Can Brazil become the world's first environmental superpower?

Brazil would not be the first nation to become rich from its resources - but its challenge is to compete economically without destroying its environment.

Outside Dr Gilberto Câmara's office, there is a large and beautiful satellite map of Brazil. From the fractal elegance of the Amazon and its tributaries, to the ochre fields holding sugar, soy and cattle, to the twinkling mega-cities of São Paulo and Rio de Janeiro in the south, the map shows why he thinks Brazil can be the world's first environmental superpower.

Câmara leads Brazil's National Institute for Space Research (INPE). His startling claim, he explains in his easy English, rests on turning a piece of standard economic theory on its head. Nations develop their economies by moving up the value chain, away from churning out commodities and towards manufacturing, say the textbooks. Brazil has abundant natural resources, so the key to prosperity is to start making stuff, right? Wrong, he says, because of the "China effect".

China mass manufactures at rock bottom prices, with the consequence that over the past two decades the cost of manufactured goods has fallen fast, while demand has pushed up cost of the commodities used to make the goods.

Câmara has adopted the slogan: "Brazil – the natural knowledge economy". He describes this as applying knowledge and technology to commodities to boost their value, and reels off examples: biofuels, in which Brazil leads world research thanks to its sugar cane ethanol and growing biodiesel production; renewable energy – 47% of the country’s energy is already green, a world record; and climate change – Brazil’s Amazon is vital to the planet's health. Of course, it also has plenty of timber, beef, iron and aluminium, though he doesn’t boast about those.
"Brazil's natural knowledge economy offers more opportunities for internal [national] research than our manufacturing industry," he says. "There is no opportunity in, say cars, as VW designs those in Germany." Câmara also suggests the approach will allow Brazil to avoid the "resources curse", reeling off Venezuela, Angola, Saudi Arabia and Sierra Leone as examples. Brazil wouldn't be the first nation to get rich on its resources, but it aims to be the first to do without destroying its own economy or environment.

So what are the catches? Having just travelled through the Amazon and then to meet ministers and other senior officials in the capital Brasilia, as well as scientists and green campaigners, I can think of a few: the country's jumbo oil discoveries, continuing deforestation, fast rising energy needs, a vast rich-poor divide and widespread local corruption and insecurity, not to mention whether they can find a way to get paid the premium needed to fund environmental responsibility.

First, let's take the vast oil finds off the coast of Rio – 50bn barrels of it – which within a few years will make Brazil a global petro-power. That, Brazil's special ambassador for climate change Sergio Sierra told me, presents a "big challenge".

"Our present policy is not to change the energy mix," he said, which is currently dominated by hydroelectric power and biofuels. "But of course the temptation will be great, enormous." An economy supercharged by petrol would not be very environmental.

Keeping to your greenhouse gas emissions pledges would be, on the other hand. And, gushing oil or not, environment minister Izabella Teixeira, says Brazil will meet its 2020 targets, which are pretty tough for an emerging country like Brazil. The key is stopping deforestation, particularly in the Amazon, and the latest figures suggest they are making fast progress. But populist changes proposed to the Forest Code laws protecting the forest, bolstered by Brazil's chasm between rich and poor and allegations of a rich world conspiracy to keep Brazil poor, pose a serious threat.

Nonetheless, Teixeira is clear that the economic development of the Amazon region, and the infrastructure to achieve it, will forge ahead. This despite protests such as those that attracted Avatar director James Cameron to the Belo Monte dam site recently. "I cannot forget this region," she tells me. "When we talk of hydropower, 66% of the potential is still in the Amazon. Can you imagine a country that has this not using this? Impossible."

Maurio Zimmermann, the energy minister, shows an equally green conviction with a series of verbal punches: 50% of the fuel in Brazil's cars is ethanol; the government auction to buy 2,400MW of wind power was oversubscribed by four times; Brazil is on target to be the second biggest uranium producer; carbon capture and storage experiments are underway.

He also mentions the 13 million Brazilians who have gained access to electricity for the first time in the last few years, with the final 300,000 switching on the lights next year. A tremendous achievement, and one he happily admits will drive up demand for power.

Another bold claim comes from the head of the country's environmental protection agency, Ibama. Basking in the glow of the latest deforestation figures and Brazil's resurgent economy, Américo Tunes says his agency's
enforcement work has broken the historic link between growth and consumption of the rainforest. "In the presence of political will and dedication, we can cut deforestation without damaging economic growth. It is absolutely not true that you cannot."

But Brazil is vast – about four times bigger than western Europe - and local corruption is rife. An Ibama enforcement officer tells me that the masterminds behind major deforestation are often local politicians. The legal system can be sclerotic – just 0.3% of all the 250,000 fines imposed by Ibama have been paid. And the populist calls to tear up the land in the name of development have millions of eager listeners.

Brazil is at a major fork in the road on its journey to prosperity. One path is rough, with few signposts and has never been walked by any country: the route to growth without environmental and atmospheric vandalism. The other is well paved and lit, with an easy-to-follow map. It is called business as usual, though it may very well end in a sheer drop. Success is far from assured, but Brazil appears ready to take on the hard road and prove that "environmental superpower" is not an oxymoron.

• Damian Carrington’s travel expenses were paid for by the Brazilian government. They had no say in the content of this article