

Changing landscapes and livelihoods in Xishuangbanna, SW China

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Sixty years of Communism and 30 years of liberalisation have brought tremendous transformations to the environment and the peoples of the (sub-) tropical Dai Autonomous Prefecture Xishuangbanna. Environmental degradation and loss of cultural and economic independence are among the clearly negative results of the political and economic integration processes. Increasing external influences, like new land use institutions and new market structures pose challenges for local communities, offering increased opportunities for cash income, but also severe changes to livelihoods.

A short history of land use

Xishuangbanna Dai Autonomous Prefecture (XSBN) is a border area in the southern part of Yunnan Province, PR China. Until 1950, it was an independent feudal kingdom with close cultural and political links to the Tai-kingdoms of Laos, Thailand, and Burma. The majority of the population belonged to the ethnic group of the Dai Lue, who dwelt in

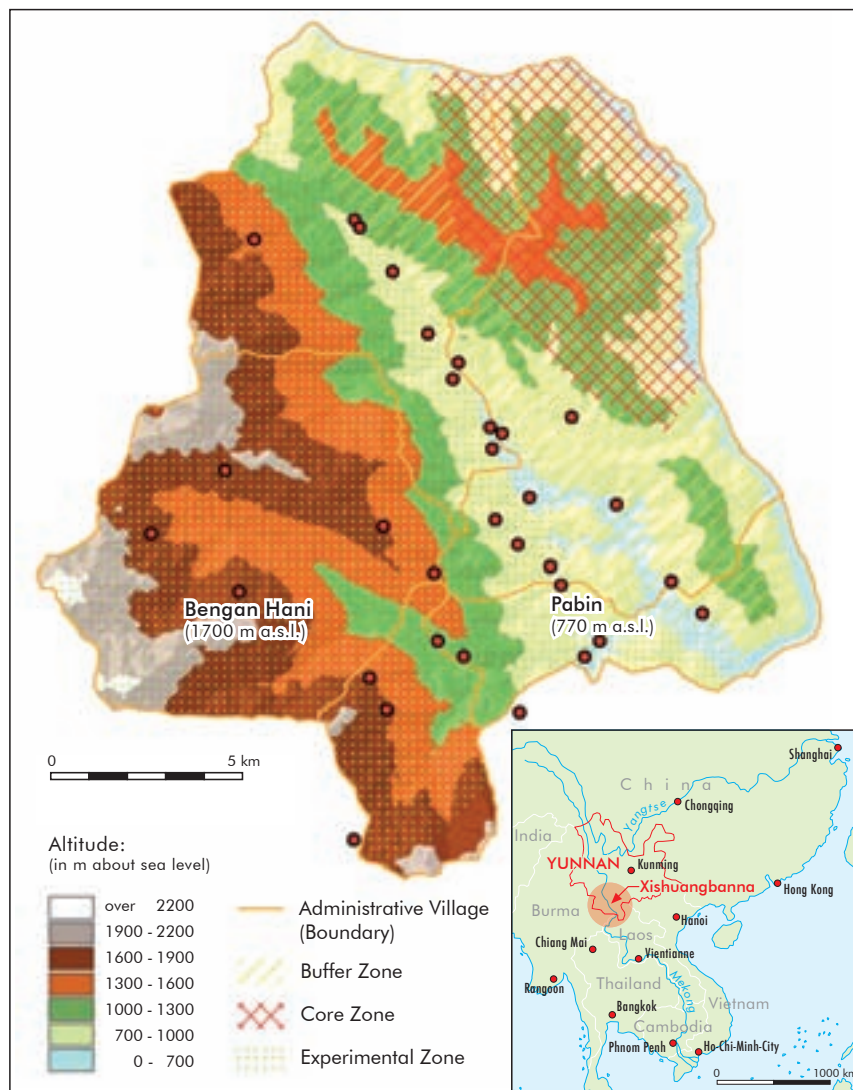
the fertile valleys – mainly engaged in paddy rice cultivation. The mountainous areas of Xishuangbanna were inhabited by other ethnic groups, which engaged in shifting cultivation and hunting and gathering. These upland groups enjoyed a large degree of independence and could thus develop or maintain their own social structure, culture, and land-use systems.

Abundance of forests and land, a low density of population, and strict local institutions governing land use allowed for a rather sustainable use of natural resources. For example, long fallow periods of 10-20 years were observed within shifting cultivation regimes, which enabled a re-growth of natural vegetation and helped to maintain biodiversity.

In 1950, XSBN was “liberated”, became part of the Chinese nation-state, and was integrated into the centralised political and administrative system of the People’s Republic of China. Local farmers lost their independence and were forced to abandon their traditional lifestyles and cultural practices. The traditional, customary institutions which facilitated maintenance of ecosystem functionality and a balanced relationship between humans and the natural environment were abolished and partly replaced by regulations based on Maoist ideology and modern technologies. These ideologies left no space for environmental concerns – nature and environment were to be subdued by technical means. Land was collectivised, and especially during the Cultural Revolution, forests were logged, to be replaced either by rubber plantations or, in less favourable environmental conditions, by fields used for shifting cultivation (Shapiro, 2001).

The new institutions failed to maintain the balance between environmental and economic interests, leading to a decline in forest cover and of (agro-) biodiversity, and to a degradation of arable land.

After Mao Zedong’s death, a shift in thought and accordingly policies placed the country on a track of liberalization. With the land-tenure reform in the beginning of the 1980s, the collective system was abandoned, and individual households once again became economic units with access to private land resour-



Naban Natural Nature Reserve: Administrative Boundaries and Borders

Map Sources: Geodata Catalogue LILAC Project (as of November 2009), elevation based on ASTER data (METI), NASA (2009); ASTER Global Digital Elevation Model, ASTER; Cartography: Claus Carstens & Stefanie Wehner

ces, based on middle-term lease contracts. Simultaneously, market structures were introduced, providing incentives for these small-scale farmers to increase productivity. From 1979 until 1984, China's agricultural production grew at an astonishing rate of 7,4% per year (Huang, 1998).

At the same time, environmental concerns were slowly reintroduced to the political agenda, hampered by the legacy of the Cultural Revolution and new environmental problems emerging together with the expansion and modernisation of agriculture.

XSBN, situated on the Tropic of Cancer, is one of the few areas in China suitable for rubber cultivation. In the 1960s, state rubber farms were established to meet China's growing demand for natural rubber. After the reforms of the 1980s, the production of rubber was also expanded to small-scale farmers as a lucrative cash crop. Rubber production fulfilled several functions: to meet the growing global demand for rubber, and to serve as a means of rural poverty reduction. The latter aspect was paramount to the government, which believed that the new policy would decrease social and political tensions in sensitive minority areas and drive modernisation



Modern Land Use in NNNR: Rubber and Rice

of still backward mountainous agricultural systems. Thus, rubber cultivation was strongly and rather successfully promoted by state agencies.

The expansion of agricultural production in Xishuangbanna, driven mainly by subsistence and cash-crop production and an increase in population, came at a high environmental cost, however: Between the 1940s and the 1990s, the share of native forests was reduced from 70% to 26%, while population density increased through natural growth and high rates of immigration from other provinces from 10 persons to 50 persons per km² (Shapiro, 2001, Henin & Flaherty, 1994).

Despite the strategic importance of cash-crop production, the ecological value of Xishuangbanna was acknowledged by the government. The region is part of the Indo-Burma Biodiver-

sity Hotspot, and despite covering only 0,2% of China's land area, it is home to 16 % of the higher plant species found in China (Zhang & Cao, 1995). Formerly established Nature Reserves were revived, and new areas were, at least nominally, put under protection. Currently, the province features five Nature Reserves covering almost 13% of the prefecture's 19,700-km² area.

Case Studies at NNNR

One of those Nature Reserves is the Naban National Nature Reserve (NNNR), which was established in 1991. It covers an area of 260 km², includes 32 villages, and is home to about 5,500 people from six different ethnic groups. The Reserve Area itself is highly diverse, for example in terms of land-use systems, resource use, topography, and vegetation types. With two-thirds of the area classified

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as state land and state forest, the forest coverage of approximately 60 % is well above the average for Xishuangbanna.

Based on UNESCO's Man and Biosphere Concept, the objective is to combine biodiversity protection with sustainable social and economic development. The Nature Reserve is divided into three different zones. The core zone, covering some of the best-maintained primary forest in XSBN, is protected from any extractive activities. The buffer and experimental zones are mainly used for agricultural activities – rubber, tea, or subsistence farming, depending on elevation (Garnier, 2008).

Compliance with regulations on the ground is monitored by forest guards from local villages under the management of the Nature Reserve Administration.

Based on two sample villages, we will analyse two different typical land-use systems as well as the underlying land-use changes and their implications for the community, together with the most important actors and their influence on land-use change.

1. Pabin

The first case study is the village of Pabin, which consists of 38 households and 149 people from the Akha/Hani ethnic group. It is located in the buffer zone at an elevation of 770 meters. In close proximity to the State Rubber Farm, Pabin was one of the first villages in the area to introduce rubber monoculture in the mid-1980s. Information on markets and prices and knowledge of cultivation technology was provided by the members of the state farm. The rubber boom has brought relative wealth to the community. With an annual (2007) income of 5,500 Yuan per person, Pabin is now one of the richest villages in

NNNR. Since the introduction of rubber, land-use and the economy have gradually changed from diverse agricultural activities like corn, rice, and upland rice production to a mono-structured system. The negative impact of the dependency became evident at the end of 2008, when rubber prices dropped from 3 US\$/kg to 1 US\$/kg.

The villagers seem to have little interest in the conservation and protection of the native forests surrounding their village. Only two decades ago, native forests and wildlife were abundant in the village area. In order to maximise the area available for rubber plantations, they replaced major parts of their forests with rubber, leading to increasing pressure on the remaining forests and the adjacent protected state forests. In order to finance the improvement of village infrastructure, parts of the remaining forest areas were even sold to an external investor, who transferred the area into a rubber plantation.

The introduction of rubber has also changed people's everyday lives. Farmers have to get up very early to finish rubber tapping before noon. Because the local residents have a lot of "leisure time" at their disposal, the consumption of alcohol and gambling has – according to the villagers – significantly increased. The interest in subsistence production, however, has declined. The relatively favourable economic situation of the households enables them to purchase rice and other food, allowing villagers to avoid the arduous labour of a second rice harvest.

2. Bengan Hani (BGH)

BGH, another Akha/Hani village, is home to 833 people in 172 households. It is located in the experimental zone of

the NNNR at 1700 meters – an elevation that is unsuitable for rubber cultivation. The land-use system is highly diverse, including paddy rice, upland rice and corn for subsistence production. Tea and, more recently, hemp harvests generate an average cash income of 2400 Yuan per farmer (2007).

NTFPs are still an important part of their daily diet and medicinal supply. Villagers have developed or maybe maintained a stewardship relation to their forests and manage them very well, in cooperation with the Nature Reserve Administration. The villagers themselves have reforested areas around the village over the last 20 years for aesthetical and practical considerations. With the emergence of regional and even international markets for NTFPs in recent years, villagers have been able to reap good profits from the collection and sale of bamboo shoots.

Since 2006/07, farmers have been strongly encouraged by different government agencies to produce fibre-hemp to supply a new factory. The plant, recently established in the county capital Menghai as one of the most modern and largest worldwide, is a joint venture of private investors and the People's Liberation Army, with local government agencies strongly propagating the expansion of hemp production. The introduction of hemp has diversified and increased farmers' cash income. Nonetheless, with the new cash crop, farmers shorten the fallow periods of land subjected to crop rotation, possibly leading to a decline in soil quality and a shorter period for the succession of natural vegetation. Moreover, due to shortage of production in animal fodder, animal husbandry – especially of pigs – has declined. This has traditionally been an important



Preparation of a rubber tree



Farmers visit the bamboo-processing factory



Farmer splitting hemp fibres



Bengan Hani Village, with the area dedicated to large-scale bamboo plantation in the background

source of fat and nutrients in the daily diet of the mountain dwellers.

In 2005, another actor appeared in Bengan: A private investor leased, for a period of 25-years, about 50% of the area subjected to shifting land use from the Village Collective to establish a large-scale bamboo plantation. Even though a monoculture plantation of this size constitutes a violation of NNNR regulations, the NNNR Administration does not have the power to overrule other government agencies that approve external investments in these rural areas.

On top of the pressure added by hemp cultivation, bamboo further decreases the amount of land available for farmers. This “loss” of land has also had an unexpected impact on social life: In the past, following a kind of “transhumance”-system, one generation from each household would spend several months of the year in “field-houses” in their plots of land remote from the village. Now that they have leased out those remote areas, all members of the household stay in their village house throughout the year, putting more pressure on social life with three or four generations permanently living under one roof.

Concluding remarks

The shift from a command economy to

a market economy, accompanied by the emergence of new and increasing efforts on the part of the Chinese government to decrease rural poverty, the formerly sparsely populated mountains and the local communities of Xishuangbanna have undergone intensive transformations over the last decades. While rural societies remained self-sustaining and independent in the past, retaining far-reaching autonomy over their resources, an increasing number of other actors have now expanded their influence over rural land resources.

The nationwide and global increase of demand for natural resource products has led to a valorisation of land resources, even in remote and inclement environments. For the chronically poverty-stricken farmers, this creates opportunities to participate in markets and increase their cash income, of course. However, mono-structured villages like Pabin in particular have become highly vulnerable due to fluctuations of the world market. This development has been accompanied by a sharp increase of environmental costs. The case of Bengan Hani shows the increasing worldwide dilemma of a declining land-per-capita ratio, combined with competing and conflicting interests between food production, production of raw ma-

“Living Landscapes China” (LILAC)

This project, subtitled “Rural development through land use diversification: actor-based strategies and integrative technologies for agricultural landscapes in the south-western Chinese highlands” is an interdisciplinary research effort involving partners from the Universities of Hohenheim, Gießen, Hannover, Kassel-Witzenhausen, Passau, and HU Berlin in close cooperation with various Chinese research institutes from the Chinese Academy of Science, including the Xishuangbanna Tropical Botanical Garden (XTBG), Mengla.

Research results from subprojects in diverse disciplinary fields (economy, ecology, and social sciences) are combined in a GIS model to develop a decision-making tool for sustainable land use planning for the Mountainous Mainland Southeast Asian region. The project is funded by the Federal Ministry for Education and Research (BMBF) from June 2007 until the end of 2010.

material for industrial production, and the conservation of nature and the environment.

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