Proposed Urban Environmental Sustainability Initiative

National Academies' Workshop on Urban Environmental Sustainability

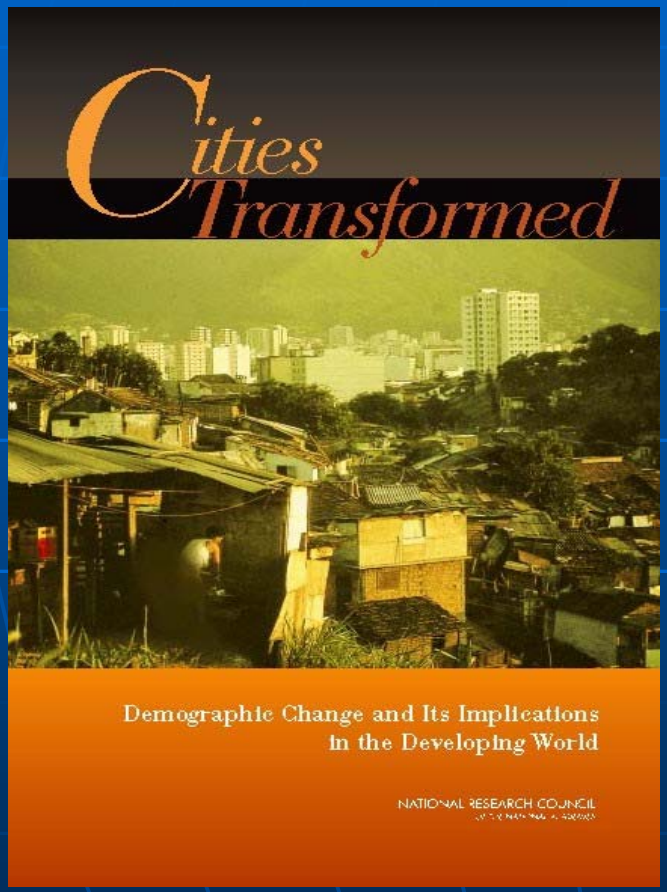
Newport Beach, CA USA

February 6-7, 2006

Goal

Enhance the capability of city leaders and residents to use knowledge from science and technology to help guide economic development efforts in ways that will improve their lives and protect critical environmental and natural resources

Urban Environmental Sustainability



"The central challenge for the governments of poor countries – to improve the social and economic conditions of their citizens while preserving the natural environment for future generations – is becoming an **urban** challenge."

(NRC, 2003)

General Principles

- "Systems" view
- Rapidly urbanizing secondary cities
- Environmental focus
- Collaborative
- Science and technology
- Outcome-based, with potential to extend results

Systems View of Cities

Environment
- Air
- Fresh water
- Coasts & Oceans
- Ecosystems & biodiversity
- Land & natural resources

Urban Services
- Water supply & sanitation
- Housing
- Transportation
- Energy
- Solid waste management
- Natural hazard mitigation

Social and Economic
- Human health
- Poverty
- Education
- Culture & quality of life
- Business and financial

Political
- City
- Regional/provincial
- National
- International

Why a Systems Approach?

- Sustainability is Inherently About Systems
- Avoids (or Minimizes) Potential to Trade "One Evil for Another"
- Addresses Observed Abundance of Individual Activities
  - Differentiates Us From On-Going Activities
  - Seizes Opportunity to "Harvest" On-Going Activities
- Creates Opportunity for Breakthroughs Based on Synergy

Challenges Created by Systems Approach:

- Measurement. But, Approaches Exist:
  - Live Cycle Analysis
  - Sustainability Indicators
  - Decision Analysis
  - Economic Analysis Based on Natural Resource Economics
- Defining System Boundaries
- Finding Willing Partners

  A Key is to Remember the Phrase That Every Practicing Engineer Knows – "Good Enough"!

Rapidly Urbanizing Secondary Cities

- Most growth will occur in small and medium-sized cities
- Opportunities to influence new urban infrastructure and management practices
- Less access to science and technology community
- Decentralization of services and responsibilities to local level

Environmental Focus

Moore Foundation Mission Statement – *As responsible stewards of the resources entrusted to us, we form and invest in partnerships to achieve significant, lasting and measurable results in environmental conservation, science and the San Francisco Bay Area*

Rapid urbanization presents major **challenges to, and opportunities for,** improving the environment and quality of life

Initiative will develop knowledge, technologies, and will (political, social, and economic) to address the challenges and take advantage of opportunities

Collaborative

Partner with local:

- City government
- Regional and national governments
- Academies of science and engineering
- Universities
- Businesses
- Nongovernmental organizations

While **coordinating with and complementing ongoing urban activities** of local, national, and international organizations

Science and Technology

- Much is already known about effective technologies and practices for environmentally sustainable urban services (from other cities, industry, universities, international organizations, “best practices”)
- Many opportunities exist for development of new knowledge and innovative technologies and practices
- Initiative will focus on where S&T can make greatest contribution

Outcome-based

- Strive to have on-the-ground impacts in the near-term
- Enhance human and institutional capacity and build knowledge base for longer-term, ongoing impacts
- Focus on transferability
- Evaluate outcomes and adapt approach over time

Principal Components

1. Enhance human and institutional capacity
2. Foster the use of technology
3. Advance the "science" of urban environmental sustainability
4. Extend the results to cities worldwide
5. Evaluate outcomes

Activities at different levels:

- **City (primary)**
- Country
- Initiative-wide
- Global

Enhance Human and Institutional Capacity: City Level

- **Locally-generated, integrated assessments** of priority environmental challenges and opportunities
- Strengthen or establish a **body within a local organization to produce S&T knowledge and tools** to inform urban development decisions
- **Multi-sectoral workshops** to develop plans to address specific urban environmental issues

Enhance Human and Institutional Capacity: Initiative-wide

- **Convene international conferences of mayors and technical experts** to discuss achievements and agree on short- and long-term urban environmental sustainability goals
- **Training programs**, **site visits** to model cities, and **personnel exchanges**
- **Mobilize volunteer scientists, engineers, and other urban professionals** to provide technical assistance where local expertise is not available

Foster Use of Technology: City Level

- **Pilot demonstrations and applications of promising technologies**, with independent review by local S&T community
- Provide **expert technical support to local institutions** that carry out or fund research, development, and demonstrations of urban environmental technologies

Foster Use of Technology: Initiative-wide or Global Level

- Develop **compendium of environmental technologies and practices with demonstrated effectiveness** in addressing urban development issues such as transportation, water supply and sanitation, solid waste management, housing, energy, land use/zoning, and natural hazard mitigation
- Establish **inducement prizes** to spur development of transformational technologies

Advance "Science" of Urban Environmental Sustainability: Country Level

- Work with local experts to carry out a **systematic comparative study** of the experience of cities in addressing environmental sustainability goals
- Develop **indicators for environmentally sustainable urban development** to be used by local and national policymakers
- Develop **interactive planning tools** for use by city and national leaders

Advance "Science" of Urban Environmental Sustainability: Global Level

- Establish **expert group to identify effective technologies and practices**
- Develop **tools for monitoring and assessing the state of the urban environment**
- Support **multidisciplinary, applied research** on critical issues of urban environmental sustainability

Advance "Science" of Urban Environmental Sustainability: Possible Research Topics

- How can new industrial and residential areas be developed taking into account environmental, economic, and social sustainability?
- What economic and environmental policy options are most effective?
- How can population projections be improved to support long-term planning
- What institutional structures are most effective for managing urban services?
- What emerging environmental issues pose the greatest threats to urban sustainability?

Extending Results Worldwide: Country Level

- Create **web-based tools** designed to provide city leaders, national leaders, and citizens access to regularly updated indicators, effective practices, and tools for urban sustainability
- Create a **city leaders network** (of mayors, leaders of S&T organizations, public) for a select group of cities in each country

Extending Results Worldwide: Initiative-wide/Global

- **Publish and actively disseminate peer-reviewed reports** on effective technologies and practices
- Establish a **worldwide network of experts** committed to improving the environment through improved urban management

Evaluating Results

Contract with organizations experienced in program evaluation in a developing world context to evaluate outcomes/impacts on an ongoing basis

- Draw upon local expertise to develop local capacity for program evaluation
- Use results to adjust future strategies