**The Third Linnaeus Lecture**
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# Biodiversity and Cities

**by**
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## Salutation

1 Dr Ahmed Djoghlaf, Executive Secretary of the Convention on Biological Diversity (CBD); Mr Peter Egardt, the County Governor of Uppsala, Sweden; Minister Ryu Matsumoto, the Minister for the Environment of Japan; Your Excellencies, Distinguished Guests, Ladies and Gentlemen.

## Thank You

2 I would like to begin by thanking my good friend, Dr Ahmed Djoghlaf, for inviting me to deliver the Third Linnaeus Lecture. Ahmed Djoghlaf played vital roles in the success of the Earth Summit. It is hard to believe that 18 years have passed since that historic conference in Rio de Janeiro.

## Homage to Linnaeus

3 The Swedish genius and father of modern taxonomy, Carl Linnaeus, was born on 23 May 1707. On the occasion of his 300th birthday, in 2007, I participated in a conference and exhibition to honour him, which was held at the Singapore Botanic Gardens. Far away, in the Canadian city of Montreal, the Secretariat of the CBD, the Kingdom of Sweden and UNESCO, decided to launch the inaugural Linnaeus Lecture. The lecture was delivered by Mr Yvo de Boer, the then Executive Secretary of the UN Framework Convention on Climate Change (UNFCCC) on the topic, "Climate Change Challenges". Climate change is, of course, a principal threat to

biodiversity. The Second Linnaeus Lecture was delivered by Professor Jeffrey Sachs of Columbia University and Special Adviser to the UN Secretary-General, Mr Ban Ki-moon, on 23 May 2008, in Bonn, on the sideline of COP-9.

Three Environmental Challenges

4 In my view, the three most important environmental challenges of our time are: climate change, the loss of biological diversity and desertification. All three are inter-related and it is a pity that the world has taken a rather unbalanced view of the three challenges: too much attention on climate change and too little on biodiversity and desertification. For this reason, I support Japan's proposal to designate the decade, 2010 to 2020, as the UN Biodiversity Decade. I also support the idea that the UN General Assembly consider holding a special summit, during its 70th session, in 2015, to do a mid-term review of the new 2020 Strategic Plan.

Loss of Biodiversity

5 At COP-6 in 2002, the world's leaders agreed to achieve a significant reduction in the rate of biodiversity loss by 2010. According to the Global Biodiversity Outlook 3 (2010), co-authored by UNEP and the Secretariat of CBD, that target has not been met. On the contrary, the evidence suggests that the rate of biodiversity loss is increasing. This trend seems to find confirmation in the first report of the IUCN Sampled Red List Index for Plants (2010), prepared by the Royal Botanic Gardens at Kew, the Natural History Museum (London) and IUCN. The key findings include the following: (i) more than 20 per cent of plants are threatened with extinction; (ii) the most threatened habitat is the tropical rainforest; and (iii) the greatest threat to habitat loss is caused by human activities, such as, the conversion of natural habitats for agriculture, including palm oil and soybean plantations or to livestock farming.

Biodiversity and Human Health

6 Sceptics have asked, why should we care if certain species of plants and animals become extinct each year? We are all familiar with the economic and medicinal benefits of biodiversity. I think the most compelling case for why we should care, has been made by Dr Eric Chivian and Dr Aaron Bernstein, in their monumental book (2008),

entitled, “Sustaining Life: how human health depends on biodiversity”. In his eloquent prologue, Mr Kofi Annan wrote:

> “One of the main reasons the world faces a global environmental crisis is the belief that we human beings are somehow separate from the natural world in which we live, and that we can alter its physical, chemical and biological systems without these alterations having any effect on humanity. Sustaining Life challenges this widely held misconception by demonstrating definitively, with the best and most current scientific information available, that human health depends, to a larger extent than we might imagine, on the health of other species and on the healthy functioning of other ecosystems.”

7 In their preface, Dr Chivian and Dr Bernstein wrote:

> “During the past fifty years … our actions have resulted in the loss of roughly one-fifth of Earth’s topsoil, one-fifth of its land suitable for agriculture, almost 90 per cent of its large commercial fisheries, and one-third of its forests, while we need these resources more than ever, as our population has almost tripled during this period of time, increasing from 2.5 to more than 6.5 billion.”

8 They also wrote:

> “We are so damaging the habitats in which other species live that we are driving them to extinction, … at a rate that is hundreds to even thousands of times greater than natural background levels. … as a result of all these actions taken together, we are disturbing what are called “ecosystem services”, that is, the various ways that organisms, and the sum total of their interactions with each other and with the environments in which they live, function to keep all life on this planet, including human life, alive.”

Urbanising Asia

9 For the first time in human history, the majority of human beings lives in urban settlements rather than rural areas. This process of rapid urbanisation is changing Asia dramatically. Let us take China

and India as examples. In 1987, only 25 per cent of China's population lived in cities. By 2007, the percentage had gone up to 42 per cent. The number is expected to rise to 60 per cent in 2030 and 70 per cent in 2050. In the case of India, by 2050, 55 per cent of its population or 900 million Indians are expected to live in cities. Of the world's 100 fastest growing cities, with a population of over 1 million, 66 are in Asia. The urbanisation of Asia will transform the world economically and environmentally.

Urbanisation and Biodiversity

10 Urbanisation is generally viewed as a threat to biodiversity. However, we cannot stop the process of urbanisation. We already live in an urban world and the future will be an even more urban one. This is not necessarily a bad thing because high density living, with proper planning and implementation, can improve efficiencies in transport and the use of resource. It can also free up land, which would otherwise be consumed by suburban sprawl, for green areas and biodiversity. Instead of viewing cities as the enemies of biodiversity, let us change the paradigm and focus on how cities can contribute positively to conserve biodiversity. Let me discuss Singapore's experience, as an example. Singapore is, however, not alone in this movement. Other cities, such as Nagoya in Japan, Curitiba in Brazil, Montreal in Canada, Brussels in Belgium, Montpellier in France, Bangkok in Thailand, Bandung in Indonesia, Iloilo City in the Philippines, Kuantan in Malaysia, Frankfurt in Germany, Hamilton in New Zealand, Joondalup in Australia, London in the UK, and Stockholm in Sweden, are part of the movement. The role which cities can play in the conservation of biodiversity was discussed both at the 2008 and 2010 World Cities Summits, held in Singapore. It is also significant that the theme of the highly successful 2010 Shanghai Expo is: "Better City, Better Life".

The Singapore Story

11 The Singapore story is important to the world because it shows that a city need not be an enemy of nature and biodiversity. On the contrary, it demonstrates three propositions: (i) that achieving economic prosperity need not be at the expense of care for the environment; (ii) that a small, densely populated city can still be clean, green and nature-loving; and (iii) that a city can play a positive role in the conservation of biodiversity and in our campaign to reduce the loss of biodiversity.

12 Singapore is a small island, strategically located at the junction between the Strait of Malacca and the South China Sea. It is a port of call for ships plying the East-West trade route, from ancient sailing ships to modern super tankers and container ships. It is a very small island, with a total area of 710 square kilometres. It is smaller than the City of Tokyo. Our population has exceeded 5 million, making us one of the most densely populated cities in the world.

13 Although the island had been inhabited since the 14th century, it had become depopulated by 1819, the year in which the British acquired it. It was a British colony from 1819 until 1963, when it became a State within the Federation of Malaysia. It became an independent State in 1965.

14 From 1819 until the 1970s, the imperative was to clear the original forest cover, mangrove forests and to level the hills, for development. As a result, Singapore has lost more than 95 per cent of its original forest cover, about 50 per cent of its animal species and 25 per cent of its vascular plants. Yet, when we look at a Google Earth satellite photograph of Singapore, we are surprised to see that half the island is green. When we look closer, we will notice that forests cover 9.2 per cent and dense vegetation cover 14 per cent of Singapore.

<u>From Garden City To City In A Garden</u>

15 How did Singapore, which is so densely populated, become so clean, green and nature-loving? I think the secret is that we have one of the world's first green political leaders, Mr Lee Kuan Yew. From the beginning of our journey from the Third World to the First, Mr Lee insisted that Singapore would accept no investment proposal if it did not have the support of the anti-pollution unit. The unit was located in the Prime Minister's Office and was empowered to overrule the economic agencies. Mr Lee believed that nature has economic value and that our clean and green environment would give us a comparative advantage in attracting foreign investment to Singapore. It was he who envisioned Singapore as a Garden City. We often refer to him as Singapore's Chief Gardener! Mr Lee's successors have taken the vision to another level. Our new ambition is to be a City in a Garden. Our ambition is to make Singapore one of the world's most liveable cities, not just for the rich and the elite, but for all our citizens,

residents and visitors.

Singapore's Biodiversity

16 Singapore is fortunate to be located within the world's richest biodiversity region. For this reason, although we have lost a significant percentage of our biodiversity, what remains is not insignificant. We have more than 2,000 species of plants, 360 species of birds, 270 species of butterflies, 120 species of reptiles, 75 species of mammals, 25 species of amphibians, 256 species of hard corals, covering 55 genera and 111 species of reef fish belonging to 30 families. You will be surprised to learn that one of our four nature reserves, the Bukit Timah Nature Reserve, only 163 hectares in size, is home to more species of trees than the whole of North America. You will also be surprised to learn that there are 3 species of crabs in Singapore which do not exist anywhere else on this planet. At the suggestion of the Nature Society of Singapore, the Government has created a wetlands nature reserve at Sungei Buloh, which welcomes each year thousands of migratory birds in their annual pilgrimage to escape the northern winter. The Government also took up a proposal by the people of Singapore to conserve an inter-tidal area that comprised 7 different ecosystems at Chek Jawa. The Government had originally intended to reclaim land which would have destroyed these ecosystems.

Efforts to Conserve Biodiversity

17 Let me now share with you a few of the best practices which Singapore has undertaken to protect and enhance our biodiversity.

18 First, the government's lead agency on biodiversity, the National Parks Board (NParks) has been proactive in leading the way. In 2009, it launched the National Biodiversity Strategy and Action Plan. Apart from championing a wide range of conservation projects, the Plan also aims to give voice to biodiversity issues in policy and decision-making. NParks also has an admirable attitude of seeking to work closely with the civil society, the corporate sector, students and volunteers. Our national water agency, PUB, has turned our concrete canals and drains into landscaped rivers with plants and mangroves. As a result, we are seeing the return of birds like the magpie robin, fishes and insects such as butterflies and dragonflies, to our heartlands, thus bringing biodiversity closer to our people.

19 Second, I must praise the contributions of our universities, research institutions and scientists. At the Raffles Museum of Biodiversity Research, at the National University of Singapore, visitors can learn about the region's plants and animals, through an extremely comprehensive collection of preserved specimens. It is also training the next generation of the region's scientists. They are also planning to build a new museum of natural history which will showcase the natural heritage of Southeast Asia. Individual scientists have been extremely active in their research, teaching and publications, on Singapore's biodiversity. One of my favourite publications is a book by four of our scientists (Hugh Tan, Chou Loke Ming, Darren Yeo and Peter Ng), on the Natural Heritage of Singapore. Two of our leading scholars, Professor Leo Tan and Professor Peter Ng, with the support of two dozen passionate graduate students, are co-editing an Encyclopedia of Singapore's Biodiversity. In 2011, the National University of Singapore will launch a new multi-disciplinary bacherlor's degree in environmental studies. We already have a master's degree on environmental management, which is co-taught by professors from seven different faculties.

20 Third, we have an active and responsible civil society. The Nature Society (Singapore), for example, is a blue-chip NGO. Its members conduct guided nature walks, bird and butterfly watching, talks as well as undertake conservation projects and surveys. Working closely with the Singapore Environment Council, the Nature Society (Singapore) works with schools and community organisations to promote the appreciation of nature and biodiversity. The marine volunteers are also very active in monitoring sea-grasses and hard corals in our waters. Our amateur naturalists are just as diverse as our biodiversity. For example, our High Commissioner to Brunei, Joseph Koh, is an expert on spiders, a professor of obstetrics and gynaecology, Ng Soon Chye, not only delivers human babies but is also encouraging Oriental Pied Hornbills to breed in Singapore, a specialist in gastroenterology, Francis Seow, is an expert on stick insects, one of our butterfly experts, Khew Sin Khoon is an architect, and one of our best natural photographers, Chua Ee Khiam, is a dentist by day. The green citizen movement is, indeed, blooming in Singapore.

21 Fourth, one of Singapore's best practices is our ability to bring government, academia, civil society, and the corporate sector to work

together. The business community in Singapore is increasingly supportive of the environment and biodiversity. Let me give you two examples in which I was involved. A leading MNC partnered NParks to plant trees, which would attract singing birds, in one of our parks. When the trees mature and the singing birds come, the forest will resonate with the songs of birds. In another project, the Nature Society (Singapore), NParks and the private sector decided to do something which has never been done elsewhere in the world. Singapore's main shopping street, the Orchard Road, is like the Champs-Elysees in Paris. In a four kilometre stretch linking the Singapore Botanic Gardens, on the one end, and the Fort Canning, on the other, we have planted trees and shrubs by volunteers along Orchard Road which are either host plants for butterflies or plants which provide them with nectar. Soon, when the plants mature and the butterflies arrive, the shoppers and pedestrians along Orchard Road will have the unique experience of being accompanied by butterflies. I hope that the shoppers on Orchard Road be so inspired by the experience that they will develop a love of nature and a sense of stewardship towards biodiversity and the ecosystems which sustain them.

Conclusion

22 Let me conclude by recapitulating my three propositions.

23 First, I agree with Dr Chivian and Dr Bernstein that the historically unprecedented loss of biodiversity is a threat to the ecosystems which sustain human life and welfare. Second, the process of urbanisation is irreversible. Therefore, instead of seeking to oppose the inevitable, we should make the cities of the world our allies and even the drivers, in our endeavour to protect our biodiversity. Third, Nagoya, Curitiba, Montreal, Bonn, Singapore and other like-minded cities are the thought leaders of a new movement to make our cities liveable, safe, green and rich in biodiversity. I therefore strongly support the Singapore Index on Cities' Biodiversity and hope that it will inspire cities around the world to join the movement.

24 We know so much more about the wonders of nature than Linnaeus did when he proposed to describe all known plant and animal species over 200 years ago. However, if we do not stop the continued loss of biodiversity, many of these species will only be found as preserved specimens in our museums and herbaria. Let us

mobilise the cities of the world and the knowledge, talent, creativity, energy of their citizens, to preserve the natural heritage which Linnaeus loved and strove to document.

Thank you. Arigato.

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