

## WUYISHAN BIOSPHERE RESERVE - CHINA'S EFFORT AT CONSERVATION

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On 21st September 1995, XIAMEN 8552, a 737 Boeing, took off exactly at 1400 hrs from Shanghai Hangqiao international airport. As it gently turned south towards Wuyishan city in the Fujian province we had a panoramic view of Shanghai, the largest city in China, through a hazy sky. I had a window seat and could watch the smooth journey of the plane over clouds, paddy fields, small and large water bodies, villages and towns. The white clouds in the distance appeared like giant piles of cotton floating in turbid waters. Around 1430 h, a mountainous terrain began to show through the gaps in the flotilla of clouds. Meandering roads on the mountains appeared like curved brown threads and villages materialised in every possible valley. The plane fluttered for a few seconds at 1450 h when it flew through dense mountains of white clouds and soon started flying below the clouds.

The pleasingly green, vast landscape below was dotted with secondary vegetation and paddy fields. Some hills had totally been stripped of vegetation, and on its rich red soil terraced cultivation was in progress. Exactly an hour after departure we had a smooth landing on the Wuyishan airport runway, 600 km from Shanghai. The airport, the city, and the mountains all around basked in the bright and warm afternoon sunlight.

The luggage was loaded into a van and soon we set off in a bus following the van to Sangong in the middle of Wuyishan Biosphere Reserve. The drive was immensely enjoyable as the driver played melodious chinese songs, and the road was not bumpy. The landscape all along was enchantingly green and a cool, pleasant breeze wafted through the bus. We crossed many rivers which appeared clean and after 30 minutes or so entered into the Wuyishan (shan = mountain) range.

The Wuyishan mountains, the pride of China are said to be a 1000 million years old and have numerous magnificent rock formations, most of which appear as if painted red. These rocks tower over dense forests which looked bluish green in the evening light with broad-leaved trees and dense patches of *Pinus taiwanensis*. There appeared to be no sign of either logging or cutting. A large variety of bamboo, *Phyllostachys heterocycla*, adorned with parakeet-green foliage, grew profusely in most places. Soon we drove parallel to the Jiuqu river (the river with nine turns) where hundreds of tourists were drifting down the greenish river in bamboo rafts which have been in use in China since time immemorial. The small villages, situated along the road, looked prosperous with little patches of tea, fish ponds, vegetable gardens and fertile fields where golden-yellow ripe paddy stood ready for harvesting. Basking in the warmth of the evening sun, water buffaloes lazily grazed in areas where grass grew profusely. At around 1700 hrs the sun disappeared behind the mountains, illuminating the western sky with a bright silvery light. A few minutes later we reached Sangong which is at an altitude of 700m on the right bank of the River Sangong, in a narrow valley. Steep mountains, with a dense growth of bamboo, pine, and other vegetation rose on either side of the valley.

While rooms were being allotted, I walked to the edge of the river where crystal clear water flowed forming many rapids and a few pools. Small fishes were numerous and some of them occasionally rolled and displayed their silvery sides before darting into the depths. Along the river, brown dipper, the only passerine bird that can dive and swim, plumbeous red start, common kingfisher, and slatybacked forktail were foraging for their dinner. Two Himalayan pied king fishers passed over my

head like missiles. As darkness gathered, one Himalayan whistling thrush, with a note of alarm, flew to a dense and dark gully in the adjacent mountain slope. Three Redbilled blue magpies, one of the characteristic birds of Outer Himalaya, chattered and flew across the valley. These birds gave me a nostalgic feeling that I was somewhere in the Outer Himalaya.

Nearly 100 years ago, Latouch, a British ornithologist, sailed to the shores of the Fujian Province, surveyed Eastern China and wrote the book 'The birds of Eastern China' with the description of 470 bird species. He discovered 44 species in the present day Wuyishan Biosphere Reserve. Twenty seven years later, Pope, an American naturalist, explored the Reserve area and added 12 new species of amphibians to science. This was followed by a description of 700 new species of insects from this area. All the early naturalists realized that the Reserve area had the best broad-leaved evergreen forests of the Central sub-tropical zone in south-east China and in the Wuyi mountain range. Therefore, there were repeated recommendations to protect this biodiversity-rich area, and the People's Republic of China heeded these requests in 1950, and declared an area of 565 sq.km as a Sanctuary to ban hunting.

As time progressed the status of the area was elevated to a Nature Reserve in 1979 and a Biosphere Reserve in 1987. Now the Reserve has two core areas, totalling 347 sq.km, flanking an experimental area. About 2000 people dwell within the experimental area in villages along roads, and another 2000 live on the southern border, all making use of the resources of the experimental area. The Reserve is administered by the Fujian Province.

The Reserve has an average altitude of 1000 m. Nevertheless, even the valleys receive some amount of snow in winter. The Reserve has often been quoted as an outstanding example of a harmonious existence between man and nature, and development and conservation. Although the tiger (South China tiger, *Panthera tigris amoyensis*) has been exterminated from the Reserve and its surrounding forests about 40 years ago and leopard sightings have become very

rare in the recent years, the Reserve is still home to many endangered and threatened species. The Natural History Museum of the Reserve in Sangong has specimens of black bear, clouded leopard, dhole, golden cat (reported to occur with four colour variations), leopard cat, serow, two species of muntjac or barking deer (*Muntiacus crinifrons* and *M.reevsi*) and tufted deer (*Elaphodus cephalophus*). All these mammal species are reported to occur in the Reserve even today. Two species of primates, rhesus (*Macaca mulatta*), and Tibetan stump-tailed (*Macaca thibetana*), occur in the Reserve. I had an opportunity to watch a group of Tibetan stump-tailed macaque. Two hundred and fifty six bird species, including the Silver pheasant, find a home here. The reptile list of 73 includes king cobra and reticulated python. The Reserve has valuable timber trees such as *Liquidembar formosana*, *Castanopsis fordii*, *Cinnamomum subavenicum* and *Sassafras trumu*.

There are two reasons for this Biosphere Reserve being deemed a good example for development and conservation. One is the low human population dependent on the Reserve and the other is the high income generated by the people by growing tea and harvesting the large bamboo in the experimental zone under the guidance of the Reserve officials. *Phyllostachys heterocycla* is reported to attain its maximum height of about 10 m in the first year itself, that too within about two months. Thereafter, for the next nine years, it grows thicker and stronger, although it is ready for harvesting when it attains an age of five. Each bamboo pole costs a little over one US dollar as soon as it is harvested, and as its regeneration from the rhizome is extremely good, over 1 million bamboo poles are harvested from the experimental zone by the local people every year. As prescribed by the Reserve officials, the local people also collect tender shoots of bamboo both in winter and spring. This also fetches a substantial amount of revenue as one kilogram of dry bamboo shoot is sold for about 3 US dollars. In turn the local people give 8% of their bamboo-related income to the Reserve and this along with the sale of tea and tourism (which raises a negligible amount of revenue) annually generates about US \$ 125,000. The Government also contributes an equal amount of money and so every year approximately US \$

250,000 is spent on the Reserve management, which includes payment to 100 Reserve staff and maintenance of four management stations. The local people have now become exceedingly prosperous, and do not cut the bamboo themselves but hire people from outside to do this hard work. Therefore a substantial number of outsiders stay within the experimental zone for a period of five to seven months a year and each labourer is paid 5-7 US \$/day.

Interestingly the Reserve staff do not carry weapons, and whenever offenses are noted, the police force of 18 officers is intimidated to track down the culprits. As the Reserve has boosted the economy of the local people in the recent years, it is reported, that there is no conflict between the people and the Reserve staff. Water buffalo killing by leopard is unheard of and as the villagers do not grow any crop in the experimental zone there is no crop raiding by wild pigs.

What led me to the Reserve was the Wildlife Conservation and Management Training Programme conducted in the Reserve by the Washington D.C. based Smithsonian Institution and the East China Normal University, Shanghai. I was invited by the Smithsonian Institution to train the participants. This training programme had its origin in 1981 when the first course, in which I was a trainee, was conducted in the Smithsonian Institution's Conservation and Research Centre, Front Royal, Virginia. The name of the course then was Primate Conservation and Management Training Programme and the funding came solely from the National Institute of Health, United States of America. Seeing the success of this course, Dr. Rudy Rudran, the moving force behind this programme, wanted to make this course available in other developing countries. He worked hard, obtaining funds from different agencies such as the Smithsonian Institution, World Wildlife Fund - United States of America and United States Agency for International Development, and has been periodically conducting the course in countries such as Argentina, Brazil, Venezuela, Kenya, Tanzania, India, Sri Lanka, Malaysia and China. The programme in China, started in 1987 in collaboration

with East China Normal University, has been one of the most successful ones. The course trains personnel from government agencies, universities and Non-Governmental Organizations and so far, all over the globe, 750 people have been trained. The 5-week training programme focuses on all aspects related to wildlife conservation and management.

The schedule of the programme was tight and I did not get much time to explore the jungle. One afternoon, however, while we were doing vegetation studies in Xiang Feng Ling, a remote location 9 km from Sangong, I went alone along a narrow trail through dense tree and scrub jungle. Lack of human signs on the path indicated that the trail had been infrequently used. As the canopy was dense, only faint rays of filtered golden sunlight lit the leaf-litter covered forest floor in patches. Cool breeze periodically whispered through the tall canopy but along the trail no leaf stirred. As a result I became a coveted mobile feeding site for a group of black and white mosquitoes which are also common in the dense wet tropical Indian jungles. The bites of these mosquitoes usually end up in a small swelling and nasty itching.

After a kilometre or so the trail ended in a deep gully which led into a valley with a dense growth of large bamboo. Near the gully I sat on the soft mat of bamboo leaf litter, rested my back on a large bamboo pole and waited with a fervent hope of seeing a large mammal. The only mammal sign I had seen on the trail was porcupine dung soaking in a puddle of water near a spring. As I waited quietly and without any movement, a cicada broke its silence once and some birds twittered in the canopy at a distance. After allowing the mosquitoes to feed on me for half an hour I got up and traced my way back.

The next morning when we went again for the vegetation studies I took off for two hours along the trail. Today the going was much slower as the incident of a large green pit viper getting killed by a participant the previous evening, while it was encountered in a bamboo thicket, made me wary. Nevertheless, I descended into the gully and went further ahead until I came to a place where the trail

was overgrown with fern, hill bamboo and pine saplings. I sat on a fallen log, amidst dense bamboo, and waited for an hour. The only sound I heard was of a scimitar babbler calling at a distance. I got up with the conclusion that the Reserve could be another example of "the stage is beautiful but the actors are missing".

As I walked back I pondered over the reasons for the lack of large mammal signs in a Reserve which has been enjoying the status of a sanctuary for the last 45 years. I wondered whether it is due to the extensive and intensive hunting in the past or silent killing, in the form of snaring and trapping, which still decimate the low density animals such as the muntjac and the serow. One abandoned jaw-trap discovered by one of the participants close to a game trail, not far from Sangong, indicated that in all possibility silent killing still occurs all through the Reserve. This conceivably explains why during my two week stay in Sangong, which is flanked by seemingly superb wildlife habitat, I did not hear a single muntjac alarm which could otherwise, in the silence of the forest, particularly at night, be heard from well over a kilometre.

On the morning of 5th October, as the mountains stood shrouded in mist and an incessant drizzle fell, I left for Wuyishan airport. We drove along the Sangong river for an hour and all along this 25 km stretch of the river there were only two or three small human settlements. The valley, which has such a low human density seemed like an ideal habitat for species like sambar and muntjac. The river was crystal clear with numerous large 1-2 m deep pools. As we drove along I looked into each and every pool that I could see from the vehicle. The pools, that could support a thriving population of large fishes, were all empty. Soon we went past the river of nine turns, vast tracts of forests and the imposing rocks. The habitat was impressive but I had realized that it is silent as far as large mammals are concerned.

At midday I left for Shangai in Xiamen 8551. As we flew due north and before the thick carpet of

dense white clouds could block my vision I had a careful look at the mountains and forests below. Presently China has only 12% of its land under forests but in the Fujian Province (121,500 sq.km), the forests (primary and secondary and plantations) cover about 42% (51,000 sq.km) of the land. Professor Lu Houji, from East China Normal University, one of the teachers in this training programme, has written about the status of South China tiger, and told me that it is still possible to demarcate a continuous habitat of about 20,000 sq.km around Wuyishan Reserve as one protected area.

Regretfully, now the large mammals of this vast forested tract are being decimated by unregulated hunting. Every winter the local people are permitted to hunt muntjac and wild pig but there is a total lack of monitoring of the species and number hunted. Sambar, for example, is a protected species but no one knows whether it is being hunted or not. Generally whatever is seen moving is shot. A vast wildlife habitat, therefore, remains nearly empty.

I wondered whether the progressive looking People's Republic of China would endeavour to establish a 20,000 sq.km protected area around Wuyishan Nature Reserve. The primary objective of this protected area programme should be to enhance large mammal abundance through education to the local people, appropriate habitat management measures and total protection from poaching. Establishing such a protected area will be a formidable task and even when instituted, sadly, the area may not be able to save the South China tiger in the wild, which, according to Lu Houji, now number between 20 and 50, fragmented in isolated areas in the vast tract. This subspecies, which has a pure bred population of about 40-50 animals in captivity in China, is most likely to become extinct in the wild by the end of this century. We may, nevertheless, have the satisfaction of saving a portion of the South China tiger's former range with an assemblage of all its prey species.

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