A Short Walk through some Chinese Mangroves

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In February this year, Dr Margaret Burcheit, Dr Peter Saenger and myself were invited by the Australian Development Assistance Bureau to visit China to discuss with Chinese scientists the feasibility of a Sino-
Australian research programme on the mangrove ecosystem in China. Our journey commenced in Guangzhou, better
known as Canton, where our Chinese hosts briefed us on their plans for us to become acquainted with their mangrove forests. Guangzhou is not noted for mangroves but is famous for its cuisine and we were quickly introduced to some of its more exotic culinary delights.

From Guangzhou we travelled to the far south of China to a tropical island on the edge of the Gulf of
Toungking, known as Haian. In the days of Imperial China, the island was known as the "edge of the world" and it was considered to be the place where civilization ended. It also served, as such places often do, as a penal colony for dissidents. Today, Haian is known to the Chinese as the "Treasure Isle" because of its iron ore, off-shore oil reserves and, the scourge of wetland areas, tourist potential.

We arrived in Haian as the military airbase as the civil airport was closed — an event to which we were to become accustomed — and our first impression of Haian Island was of a large, well-guarded military installation. We learned later that the Sino-Vietnamese border was experiencing one of its periodic bursts of activity. Our second impression as we drove from the military base to Haian, the main city of Haian, was that we had entered the twentieth century. The villages along the way appeared as though nothing had changed for centuries and we saw no signs that they had ever been touched by any industrial revolution. The timeless nature of the rural communities in Haian position with the threatening war machinery of the late twentieth century created an impression of a time warp that would have pleased the most creative of science fiction writers.

Still somewhat dazed from the culture shock, we were introduced to the mangroves of Haian. The island
boasts a diverse collection of mangroves and there are twenty-nine different species recorded of which only two
do not occur in Australia. These are Sundala cordata and Sonneratia alba.

Until the 1950s, all the coastal counties of Haian had substantial mangrove communities that are estimated
to have occupied some 10,000 ha of intertidal land. In April 1950, the Japanese Nationalists who had
retreated to Haian surrendered to the Red Army. Almost immediately the social turmoil commenced that led to
the collectivisation of agriculture in the Great Leap Forward of the mid-fifties and the overwhelming anarchy of
the Cultural Revolution that lasted from the early sixties to the late seventies. The social turmoil continues
today in the post-Gang of Four era and we were started when our guides explained that one of the new objectives
was "to cast off the shackles of capitalism".

As a result of the uncontrolled exploitation, reclamation and clearing of the tidal forests that accompanied the
political upheavals of the past three decades there are now only about 5,000 ha of mangroves left on Haian.
In some of the cleared areas, northern dykes were constructed and in the mudflats behind were planted rice or
other crops in an effort to boost national food production. It soon became apparent that the yields from the
reclaimed waterlogged salty soils were only about half of that of the traditionally irrigated land.

In our discussions with local officials, foresters and villagers dwelling close to the mangroves, we were
impressed by the history and depth of concern that existed for the preservation of the mangroves. In the middle
of one small village situated on the fringe of a large mangrove area we were shown, in a still used shrine, a
tablet erected in 1870 by the then provincial council that proclaimed that the prosperity of the village depended
on the conservation and controlled use of the mangrove system. The tablet also listed the rewards and penalties
associated with the husbandry and abuse of the mangroves. As always, there is an appropriate Chinese saying, "where the mangroves are the crows will walk into the street".

The mangrove ecosystem in Hai Nan has been, and continues to be, of great importance in the traditional, near-subistence, mixed farming and fishing economy of the coastal villages. The mangrove ecosystem is an extensively utilized resource. First, mangroves provide protection from tides for the rice fields, farmlands, and villages that lie on their landward boundaries. In some villages the houses are built in the mangrove stands themselves. The protective function is perceived as very important by the local people. From ancient times, the Chinese common name for mangrove has been 'sea pacifier'. Second, a range of plant and animal products obtained directly from the mangrove forests are important to the villagers. Mangroves are often used for fireswood and charcoal, while larger trees are used for housing construction, furniture and ship building. Local artists have traditionally used mangrove timber for carving. The foliage of some mangroves is used as supplementary fodder for domestic farm animals. Such as goats and pigs and in the case of Alectryon macranthus, as mulch for growing sweet potatoes. Fruits of mangroves species such as Aegiceras corniculatum, Barringtonia asiatica and Rhizophora stylosa are used directly for food production. Dried roots of the mangrove fern Acrostichum aculeatum are used for cooking fires. Mangroves are also considered as good medicinal herbs in Chinese medicine. Convolvulus alatus and Acanthospermum australe have been used as medicine for centuries. Mangroves are also useful in bee-keeping, fish net drying and tannin production.

Fish, prawns and oysters make extensive use of mangroves as breeding and habitat areas. Crab traps are set in the forest of trees and pulled into the mud of the forest floor. Worms, sponges and various other shellfish are obtained from the mud, and in some cases cultivated on stones laid out in the mud. Temporary prawn and fish camps are constructed on each tideline. In some villages permanent family-owned fishpots are maintained most productively. Traditionally, algae have been gathered for food, and a visit was made to a village factory engaged in the commercial production of agar and alginates. In certain areas, commercial scale fish, and prawn farms are being established. Oysters, prawns and fish are netted in fixed-frame intertidal nets from hundreds of small craft operating in and near the mangroves. The catch is used both for family consumption and for the markets in nearby townships.

A practical demonstration of the importance of the mangrove ecosystem in the food chain was provided by Mr Fu, the Mayor of Wen Chang County. He presented us with a banquet at which it seemed the whole bounty of the mangroves was placed before us in the form of endless smoking dishes. The one that lingers in the memory is 'tongseng with coconut'.

Over the last four or five years strenuous local and central government efforts have been made to halt the previous degradation, and to regenerate and extend the remaining mangrove areas. The surviving stands are virtually entirely comprised of secondary scrub and woodland communities, having only fairly recently regrown after previous partial destruction. In a determined attempt to conserve the tidal forests, three mangrove reserves and 'research stations' have been established on Hai Nan Island since 1980. They are the Dong Zhi provincial reserve, the Wen Chang county reserve and Lin Guo county reserve. In all, there are some 4,500 ha of mangrove forest within the protection of a reserve. At the same time a scheme of rewards and penalties was introduced once more by the Provincial Government for the protection of the mangroves. It is the primary function of the mangrove research stations to provide patrols of rangers to administer the regulations, and to encourage villagers in the protection and maintenance of the ecosystem. In Dong Zhi reserve, some very limited planting trials for repleting programmes have also been carried out. No fundamental research, and no data collection on weather, tides, plant growth or fishery harvests are at present being undertaken.

The scale of the conservation measures is very significant as an indicator of the seriousness with which the proper regeneration, preservation and continued utilisation of these ecosystems are viewed by the local population and the provincial and central administrations. The establishment of these stations provides a physical and social basis for future programmes of scientific research into the mangrove ecosystems of Hainan Island.

It was made clear to us that the Chinese Government and the people in the mangrove areas were deeply aware of the significance of the mangrove forests to the well-being of the local communities, and that conservation and rehabilitation of mangrove areas had been given a high priority among the many problems facing the people of Hainan Island. The need for help in understanding the mangrove ecosystem and in managing it in a productive fashion was explained to us by people from vastly different social and economic perspectives.

As Hainan changes in accordance with government plans for the commercial and industrial development of the island, more pressures will topple on all remaining mangrove areas. Urban development of estuaries, alterations of landform, land usage, water catchment and drainage, and the growth of tourist and recreational facilities.