

December 2014

The Bittersweet Taste of Rice. Sloping Land Conversion and the Shifting Livelihoods of the Drung in Northwest Yunnan (China)

Stéphane Gros

Centre National de la Recherche Scientifique, sgros@vjf.cnrs.fr

Follow this and additional works at: <http://digitalcommons.macalester.edu/himalaya>

Recommended Citation

Gros, Stéphane (2014) "The Bittersweet Taste of Rice. Sloping Land Conversion and the Shifting Livelihoods of the Drung in Northwest Yunnan (China)," *HIMALAYA, the Journal of the Association for Nepal and Himalayan Studies*: Vol. 34 : No. 2 , Article 11. Available at: <http://digitalcommons.macalester.edu/himalaya/vol34/iss2/11>



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](https://creativecommons.org/licenses/by-nc-nd/3.0/).

This Research Article is brought to you for free and open access by the DigitalCommons@Macalester College at DigitalCommons@Macalester College. It has been accepted for inclusion in HIMALAYA, the Journal of the Association for Nepal and Himalayan Studies by an authorized

The Bittersweet Taste of Rice. Sloping Land Conversion and the Shifting Livelihoods of the Drung in Northwest Yunnan (China)

Acknowledgements

The author's fieldwork among the Drung in Yunnan was conducted at different times during the spring of 1998 and in the winters of 1999-2000, 2000-2001, and 2003, over a total of nearly eighteen months, with an additional field trip in autumn 2010. The author is indebted to the Drung people who hosted me and accepted to work with me. Prior versions of this article have been presented on several occasions and have benefited from constructive comments. The suggestions received from Georgina Drew and two anonymous reviewers have greatly helped improve the argument. The author would also like to thank Bernadette Sellers for her language editing. This article has been written within the framework of the European-Research-Council-funded project "Territories, Communities, and Exchanges in the Kham Sino-Tibetan Borderlands" (Starting Grant No. 283870).

The Bittersweet Taste of Rice: Sloping Land Conversion and the Shifting Livelihoods of the Drung in Northwest Yunnan, China

Stéphane Gros

Economic development and environmental protection have often proved to be conflicting driving forces behind change in northwest Yunnan province, China. In 2003, the Sloping Land Conversion Program brought an end to traditional shifting cultivation in the Dulong valley—part of the Gaoligong Mountain Nature Reserve, Gongshan County—and is now threatening Drung people's livelihood and culture while further increasing villagers' dependence on state subsidies. This paper addresses the implementation of this program and the difficulties encountered by locals in relation to environmental protection and economic development issues. It describes the specificities of swidden cultivation and explores aspects of human-environment relatedness in the Dulong Valley.

Keywords: Dulong (Drung, Trung, T'rung), China, Yunnan, Sloping Land Conversion Program, swidden agriculture, biodiversity, development, livelihood, suicide.

Introduction

During one of my field trips to China's Dulong Valley in the autumn of 2010, a man committed suicide by poisoning himself. It was not the first case of suicide of which I had heard. In fact, an unusual number of villagers, mainly male, took their own lives in the preceding years. This particular instance happened at night. I saw the man that evening as he drank with friends. Several days later, I went to the funeral and questioned villagers about the possible motivation that led this man to consume poison. An interlocutor offered me this memorable answer: "When the rice is not good, people eat poison."

Rice has long been sought after as a food product, something previous generations of Drung people rarely ate. A status symbol that is purchased occasionally by those who could afford it, rice generally represents symbolic and cultural differences between the poor mountainous area of the Drung and the rich fertile flat lands of the Chinese. Throughout the last decades, rice has become a more accessible food, and is one of the main subsidies the government provides to needy households. As this article will show in detail, rice is now the staple diet of the Drung as each household receives an annually subsidized amount in compensation for a ban on traditional swidden cultivation in the Dulong Valley. From a highly valued staple food in the past, rice now has a rather bittersweet taste, or so it would seem. An in-depth study remains to be undertaken to correlate cases of suicide with the actual change in social conditions. Nevertheless, the above-mentioned statement

hints at the discontent engendered by the state's food handouts and its related socio-economic disruptions.

A number of forces have actively deterred Drung people from relying on the subsistence livelihoods that over time helped foster their social and cultural distinctiveness. For several decades, China has implemented many policies shaped by specific notions of socio-economic development and state-centered discourses on nation building, and aimed at controlling and integrating minority nationalities (*shaoshu minzu*). In the official discourse, rural communities' economies have increasingly come to represent a threat in the eyes of the central government. The state considers subsistence livelihoods to be linked with destructive agricultural practices, demands on resources for firewood, and land degradation caused by cattle grazing. These perceived attributes are seen as contributing to soil erosion, endangering the self-renewal of forests and ecosystems, and causing lowland flooding. Ecological catastrophes, such as the flooding of the Yangtze in 1998, prompted the launch of two nation-wide programs: the first aimed at protecting natural forests under a Natural Forest Protection Program (*tianranlin baohu gongcheng*), and the second at converting agricultural land into forests or grassland under the Sloping Land Conversion Program (*tuigeng huanlin huancao gongcheng*, literally 'return farmland to forest or grassland,' also called 'Grain for Green').¹

Within this broader context, this article discusses the case of the Drung (Dulong) people who live in the Dulong Valley. This secluded valley is located in the northwest of Yunnan province, Gongshan County (Map 1) and it is part of a nature reserve. Since 2003, the implementation of the Sloping Land Conversion Program (SLCP) in this valley has required that almost all cultivated land be reforested. Locals have not been allowed to cultivate mountain fields using swidden cultivation techniques, but have been asked to convert forest cropland situated on slopes that have a gradient of more than 25 degrees. In return, they receive government help in the form of cash and rice for sustenance (see Gros 2005, 2011; Xiao 2005; Li 2008).² Initially scheduled for a period of eight years, the program has been extended, making villagers even more dependent on subsidies. As Shen et al. (2010) have recently demonstrated, the implementation of SLCP in the Dulong Valley has effectively led to a reduction in traditional agriculture and livelihoods, threatening the diversity of crop species and cultural traditions. I will show that development plans such as SLCP have increased the level of dependence on the State and that such a form of subordination has significant social and cultural impacts.

Officially, SLCP's main objective is to reduce land degradation in upland areas by increasing vegetation cover and by reducing soil and water erosion and to provide farmers

with compensation in the form of grain or cash over an initial period of five to eight years, depending on local disparities in implementing the program. SLCP also pursues a parallel agenda of poverty alleviation by promoting cash crops (such as fruit trees, tea, or medicinal plants) to generate income or by even increasing participation in off-farm labor markets and by favoring "labor export" (Harwood 2014: 169-174). However, villagers are provided with very few economic opportunities and the question remains open as to whether any sustainable livelihood is still possible in the Dulong Valley. The Sloping Land Conversion Program belongs just as much to the hegemonic paradigm of 'developmentalism,' based on techno-economic policies designed to trigger growth, as to environmental ideologies that inform nature protection and biodiversity conservation policies. Such policies apply a 'scientific' logic that qualifies certain types of landscape as degraded and contributes to defining certain people as poor and their livelihoods as destructive.

As an environmental compensation scheme, SLCP—one of the world's largest funds for ecosystem services—is now well documented at both macro- and micro-level through case studies, providing information on its positive and negative impact on ecological changes, livelihoods and revenues, and more generally the structure of rural economies (Démurger, Fournier, and Shen 2005; Weyerhaeuser, Wilkes, and Kahrl 2005; Trac et al. 2007, 2013; Liu et al. 2008; Bennett 2008; Zhao et al. 2013). These studies show that the actual implementation of such national top-down policies and their success vary quite substantially from one township to another owing to variations in local economic and institutional circumstances.

However, most studies have tackled problems of implementing SLCP and its consequences, using mainly quantitative data that illustrate the weaknesses and threats to livelihoods as well as implementation problems, yet they seldom allude to other resources and activities (kin relations, rituals and beliefs, local politics) that play a role in how such socio-economic changes affect local communities or enable them to counteract external forces of change. Cultural factors as well as ethnicity are crucial sources of creativity within livelihood strategies even on implementing top-down policies with pre-set developmental goals (see Forsyth and Michaud 2011).

In this article, I will review some of the main changes introduced in the name of development that can be identified as contributing to significant transformations in Drung livelihoods. I will then turn to the specificities of their swidden cultivation practices and associated knowledge and values.³ This will provide the necessary background in order to go further in assessing the

implementation of SLCP and illustrating the farming patterns that it has disrupted. My overall goal is to highlight emerging problems and potential long-term consequences of this program for the Drung people. While SLCP has not been the only trigger of change for the Drung people, it has certainly exacerbated a situation of increased marginalization and dependence. Overall, it is argued that state-led socio-economic development policies, together with environmental protection policies, have also deeply affected people's sense of interconnection with the environment they live in.

A Balance between Development and Conservation

By promoting Yunnan as a 'Great Province of Ethnic Cultures' with a 'Green Economic Model' since the late 1990s, the provincial government has drawn on its cultural and biological diversity for its socio-economic development. The decision to ban logging—an industry that used to provide one of Yunnan's primary economic revenues—was taken in 1998 and a series of state policies for rural development and poverty alleviation were consecutively enacted, combining the pursuit of economic growth and initiatives to preserve nature and culture, often for the sake of tourism.⁴

Gongshan County, and Nujiang Prefecture to which it belongs, has long remained unaffected by flows of tourists. The area's extreme mountainous terrain has constituted a major barrier to economic development and the County is still recognized as a 'poor mountain area county' (*pinkun shanqu xian*) in official parlance. In 2008, nearly 65 percent of the population was living below the national poverty line, while more than 80 percent of the population is made up of agricultural farmers. The county, however, remains a deficit-laden grain producer and major subsidy recipient.⁵

The Dulong Valley, situated on the border with Myanmar, has a long history of 'backwardness' and 'neediness' in the official discourse and remains the most secluded township within Gongshan Dulong and Nu nationalities Autonomous County (*Gongshan Dulongzu Nuzu zizhixian*). This narrow valley, formed by the easternmost source of the Irrawaddy River, is part of the Gaoligong Mountain Nature Reserve and is inhabited by over 4,000 members (almost 70 percent) of the Drung (Dulong) minority nationality (*minzu*), one of the least populous groups in China (Cai 1983; Li 1999; Gros 2004, 2012a). Since the 1950s, before environmental protection became a priority, numerous development plans had been implemented and many forms of assistance had reached the remote Dulong Township. The Drung people's status as a state-sanctioned *minzu* and their classification as a 'primitive society' in the official discourse make them primary targets for socio-economic

reforms. At national as well as at county level, ethnic distinctiveness can be a means of obtaining more state-provided resources—and the Drung are on-going recipients of subsidies and technical support.

Their agricultural system, based on swidden cultivation, has long been seen as an obstacle to their economic development, and successive reforms and plans have been implemented to diversify agricultural techniques, increase yields, and develop economic species. As I have shown elsewhere (Gros 2005, 2011), many Drung portray the Chinese state as a benefactor since it has provided economic assistance, and they have a tendency to praise central government for its ongoing help. This idealization of the state as a benefactor is pragmatic and non-exclusive of a growing sense of dissatisfaction and discontent, which is generally fed by local people's feeling of relative deprivation and exclusion from economic opportunities. It also indicates the extent to which the Drung expect support from the state and how much they depend on it. I shall return to this situation of dependence in the last section of the article.

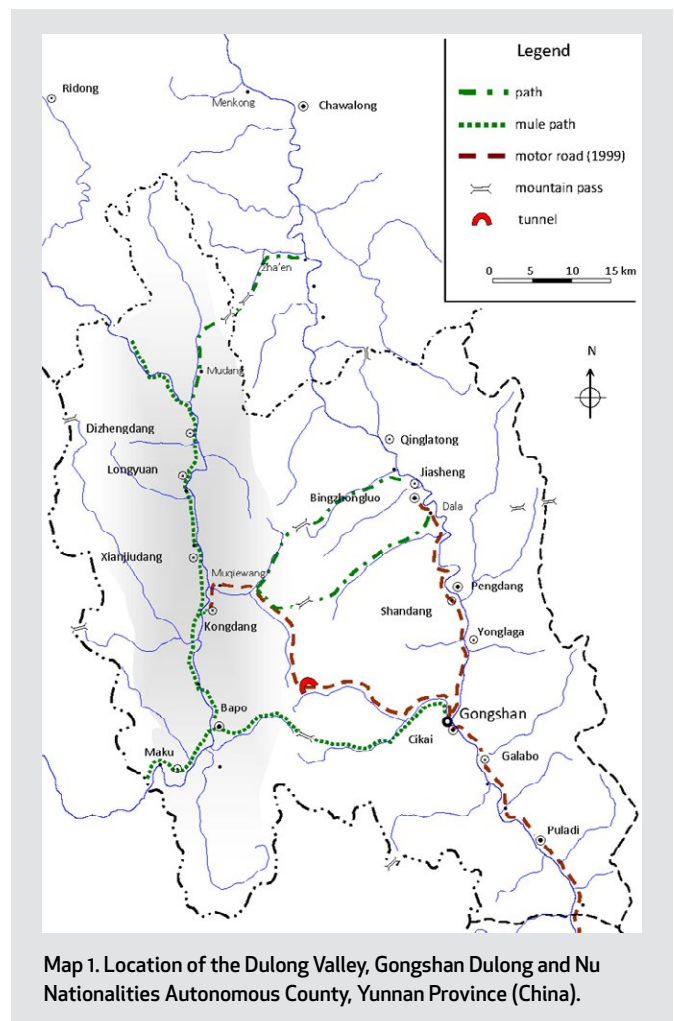




Figure 1. One of the first multi-story buildings in the Dulong Valley, Kongdang village, County seat.

(Stéphane Gros, 2003)



Figure 2. Memorial in honor of the road, Kongdang village, 2010. The memorial reads: "Building the road to the Dulong River, promoting the economic development of Nujiang." Jiang Zemin, 1 May 1999.

(Stéphane Gros, 1999)

In order to support economic development priorities, the long-awaited construction of a motor road officially began in order to make accessible the valley of the Drung, which remained one of China's poorest and most isolated townships. The road across the Gaoligong mountain range was finished in autumn 1999, and since then, when not blocked in winter by heavy snow, tons of cement, steel, and construction machinery have arrived in the valley. The 96-km-long road has allowed the transportation of goods and supplies and has been central to various development plans aimed at improving the Drung people's livelihood. The first multi-story buildings were built in the early 2000s, as well as hydroelectric power stations (as shown in Figure 1). It opened the way to installing satellite antennas to receive national television channels, and more recently for mobile phone connections.

According to official parlance, the road exemplifies a physical and conceptual boundary between 'backward' regions and cosmopolitan China, an effort to build 'material civilization' (*wuzhi wenming*), which means not only bringing material development but also 'spiritual civilization' (*jingshen wenming*) to which the road would finally provide access. The road to the Dulong Valley is crucial to 'modernization' and 'progress,' and is celebrated by the very first memorial monument ever built in the Dulong Township (Figure 2). Since 2010, a further investment of one billion yuan in a project called 'Help the whole Dulong nationality' (*Dulong zheng zu bangfu xiangmu*) is supposed to have addressed the 'warm and full problem' (*wen bao wenti*) by improving housing conditions, infrastructures, social development and population 'quality,' while contributing to environmental protection. The project includes the completion of a six-km-long tunnel below the snow line, so that the Dulong Valley will thereafter be accessible even in winter. In January 2014, President Xi Jinping himself celebrated this major achievement that will contribute to putting an end to the valley's isolation (China Daily 2014).

The 'material civilization' and 'spiritual civilization' that socio-economic development will help establish through the single-party state's intervention is yet another formulation of the longstanding dichotomy alluded to in the introduction to this article: minorities located at the periphery, such as the Drung, have to reach a higher level of civilization through a state-initiated process of social transformation, which includes changes in their agricultural practices and modes of subsistence that are seen as the cause of their persistent backwardness and of environmental degradation. According to this view, cultural specificities—and a variety of factors contributing to what is officially referred to as a problem of the 'quality' (*suzhi*)

of the population—are targeted as principal barriers to development goals. Religious practices, modes of dwelling, education, forms of subsistence activities, and agricultural practices such as swidden cultivation are now problems that have to be overcome.

At the same time, environmental concerns have contributed to regarding swidden cultivation as not only economically unsustainable, but also environmentally destructive. This has become an increasingly problematic issue, considering the area's natural wealth. The Gaoligong Mountains, because of their special geological and climatic conditions ranging from humid tropical forests to alpine areas, are rich in biodiversity. Northwest Yunnan is well known in China for its biological and cultural diversity and the region, covering an area of almost 70,000 km², has been designated as a global biodiversity 'hotspot' by the World Wildlife Fund and the International Union for Conservation of Nature.

The Dulong Valley forms a significant part of Gaoligong Mountain Nature Reserve that stretches along the Sino-Burmese frontier. Designated a provincial-level (1983) and national-level (1986) nature reserve, in 2000 it was classed as a Biosphere Reserve and received the label World Heritage Site as part of the larger Three Parallel Rivers area (World Heritage Committee 2003; Chaplin 2005). The setting up of the reserve in the Dulong Valley faced a major hurdle given that the population's level of poverty and dependence on natural resources (including a wide range of non-timber forest products) did not allow for strict implementation of protection policies. Paradoxically, forestry products were still one of the core resources of Gongshan economy until the late 1990s.

The Dulong Valley's unique geographical location and topography makes it an area of extremely high natural biodiversity. As it is an inhabited area, resource extraction practices and the persistence of swidden practices in particular are often seen, by government agencies and some researchers in China, to be obstacles to achieving conservation objectives. Whereas, from a forest conservation perspective, swidden agricultural practices should indeed be eradicated (Long et al. 2004), it can be argued that it contributes to the maintenance of the diversity of both crop and animal genetic resources and plays an important role in maintaining cultural identity (see Wilkes and Shen 2007). Swidden agriculture, as practiced by the Drung people until they were forced to abandon it, generated significant agrobiodiversity and showed evidence of long-term sustainability as I will discuss in detail below.

Land Use in the Dulong Valley and Reforestation Process

For centuries, swidden cultivation was an important farming practice and an integral part of subsistence economies and of natural resource management for many societies across the eastern Himalayas and South East Asia. Swidden agriculture has long been seen as the antithesis of state forest management and conservation policies, and state policies in China, like elsewhere, have generally sought to restrict or eradicate swidden practices (Yin 2001; Ives 2004; Sturgeon 2005; Forsyth and Walker 2008; Fox et al. 2009; Padoch et al. 2007). Throughout the region, there has been an externally driven historical process of 'de-swiddening' (Schmitt, this issue), and since the onset of modern nation states, government policies have greatly contributed to transforming the landscape and swidden practices in significant ways (Fox et al. 2009).

Until 2003, traditional agriculture in the Dulong Valley was based on rotational swidden agriculture that was central to the livelihoods and cultural pathways of the Dulong people, and hunting and gathering were still common activities (see He 1995; Li 1999, 2008, 2012; Qi 2006). Traditionally, primary or secondary forests were cleared for swidden agriculture and crops cultivated over a one- to three-year period before cropping was abandoned and the land was left to lie fallow (during a period of up to five years on average). During the cropping period, depending on household needs, on the fertility of the soils at each site and on perceived site requirements, annual rotations were used for several crop types: maize, barnyard millet (*Echinochloa frumentacea*), foxtail millet (*Setaria italica*), finger millet (*Eleusine coracana*), two kinds of buckwheat (*Fagopyrum tataricum* and *Fagopyrum esculentus*), and several varieties of taro and beans.

In the Dulong valley, well-managed swidden made it possible to use land that would otherwise be unusable for other forms of agriculture, such as steeply sloping land which amounts for more than 90 percent of the cultivated surface area. Besides swidden agriculture, traditional Dulong agriculture also comprises permanent maize fields usually located on flatter land and small vegetable gardens around houses. Irrigated rice was introduced in the late 1950s but only proved successful in a small number of locations, mainly in the central part of the valley.

Given that the population has remained sedentary for more than a century, primary forests have retreated and are no longer cleared. Slopes that are dominated by alders (*Alnus nepalensis*) are the areas most preferred for swidden agriculture in the Dulong Valley. *Alnus nepalensis* is a fast-growing species that has nitrogen fixing properties

and contributes to soil fertility. For a large part, swidden fields are so-called 'alder fields,' making up a landscape with distinctive patches on mountain slopes (Figure 3).

During clearing, a few larger *Alnus* trees are selected to be kept and pollarded (by removing branches and foliage to encourage new growth), whereas smaller trees and other undergrowth are cut, left to dry, and then burned. Burning dried vegetation accelerates decomposition, releases useful nutrients for crop production, and kills weeds and pests. Pollarding the retained *Alnus* trunks reduces the impact of shading on crops, and the thin branches that subsequently grow are sometimes also cut and burned in the second and third years of cropping to maintain soil fertility.

While *Alnus nepalensis* is a well-known species widely used on swidden fields in parts of Yunnan or the Himalayas, Dulong swidden agriculture presents its own remarkable specificities. Not only are the stumps of alders left in fields to allow for the regeneration of the cover during the fallow period but in addition, some months after burning, *Alnus* saplings previously collected from nearby locations are also transplanted to the cleared site (Figure 4).

While it has been shown that demographic growth has contributed to greater pressure on the environment and on forest cover regeneration below 2,000 meters, especially in the southern part of the valley (He 1995: 53-54), there is also evidence that during the period 1950-1960 the distribution of tools (machetes, axes, hoes, etc.) to villagers and their gradual resettlement from isolated hamlets higher up to villages along the riverbanks contributed greatly to the degradation of the remaining forests in this altitudinal belt (He and Li 1996: 20; Li 2004: 241-243). When taking these changes into consideration, it becomes evident that traditional swidden agriculture in the Dulong Valley is not a main driver of environmental degradation. While villagers themselves comment on the fact that the extraction of timber for construction (houses and granaries) and firewood has impacted forest coverage and made this resource less accessible and more scarce overall, the very sustainability of swidden agriculture in the valley, for a community that has now been settled for more than a century, relies on the efficient rotational system that made it possible for farmers to keep planting similar plots of land over time, and generation after generation. I am not suggesting that swidden agriculture in the Dulong Valley has no environmental implications but I do wish to question the certainty with which environmental degradation has been cited by the state and other actors to justify protection policies and reforestation.



Figure 3. Patchwork of alder fields on mountain slopes, central Dulong Valley.

(Stéphane Gros, 1999)



Figure 4. Planting of alder saplings, Dizhengdang village, Northern Dulong Valley.

(Stéphane Gros, 2000)

The SLCP comes as the last in a series of interventions aimed at ‘improving’ agricultural practices and at reducing their impact on the environment. As mentioned earlier, one of the main rationales behind the implementation of SLCP in western China is the problem of erosion in the lower basin of China’s great rivers, such as the Upper Yangtze and Upper Mekong which are the program’s primary targets. By planting trees on cultivated steep slopes, the aim is to increase vegetation cover and to reduce soil and water loss. In light of this, the inclusion of the Dulong valley in the program is debatable. Firstly, the Dulong River is the source of the Irrawaddy, which flows into Myanmar and therefore does not constitute a particular ecological threat to any parts of lowland China. Secondly, erosion is not a particular problem in the valley as there is still significant forest cover. Thirdly, rotational swidden land targeted by the program, while representing more than two thirds of the land used for agricultural production by the Drung, makes up less than 1 percent of the total surface area of the Dulong Valley. The pressure on local natural resources caused by agricultural practices is therefore limited. The implementation of SLCP reflects the great attention the Chinese government pays to areas with a rich natural biodiversity, the state’s emphasis on creating nature reserves, and a social engineering agenda that aims at transforming local livelihoods seen as ‘backward’ for the sake of economic development.⁶

Consequences of the Sloping Land Conversion Program

Although the government has tried to discourage swidden or rotational agriculture in the Dulong valley since the 1960s, SLCP is the first such effort to come up with specific implementation measures. As the Dulong Valley is a narrow gorge characterized by steep valley slopes throughout,

when the program started in 2003, most rotational arable land was located on slopes with a gradient of over 25 degrees: in fact, 97 percent of cultivated land in the Dulong valley has more than a 30 degree slope, so that apart from retaining paddy, permanent fields, and vegetable gardens, the program implied a massive conversion of nearly all cultivated land (see Tables 1 and 2). Rather than targeting specific plots of land, the subsidies provided by SLCP were divided equally among all farming households, and all land in the cultivated phase of swidden agriculture had to be planted with trees (mainly *Alnus nepalensis* and *Pinus yunnanensis*).

At the end of 2002, the original plan was to convert a total of 933 ha of cropland out of the 988 ha of cultivated land in the Dulong Valley. In this area, 655 ha were land that was traditionally used for swidden agriculture, and in addition to this, 78 percent of permanent arable land was converted to forest. By 2005, 788 ha of land had already been converted (separated into ecological forests and economic forests), with the remaining 200 ha of cultivated land being a combination of rice fields and permanent fields. Of the 788 ha of land converted, 466 ha were officially reforested as ecological forests (timber-producing forests), while the remaining was reforested as economic forests for future use. Villagers were supposed to receive seedlings for the latter, but the Forestry Administration failed to provide them for some time, so non-economic species were in fact often planted.

In return, farming households were given a grain subsidy in the form of paddy rice. In addition to the grain subsidy funded through SLCP, local villagers also began to receive a ‘subsistence allowance’ in the form of a cash transfer from the local government. According to a recent study, by

Household	Population	Cultivated Surface Area				Total Surface to be Converted
		Rice Fields	Terraced Fields	Permanent Fields	Swidden Fields	
835	4140	35.3	44.8	253.1	655.3	933.8
988.5						

Table 1. Original scheduled conversion of cultivated fields into forests in the Dulong Valley (2003).

Source: Gongshan Forestry Office

Household	Population	Cultivated Surface Area		Total Surface to be Converted
		Rice Fields	Permanent Fields	
873	4093	23.7	176.3	788.5
200				

Table 2. State of cultivated land after SLCP implementation in the Dulong Valley (2005).

Source: Gongshan Forestry Office; Li 2008

2009, the total subsistence allowance paid by local governments had reached more than 1.86 million Yuan (over 310,000 USD) (Shen et al. 2010).

In other words, whereas in other areas of western China the land conversion policy stipulates that grain subsidies should be given on the basis of the land area that has been converted, in the Dulong Valley, given that most land was to be converted, the local government decided to allocate the subsidy on a per capita basis (180 kg of rice per year/person). This was a way of ensuring government funding for grain supplies to bring Drung villagers' grain consumption levels up to the poverty threshold, although this has not proved successful.

In the 1990s, the average grain production in the Drung area was approximately 170 kilograms per capita, and the average income was 214 yuan per year (33 USD). Almost one third of the population received poverty alleviation grain or money. However, in 2003, prior to the implementation of SLCP, grain production was allegedly 329 kilograms per capita, and the average net income was 314 yuan (48 USD). After the decision to implement the SLC program in late 2003, the Drung were asked to stop planting crops and instead they received a subsidy in rice. In 2005, State subsidies in rice amounted to an average 171 kg/person/year, and the annual average income stood at 596 yuan, which was partly made up of cash subsidies.

In 2010, according to my own survey at village level in Dizhengdang (57 households), villagers were receiving an average 175kg/pers/year of rice, their own grain harvest (mainly maize) amounting to roughly 107kg/person/year, and the average net income was 453 yuan (69 USD) (including 228 yuan in subsidies) (See Table 3).

These results differ from the figures recorded in 2009 for income levels in Dizhengdang which, based on local government statistical reports, would amount to an annual total of 2,301 yuan (see Shen et al. 2010: 208).⁷ However, as stated by the authors, most of what is classed as 'forestry income' in government statistical reports is direct cash payments made in lieu of grain subsidies under SLCP. The same authors also found that subsidies comprise approxi-

mately 25-30 percent of the income in their study villages, whereas cash payments made in lieu of grain subsidies under SLCP account for a further 18-27 percent (ibid.). Such findings are in keeping with the data I collected in 2010 that show that nearly 50 percent of income is derived from subsidies.

The implementation of the field conversion policy has certainly constituted a major socio-economic change in the Dulong Valley. While drastically affecting livelihoods, it has contributed to further eroding agro-biodiversity. Since its implementation, many crops and varieties that used to be planted in swidden fields have simply disappeared. Of the forty-nine crop varieties identified, five had disappeared by 2005, and seventeen have only been sustained by very few households; only eight of these are still regularly planted on the small remaining areas of cultivated land, while the others are no longer planted (see Xiao 2005; Wilkes and Shen 2007; Shen et al. 2010). Villagers who have kept seeds of swidden crops occasionally plant them. But most of these crops are not suited to non-swidden fields, and since villagers are no longer allowed to cultivate swidden land it is unlikely that these crops will survive in the long term.⁸ Without a doubt, the disappearance of a variety of buckwheat (*Fagopyrum tataricum*) will seriously limit some ritual activities: dough figurine offerings to mountain spirits in particular can only be made using this kind of buckwheat flour, as it is considered to be the only 'pure' grain suitable for these lofty deities.

For years, there have been government incentives to develop livestock farming, for example by breeding the so-called Dulong cow (*Bos frontalis*, known as *mithun* in the Himalayas) or even by introducing techniques for breeding mountain goats. The conversion policy has, however, restricted the already very limited pastureland; livestock farming is therefore difficult, leading some families to abandon it (cf. Shen et al. 2010: 208). Oxen and horses regularly cause damage to the limited number of cultivated fields that are not properly fenced off, leading to clashes between villagers. Moreover, villagers complain that bears—which they are not allowed to hunt—come down the mountain more and more often to eat corn in

Year	Population	Cultivated Surface (ha)	Grain (kg/pers/year)	Net Income (yuan/pers/year)
2010	113	14.3	175 (rice subsidy) 107 (maize)	453 (incl. 228 in subsidies)

Table 3. Grain production and average income at village level. Estimation in Dizhengdang (2010).

the few remaining fields near inhabited areas, as there are now no swidden fields higher up, and these villagers file complaints to claim compensation.

While some trees of economic value have been planted (walnut trees, Sichuan pepper, or even tea) using seedlings distributed by the forestry administration, this is not a source of secondary economic activity. The paradoxical effect of SLCP with regards environmental protection is that villagers, with a very limited source of income, rely on the exploitation of natural resources to generate cash. Drung people have long been suppliers of forest products, and there exist historical records that attest to a trade in medicinal plants such as goldthread (*coptis teeta*) and fritillaria bulbs (*fritillaria cirrhossa*). Together with wild animal products (such as musk or bear gallbladder), forest resources have long constituted the main trade items and a source of revenue. Following a shift in outside demand, Drung people extracted camphor oil (from *Cinnamomum glanduliferum*) in the early nineties, rendering camphor trees almost extinct, and they have since started collecting a variety of medicinal plants, notably paris (*Paris dulongensis*) more recently and gold berry (*Solanum*).⁹ Nowadays, with more time on their hands to devote to this activity, wild medicinal plant-collecting has become a flourishing activity which could seriously impact the area's natural environment: not only through the potential depletion of resources, but also by the damage caused by large groups of collectors who set up camp at a high altitude and cut firewood. Despite early legislation and protection measures, poaching and trafficking of wildlife is still rife across the border with Myanmar, as well as within China: wildlife products still make highly valued present for cadres.¹⁰

With the implementation of SLCP, the local government is promoting economic activities that could help generate cash. The most significant and successful since 2007 has been the large-scale plantation of black cardamom (often planted in the understory of secondary forests) and even paris plants, especially in the southern part of the valley. As of 2013, cardamom plantations covered 2,200 ha, generating 29,300 USD in revenue (Yunnansheng Fupin Ban 2013).

The setting up of the nature reserve, the implementation of SLCP, and subsequent development plans have bolstered the hope that tourism will be the main driving force behind economic growth in the valley. 'Nature' is therefore being protected for the sake of the future tourism industry, and five model 'culture villages' (*wenhua tese cun*), with newly built modern houses, are currently the focus of advertising campaigns aimed at making these villages major tourist destinations.¹¹

Since the cultivated surface area is now drastically limited, and since tourism is yet to grow in the region, many individuals no longer work and have limited job prospects, thus relying instead on grain and relief from the government. As less time is devoted to working in the fields, there is more time for leisure activities, and more time to drink. According to villagers, cases of alcoholism and fighting are on the rise. From my own observations at the village level, and as indicated earlier, it would appear that the rate of suicide is soaring: young or middle-aged males poison themselves (using pesticides or aconite), often in a state of drunkenness. As alluded to in the introduction to this article, I was witness to one such event. I had recorded several other cases, and an in-depth study still needs to be undertaken to correlate these cases of suicide with the actual social conditions. But in this particular case, this unmarried, jobless, middle-aged man seemed to fit into the category of those who demonstrate growing discontent with their current predicament, resulting in acts of despair. The new social and economic situation is contributing to livelihood insecurity for the younger generation; labor migration is often inevitable if there is a family to support, and an increasing number of young women now marry outside their community. This is not specific to the Drung, and the escalation of social problems appears to be linked to social changes triggered by SCLP and related policies in Gongshan County in general (Harwood 2014: 92).¹²

Relatedness, Dependence, and Concluding Remarks

Development programs and environmental protection projects, such as SLCP, tend to ignore people's understanding of the environment, or 'nature.' There are other deep-seated consequences of policies like SLCP. For the Drung, the environment is not merely a scientifically knowable entity to be preserved or protected; rather, it is made up of diverse entities, such as spirits and vital forces that take different forms and are constitutive of multiple mechanisms of agricultural and social reproduction. The dominant 'environmental ideologies' that typically inform nature protection plans rarely take into account indigenous models of human-environment interactions. Other 'environmental subjectivities' (Campbell 2010) come into play, illustrating nuanced aspects of human-environment relatedness. In this sense, beyond the various ways of talking about the environment or nature and of making it an explicit category, 'environmental subjectivities' also include the different ways of talking about and interacting with non-humans.¹³

One might say that SLCP has traded 'nature' conservation and food security goals for the biocultural heritage of a people and their right to pursue sustainable livelihoods

without relying on government handouts to meet their basic needs (Wilkes and Shen 2007). While such a discourse finds its justification in debates about development policies and indigenous rights, it does not fully translate the specificity of human-environment relatedness as a form of embeddedness, a way of living within the environment (cf. Ingold 2000). One of the more profound consequences of policies such as SLCP, it would seem, is precisely that it contributes to destroying this embeddedness and the means (material, but also skills and knowledge) to maintain it.

Subsistence procurement activities, such as hunting and farming, illustrate the different kinds of relationship the Drung people forge with non-human entities. What is sought in subsistence activities when relating to other beings—whether spirits or natural elements—are the vital principles of animals or plants. As such, these ‘vital principles’ are nutritious: they are part of the hunt or the harvest. The benefits that Drung people used to strive to achieve through their subsistence activities are these vital forces that make up ‘good fortune’ (*kār-jī*) and provide an abundance of food needed for subsistence. Good fortune is seen as a vital force, and the concept is very similar to the idea of luck. It is very important to keep good fortune within oneself, for having none would influence the harvest, the hunt, and domestic animals would not grow fat. Consequently, a wealthy man is—or at least was—regarded as someone who regularly hunts a lot of wild animals, and whose harvest is abundant even if he does not put a lot of effort into it.

Fertility, as a reality and a symbolic expression of the success of activities aimed at producing, or more accurately at extracting or ‘procuring’ consumable commodities, is not easy to achieve, nor is it an inexhaustible gift of nature. In this sense, Drung people not only subsist by hunting and cultivating in an environment they would accordingly objectify and perceive for utilitarian purposes; they interact with their environment which is inhabited by beings one can relate to, knowing that what happens to them can affect and be affected by what happens to people. For the Drung, these relationships are inseparable from principles of relatedness and interdependency based on the conception of an energetic flux of fertility that animates the cosmos (Gros 2012b).

All these forces, principles of vitality and fertility, are essential and necessary for people to be able to live in their environment, and are the reason why people still interact with non-human beings that are either a threat to their fertility or a means of enhancing it. These interrelations and interdependencies form the basis of a ‘cosmopraxis’

(Schlemmer 2009) the efficacy of which depends largely on activating—through rituals and incantations—the unstable presence of these interlocutors, and they are therefore dependant on the continuity of economic and religious practices.

Following successive waves of social and economic reforms over the last decades, changes in subsistence activities and the decline of forms of religious activities directly linked to them, rituals that were central to ensuring people’s fertility and prosperity have now, tellingly, mainly disappeared from the Dulong Valley. The generational gap in the transmission of knowledge and, increasingly, the systematic schooling of children in boarding schools far from home, have deepened the loss of a body of knowledge regarding skills and techniques, and forms of relatedness with the environment. Even the intimate world within the house has been altered, as well as the daily diet. Eating is a significant part of the differential definition of social groups and individuals, and rice has long been a prestigious and desired food among the Drung. Nowadays Drung people live off rice subsidies. They no longer voice strong claims over land for growing traditional crops nor do they seek the ‘good fortune’ and ‘vital principles’ as before. As others have noted (Xiao 2005: 8; Wilkes and Shen 2007: 78), villagers seldom complain about their situation, and see advantages in not having to work in the fields anymore. Yet, ironically, the policy of assistance, which benefits the Drung materially and allows for more leisure, guarantees them little more than the right to be poor.

There are two apparent paradoxes in this complex situation: on the one hand, development should be a form of empowerment of individual economic actors, when in fact it increases the level of dependence on the State; on the other hand, one would expect strong resistance to such a form of subordination, but present-day dependence has to some extent become an accepted condition.

This brings me back to the problem of the current state of dependence of the Drung, and how it is perceived. There is in fact some historical continuity: forms of political and economic dependency were dominant on a regional scale and across ethnic boundaries, and Drung history is in some ways a succession of forms of dependence and subordination to their more powerful neighbors. Drung people were included in regional polities through relations based on exchange and dependence; a hierarchical dependence where diverse ethnicities were integrated in a regional social system (a tributary system of allegiance) within which they held a recognized social position—even if the Drung were certainly at the lower end of it (see Gros 2005, 2011,

2012a, 2012b).¹⁴ This older form of dependence, hierarchical and unequal as it was, was based on customary forms of reciprocity that ended with the PRC's single-party-state's new social categorization and welfare system.

The critical issue is that the present-day SLCP policy pushes dependence to the extreme. In the name of development and/or environmental protection, the flow of aid reaching the Drung (gifts with no possible return, hence no reciprocity) contributes to the progressive disappearance of their means of subsistence and associated socio-cultural practices. As Harwood (2014: 97) has rightly remarked, SLCP results in a surplus of rural laborers who are to be turned into off-farm workers so that they can contribute to the national economy—not to the reproduction of their socio-cultural systems. It thus creates monadic individuals shaped for wage labor and the market economy. Land-use practices are disappearing in the process as well as associated activities and values that contribute to Drung cultural identity and lifeways. This in turn invalidates other relational logics and leaves room for a form of detachment that encourages the development of self-interest, as well as forms of escape such as migration and, in some extreme cases, suicide.

Stéphane Gros is a social anthropologist, researcher at the Centre for Himalayan Studies, Centre National de la Recherche Scientifique (C.N.R.S., France). He has been conducting anthropological research in Northwest Yunnan province, China, since the mid-nineties, especially among the Drung (Dulong). He has published a monograph entitled *La Part Manquante* (Société d'ethnologie, 2012) and a number of articles on issues of interethnic relations and ethnic classification, representations of ethnic minorities, poverty and categorization. He is Principal Investigator for a European Research Council-funded project on the Sino-Tibetan Borderlands (Starting Grant No. 283870, 2012-2016), and has served as Managing Editor (2011-2014), and is now Editor-at-Large for the open-access anthropology journal *HAU: Journal of Ethnographic Theory*.

The author's fieldwork among the Drung in Yunnan was conducted at different times during the spring of 1998 and in the winters of 1999-2000, 2000-2001, and 2003, over a total of nearly eighteen months, with an additional field trip in autumn 2010. The author is indebted to the Drung people who hosted him and accepted to work with him. Prior versions of this article have been presented on several occasions and have benefited from constructive comments. The suggestions received from Georgina Drew and two anonymous reviewers have greatly helped improve the argument. The author would also like to thank Bernadette Sellers for her language editing. This article has been written within the framework of the European Research Council-funded project "Territories, Communities, and Exchanges in the Kham Sino-Tibetan Borderlands" (Starting Grant No. 283870).

Endnotes

1. The Chinese state is devoted to alleviating poverty and to reducing regional disparities through a series of state-sponsored investments and land use projects that fall within the framework of the ambitious Great Opening of the West campaign (*Xibu da kaifa*), launched in March 2000 (Goodman, ed., 2004; Oakes 2007). As it promotes rapid economic development, China's leadership has reiterated its commitment to protecting and improving the natural environment in the West, initiating logging bans and afforestation campaigns. In this framework, ecological considerations have led to drastic decisions about environmental rehabilitation or 'ecological construction' (Economy 2002; Yeh 2005, 2009), introducing large-scale changes in subsistence activities and reconfiguring the local economies of hinterland communities.
2. Swiddening, which is the main form of agriculture in the Dulong Valley, implies the periodic cutting and burning to make small clearings. A field is cropped for several years, and then left to lie fallow. See *infra* for a more detailed description of how it is practiced by the Drung.

3. For the sake of space I will only be able to touch upon the complexities of people's sense of interconnectedness with and cultural understanding of the environment; for a more in-depth discussion, see Gros (forthcoming).

4. There has been a surge in literature on the subject over the last ten years; see among others, McKhann (2001), Hillman (2003), Litzinger (2004), Oakes (2007), Hayes (2007), Kolás (2008).

5. Harwood (2014) provides a useful outline of the general issues linked to development programs in the Gongshan area.

6. See for example Gladney (1994) and Harrell (1995) about backwardness and other stereotypes applied to the PRC's "national minorities," and more recently Harwood (2014) for Gongshan area, whose study highlights how the basic logic of development relies on the general assumption that such a secluded ethnic minority region suffers from shortages.

7. This figure is significantly higher than the one from my own data, but also above the average income of 916 yuan in 2009 which increased to 1,255 yuan in 2011, as provided in some sources (Yunnansheng Fupin Ban 2013).

8. The Yunnan-based Centre for Biodiversity and Indigenous Knowledge (CBIK) has been working with community members and local government, convening workshops to provide support for agrobiodiversity. After a successful seed fair event in 2008, the county Forestry Bureau and township government approved the idea that 1 ha of land be used for swidden cultivation. Eight traditional crops have been cultivated by using traditional methods on the approved plot. See Shen (2008); Shen et al. (2010: 209-10).

9. Other than those already mentioned, there is a vast selection of plants with medicinal properties that have been or still are collected in the Dulong Valley for economic purposes: *Gastrodia elata*, *Cordyceps*, *Ganoderma lucidum*, *Astilbe chinensis*, *Magnolia officinalis*, *Panax japonicus*, *Engleromyces goetzi*, *Poria*, *Polygonum*, *Picrorhiza*, *Aconitum*, *Angelica*, *Polyporus*, *Bergenia*, *Codonopsis*, *Dendrobium*, *Aconitum*, *Anemarrhena*, *Heridium*, *Aristolochia*, *Notopterygium*, *Artemisia*, among others. See Li (1996), Long et al. (2004), Li (2012).

10. Cf. Zackey (2007) for how a sense of deprivation can lead to poor environmental management and illegal tree cutting.

11. Though backpacking is still a new and limited activity in terms of the scale and the number of people—who often go through the Dulong Valley on their way to Tibet—the litter they leave behind at campsites is becoming an eyesore.

12. The increased economic dependence, and marginalization thereof, of the majority of rural inhabitants seems to be leading to a situation similar to the one witnessed among the Lahu further south in Yunnan, where women increasingly marry outside the community, and the rate of male suicides is on the rise (Ma 2013: 188 ff.).

13. For the Gongshan area, Wilkes (2000) has pioneered a research agenda that pays full attention to local cultural understandings. I provide a more detailed discussion of Drung people's conception of the environment in Gros (forthcoming).

14. The kind of continuity I would like to highlight, despite changes in living conditions and the political environment, is the Drung people's understanding of hierarchy and political legitimacy, and the fact that rulers have always been seen as the source of essential wealth (goods) for social reproduction. The Drung's inclusion in a hierarchical political system has to be linked to their understanding of an economy of prestige (through sacrificial feasting and redistribution) as well as an economy of wealth. Generally speaking, wealth comes from the outside that is intimately associated with those holding (political) power.

References

- Bennett, M. T. 2008. China's Sloping Land Conversion Program: Institutional Innovation or Business as Usual? *Ecological Economics* 65 (4): 699-711.
- Cai, Jiaqi. 1983. *Dulongzu Shehui Lishi Zonghe Kaocha Baogao*. Minzu Diaocha Yanjiu (zhuanke), vol 1. Kunming: Zhongguo Xinan Minzu Yanjiu Xiehui, Yunnansheng Minzu Yanjiusuo.
- Campbell, B. 2010. "Subjectivity and Governance in the Himalayan Environment." In *Nature, Culture and Religion at the Crossroads of Asia*, edited by M. Lecomte-Tilouine, 156-189. New Delhi: Social Science Press.
- Chaplin, G. 2005. Physical Geography of the Gaoligong Shan Area of Southwest China in Relation to Biodiversity. *Proceedings of the California Academy of Sciences* 56 (28): 527-556.
- China Daily. 2014. President Xi Encourages Ethnic Minority People. *China Daily*, 3 January 2014. <http://www.chinadaily.com.cn/xinhua/2014-01-03/content_10958502.html> (accessed 27 February 2014).
- Démurger, S., M. Fournier and Shen G. 2005. Forest Protection Policies: National Guidelines and Their Local Implementation in Northern Sichuan. *China Perspectives* 59. <<http://chinaperspectives.revues.org/481>> (accessed 14 November 2008).

- Economy, E. 2002. China's 'Go West' Campaign: Ecological Construction or Ecological Exploitation. *China Environment Series* 5: 1–10.
- Forsyth, T. and J. Michaud 2011. Rethinking the Relationships between Livelihoods and Ethnicity in Highland China, Vietnam, and Laos. In *Moving Mountains. Highland Livelihood and Ethnicity in China, Vietnam, and Laos*, edited by J. Michaud and T. Forsyth, 1–27. Vancouver: University of British Columbia Press.
- Forsyth, T. and A. Walker. 2008. *Forest Guardians, Forest Destroyers. The Politics of Environmental Knowledge in Northern Thailand*. Seattle: University of Washington Press.
- Fox J, Y. Fujita, D. Ngidang, N. Peluso, L. Potter, N. Sakuntaladewi, J. Sturgeon, and D. Thomas. 2009. Policies, Political-Economy, and Swidden in Southeast Asia. *Human Ecology* 37: 305–322. doi: 10.1007/s10745-009-9240-7.
- Gladney, D. 1994. Representing Nationality in China: Refiguring Majority/Minority Identities. *The Journal of Asian Studies* 53 (1): 92–123.
- Goodman, D.S.G. (ed.). 2004. China's Campaign to 'Open Up the West': National, Provincial level and Local Perspectives. *The China Quarterly Special Issue*, No. 5. Cambridge: Cambridge University Press, 2004.
- Gros, S. 2004. The Politics of Names: The Identification of the Dulong (Drung) of Northwest Yunnan. *China Information* 18 (2): 275–302.
- . 2005. Le nouveau partage du monde: Pauvreté et dépendance dans les marges du Yunnan (Chine) (A new partition of the world: Poverty and dependence on Yunnan's margins, China). *Moussons* 8: 61–88.
- . 2011. Economic Marginalization and Social Identity Among the Drung People of Northwest Yunnan. In *Moving Mountains. Highland Livelihood and Ethnicity in China, Vietnam, and Laos*, edited by J. Michaud and T. Forsyth, 28–49. Vancouver: University of British Columbia Press.
- . 2012a. *La Part Manquante: Echanges et Pouvoirs Chez les Drung du Yunnan (Chine)*. Nanterre: Société d'ethnologie.
- . 2012b. Cultes de Fertilité Chez les Drung du Yunnan. *Moussons* 19 (1): 111–136.
- . Forthcoming. Nature De-Naturalized: Changing Views and Attitudes Toward the Environment Among the Drung of Northwest Yunnan. *The Asia Pacific Journal of Anthropology*.
- Harrell, S. 1995. Introduction: Civilizing Projects and Reaction to Them. In *Cultural Encounters on China's Ethnic Frontiers*, edited by S. Harrell, 3–36. Seattle and London: University of Washington Press.
- Harwood, R. 2014. *China's New Socialist Countryside. Modernity Arrives in the Nu River Valley*. Seattle: University of Washington Press.
- Hayes, J. P. 2007. The Recent Environmental History of Tiger Leaping Gorge: Environmental Degradation and Local Land Development in Northern Yunnan. *Journal of Contemporary China* 16 (52): 499–516.
- He, Daming. 1995. Dulongzu Jujuqu Renkou Yu Huanjing Zhichi Xitong de Yanjin (Evolution of the population-environment support system in the Drung inhabited area). In *Gaoshan Xiaqu Ren-Di Fuhe Xitong de Yanjin*, edited by He Daming, 25–57. Kunming: Yunnan Minzu Chubanshe.
- He, Daming, Li Heng 1996. Dulongjiang he Dulongzu Zonghe Yanjiu (Comprehensive study of the Drung in the Dulong Valley). In *Dulongjiang he Dulongzu Zonghe Yanjiu*, edited by He Daming and Li Heng, 1–26. Kunming: Yunnan Keji Chubanshe.
- Hillman, B. 2003. Paradise under Construction: Minorities, Myths and Modernity in Northwest Yunnan. *Asian Ethnicity* 4 (2): 175–188.
- Ingold, T. 2000. *The Perception of the Environment: Essays on Livelihood, Dwelling and Skills*. London: Routledge.
- Ives, J. D. 2004. *Himalayan Perceptions: Environmental Change and the Well-Being of Mountain People*. London and New York: Routledge.
- Kolås, Å. 2008. *Tourism and Tibetan Culture in Transition: A Place Called Shangri La*. New York: Routledge.
- Li, Heng. 1996. Dulongjiang Diqu Jingji Zhiwu Minglü (List of Economic Plants of the Dulong Region). In *Dulongjiang he Dulongzu Zonghe Yanjiu*, edited by He Daming and Li Heng, 95–256. Kunming: Yunnan Keji Chubanshe.
- Li, Jinming. 1999. *Dulongzu Yuanshi Xisu yu Wenhua* (The Primitive culture and customs of the Dulong). Minzu Wenxue Yanjiu Jikan, vol. 13. Kunming: Yunnansheng Shehui Kexueyuan Minzu Wenxue Yanjiusuo.
- . 2004. "Gongshanxian Dulongjiangxiang Kechixu Fazhan Chutan" (Preliminary Discussion on Sustainable Development in Dulong Township, Gongshan County). In *Shengtai Wenhua yu Kechixu Fazhan*, edited by Guo Jiaqi, 212–259. Beijing: Zhongguo Shuji chubanshe.

- . 2008. Shengtai Baohu, Minzu Shengji Kechixu Fazhan Wenti Yanjiu. Yi Dulongjiang Diqu Dulongzu Wei Li (On the problem of environmental protection, subsistence, and sustainable development: The example of the Dulong people of the Dulong Valley area). *Yunnan Shehui Kexue* 3: 81–85.
- . 2012. Dulongzu Yesheng Zhiwu Liyong de Chuantong Zhishi Yanjiu (Traditional Knowledge about the Use of Wild Plants among the Dulong People). *Xueshu Tansuo (Academic Exploration)* 2: 63–68.
- Litzinger, R. 2004. The Mobilization of ‘Nature’: Perspectives from North-West Yunnan. *The China Quarterly* 178: 488–504.
- Liu, Jianguo, Li Shuxin, Ouyang Zhiyun, Tam Christine, and Chen Xiaodong. 2008. Ecological and Socioeconomic Effects of China’s Policies for Ecosystem Services. *Proceedings of the National Academy of Sciences of the United States of America* 105 (28): 9477–9482.
- Long, Chunlin, Li Rong, Dao Zhiling, Liu Yitao, and Li Heng. 2004. Dulongzu Cunshe de Ziran Ziyuan Guanli (The Management of Natural Resources in Dulong Communities). *Yunnan Zhiwu Yanjiu* 15: 35–41.
- Ma, Jianxiong. 2013. *The Lahu Minority in Southwest China: A Response to Ethnic Marginalization on the Frontier*. London: Routledge.
- McKhann, C. F. 2001. Tourisme de Masse et Identité sur les Marches Sino-tibétaines. *Réflexions d’un Observateur. Anthropologie et Sociétés* 25 (2), 35–54.
- Oakes, T. 2007. Welcome to Paradise! A Sino-American Joint Venture Project. In *China’s Transformations: The Stories Beyond the Headlines*, edited by L. Jensen and T. Weston, 240–264. Lanham, MD: Rowman & Littlefield.
- Padoch, C., K. Coffey, O. Mertz, S. Leisz, J. Fox, and R. Wadley. 2007. The Demise of Swidden in Southeast Asia? Local Realities and Regional Ambiguities. *Danish Journal of Geography* 107 (1): 29–42.
- Qi, Yinfeng. 2006. Dulongzu Senlin Chuantong Zhishi Zhong Lunxie di Liyong Anli Yanjiu (Dulong Forest Indigenous Knowledge: A Case Study in Rotational Agriculture). In *Gaoligongshan Minzu yu Shengwu Duoyangxing Baohu Yanjiu (Ethnic Minorities and Biodiversity Research in the Gaoligongshan)*, edited by Q. Xiong and X. Shi, 262–269. Beijing, China: Science Press.
- Schlemmer, G. 2009. Jeux d’Esprits. Ce Que Sont les Esprits Pour les Kulung. *Archives des Sciences Sociales des Religions* 145: 93–108.
- Shen, Shicai. 2008. Zhongguo Dulongjiang Zhongzi Jiaoliuhui ji Daogeng Huozhong Jilupian Paishe Yantaohui Chenggong Zhaokai (China Dulong Seed Exchange and Slash and Burn Documentary Shooting Seminar Held Successfully). *Centre for Biodiversity and Indigenous Knowledge*. July 29, 2007. <<http://www.cbik.ac.cn/Get/WhatWeDo/Indigenous/143143419.html>> (accessed 12 November 2008).
- Shen, Shicai, A. Wilkes, Jie Qian, Lun Yin, Jian Ren, and Fudou Zhang. 2010. Agrobiodiversity and Biocultural Heritage in the Dulong Valley, China. *Mountain Research and Development* 30 (3): 205–211.
- Sturgeon, J. 2005. *Border Landscape: The Politics of Akha Land Use in China and Thailand*. Seattle: University of Washington Press.
- Trac C. J., S. Harrell, T. M. Hinckley, and A. C. Henck. 2007. Reforestation Programs in Southwest China: Reported Success, Observed Failure, and the Reasons Why. *Journal of Mountain Science* 4 (4): 275–292. doi: 10.1007/s11629-007-0275-1
- Trac C. J., A. H. Schmidt, S. Harrell, and T. M. Hinckley. 2013. Is the Returning Farmland to Forest Program a Success? Three Case Studies from Sichuan. *Environmental Practice* 15 (3): 350–366. doi: 10.1017/S1466046613000355
- World Heritage Committee. 2003. Three Parallel Rivers of Yunnan Protected Areas. Decision adopted by the 27th session of the World Heritage Committee, 27 COM 8C.4. Paris: United Nations Educational, Scientific and Cultural Organization.
- Weyerhaeuser, H., A. Wilkes, and F. Kahrl. 2005. Local Impacts and Responses to Regional Forest Conservation and Rehabilitation Programs in China’s Northwest Yunnan Province. *Agricultural Systems* 85: 234–253.
- Wilkes, A. 2000. Environmental Ideologies: Ways of Talking About Nature & People in Gongshan County, Nujiang, China. In *Links Between Culture & Biodiversity: Proceedings of the Cultures & Biodiversity Congress 2000*, edited by Xu Jianchu, 41–51. Kunming: Yunnan Sciences & Technology Press.
- Wilkes, A., and Shen Shicai. 2007. Is Biocultural Heritage a Right? A Tale of Conflicting Conservation, Development, and Biocultural Priorities in Dulongjiang, China. *Policy Matters* 15: 76–83.

Xiao, Jianwen. 2005. *Dulongjiang Tuigeng Huanlin dui Nongye Shengwu Duoyangxing de Yingxiang: Chubu Diaocha Jieguo* (Preliminary Survey of the Impact of Sloped Land Conversion on Agro-Biodiversity in Dulongjiang Township). CBIK Report 24. Kunming: Center for Biodiversity and Indigenous Knowledge.

Yeh, E. 2005. Green Governmentality and Pastoralism in Western China: 'Converting Pastures to Grasslands.' *Nomadic People* (N.S.) 9 (1-2): 9-30.

———. 2009. Greening Western China: A Critical View. *Geoforum* 40: 884-894.

Yin, Shaoting, 2001. *People and Forests: Yunnan Swidden Agriculture in Human-ecological Perspective*. Translated by M. Fiskesjö. Kunming: Yunnan Education Publishing House.

Yunnansheng Fupin Ban (Yunnan Provincial Poverty Alleviation Office). 2013. Dulongjiangxiang Zhengxiang Tuixing Zhenzu Bangfu Gongzuo Qude Jieduanxing Chengguo (Substantive Results Achieved by the Help the Whole Nationality Project in Dulong Township). 22 January 2013. <http://www.ynfp.cn/news_show.asp?newsid=615> (accessed 27 February 2014).

Zackey, J. 2007. Peasant Perspectives on Deforestation in Southwest China. Social Discontent and Environmental Mismanagement. *Mountain Research and Development* 27 (2): 153-161.

Zhao, Fazhu, Han Xinhui, Yang Gaihe, Feng Yongzhong, and Ren Guangxin. 2013. Policy-Guided Nationwide Ecological Recovery: Assessment of the Grain-to-Green Program of China. *Journal of Food, Agriculture & Environment* 11 (3-4): 1882-1890.