

Protecting the environment from consumption pressures

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ECONOMIC GROWTH usually raises per capita income and expands consumption. Although consumption is good in that it helps to improve the quality of life of the population at large, it can also be bad for the environment in that it stimulates greater energy consumption and environmental devastation. Accompanying economic development are such problems as deforestation, greenhouse gas emissions, and more waste.

When there are more people having access to more goods, especially cars and electronics, pressures to exploit natural resources rise. Ronaldo Seroa, professor of environmental economics, State University of Rio de Janeiro, believes the pressures could be mitigated if pollution were priced to reflect the loss of the quality of the environment and the welfare of the population: "With shortages of natural resources, use of the environment becomes more expensive, and people and the productive sector will be interested in finding a way to reduce their costs."

Emilio La Rovere is coordinator of the Center for Studies on Climate Change and the Environment at the Institute of Graduate Studies and Research in Engineering (COPPE) of the Federal University of Rio de Janeiro; COPPE has a partnership with Tsinghua University in Beijing, where pollution has from time to time made international headlines. Most of the local and global impact on the environment is caused by how societies produce and consume energy, La Rovere explained. "There is no

free lunch. The more energy is consumed, the greater the impact on the environment. First, we need more energy efficiency, for example, cars running at 40km per liter (94 miles per gallon). Second, we should learn to use [alternative sources of energy]. We will not solve the problem using fossil fuels on a large scale, such as coal that generates pollution, acid rain, and global warming."

On the use and sources of energy, the difference in natural resources endowment between Brazil and China is striking. Brazil has plenty of sources of renewable energy—80% of the energy it generates comes from hydropower, and it has huge potential to expand wind power generation, solar power, biodiesel (oilseed), and ethanol (sugarcane) production. In China energy is mainly produced from polluting sources, predominantly coal.

To get an idea of the severity of the problem, coal accounts for 67% of domestic consumption of energy—well above the international average of 24%. In 2012 China also imported 285 million metric tons of crude oil, about 60% of domestic consumption of oil. "Energy security has become a major challenge for rapid Chinese economic growth. China's energy consumption per unit of GDP is 2.2 times higher than the global average, 2.8 times higher than the American, and 4.3 times higher than the Japanese. There is a lot of room to improve energy efficiency," said Yang



Wanping, professor of economics and finance, Jiaotong University of Xi Na province. Yang believes that increased government control, technological advances, increased efficiency, and market-determined energy prices should force companies to improve their energy efficiency. Demand for energy is projected to be 2.9 to 3.9 billion tons of coal equivalent energy (TCE) by 2020.

Recognizing this barrier to future sustainable economic development, China, the biggest polluter on the planet, has been investigating methods of environmental control. The State Council, the country's highest administrative authority, has decreed that by 2017 industries operating in China will have to reduce their emissions of greenhouse gases by 30%. However, the central government stance on pollution control also needs to be extended to local governments, Yang said. "Although the central government has established laws, regulations, and policies, often local governments apply environment policies only mildly, for political reasons." He believes that "intensifying supervision and increasing penalties against environmental crimes are the main measures that can make pollution control by local administrations more efficient."

In Brazil, there has been significant progress in efforts to reduce deforestation, mainly because of tighter laws, such as the new Forest Code, and pub-

lic policies since 2004 to improve satellite monitoring and law enforcement by the Brazilian Institute of Environment and Renewable Resources. According to the National Institute for Space Research, deforestation area fell from 19,014 square kilometers a year in 2005 to 4,656 in 2012.

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Currently, the biggest problem, which can keep the country in the middle-income trap, according to José Gustavo Feres, economist, Institute of Applied Economic Research (IPEA), is unequal access to basic sanitation, especially sewage treatment. Today, treated water reaches almost 95% of urban areas and 28% of rural areas, but although it has grown in the last decade, sewage treatment reaches only 64% of urban areas and is nonexistent in rural areas. "This has severe social repercussions," Feres said, "because the low-income population suffers most from deficient sanitation. We must mobilize more investments. If I had to rank Brazilian environmental problems, I

would certainly place sanitation first."

Seroa and Yang believe that innovative technologies will promote sustainable consumption of energy and goods that generate less solid waste. But to reach that point, Seroa emphasized, "We have to have proactive policies that encourage the creation of new clean technologies, granting subsidies to innovative producers and raising the cost of products that pollute more." ■