

Urbanization, Industrial Transformation, and Environmental Change (APN 2000-18)

Project Leader:

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APN Funding

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Participating countries

Australia, China, India, Indonesia, Japan, Malaysia, Republic of Korea, Singapore, Thailand, United Kingdom, USA

Introduction/Background

On 12-14 July 2000, APN hosted a scoping workshop to assist in the development of research programs on how urbanization affects the environment and how environmental changes due to urbanization and the associated industrialization can be mitigated. Participants were selected on the basis of interest shown at a prior scoping workshop (October 1999) and other evidence of interest and willingness to contribute to a collaborative research planning effort. Natural scientists, engineers, and social scientists were involved. The International Human Dimensions Programme – Industrial Transformation (IHDP-IT) science project views these workshops as part of the implementation of the Cities and Industrial Transformation focus of IDHP-IT and participated in the planning of the workshops. The two research proposals resulting from the workshops are seen as important contributions to the implementation of the Industrial Transformation Science Plan. The Scientific Committee of IHDP-IT will support the development of the projects as a basis for further research on Cities in Southeast Asia.

Outline of activities conducted

Building upon the discussions at the previous workshop, this workshop considered three specific potential projects that could be developed into regional pilot projects. Participants convened in plenary session to come to a joint understanding of the task for the workshop; broke into three small working groups for reports, discussions, and research planning; and then reconvened in plenary session for inter-group discussions.

These three projects include:

- 1) Changes in the hydrological cycle, the impacts of human activities on the hydrological cycle, and the effects of those changes on the adequacy of supplies of usable water.
- 2) Urban emissions of greenhouse gases, other gases, and particulate matter, and why levels of emissions differ among the cities of the region.
- 3) The state of and options for transportation systems to serve the growing cities of the region.

The following sections summarize discussion and recommendations on each of the candidate pilot projects:

Urban Environmental Issues – Water for Asia-Pacific Cities

Of the potential effects of climate change, the implications for water resources are among the most important to society. In many parts of Asia and the Pacific, the demand for consumptive uses of freshwater (e.g., drinking water supply) and for non-consumptive uses (e.g., navigation, hydroelectric power generation, industrial cooling, and in stream flow) is barely balanced by sustainable surface and ground water. Poor water quality is also affecting the health and well being of urban populations, particularly in developing nations. To achieve better urban water management in the face of global climate change, a greater understanding of hydrology and water demand in cities is required. The project developed in Kobe would provide such information and would inform social and institutional adaptations to climate change. Cities to be compared include Kobe; Tianjin; Bangkok; Bandung; Suva; Singapore; Karachi; Phnom Pen; and Kuala Lumpur. The key idea is to “follow the water” that serves these cities from its origins in precipitation or aquifers to its disposal as waste or reusable water.

The Budgets of GHGs, Urban Air Pollutants and their Future Emission Scenarios in Selected Mega-Cities in Asia

The proposal aims to generate emission inventories of greenhouse gases and other urban air pollutants from seven selected Asian mega-cities, which are the region’s epicenters of human settlement and of use of energy and resources. The selected mega-cities are Tokyo; Beijing; Shanghai; Seoul; Manila; Delhi, and Calcutta. These are selected on the basis of their differences and commonalities. The project will (a) prepare inventories of emissions of GHGs and urban air pollutants from the selected mega-cities for the years 1970, 1980, 1990, 1995 and 2000; (b) develop methodologies to account for “embodied emissions” and to undertake “Life Cycle Assessment;” (c) develop indicators for comparative analysis; and (d) develop future projections under different scenarios for energy and fuels. The project will provide useful information to policy-makers about appropriate measures to reduce the threat of global warming, to improve air-quality, and to promote sustainable development by employing efficient use of energy and resources.

Outcomes/Products

The first two groups (water and gases) submitted proposals for regional pilot projects in APN’s September 2000 competition and hope to learn of their success in Spring, 2001. Researchers are prepared to begin research and have, in addition, become further involved in international activities sponsored by the IHDP, IGBP, and (soon) WCRP. This arises from the decision of the three international global change science programs to form joint projects. The areas of two of these joint projects (water and carbon cycle) coincide with the proposals submitted to APN.

Future directions/Follow-up work

The working group on transportation had not previously convened and may seek only a seed grant. The two proposals submitted to APN should, if supported by APN, yield

important pilot studies, which would then lead to major comparative research across the Asia-Pacific region.

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