

## Is it enough to have 'green' Common Wealth Games 2010?

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India hosted the XIX Common Wealth Games (CWG) 2010, in New Delhi, for the first time. It is only the second time that these games have been organized in Asia. A distinctive feature of the CWG 2010 was the emphasis of the organizers on environment; they wanted these games to be remembered not only as a sporting spectacle but also as the first-ever 'green games'. The most significant green initiative undertaken by the Organizing Committee of CWG 2010 was to minimize the carbon footprint of the games through implementation of effective carbon emission mitigation, reduction and offset techniques. To add 'green' feather, biodiversity was enhanced in and around the games village through innovative landscaping. However, vigilant ecological monitoring is required to prevent deliberate and/or inadvertent introduction of invasive alien species (IAS) that complicate the conservation of biodiversity and ecosystem integrity worldwide<sup>1</sup>. In fact, during the Beijing Olympic Games 2008, extensive efforts were made to improve the urban landscape through the introduction of alien plants; and across Beijing city, 60,400 kg seeds of assorted species and 31,430,000 woody seedlings were imported from other countries during 2002–2004 (ref. 2). A notable ecological fallout was the co-introduction of an insect pest (*Opogona sacchari*) with the Palmillo plant (*Dracaena fragrans* Ker Gawl.), an ornamental species native to South America which was intentionally introduced for the purpose of landscaping. The insect pest, later on, invaded 15 provinces of the country, infesting about 50 ornamental and crop plant species<sup>3</sup>. India has also imported alien species of orchids from Thailand and palms such as the Mexican Dioon (*Dioon spinulosum* Dyer) for the landscaping in and around Delhi International Airport (<http://www.indembassy.org.pe/news%20mew.pdf>). Reportedly 'as many as 39 varieties of trees, 26 kinds of plants, 39 types of ground covers and 6 types of cacti and succulents will blend with 30,000 sq. mt of lush green lawns along the terminal and its causeways'. In the absence of an efficient and effective biosecurity system in the country, these

alien plants were directly planted without prior knowledge of their likely escape from cultivation and spread in the surrounding environment. Even if we presume that the alien plant species deliberately introduced for landscaping do not become invasive, they might serve as vectors for the unintentional launch of alien parasites and insects.

Another point of concern is the possible influx of the propagules of IAS by 6081 athletes from 71 countries who participated in the games ([http://en.wikipedia.org/wiki/2010\\_Commonwealth\\_Games](http://en.wikipedia.org/wiki/2010_Commonwealth_Games)), and about 75,000 foreign tourists that the games attracted. In fact, tourism is regarded as a major contributor to biological invasions and the Conference of the Parties in the eighth meeting of the Convention on Biological Diversity (CBD)<sup>4</sup>, with respect to alien species that threaten ecosystems, habitats or species:

- *decided* to consider, as appropriate, in its future work relating to sustainable tourism, the issue of tourism as a pathway for introduction and spread of IAS;
- *urged* the Parties and other Governments, and regional bodies where appropriate, to take measures to address the issue of tourism as a pathway for introduction and spread of IAS... with particular emphasis on tourism in sites of high conservation value; and
- *encouraged* the World Tourism Organization, the International Air Transport Association, and other relevant international organizations to promote education and public awareness regarding the issue of tourism as a pathway for introduction and spread of IAS.

India, being party to CBD, stressed on the regulation of introduction of IAS and their management in its National Biodiversity Action Plan ([http://envfor.nic.in/divisions/csurv/Approved\\_NBAP.pdf](http://envfor.nic.in/divisions/csurv/Approved_NBAP.pdf)). However, there is a lack of specific legislation or policy to deal with IAS. This entails the development of a national system for regulation of all introductions, and an appropriate early warning and awareness system in response to new sightings of IAS. Identification of path-

ways of introduction is also crucial for developing preventative methods including screening systems, interception programmes, early warning strategies, rapid response systems and import regulations<sup>5</sup>. The CWG 2010, being an international large scale event, attracted a large number of tourists thereby, increasing the risk of importation of IAS from almost all the biogeographical zones of the world. In such a situation, prevention should have been promoted as a more environmentally desirable and economically viable strategy; but it is hindered by the difficulties encountered in separating invasive from non-invasive alien species. Furthermore, the high number of candidate IAS, the investment required in taxonomic expertise and modern inspection capacity, and the exorbitant costs involved with individual risk assessments may act against the net benefits of prevention. More rewarding avenues may be found by pursuing neural networks to predict the potential composition of pest assemblages in different regions and/or model introduction pathways to identify likely invasion hubs.

Despite odds we still believe that 'it is never too late to mend'. Even if we failed to scrutinize the introduced plants for potential invasive alien pests at their ports of entry, the early detection and rapid response is still an effective management option. Rapid response should be consequent on early detection but, when IAS are rare, detection rates are compromised by low occurrence and limited power to discern significant changes in abundance. Power could be increased by developing composite indicators that track trends in a suite of IAS with similar life histories, shared pathways and/or habitat preferences. Whether or not established alien species exert harmful impact, the precautionary principle encourages action to be taken to eradicate potentially harmful invasive species as soon as they are detected<sup>6</sup>. Thus, as an effort towards an early warning system, it is our endeavour to make policymakers and stakeholders aware that all that is green is not always 'gold'; it is worthwhile to *monitor all these recent introductions* so as to prevent their establish-

ment and spread in the ecosystem at the cost of native species.

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## Smile with Science

By - Sumanta Baruah



## What monsoon means\*

*Sunita Narain*

There is one being-Indian-thing, which spans the urban or rural, rich and poor divide: our annual watch and wait for the monsoons. It begins every year, without a fail as heat climbs, and monsoons advance. The farmers wait desperately because they need the rain, at the right time, to sow their crops. Without this water, they cannot plant. The city managers wait because by the beginning of each monsoon period, the water reservoirs that feed cities are precariously low. They need the rain to replenish supply. All of us wait, in spite of our air-conditioned living, for the relief rain will bring to the swelter of the scorching heat and dust. This is perhaps the only time when the entire country is enjoined in its desperation. It cannot exhale till it rains.

But even as I write this, I think of three questions: one, if this phenomenon called the monsoons is so important in every Indian's life: How much do we really know about it? Do we know why it rains? Do we know that scientists are still squabbling about the definition of monsoon? The only one they have is seasonal winds, which have regular directions and they get flummoxed when this changes. Do we know that our monsoon is the most globalized or all of us? It is integrated and linked to the ocean current in the far away Pacific or the temperature of the Tibetan plateau, the Eurasian snow or even the freshwater content in the Bay of Bengal. Do we even know who the monsoon scientists are in India and how they are desperately learning to chase this unpredictable and variable creature better by each passing day? We don't. Not really. We have been taught some of the science in school, but never in real life. It is not part of the usable-knowledge, what we think we need to know to survive in our world of today. But we are wrong.

The grand old man of the Indian monsoon, the late P. R. Pisharoty, would have told you that this annual event brings us rain in just about 100 h in the 8765 h year, which means it is our challenge to manage it well. Environmentalist Anil Agarwal would have explained we need to understand the monsoon to understand how nature uses weak forces rather than concentrated forces to do its work. Just think: it takes a very tiny temperature differences to carry as much as 40,000 billion tonnes of water from the oceans and across thousands of miles to dump it as rainfall over India.

This lack of knowledge of nature's ways is at the core of the 'environmental crisis', he would say. Consider again: today we use concentrated energy sources like coal or oil that have created enormous problems like local air pollution and global climate change. If we understood the ways of nature, we would shift to weaker sources of energy, like solar or move to using rainfall, not wait till it is concentrated in rivers or in aquifers. 'Humans have come to rely much more on concentrated water sources like rivers and aquifers in the last 100 years. But the heavy use of these sources is leading to their overexploitation. In the 21st century, human beings will once again move to weaker water resource like rainfall', said Anil. In other words, the more we understand the monsoons of our lives, the more we will understand how to move from just unravelling nature to imitating its way and to build a way of development that is sustainable.

The second question, I have is how much do we know how to live without the monsoons? I am sure you have heard it said that very soon, we will be 'developed' and that would mean that we would no longer be 'dependent' on this crazy national obsession called the monsoon. Let's be very clear that this is not going to happen in a hurry. After some 60 odd years of Independence and after considerable investment in creating surface irrigation systems, the bulk of Indian agriculture remains rainfed. This

literally means that farmers wait to sow and plant and harvest on the mercies of this extremely capricious and undependable God. But this is not even the full picture. What is not said is that between 60% and 80% of the irrigated area is watered by groundwater, a resource, which needs the rain to recharge and refill its supply. This is why, every year, as the monsoon progresses, from Kerala to Kashmir, or Bengal to Rajasthan, hearts stop beating if it halts, slows or dies. The words low pressure and depressions are part of the Indian lexicon. The monsoon is and will remain India's true finance minister.

Therefore, I believe, instead of wanting to reduce dependence, we should celebrate our enjoinderment with this rain creature. We should deepen our engagement with the monsoon. Our monsoon lexicon must expand so that we harvest the rain, every drop of it where and when it falls. This must be the national obsession, treasuring the value of each raindrop. We must build a water future based on decentralized systems – checkdams, lakes, ponds, wells, grasses and trees – everything that can slow the journey of rain to the oceans.

If we can do this, then we can also answer my third and most painful question. How should we live and celebrate the rain that falls in our cities and our fields? Today, we cry when it does not rain and we weep when it does as rain brings floods and disease in fields and water-car jams in cities. Just think of the devastating cycle of water stress to water flood we witness each year, without fail and with increasing ferocity. The only way to change is to begin to relearn the art of living with water that falls every year.

The monsoon is a part of each of us. Now we have to make it real.

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