

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

Irfan Rashid, Anzar A. Khuroo, Gyan Prakash Sharma, Zafar A. Reshi and J. S. Singh

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 worldwide¹. 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 species³. 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%20mcw.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), 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)⁴, 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/csury/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 regulations⁵. 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 detected⁶. 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-

OPINION

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

1. Vila, M. *et al.*, *Front. Ecol. Environ.*, 2010, **8**(3), 135–144.
2. Zhang, J. H., Zhang, J. L., Cui, J. C., Jia, H. and Liu, C. L., *Plant Quarantine* (in Chinese), 2006, **20**, 114–116.
3. Yin, Y. S., Gu, Z. Y. and Zhou, M. H., *Insp. Quarantine Sci.* (in Chinese), 2006, **16**, 76–78.
4. Secretariat of the Convention on Biological Diversity, *Decisions adopted by the Conference of the Parties to the Convention on*

Biological Diversity at its Eighth Meeting, Curitiba, Brazil, 20–31 March 2006, pp. 24–248.

5. Hulme, P. E., *J. Appl. Ecol.*, 2006, **43**, 835–847.
6. Wittenberg, R. and Cock, M. J. W., *Invasive Alien Species: A Toolkit for Best Prevention and Management Practices*, CAB International, Wallingford, UK, 2001.

*Irfan Rashid** is in the Department of Botany, Government College Baramulla,

Jammu and Kashmir 193 101, India; Anzar A. Khuroo is in the Centre for Biodiversity and Taxonomy, University of Kashmir, Jammu and Kashmir 190 006, India; Gyan Prakash Sharma is in the Department of Environmental Biology, University of Delhi, Delhi 110 007, India; Zafar A. Reshi is in the Department of Botany, University of Kashmir, Jammu and Kashmir 190 006, India; and J. S. Singh is in the Department of Botany, Banaras Hindu University, Varanasi 221 005, India.

*e-mail: ecoirfan@yahoo.co.in
