

ENVIRONMENTAL DEGRADATION IN SOUTHWEST CHINA

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Deforestation in Central Ganzi Prefecture

The People's Republic of China is rich in cultural and natural diversity with over 50 ethnic groups and is listed by biologists as a 'megadiversity' country. In terms of biodiversity it comprises more than 30,000 species of higher plants and 2,100 terrestrial vertebrates. Several hundred species are endemic to China, the most famous being the giant panda, the lesser panda and the Yangtze crocodile.

Much of this variety is found in an area of southwest China, where in a few locations the untouched

ecosystems are among the most diverse living assemblies in Asia. Since 1950 the forests have been indiscriminately felled reducing forest cover from 30% to 13%. This has threatened biodiversity, causing drastic declines of mammal and bird counts, recurrent flooding and erosion, and recurrent snow disasters. These not only threaten global climate, but also undermine the livelihood of the local people. China is the nation with the longest continuous culture on earth, and from the earliest times (The Shang Dynasty 1766-1122 BC) there

is evidence of both a conservation ethic and an understanding of environmental processes. Environmental consciousness used to be reinforced not only by rulers but through Daoism, Confucianism and Buddhism but it appears to have been retained mostly as an ideal which was gradually superseded by modernity. Although the recorded history of southwest China is not as old as Han China there is evidence that the people have lived sustainably with their fragile world for 2,000 years, and still today exhibit a conservation ethic deeply

embedded in their animistic and Buddhist traditions and supported by historic government decree. Modernity rather than enhancing the well-being of the peoples of southwest China is seemingly destroying their environment, their kinship patterns, social cohesion, indigenous culture and robbing them of their means of life.

Last year China announced very ambitious plans for forest conservation and the provision of funding to re-deploy loggers as tree planters. It has however taken the very serious floods that occurred in China last summer for both the State and local government to introduce desperate measures, in an attempt to ameliorate the problem. It was not until 17 August that the authorities admitted that some of the flooding was due to deforestation in the upper reaches of the Yangtze River. As a result, a complete felling ban was introduced in western Sichuan, plans for log channels at Ertan hydroelectric power station were suspended, and US\$52 million a year was released to re-deploy loggers in reforestation. In order to facilitate reforestation, it was announced that 9 million hectares of grazing land would be closed. Similar measures were instituted along the upper reaches of the Yellow River and in Yunnan Province and Tibet Autonomous Region.

Although these measures are generally welcome there are already signs that the logging bans are being flouted, and officials who question if funding for conservation is a sustainable income stream. Concerns have been expressed about the impact of the ban and pasture closure on the one million Tibetans who are dependent on the logging industry and there is concern that most of the funds for replanting will go to Han Chinese forestry workers, which may heighten ethnic tension.

We cannot turn the clock back, and whether we like it or not, modernity has impacted southwest China's



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mountain peoples. There are lessons we can all learn from China's disastrous floods, about our view of the natural world and our paradigms of resource management. If some of the measures China has introduced result in new perceptions of the forest as a multifunctional resource, sustainable eco-forestry management systems, the empowerment of local people as forest stewards, fairer access to resources and forest systems that enhance local well-being and the environment, it will represent a turning point.

Southwest China

Southwest China is deeply dissected by four of Asia's largest rivers (Bramaputra, Salween, Mekong and Yangtze), that flow in a southeast course through deep limestone and sandstone gorges. Elevation ranges from 2,000m to more than 7,000m and the area is dominated in the east by Minyak Gangkar (7,590m). The steep slopes are mostly covered by coniferous forest, and the region contains China's largest forest resource. Nowadays this vast region, known to the indigenous Tibetan people as Kham is divided for political and historical reasons between four Chinese provinces and comprises 47 counties. The region was characterised by its very rich biodiversity. There are still believed to be over 1,500 species of higher plant, more

than 90 mammal species, more than 350 bird species, and more than 25 reptile and amphibian species. Of note are 52 conifer species, 10 pheasant species and 330 mushroom species.

Deforestation

The forests of southwest China, were among the most extensive areas of forest cover in the whole of China, and include the forests of southeast Tibet, western Sichuan, northern Yunnan, southwest Gansu, and southeast Qinghai. Since 1950, when they were designated China's 'second timber production base' and macro-scale timber production enterprises were established, all these areas have experienced indiscriminate felling. The destruction was caused by 'planned' commercial timber extraction, and not through population pressure. The forests of southwest China have seemingly never been managed on a sustainable basis, and most of them lack a management plan or any form of monitoring. Timber is not only required for China's booming economy, but it is often the most important source of cash revenue for local administrations, enabling them to fund education, health and infrastructure. State forest enterprises are required to sell a minimum timber quota, which is often as much as three times the sustainable yield, at a price that is often below production costs.

To compensate for this they sell even more timber on the free market and in some areas annual felling is four times more than the sustainable yield. As a result forest cover in Tibet has fallen from 9% (1950) to 5% (1985), in Yunnan from 55% (1950s) to 30% (1975) and in Sichuan from 30% (1950) to 6.5% (1998).

Some of the most disquieting reports on deforestation come from Sichuan and Yunnan. Although deforestation began in the early 1950s rapid acceleration did not begin until the 1960s. In theory, the 104 state forest areas should only fell 760,000 cubic metres a year on a sustainable basis, but they have exceeded 2 million cubic metres year-on-year. Logging, clearing of forest for cultivation, expansion of pastures and forest fires have so seriously upset the ecosystem in the mountainous prefectures of western Sichuan that environmentalists fear that the Yangtze, whose tributaries drain the prefectures, will become as bad as the Yellow River. Of the provinces' 139 counties only 12 now have forest covering more than 30% of the land, 22 have between 20% and 30%, but 91 have less than 10%, and 14 counties have less than 1%. Yunnan still ranks fourth in China in terms of total timber resources, but in relative terms the province's deforestation has been even more extensive than in Sichuan, and its loss of forest land appears to be by far the worst in China. In the early 1950s about 55% of Yunnan was covered by forests, but by 1975 it had dropped to 30% and annual wood consumption was double the growth rate. To make matters worse large-scale clear felling is widely practised, tree planting to tree felling ratios are very low (1:10), tree seedling survival rates of less than 30% are common, less than 40% of woody biomass is utilized and only about 7% of milling wastes are utilized. Four decades of forest destruction have threatened the region's biodiversity, environment and climate.

Biodiversity threatened

At the national policy level China has a solid record in the area of biodiversity conservation, and was one of the first countries to ratify the Convention on Biological Diversity and to develop an Agenda 21 portfolio. However policy has made very little difference to the peoples of southwest China, where many of the reserves lack staff, funds, infrastructure or a management plan. The international conservation community has focused on the panda at the expense of other endangered species.

Although the biodiversity of southwest China is still considerable, deforestation is doing away either singly or in concert with much of the natural foundation requisite for such diversity. The most dominant tree species in the temperate and subalpine zone of southwest China include *Picea*, *Pinus*, *Abies*, *Tsuga*, *Quercus*, *Juniperus*, and *Larix* and at lower level *Fagaceae*, *Lauraceae*, *Araliaceae*, *Manoliaceae* and many species of bamboo.

Deforestation is posing a threat to the dominant forest species, and especially to a number of very rare gymnosperms (e.g. *Metasequoia glyptostroboides*). A great deal of information exists on extinct or endangered birds and mammals in China. Many of the endangered species are found in southwest China and include 18 mammal and 23 bird species. Where forests have been indiscriminately cut

this has resulted in large declines in mammal and bird counts. The reduction in predators, has resulted in a massive infestation of rodents and small mammals in many areas of southwest China resulting in the degradation of over 8 million hectares of pasture and extensive areas of 'black sands' where no grazing can occur.

Environmental and climatic change

Deforestation is not only responsible for very high rates of evapotranspiration and albedo (heat and light reflection), but also a reduction in water retaining capacity that has resulted in extremes of water run-off. These extremes have seemingly led either to drought and desertification or erosion, debris flow and floods. Increased albedo has been linked with the exacerbation of snow disasters and increased erosion and floods have led to degraded hydroelectric and irrigation systems, loss of life and damage.

The 1996 and 1998 snow disasters

Snow disasters in southwest China are occurring with greater frequency, length and severity and are being linked with global climate change, local deforestation and overgrazing. The two most recent disasters in 1995/6 and 1997/8 resulted in the death of many nomads and hundreds of yaks. The loss of tree and grass cover appears not only to reduce

Stuck in snow in Mongay, near Shiqu Town



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Mudslide by Dadu River, near Shimian

transpiration, and ground infiltration, but also to allow increased run-off, erosion and albedo. Trees and grass absorb heat and light, reducing albedo and regulating climate. The loss of tree and grass cover increases albedo resulting in extremes in climate in general and colder and longer periods of snow in particular. The traditional way of life of southwest China's nomadic pastoralists is already under threat from modernisation, sedentarisation and the market economy, and recurrent snow disasters appear to threaten their very existence.

The 1998 floods

Last summer, China experienced severe floods effecting many of Asia's largest rivers. The Yangtze River experienced the worst flooding since 1954, claiming more than 3,650 lives and causing more than US\$30 billion in damage. Although most of the flooding occurred in the Chinese lowlands it also occurred on the Tibetan plateau. In Tibet AR, the Yarlung Tsangpo (Bramaputra), the Kyi-chu and other rivers rose to record levels resulting in the loss of at least 53 people and 4,000 head of livestock

(mostly yak). More than 40 counties were affected and most of Tibet's roads were damaged. Flood frequency has been increasing in both Tibet and southwest China. During the Qing Dynasty (1644-1911) the Yangtze flooded every decade and between 1921-1949 the frequency rose to once every six years. In the 1980s the frequency rose to a large flood every two years. Now the situation is much worse with floods in 1994, 1995, 1996 and last year. Although some have blamed the weather (el niño and la niña) and heavy snow melt, most have blamed heavy agriculture, intense logging and water conservancy projects. All these factors have raised the riverbed, filled it with silt and made it nearly impossible to control. This has forced the authorities to consider drastic measures and has prompted an increase in environmental activism.

Felling bans

The Chinese government first officially recognized the link between deforestation and environmental destruction after the floods of 1981 and 1983, and measures were

implemented in some areas. Chinese forest researchers have for many years been developing pragmatic eco-friendly silvicultural and harvesting guidelines for southwest China's mountain forests. All these measures, however well intentioned, have rarely been translated into best practice on the ground. Best practice has always had to compete with the 'socialist market forces'. After nearly four decades of timber mining, the floods have led government to consider more closely both logging practices and reforestation in the headwaters of many of Asia's largest rivers. In mid August the State Council admitted that the Yangtze River flooding was related to soil erosion in the upper reaches and it urged all governments to protect their forests. Sichuan provincial government responded by introducing a felling ban from 1 September 1998 in an area of western Sichuan, the Chuanxi Forest Area, comprising 4.5 million hectares in 54 counties. The government also closed 9 million hectares of grazing land to facilitate reforestation and abandoned plans for log float channels at the Ertan power station. In late August the

State Council further urged 51 key forestry enterprises in the upper Yangtze and Yellow River to stop logging and the State Forestry Administration stated that no single natural tree should be felled in the upper Yangtze. In early September Yunnan Province announced a felling ban along its section of the upper Yangtze and in December Tibet Autonomous Region ordered all lumber processing mills in southeast Tibet (Chamdo and Nyangtri prefectures) to cease operations.

Reforestation and forest conservation

Even before the recent floods plans were afoot for a raft of forestry measures that included cuts in logging quotas, felling bans, a very large forest conservation project and an emphasis on afforestation, forest protection and forest tourism. In 1997 the State announced a felling ban in its natural forests from 1 July 1998 (including the upper Yangtze and Yellow Rivers) and agreed to provide US\$2.3 billion in loans or credit to allow forest workers to move from logging to planting. Sichuan agreed to focus on tree planting rather than logging, and is expected to receive US\$722 million to support a forest conservation programme. After the floods the State Council, Premier Zhu Rongji and local government encouraged tree planting, forest conservation and forest tourism, rather than felling, and encouraged the use of the US\$2.3 billion loan to turn loggers into tree planters.

Environmental activism

Environmental activism is a relatively new phenomenon in China and has only begun to surface in southwest China in the last five years. In late 1995 the government of Yunnan planned to log 100 square miles of virgin forest in Dechen Tibetan Autonomous Prefecture (TAP), one of the last refuges of the endangered golden monkey (*Rhinopithecus roxellanae*). China's first officially recognized environmental organisation

'Friends of Nature' (FON), the well known environmental writer Tang Xiyang and others teamed up to organise a campaign to save the monkeys. FON founder, Liang Congjie led a letter-writing campaign and mobilized the media to draw attention to the situation. When county officials protested that logging was a key source of revenue, the central government intervened. Officials agreed to halt logging if conservationists could find alternative income streams. Eco-tourism, sustainable harvesting and mushroom sales have been suggested. More recently FON has lobbied furiously inside China to raise awareness of such

Chinese Central TV crew to film the widespread logging going on in Mewa County (Ngawa TAP), despite the government ban. Tibetans, however, have not been encouraged to speak so freely about damage to their environment caused by mining. When for example Kabukye *Rinpoche*, expressed concern about environmental damage caused by gold mining near the Nabzur monastery (Serta County, Kandze Prefecture) he was imprisoned for six years and accused of 'counter-revolutionary-splittism'. The *Rinpoche* (Reincarnate Lama) was very well respected and his imprisonment caused widespread anger among Tibetans.

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issues as re-afforestation and the plight of the endangered Tibetan antelope. In a letter received by the New York based group, Human Rights for China, over 300 environmental activists and respected scholars from 19 provinces claimed that the floods were caused by poor environmental management in the Yangtze river basin, and they were critical of the government for using the disaster as a means of gaining publicity for the role of the military. In September a member of FON accompanied a

The impact of the new measures

There is no question that desperate measures are required, including sustainable forest management, but there are those who question the wisdom of a felling ban in isolation from other measures. There were initial concerns that the logging crews in western Sichuan would simply move across the Yangtze and destroy the forests of western Kham (eastern Tibet AR), China's largest remaining old-growth forest, as they had done

before from Yunnan. However on 9 December 1998 the Tibetan government ordered the shutdown of all lumber processing mills in southeast Tibet and announced that former loggers would be re-employed as tree planters. There were also initial concerns that the ban only applied to state forestry enterprises, but local authorities also instituted their own bans.

It is questionable if all those dependent on the logging industry can be re-employed in tree planting and how the closure of 9 million hectares of grassland will impact the local economy. Already there is evidence that the ban is being flouted and there are those in the forest industry who are not convinced that their incomes will be sustained from forest conservation and protection.

There is also concern about the capacity of the forestry departments, and the willingness of the Tibetan people to engage in major re-forestation. Although there are some very good large nurseries in western Sichuan, they tend to only include a few industrial species, and survival rates of planted trees have been very low. If the forests of southwest China are to be multifunctional and managed on a sustainable eco-forestry basis there appears to be a need for a large network of small village nurseries, growing a variety of species of use for industry, local subsistence and cottage industry, and for environmental protection and enhancement.

Although forest tourism, or eco-tourism, has huge potential as a means of support for conservation and community development, there is a need for both environmental and socio-cultural sensitivity. Over-developed forest parks, characterised by large concrete hotels, wide roads and poorly placed power lines will not attract western tourists and tourist facilities and infrastructure should be developed that are in keeping with local conditions and building styles.

Conclusion

Although a felling ban is understandable, an integrated, ethno-friendly 'sustainable suite' of measures appears to be necessary to redeem the situation. In order to secure the co-operation of the local people in both conservation and afforestation they need to 'own' the programme. There is a need to ensure that local people are empowered as forest stewards, and forest management plans enhance their well-being and that of southwest China's biodiversity.


Forests need to be viewed as multifunctional resources (rather than timber mines) and sustainably managed on an eco-forestry basis predicated on local felt needs, definitions of 'progress' and indigenous knowledge and practice. The forests of southwest China need management systems that reflect a diversity of role and need and mechanisms for full co-operation with the local people. Most of southwest China's forests lack an inventory, a management plan or any form of local monitoring. Capacity building in Remote Sensing, Geographic Information Systems, Global Positioning Systems and monitoring techniques appears to be required given the vastness and remoteness of the terrain.

Eco-tourism, has the potential to provide much needed income and a means of supporting nature conservation but there are dangers of elite capture, overdevelopment, and further environmental destruction. Although the peoples of southwest China are known for their hospitality and largesse, a major tourism impact assessment appears to be apposite before major eco-tourism development begins.

Multifunctional forests require appropriate nurseries similar to the community forestry nurseries found in Nepal. Large single species nurseries may be efficient and easy to manage and provide the most suitable species for industry, but they don't always

provide the optimum species for enhancing biodiversity, water and soil conservation or local need. Community nurseries are local and can be developed in concert with the needs and requirements of the local people and their environment.

Given the felling bans, the need in southwest China for income and the demands of China's booming economy, research into 'wood substitutes' is required. Southwest China produces vast amounts of timber and milling waste and has potential for fibre crop production in agro-forestry systems. Biocomposite technologies based on fibre crops (for example flax, hemp, willow and poplar at close spacing on very short rotations) or forestry/agricultural waste could be developed as a cottage industry both to provide local income and to supply China with a wood substitute.

We all need to use the recent floods as a turning point to review our epistemologies of progress and the natural world. Our paradigms of 'progress' and 'development' predicated on neo-liberal greed, selfishness, environmental exploitation and western development discourse have failed the poor, the marginalized and the world's minority mountain peoples. As the world searches for holistic, eco-friendly and ethno-friendly alternatives, increasing attention is being paid to indigenous paradigms. Who knows, we may even learn from the indigenous peoples of southwest China the secrets of sustainable living as Planet Earth approaches the year 2000. 

This article is a concise version of a fully referenced paper that is available on the author's website.
(http://ourworld.compuserve.com/homepages/John_Studley/China_re.htm)

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