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BOOK REVIEW

Landscape ecologists have a role in poverty relief

J. D. Sachs, The End of Poverty: Economic Possibilities for our Time. Penguin Press, New York, NY, USA, 2005, 397 pp, illus; 25 cm, Hardbound, US 27.95, ISBN 9781594200458, Paperback, US 16.00, ISBN 9780143036586

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The causes, consequences, and solutions to human poverty throughout the world lie squarely in the realm of landscape ecology. I believe the book "The End of Poverty: Economic Possibilities for our Time" by Jeffrey Sachs should motivate additional research and implementation of principles within landscape ecology into this critical arena.

The bottom line from this book: the 1.1 billion people living in extreme poverty can be lifted onto the first rung of the economic ladder with financial input from persons, corporations, organizations, and (especially) governments from the rich countries. These investments, approximately $60/person/yr until about 2025, if they are carefully targeted and consistently provided, would allow the poor countries to attain a reasonably sustainable development (rather than the downward ecological, sociological, and economical spiral now occurring). Landscape ecologists can provide expertise to efficiently use funds to the greatest value and to research sustainable, integrated pathways to development.

The Millennium Development Project, which Sachs leads, assists countries in reaching their Millennium Development Goals (MDG) by 2015 (www.undp.org/mdg). These eight internationally agreed upon goals include: (1) eradicate extreme poverty and hunger; (2) achieve universal primary education; (3) promote gender equality and empower women; (4) reduce child mortality; (5) improve maternal health; (6) combat HIV/AIDS, malaria, and other diseases; (7) ensure environmental sustainability; and (8) establish a global partnership for development. The MDG also have 18 targets and 48 indicators that provide measurable targets for 2015. The first target calls for the halving of extreme poverty (people living on less than $1 a day) and hunger (insufficient dietary energy consumption) by 2015. Sachs' plan calls for finishing the job by 2025.

Bono notes in the forward of this book that "...we could be the first generation to outlaw the kind of extreme, stupid poverty that sees a child die of hunger in a world of plenty…We are the first generation that can afford it….We can be the first generation that no longer accepts that an accident of latitude determines whether a child lives or dies—but will we be that generation?"

This opportunity and responsibility involves landscape ecology at the local, national, and global scales—the movement and interactions of materials, resources, information, technology, and humans among a huge mosaic of disparate land types and capabilities. A key link is water security—1.8 million children die each year due to inadequate water and sanitation—a result of 1 billion people lacking safe water and 2.6 billion lacking adequate sanitation.

Sachs initially presents an overview of the global poverty scene and presents startling facts: more than

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20,000 people, mostly children, die *each day* due to impacts of extreme poverty. Across the globe, 1.1 billion people live in extreme poverty, fighting for survival on a daily basis. An overwhelming proportion (93%) of the extreme poor live in East Asia, South Asia, and sub-Saharan Africa. Another 1.5 billion people are poor, but living above mere subsistence. Another 2.5 billion people are a few rungs up the economic ladder and live and eat adequately. The remaining billion people live in the high-income world, including most everybody in the rich countries but also an increasing number of affluent people living in middle-income countries.

Sachs provides an historical account of the spread of economic prosperity. Interestingly, nearly everyone on the planet was poor in 1820. Since then, however, dramatic deviations in incomes have occurred. For example, incomes in the United States increased by 25-fold during this period, while incomes in Africa only increased four-fold, resulting in the huge disparity we see today. Why this disparity? Why are many countries stuck in poverty? Corruption, poor governance, and war do not explain global patterns and, in fact, many countries have experienced significant economic growth in spite of such handicaps. Sachs provides eight reasons.

The first is that countries are stuck in the poverty trap—which means that poor countries do not have the ability to climb to the first rung of the economic ladder without help. When people have to invest their entire income, or more, just to survive, there is no money left to invest in the future. In fact, they often are depleting their natural capital (forests, soils, fish, etc), which is clearly not sustainable, and there is negative growth.

The second key factor for the disparity relates to physical geography, though this should not surprise landscape ecologists. Just compare most any natural resource between United States or western Europe against those in sub-Saharan Africa. Transportation costs within land-locked countries are a large barrier to trade and economic progress. Agricultural productivity and disease ecology (e.g. malaria) are also tightly linked to geography and economic prosperity. However, most of these geographic limitations can be overcome with investments and development using good landscape ecology principles.

The other causes of countries getting stuck in poverty include (3) government fiscal traps, e.g., debt; (4) governance failures; (5) cultural barriers, e.g., blocking women from fully participating in the economy; (6) geopolitics, e.g., trade barriers; (7) lack of innovation, due to insufficient investment in research and development; and (8) the demographic trap, when impoverished families chose to have many children.

Sachs recommends a clinical economic (including ecological) approach to reducing poverty in each country, with a careful diagnosis in each of the eight causes. He then provides detailed examples of countries he has worked with to reduce poverty: Bolivia, Poland, Russia, China, India, and many in Africa.

The developed nations of the world are capable of greatly reducing chronic poverty. The 2002 Monterrey Consensus "urges all developed countries that have not done so to make concrete efforts toward the goal of 0.7% of gross domestic product as official development assistance".

As of 2002, total aid was $53 billion (0.2% of rich-world GNP). To reach the Millennium Development Goals, Sachs estimates $135–$195 billion are needed each year from 2006–2015 (only .44–.54 percent of the rich-world GNP), and would result in remarkable progress in the 'Big Five' development interventions to eliminate extreme poverty: agriculture, health, education, power/transport/communication, and safe drinking water and sanitation.

Can the rich world afford this extra spending on the poor? As one answer, the extra money for the US share ($\sim$$50 billion) could be found in households with incomes above $500,000, if those people chose to give back only what the recent tax cuts returned to their pockets. The Columbia Earth Institute and sponsors invested about $70/person/yr in Sauri, Kenya and is lifting that village onto the development ladder. This process can be scaled up, but will need expertise in several disciplines, including landscape ecology. Examples of scaling up exist, including the eradication of smallpox and polio, and the green revolution in Asia, and can be done again here.

Sachs goes on to recommend steps to make it happen. Some specific ideas for landscape ecologists, apparent from the book and my own analysis, include:

1. Model the impacts and possible mitigation of climate change on water and agricultural

production, especially in the most vulnerable zones with high levels of extreme poverty.
2. Create innovative, landscape-level systems for efficient water use, agricultural production, and infrastructure in the zones of extreme poverty.
3. Work towards sustainable management of ecosystems, especially fragile ecosystems, that are deteriorating due to human pressures.
4. Assist in planning for urban growth that also sustains agriculture productivity using appropriate water, soil, and food management systems.
5. Build models of low-cost but sustainable means of protection against natural or technological disasters, especially storms, floods, and droughts (climate-related disasters).
6. Design infrastructure and energy improvements in developing countries with maximum positive human impact and minimum negative environmental impact.
7. Work to better understand the diseases of the poor and spatial and temporal relationships of these diseases.
8. Work to understand how over-consumption and excessive wealth contributes to environmental degradation and poverty elsewhere in the global landscape, and propose/model remedial solutions.
9. Develop partnerships with ecologists, economists, landscape architects, wildlife managers, and land managers in developing countries that make a difference.
10. Seek out students from poor countries who can provide direct linkages to projects back in their home countries.
11. Assist in land-use and urban planning efforts where practical and feasible, focusing on improving conditions for slum dwellers.
12. Work to help influence decision-makers to realize that investments toward the goals outlined above are well spent and the right thing to do.

I end as Sachs does, with a worthy quote to put into practice: "Let the future say of our generation that we sent forth mighty currents of hope, and that we worked together to heal the world."