COMMENT

Forests and environmental degradation in SW China

JOHN STUDLEY

46 Sarsfeld Road, London SW12 8HN, U.K.

As the waters from China's worst flood since 1954 receded in the Yangtze River valley, many people.. hoped.. that it would be a turning point - a warning to the world's most populous country that it can no longer ravage its environment as it rushes to modernity.

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INTRODUCTION

The Peoples Republic of China is rich in cultural and natural diversity. and is listed by biologists as a 'megadiversity country'. Since 1950, when China embraced modernity, the forests have been indiscriminately felled reducing forest cover. 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 undermine the livelihood of the local people and great loss of life and damage downstream. In South West China the government has promoted ambitious plans for forest conservation and reforestation, culminating in a felling ban and the closure of grazing lands. This Comment draws attention to the new environmental activism emerging in the country and discusses prospects for successful implementation of the new policies

SW CHINA: GEOGRAPHICAL BACKGROUND

"South West" China encompasses an area known by Westerners as "East Tibet", by the indigenous Tibetan people as *Kham*, and by the Republic of China as "*Xikang*". It is deeply dissected by four of Asias largest rivers (*Bramaputra, Salween, Mekong* and *Yangtze*), which flow in a SE course through deep limestone and sandstone gorges. Elevation ranges from 2000m to more than 7000 m and the area is dominated in the east by *Minyak Gangkar* (7590m) (Ch. *Gongga Shan*). The steep slopes are mostly covered by coniferous forest, and the region contains China's largest forest resource. Nowadays this vast region, is divided for political and historical reasons between four Chinese provinces and comprises 47 counties . The region was characterised by its very rich biodiversity and in a few locations the untouched ecosystems are among the most diverse living assemblies in Asia (Ogilvie 1996 Smil 1984). There are still believed to be over 1500 species of higher plant, more than 90 mammal species, more than 350 bird species, and more than 25 reptile and amphibian species.

CULTURE AND ENVIRONMENT

China is the nation with the longest continuous culture on earth, and from the earliest times (The Shang Dynasty 1766 BC-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 subsumed by modernity (Edmonds 1994, Needham 1956, 1986, Schafer 1962, Smil 1984)). Although the recorded history of SW 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 both in historic government *Tsatsig* (Tib. Decree) and in their animistic (*mi chos*), Bon (*bon chos*), and Buddhist (*lha chos*) traditions (Bjork 1993, Tenzin P. Atisha 1996, Studley 1999, Samuel 1993 Stein 1972, Powers 1995). Modernity, rather than enhancing the well-being of the peoples of SW China, is seemingly destroying their environment and indigenous culture and robbing them of their means of life.

In 1997 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 in 1998, for both the State and local government to introduce desperate measures, in an attempt to ameliorate the problem. It was not until 17th August (in a news analysis by Xinhua news agency) that the authorities recognised that some of the flooding was due to deforestation in the upper reaches of the Yangtze river. As from 1st September 1998, a complete felling ban was introduced in Western Sichuan (Eastern Kham), plans for log channels at Ertan hydroelectric power station were suspended, and $US 52 million per year was released to re-deploy loggers in reforestation. To facilitate reforestation, it was announced that 9 m ha 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 (TAR) (Winkler 1998b). 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 1 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.

DEFORESTATION

The forests of SW China, were among the most extensive areas of forest cover in the whole country, and included the forests of SE Tibet AR, Western Sichuan, Northern Yunnan, South West Gansu, and SE Qinghai. Since 1950, when they were designated China's "second timber production base" and in 1956 when macro-scale timber production enterprises were established all these areas have experienced indiscriminate felling (Richardson 1990, Li 1993). The majority of the destruction was not caused by population pressure, or "criminal elements", or local farmers, and it did not mostly occur "40 years ago to fuel backyard steel furnaces of Chairman Mao's ill fated Great Leap Forward" (Fred Pearce 1999). It was caused by "planned" commercial timber extraction based on government quotas (Smil 1984, Winkler 1998a). The forests of SW China have never been officially managed on a sustainable basis, and most of them lack a management plan or any form of monitoring (Richardson 1990). 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 & infrastructure. State forest enterprises are required to sell a minimum timber quota which was often as much as 3 times the sustainable yield, at a price that was often below production costs (Winkler 1998a). To compensate for this they have sold even more timber on the free market. As a result in some areas annual felling was four times more than the sustainable yield. Consequently :- Forest cover in Tibet AR has fallen from 9 % (1950) to 5 % (1985), in Yunnan from 55 % (1950's) to 30 % (1975), and in Sichuan from 30% (1950) to 6.5% (1998). (Pomfret 1998, Winkler 1996 1998a). Some of the most disquieting reports on deforestation come from Sichuan and Yunnan Province.

Deforestation in the most accessible parts of Western Sichuan (mostly Aba Prefecture) began in the late 1950's, and although Sichuan did lose one tenth of its growing stock (or 1.24 Mha) during the Great Leap Forward (1958-61) this was mostly in the East. Deforestation accelerated in Aba Prefecture in the late 1960's, when it supplied up to 84% of Sichuans timber quota. It was not until the 1980's and 1990's , when most of Aba's forests were depleted (It only supplied 15% of Sichuan's total quota in 1980) that large scale deforestation spread into the main Yangtze catchment in Kham. The forests of Kham comprise ca 95% of forest land found in the "headwaters of the Yangtze", and their destruction , from the 1980's appears to have been parallelled by an almost annual occurrence of environmental destruction (Studley 1999 Wang Hongchang undated Smil 1984)

In theory the 104 state forest areas of Western Sichuan should have only felled 760,000 m3 a year to be sustainable , but they have exceeded 2m m3, year on year (Smil 1984) 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 come to have as bad a reputation as the Yellow River. Of the provinces 139 counties only 12 now have forest covering more than 30 percent of the land, 22 have between 20 and 30 percent, but 91 have less than 10 percent, and 14 counties have less than one percent.

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 greatest in China. In the early 1950's about 55 percent of Yunnan was covered by forests, but by 1975, it had dropped to 30 percent, and annual wood consumption was double the growth rate

To make matters worse , all over SW China, large scale clear felling was widely practised, tree planting to tree felling ratios were very low (1:10) tree seedling survival rates of less than 30% were common (Dong 1985, He 1991), less than 40% of woody biomass was utilized and only about 7% of milling wastes were utilized (Smil 1993).

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 (Smith undated). However policy has made very little difference to the peoples of SW China, where many of the reserves lack staff, funds, infrastructure or a management plan. The international conservation community has focussed on the panda at the expense of other endangered species (Schaller 1998a). Although the biodiversity of SW China is still considerable, deforestation is doing away either singly or with other influences, with much of the natural foundations requisite for such diversity. The most dominant tree species in the temperate & subalpine zone of SW China include *Picea, Pinus, Abies, Tsuga, Quercus, Juiperus, & Larix* and at lower level *Fagaceae, Lauraceae, Araliaceae, Manoliaceae* and many species of bamboo. Deforestation is posing a threat not only to the dominant forest species, but especially to a number of very rare gymnosperms (Gyurme Dorje 1996, Li 1993).

A great deal of information exists on extinct or endangered birds and mammals in China. Many of the endangered species are found in SW 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. (Ma & Chang 1980, Smil 1984 Tsultrim Palden Dekhang, Li 1993). Many blamed the reduction of predators for an influx of rodents and lagomorphs, which were thought to be responsible for the degradation of over 8m ha pasture and extensive areas of "black sands" (Smil 1984 , Richardson 1990, Allen 1999). Recent research, by the CCICED (China Council for International Cooperation on Environment & Development) however has concluded that the increase in rodent & lagomorphs numbers was a result , and not a cause, of pasture degradation. They are not only a very important "keystone" species, that re- cycle soil, and provide nesting habitat for many birds, but they provide food for medium sized predators and raptors (Smith nd , Foggin 1999 Smith & Foggin 1999).

ENVIRONMENTAL & CLIMATIC THREATS

Deforestation is not only linked with decreased rates of evapotranspiration and increased albedo, but a reduction in moisture flow and water retaining capacity. These changes , have been linked with the onset of large scale deforestation in

Kham, and have led either to drought & desertification or erosion, debris flow and floods (Yang 1986, Winkler 1998a, Tacke 1981,Richardson 1990, Wang Hongchang nd, Anon 1998b). Increased albedo has been linked with the exacerbation of snow disasters and increased erosion and floods have led to degraded hydro-electric & irrigation systems, loss of life and damage (Winkler 1998b)

The 1996 & 1998 Snow Disasters

Snow disasters in SW China appear to be 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 thousands of Yak. The loss of tree and grass cover appears not only to reduce transpiration, and ground infiltration, but allow increased stream flow, erosion and albedo (heat & light reflection). The increase in albedo results in extremes in climate in general and colder and longer periods of snow in particular. The traditional way of life of SW China's nomadic pastoralists is already under threat from modernization, sedentarization, and the market economy and recurrent snow disasters appear to threaten their very existence. (Anon 1996 , O'Kane 1998)

The 1998 Floods

During the summer of 1998, China (India & Bangladesh) 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 USD 30 billion in damage. Although most of the flooding in 1998 occurred in the Chinese lowlands it also occurred on the Tibetan plateau. In Tibet Autonomous Region , the *Yarlung Tsangpo (Brahmaputra)*, the *Kyi-chu* and other rivers rose to record levels resulting in the loss of at least 53 people & 4000 head of livestock (mostly Yak). More than 40 counties were affected and most of Tibet's AR roads were damaged. Flood frequency has been increasing in both Tibet and SW 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 80's the frequency rose to a large flood every two years. Now the situation is much worse with floods in 1994, 1995, 1996 and 1998.

The floods have sparked much debate (in the Press & Internet) over the links between deforestation & flooding. Within popular & indigenous cosmology in both SW China & N. India, there is a perceived link between deforestation and not only flooding, but the degradation of biodiversity, environment, climate & the wellbeing of indigenous people. This perception has led , in some areas, not only to agrarian protest, and endogenous reforestation efforts, but to the formation of ecological movements (Behn 1989, Guha 1993, Studley 1999). Some, however speaking seemingly from the ethnocentric and dominant perspective of western science and vested interest, have questioned a causal relationship between mass scale tree felling and flooding and dismissed it as “folklore & scientific myth” (Banuri & Marglin 1993 Shiva 1989 Pearce 1999 Calder 1999 Chomitz & Kumari 1996). In the Chinese literature some blamed the floods of 1998 on the weather, or heavy snow melt, but most have blamed intensive agriculture, logging and water conservancy projects. Whatever the cause of the flooding, many factors have seemingly raised the river bed, filling it with silt and made it nearly impossible to control. This has forced the authorities to consider drastic measures.

THE FELLING BANS

The Chinese government first officially recognized a link between deforestation and environmental destruction, after the floods of 1981 & 1983 (Richardson 1990), and measures were implemented in some areas. Chinese forest researchers have for many years been developing pragmatic eco-friendly silvicultural and harvesting guidelines (eg Yang 1986 1987). 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” which has treated trees as a free good and lacks the negative feedback processes of conventional market economies (Zhang 1998). After nearly four decades of timber mining, the floods have caused government to consider more closely both, logging practices and reforestation in the headwaters of many of Asia's largest rivers. In mid August 1998 the State Council recognized that the Yangtze river floods were related to soil erosion in the upper reaches and it urged all governments to protect their forests. Sichuan Provincial government responded by a) introducing a felling ban from 1 Sept 1998, in a area of W. Sichuan, they called the “Chuanxi Forest Area”, comprising 4.5m ha in 54 counties. b)Closing 9m ha grazing land to facilitate reforestation & c)Abandoning plans for log float channels at the Ertan power station. In late August 1998 the State Council further, urged 51 key forestry enterprises in the upper Yangtze & 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 1998 Yunnan Province announced a felling ban along its section of the upper Yangtze and in December Tibet AR ordered all saw mills in SE Tibet (*Chamdo & Nyangtri* (Ch. *Nyingchi*) Prefectures) to cease operations (Winkler 98b). Almost immediately after the felling ban was introduced timber prices in the Beijing wood market rose by 20- 30% and the authorities are expecting an annual shortfall of 45 million cubic metres (out of a total requirement 110m cubic metres) by 2000 (Anon 1998a)

REFORESTATION & FOREST CONSERVATION

Even before the 1998 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 USD 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 USD 722 m to support a forest conservation programme. After the floods the State Council, Premier Zhu and local government encouraged tree planting, forest conservation & forest tourism, rather than felling, and encouraged the use of the USD 2.3 billion loan to turn loggers into tree planters (Winkler 98b)

ENVIRONMEMTAL ACTIVISM

Environmental activism is a relatively new phenomena in China and has only begun to surface in SW China in the last 5 years. In late 1995 the government of Yunnan planned to log 100 square miles of virgin forest in *Dechen* (Ch. *Deqen*) Tibetan Autonomous Prefecture, one of the last refuges of the endangered golden monkey *(Rhinopithecus roxellanae)*. China's first officially recognised environmental organisations "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 Congje 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. (Ecotourism, sustainable harvesting & mushroom sales have been suggested). More recently FON has lobbied furiously inside China to raise awareness of such 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 1998 a member of FON accompanied a Chinese Central TV crew to film the widespread logging going on in *Mewa* (Ch. *Hongyuan*) County in *Ngawa* (Ch. *Aba*) Tibetan & Chiang Autonomous Prefecture, despite the government ban (Hao Bing 1998). 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 widely respected and his imprisonment caused widespread anger among Tibetans. (Poole 1998, Pomfret 1998, Anon 1998c). Although Tibetan attempts to protect and conserve their environment are often misconstrued, there is evidence that monasteries engage in re-forestation, conservation and wildlife protection (Studley 1999)

THE IMPACT OF THE NEW MEASURES

There is no question that desperate measures are required , especially sustainably 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 (E. TAR), China's biggest remaining old-growth forest (Lu Zhi in Pomfret 1998), as they had done before from Yunnan. However on 9th December the Tibet AR government ordered the shutdown of all saw mills in SE Tibet and announced that former loggers would be re-employed as tree planters (Winkler 98b). There were also initial concerns that the ban only applied to state forestry enterprises, but local authorities also instituted their own bans. It is questionably if all those dependent (ca 1 million Tibetans) on the logging industry can all be re- employed in tree planting and uncertain how the closure of 9 m ha of grassland will impact the local economy. There are concerns that most of the funds will go to state employed Han Chinese forestry workers, which will inflame ethnic tension with the Tibetan peoples. 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. (Poole 22/11/98 Winkler 1998b). There is also concern about the capacity of the forestry departments, and the willingness of the Tibetan people to engage in major reforestation. Although there are some very good large nurseries in Western Sichuan, they tend to include a few industrial species, and survival rates of planted trees have been very low. If the forests of SW China are to be mutifunctional 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 tree & shrub species of use for industry, local subsistence & cottage industry & for environmental protection & enhancement (Calder 99). Although one year on, the roads, and towns of Western Sichuan are no longer clogged with logging trucks, and funding is being made available for conservation, there is concern, given China's need for timber, how long the restrictions will last. In the past logging bans & log movement orders have been introduced but , given time, they have been circumvented..

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 & socio-cultural sensitivity and for models of ecotourism-for-development as apposed to ecotourism-for-business. Over-developed forest parks, characterised by large concrete hotels, wide roads & poorly placed power lines will not attract Western tourists (Schaller 1998b) and tourist facilities and infrastructure should be developed that are in keeping with local conditions and building styles (Bornemeier et al 1997, McLaren 1998)

CONTINUING REQUIREMENTS

Although a felling ban is understandable, an integrated "sustainable suite" of measures appears to be necessary to redeem the situation. In order to secure the cooperation 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 endogenous forest management plans are developed that enhance their wellbeing and that of SW China's biodiversity. Ways should be sought that build on indigenous conservation ethics and the role of monasteries in re- forestation and wildlife protection.

Forests need to be viewed as multi functional resources (rather than timber mines) and sustainably managed on an eco-forestry basis predicated on local felt needs, definitions of “progress”, & indigenous knowledge and practice. The Forests of SW China need management regimes that reflect diversity of role & need and be prepared in cooperation with the local people

Most of SW China's forests lack an inventory, a management plan or any form of local monitoring. Capacity building in Remote sensing, GIS and GPS technologies appears to be required given the vastness and remoteness of the terrain.

Multi functional 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 dont always provide the optimum tree, shrub, & ground cover species for enhancing biodiversity, water & soil conservation or local need. Community nurseries can be developed to meet the needs of the local people and their environment.

Given the felling bans, the need in SW China for income, and the demands of China's booming economy, research into “wood substitutes” is required. SW 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 (eg Flax, hemp, and Willow & 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”.

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

We all need to use the floods as a turning point to review our epistemologies of management of the natural world. Our paradigms of “progress” and “development” predicated on neoliberal greed ,selfishness, ethnocentrism, environmental exploitation and Western development discourse have failed:- the poor, the marginalized and the worlds minority mountain peoples. As the world searches for holistic, eco-friendly & ethno-friendly alternatives increasing attention is being paid to indigenous paradigms. Who knows we may even learn from indigenous peoples of SW China the secrets of sustainable living as Planet Earth enters the new millennium.

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