Asia and the Pacific

Warming temperatures, extreme weather events, and threats to sustainable water supplies and biodiversity pose growing environmental challenges in the region while Governments are beginning to address some key environmental problems.

REGIONAL WARMING TRENDS

In 2006, researchers reported a progressive and accelerated long-term Asian warming trend over the period 1860-2004 (Huang 2006). This trend has been accompanied by an increase in frequency of extreme weather events. Analysis of rainfall gauge data in India shows that over the last fifty years the frequency of severe rainstorms increased while the frequency of moderate events decreased. The number of storms delivering more than 100 millimeters in a day has increased by 10 per cent per decade while those delivering over 150 millimeters per day doubled. This trend suggests increasing risks of extreme rainfall. The resulting landslides, flash floods, and crop damage could have major impacts on the economy, society, and environment (Goswami and others 2006).

Throughout 2006, storms lashed countries across Asia, flooding landscapes in Timor-Leste, China, India, Pakistan, Thailand, Bangladesh, Sri Lanka, Korea, Kashmir, and Afghanistan. The flooding brought mudslides and, in Sri Lanka, re-exposed landmines. In December, the Philippines faced the fourth typhoon in as many months with flooding and deadly mudslides that buried hundreds of victims (ReliefWeb 2006).

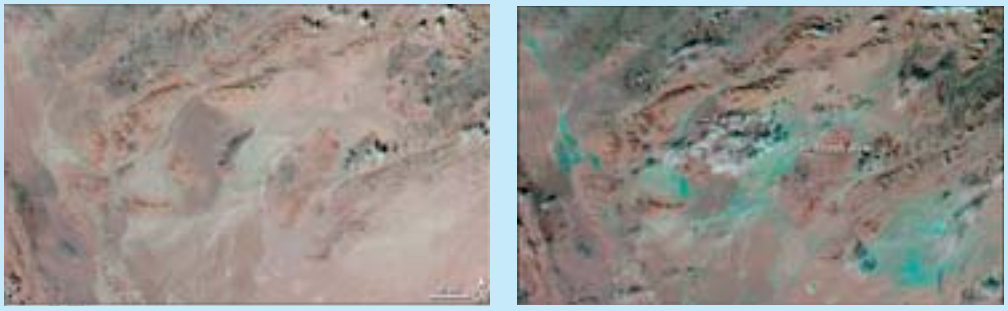
In Australia, a drought trend persisting since 2002 reached severe levels in 2006. According to the Australian Bureau of Meteorology, the situation worsened since August, with a near total failure of the rains needed for planting season (BOM 2006).

Underlying continent-wide trends, local and regional climate patterns are also shifting **(Box 1)**. Despite episodes of flash flooding, parts of Central Asia will soon mark a decade of drought **(Figure 1)**. Theories explaining the persistent lack of precipitation over the Iranian Plateau vary from a teleconnection (long-distance relationship) with warmer temperatures in the western Pacific and the eastern Indian Oceans to an anomalously persistent South Asia High over the region (Hoerling and Kumar 2003, Qian and others 2002). In China, 2006 was a disastrous year of weather, characterized by less rain, drought, and high temperatures. The anomalous weather was attributed to global warming by the Beijing Climate Center of the China Meteorological Administration (CMA 2006, Xinhua 2006). **(Box 2 and Box 3)**.

Source: Still Pictures

In India the frequency of severe events has increased over the last fifty years.

Figure 1: November 2006 floods in the normally arid desert of western Afghanistan



30 October 2006

17 November 2006

At least 56 people were killed and thousands of hectares of farmland were washed away during this flooding in arid western Afghanistan. The dried-up beds of the Farah and Khash Rivers and their tributaries on 30 October 2006 turned into flood plains (in turquoise) less than three weeks later on 17 November 2006.

Source: NASA Earth Observatory and Reliefweb 2006

Source: Reuters/The Bigger Picture

On 25 August 2006 a boatman repairs his craft on the dry bed of the Jialing River that joins the Changjiang (Yangtze) River in Chongqing municipality.

Box 1: Anomalous patterns in Indus Valley Basin Glaciers

The Himalaya Mountains contain high altitude glaciers that supply water to many of Asia's major rivers. The Syr Darya and Amu Darya supply water to much of Central Asia, while the Huanghe, Changjiang (Yangtze), Red, Mekong, Salween, Brahmaputra, Ganges, and Indus Rivers provide water to more than half of the world's population.

Throughout much of Asia, people depend heavily on glacial melt-water for their main dry season water supply. Currently, this water is supplied gradually to downstream users—including hydroelectricity generating plants—as ice and snow pack melt over the warm months. But in a warmer world problems of water scarcity will be exacerbated. Rising temperatures will add glacier melt to snowmelt, increasing flooding during planting season. They will also lead to less winter precipitation being stored as snow. Dry season flows of water will be reduced and crop production will be affected.

According to monitoring data, temperatures in the mountain and high plateaus are rising and most glaciers are rapidly retreating. In Nepal and Bhutan, melting glaciers are filling glacial lakes beyond their capacities, resulting in outburst floods. Tibet's glaciers have accelerated their rate of melting since the 1990s. According to China's foremost glaciologist, Yao Tangdong, most glaciers in the Himalaya region of Tibet could melt by 2100, causing ecological catastrophe.

However, in the western extremes of the Himalaya, along the Karakoram and Hindu Kush ranges, scientists have recently detected some contrasting trends. According to an analysis of data collected for the Upper Indus Basin from 1900 to 2000, winters since 1960 have been warmer and summer temperatures cooler in the basin. At the same time winter and summer precipitation has increased. The lower summer temperatures produce a downward trend in runoff because the winter accumulation is not melting away quickly. Glaciers are gaining volume and mass. The researchers have found similar tendencies in parts of northwest India and in some of Nepal's lower altitudes, as well as in northern parts of Pakistan and the Wakhan Corridor of Afghanistan.

Scientists suggest this cooling may be related to shifts in large scale atmospheric circulation patterns in Asia and feedback related to the Indian monsoon. The implications for water resources in the Indus valley are complex but researchers anticipate that understanding climate variability at these smaller scales will lead to better forecasting of water supply over the short and long terms.

Sources: Barnett and others 2005, USGS 2005, Cyranoski 2005, UNESCO 2006, Fowler and Archer 2005, Fowler and Archer 2006

Evidence of glacio-lacustrine deposits and recent tree growth at the foot of an old slope collapse, Karakorum Range, Pakistan

Source: Karl Schuler/ Mountain Forum

BIODIVERSITY CONSERVATION INITIATIVES

Many Asian governments recognize the value of biodiversity conservation and actively support surveys to document diversity and programs to protect biodiversity-rich areas. The Asia Pacific region has made progress in protecting natural areas **(Box 4)**. The ratio of protected area to surface area in the region increased from 7.4 per cent in 1990 to 10.6 per cent in 2006 (GEO Data Portal 2006 based on UNEP-WCMC). In 2006, the World Heritage Convention inscribed Khao Yai National Park in Thailand and Shiretoko in Japan as World Heritage sites (IUCN 2006a). Two natural forest areas in central Laos were also certified under the Forest Stewardship Council (FSC) Certification scheme in 2006 (WWF 2006).

In May, Australia announced 58.5 million hectares of new protected zones—a total area as big as the State of Victoria—included in 13 new marine protected areas. Currently, about one-third of the world's marine protected areas are in Australian waters (DEH 2006). Despite these new additions, there is considerable scope for improvement in regional efforts to protect the marine environment—marine protected areas have advanced only modestly from 1.6 per cent of the territorial area in 1990 to 2.2 per cent in 2006 (GEO Data Portal 2006 based on UNEP-WCMC).

The wealth of the region's biodiversity was further documented in 2006. In February, Conservation International (CI) announced the discovery of dozens of new species during a biodiversity survey of Western New Guinea's Foja Mountains. The expedition—co-sponsored with the Indonesian Institute of Science and including scientists from Indonesia, the United States, and Australia—documented a rhododendron with a six-inch wide flower, four new species of butterflies, and 20 new kinds of frogs. The scientists spotted the first

Box 2: Water Issues in China

In 2006 more than 17 million people and 16 million livestock suffered drinking water shortages in southwest China, caused by drought. Estimates indicate that at least 1.3 million hectares of agricultural land in the Sichuan Basin, which includes Chongqing municipality, suffered drought effects and another 280 000 hectares of crops were destroyed. Crop losses cost the region more than US$1 billion, with some estimates putting losses as high as US$2.43 billion. Levels of the Changjiang (Yangtze) River near Chongqing were at a 100-year low during the drought, and reservoirs that supply Chongqing's water were only one-third full, leaving 7.9 million of the city's 31 million inhabitants without adequate drinking water.

In China, urban water supplies have deteriorated in step with booming economies. In a survey of 600 Chinese cities, two thirds had inadequate water supplies and 1 in 6 had severe water shortages. Industrial and domestic wastes are insufficiently treated before entering the surface water so the quality of surface water has become a serious problem. A survey of seven major rivers in the country found that nearly one third of the river section samples registered the worst grade possible of national water quality standards, indicating that the water supply in these sections is of very poor quality and has no practical use, not even for irrigation.

Chinese policy makers recognize the gravity and complexity of their environmental problems and have formulated policies to protect the environment while fostering economic growth. Strengthening water conservation is one of the top priorities set out by the Chinese Premier for environmental protection: others include controlling water, atmospheric, and soil pollution; enhancing protection of ecosystems; adjusting the economic structure to be more environmentally sound; and boosting the environmental technology and protection industry.

Sources: Xinhua 2006, Li 2003, SEPA 2005, Shao and others 2006, Wen 2006

The "Giant White" Rhododendron, a species yet to be described, is the largest rhododendron species in the world.

Source: Wayne Takeuchi/ Conservation International

A new species of honeyeater was discovered in the Foja Mountains of Papua province, Indonesia, on the island of New Guinea.

Source: Bruce Beehler/Conservation International

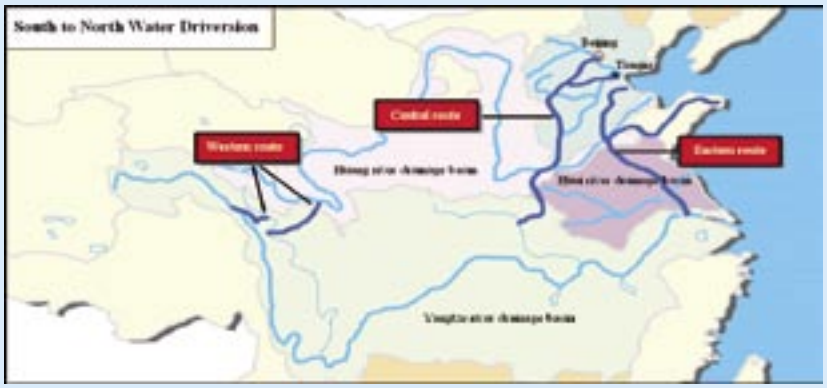
live male Berlepsch's Six-Wired Bird of Paradise (*Parotia berlepschi*) ever seen and an orange-faced honeyeater, the first new bird discovered on the island of New Guinea since 1939 (CI 2006a).

The Indonesian government has already designated the region a wildlife sanctuary and CI is working with government officials and the people within the greater Mamberamo Basin, which includes the Foja Mountains, to preserve the area's incredibly diverse wildlife (NPR 2006).

Two more surveys led by Conservation International in 2006 documented the marine biodiversity of the Bird's Head Seascape, off the northwestern end of Indonesia's Papua province. This part of the 'Coral Triangle' includes more than 1 200 species of fish and almost 600 species of reef-building coral—75 per cent of the world's known total. Only 11 per cent of the seascape is currently protected, most of it in the Teluk Cenderawasih National Park (CI 2006b).

The three surveys are part of CI's Rapid Assessment Program, an initiative to document forest and marine sites around the world to inform and promote knowledge-driven conservation. The collected data supports priority-setting, definition of conservation outcomes, and decision-making by local stakeholders and leaders (CI 2006c).

Box 3: Supplying water to the thirsty



Source: Li Qiangzi / Chinese Academy of Sciences

Over 80 per cent of water runoff in China takes place in the south, while the north—with 37 per cent of the country's total population and 45 per cent of cultivated land—has only 12 per cent of China's total water resources. The colossal South to North Water Diversion Scheme will shift water across great distances to supply drinking and irrigation water to China's northern regions where 96 million people now lack adequate water supplies, according to Chinese government estimates. The project involves creating three canal systems linking the country's four major rivers—the Changjiang (Yangtze), Yellow, Huaihe, and Haihe—and is expected to take 50 years to complete.

In July of 2006, construction of a tunnel was completed linking canal sections on either side of the Caohe River. The canals and sub-river tunnels run between pumping stations, reservoirs, and dams. According to the long term plan, two more phases of the scheme—a central route running from the Three Gorges Dam reservoir and a western route delivering water from Tibet—will add to the eastern supply by 2050, altogether transferring a total of 44.8 billion cubic metres of water northward every year.

Critics of the scheme are concerned about ecosystem destruction and contamination from pollution. To counter pollution in the first phase alone, around 130 sewage treatment plants will be established as well as a series of supporting activities that include 149 industrial pollution control projects, 21 polluted water diversion schemes, and 16 comprehensive pollution control initiatives. Health concerns loom over the possible spread of schistosomiasis when the channels all connect. The snails that carry schistosome flukes are endemic to the Changjiang (Yangtze) River in Jiangsu Province—the southeastern source of the scheme's first phase. Public health officials are advising on preventive measures to control the spread of the snails when the water flows.

The official release of the western leg project proposal was scheduled for the end of 2006. Regional scholars and engineers recommend further inquiries addressing concerns about geology, ecology, and the environment; the Qinghai-Tibet Plateau and its shrinking glaciers; the volume of water to be transferred; influence of the transfer on electricity supplies; relocation and protection of people and cultural relics; compensation to residents; and fundraising.

Sources: Chinapage 2006, Stone and Jia 2006, Liu 2006, China Daily 2006, China Newsweek 2006

Box 4: Fijians honoured with conservation award

Fijian Prime Minister Laisenia Qarase and Paramount Chief Aisea Katonivere of Fiji's Macuata province on the island of Vanua Levu received the second annual Global Ocean Conservation Award on World Ocean Day, 8 June 2006.

They were honoured for their work ensuring that at least 30 per cent of Fiji's inshore and offshore marine areas will be effectively managed and financed within a comprehensive and ecologically representative network of marine protected areas by the year 2020.

Last year Palau, the Federated States of Micronesia, the Marshall Islands, Guam, and the Northern Mariana Islands matched Fiji's pledge to protect 30 per cent of near-shore marine resources and 20 per cent of terrestrial resources on their islands by 2020. Inspired by this 'Micronesia Challenge', the Caribbean island of Grenada pledged in March of 2006 to put 25 per cent of its near-shore marine resources under effective conservation by 2020.

Source: IUCN 2006b

Regional Biodiversity Conservation

One of the most ambitious multilateral biodiversity conservation projects in the world is taking shape in the Greater Mekong Sub-region (GMS), comprised of Cambodia, Laos, Myanmar, Thailand, Viet Nam, and China's Yunnan Province. Home to more than 300 million people, the sub-region's vast wealth of human and natural resources marks it as a new frontier for economic growth in Asia.

The GMS Biodiversity Conservation Corridors Initiative promotes biodiversity conservation as an important component of economic development and endorses sustainable use of natural resources. By 2015, GMS countries plan to establish nine priority biodiversity conservation landscapes and corridors. Core aims of the initiative include maintaining the quality of ecosystems through enhanced connectivity while restoring and protecting ecological integrity. At the same time, the initiative intends to ensure sustainable use of shared natural resources, reduction of poverty, and improvements in the livelihoods of people (ADB 2005, ADB 2006).

CONCLUSIONS

Reconciling economic development and conserving nature is a challenging but essential goal of sustainable development. Rapid economic development is a key factor responsible for environmental challenges faced by the region. But that same economic development can provide resources and motivation to drive environmental policy formulation and implementation, especially on the use of scarce resources and conservation.

The Mekong Basin provides ecosystem services, transportation routes, resources—and a location for floating markets like this one in Can Tho, Viet Nam.

Source: Jean-Léo Dugast / Still Pictures

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