

Goodbye Mother Ganges

In the fall of 2008 I returned to India to see for myself how the country - and more especially the Ganges - has changed in the 25 years since I completed my walk. What I found dismayed me. In the headlong rush to become consumers, few people are asking whether it is even possible for more than one billion people to adopt such a profligate and wasteful lifestyle. And if it is not, what an opportunity is being lost to sustainably raise hundreds of millions of people out of poverty and what a wicked lie is being fed to so many people for the sake of a few to become rich.

The river Ganges is one of the great rivers of the world – and it is lack of water, I believe, that will ultimately cripple the aspirations of all Indians to live decent, healthy and meaningful lives if India continues to pursue the failed model of endless consumerism.

In little more than one generation, India's most sacred river - Ganga Ma, Mother Ganges - will dry up, at least for part of every year. She will no longer be the "sur-sari" (divine flow of energy), the living entity and mother who bears away all troubles and pollutions and brings life wherever she flows. Instead, in the hot season, Ganga will become a series of stagnant pools or, at worst, a fetid sludge of industrial and domestic wastes. The river as she has been worshipped by millions of Hindus across India for thousands of years will be dead.

This is no alarmist hyperbole, but a reasonable prediction based on available facts and established trends. It is already happening to other great waterways of the world, such as the Indus, the Rio Grande, the Colorado, the Murray-Darling and the Yellow river. India is on the move.

Expectations are sky high. Businesses are booming; the combination of a burgeoning consumer economy and a population set to reach almost two billion within 40 years¹ will create a thirst for water that cannot be slaked. "Water stress" is already happening in places all over India. Increasing shortages and conflict will be the inevitable results. As early as 2005, the World Bank was already describing India as "a country about to enter an era of severe water scarcity"².

My personal confirmation that something was dreadfully wrong with Ganga came when I stood on the north bank of the river near Mirzapur, a short distance upstream from the holy city of Varanasi. It was the end of the monsoon season in 2008 and Ganga Ma should have been brimful with water and fertile silt. Instead, I looked down from the high bank across a desolate scene of grey water flowing around sandbanks. The level of water should not have been so low until the start of the dry season in March. Why did the river have so little water? And if the river is so low now, what impact on water resources will the booming economy of India and transformation of society have in the face of a still rapidly increasing population? The answers are complex and discouraging.

I was in India to experience for myself how the country, and particularly the Gangetic plain, was changing and had changed in the 25 years since I completed my 2000-mile pilgrimage along the entire length of the Ganga. I wanted to meet some of the people who were so kind to me and to see how their lives had changed and what the transformation of their country might yet hold for them. I travelled along the Ganga from Ganga Sagar in the Bay of Bengal to Gau Mukh, in the Himalayas, where the Gangotri glacier gives birth to the Bhagirathi. It was fantastic to

¹ Population Reference Bureau, September 2007.

² "India's Water Economy: Bracing for a Turbulent Future", World Bank Report 34750-IN, December 22, 2005.

drink tea and to stay with some of the people I'd met in those many months of the padayatra. But I left India with a profound pessimism for the future which subsequent research of statistics and trends has only confirmed and deepened. I did find people fighting hard through voluntary organizations to conserve water, prevent and clean up pollution, save dolphins and tigers etc. but while their efforts will help, frankly, I believe their efforts will be overwhelmed by the scale and complexity of the water challenges.

Infinite consumption

In the headlong rush to attain consumer nirvana, few people are grappling with the likely impacts of the possible doubling of India's population in the next 90³ years – to more than 2 billion people – or questioning the creation within the next 16 years of half a billion new middle class consumers is either desirable or possible. The international management consultants McKinsey and Co. predict that 700 million Indians will live in cities and 583 million will have "middle-class" lifestyles by 2025⁴. But their reports do not ask what resources – especially water - such a transformation might demand or what it would mean for India or the life and welfare of the planet.

The assumption is that because everyone assumes a right to a "Western lifestyle" that Mother Earth will always provide. Reality will not be so generous. For example, American and European constitute just 4 percent of the world's population yet consume 20% of resources⁵ -- with the consequences of pollution, wildlife extinction and climate change

³ "The Future Population of India, A Long-range Demographic View", Population Foundation of India,. August 2007.

⁴ McKinsey Global Institute, quoted in "Next Big Spenders: India's Middle Class", BusinessWeek, May 19, 2007.

⁵ Bangkok Post, May 30, 2003

already evident around the world. Is it likely that the current 96% "have-not" population of the world can also enjoy what Western consumers take for granted without severe repercussions for all life on this planet? This is not to argue inequalities should remain but to question the notion that the consumer lifestyle is a desirable option for the human race.

According to The Economist's Pocket World in Figures 2008⁶, 56% of all Canadians have cars compared to 0.8% in India, 76% of Americans have computers (1.5% in India). Canadians use the equivalent of 8,411 kilos of oil per person in energy (Indians use 531 kgs.). Americans fly a total of 4155 kms per person (Indians 31 kms). Most other indicators show similar imbalances. The potential for raising living standards in India is obvious but in the current celebrations over India's rapid economic development few business leaders, politicians or economists want to confront the impossibility that all Indians can attain Western living standards. The current usage and wastage of resources in today's Western societies is unimaginable on the scale of India's population.

For example, Swedish consumers use 15,000 litres of fresh water a year to flush away to 50 litres of faeces and up to 500 litres of urine⁷. In India, only 13% of sewage receives any form of treatment and 700 million people have no toilet⁸. If Indians were to enjoy flush toilets like the Swedish, this would require the treatment of 45 billion litres of contaminated water every day.

Water Resources

Significantly, the Economist pocket book makes no mention of water resources or water consumption in any country. The assumption has been that fresh water will always be there, no matter how much we

⁶ "Pocket World in Figures" 2008 ed., Profile Books, London, 2007.

⁷ Stockholm Environment Institute, Agence France Presse, August 26th 2005.

⁸ The Economist, December 11th, 2008.

use. However, more and more people around the world are discovering that this is no longer true in their community. As the world's population continues to increase, as global living standards rise and climate changes increasingly affect rainfall, no-one anywhere will be able to take the availability of fresh water for granted.

Whenever I questioned the predictions for India's transformation into a consumer superpower, people either dismissed me for seeming to question their right to enjoy the same lifestyle I enjoy or shrugged their shoulders at the madness of it all. Questions about water and pollution were brushed aside as luxurious indulgences to be put out of mind.

"India is a motor for the world economy," declares the investment bank Goldman Sachs⁹. Whether it is actually possible to transform hundreds of millions of people into Western-style consumers living in cities is never questioned. But considering the enormous global impacts that just a tiny percentage of people with a high living standard is already having on the planet, it is surely much too late to imagine "business as usual" or that all and any economic development will be benign or sustainable. And this is not to begin to include the impact of similar development in China.

Everywhere in India people are hungry to improve their standard of living now that political changes at last make that possible. The economy has grown at an average rate of 7.5% each year since the end of the Licence Raj in 1991. Since 1985, the percentage of people living on less than a dollar a day has fallen from 93% to 54% of the population.¹⁰

⁹ "India's Rising Growth Potential", Goldman Sachs, January 22, 2007.

¹⁰ "The Bird of Gold; The Rise of India's consumer Market", McKinsey Global Institute, May 2007.

The New Middle Class

Everywhere I visited along the Ganga there was plenty of evidence of the rising prosperity. Where there had been only a single tea-stall, or none, now there were three or four. Some 40% of households now own a bike and even the smallest village had at least one bicycle repair stall and a kiosk offering telephone links to anywhere in India or the world. (I remember spending whole days waiting and hoping for a phone connection!) People are energized; the old "cannot" attitude has been replaced by a hungry "why not?"

Cars, cellphones, televisions, large and small private schools are everywhere. Brick-built houses are replacing adobe houses. Housing suburbs and shopping malls are mushrooming in the ever-expanding cities. As long ago as 2001, India already had 35 cities with more than one million people¹¹. Mumbai already has 17 million people; Delhi has 15 million people. 700 million people are expected to be living in cities by 2050, according Goldman Sachs¹².

Those who succeed in the new economy – the new middle class with incomes of 200,000 – 1 million rupees (\$4,376 - \$21,882)¹³ are determined to enjoy the rewards they have earned. They revel in their ability to shop, shop, shop on credit cards and flock to huge new shopping malls, such as Ansal Plaza and Center Stage Mall in Delhi.

Having gained such rewards for themselves, few give much thought to the resources used to support them. People resent any questioning of sustainability or social justice. India's vibrant economy is a new Juggernaut, much like the Jagannath in Orissa, with its brightly painted

¹¹ "India's Rising Growth Potential", Goldman Sachs, January 22, 2007.

¹² "India's Rising Growth Potential", Goldman Sachs, January 22, 2007.

¹³ "The Bird of Gold; The Rise of India's consumer Market", McKinsey Global Institute, May 2007.

tower winning the devotion of millions of people, while the cart on which the attractive Lord Krishna rides is dragged forward by barefoot devotees.

India's new middle class is hungry for all the pleasures and playthings of the nouveau rich – and all that stuff takes an enormous amount of water to produce. The new India may appear wonderful and feel fantastic for those who attain its comforts. But it is happening in a way that I believe is completely unsustainable. Unsustainable because there is not enough water in India to supply the thirst of the vast industrial consumer society that is being promised to everyone. Water use in the West has been profligate, but the population is modest and, in the temperate climates, the rainfall, so far, has been adequate.

A Lot Less Water Per Person

Currently India has 20% of the world's population and only 4% of the fresh water¹⁴. Half the total annual rainfall falls on just 15 days. More than 90% of the river flows occur in just one-third of the year¹⁵. The country is semi-arid for the rest of the year. Agriculture currently accounts for about 60 to 80 % of all water usage in India. Abundant and cheap water has been an essential component of the Green Revolution and India's ability to feed all her people. Whether high yields can be sustained, let alone increased to keep up with population growth is a vital question. The population of the Ganges drainage basin has risen 50% since 1981 to almost 400 million people today. It is forecast to double again to 700 million by 2051¹⁶. At the same time, no more rain is falling over India; 60% of the water in the Ganga is already diverted for

¹⁵ "India's Water Economy: Bracing for a Turbulent Future", World Bank Report 34750-IN, December 22, 2005.

¹⁶ "The Future Population of India, A Long-range Demographic View", Population Foundation of India,. August 2007.

irrigation¹⁷, groundwater resources are falling and much less water is available today per person, just as demands from industry and consumers are set to soar. Water availability per capita has fallen by more than half in the last 20 years¹⁸.

People have been "mining" groundwater without planning or management for years using deep-bore tubewells; some 21 million such wells have replaced the traditional shallow wells where bullocks drew up water in leather buckets. Farmers have been withdrawing 200 cubic kilometres of water per year, according to Tushaar Singh, head of the International Water Management Institute's station in Gujarat, India¹⁹. The result is that today almost 20% of groundwater blocks (an administrative area) are considered overexploited. (In the Punjab, India's breadbasket state, 79% are overexploited or critical.²⁰)

At a conference of 600 delegates from all along the Ganga organized by the Ganga Maha Sabha which I attended in Varanasi, everyone reported the water table in their district was falling; in some places by more than 60 feet in the last 10 years. To win votes, politicians have provided free or heavily subsidized electricity to run irrigation pumps and this is only exacerbating the rapid depletion of groundwater resources. Groundwater supplies water to about 70% of the irrigated land and 80% of domestic water supplies²¹. In addition, much of the groundwater is contaminated with traces of cadmium, fluoride, arsenic,

¹⁷ "Ganga and Indus Rivers Drying Up: WWF-India", Daijiworld.com, March 27th, 2007.

¹⁸ IANS, April 10th, 2007, Reuters, June 9th, 2003.

¹⁹ Reuters, August 26th, 2004.

²⁰ "India Digs Deeper, but Wells Are Drying Up", New York Times, September 30th 2006.

²¹ "India's Water Economy: Bracing for a Turbulent Future", World Bank Report 34750-IN, December 22, 2005.

nitrate and lead. Nearly 70% of the 166 million people in Uttar Pradesh, through which the Ganga flows, have no access to safe drinking water²².

Brownouts, Blackouts, The Electricity Shortage Continues

Deeper wells require more electricity. Yet 25 years after I first experienced India's chronic power shortage, not a single place I visited in 2008 – not even major cities like Kolkata or Varanasi -- have reliable electricity. In 2007, peak demand outstripped supply by almost 15%. Some 600 million people still have no mains power²³. About 35% of electricity is stolen every day. And plans to add 50% capacity from 2007 to 2012 and increase supply by 800% by 2030²⁴ are unlikely to be reached – no such ambitious targets have been achieved.

The hydro potential of the Ganga is being harnessed in the foothills of the Himalayas with more than 20 projects in the short stretch before the Ganga emerges from the mountains at Haridwar. Enormous power transmission lines stretch across the valleys, thousands of people and villages and towns have been displaced but the region has benefitted very little. Children living in the shadow of the transmission lines often do their homework by lamp light. Power from the enormous Tehri dam, commissioned in 2005, goes to mostly Delhi to power the shopping malls and suburban homes of the new middle class. Even so, shops in Delhi were ordered to close early and to stay closed one day per week because of lack of power in 2006²⁵.

Largely as a result of the shortages of electricity, not one city in India has a reliable supply of piped water. This only exacerbates the

²² "Millions of people drink contaminated water in India's most populous state, says report", Associated Press, September 12, 2003.

²³ The Economist, December 11th, 2008

²⁴ "http://en.wikipedia.org/wiki/Electricity_sector_in_India", 2009

²⁵ Associated Press, May 8th, 2006.

demand for more tubewells pumping more groundwater, causing levels to fall further. In some states water is pumped up from one kilometer below the surface²⁶.

Everything We Do Uses Water

Even as India's groundwater resources are falling, increasing prosperity is changing how much and what people eat – which affects water consumption. When what one person eats in a year is multiplied by the total population, the increase in water usage can be enormous. It takes 3000 litres to grow one kilo of rice, 1300 litres to grow 1 kilo of wheat, 3900 litres for 1 kilo of chicken, 4000 litres for 1 kilo of goat meat, 4800 litres for pork, 6100 litres for sheep, and a whopping 15,500 litres to produce 1 kilo of beef. (Of course, traditionally, beef has not been eaten by Hindus, nor pork by Muslims.) In addition, rising prosperity creates demand for a whole range of other agricultural products, such as cotton shirts (2700 litres per shirt), apples (70 litres each), coffee (140 litres per cup)²⁷.

So far, the industrial use of water accounts for only small percentage of consumption in India. This is partly a reflection of the low level of industrialization. As more and more factories are built to supply products to consumers, industrial demand for water will soar. For example, the new Nano car, selling in India for \$2,100, promises a vast new class of car owners. If just 5% of Indians owned a car (compared to 56% today in Canada) that would put 50 million new vehicles on the roads. Just making the steel for one compact car requires about 39,000 litres of water²⁸.

²⁶ Reuters, August 26th, 2004.

²⁷ www.waterfootprint.org

²⁸ www.waterfootprint.org

Inevitably people who buy cars will demand roads to drive them on. They will seek to escape city congestion and many will opt for low-density suburban housing (occupying farm land) and expect air-conditioned shopping malls with ample parking. All of this requires land, water and energy. The whole schema of car addiction, that is the norm in the West, is likely to be transferred to India. But the dream is only possible for a small percent of the population. For everyone else, car culture will bring higher costs (as the prices of scarce resources are bid up by those who can afford them), degraded public services and an unhealthy environment. The opportunity to leapfrog the mistakes of the West, avoid the societal and environmental costs of car cultures and find better ways to transport people than individual vehicle ownership is being lost.

A new 8-lane, 1047 km highway, The Ganga Expressway, is being built along the north bank of the Ganga from Greater Noida to Ballia as part of the government of Uttar Pradesh's economic development ambitions for India's most populated state. Ten new industrial hubs will be an integral part of the plan and the road builders are being paid partly in land that can be developed. The new hubs will attract jobless farm workers (more population, less agricultural land) and will doubtless become cities. Where will the water come from? An abundance of water is already a mirage in India. The level of the Ganga is already low and groundwater supplies are steadily falling.

Of course, water within a factory can be recycled many times and water use can become more efficient. However, this assumes there is a price to clean water and a cost to pollution. Because of the failure of public supply, private wells are the norm for industry so water is virtually free and can be overexploited without penalty. India boasts strict environmental standards but enforcement is patchy at best or non-existent. Campaigns by NGOs to get industry to clean up are battling the

prevailing belief that business, jobs, products and profit (economic development) must have priority over "the environmental". The result is widespread contamination of land and water.

Revering Mother Ganges – Aligning Lifestyle With Belief

Hundreds of millions of people revere Mother Ganges. But what does that mean in practice when their untreated sewage and the outfalls of the factories producing goods they are buying pour into the river every day? \$500 million invested in sewage treatment in Delhi has failed to prevent 3.6 billion litres of raw sewage being dumped into the Yamuna river²⁹ every day. The river "flows" by Agra and joins the Ganga at Allahabad, where 50 million pilgrims attend the Maha Kumbh Mela every 12 years.

In Varanasi, the river contains 60,000 faecal coliform bacteria per 100 ml as she passes the ghats where hundreds of thousands of pilgrims bathe every day. (500 bacteria per 100ml is considered unsafe for bathing³⁰). Sewage contamination is everywhere in India yet attempts to clean up and treat human waste have largely failed. Only 13% of sewage in India is given any treatment³¹. Installing flush toilets in new houses and using water to carry human waste to enormous treatment plants is surely not a practical solution in a country with so many people and so little water.

Many Indians are aware of what is happening and India is wonderfully rich in well-organized NGOs campaigning for everything, including fighting pollution, better environmental standards and wildlife

²⁹ "Putrid rivers of Sludge", Newsweek, July 7, 2008.

³⁰ "Despite good laws and even better intentions, India caused as much pollution as any rapidly industrializing poor country", The Economist, July 17th, 2008.

³¹ The Economist, December 11th, 2008.

protection. However effective their individual efforts, they are fighting a collective and cultural mindset that discounts the public environment – as has long happened also in the West. Individuals keep themselves scrupulously clean but tolerance of squalor is remarkably high. People throw garbage out of windows because they can. Factory owners do the same. (And Western consumers dump hazardous materials for "recycling" in India!) Attitudes are hard to change.

Veer Bhadra Mishra, president of the Sankat Mochan Foundation in Varanasi which organizes the Clean Ganga Day, admits that despite the Ganga Action Plan launched by the government in 1986, "I still feel that we have not been able to achieve anything. Our aim is still what it was – to clean the Ganga," said Dr. Mishra.³²

Well-to-do, educated pilgrims from Delhi and other booming cities travel up the long road to Gangotri to worship Ganga Ma and obtain Ganga-*jal* (sacred Ganges water). Yet, though pilgrims, they still throw plastic water bottles and food wrappers from the windows of buses. And on the footpath to Gau Mukh (the Cow's Mouth where the river is born from the foot of the Gangotri glacier), I gathered several kilos of garbage. How many shoppers at Center Stage Mall in Delhi think of the destruction of the sacred river which their desires and appetites are causing? As in the West, there is a painful disconnect between belief, words and action. Millions of Hindus still sincerely believe Ganga Ma cannot be polluted, no matter how much filth is thrown in her face.

When the Gangotri Glacier is Gone

As the challenges of increasing population, water usage and pollution continue to escalate in India, they are on a collision course with climate change. The Gangotri glacier, birthplace of the Ganga, has been

³² "Ganga Action Plan Bears No Fruit", The Hindu, 28/8/04

slowly melting for two centuries and is now retreating at 35 metres a year (double the rate of pre-1971³³). The glacier provides up to 70% of the water of the Ganga during the dry summer months but experts predict the glacier could be gone by 2030³⁴. As the glacier melts more water will be released, giving the appearance of abundance, but then flow will fall by 50%³⁵ along the 1600 miles to the Bay of Bengal will fall. Mother Ganga will become long stretches of stagnant and heavily polluted water in the dry season.

Rainfall patterns are also predicted to change, potentially bringing heavier rainstorms and less total rainfall. According to the Peterson Institute for International Economics, changes in rain patterns and temperatures could cut India's agricultural output by 30% by the 2080s³⁶. A half a degree Celsius rise in winter temperature would reduce wheat yields by almost half a tonne per hectare; the wheat yield in India currently averages 2.6 tonnes per hectare³⁷

Conflict over water resources is inevitable. State governments already vie with one another to gain valuable water rights. Farmers blame industry for falling water levels. In a foretaste of what is to come, Coca Cola was ordered to shut down in two states for over-extraction and polluting local groundwater. Even in 2005, the Indian Minister of Finance was warning about "a growing set of little civil wars over water"

³³ Christian Science Monitor, January 3rd, 2007.

³⁴ "India: A Sacred River Left in Peril by Global Warming, Glacier That Feeds Ganges is Vanishing", Washington Post, June 17, 2007.

³⁵ "Glaciers feeding Indian rivers may be wiped out", Indo-Asian News Service, April 28, 2004.

³⁶ The New York Times, June 22nd, 2008.

³⁷ IANS, April 10th, 2007.

and the Minister of Water Resources noted that he was really "the Minister of Water Conflicts."³⁸

The truth is that there is not enough water, and other resources, in India to provide the Western standard of living for the people of India using the technologies and mindset that provided this miracle in the West. It has only been possible in the West because we have grabbed a disproportionate share of our planet's resources and polluted in return. Sustainable economic development will only be achieved to the extent to which the profligacy and mismanagement of the West are avoided. Just tacking environmental regulation onto the last century's models of economic development may bring short-term prosperity to a privileged few but it will doom India's vast majority to permanent poverty amid a poisoned environment.

All of this makes for gloomy reading, but I am not a pessimistic person by nature. Many people know values and expectations have to change in order to raise all humanity out of destitution and avoid destroying our own habitat. Sustainable, low impact technologies are being developed in India and in many countries that allow millions of people to leap-frog outdated systems. The clearest example is the superfast adoption of cell-phones instead of installing a vast physical network of copper landlines. However, it will take more than clever gadgets to create an abundant and sustainable future for India or for anyone.

There are signs of growing environmental awareness. For example, the state of Maharashtra has banned plastic bags. And collecting rainwater is now mandatory in new buildings in Mumbai. In February, 2009, the Government of India set up the Ganga River Basin Authority to try to bring comprehensive responses to the challenges. Whether this is

³⁸ "India's Water Economy: Bracing for a Turbulent Future", World Bank Report 34750-IN, December 22, 2005.

just one more talking shop or will have real power to overcome not only bureaucratic ineptitude and political corruption, but also the enormous weight of private and public interests vested in the status quo and unsustainable development remains to be seen. India has never lacked environmental planning or regulation but these have had little force against the immediate demands of one thousand million people.

If Ganga and all of India's other waterways are to avoid becoming quagmires of sewage and industrial chemicals, the classic Western economic goal of producing as much stuff as possible (to increase GDP) will have to be transformed by India's spiritual heritage into a new ethos. Perhaps love for Mother Ganges can be expressed in a new way that celebrates abundant, sustainable life for all – not just those few human beings with credit cards. Whether or not the people of India are ready to make the hard choices and changes – and so become teachers to the rest of the world -- is perhaps the greatest challenge facing them as individuals and as members of a dynamic society and culture.

Aboard 'Kuan Yin", Canada,
summer 2009.