

Population and Environmental Challenges in Asia

Asia-Pacific Population & Policy summarizes research on population and reproductive health for policymakers and others concerned with the Asia-Pacific region.

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In Asia—perhaps more than in any other region—the interplay between population growth, resource depletion, and environmental degradation is cause for concern. Population growth and economic development encroach on forests, wetlands, and prime agricultural areas, threatening biodiversity and raising serious concerns about air quality and food and water security. This issue of *Asia-Pacific Population & Policy* discusses some of the key population and environmental challenges facing the region.

RISING POPULATION NUMBERS

Today, Asia has more than one-half of the world's population living on less than one-third of the planet's arable land. And over the next 50 years, Asia's population is projected to grow by some 44 percent.

Populations will double or nearly double in Afghanistan, Bangladesh, Cambodia, Laos, Nepal, and Pakistan. Growth rates will also be particularly high in India, Indonesia, Iran, Malaysia, Mongolia, Myanmar, the Philippines, and Vietnam. Many of these countries already rank high in terms of stress on land, water, and other natural resources. And their capacity to cope with additional environmental stress is limited.

Overall population growth is not the only concern. Between 2000 and 2030, the proportion of elderly in Asian pop-

ulations will double—from 6 to 12 percent. Over the same period, the proportion of Asians living in cities will rise from 37 to 53 percent. And as living arrangements shift from large extended families to small nuclear families, the number of households in Asia will increase much more rapidly than population numbers alone would imply. All of these changes have implications for resource use and pressure on the environment.

CHANGING CONSUMPTION PATTERNS

Economically and industrially, Asia is the fastest-growing region in the world. This economic and industrial development is inevitably accompanied by changing patterns of consumption.

The number of motor vehicles in the region provides one useful indicator of expanding consumption and economic growth. Today, the total number of cars, trucks, and buses in Asia is doubling every seven years, causing more fuel consumption, air pollution, traffic jams, and demands for road construction—often at the expense of prime agricultural land. Over the next 20 years, the number of motor vehicles is projected to increase at least fivefold in Asia's two most populous countries—from 10 to 57 million in India and from 15 to 75 million in China.

Demand for food is also projected to rise dramatically, fueled both by popu-

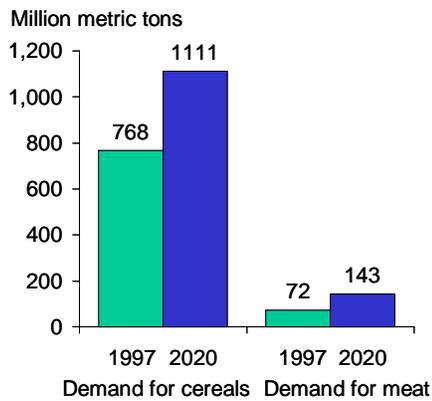


Figure 1 Projected growth of demand for cereal grains and meat: Asia, 1997–2020

Source: Mark W. Rosegrant, Michael S. Painsner, Siet Meijer, and Julie Witcover. 2001. *Global food projections to 2020*. Washington, DC: International Food Policy Research Institute.

lation growth and a rising demand for meat, requiring large amounts of grain to feed livestock. Between 1997 and 2020, Asia's demand for cereal grains is projected to increase by 45 percent, and the demand for meat is projected to double (Figure 1). China alone will account for more than one-fourth of the increase in world demand for grain.

PERSISTENT POVERTY

Economic development contributes to environmental stress, but—ironically—another problem is the persistence of poverty. An estimated 800 million Asians survive on incomes of less than US\$1 per day (measured in terms of purchasing power parity). Environmental deterioration affects the poor and disadvantaged disproportionately.

Poor slum dwellers in cities, who lack the most basic sanitation facilities, do not have the luxury of worrying about environmental pollution. In rural areas, poor farmers tend to live in the most marginal, fragile environments where they may be forced to sacrifice long-term sustainability for short-

term survival, overexploiting croplands, pastures, and forests.

RISING DEMAND FOR ENERGY

Increasing population numbers and growing affluence—at least for some—have already resulted in rapid growth of energy consumption. Over the next 20 years, the demand for energy will grow more quickly in Asia than in any other region. The fastest growth will be in Asia's developing countries.

For example, China's total energy consumption in 1999 was less than half that of Western Europe, but by 2020 China is expected to surpass Western Europe in energy consumption (Figure 2), coming second only to the United States. This increase in energy consumption will be fueled primarily by economic development and changing consumption patterns rather than by population growth.

China's heavy reliance on coal is of particular concern from an environmental standpoint because coal burns less efficiently than other fossil fuels. By 2020, coal consumption will help make China the second largest producer of greenhouse gases in the world after the United States (EIA 2001).

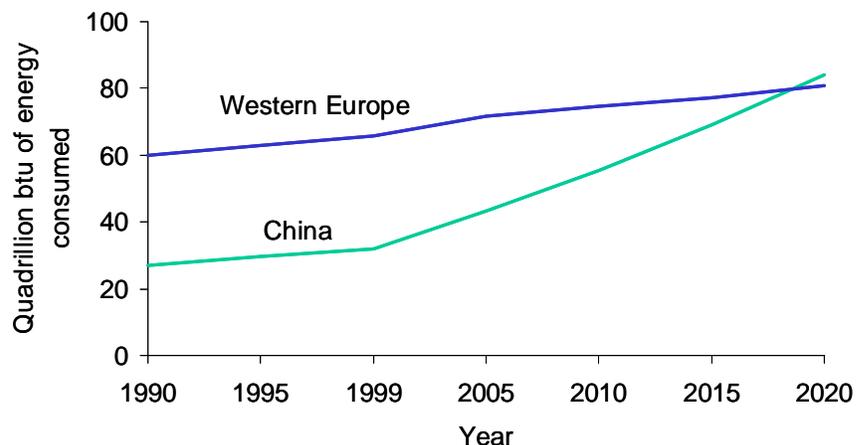


Figure 2 Projected growth of total energy demand: China and Western Europe, 1990–2020

Source: EIA (2001).

UNPLANNED URBANIZATION

Primarily as a result of rural-to-urban migration, Asia is the fastest urbanizing region in the world. According to United Nations estimates, the urban population in Asia will nearly double in the next 30 years. By 2030, more than half of Asia's population will live in cities—some 2.6 billion people.

By 2015, the urban population of Asia will be larger than the urban population of all the other regions of the world combined (United Nations 2001b). This rapid—largely unplanned—expansion of urban areas has robbed many Asian countries of some of their most productive agricultural land and has resulted in serious problems of air, soil, and water pollution.

ENVIRONMENTAL CHALLENGES

Population growth and economic development contribute to many environmental problems in Asia. These include pressure on land, habitat destruction and loss of biodiversity, water scarcity and water pollution, air pollution, and global warming and climate change.

Pressure on land. Asia faces the most acute pressure on agricultural land of any region. Over the past 30 years, while Asia's total population increased by about 68 percent, the total area of land under cultivation increased by only 21 percent—from 355 to 430 million hectares. This expansion has been largely at the expense of lowland forests. Today, there are very few possibilities for further expansion—almost all the suitable land in the region is already under cultivation.

The shortage of land has resulted, and will continue to result, in greater intensification of land use. Pastures are overgrazed, rivers, lakes, and coastal areas are overfished, and more crops are produced from the same fields, using more irrigation water and more chemical fertilizers and pesticides.

Throughout Asia, it is estimated that about one-third of all cropland has already been damaged by agricultural practices that are not sustainable. And every year, good agricultural land is lost to industrial and infrastructure development and urban sprawl. As a result, the area of productive farmland may actually decrease in coming decades.

Habitat destruction and loss of biodiversity. Asia is home to diverse ecosystems that host many plant and animal species. More than two-thirds of the planet's biological resources are found in 17 countries, and five of these—China, India, Indonesia, Malaysia, and the Philippines—are in Asia. Indonesia alone is home to more than 30,000 plant species (ADB 2001).

Due in part to population pressure, forests and wetlands have been cleared and drained, resulting in the loss of an estimated 70 to 90 percent of the region's original wildlife habitat (United Nations 2001a). Habitat destruction and pollution also threaten fresh-water and marine fish and coral reefs in the region.

In addition, modernization of agriculture threatens potentially valuable local crops. In Indonesia, some 1,500 local varieties of rice have disappeared in the past two to three decades as farmers plant a single, improved variety.

Water scarcity and water pollution.

Over the past century, the use of fresh water increased more rapidly in Asia than anywhere else in the world (ADB 2001). Today, Asia has the least fresh water available per person of any region.

Water pollution is also a serious problem, mainly caused by the disposal of untreated sewage and industrial waste, nitrates from animal waste and chemical fertilizers, and the intrusion of seawater. Levels of suspended solids in Asia's rivers have grown more than fourfold since the early 1970s and are now about four times the world average.

Largely because of widespread pollution, one out of three Asians does not have access to safe drinking water, defined as a reliable source within 200 meters of the home. Polluted, unsafe water causes millions of deaths every year, particularly among infants and young children.

Air pollution. Asian cities are among the most polluted in the world. Harmful air pollutants include carbon monoxide (CO), sulfur dioxide (SO₂), and nitrogen dioxide (NO₂). In Delhi, Beijing, Karachi, and Jakarta, suspended particulate levels in the air are many times higher than recommended by the World Health Organization (WHO). In fact, of the 15 large cities on the planet with the worst air pollution, 12 are in Asia.

Lead pollution is also a problem. In Mumbai and Delhi, about one-half of children under age three show levels of lead in their blood known to be harmful to a child's brain and central nervous system (IIPS and ORC Macro 2000).

In the poorest countries of Asia, indoor air pollution may pose an even

greater hazard for human health. Cooking and heating with wood, crop residues, animal dung, and low-quality coal produce smoke that contains dangerous particles and gases. When fuels such as these are burned indoors, often with inefficient stoves and poor ventilation, they can cause tuberculosis, blindness and other serious respiratory diseases.

Global warming. On a per person basis, the emission of carbon dioxide (CO₂) and other greenhouse gases is much lower in Asia than in the industrialized nations. Yet given Asia's large population and rapidly increasing energy use, the region plays an important and growing role in global warming.

In the 1950s, Asian countries produced about one-fifth of the CO₂ emissions produced by Europe, but by the mid-1980s carbon emissions from Asia surpassed those from Europe (Figure 3). If current trends continue, carbon emissions from Asia will double between 2000 and 2020 (EIA 2001). By 2010, Asia will be the leading producer of CO₂ in the world.

The growing emission of greenhouse gases is a result both of rising energy demands and the use of inefficient, polluting technologies. Carbon emissions per unit of gross domestic product (GDP), for example, are more than twice as high in China as in Japan (Figure 4), indicating that industries in China use much less efficient production technologies than Japanese industries. Yet carbon emissions per person are more than three times as high in Japan, indicating much higher consumption levels by the Japanese.

POLICY IMPLICATIONS

Projections of future resource requirements and environmental stress in Asia are worrying, whether the focus is on population numbers alone or on the

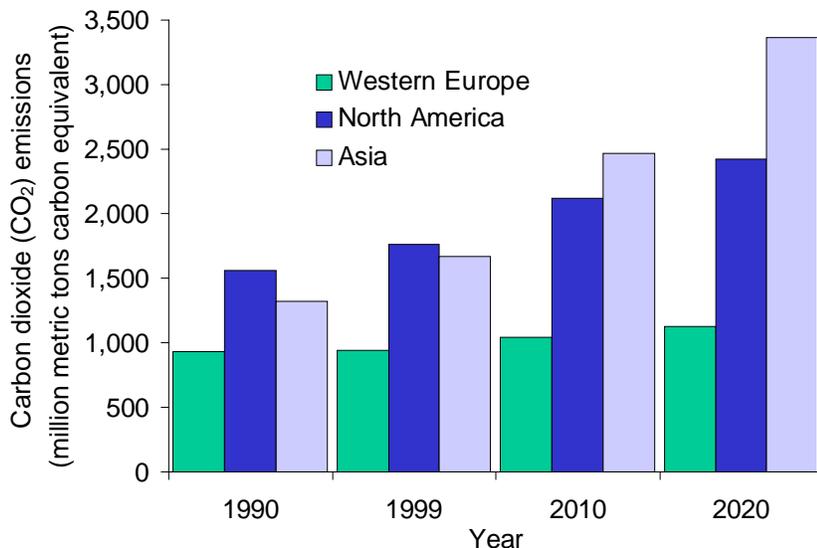


Figure 3 Growth of carbon (CO₂) emissions in Western Europe, North America, and Asia, 1990–2020

Source: EIA (2001).

effects of poorly planned economic development and changing consumption patterns. It is not easy to predict the future magnitude of environmental problems in the region, but issues of land degradation, habitat destruction, loss of biodiversity, water scarcity, and water

and air pollution have already reached crisis proportions in some places.

Unless significant measures are taken to incorporate environmental concerns into agricultural development, urban planning, technological innovation, industrial growth, and resource

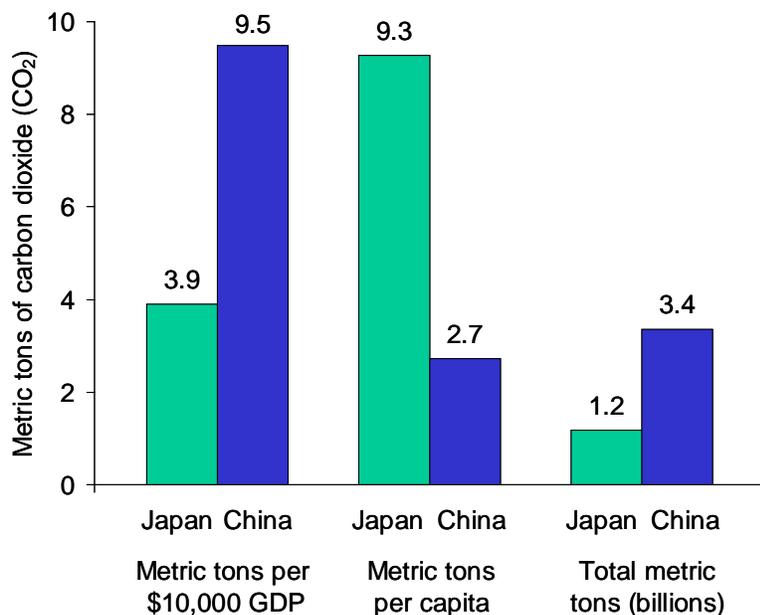


Figure 4 Carbon (CO₂) emissions in Japan and China per \$10,000 GDP, per capita, and total: 1996

Source: World Resources Institute. 2001. *World resources 2000–2001 database*. Washington, DC.

Note: GDP is expressed in terms of current purchasing power parity.

management, the situation will worsen. At the international level, technological innovation and the transfer of technical and management skills will play a major role in alleviating Asia's environmental problems. At the national level, political and economic priority setting will be essential.

And finally, slowing down population growth will be a key component of any effort to protect Asia's natural resources and environment. Population growth continues for many years after fertility reaches replacement level, so the sooner fertility can be brought down the sooner the process toward stabilizing population numbers can begin. When looking at current and future environmental concerns in Asia, the number of people to be fed, clothed, housed, transported, educated, and employed may not be the only issue, but it is an issue that cannot be ignored.

REFERENCES

- ADB (Asian Development Bank). 2001. *Asian environment outlook 2001*. Manila.
- EIA (Energy Information Administration). 2001. *International energy outlook 2001*. Washington, DC: U.S. Department of Energy, Office of Integrated Analysis and Forecasting.
- IIPS (International Institute for Population Sciences) and ORC Macro. 2000. *India: National Family Health Survey (NFHS-2) 1998–99*. Mumbai.
- United Nations. 2001a. *State of the environment in Asia and the Pacific: 2000*. New York: United Nations Economic and Social Commission for Asia and the Pacific and Asian Development Bank.
- United Nations. 2001b. *World urbanization prospects: The 1999 revision*. New York: Population Division, Department of Economic and Social Affairs.