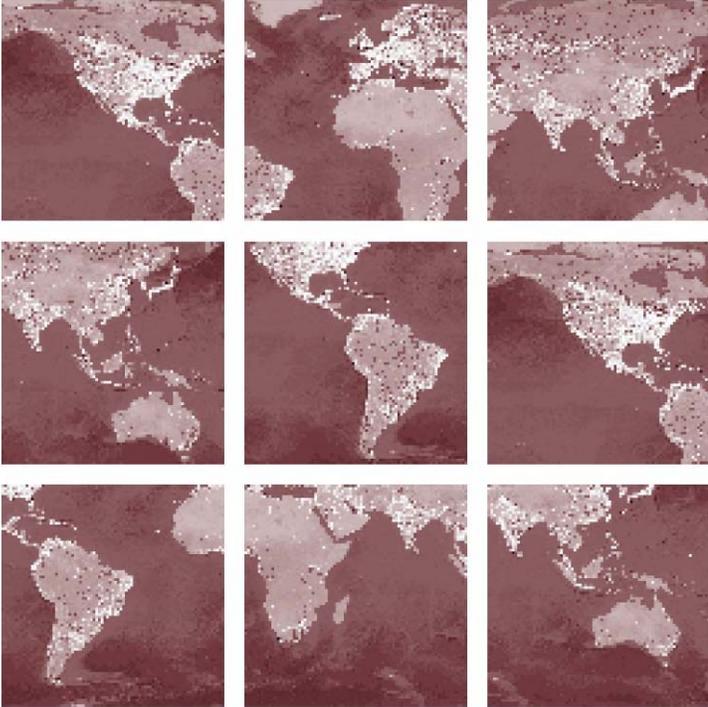


CHAPTER EIGHT

WHY THE BRICS DREAM *SHOULD BE GREEN*

February 2007





WHY THE BRICs DREAM SHOULD BE GREEN

Last Fall we discussed ‘why the BRICs dream won’t be green’, highlighting the challenges ahead as the BRICs seek to balance economic development with environmental protection. This month we argue that the BRICs dream should be green: these countries will need to play a key role in global efforts to combat climate change, and it is in their own interest to do so.

Urbanisation, industrialisation and intensive agriculture mean that environmental pressures in the BRICs are unlikely to abate for decades. In recent months, environmental issues have come increasingly to the fore, thanks in large part to the publicity surrounding the Stern Review on climate change.

The BRICs will need to play a key role in global efforts to tackle climate change. While it is true that today’s industrialised economies are responsible for the vast majority of greenhouse gases (GHG) already in the atmosphere, developing countries are expected to account for 75% of GHG emissions over the next 25 years—with China alone responsible for one-third of the global total. China is already the world’s second-largest emitter of carbon dioxide, and is expected to overtake the US within a decade.

Critically, we think it is in the BRICs’ *own* interest to reduce their emissions and pollution, and to pursue a cleaner path of development. The BRICs already face a host of environmental problems, including air and water pollution, rising strains on water supplies and resource depletion.

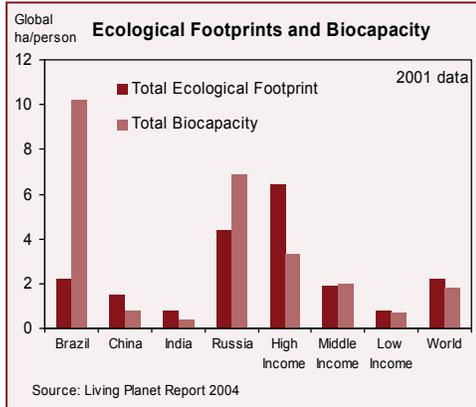
The BRICs are particularly vulnerable to the effects of global warming. Many of the major cities—Shanghai, Mumbai, St. Petersburg, Rio de Janeiro—are low-lying coastal cities. Rising sea levels could affect significant economic activity, as well as some 600mn people living along the coasts (nearly one-quarter of the total BRICs population).

Climate change could hit other parts of the BRICs economies hard as well. Per capita levels of arable land are well below the global average in China, India and especially Brazil. Higher global temperatures are expected to change rainfall patterns and growing seasons, accelerate glacial melting and create more extreme storms. Agriculture, which accounts for 5%-20% of GDP in these countries, would be especially vulnerable; the risk seems particularly high in India, where agriculture is highly reliant on the annual monsoon.

There are some hopeful signs. Forest coverage has increased in China and India since the early 1990s; Brazil is the world leader, by far, in the use of renewable fuels; and India protects a large share of its forests in an effort to conserve biodiversity.

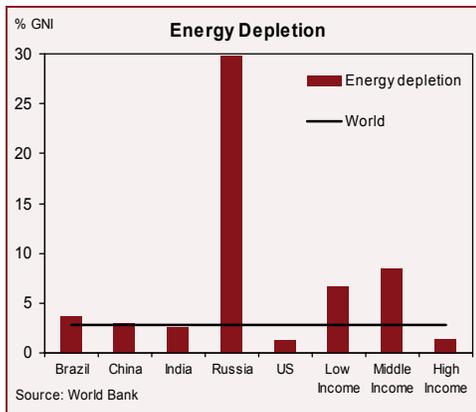
**Sandra Lawson, David Heacock and Anna Stupnytska
February 13, 2007**

Why the BRICs Dream Should Be Green



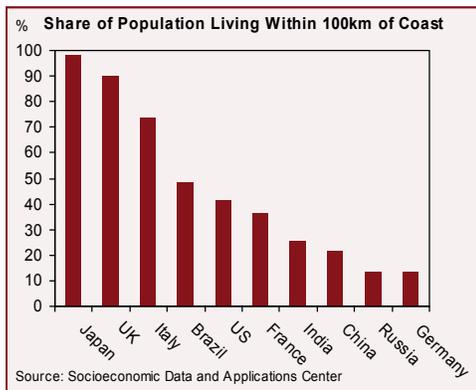
Unsustainable Resource Usage in China and India

- The World Wildlife Fund's 'ecological footprint' (EF) measures a country's natural resource consumption using prevailing technology and resource management schemes. Comparing these demands on nature with the country's biocapacity gives a sense of environmental sustainability.
- On latest estimates, ecological footprints are twice as large as biocapacity in China and India. These are in line with high-income countries and above the world average, indicating that current resource consumption and exploitation are unsustainable. Brazil has one of the highest biocapacities in the world, almost five times its EF, with Russia relatively close behind.



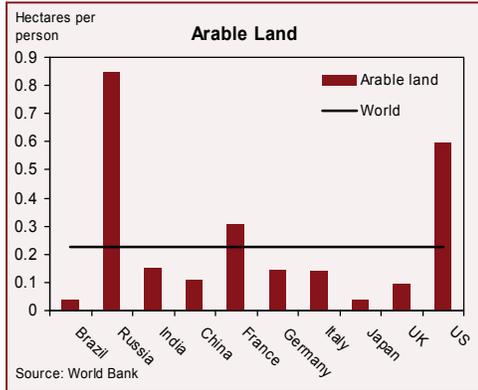
Russia Is By Far the Most Reliant on Energy Depletion

- The share of national income tied to natural resource depletion is problematic, given that natural resources are generally non-renewable and cannot be relied upon for growth indefinitely.
- Among the BRICs, Russia is the most reliant on energy resource depletion (crude oil, natural gas and coal). In 2004, Russia's energy depletion accounted for roughly 30% of its gross national income (GNI), more than 10 times the world average. Brazil is by far the biggest user of minerals, at 1.1% of GNI.



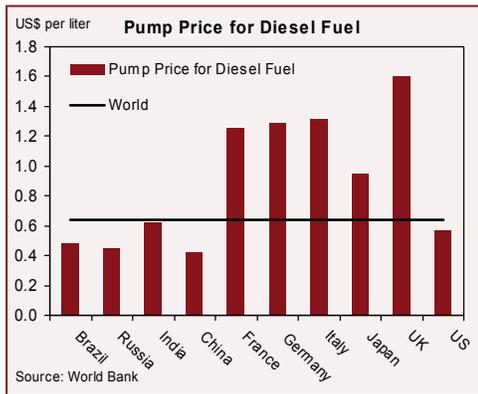
Coastal Cities at Risk, Especially in India and China

- Sea levels are expected to rise more rapidly in coming decades. Some 600mn people—nearly one-quarter of the total BRICs population—live within 100km of the coast.
- Mumbai and Shanghai, with a combined population of 32mn, are both situated on the coast, while Brazil and Russia also have major coastal cities, including Rio de Janeiro and St. Petersburg. A disproportionate amount of the economic activity in these countries flows through these hubs and could be crippled if sea levels rise to critical levels.



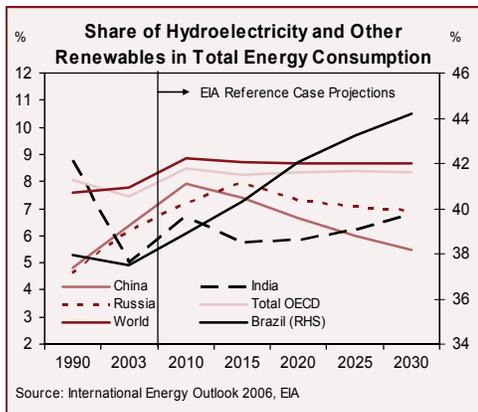
Limited Arable Land Underscores Vulnerability

- Agriculture remains an important sector of the BRICs economies, accounting for an average 11% of GDP in 2005. This is especially true in India (19% of GDP) and China (12% of GDP), where the majority of the population lives in the countryside (roughly 70% in India and 60% in China).
- Arable land per capita is below the world average in all the BRICs except Russia. Changing weather patterns could be devastating, especially for India, which is already reliant on the annual monsoon season.



Scope for Increases in Energy Taxes

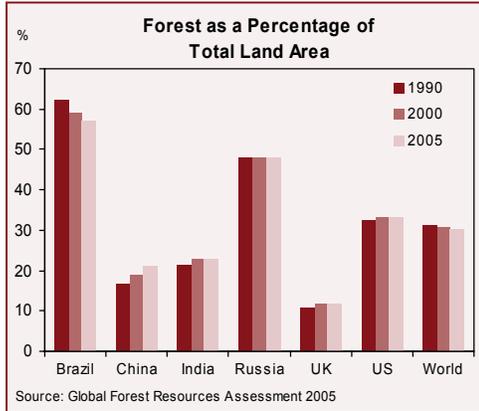
- As we have shown previously, the energy intensity (energy units per Dollar of GDP) of the BRICs is high relative to both the G6 and the world average. One reason is the below-average tax rates on energy, shown here as the average pump price of diesel fuel.
- India, which was one of the first countries to adopt emission regulations, is the only BRICs country with a higher diesel fuel pump price than the US. China has the lowest pump price for diesel fuel among the BRICs; increased fuel regulation there has been hotly contested.



Brazil Leads in Hydroelectric and Renewables

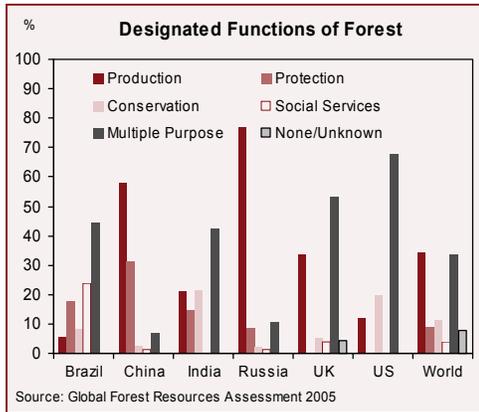
- By 2030, the share of hydropower and renewables in total world energy consumption is projected to increase by 1ppt, to 9%. Growth is likely to come from large-scale hydroelectricity power projects, particularly in China and India. At the country level, renewables in China will become slightly less important relative to other sources.
- Brazil's already impressively high share is projected to rise from around 38% now to above 44% by 2030. As hydroelectricity already accounts for more than 80% of Brazil's electricity consumption, most of the increase is expected to come from biofuels and other renewables.

Why the BRICs Dream Should Be Green



Deforestation on the Rise in Brazil and Russia

- Russia and Brazil are the most forest-rich countries in the world, with China and India also among the top ten. Overall, the BRICs account for 40% of the world's total forest area. China is the only BRIC with rising afforestation; from 2000 to 2005 it made a significant contribution to a net gain of forests in Asia.
- The net change in the world's total forest area from 2000 to 2005 was negative, estimated at - 7.3mn hectares per year. Brazil reported the highest (and rising) rate of deforestation, at -3.1mn ha per year, mainly due to conversion to agricultural land, particularly soy fields. Russia also showed a negative trend, losing forest on a net basis since 2000, having gained ground in the 1990s.



China and Russia Use Forests Mainly for Production

- Production remains the primary function of forests in China and Russia, where almost 60% and 77% of total forest area is used for this purpose, respectively. In Brazil, just 5% of forests is used for production, with the majority used for social and multiple purposes.
- Conservation of biodiversity is relatively important in India, where 22% of total forest area is used for this purpose. This is the highest in the BRICs and slightly higher than in the US. China and Russia report the lowest share of forest designated for conservation, although one-third of Chinese forests are under protection.