

RESEARCH NOTE

THE FOUNDING OF DUNGSAM YONGLA RIWO PELBAR DARGYE CHHOLING AND THE LIST OF SUCCESSIVE LAMAS

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In a vision, the great Treasure Discoverer Rigzin Jigme Lingpa, the eminent disciple of the greatest treasure discoverer Kunkhen Longchen Ramjam, saw distinctive places like Tsarita, Singye Dzong etc, from among which an abode of holy Vajra similar to the stature of the above places came in his vision. This particular place had the fullest details of the impressions of the Vajra indicative of wrath and it bore the quality of resistance against war along the Indo-Bhutan borders.

Now, Jigme Kundrel, born in Wang Dhaklungkhar and the would-be disciple of Jigme Lingpa was in Tongsa having entered the service of "Garpa" under the Royal Government of Bhutan. He was assigned the charge of the meat store keeper and during the five years of his service in the store, he had to resort to slaughtering countless number of animals which inevitably led to regret and sorrow. As a result, he pleaded for resignation from such a service, but was not released and had to serve in the same capacity for another five years. Subsequently, his sorrow for everlasting cycle of life and pity for the sins knew no bounds and finally absconded from service. As fate would have it, after traveling day and night, he arrived at Samye Chhimpur where he met the most outstanding and accomplished treasure discoverer Rigzin Jigme Lingpa. His sorrow and empathy further increased and he secretly went to see Terton Jigme Lingpa and fell at his feet. Eventually, he received discourses on and accomplished the "Longchen Nyingthig" tradition of Buddhism. He

specialized in the practice of "Pongwa Samten" (order of abandonment) for about fifteen years and realized the reasoning of everything thus winning a seat at par with the "Lamas". He was, then, instructed by Terton Rigzin Pema Lingpa to proceed to "Lhomon" (the country in the south) where an abode of Vajra indicating wrath existed. Here, Jigme Kundrel would be blessed with the "Dorji Phurba" (Vajra-Kilaya) doctrine of Buddhism and would be able to restrain conflicts that would, otherwise, prove to be harmful to the sentient beings. In accordance with this prophecy, he traveled from Lhodrak through Monla Karchung and arrived in Bumthang. He visited the top of Wangthangla in Ura and pondered on the possibility of that particular place being the site prophesied by Terton Rigzin Jigme Lingpa. Here appeared the goddess Dechhen Gyalmo who pointed towards Yongla Gonpa and instructed him to go there, as that was the place of prophecy where Jigme Kundrel could fulfill the needs of the sentient beings. Having arrived at Yongla, he entered into meditation on the core subject of the religion and subsequently turned the wheel of the Dharma amidst many eminent and ordinary people.

At one time, there appeared a hoard of warring faction (Mutekpa or people without a religion) from India who camped in Kumarikata and brought the activities of the people on the Bhutanese side to a complete standstill and usurped the land. At this instance, the commissioner stationed at Dungsam could not bear the thought of a small army fighting such a large army and having set fire to Shali Dzong, he prepared to escape to the Capital. However, Lama Jigme Kundrel told him that there would be a solution to this problem and that the commissioner should not go ahead as planned. Thereafter, the Lama meditated on "Palchhen Dorji Phurpa" and conducted the "Tordog" ceremony, which not only caused fire to the camps of the opponents, but also brought about huge snakes and induced the oxen to go mad followed by unceremonious symptoms like the mad oxen victimizing the enemies. Therefore, the enemies retreated in fear and the commissioner reported this to the Lamas and

officers in the capital. As a result, the officers and the Lamas were highly pleased with Lama Jigme Kundrel that he was showered with presents and made the "Lachhen" through the dispatch of a set of five-colored scarves. He then continued his good work for the welfare of the sentient beings.

At a time when he was on his death bed, he enrolled his disciple in the Central Dratshang who was eventually made the ambassador, who also improved the external and internal aspects of the Lama's abode, offered presents to the Lamas in Samye (Tibet) and also made offerings to Shabdrung Rinpoche, Lama Thripa, Khenpo of Dratshang, the entire Dratshang, the Deb Raja and the Ministers. He also obtained government orders to register land at Yongla Gonpa, which was registered during that time. Later, during the tenure of Lama Tharpa Gyaltsen, there had been many disciples and many people came forth offering their land to the Gonpa. Lama Sangay Chhoephel, who enrolled in the Dratshang, followed Lama Tharpa Gyaltsen. In spite of the fact that he became the Lama of Yongla at a very early age, he was unable to accomplish his studies. However, as he had many children, Gongsa Ugyen Wangchuk most graciously retained him for many years as the Lama of Yongla. Nevertheless, as the Lama had too many children and relatives coupled with the fact that he himself was short tempered, the followers dispersed having turned towards Wangling and Pali superiors and this further resulted in the loss of religious articles. The Lhakhang itself was also affected by earthquake. During the visit of Gongsa Jigme Namgyal to Dungsam, he visited Yongla and on his return to Tongsa, Sungkhorpa Tashi Chhoegyal was sent to repair the Lhakhang followed by addition of about seven households to the list of followers (Drapa) during Gelong Sangey Wangdi's time. Even though he was there for about twenty years, he could neither complete the statues nor repair the Lhakhang. After him, Tshewang Tenzin from Depung was installed as the Lama followed by Nado from Bji. In spite of these successive appointments of Lamas, the texts of "Kanjur" and "Tenjur" were damaged due to the leakage of rain through the

Lhakang, which was now in a very deplorable state. At this time, the late Home Minister was serving the highest authority of the country in the capacity of Gyaldon and during the Fire Sheep Year (corresponds to 1967) he donated a sum of Nu. 20,000.00 and the Lhakang was repaired through the utilization of three years "Drugdom Woola".

ཐབས་བྲལ་བར་བསམ་ནས་ཤལ་མེད་ཡང་མེ་བཏང་རྟེ་ གཞུང་དུ་བྲོས་གྲམ་བྱེད་པར་ སྤྱི་མཐོན་ཆེན་པོ་
 ལྷན་པུ་མི་དགོས་བརྗོད་ཐབས་ཡོངས་གསུངས་དབུ་ཆེན་རྟེ་ལྷན་པའི་མངོན་སྲོད་དུ་གཤེད་དགོངས་
 བལ་བཞུགས་ཏེ་གཏོར་བརྗོད་མཛད་པར་མཐའ་མིའི་དམག་གྲར་དུ་གྲོ་བྱུང་སྤྱི་མཐོན་ལས་མེ་འབར་
 རྟེ་དམག་གྲར་ཐམས་ཅད་ཚོག་ཅིང་སྤྱི་མེན་ཆེན་པོ་འཕྲོན་པ་དང་གྲང་རྣམས་རྩོ་ཞིང་དམག་མིལ་བུར་བ
 སོགས་མི་དགོ་བའི་ ཏུགས་མཚན་མང་པོ་འབྱུང་བས་དངངས་རྟུག་གི་སྤྱི་ལོག་པས་དེའི་ཚེ་བྱུང་
 བས་གཞུང་སུ་ལྷ་དཔོན་འིགས་ལ་ཞུས་པས་ སྤྱགས་དབྱེས་བཅེན་པོས་གསོལ་རས་རྩ་ཆེ་བ་དང་དར་
 ལྷ་ལྷ་གནང་རྟེ་སྤྱི་ཆེན་འགོ་སར་བཀོད་མཛད་པ་ནས་བཞུན་འགྲོར་པན་པའི་མཛད་པ་བསམ་གྱིས་ལྷ་བྱུང་
 བ་བྱུང་ཞིང་འེ་ཞིག་སྤྱི་ལྷ་དཔོན་ལས་འདས་འཛིན་གྱི་ཞལ་སྲོབ་སྤྱི་ཚང་གཞུང་གྲམ་དུ་བཞུག་ཅིང་ རྩལ་
 ཚབ་སྤྱི་བཀོད་མཛད་པ་ དེའི་ཀྱང་གནན་ས་ལྷ་འང་རྟེན་གསུམས་ཡར་རྩལ་སྤྱི་བཞེད་ས་བ་དང་ལྷ་ས་
 བསམ་ཡས་སོགས་ བོད་རྒྱ་ལྷོགས་གི་གནན་རྟེན་རྣམས་ལ་མཚན་འབྲུལ་མཚོན་ ཇོས་རྩ་ཆེར་ལུལ་ཞིང་
 རང་འེ་འབྲུག་ཏུ་འང་ཞབས་དུང་འེན་པོ་ཆེ་སྤྱི་མཐོན་པ་རྩལ་སྤྱི་སྤྱི་མཐོན་ཆེན་པོ་ཚང་དམང་ གཞུང་
 བདེ་སྲིད་རྩལ་སྤོན་བཅས་པར་འབྲུལ་མཚན་ལན་ གསུམ་དུ་ལེགས་འབྲུལ་རྩ་ཆེར་མཛད་ཅིང་གཞུང་ས་
 བས་བཀའ་ལོག་ལྷ་མ་གནང་བ་སོགས་ ལོན་ཏུ་མན་ཡོངས་ལ་པའི་ས་ཞིང་སོགས་ཀྱང་དེ་སྐབས་བྱུང་
 ཞིང་ས་ལྷམས་ཡང་གནང་འདུག་དེའི་རྗེས་སྤྱི་མཐོན་པ་རྩལ་མཚན་དུས་ཀྱང་སྤྱི་མཐོན་སོགས་མང་ཞིང་
 ས་ཞིང་ཡང་ལུལ་འན་མང་པོ་བྱུང་འདུག་ཅིང་དེའི་རྗེས་སྤྱི་མཐོན་པ་རྩལ་མཚན་འཕེལ་གཞུང་སྤྱི་ཚང་ དགོ
 འདུན་བཟུལ་དུ་བཞགས་པ་ཡིན་ཀྱང་ གཞོན་དུས་ནས་ཡོངས་ལ་སྤྱི་མཐོན་ ཆོས་རྒྱལ་འཕྲོན་པས་ལུ་ཆོ
 ཡང་ལོན་ཏུ་མང་བས་གོང་ས་རྩོན་དབང་ལྷུག་ནས་སྤྱགས་གཞིགས་གང་དུ་གཤེད་མང་པོའི་བར་ ལོ

རང་མི་ཚོ་གང་ལྟ་མ་ཉེན་བཞག་ཉེ་བའོར་བུ་ བརྒྱན་མང་ལྷན་ལྷན་གསལ་བརྒྱན་རྒྱུ་བཅས་ལྷན་ལྷན་གསལ་མི་མེད་
 རྣམས་ཀྱང་ དབང་གྲོང་བད་ཡི་གོང་ ཞབས་རྣམས་སྲུ་བསྲུ་མ་ཞུས་ཉེ་ལའོར་དུ་སོང་རྟེན་མཚོན་ཆས་
 ཐམས་ཅད་ཀྱང་འབོར་རྒྱགས་སོང་ ལྷ་ལང་ ཀྱང་ས་གཡོའི་ཉེས་སློན་དུ་འགྱུར་བར་གོང་ས་འཇིགས་
 མེད་དབང་ལྷན་གྲུང་བསམ་དུ་ཚོན་གཞོན་ གཞིགས་བསྐོར་དུ་ཚོན་ཉེ་ བཞོང་སར་བསྲུང་འབོར་
 བཀྲིས་ཚོས་རྒྱལ་བཏང་ཉེ་ ཞིག་གསོལ་བྱ་ཞིང་དེའི་རྗེས་ཚོས་བརྟེན་རབ་ལྗེ་ དག་སྟོང་ སངས་རྒྱས་
 དབང་བསྐྱེས་ཡོངས་ལར་བཞོན་ཅིང་ ལྷ་བ་དགུང་བདུན་ཅམ་འབོན་གནང་ ཉེ་ལོ་ལས་གཅིག་ཅམ་
 བཞུགས་ཀྱང་སྐྱེ་བྱ་གཟུངས་འབྲུལ་ལྷ་ལང་ཉམས་གསོས་གང་ ཅི་མཚན་མ་འབྲུབ་དེའི་རྗེས་འབྲས་
 ལྷངས་བ་ཚོད་བང་ བརྟེན་འཛོན་ལྷ་མར་བཞོན་དེའི་རྗེས་སྐྱིས་བ་ནག་དོ་ལྷ་མར་བཞོན་ཀྱང་བཀའ་བརྟེན་
 བསྐྱེས་སོགས་དཔེ་ཆ་རྣམས་ཐིག་པས་ ལྷ་རྟེན་རྣམས་ཆག་རལ་སོང་ལྷ་ལང་ཐིག་ཏུ་ལོ་བརྒྱལ་བར་
 འགྱུར་བར་མི་རྗེ་གོང་ས་ཚོན་པའི་སྐྱིད་སྲུག་ལྷོན་པོ་རྒྱལ་མགོན་ལྷན་འགོ་སར་ ཡོད་སྐབས་མེ་ལུག་ལོར་
 ལུག་བས་ཞིག་གསོལ་ བྱ་དགོས་བྱུ་འགོ་སོང་དངུལ་འུབ་༡༠༠༠༠ གཉིས་ཐེ་ལྷ་རྟོང་མདོ་ན་ལོ་དུ་ག་
 བརྟེན་མཚན་ལོང་གསུམ་བཅས་གནང་ནས་ཉམས་ གསོས་ཞུས་པ་ལགས་སོ།།

**THE FIRST MEETING OF THE KING UGYEN WANGCHUK
WITH RAJA UGYEN DORJI IN KURJEY LHAKHANG***

The Lord (King Ugyen Wangchuck) had himself taken on his shoulders the activities that would benefit the Tenpa (Buddha's doctrine). The Lord had submitted frequent letters to the Thirteenth Dalai Lama- Tibetan Government's precious jewel of the monastic communities and public- that there was no need to proceed to other neighboring countries. The Lord had given personal assurance in an important message that even if the external aggressors reach the centre of the country (Tibet), the Chamgoen Rinpoche will not be harmed. In the detailed letter sent by the Lord to the two British envoys, including Colonel Sahib, he had conveyed that they must not at all have doubts on the Bhutanese. The Lord had also written in the letter that there was no need for any dispute and conflict with the Tibetan Government, for the Bhutanese would mediate. Even though the Lord's envoys; the son of Trongsa Penlop (*choszhab*) Takdzongpa and his cousin Thimp-dzongpa Kuenzang Thinley were sent deliberately, the two British envoys - Lakchi and Colonel Jernel had said that there were several reasons mentioned in the correspondences found in the offices of the British Government and the Tibetan Government for Britain to fight against Tibet. Moreover, instead of agreeing to the mediation, the two British envoys had said ill words that Bhutan would be invaded. The mediation could not succeed and they had to return.

Several years before this event, due to the accumulated merit and fortune of all people in this country, His Majesty the first King had taken over the entire country into his hands. In order to spread the pre-ordained fame (like summer thunder) in Tibet, India and other bordering countries and to promote

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the noble deeds that were being carried out by the Lord, there was a meeting between the Lord and Drukpa Jaboed Ugyen in Kurjee in Bumthang, as recommended by the Great Refuge Zhabdrung Jigme Chogyal. Drukpa Jaboed Ugyen had become a famous man of unlimited wealth accumulated from business through hardship and tirelessness. He had undying faith in the Buddha's activities in general and the Pelden Drukpa Tenpa Rinpoche in particular. In addition to his deep faith and devotion to Zhabdrung Jigme Chogyal, he had offered a great deal of possessions, objects and silk and gained popularity. Due to Drukpa Jaboed Ugyen's fame, the Zhabdrung felt confident that he should be appointed a minister, desirable and of service to the Lotus Feet of the Lord. After they (the Lord and Jaboed Ugyen) met for the first time in Bumthang Kurjee, the Lord felt happiness beyond description, as though he came across his own son. They had lively discussion at great length without feeling tired. The Lord felt great pleasure. The Lord inquired about his ancestral genealogy. Ugyen said that his maternal pedigree is Tsentongpa and paternal pedigree is the side-son of Dungkar Pala Gyeltshen known as Shangpa Puenchog. The Lord remarked, "We are definitely sons of brothers". Since then, the Lord and Ugyen privately maintained intimate relationship of brothers, while in public they were the Lord and the servant. Ugyen had then pledged constant loyalty and *damtshig* through his body, mind and speech that he would serve the Lord with everything including material and physical resources and without caring for his own life. As pledged, he continued his loyalty and dedication to the Lord. Not so long afterwards, the Lord also conferred the post of Pasakha Kutshab on Ugyen.

Thereafter, *Chos-Lyon* Ugyen submitted details regarding immediate and ultimate trends and situations (of the neighbouring countries) and suggested that it would be constructive if the Lord visited Tibet. Divinations to foretell future were sought from deities and lamas. Accordingly, extensive rituals were performed to overcome obstacles.

In the first month of the Wood Dragon Year (1905), trusted servants of the Lord were selected to accompany him. Among the fifty people, the principle servants were Kazi Ugyen, Wangdi Dronyer Kunzang Domchug and Tsongpon Darjay of Tashigang. Even though they reached Phari, Sa Wang Lhalu of the Government of Tibet, Younger Prince Kushu of Kuentse Lhajarey and Prince of Traling did not agree to settlement. As a result, fight broke out in Jangtse. Tibetan forces failed to resist the external forces that they reached Lhasa. The monasteries of Sera, Drepung and Gadan rose in force. But, Drepung was on the verge of being destroyed. The Lord felt greater love and care for Tibet than his own country. With the Lord's resourcefulness and ingenuity, he discussed in depth with the British envoy, Colonel and stopped the enemy forces. There was no damage to any of the monasteries, due to the responsibility shouldered by the Lord for the benefit of the Tenpa. Hence, until now, there are seven thousand and seven hundred in Drepung, five thousand and five hundred in Sera, and three thousand and three hundred in Gadan.

THE TRADITION OF BETEL AND ARECA IN BHUTAN

Françoise POMMARET*

Doma zhes is one of the most heard and widespread phrases in Bhutan: " Please have betel leaf and areca nut" becomes a leitmotif each time two individuals meet, at the end of a meal, and in all the occasions of everyday life. It is impossible not to notice the importance that the betel leaf and nut holds in Bhutan. One can multiply the scenes and the examples: Customers buy the betel leaf at the weekly Sunday market, their dress's pocket bulging with silver boxes, or just simply with plastic bags filled with betel leaves; petty sellers at bus terminals selling ready made quid, called *kamto*, in cone-shaped papers; monks returning to the monastery with their bags filled with quantity enough to last for a week's consumption; betel leaf with a small piece of areca nut that the host offers with his two hands to the guests at the time of a ceremony; betel leaves and nuts put in a plate along with those filled with chocolates during archery games or official ceremonies ; betel leaves and nuts passed round after dinner ; red stains in the street; men and women with red stained teeth sweating profusely.

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This is a slightly-modified version.

These descriptions invite questions and amongst them, what is the true significance of the "betel" in the Bhutanese context? Can the date of the betel leaf and nut consumption habit be traced back?

The importance of these plants is well known in the Indian sub-continent as well Southeast Asian countries. On the contrary, we know that the Tibetans did not consume areca nut and leaf. Could Bhutan, the country lying on the crossroad of these two worlds, have been influenced by the habits of their southern neighbours? Besides its addictive properties, what role does betel have in the Bhutanese society? Why is the consumption of betel accepted where as tobacco is strongly condemned?

Areca Nut, Leaf and Lime

The majority of the westerners are under the impression that betel is the nut. We talk even of betel nut and the mistake was made even as early as 1673. The betel (*Piper betel*) is, in fact, the leaf that envelops the nut and the later is areca nut (*Areca catechu*). In Bhutan a quid comprises a piece of areca nut, *doma*,¹ betel leaf, *pani*, (from *pan* of Hindi, which is derived from Sanskrit *parna* meaning "leaf " ²), on which lime, *tsuni* is applied. The areca nut is rolled in the leaf and the quid obtained is called *doma*, the abbreviated form of *doma pani*.

The areca nut was not indigenous to Bhutan but imported from Assam and Bengal. The cultivation of areca nut commenced in the 1960s in the southern foothills as it became really populated after the control of malaria and the development of communications with the interior parts of Bhutan. Today it forms one of the important sources of income. However, a part of it is still imported from India.

¹ Spelled in Dzongkha as *dog ma* (or *rdo ma*), this word is also applied to the fruit of any type of tree.

² Hobson-Jobson, 1989: 689.

The areca nut is consumed in two ways: The fresh nut, called *kanza* is harvested in summer; the old nut is known as *muza*.³ The later, consumed in winter and spring is stored in big holes dug in the earth. With a size of a table tennis ball and slightly oblong, the fresh areca nut has a dark orange greenish bark and produces a juice with the reputation of possessing strong intoxicating properties; the old nut with a dark brown bark and covered with fibres is preferred to the fresh ones as it is less strong.

The betel, *pani*, is a creeper, which grows wild in the sub-tropical regions of Bhutan, normally below 1300 m. It is found in the regions of Punakha, Kheng, in the southern parts of oriental Bhutan and along the Indian border. Two types of betel leaves are consumed. *Rata* is the one that grows wild whereas *trodom*⁴, which belongs to the same species of betel leaf of India, is basically cultivated in the village of Tabadramtsi in Samtse district of Southern Bhutan. The *rata* is smaller and is bought along with the stalk whereas the *trodom* is sold in the form of packet of leaves. The former is cheaper and in effect less strong than the later. It is difficult for an individual accustomed to chewing *trodom* to shift to *rata* and vice-versa.

Imported only in small quantities from India, lime, *tsuni*, is largely produced artisanally in the villages. The best limestone is found in Chendebji in central Bhutan but all the villages make use of what is available in their region. They produce lime, which is boiled till a white creamy paste is obtained. The product is consumed in the village or put in small empty condensed milk cans and sold in the market. The lime produced in Bhutan is considered weaker and less corrosive than the ones imported from India. It is said that the paste of lime prepared for important officials and royalties is mixed with white cow butter to weaken the astringency. It

³ There is no standard Dzongkha spelling for these terms.

⁴ Idem.

is also possible to add a plant - the species of which is unknown to me- that turns the paste into orange.⁵

The different ingredients can be bought at the weekly markets even in the small urban centres. The areca nuts are kept in big jute bags and the merchants normally present a nut cut into halves so that the clients can judge the quality of what they are buying. The fibre of the nut that covers the bark is also peeled off with a knife. The most current unit of sale is the *pon*, a word of Indian origin, and equivalent to 80 nuts.

The stalk bearing the *rata* leaves are tied together in tens and stacked in crudely woven bamboo baskets whereas *trodom* leaflets are folded and packed in boxes. As for lime, it is sold in the empty condensed milk cans, which forms a kind of unit of measurement.

Each person then makes their own preparation at home, cleaning the leaves and applying lime to the personal taste, placing half or a quarter of a nut before folding the leaves and putting all of it in the mouth. The ingredients are generally kept in a plate or a *bangchung*, a container of woven bamboo. The addicted and chain consumers carry the required quantity for the day in a small plastic or a cloth bag tucked in their *hemchu* (a pocket formed by the folds of the upper part of the Bhutanese dress). A small metal container is used for carrying the lime.

The grand style of carrying betel ingredients consists of a rectangular silver box, *chaka*⁶ which contains the betel leaflets and nuts, and a round box with conical lid, also in silver, *thimi*,⁷ for lime. In the past, Bhutanese carried these two containers in their *hemchu* but today they seem to prefer plastic or cloth bags which are lighter and not as bulky.

⁵ Information provided by Dasho Shingkarlam during an interview in Thimphu on January 4, 1996.

⁶ In Dzongkha, *lcags dkar* means, "white iron", because the first of this type was made of this metal and not in silver like today.

⁷ In Dzongkha, *kri mi*.

In most of the shops along the road, at the bus terminals, or in villages, one can buy the ready-made quid wrapped in a conical paper containing four pieces. The quid therefore look like a bouquet where the betel nuts would be the flowers. Called *kamto*, a quid costs Nu. 5 in 2001. Bhutanese would eat it straight away if they are in need. However usually, before chewing it, many people unfold the betel leaves to check that the required dose of lime is correctly applied. In the eastern part of the country, lime, betel leaves and nuts are simply rolled in a paper and it is left to the consumer to prepare the quid according to personal taste.

Addiction and Properties

Doma pani provokes a phenomenon of addiction and is therefore, according to the medical criteria, a drug. Certain people wake up late in the night and cannot go back to sleep without chewing a quid. Even the old people who have weak teeth make use of a special instrument known as *drecha*⁸ to grind the nut into small pieces so as to reduce the difficulty of chewing. And, a chain consumer can chew up to fifty quids a day. On the other part, the dropping of the habit of chewing the betel can provoke in certain persons withdrawal symptoms: headaches, giddiness and irritation.

The noxious effects of *doma* are well known: lesion of mouth and gums, abrasion of teeth, and mouth and throat cancer. More still, most of the Bhutanese do not spit the juice but swallow it, which also seems to cause lesions of the intestine walls. *Doma pani* consumed first in the morning without eating can also lead to suffering from diarrhea. But, the Bhutanese see *doma pani* as increasing their resistance to fight against cold; it also creates a sensation of warmth, and keeps oneself awake and concentrated. It is also plausible

⁸ It is a tube of a wood or metal in which is put the nut, which is chopped and ground to small pieces by a sharp tool.

that *doma pani* kills some of the taste buds. This could be an explanation for the impressive quantity of chili consumed especially in Western Bhutan where it is a vegetable and not a seasoning.

In parts of western Bhutan, it is believed that *doma pani* and hot water should be given to women who have delivered so as to avoid the possibility of the newborn suffering from diarrhea.

Origin and Substitutes

The betel leaf and nut chewing culture is believed to be an age-old practice as it plays a very important social role; in the same way as the archery, it appears that this custom cannot be disassociated from Bhutanese culture. However, the exploration of historical sources and the fieldwork lead us to doubt its ancient nature, at least in most parts of the country.

The Bhutanese Code of Laws (*bKa' khrims*) was composed in 1729 by Tenzin Choegyel, the future 10th Je Khenpo, under the command of the 10th temporal ruler Mipham Wangpo (1729-1736). This text gives very detailed prescriptions on different aspect of life and especially a strong condemnation of tobacco (ff.107 a-b) but betel is not mentioned.

The 1775 report of George Bogle, the first British emissary to Bhutan who visited the country in 1774, does mention the large consumption of alcohol as a kind of Bhutanese habit but is silent on the issue of betel. In the like manner, Bogle enumerates the dishes displayed on his table but does not mention *doma*. However, it seems that betel nut was already imported from India at that time since Bogle writes: "The consumption of Bengal goods except tobacco, betel nut, and other bulky articles is very small in the Deb Raja's country".

In 1783, Samuel Turner, another British emissary visited Bhutan. He describes in great details all the presents offered

to him and also the Bhutanese customs but does not remark at all on betel. In 1815 the British sent an Indian called Kisan Kant Bose on another mission to Bhutan. In his mission report he writes: "From the low-lands under the Hills and on the borders of Runpore and Cooch Behar, they import swine, cattle, pan and betel, tobacco, dried fish, and coarse cotton cloth".

With the Pemberton mission in 1838 began the derogatory reports on the 19th century Bhutan, reports that explained the bad relations, which existed between Bhutan and the British. Pemberton mentioned the export of tobacco to Bhutan but not that of betel, and neither does he describe the betel chewing habit, which he could not have missed if it was as wide spread as today. Doctor W. Griffith who participated in the same mission also does not describe this betel chewing custom but remarks that "the Booteahs depend on the plains for supplies of betel nuts, otherwise they might advantageously cultivate the tree on many of the lower ranges."

J.C. White who was the *Political Officer* to Sikkim and Bhutan relates that at the time of the enthronement of the king in 1907 "three kinds of tea, rice and pan were offered in turn." As per Mrs. Williamson's diary who in 1933 had accompanied her husband, the Political Officer of that time, there is not even the slightest mention of the betel chewing habit in Bhutan.

These witnesses pose a problem. Most provide very detailed information on the export of areca nuts from India to Bhutan but none projects even a glimpse of its consumption. One can propose two hypothesis for the lack of this information: either, coming from India where betel was consumed in large quantities, the British must have judged unnecessary to describe a well know custom, or this habit was not as widespread as today and probably restricted only to a small section of the population. It is difficult to be definite on the basis of theses sources. The book of K.Nishioka, a Japanese

who had lived in Bhutan for 20 years, provides a contemporary parallel; he is silent on the betel leaf and areca nut but attaches a lot of importance, among others, to the description of the production of alcohol.

There is no place for doubt that the custom of making betel quid came from India, and that the ecological condition of Bhutan favoured the expansion of the areca nut plants, whereas it remained unknown in Tibet. The very term *pani* for betel, as we have seen, comes from the Hindi *pan* which means betel leaf. The combined form of all the ingredients that one eats is interestingly mentioned as early as 1298 in the accounts of Marco Polo.⁹ *Pan* would be the abbreviated form of *pan supari* as *supari* in Sanskrit signifies "pleasant" and applied to designate the areca nut in Hindi.¹⁰

The term *supari* was not introduced in Bhutan, and in India it is referred only to the dried areca nuts chopped into small pieces and flavoured with all kinds of ingredients; this is the Indian "dry type" that the Bhutanese refers to, in opposition to the "humid type" that they chew with betel leaf and lime, and it is also the most appreciated in Assam and Bengale. In effect, it certainly is from these border areas with which Bhutan shared commercial relations that the consumption of the combined ingredients was adopted. Chakravarti, an Indian writer asserts "the Bhutanese seemed to have picked up this habit from the people of the plains in Assam in course of their trades and raids through centuries. Bhutan draw its requirement of betel leafs and areca nuts from Assam. Betel leafs, however grow in some quantity in the jungles of lower Bhutan also."

It is not a surprise that the Bhutanese sources remain silent on *doma*, if we know that the texts essentially had a religious tonality and the lay customs as well as the personal habits were usually not documented. However, a text titled

⁹ Hobson-Jobson, 1989: 89.

¹⁰ Hobson-jobson, 1989: 689.

Significance of chibdrel, Serdreng and Zhugdrel Ceremonies, enumerates *doma pani* among the offerings made during the *Zhugdrel* ceremony: ¹¹ "This is followed by oblations of wine (*marchang*), flag, *changyep* (ceremonial money) and *doma pani* (areca nut and leaf)." Similar references are found in the two protocol manuals (*Driglam Namzha*) published in 1999.

If we now turn towards folk literature, just recently and partly documented, mention of *doma* is made in at least two popular stories, *Gasa Lamey Senge* and *Namtala* which dates back to the second half of the 19th century. Similarly, *doma* appears in the colourful history of Ap Wang Drugay, a highly amusing personality and the Bhutanese equivalent of Akhu Tompa of Tibet, who is supposed to have lived in the 19th century.¹² However, to my knowledge, in the hundreds of stories documented, there is not even a single in which betel and areca play a central role.

The field work that I had conducted in December, 1995 first confirmed that *doma pani* was consumed at a much lesser degree in eastern and central Bhutan; on the other hand, it showed that the generalized and frequent habit of chewing *doma* was probably due to the development of communications and trade with India in the 1960s as well as the monetary increase among the population and therefore quite recent.

The biography of Dasho Shingkar Lam,¹³ high official who served the second, third and the fourth kings throws light on this point. When he arrived to western Bhutan from Bumthang, (central Bhutan) in 1947, he remarks: "People in Paro seemed to be richer and were accustomed to the consumption of betel nuts as a daily necessity, whereas it was still an occasional indulgence in central Bhutan." He

¹¹ In dzongkha: *gshugs grel*.

¹² " (He) chewed ruminatively upon the makings of a doma," in "Opening Spell," Chiramal, J.M., *Ap Wang Drugay*, Thimphu, Yangchenma publications, 1995, n.p.

¹³ *Drag shos Shing khar bla ma*.

confirmed this to me later in a personal interview.¹⁴ The western Bhutanese and, in particular, those of Paro and Ha had the habit of chewing betel and areca nuts since an unspecified date but for a very long time, according to him. They bought them from the borders areas during trading trips, and during the transhumance when they migrated south with their cattle in winter. Both activities were tied together. It is interesting to note that the region of Tabadramtse where areca nut is cultivated is one of the areas of winter transhumance.

It therefore seems that *doma pani* was restricted for a long time to the upper layer of the society, and to the western Bhutanese who had the occasion of migrating to the plains. On the other hand, the villages in the interior pockets of Bhutan had plants of several types that substituted betel and areca. These plants are still used today in areas cut away from the roads.

The most currently used plants are *rushing* and *gonra*.¹⁵ *Rushing* which means "creeper tree" is identified as *Poikilospermum*. Found in abundance mainly in the subtropical regions of Khyeng and Lhuntse, it is essentially consumed in these areas as well as in Bumthang. Today, at times a small amount of it is added to the combination of betel, areca and lime. The bark of the creeper was peeled off, then chopped into small pieces and dried to be eaten. It produces a red juice. The western Bhutanese also consumes the bark of the wild peachtree whereas those of the east and particularly the residents of Lhuntse chew the bark of the chir pine (*Pinus Roxburghii*). *Gonra* (Tshangla; Dzongkha: *Bjukosisi*; Bumthangkha: *yukuling*; *potentilla pendoncularis* fam. *Rosaceae*) is found in almost all parts of Bhutan but is mainly consumed by eastern Bhutanese. The root is dug out,

¹⁴ Interview with Dasho Shingkarlam in Thimphu on January 4, 1996.

¹⁵ Ugyen Thinley of the Department of Forest helped me by identifying the botanical names of these two plants and I thank him sincerely.

boiled and then chopped into small pieces. When chewed it produces a red juice and has a bitter taste. All the substitutes of areca nut are also prepared with betel leaf and lime when available.

The field work and the sources allows us therefore to present an image of *doma pani* consumption which is less uniform but a habit more ancient than the impression created by the sources referred to at an earlier stage. If it appears that Bhutan imported areca nut from India at least from the mid-18th century as per the British sources, the consumption itself was not that wide spread like today and probably confined itself to the category of luxury items for many while the inhabitants of the interior pockets satisfied themselves with other substitutes available in their area.

Don et Partage: Le Role Sociale du Betel

These conclusions are partially confirmed if we examine the role that the betel plays in the Bhutanese society. Today, a lot of Bhutanese chew *doma pani* but the consumption is much higher in western Bhutan where areca nuts have been imported since two centuries ago if we trust the British sources. In the weekly market of Thimphu, the capital, a section of the place is fully reserved for the sellers of *doma pani*. However, the younger generation seem to be eating much less *doma* than their parents, often because they find the smell offensive or for esthetic reasons.

All the informants above 50 years agreed to say that, in their youth, *doma pani* was a luxury and that areca nuts was ten times more expensive than today and not available everywhere. All of them are of the opinion that the development of roads in the 60s allowed the habit of chewing *doma* to reach all the layers of the society and to become generalized beyond western Bhutan.

According to the same people, in their youth, important people presented *doma pani* to the villagers as a valuable gift,

*soetra*¹⁶, or even as a payment. The villagers would be so thrilled when they received a whole areca nut along with two or three betel leaves. Likewise, Dasho Shingkarlam¹⁷ relates that at the time of the Second King (1926-1952), the later had the habit of giving a quid already prepared by a servant as *soetra*: the areca nut was enveloped in a leaf on which was also put some lime.

The sources say the same thing although they must be deciphered further. We have seen that J.C.White explains that three types of tea, rice, and *pan* were offered to the guests of the coronation ceremony of the First King. At that time the Bhutanese did not drink much tea (*Camilla sinensis*) but leaves of different kinds of tree in the guise of tea. If there was tea, then they prepared salted butter tea. To serve three varieties of tea, therefore, was demonstrating great lavishness, and all the more to offer three kinds of rice as the majority of the Bhutanese did not eat rice and consumed maize, barley and buckwheat according to the region.

We can then imagine that to serve three kinds of *pan* was a sign of wealth. The King, moreover, had a courtier whose duty was to carry the container of betel and areca, "a senior *changgap* carrying *doma bata* (betel nut container)".¹⁸ *Bata*¹⁹ is a round metal container, the lid of which is often decorated with lotus motifs and its use reserved to the King, the Chief Abbot and the ministers.

In the mid -19th century, making presents of betel or *doma pani* was an acceptable gift as related in the history of Namtala, a courtier of the lord of Dramitse in eastern Bhutan. Namtala returned from a mission conducted for his lord but "on the way he realised that he had not taken any gift for his lord, so he took some betel leaves from the forest and put

¹⁶ Spelled as *gsol ras*, it is a gift from a superior to an inferior.

¹⁷ Interview with Dasho Shingkarlam, Thimphu, January 4, 1996.

¹⁸ Karma Ura, 1995 : 179.

¹⁹ In dzongkha, *sba khra*.

them in his *gho*.²⁰ The lord of Dramitse was very surprised to see Namtala back the next day. He accepted his gift of betel leaves."

Similarly, in the history of Sengye, the servant of the Lama of Gasa,²¹ the chamberlain of the *Desi*, the temporal head of Bhutan, used to visit the house of the well-off villagers in Punakha who "tried to serve him as well as possible. They were not poor but they were not rich either and it was an honour for them to receive the *Desi's* chamberlain in their houses. They offered him *Doma* and drinks." When Dasho Shingkarlam was serving at the court of the Second King, sometime in 1948, he encountered a young village girl and flirted with her by offering several areca nuts: "In the course of our frivolous talk, I took out my pan holder and scooped a dash of *tsuna* (lime paste) with two ruffled leaves of pan. I recall I did not put a quarter of a betel nut on the pan as commonly done, but three pieces of betel nut, which I am sure she understood as romantic (and perhaps narcotic) lavishness."²² The areca nut was rare enough if offering three nuts was considered as a great generosity, accessible only to important people. We remember Dasho Shingkarlam's surprise when he noticed that the people of western Bhutan consumed a lot of areca nut.

In this context, it is very possible that the offering of *doma pani* during the ceremony of *zhugdrel* represented a precious gift to the monks who had the authorisation to chew betel and areca but could neither smoke nor drink alcohol.

In India the custom of offering *pan* to the guests whom we want to honour is very old as attested by *Hobson-Jobson* dictionary:²³ in 1616 "the king giving me many good words, and two pieces of his Pawnee out of his dish, to eat of the

²⁰ The *Gho* (*gos*) is the men's dress.

²¹ *Ga sa bla ma'i Seng ge*, a very popular story from the mid-19th century.

²² Karma Ura, 1995 :101.

²³ Hobson-Jobson, 1989: 689.

same he was eating;" and, in 1800, "On our departure pawn and roses were presented (...)". It is therefore probable that Bhutan had borrowed, along with the areca nuts, this gesture of friendship and honour from India, and it was all the more appreciated that the ingredients were relatively rare.

Because of its diffusion and availability, *doma pani* is no more considered an important gift or a mark of honour, but as a symbol of conviviality and friendship. To offer *doma pani* when meeting someone at the bus stops or at the time of a fortuitous encounter implies the desire to chat, and therefore if two persons already know one another, it means that they wish to maintain and strengthen their friendship.

At the time of marriage or promotion ceremony, a servant or any relative gives with two hands, an elementary courtesy, a demi-nut and betel leaf to the guests who have come to congratulate and offer good wishes and presents. During official ceremonies or archery tournaments, plates containing half areca nuts, betel leaves and lime are kept on low tables in front of the guests. However, an individual from the inferior social ladder would usually respect the etiquette and would not chew *doma pani* in the presence of someone superior, unless the latter tells him or her to do so. On the contrary, among equals, when the ambience becomes relaxed with lively conversations, the plate of *doma pani* passes round from one hand to another and each one chooses with care his or her leaf, nut as well as the necessary amount of lime. Similarly, at the end of a meal the guests sigh with contentment when the container of *doma pani* circulates. A real meal never does close without a quid and the host should not forget it. This sharing is done in a relaxed manner only between the people coming from the same social level; in this case there is no protocol and to share *doma pani* is a symbol signifying free and open conversation.

It is also a mark of friendship, and even of intimacy if someone asks somebody else to prepare a quid. This implies that they know each other well.

Consumed by men as well as women, by laymen as well as monks at all the hours of the day, *doma pani* is perceived today by the Bhutanese as signifying a moment of relaxation and conviviality. Despite the knowledge of its negative effects on the health, *doma pani* had never been an object of opprobrium while tobacco is strongly condemned.

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**A LANGUAGE FOR RULES, ANOTHER FOR SYMBOLS:
LINGUISTIC PLURALISM AND INTERPRETATION OF
STATUTES IN THE KINGDOM OF BHUTAN***

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**From the Middle Ages to Modernity: the End of Isolation
and the Development Policy of the Kingdom of Bhutan.**

From being almost completely unknown to the average Westerner, the Kingdom of Bhutan has recently become a fashionable destination for elite tourism. This small Himalayan state with a population of about 600 000, landlocked between India and China, has a lot to give to those willing to pay the tax imposed by the government on leisure trips to the country, which offers unparalleled natural landscape, magnificent Buddhist temples and a fascinating cultural heritage.

* The essay is primarily based on research conducted during a stay in Bhutan in connection with work at the Department of Legal Affairs between August and October 2000. I wish to express my warmest thanks for the kindness shown by His Excellency the Foreign Minister Lyonpo Jigmi Y. Thinley, by His Excellency the Chief Justice Lyonpo Sonam Tobgye and by Dasho Tashi Puntshog. Relevant information derives also from the patient explanations provided by my former colleagues at the Department, and especially by Lobzang Rinzin, former Government Prosecutor. Mention must also be made of Delphine Doltramare, an old friend of Bhutan, for making my visit to Bhutan possible. None among these persons had, however, the opportunity of reviewing the text, and I remain responsible for any possible error of fact or appreciation. A slightly different version of this essay has been previously published in R.Sacco ed., *L'interprétation des textes juridiques rédigés dans plus d'une langue*, Torino-Paris, 2002.

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Bhutan has – however – an interest going beyond its well merited tourist reputation. This country can be a case study without equal for both comparative lawyers and law-and-development scholars, for the same reasons that make it attractive for tourists.

The well preserved natural landscape and the cultural uniqueness are indeed due to the almost complete isolation in which the Kingdom has been until recently, due to complex geopolitical factors, which made it possible to avoid submission to the neighbouring British Raj¹, as well as to any other colonial power. The “Kingdom of the Dragon” pursued until the early sixties a policy of almost total refusal of foreign cultural influence, lasting longer than that of the other Himalayan kingdom, Nepal.

Isolation was so complete that it can be said, quoting a local authority, that in Bhutan “the period which seems medieval in character extends right up to the end of the 1950s”. Until then, “Bhutan was the last physically isolated state in the modern world, the only political entity that was almost totally ignored by the world”².

Modernization started with the realization of basic infrastructures (until then Bhutan had no motorable roads and was connected only by footpaths and mule tracks) upon the initiative of the third king Jigme Dorji Wangchuck, also

¹ On the relation between the Kingdom of Bhutan and the British Raj, see P. COLLISTER, *Bhutan and the British*, New Delhi-Mumbai-Bangalore-Madras-Calcutta-Patna-Kanpur-London, 1987, rep. 1996 and MANORAMA KOHLI, *India and Bhutan. A Study in Interrelations 1772-1910*, New Delhi, 1981.

²The definition is from Holsti, quoted by PRIESNER, infra note 4. An informed description of the early history and political development of Bhutan is also NAGENDRA SINGH, *Bhutan. A Kingdom in the Himalayas*, New Delhi, 1978. The author was constitutional adviser to the third king of Bhutan.

on the basis of a national security concern following the suppression of the Tibetan revolt by the Chinese in 1959. In the absence of diplomatic relations with third countries, the first development plans were financed almost entirely by India.

The relatively free access for foreigners is instead a much more recent development, linked to the still very prudent tourism policy of the last 20 years. The limits to the access of tourists are the most superficial signs of an overall approach to development which is quite unique, and is usually presented by means of a catchphrase “Gross National Happiness is more important than Gross National Product”, which was introduced by the present king Jigme Singye Wangchuck in the late eighties.

The approach to development known as “Gross National Happiness”³ has different components, deeply rooted in pre-existing Bhutanese values, including the special importance given to the absence of foreign (political as well as economic and cultural) domination and the role of Buddhism as a component of national identity (although not everybody in the country is a Buddhist, as we will mention later)⁴.

³ The best descriptions of the relation between development choices and national identity are probably in JIGMI Y. THINLEY, “Values and Development: Gross National Happiness”, and S.PRIESNER, “Gross National Happiness – Bhutan’s Vision of Development and its Challenges”, both in *Gross National Happiness. Discussion Papers*, Thimphu, 1999, pp. 12 ff., 24 ff. See also S.B.FRYE HARGENS, “Integral Development: Taking ‘The Middle Path’ Towards Gross National Happiness”, in *Journal of Bhutan Studies*, vol. 6, 2002, pp. 24 ff.

⁴ The nation state is a late development in Bhutan. It can be traced back to the unification of the country in the XVII century by Nawang Namgyal, a member of the Tibetan Drukpa sect. Unification did not mean centralized administration, since Bhutan was governed locally through the “Dzongs”, fortresses acting as religious and political centres, and “the state’s primary function was to support the religious establishment, which in turn promoted humanistic morality and ethics among the lay

In this perspective, the four major goals of the government are economic self-reliance, protection of the environment, cultural advancement and “good governance”, with a strong skepticism about all development doctrines focusing merely on quantifiable economic indicators. In order to keep a balance between material and spiritual values, one of the absolute priorities of the government has been that of preserving as much as possible the cultural fabric of the Bhutanese society, cautiously evaluating the consequences of the transformations deriving from international exchanges.

“Gross National Happiness”: are we facing empty words? It is not possible here to give even a succinct description of the interesting Bhutanese path to development, as we will just go through one of the operational consequences of development policy, i.e. legal reform, in order to sketch the background of the linguistic problems of statutory interpretation. We will only say that the record of the Bhutanese experience, where enviable economic growth has been matched by dramatic advancements in the quality of life⁵, suggests its further study also from a legal perspective, until now rather neglected.

“Gross National Happiness” and the Law: Legal Reform and Western Legal Models in the Bhutanese Context

What is the role of law in the careful journey of Bhutan towards modernization? Until the early nineties it was a relatively minor one. At the beginning - as we have mentioned

population” (S.PRIESNER, op.cit., p. 33). To a period of intense strife in the XIX century, followed the establishment of the monarchy in 1907, when a member of the still ruling Wangchuck family was able to concentrate in his hands all the power, previously divided between several political positions, while keeping the previously existing administrative structure. On the fragmentation of power in ancient Bhutan see specially KARMA URA, op. cit., pp. 25 ff.

⁵ Some data can be found e.g. in *Bhutan. Society and Polity*, RAMAKANT and R.C.MISRA eds., New Delhi, 1997.

- material infrastructures were the absolute priority, followed by general access to training, primary education and health services.

In this context, the legal system kept an indigenous character. There are no studies on Bhutanese traditional law, and the country can be considered virgin ground for legal anthropological research⁶. However, the first identifiable layer of the Bhutanese legal system can be roughly said to correspond to the tradition described by Rebecca French in her pioneering book, *The Golden Yoke*. The traditional way of thinking about law in Bhutan uses the same categories as Tibetan law, referring to the same basic texts and the same teachings of Lamaist Buddhism, with a crucial role played by mediation and arbitration by persons of authority. A certain stigma is attached to formal litigation, although probably not as strong as in other Asian societies⁷. Traditionally, disputes are presented to independent and respected persons, or to the village headmen, with the aim of reaching a lasting settlement. Ideally, the settlement should be formalized in a signed agreement (*Genja*) establishing a pledge or stake (*'ba*) to be forfeited if a statement is proved false or if the terms of the agreement are violated.

In 1953 the National Assembly (*Tshogdu*) was created, including not only elected representatives but also representatives of the monk body and a number of high civil servants directly appointed by the king. The formal separation of powers was completed in the '60s with the creation of the court system, with its 20 district courts, and eventually the setting up of the High Court in Thimphu in 1968.

⁶ Concerning legal anthropology, an interesting work in progress seems to be that of Richard Whitecross, carried out at the University of Edinburgh.

⁷ On dispute resolution in Bhutanese culture see M.A.R.I.S., "Conflict and Conciliation in Traditional Bhutan", in *Bhutan: Perspectives on Conflict and Dissent*, M.HUTT ed., Gartmore, Stirlingshire, 1994, pp. 21 ff.

In 1959 the National Assembly, in one of its first sessions, enacted a body of laws called *Thrimzhung Chhenmo* (“the Supreme Laws”). This is for foreign eyes a very peculiar legal text (with no relation to any Western code), certainly worth deeper study, which embodies traditional Buddhist values in the form of a collection of criminal law provisions accompanied by fundamental rules of procedure, as well as rules regulating religious rites or more generally protecting religious values (see the detailed rules on donations for religious purposes, cremation, and so on). Although the structure of most of the provisions is of a criminal character, sanctions are also established for wrongdoings related to sales and other commercial transactions, thus providing an embryo set of civil law rules. The *Thrimzhung Chhenmo* has been commonly perceived and described as a “general law of the land”, sometimes with a “quasi-constitutional” flavor, by stressing the principle of equality contained in its first part⁸.

The “Supreme Laws” of 1959 were followed by the enactment of a number of statutes regulating the most important fields of social life and some matters of increasing public interest. We have thus the Forest Act of 1969, the Land Act of 1979, the Inheritance Act of 1980, the Marriage Act of 1980, the Livestock Act and the Debt Act both of 1981, and some others.

The acts concerning family relations have also a rather indigenous character, and did not want to bring dramatic changes to the very stable Bhutanese society of their time, strictly sticking to traditional values. The same is true for the statutes concerning land use, which were aimed at regulating use of collective resources in a period of transition in Bhutanese agriculture, caused by the introduction of cash crops for export. Some of these acts were certainly important

⁸ The section OM states “Except for His Majesty the *Druk Gyalpo*, all other citizens of Bhutan, irrespective of their rank, social status or official position are equal under the *Thrimzhung Chhenmo*”.

steps in the modernization process, especially the Forest Act and Land Acts, establishing for instance that the government is the owner of all trees, including those growing on private land. One should not in any case overestimate the impact of legislation on individual relations in this first wave of lawmaking. Social control has continued for a long time to be firmly in the hands of traditional bodies, with formal court adjudication as second best compared to mediation⁹.

From this slow march forward, in the last few years Bhutan has instead moved to a real – to use the famous phrase by Grant Gilmore - “orgy of statute making” (by local standards). In 1992 we have the enactment of a Financial Institutions Act of Bhutan, followed by a Forest and Nature Conservation Act (repealing the 1969 Forest Act) in 1995, and in the same year 1999 of a Moveable and Immovable Property Act, a Telecommunications Act, a Legal Deposit Act, a Postal Corporation Act, a Bankruptcy Act, a Road Safety and Transport Act. This was just the beginning: in the following year we can see a new Companies Act, an Environmental Assessment Act, an Industrial Property Act, a Commercial Sale of Goods Act, a Copyright Act and many others.

Behind this “orgy”, there is the will of the Government to guarantee “good governance” during those, which are perceived as watershed years for Bhutan.

In 1998 Bhutan had a growth rate of about 6%, was about to launch its own television station, was soon to be connected to the Internet, and one year before shares of half a dozen public-sector undertakings were sold to the public to introduce privatisation¹⁰. “Good governance” in the context of swift economic growth was perceived as requiring adequate legislation, and in this case there was no doubt that

⁹ On the role of mediation see also A.SEIDMAN-R.B.SEIDMAN, *Bhutanese Legal System and Terminology. Report on the Outcomes of the Workshop, 22-26 February 1999*, Thimphu, 1999, p. 13.

¹⁰ For a journalist’s overview see A.DAVID, “Shangri-La Wake Up Call”, *Asiaweek*, September 3, 1999, pp. 44-47.

legislation had to follow foreign – Western - models. All these acts have indeed seemingly been drafted by foreign consultants working for the concerned Bhutanese ministries, mostly through financial support from international institutions, as for instance UNDP.

The quality of this international legislative assistance would be worth a long discussion. The acts produced in these last years are on average of good technical quality, but are in general not at all “country specific”, showing no signs of any significant interaction between the foreign consultants and the local lawyers. They follow the legislative style of the common law (with a preamble giving detailed definitions of the terms used), and are clearly inspired by different American and South Asian statutes.

A detailed analysis of this last wave of legislative reforms is still to be carried out, and it could probably provide interesting results concerning the sources used by the drafters. Generally, the process has been rather chaotic, and its efficacy affected by the lack of Bhutanese lawyers with specialist competence. Important lessons about the limits of “country specific drafting” in particularly difficult environment, and with extremely scarce resources, have been drawn by Ann and Robert Seidman during a visit to Bhutan organized in collaboration with UNDP, but it is not yet clear whether their analysis had any impact on the Bhutanese drafting practice¹¹.

There is, however, an important exception to the use of international experts for the drafting of new statutes, i.e. the Civil and Criminal Procedure Code enacted in 2001. The drafting of this code is mostly due to the personal commitment of the Chief Justice, a man of vision who had his legal education in Australia. Although with significant adaptations to the local reality, also this piece of legislation clearly borrows from common law procedural models

¹¹A.SEIDMAN-R.B.SEIDMAN, op. cit.

(including American solutions like discovery and class action), in some cases in forms already adopted in India.

The importance of traditional mediation followed by the *Genja* can still be perceived in this code, which contains a chapter concerning “Adjudication without proceedings” where in civil cases an official role as mediators is assigned to different local authorities (including members of the National Assembly) and the legal value of related out-of-court agreements is recognized¹².

Language Pluralism and Legislative Drafting

Since statutes are the most important legal source in the process of modernisation, the problem of their language is a crucial one.

The overall context in which the legislator operates is rather difficult. The languages spoken in Bhutan are currently considered to be 24, 8 if one takes into account only those which have at least 10 000 speakers. Among these, all but one (Nepali) are Tibeto-Burman languages. Those having the largest number of speakers are *Dzongkha* (estimated 160 000), which is the native language of Western Bhutan, *Tshangla* (estimated 138 000) also known as *Shâchobi Kha* or *Sharchop*, predominant in the eastern part of the country, *Khengka* (estimated 40 000), *Bumthangkha* (estimated 30 000) spoken in the Bumthang district and in the whole of central Bhutan. Nepali, a Hindu-Aryan language, is spoken (in a form in some respects different from standard Nepali) mainly in Southern Bhutan, following the immigration of labourers at the beginning of the 20th century. The figure of Nepali speakers, currently estimated around 156 000, is a politically sensitive point, since there is still open conflict on

¹² See chapter 22. About the machinery of justice in Bhutan see my forthcoming essay “Happiness, Development and Procedure. The Changing Faces of Justice in the Kingdom of Bhutan”, in *Festschrift till Per Henrik Lindblom*, Uppsala, 2004.

the status of an important number of persons (part of them now in refugee camps in Nepal) who claim to be members of the Bhutanese Nepali minority and to which the Bhutanese government refuses citizenship affirming that they are recent immigrants¹³. The position of the Nepali minority, which with its Hindu religion constitutes what is often perceived as a challenge to national identity, is probably the most serious problem of contemporary Bhutan.

Until the sixties, there was no official language policy, and no spoken language was a national language. This also because none among the spoken Tibeto-Burman languages had developed into a written language. Before modernization, illiteracy was rampant and contacts between the different linguistic areas were limited by the difficult communications. The written language used in drafting official documents was Classical Tibetan, also known as *Chöke* (or *Chökey*), which was also the language of the traditional education of the monastic body in the lamaseries. The approach to language use was rather pragmatic, as is shown by the fact that when the first few secular schools were opened in Bhutan at the beginning of the 20th century, the medium of instruction chosen was Hindi, because of easy access to textbooks in this language¹⁴.

In 1961 a royal decree by King Jigme Dorji Wangchuck established that “Dzongkha” was the national language of Bhutan¹⁵. This did not mean that the language of Western Bhutan was promoted as such to national language. Instead, “the term ‘Dzongkha’ was still primarily used to denote not the spoken language of Western Bhutan, but the literary exponent thereof, *Chöke*. Because *Chöke* was considered the literary form of *Dzongkha*, the liturgical language and the spoken tongue were not popularly perceived as being two

¹³ For different voices on this problem see “*Bhutan: Perspectives on Conflict and Dissent*”, cit.

¹⁴ See G.VAN DRIEM, *Dzongkha*, Leiden, 1998, p. 7.

¹⁵ On the development of the present language policy see G. VAN DRIEM, *Dzongkha*, cit., pp. 8 ff.

distinct languages”¹⁶. The adoption of textbooks in “Dzongkha” (actually *Chöke*) instead of Hindi and the teaching of *Dzongkha* as a written language in schools implied thus the usage as a medium of written communication of a language that was in the same relation to the spoken languages as Latin is to Italian or French.

Since the seventies, the language policy has aimed at the vernacularization of the written language, to bring it closer to the living language. In this perspective, a Dzongkha Division of the Department of Education was created in 1971, followed by a Dzongkha Advisory Committee 1986. The two merged in 1989 with the establishment of the still existing Dzongkha Development Commission, which develops textbooks, works on the compilation of dictionaries and, has the power to introduce neologisms and new spellings. In the standardization of modern *Dzongkha*, which is based on the cultivated form of the native language of Western Bhutan, a prominent role has been played from the early nineties by a Dutch linguist, George van Driem, who is the author of the first extensive grammar as well as the person behind the official system for romanization to be used for presenting names and words to the international public, since *Dzongkha* otherwise uses the alphabet of Classical Tibetan, known as *’Ucen* script.

With standardization, *Dzongkha* has acquired an increasingly central role in the defence of the cultural identity of Bhutan, and the government constantly promotes its use. In spite of this, the advancement of *Dzongkha* suffered from the competition with English since the beginning of modernization. It must indeed be remembered that in schools, because of the unavailability of *Dzongkha* textbooks in many fields and the lack of adequate terminology for scientific and technical subjects, most of the education still takes place in English. With modern education, “English supplanted *Chökey*, inasmuch as most educated Bhutanese

¹⁶G. VAN DRIEM, *Dzongkha*, cit., p. 8.

could read and write fluently in English but not in *Chökey* or *Dzongkha*. To a large number of educated persons “literacy came to be equated with knowing English, and education and scholarship came to be judged by Western standards”. Even because of the increasing number of young Bhutanese who receive their education abroad, English is absolutely preponderant among the educated elite, for which a “recent survey shows that around 80% ... can read, write and speak good English but, in the case of most of them, their knowledge of *Chökey* or *Dzongkha* can only be ranked as semi-literacy”¹⁷. The only newspaper published in Bhutan, the weekly *Kuensel* is published in three identical editions, in *Dzongkha*, English and Nepali.

The linguistic skills of lawyers well reflect the linguistic pluralism, which dominates Bhutan. Persons with formal legal education are still few in Bhutan, and are almost uniquely represented by young law graduates who, after selection by the government, spend the years needed to obtain a law degree in an Indian University. They are thus fluent in English (medium of education in Indian law schools), with a good command of the legal terminology of the common law. Besides that, their mother tongue is one of the different regional languages, which can well not be *Dzongkha* (it is for instance often *Tshangla*, which is very different) or one of its closest relatives. *Dzongkha* is certainly known and spoken, but advanced writing skills cannot be taken for granted. Very often, lawyers also have a good knowledge of spoken Nepali (but seldom of the written language, which uses the same script as Sanskrit).

Because of the difficulties in mastering written *Dzongkha*, English has an important role as *lingua franca* in the administration. Internal communications, reports and other documents are very often written in English, also because of the easier availability of word processing facilities.

¹⁷ KARMA PHUNTSO, op.cit., p. 115.

The difficulties related to the use of *Dzongkha* permeate the whole legislative drafting process as well. The first versions of new statutes are constantly drafted in English. This is – of course – a matter of necessity when the legislative activity takes place with international technical assistance, but is also a natural consequence of the fact that the legal training of Bhutanese lawyers is in English. Translation takes place before transmission to the National Assembly. The bill is ordinarily first approved by the cabinet in the English version, and the full cabinet (Ministers plus Royal Advisory Council) normally reviews also the *Dzongkha* version before submission to the Assembly¹⁸.

The translation process is difficult and a cause of significant delays in the legislative process. The number of official translators is very small, and legal competencies are practically absent among them. Those selected as translator “simply exhibit unusual skills in interpreting English into acceptable *Dzongkha*”¹⁹. Because of their small number, the solutions have been traditionally found case by case, relying on the help of officials from different ministries, from the High Court and from the Dzongkha Development Commission. The specific problems related to the finding of adequate English translations for complex English legal terms are normally tackled by the Dzongkha Development Commission and the High Court. At least in 2000, a certain role in the review of translations was left to the then recently created Department of Legal Affairs.

In the West, the debate about the risks of legal translation is an endless one, but seldom the difficulties experienced are comparable to those of Bhutan. Most of the recently enacted statutes are very complex texts, containing numerous terms with very specific technical meaning. The language, in which the acts are translated, as well as Classical Tibetan, has never been used in the framework of a modern legal system.

¹⁸ A. SEIDMAN-R.B.SEIDMAN, op. cit., pp. 19-20.

¹⁹ A. SEIDMAN-R.B.SEIDMAN, op. cit., p. 28.

An extensive Dzongkha dictionary is still to be published, and thus translators currently use Tibetan dictionaries in order to find suitable terms.

It is of course difficult for an external observer to assess the quality of translation. During the debates in the National Assembly, remarks on seemingly inadequate *Dzongkha* terms are rather common, and it is also possible to find situations where some members of the assembly asked to postpone the enactment of a bill because of the impossibility to understand it, as was the case during the 1999 debate on the Bankruptcy Act²⁰. During that debate, a Royal Advisory Councillor, in answering to the members worried about their limited comprehension, stated that the “main reason for not being able to understand the *Chathrim* [the act]”, “was [that] the national language, *Dzongkha* is at present in a process of developing. Difficulty of understanding arises when equivalent words in *Dzongkha* have to be coined in accordance with the *Chathrim*”.

It is however quite difficult to distinguish between problems of comprehension related to the translation process and the difficulties inherent in the review of technical legal texts by persons with a very limited grasp of Western legal concepts. This aspect also emerged during the debate about the Bankruptcy Act (which was eventually approved in the same session). The above-mentioned Royal Advisory Councillor concluded “the members will be able to understand it gradually as they put them into practice and become more familiar. Besides, it is the practice in many countries of the

²⁰ See *Translation of the proceedings and resolutions of the 77th session of the National Assembly of Bhutan (29th June-4th August, 1999)*, Thimphu, s.d., p. 318-327. The statement of the Royal Advisory Councillor mentioned in the following is on p. 325 (the emphasis is ours). In the same proceedings, see also the remarks on linguistic points about other acts approved in the same session (see under Bhutan Municipal Act, Bhutan Telecommunication Act, Moveable and Immoveable Property Act).

world to *deliberately* draft legal documents in such a way that it is difficult for the general public to understand them”.

Interpretation of Statutes

Statutes are approved by the National Assembly in both the English and *Dzongkha* versions. There is no general rule about which language version should prevail. Some of the acts approved in the last years contain, however, a provision according to which “in case of any differences in the interpretation the *Dzongkha* text should prevail”, or other similar wording. In at least one case, this choice was made during the debate in the National Assembly by amending a bill, which established instead that the English version was to prevail²¹.

Such provisions are certainly consistent with the language policy aimed at strengthening the position of *Dzongkha*, but their real weight in the peculiar Bhutanese context is rather unclear.

The Bhutanese judiciary is increasingly staffed with lawyers trained in the Western legal tradition, usually - as we have said - through a law degree acquired in Indian law schools²². Previously, the main access to the judicial career was through “on the job” training in the High Court of Justice or in another court, together with an oral and written exam²³.

The few years spent in India (in what is normally the first visit abroad) do not of course deprive the “new lawyers” of their

²¹ See Translation of the proceedings and resolutions of the 77th session of the National Assembly of Bhutan (29th June-4th August, 1999), Thimphu, s.d., p. 314, concerning the Bhutan Telecommunication Act 1999.

²² This is sometimes followed (but it is a recent development) by a master degree in a major European, American or Canadian university, financed by some foreign donor.

²³ See on this point C.HAINZL, *The Legal System of Bhutan. A Descriptive Analysis*, Vienna, 1998, p. 35.

cultural roots. The foreign education of the future judges is completed by a one year long “national legal course” under the direction of the High Court, which stresses the importance of the local tradition. The papers written by the participants to the course for the closing ceremony provide a very interesting picture of the Bhutanese legal style. In the collection I had the opportunity to read ²⁴, almost all the papers deal with Buddhist precepts, values and literature. These papers were written before leaving for legal studies in India, but a strong link with the traditional learning seems to survive after the immersion in the Western legal tradition.

Some evidence of this can be drawn from the description of the Bhutanese legal system written by Lobzang Rinzin, a brilliant young lawyer serving at the Department of Legal Affairs during my stay in Bhutan. In his exposition, the bases of the present legal system are still represented by the fundamental teachings of Mahayana Buddhism as contained in the laws compiled in 1652 by Zhabdrung Ngawang Namgyal, which included the definition of the “ten nonvirtuous acts” (divided into immoral actions of the body, of speech, and of the mind) and of the “sixteen virtuous acts of social piety”²⁵.

Following the Lamaist tradition, these spiritual laws “were said to resemble a silken knot (*dargye duephe*) that is easy and light at first but gradually becomes tight, while worldly laws were compared to a golden yoke (*sergyi nyashing*) that grows heavier and heavier with the degree of the crime”. Most important, this is not presented as the description of a remote past: “these laws evolved over the centuries as a reflection of the culture and lifestyle of the people, keeping the stream of justice clear and pure”. Notwithstanding the modifications realised by the following temporal rulers “the principles of

²⁴ See the “papers written for the closing ceremony for the second batch of the national legal course”, 6 November 1996.

²⁵ *Ibidem*, p. 1. On these concepts see R.REDWOOD FRENCH, *op. cit.*, pp. 80-82.

Buddhism and natural justice themselves, as originally set forth, have not changed and have always been upheld”²⁶. Modern legislation is considered nothing more than the most recent development of such tradition, due to the enlightened initiative of the present king, with no conflict with the Bhutanese perception of justice.

Certainly, the symbols, the style, are those of Mahayana Buddhism, and it is difficult to isolate statutory interpretation from the general cultural environment of the legal process. However, the development process unavoidably leads to the increased importance of legislation, and many recent statutes are considered milestones on the path to “Gross National Happiness”. These statutes are, as we have mentioned, sometimes transplants sometimes more or less *ad hoc* products, but are in any case legal instruments of a Western character, with a prevailing influx of the legislative technique used in the common law jurisdictions.

When they are called to interpret these statutes, it seems that the Bhutanese judges – at least those trained abroad – follow a Western pattern. In a “data free land”²⁷ such as Bhutan it is very difficult to provide much more than anecdotal evidence. Decisions, including those of the High Court, are not published and it seems that their diffusion is considered as a risk of infringement on the privacy of the parties. Nor can scholarly studies provide any help. There are no law reviews in Bhutan and until now just one law book has in my knowledge been published by a Bhutanese author, based on his LLM dissertation at the University of Leiden²⁸.

²⁶ *Ibidem*, p. 2.

²⁷ “Bhutan has been termed as a ‘data-free’ country in the sense that social research is entirely a new phenomenon for the Bhutanese”, A.C.SINHA, *Bhutan. Ethnic Identity and National Dilemma*, New Delhi, 2nd rev. ed., 1998, p. xxii. The original definition is by Leo Rose.

²⁸It is the book written by KUENLAY TSHERING, *Integrating Environment ad Development in Bhutan. A Legal Perspective*, Delhi, 1999.

The only written sources can be found among the few unpublished documents written by local lawyers when called to interact with international experts. One such document is the paper prepared by the registrar of the District Court of Thimphu where, after the standard reference to the “deep influence by the doctrine of Buddhism”, he gives an overview of the interpretation of laws.

The picture is one where the judge must issue decisions in strict conformity with the provisions of the statute, without any explicit lawmaking role: “The function of the Court is *Jus dicere* (to interpret laws) and not *Jus dare* (to make laws)”²⁹. As a legal basis for this statement, the author mentions a provision of the *Thrimzung Chhenmo*, where it is established that “the judge shall decide cases and award punishment strictly in accordance with the provisions of law. He shall not allow himself to be swayed by any personnel opinions while interpreting the provisions of law”³⁰.

The other guidelines for interpretation are seemingly borrowed from the common law tradition, although the description is somewhat chaotic: “Literal interpretation is the rule”, but “when the *sententia legis* cannot be determined by the language of the statute”, help is provided by the “mischief rule”, and by “logical interpretation”, defined as the “supplying by the judge of an intelligent interpretation to furnish what is lacking in the law”, reading “the statute as a whole and not in isolation”. Some maxims are mentioned, as *noscitur a socio* (“Rule of *eiusdem generis*”) and *expressio unius est exclusio alterius* (defined as “a valuable servant but a dangerous master”) ³¹.

²⁹ *Ibidem*, p. 7.

³⁰ *Thrimzung Chhenmo*, DA 1-5.

³¹ An early recognition of the possibility of recourse to analogy is contained in a statement to the National Assembly of the Representative of the High Court, according to which “when the law of the land lacked explicit guidance for the Court, inferences

The scarce information provided by this document, which is in practice the only available material about interpretation of modern statutes in Bhutan, leaves many open questions about how the judges actually operate, and absolutely nothing is said about the problem of the conflict between the meaning of a word or phrase in the English and in the *Dzongkha* versions.

Should a problem of this kind arise, it would be solved as any other case in which a provision “is ambiguous or capable of deferring [sic] interpretations” i.e. by decision of the High Court, on a majority vote³².

In the special Bhutanese context, where the number of judges is very limited, a linguistic problem that should acquire major practical importance or general interest, could also be discussed during the Annual National Judicial Conferences, where the judges gather to discuss common problems and even points of interpretation³³.

In Bhutan it would be however rather meaningless to try to identify a detailed doctrine on the solution of problems of interpretation of recent statutes, including those of a linguistic kind. Because of the very limited size of the legal system, the concentration of legal competence in an extremely small number of persons, and the personal prestige of the

must be drawn from other provisions of the same law to arrive at a just decision”. See National Assembly, 59 (1983), p. 24.

³² See RITU RAJ CHHETRI, op. cit. Such a provision is now included in the new Civil and Criminal Procedure Code, which under 27.1 (“Power to fill lacuna”) establishes that “Every judge shall decide a case strictly in accordance with the provisions of Law. Where any section is ambiguous or there exists lacuna, the decision of the majority Judges of the Supreme/High Court shall prevail”.

³³ See *Agenda for the 13th National Thrimpons Conference* (no date). Resolutions are normally distributed to judges, although with some delay, see pp. 15-16.

Chief Justice, many problems are certainly solved through informal means.

What is instead more relevant to stress is that the bilingual character of modern Bhutanese legislation is in some sense flawed. On the one hand, the government's language policy consistently affirms the priority of the *Dzongkha* version, but on the other hand the common language of lawyers is still more English than *Dzongkha*.

This is especially true when dealing with the recent statutes drafted with international assistance. Their translation in *Dzongkha* is an impressive accomplishment for which the Bhutanese deserve praise and admiration. It is however a fact that *Dzongkha* is not the mother tongue of many lawyers, and most of them do not have advanced skills in the written language. They are instead well versed in the English language and in the English legal terminology after their studies abroad.

In particular, when it comes to the recent statutes dealing with very technical matters, as for instance the Bankruptcy Act and the Commercial Sale of Goods Act, it is unavoidable that the text used is mostly the English version. Starting from the *Dzongkha* versions, the judges and the other lawyers employed in the ministries (until now there are no lawyers in private practice) would have more difficulties in resorting to other materials to solve interpretation problems.

So far we have been concerned only with interpretation by the judges, and we have mentioned the absence of law graduates in private practice. Although the few persons with a law degree can only be found in the ranks of the judiciary or of the public administration, there is however a group of persons providing assistance to parties of disputes. These "practitioners", who are either village elders or headmen or retired officials, known for their wisdom and eloquence in *Dzongkha*, are called *jabmis*, and they are acquiring an increasingly important role in Bhutanese society. They can

represent litigants in court, or perform activities of an advisory nature. Since 1996, the High Court organizes training courses for them, where they are given information on the judicial system and clarifications on the new laws, and eventually granted licenses. In 1998, there were about 200 *jabmis* in Bhutan³⁴.

Until a few years ago, the lack of formal legal training was not a great problem for the *jabmis*, since the written legal materials were represented by the *Thrimzhung Chhenmo* and a few other acts. Proficiency and eloquence in *Dzongkha* was enough for the practice, and knowledge of English legal terminology was rather limited. This embryo legal profession cannot be expected to use more than very simplified patterns of interpretation. There are indeed some cases where the *jabmis* have started an activity of a more entrepreneurial character dealing with business matters in the capital Thimphu and in the commercial town Phuntsholing in the south³⁵. Also for the *jabmis*, those more likely to deal with the more elaborate statutes will be certainly inclined to use the English version. This is specially true for those (particularly in the south) who are native Nepali speakers.

The Language of Statutes in the Balance Between Tradition and Modernity: A First Assessment

In the application of modern legislation, the English version thus has certainly many advantages compared to the *Dzongkha* one. The prescriptions contained in some statutes according to which “the *Dzongkha* version shall prevail” can have but limited weight.

Those inclined to read reality through the glasses of “globalization”, will see this as another sign of the

³⁴ About the *jabmis* see C.HAINZL, op.cit., pp. 36 ff.

³⁵ The problem of the training of *jabmis* has been discussed at the National Assembly in 1997. See Proceedings of the National Assembly 75 (1997), pp. 111 ff.

unavoidable predominance of the “global” (English) on the “local” (in this case, a little known Tibeto-Burman language), the latter doomed to marginality in a near future.

In Bhutan, it is not certain whether this is actually the case, since the problem of the language of statutes is just one element of a complex dialogue between tradition and modernity.

The modernization of the legal system goes on. The ideal of “Gross National Happiness” presupposes the growth of market economy, and increased international exchanges. To sustain this growth, the government has introduced the necessary legislative framework by having the acts just mentioned passed by the National Assembly. Some of them have certainly not been drafted according to the law-making methodology proposed by the best “law-and-development” scholars³⁶, but in the Bhutanese context this would have implied important delays in the reform process, as well as an overload for the country’s few trained lawyers. The limited human resources have instead been concentrated on a few acts, as for instance the Code of Procedure enacted in 2001, after several years of work³⁷.

It is interesting to note that the length of time for the drafting work for this code was also due to the process of translation into *Dzongkha*. In this case – as it is unanimously recognized – the language is of the highest class, although many terms are not easily understandable for the average person, as it

³⁶ About the methodological guidelines to follow in developing countries see A.SEIDMAN and R.B.SEIDMAN, “Using Reason and Experience to Draft Country-Specific Laws”, in *Making Development Work. Legislative Reform for Institutional Transformation and Good Governance*, A.SEIDMAN-R.B.SEIDMAN-T.W.WÄLDE eds., The Hague-London-Boston, 1999, pp. 249 ff.

³⁷ See Assembly enacts historic legal code, *Kuensel*, July 28, 2001.

was admitted by the Chief Justice himself in his speech to the National Assembly³⁸.

The efforts to ensure the best possible linguistic quality of the *Dzongkha* version of the code of procedure are the latest moves in a complex enterprise, where “black letter law” on statutory interpretation has only a minor role. The Bhutanese policymakers want to strike some sort of balance between local and global, between tradition and modernity. The international dimension of modernization implied the accession of Bhutan to the common law family, as a direct consequence of the choices concerning the education of future lawyers and the legislative drafting. From the linguistic point of view, such transition could not have been realized without further strengthening the position of English in Bhutanese society. With a pragmatic approach, the government did not want to hamper the effectiveness of legal reform by introducing too narrow restrictions to the use of English, probably realizing that it will unavoidably become the medium of legal-technical discourse in an increasingly open country.

On this background, the function of the translation of all statutes into *Dzongkha*, and the theoretical predominance of the *Dzongkha* version, is not likely to be that of substituting English, or of competing with it for the position of general medium of legal discourse, once the process of standardization is completed.

The overall impression is instead that a sort of “division of labour” between the two languages has been established, one where English is the tool required for operating the legal machinery borrowed from the West to govern economic development. English is the code in which the new rules are written, and it clearly tends to dominate all discourse concerning their interpretation, i.e. the professional discourse of lawyers.

³⁸ *Ibidem*.

While English becomes the code of *rules*, *Dzongkha* keeps the role of “social glue”³⁹, of defense against cultural alienation, of brick stone of national identity (with all the problems related to its being foreign to Bhutanese Nepali speakers). Above all, through its roots in Classical Tibetan, *Dzongkha* is able to evoke the *symbols* of the indigenous legal culture surviving in the interstices of “imported” law. “Rules” and “symbols”: in Bhutan, it is not clear which of the two carries more power.

³⁹ About the idea of language as “social glue” see for instance the remarks in P.G.MONATERI, “ ‘Cunning Passages’. Comparison and Ideology in the Law and Language Story”, in *Les multiples langues du droit européen uniforme*, R.SACCO-L.CASTELLANI eds., Torino, 1999, pp. 123 ff.

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A PROVISIONAL PHYSIOGRAPHIC ZONATION OF BHUTAN

Chencho Norbu etal¹

Abstract

The concept of physiography integrates all of the main components of the natural environment, such as bedrock, surface drift deposits, landform, soils, climate, water, and plants and animals. This paper summarizes the provisional physiographic zonation of Bhutan, based on soil survey fieldwork by the National Soil Services Centre, with some material incorporated from other environmental disciplines.

The main influence in shaping the landscape of Bhutan has been the uplift of the Himalayas following the collision of the Indian and Asian continental plates. This has given rise to the basic topographic structure of the country with the High Himalaya in the north from which long ranges formed of metamorphic rocks run southwards and then descend steeply to the duars. The main valleys follow more or less north-south course, but show considerable variation in their longitudinal profiles. They all have narrow gorge-like sections in the South but vary in the sections upstream. In western and central Bhutan the riverbeds have stepped profiles and the flatter sections form Inner Valleys with relatively gentle side slopes and wide floors at altitudes ranging from 1100 m at Wangdi to 2600 m at Jakar. The rivers in the east are cut deeper, and their valleys are narrow and steep throughout.

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This structure forms the basis of the proposed zonation in which Bhutan is divided into transmontane plateau, High Himalayan peaks, High Himalayan plateau remnants, North-South valleys and ranges, front foothills and duars. The North-South valleys and ranges are the most extensive group of zones. In the west and centre they are subdivided into southern, inner and northern valleys but the steep ridges and deep valleys of Eastern Bhutan are not divided. The Merak-Sakten block and Southeastern Bhutan are anomalous because of their geological and topographic structures.

It is hoped that field scientists in a range of disciplines will find the zonation useful and that they will test it and suggest improvements.

Introduction

The Royal Government stresses the concepts of environmental stewardship, responsibility to future generations and good husbandry in the development of Bhutan's natural resources. Sustainable development along these lines depends largely on willing and informed participation by the field managers of the resources, i.e. the farmers, foresters, pastoralists, mine managers and other rural people. These managers already have considerable indigenous knowledge relating to the use of their land. However their efforts can be augmented by technical improvements based on modern research, surveys, and other studies. It is one of the roles of the scientific community to provide the information necessary for such improvements

Scientific inputs will contribute to the development of feasible, profitable, attractive and sustainable forms of land use only if they are based a sound understanding of the physical, chemical, and biotic nature of the natural environment. At present data and understanding of separate aspects of the environment in Bhutan are building up, with specialist studies and surveys in different disciplines already in print, in progress, or planned. The aspects best reported

so far are the bedrock geology and botany, thanks respectively to the work of the Geological Surveys of Bhutan and India, and to the Flora of Bhutan, forest inventories and other studies by the Ministry of Agriculture. We also have information on climate and hydrology, landforms and geomorphology, surface drifts and soils, although systematic data collection on these began later.

The collection of basic data in the separate disciplines has only just started, and needs to be sustained, refined and expanded. However, some attention also needs to be paid to the interactions between environmental subsystems and disciplines. Data from one discipline can contribute to insights in another. For instance, cross-disciplinary background data on bedrock and surficial geology, climate, topography, and ecology are crucial to understanding soil patterns.

As well as cross-disciplinary exchanges, there are benefits in holistic multidisciplinary integration. Planners and policy makers rarely have time to go through all of the specialist documents from each of the disciplines relevant to forthcoming decisions. If scientists wish environmental concerns to be fully considered, they need to make their points sharply and vividly. One of the best ways of doing this is by presenting their findings in succinct and coherent cross- or multi-disciplinary syntheses.

The term used here to encompass the holistic and multi-disciplinary overview of the whole environmental system is 'physiography'. This is taken to include all aspects of the physical environment and the natural ecosystems that it supports. It excludes human artifacts such as agriculture and settlement but nonetheless it does give a general indication of agroforestral production potential. The physiographic approach highlights linkages between various environmental subsystems. For instance, it highlights the impacts of the development of a road or a mine on the soils,

water, vegetation, and air quality in the vicinity, and in areas down slope, downstream and downwind.

The Wang Watershed Management Project (2002) recently used the concept of physiographic integration in its mapping of the project area's land resources. The four dzongkhags of Thimphu, Paro, Haa and Chhukha (ca 6800 km², 15% of Bhutan) were mapped as 29 land systems and one land region. Each land system consists of a landscape type with a limited range of variation in bedrock and surface geology, landform, climate and hydrology, soils, and natural vegetation. This environmental combination determines the range of agricultural and other livelihood options. Where one of the main environmental components changes significantly, it affects the others, and results in a different landscape, and this is mapped as a different land system. Similar land systems are grouped as land regions. The land systems mapping enabled identification of areas within the Wang project area that are particularly vulnerable to specific types of environmental degradation, including landslides and soil acidification.

This paper presents a provisional, broadly defined physiographic zonation of the whole country by the National Soil Services Centre. As soils are formed by the action of air, water and living organisms on loose mixtures of rock, mineral and organic particles at or near the ground surface, soil surveyors are forced to take account of the geology, climate, hydrology, landforms and ecology in unravelling the soil patterns of their survey areas. They have no option but to think in cross- and multi-disciplinary terms. The zonation presented tries to be evenly balanced between disciplines, but it inevitably has a soils orientation and will benefit from contributions from specialists in other disciplines.

Previous Zonations

In addition to the Wang watershed, there have been several previous attempts to divide the landscape of Bhutan into

meaningful zones. Some are brief and generalized introductions to historical, cultural and social studies (e.g. Navara, 1997). Others are oriented towards single scientific disciplines, such as the subdivision of the country in the *Flora of Bhutan* into 23 plant-collecting districts by subdividing three latitudinal regions (North, Centre and South) by major river catchments (Noltie, 1994).

A feature of some of the previous zonations is that they tend to treat Bhutan as an eastwards extension of the Central Himalayas, and characterize the kingdom mainly as a series of East-West trending altitudinal belts. For instance, Eguchi (1987 & 1991) tried to apply Gansser's (1983a) pan-Himalayan structure of five E-W zones. Eguchi found the structure unclear in Bhutan, but nonetheless divided Central Bhutan into four approximately E-W zones, i.e. Southern foothills; Southern High Himalayas; Lower Midland of High Himalayas; and Northern High Himalayas. Takada (1991) followed this division, except that he referred to the third zone as 'intramontane basins', possibly to avoid confusion with the rather different Midlands zone of Nepal. In his later studies, Eguchi (1997) followed Takada's lead and refers to the third zone as 'the intramontane basin'. He also uses 'Great Himalayas' for the fourth zone, to avoid confusion with 'High Himalayas', as this has geological as well as topographic connotations in Nepal.

However some of the earlier zonations do recognize the substantial differences in topographic structure between the Central and Eastern Himalayas. They stress the predominantly North-South lineation of the Bhutanese landscape (e.g. Navara, 1997), which is also implicit in some of the older names for the country, such as 'Southern valleys' and 'Southern country of four approaches' (Pommaret, 1994).

The 'Guidelines on landforms and materials' by the Land Use Planning Project (1996) is the most systematic characterization of the physical landscape of the whole of Bhutan to date. It aimed to develop and apply a methodology

for landform description in Bhutan based on slope gradient, degree of dissection, drainage lines, drainage pattern, valley form, watershed divides, mass wasting processes, and some general criteria. These define individual landform elements, which are combined to characterize 153 land units. Four of these are fluvial plains at low- and five at mid-altitudes; 14 are foothills at low and 28 at higher altitudes; 28 are mountains at mid- and 25 at high altitudes; three are mountainous plateaux; eight are valleys at low-, 12 at mid-, and seven at high altitudes; one is a fluvio-colluvial plain; three are fluvio-glacial plains; one is permanent snow and ice; nine are glaciated highlands; four are complex erosional/transport slopes; and one is for complex transport/depositional slopes. The main criteria are topography and bedrock geology, with limited data on soil chemical characteristics. There is no characterisation of hydrology, ecology, or soil morphology, and the units are not fully equivalent to land systems. The units are grouped by type, not in spatially contiguous zones, so that the Guidelines are an inventory, rather than a structural overview, of the landscape. However some of the units can be grouped to correspond with the zones proposed below.

An interesting zonation of a limited area is the natural resources inventory of Zhemgang. This divided the dzongkhag into seven landscape types, which were holistically defined on multiple aspects of the physiography. They are roughly equivalent in concept, extent and permitted variation (Zhemgang Dzongkhag, 1995) to the land systems used in Wang but are not as systematically characterized.

Sources

The proposed zonation is based on the integration of findings and data from sources in several disciplines, as listed in the bibliography and particularly including:

Solid Geology

The main geological overviews of the whole country are Gansser (1983) and Bhargava (1995). There are several hundreds of studies of individual areas and mineral prospects, carried out by the Department of Geology and Mines (DGM) in the Ministry of Trade and Industry and the Geological Survey of India. The reports are archived in the DGM library.

Surface Drift Deposits

The loose materials deposited at the surface by slope creep, landslides, rivers, wind, and glacial and periglacial processes are of interest to several disciplines. Laskar (1995) gives a brief geological overview of Quaternary deposits, and Ikemoto & Gurung (2000) is a more detailed geological study of the surface deposits in the central valley of Thim Chhu. Drift deposits are the parent materials of many agricultural soils in Bhutan, and their impacts on the properties and distribution of soils are summarised in Baillie *et al.* (2002). The Wangdi groundwater study (PCI, 1996) included a useful map of drift materials in the inner valley of Puna Tsang Chhu. Drift deposits are also of interest to civil engineers as potential foundations, construction materials, and hazards. Some of their reports include detailed descriptions of these materials (e.g. Sharma *et al.*, 1998).

Geomorphology

The main sources for topographic data are the 1:50 000 and 1:25 000 topographic maps issued by the Surveys of Bhutan and India. Many of the 1: 50 000 sheets are quite old, and were prepared without satellite imagery and global positioning systems, and have contour intervals of 40 m. Currently they are being replaced with more detailed mapping, but even the older sheets are of good quality and give clear depictions of landscape features. The other primary geomorphological data

are Landsat MSS, Landsat TM and SPOT satellite images, which vary in age, resolution and cloud cover.

Apart from the Guidelines noted above, the only published geomorphological analysis of the whole country is by Motegi (1998). The Chiba University reports include some regional and detailed geomorphological studies (Eguchi, 1987, Takada, 1991). Woehrer (1992) describes geomorphological aspects of the forestry development area near Ura. Baillie & Norbu (2002) analyzed the longitudinal profiles of the country's main rivers, interfluvies and relief. Topography is of peripheral interest to a wide range of environmental scientists, and many of them note geomorphological features in relation to their specialist studies. For example, geological reports have included field observations of drainage patterns and valley forms (Srivastava & Das 1982; Golani & Singh 1993), Strahler stream orders (Ravindra & Chattopadhyay, 1982), and river terraces (Jangpani, 1964 & 1968). Soil survey reports note topographic features and include discussions of river terraces, slope stability, and other geomorphological features.

Soils

A recent summary of the soils of the whole country (Baillie *et al.*, 2002) is based mainly on the soil survey reports by the National Soil Services Centre, backed up by the land resources surveys by the Land Use Planning Project and some earlier *ad hoc* studies (e.g. Sinclair Knight, 1983; Okazaki, 1987).

Climate and Hydrology

The main source of primary climatic and hydrological data is the Division of Power of the Ministry of Trade and Industry. There are summaries in Land Use Planning Project (1994) and Land Use and Statistics Section (2001).

Biota

The Flora of Bhutan characterizes all of the vascular plants so far found in the country (e.g. Noltie, 1994;). Some individual families and genera have also been reported separately (Pradhan, 1999). The Chiba University reports (Ohsawa, 1987 & 1991) analyse aspects of plant ecological relationships and distributions. The maps and reports of the Forest Resources Division of the Ministry of Agriculture contain much information about the distributions and current management status of many plant species and communities. Inskipp *et al.* (1999) covers all of the main birds of Bhutan, and there are studies of individual groups (Pradhan & Wangdi, 1999; Pradhan, 2000). There are, as yet, no similarly comprehensive inventories of the mammals or other groups of animals.

Physiographic Structure of Bhutan

Any physiographic zonation is based on a model of how the landscape was formed, how it functions, and how the components interrelate. This section summarizes the general model that underpins our proposed zonation. As the understanding of Bhutan's geo-ecology improves, the assumptions, the model and therefore the zonation will need to be refined.

The geology and topography of Bhutan are shaped by the intense tectonic activity that resulted from the collision of the Indian and Eurasian continental plates, the closure of the intervening Tethys Ocean, and the uplift of the Himalayas. Although the intercontinental collision occurred about 50-40 million years (Ma) ago, the main uplift began at about 25-20 Ma. It may have started earlier in the Western Himalayas, and then progressed eastwards. In the Bhutan section of the Eastern Himalayas the main uplift seems to have been most active 15-10 Ma ago. The rate of uplift was probably not uniform, and the absence of antecedent rivers between the Arun in Eastern Nepal and Kuri in Eastern Bhutan suggests

that uplift was particularly rapid in the Kachenjunga – Kangkar Phuntsum section of the Himalayas (Motegi, 1998).

The collision and uplift heated and compressed thick sheets of rock, and squeezed them southwards and eastwards in a series of thrusts (Motegi, 1997), collectively referred to as the Main Central Thrust (MCT). These rocks now outcrop as intensely metamorphosed gneisses, quartzites, schists and marble, which are intruded with ultramafic and granitic bodies. The intrusions range from pegmatitic veins to the large Miocene batholiths that form some of the High Himalayan peaks. The highly metamorphosed rocks and granites are the eastwards continuation of the Central Crystalline Complex of the Central Himalayas.

In Nepal the complex is flanked to the south by wide outcrops of Lesser Himalayan sediments and metasediments. Bhutan is lithologically more homogeneous, with the gneisses underlying more than 70% of the country (Wangdi & Dorji, 1992), and stretching southwards almost to the Indian border, except in the valley of the lower Kuri and in the southeast. The Lesser Himalayan formations along the southern border and in the southeast include a wide range of sedimentary and low grade metamorphic rocks, including argillites and metargillites, sandstones and quartzites, limestone, dolomite, and gypsum. Apart from these Lesser Himalayan formations, the main non-gneissic rocks in Bhutan are three large outcrops of marine sediments, submarine basalts and their metamorphic derivatives. These rocks originated on the bed of the Tethys Ocean and were metamorphosed during the closure of the ocean and the uplift of its floor.

The MCT has been relatively quiet since about 10 Ma. The main focus of tectonic activity since then has been further south, along the Main Boundary Fault (MBF), which separates the gneisses from the Lesser Himalayan formations. The MBF is the main centre of current seismic activity and the rate of uplift there is in the range 1-10 mm per year. The

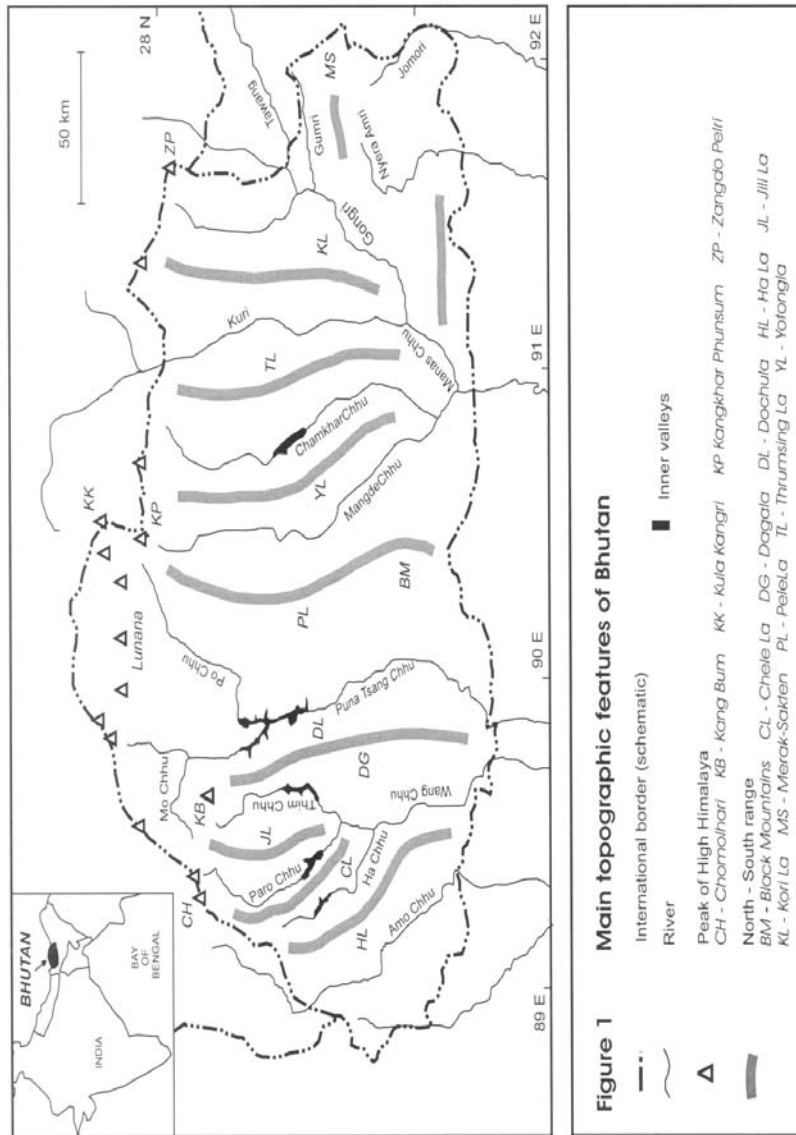
north and centre are seismically less active but are still rising at 0.5 - 5 mm per year.

The topography is shaped by the combination of substantial uplift and relative lithological uniformity. The dominant topographic features are the High Himalaya, close to the northern border, and the large mountain ranges and deep valleys that run southwards from it (Figure 1). The crests of the main N-S ranges are uneven and rugged, but have long stretches approximately concordant at 3500 - 4500 m. The southern ends plunge down to rugged foothills and the alluvial plains of Assam and Bengal. Several of the ranges in the west and centre of the country (from Dochula to Yotongla) have dips in their middle sections and rise again to the south (Baillie & Norbu, 2002).

The rivers of Bhutan are effective in clearing large volumes of debris. For example, the Gumri annually removes 10^5 - 10^6 m³ of soil and rock from the recently reactivated Shongri landslide complex at Radhi, without significant accumulation as an alluvial cone at the Shongri-Gumri confluence or as sandbanks in the main river. The rivers flow steeply more or less southwards to the Brahmaputra. There are many glacial lakes in the High Himalaya, and a few small - medium sized lakes at lower altitudes but none of these form substantial sediment traps in the manner of the Karewa beds of the Kashmir valley or Midland basins and Siwalik duns of Nepal (Gansser, 1983b).

The North-South Rivers are working down to the common base level of the Brahmaputra, but their dissection histories and longitudinal profiles of their beds vary considerably (Baillie & Norbu, 2002). The Kuri and Gongri -Tawang in the east are antecedent rivers, and rise on the Tibetan Plateau. They have cut gorges through the High Himalaya as the range has risen. In contrast the rivers in the centre and the west of the country are consequent to the main MCT uplift and rise on the southern slopes of the High Himalaya. Puna Tsang

Figure 1



Chhu is deeply incised, passing Punakha at about 1200 ma.s.l, whereas Chamkar Chhu is still above 2600 m where it passes Jakar Bridge, at about the same latitude as Punakha. The differences between the rivers in downcutting history and longitudinal profiles are attributed to local variations in pulses and pauses during uplift, faulting, rock barriers to the upstream migration of knickpoints, and to local events such as damming by landslips and debris flows (e.g. Motegi, 2001). Although steep by global standards (Meybeck *et al.*, 2001), the gradients of the riverbeds are not exceptional for the Himalayas (Watanabe & Rothacher, 1996).

In western and central Bhutan the main valleys widen out in their middle sections to form relatively open valleys, with straight or concave lower slopes. The floors of these valleys are at altitudes ranging from 1100 to 2600 m, are up to a kilometre wide, and have substantial alluvial deposits. The valleys in eastern Bhutan are cut deeper, and have steep convex side slopes, narrow V-shaped valley floors and negligible alluvium. The topographic differences between the east and the rest of Bhutan are illustrated by comparison of the profiles of the riverbeds and crestlines of Thim Chhu/Dochula in Figure 2A and Kuri/Thrumingla in Figure 2B. All of the rivers run in deep, narrow gorge-like valleys through the southern mountains, with frequent high cliffs on the lower slopes. In the front hills the rivers have strike-aligned E-W stretches where they follow soft rocks between ridges of harder beds.

Bare rock accounts for less of Bhutan than expected from the mountainous terrain, and much of the surface is mantled with drift materials. The most widespread deposits at high altitudes are glacial and periglacial mixtures of stones and sand. At lower altitudes, many of the slopes are covered with colluvium, which is a mixture of soil and stones deposited by slow creep and many small landslips and slumps. Some slopes have deposits from large landslips. These are larger, more frequent and more extensive in the South, where the

rainfall is heavy and intense, rocks are relatively soft, and there are more earth tremors to set the slips going.

The valleys of the East-West tributary streams ('rong chhu') in the west and centre of the country are floored with deep and poorly sorted mixtures of soil and rock. These appear to have been deposited very rapidly by sudden floods, possibly after rapid ice melts at the end of glaciations, by the breaching of landslide dams, or during periods of exceptionally high rainfall during the Holocene. These deposits are known as alluvial fans, debris flows or mudflows (Laskar, 1995; Ikemoto & Gurung, 2001).

The main N-S Rivers ('tsang chhu') have deposited long distance alluvium in the floors of their valleys. These deposits were laid down at different stages in the down cutting of the rivers, and remnants of the older deposits now form river terraces on the sides of the valleys. The clearest and most complex sequence of terraces is in the Bumthang section of the valley of Chamkar Chhu, where the highest river terrace so far identified there is at 250 – 300 m above the present river level. The highest terraces in the Wangdi-Punakha section of the Puna Tsang Chhu valley are about 100-120 m above the current river level (Motegi, 2001). Alluvia from the main rivers are well layered and well sorted for size, with distinct strata of well-rounded boulders, gravel, sand and silt. They have been transported considerable distances from near the Tibetan border, and are lithologically heterogeneous.

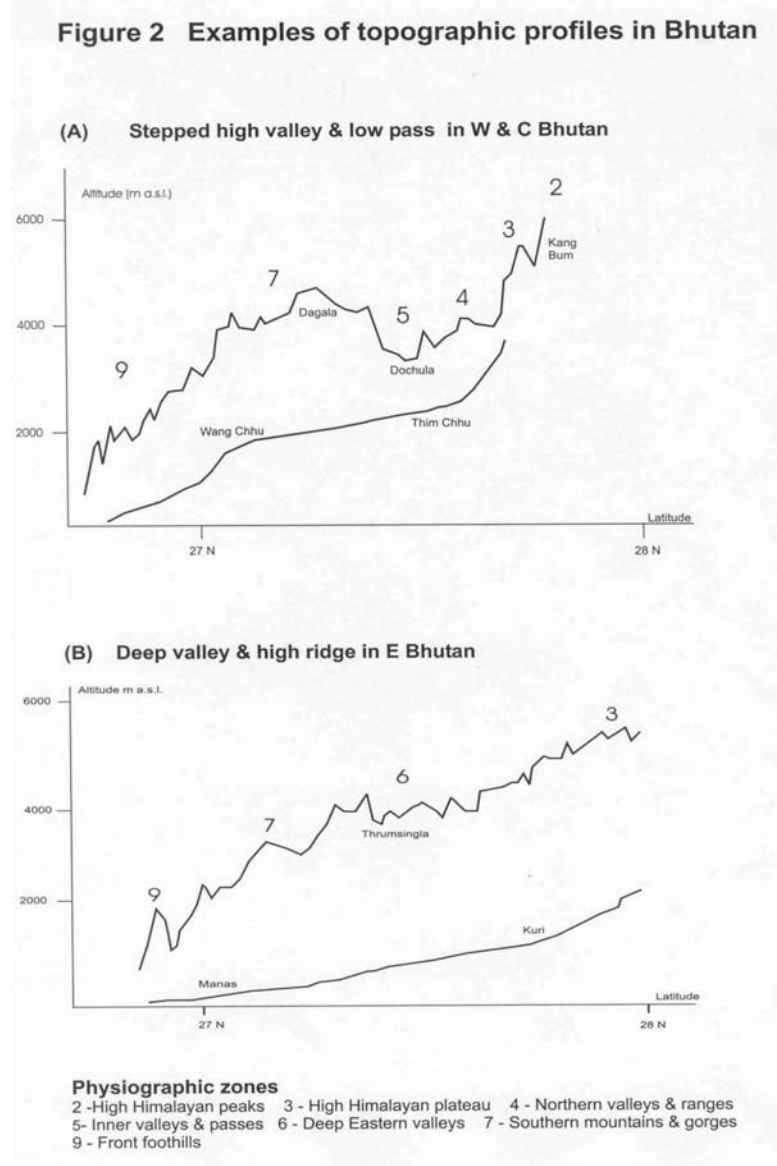
Many rocks, soils and surface deposits are mixed with or covered by windblown silt and fine sand. Much of this comes from local sources, but some probably came from Tibet in cold dry phases in the Quaternary (last 2M years) when the monsoon was weaker than now (Gratzer *et al.*, 1997). It is also possible that minor amounts have blown in northwards from India.

The general climate is wet and hot in the south, dry and cold in the north, dry and warm in the inner valleys, moist and cool on the N-S ranges, and alpine - arctic in the High Himalaya. Temperatures vary with altitude, with lapse rates of 0.5 – 0.6 °C per 100 m of altitude (Eguchi, 1991), and mean air temperatures range from over 20°C to below zero. The winters are dry and bright, dominated by outflows from the Tibetan high-pressure system.

Bhutan is rarely affected by the westerly disturbances that bring significant winter rain to the Western Himalayas (Mani, 1981). The rain falls mainly during the summer monsoon. Precipitation is generally higher than in the Central and Western Himalaya, due to the location close to the head of the Bay of Bengal. Although probably screened from the full brunt of the monsoon by the Meghalaya hills in India, southern Bhutan still receives heavy and intense orographic rainfall, with annual means in the range 2.5 - 5 m and occasional storms of more than 500 mm/day (Land Use Planning Project, 1994). The rainfall data for the central and northern parts of the country show a decrease in precipitation northwards, with many stations recording annual means of less than 1000 mm (Land Use Planning Project, 1994). However, this exaggerates the dryness of central Bhutan, and is due to the location of most of the rain gauges on or near the floors of the inner valleys. These are typical Himalayan dry valleys, and their cloud cover and rainfall are suppressed by strong up-valley and up-slope winds (Whiteman, 2000), e.g. 'Windy Wangdi'. The limited data for rainfall on the hills (Eguchi, 1991) indicate that the middle and upper slopes are considerably more moist than the valley floors. In the far north, places like Lingshi and Laya are above the valley floors and their low rainfalls are taken to indicate genuine regional dryness rather than localised topographic variation.

The river flow data for the central and northern parts of the country show mean annual runoffs of 800 – 2000+ mm (Land Use & Statistics Section, 2000;). As all runoff ultimately

Figure 2



derives from precipitation, some of which is recycled directly back to the atmosphere as evapotranspiration, the river flows confirm that precipitation over almost all of Bhutan exceeds one metre, and that the dryness of the lower slopes of the inner valleys is localised and atypical.

Local annual runoffs are in excess of two metres from high rainfall sub-catchments in the south (Wang Watershed Management Project, 2002). The seasonal pattern of the river flows closely follows the summer rainfall, with the highest flows in July and August, suggesting that hydrological pathways are mostly short and direct. Groundwater aquifers are small and localised, and do not contribute significantly to the overall hydrology (PCI, 1996).

The soils are greatly influenced by the nature of the surface materials, with distinctly different groups formed in glacial and periglacial deposits, colluvium, debris flows, main river alluvia, and windblown material. Various combinations of these result in a high proportion of layered profiles, in which recent deposits bury older soils. There are also altitudinal variations in the processes of soil formation, so that distinctive types of soil profiles are formed in the main eco-climatic zones. The main trends are for leaching, acidification and podzolisation to increase with altitude, together with the slower decomposition and greater accumulation of organic matter (Baillie *et al.*, 2002). Over two thirds of the land cover is classified as forests. Temperature and altitude appear to be the most important determinants of the forest types, which range from subtropical mesic rainforest in the wet southern foothills up to about 1000 m a.s.l., through warm (1000 – 2000 m) and cool (2000 – 3000 m) temperate broadleaf forests, and mixed conifer forest at 3000–3500m, to subalpine East Himalayan silver fir forest at 3500 – 4000 m. Precipitation and moisture supply are also significant, and the altitudinal sequence is clearest in moist areas.

In drier areas, especially on the slopes of the inner valleys, pines replace the broadleaf forests. Open woodlands of chir pine (*Pinus roxburghii*) are dominant below about 1800 m, with forests dominated by blue pine (*P. wallichiana*) from there up to about 3000 m, reaching 3300 m in disturbed sites (Ohsawa, 1987). Aspect affects local patterns, with broadleaf forest on moister and cooler northern slopes and pines on the warmer and drier southern slopes of the same valleys. In the alpine zone above the treeline, at about 4000m, exposed windward slopes have short floristically diverse grassland, whereas more sheltered leeward slopes have dense scrub of dwarf Rhododendrons and juniper.

Physiographic Zonation of Bhutan

Figure 3 schematically outlines their spatial relationships, and Figure 4 shows their general distribution.

Trans-Himalayan Plateau

Satellite imagery shows Bhutan's northern border as extending beyond the crest of the High Himalaya in places, so that the kingdom includes two small areas of the trans-Himalayan plateau. The larger is to the north of the Lunana Range, and the other is to the northwest of Chebisa, near Lingshi, but is too small to show on Figure 4. These areas appear similar to the adjacent areas of Tibet. The valleys are wide and U-shaped and the interfluves are rounded, giving generally moderate relief and slopes. There are several large lakes and dry lakebeds. The imagery indicates that the area is dry, as is to be expected from its location in the rain-shadow behind the High Himalaya. Figure 4 shows this zone as part of the High Himalayan region, but this has been done only for cartographic convenience and because the zone is insignificant within Bhutan. The landscape is quite different from the High Himalaya, and is really part of the Tibetan plateau.

There are remnants of rugged glacial plateaux at 4000+ m along the southern fringe of the high peaks. The landscape of this sub-zone looks rather more Fenno-Scandinavian than Alpine. It has rugged - rolling topography, with local relief often less than 500 m.

Figure 3

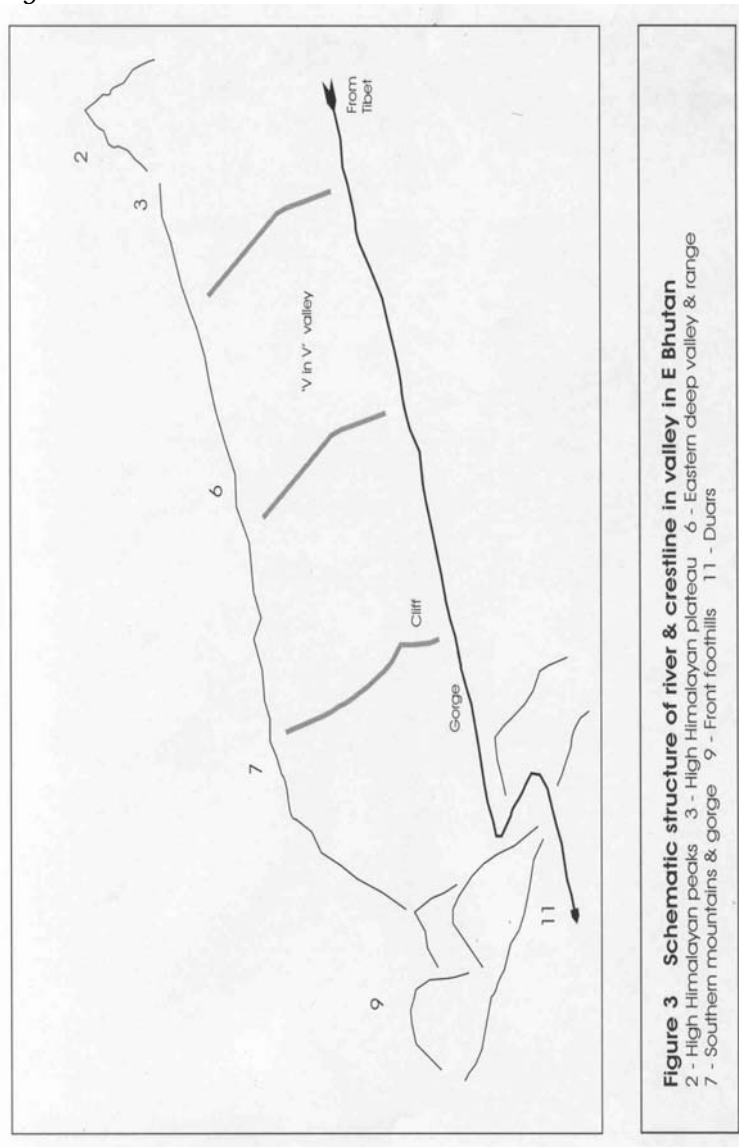


Table 1: Proposed physiographic zones of Bhutan

Zone		Altitude range (m a.s.l.)	Climate	Bedrock	Surface drift	Landforms	Hydrology	Soils	Natural vegetation
High Himalayas	Trans-Himalayan plateau	4000 – 5500	Alpine – arctic; dry	Tethyan metasediments	Glacial, periglacial, aeolian & lacustrine	Wide U-valleys; some with old lake beds; rolling interfluves	Limited runoff; some drains internally to lakes; rest northwards to Tsangpo	Not seen, but probably limited development	Sparse high altitude steppe
	High peaks	5000 – 7600	Alpine & arctic; sub-humid	Gneiss; Tethyan metasediments; intruded by granites.	Snow, ice & bare rock; glacial & periglacial drift	V high mountains; glaciers & glacial lakes in U-valleys	Snowmelt contributes to spring runoff	Stony debris.	Mostly bare; some mosses & alpines
	Dissected plateaux	4000 – 5500	Alpine; sub-humid		Bare rock, glacial & periglacial; some aeolian	Rolling dissected plateaux with many lakes & wide U-valleys		Stony debris; silty meadow soils & scattered shallow peat.	Much bare; alpine grassland; juniper & Rhododendron scrub
N-S valleys & ranges	Northern valleys & ranges in W & C	2000 – 4500	Temperate – alpine; subhumid	Gneiss, schist, quartzite & limestone with intrusions; some Tethyan	Periglacial, aeolian & colluvium on slopes; some alluvium in main & side valleys	High N-S ranges; deep U- valleys upstream, more V- downstream	Moderate runoff	Temperate forest soils, stagnogleys, podzols & alpine meadow soils.	Mixed conifer & fir forests; alpine meadow & scrub
	Inner valleys & passes in W & C	1100 – 4000	Temperate – subalpine; moist on slopes, sub-humid on valley floors.		Periglacial, aeolian, colluvium on slopes; substantial alluvium in main & side valleys	High N-S ranges; wide valleys with river terraces & large side valley fans	Moderate runoff from mid & upper slopes but low from valley floor & lower slopes.	Temperate forest soils, stagnogleys, & podzols.	Chir pine woodland on lower slopes; temperate broadleaf upslope; temperate & subalpine conifer forests at higher altitudes
	Eastern valleys & ranges	500 – 4000	Warm temperate – subalpine; moist on slopes, dry - subhumid on valley floors.	Gneiss, schist, quartzite & limestone with intrusions; some Lesser Himalayan rocks	Periglacial, aeolian, colluvium on slopes; little alluvium in main & side valleys	High N-S ranges; deep, narrow V – valleys; few terraces or fans	Moderate runoff from mid & upper slopes but low from valley floor & lower slopes.		

N-S valleys & ranges	Southern mountains & gorges	400 – 5100	Subtropical –alpine; wet - moist.	Gneiss, schist, quartzite & limestone with intrusions	Periglacial, aeolian, colluvium on slopes; v little alluvium in valleys	High N-S ranges, with plateau remnants; deep, narrow & steep valleys & gorges	High runoff from lower slopes; moderate from higher altitudes	Subtropical & temperate forest soils, stagnogleys, podzols & alpine meadow soils	Subtropical & temperate broadleaf forests; temperate subalpine conifer forests; alpine meadow & scrub
	Merak-Sakten block	1500 – 4500	Temperate – subalpine; moist	Tethyan metasediments	Periglacial, aeolian, colluvium on slopes; substantial alluvium in high valleys	High E-W block; upstream valleys wide with terraces & fans; valleys downstream deeper & steeper	Moderate runoff	Temperate forest soils, stagnogleys, podzols & alpine meadow soils.	Some chir woodland in lower valleys; temperate & subalpine conifer forests, alpine meadow & scrub
South	Front hills	100 – 2000	Tropical – temperate; v wet.	Lesser Himalayan sedimentaries & metasedimentaries.	Deeply weathered rock & colluvium; much landslide debris; limited alluvium	Alternating E-W & N-S valleys & steep ridges	V high runoff	Deep, stony, & unstable; highly leached & weathered	Tropical, subtropical & warm temperate broadleaf forests
	SE Bhutan	100 – 3000	Tropical – temperate; wet.	Lesser Himalayan sedimentaries & metasedimentaries.	Deeply weathered rock & colluvium; much landslide debris; limited alluvium	Alternating E-W & N-S valleys & steep ridges	High runoff	Deep, stony, & unstable; highly leached & weathered	Tropical, subtropical & temperate broadleaf forests
	Piedmont (Duars)	100 – 600	Tropical – subtropical; wet - v wet.	Quaternary alluvium	Torrent & fan alluvium; mostly coarse grained	Low angle piedmont fans & terraces; wide braided river beds	High runoff; some groundwater	Deep, stony, raw alluvial soils; highly leached	Tropical & subtropical broadleaf forests; riverine scrub

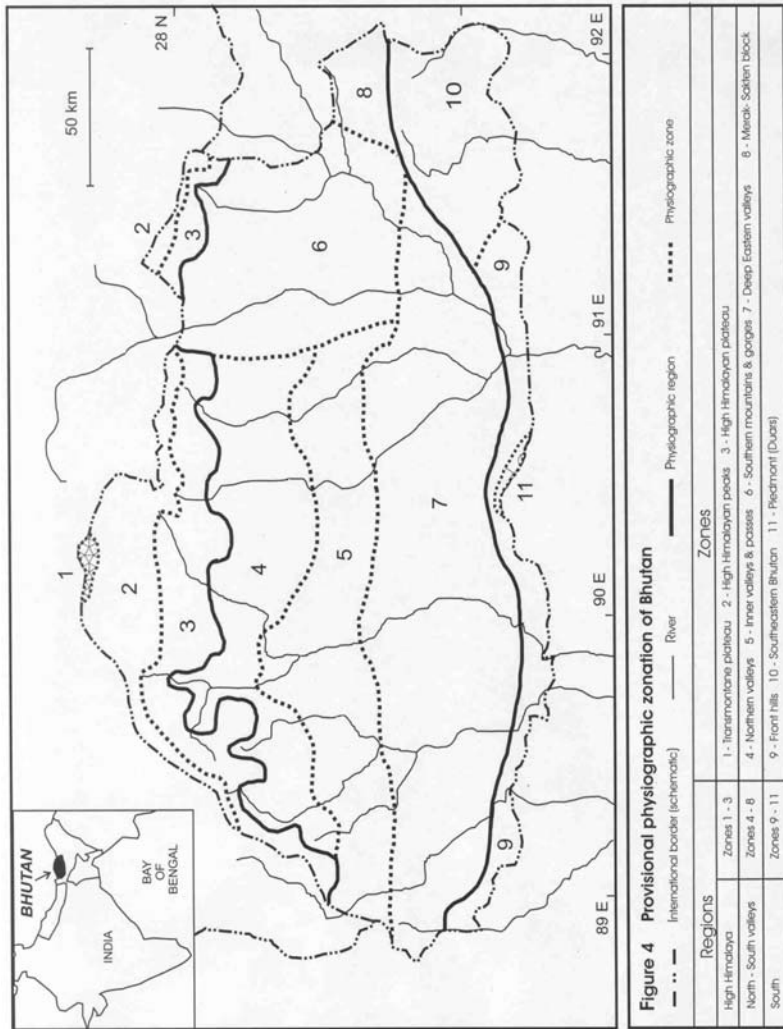
The 1: 50 000 maps and satellite imagery show that many of the drainage patterns are poorly defined, with indeterminate watersheds on lake-dotted uplands. Most of the lakes are in cirques, and are linked as cascade systems down to the northern reaches of the main N-S Rivers. Much of the surface is covered with glacial debris, and periglacial processes, such as frost heave and ground patterning, are locally active. There are areas of alpine meadow soils in wind-blown sands, and patches of frost-heaved shallow peat in gently sloping and poorly drained sites. Where the ground is not bare, the vegetation consists of short grassland on exposed windward slopes, with dense but stunted *Rhododendron*, juniper and *Vaccinium* scrub in more sheltered sites.

The Kang Bum block on the upper Thim/Mo watershed is shown as an extension of the High Himalayan plateau in Figure 4. The area around the summit is above 6000 m, and is actually as an outlier of the peaks zone but this is too small to be mapped separately.

North - South Valleys and Ranges of Western and Central Bhutan

This is the most extensive region. The dominant feature is the North-South lineation of the valleys and ranges, although many sections of the rivers are aligned slightly obliquely, mostly NNW-SSE. These deviations are thought to be due to structural lineations in the underlying bedrock.

Figure 4



There are three zones within this group. They are differentiated according to the form of the valleys and configuration of the ranges.

In central and western Bhutan, the northern zone, the valleys are U-shaped and were shaped mainly by glacial processes. They become deeper, steeper and more V-shaped downstream, where river dissection becomes dominant. The interfluvial ranges between these northern valleys vary from glaciated plateau remnants with alpine scrub in the north to steep-sided sharp ridges with fir forest further south. Although the ridges are high, the valley floors are also at high altitudes, so that relief in the northern subzone is moderate, at about 2000 – 2500 m. The side valleys are narrow and steep and are floored with discontinuous and jumbled bouldery torrent deposits.

The central zone is formed by the inner valleys and low passes. The interfluvial ranges are sharp ridges, with mixed conifer and blue pine forests on the lower slopes and fir forest above. However, they are relatively low, so that the relief is gentler in this zone than elsewhere. For example it is only 900 m from the valley floor at Semtokha up to Dochula (Figure 2A), and similarly from Jakar up to Yotongla. The slopes are moderate by Bhutanese standards, and the passes are the main routes for East-West travel. The side valleys are relatively gently graded and deep, unsorted deposits of debris or mudflows, which terminate in alluvial fans and floor their wide lower reaches. These abut the river terraces and floodplains formed in long distance alluvium deposited by the main N-S Rivers.

The southern zone consists of high mountains and deep gorges. The crestline of the Dochula range rises southwards from the pass at 3100 m to 4700 m in the Dagala range. Similarly the Pelela range rises southwards from 3400 at the pass to about 5000 m in the Black Mountains. The Dagala landscape is periglacial, with undulating high U-shaped valleys, cascades of cirque lakes, and frost-heaved ground patterns. It is topographically and eco-climatically similar to,

but spatially separated from, the plateaux sub-region of the High Himalaya. The Black Mountains are more dissected and rugged than Dagala, and lack extensive rolling areas with glacial lakes. The main rivers run through the southern mountains at low altitudes, so that the valleys are narrow and deep, and include stretches of gorge. The combination of high summits and low valleys gives very high relief, with, for instance, a drop of over 4100 m from the Black Mountains down to Puna Tsang Chhu. The very steep lower slopes in this zone include many high cliffs. The lower sections of the side valleys are very steep and rocky, and some of them end as waterfalls over cliffs. This zone includes some of the most rugged terrain in Bhutan, which hampers North-South movement.

Deep Valleys of Eastern Bhutan

The valleys of Ku Ri and Gong Ri-Tawang form a variant of the North-South valleys and ranges. In this zone the valleys do not open out in their middle sections and stay deep and narrow from the southern mountains to the northern border. The ranges do not have distinct mid-latitude dips, so that relief is considerable throughout (Figure 2B). The upper sections of slopes run down to a convexity, below which they are distinctly steeper, giving the 'valley within valley' form (Figure 3) noted by Sinclair Knight (1983). This shape appears to have been formed by two major phases of river down cutting, separated by a period of relative stability. The side valleys are mostly steep and narrow and have few debris- or mudflows and alluvial fans. The narrow main valleys have few long distance alluvial deposits. Because the valleys are deep, the dry lower slopes are extensive and there are substantial areas of chir pine woodland.

Merak – Sakten

The Merak-Sakten zone is an anomaly located on a Tethyan outcrop that is separated from the main Tibetan block. The block is aligned East-West and reaches altitudes of over 4000

m, where there are periglacial drift deposits and alpine vegetation and soils on the dissected summits. The block disrupts the general North-South drainage pattern and prevents Nyera Amri from cutting back to the High Himalaya. Instead its headwaters drain the southern section of the massif, and its upper course runs East -West. The northern part of the block is drained by Gum Ri, which also runs East -West, parallel to the axis of a syncline in the Tethyan sediments. The upper parts of the valleys are wide and gently graded and have substantial terraces, e.g. Sakten. Downstream the rivers cut down steeply, and the valleys are narrow and rocky

Front Hills

The south of the country is separated as a distinct region, and the foothills at the southern ends on the main ranges form the most extensive zone within it. The hills are drained by E-W tributaries of the main rivers, and also by streams that flow directly southwards to the duars. This zone lies to the south of the Main Boundary Fault and is underlain by Lesser Himalayan rocks. Its topography is somewhat aligned parallel to the E-W strike, and the main rivers show a degree of structural control, although many of the low order drainage patterns are dendritic. Thus the lower Amo and Puna Tsang have rectangular courses, with alternating E-W and N-S reaches. Similarly the lower course of the Wang is rectangular in the Gedu-Darla area, and has a strike-aligned WNW-ESE stretch of 15 km from Sinchula to Piping, where it turns southwards again.

Many of the Lesser Himalayan meta-sediments and sedimentary rocks are of low competence against erosion. As they are also subject to heavy and intense rainfall, runoff and surface erosion rates are high. In addition, the MBF runs along the northern edge of this zone and is still active. The saturated soils and highly weathered rocks are subject to frequent and substantial landslides, some of which are seismically triggered. This zone has one of the highest

proportions of unstable slopes in the country. The minor valleys tend to be floored with recent, deep, and unstable landslip debris.

Southeastern Bhutan

In the southeast of Bhutan the MCT swings northeastwards and away from the MBF. The outcrops of the intervening Lesser Himalayan formations therefore broaden out to the east of the Manas and to the south of Merak-Sakten, and are more than 40 km wide at the border with Arunachal Pradesh (Bhargava 1995). The effects of the marked E-W geological lineation on the topography are less marked than in the Lesser Himalayan outcrops in Nepal, and there are no clear equivalents of the Mahabarat Leh, Duns or Siwaliks. However, although much of the landscape is quite jumbled and has sub-dendritic drainage systems, there are some structural effects. For instance, the Manas follows an E-W course for 20 km down from its confluence with Kurung Nadi to its confluence with Mangde Chhu. This trend is extended further east for another 9 km by the thalweg of Kurung Nadi. The floor of this 30 km trench is at about 150-200 m a.s.l., and is separated from the piedmont (duars), which is only 5 - 7 km to the south, by a marked E-W ridge. Similar structural effects can be seen in the valleys of Nyera Amri and Jomori. Like the front foothills, this zone has high rainfall, extensive outcrops of incompetent rocks, and is traversed by active faults. It therefore has a high proportion of unstable slopes, many landslides, and choked side valleys. It corresponds with the narrow ridge and valley region mapped in the adjacent part of Arunachal Pradesh (Chakrabarti *et al.*, 1987)

Duars (Piedmonts)

The duars are the piedmont fringes of the Brahmaputra alluvial plain (Chakrabarti *et al.*, 1987), and are the East Himalayan equivalent of the terai of Nepal. The largest remnant of the duars in Bhutan covers about 60 km² around Geleyphu. There are several others but these are too small to

show on Figure 4. Clastic Quaternary alluvial deposits wholly underlie the duars. The main topographic elements around Geleypphu are gently sloping linear or slightly concave colluvial aprons and alluvial fans; wide braided river beds and floodplains with extensive sand and gravel spills; and wide tilted river terraces at heights of 3 - 20 m above the floodplain. The smaller areas of duars in Bhutan mostly have only the upper fringes, and consist mainly of colluvial deposits at the base of the foothills, and the unstable alluvial fans of flashy streams, e.g. Patsakha. Their corresponding floodplain and terrace elements lie to the south of the border. There are spectacular views of these landforms from the Bhutan foothills, such as that of the braided floodplain of the Torsa from Sorchen.

Figure 4 shows the duars as part of the South region, but this has been done only for cartographic convenience and because the zone is of very limited extent within Bhutan. The landscape is quite different from the southern Himalaya, and is really part of the Brahmaputra-Ganges alluvial plain system.

Further Subdivision

The proposed zonation is generalised, and is intended for national and regional scales. It will be necessary to subdivide the zones for more local or detailed studies. Subdivision on physiography will give land systems, similar to those in Zhemgang and the Wang watershed. It is quite easy to fit the Wang land systems into the proposed zones. Five of them qualify for the Front Hills zone of the southern region. The others are in the N-S Valleys zones, with seven in the Southern Mountains, 12 in the Inner Valleys, and five in the Northern Valleys. The watershed includes large areas of High Himalayan peaks and plateau, but these were mapped as a single region and not differentiated into land systems (Wang Watershed Management Project, 2002).

Specialists may wish to define subzones on particular aspects of the environment. For instance, geologists might subdivide the N-S valleys on the basis of bedrock, with separate units defined for gneissic, schistose and Tethyan outcrops. Hydrologists, and soil and life scientists may feel that the present zones encompass too much variation in altitude, temperature and moisture status, and may wish to define altitudinal or climatic subzones

Conclusion

However, it is premature to talk of subdivision until the general approach has been accepted and adopted. The next stage is to see if geologists, ecologists, hydrologists and other field scientists find the zonation useful. If they do, they are invited to suggest improvements and refinements. This journal would seem to provide a good forum for the exchange of views and for the dissemination of consensus.

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TYPES OF LAND DEGRADATION IN BHUTAN

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Introduction

There is a growing global awareness that land degradation is as much a threat to environmental well-being as more obvious forms of damage, such as air and water pollution (e.g. Greenland & Szalboics, 1994; Conacher, 2001). Although the source of land degradation is usually local, its effects often stretch for considerable distances from the source site. It can impact large areas and many people. Governments, NGO's and community groups therefore have the right and duty to be concerned, and to intervene and assist where needed.

Because of its topography and altitude, Bhutan has inherently limited resources of productive land. Moreover, the predominantly steep slopes put these resources at particular risk from some forms of degradation. Land degradation is therefore an even more serious threat in Bhutan than in most places. This is recognised in policy, vision, and review documents, such as the Biodiversity Action Plan (MOA, 1998), the National Environment Strategy (NEC, 1998), and Bhutan 2020.

Practical action has also begun on the ground. Khangma RNR Research Centre undertook a multi-village land degradation assessment in the six eastern dzongkhags (Turkelboom *et al.* 2001). This was a participatory survey for extension agents and farmer, and it did not get deeply involved in technical aspects of land degradation. The National Environment Commission has also conducted participatory non-technical surveys of land degradation, and

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has assisted communities to plan local remedial action plans (NEC, 2000).

Sustainable and successful intervention requires clear understanding of the nature of the problem. In order to clarify what is meant by land degradation and to quantify its global extent, the Food and Agriculture Organisation and the International Soils Reference and Information Centre initiated the Global Assessment of Soil Degradation (GLASOD) in the early 1990's (Oldeman, 1994). Young (1994) applied the GLASOD classification and criteria in a survey of land degradation in South Asia. Unfortunately it was compiled without data from Bhutan. Initially he tried to extrapolate to the situation in Bhutan from neighbouring parts of the Himalayas, but felt that this gave an exaggerated picture of degradation in the country. In the end he assumed that 10% of Bhutan's cropland is subject to some degradation, but only one tenth of that is assumed to be more than slight.

Planning, practical intervention on the ground, and discussion of the Bhutan situation in the regional and global contexts (e.g. Bhutan – Bangladesh Joint Team, 1990) all require clarification of the types and extent of degradation in the country. As a contribution towards this, the National Soil Service Centre and the Wang Watershed Management Project held a technical workshop at Semtokha in October 2001. The aim was to frame a comprehensive inventory and technical descriptions of the land degradation processes, effects and indicators that are important in Bhutan. This paper summarises the main findings.

Definition of Land Degradation and its Interactions with Natural Hazards

We started from GLASOD's functional definition of land degradation (Oldeman, 1994), but extended it to include

diversity as well as productivity, i.e. 'Land degradation is the decline of land's capacity to sustain agroforestral and other biotic production and diversity due to human activity.'

This definition has significant implications:

The definition excludes decline in productivity that is due wholly to natural causes, and land degradation is restricted to anthropogenic effects. The definition in the South Asian survey (Young, 1994) did not restrict degradation in this way, nor did Stocking (2001). However Stocking and Murnghan (2001) indicate that land degradation includes all productivity-reducing effects that are due to 'inappropriate use', implying that degradation is a result of human activities. The definition excludes changes, no matter how visible, that do not detract from the land's productivity.

The exclusion of natural processes is particularly problematic in Bhutan. Because of its high relief, steep slopes, and location in a zone of orogenic (mountain building) activity, the landscape of Bhutan is naturally dynamic. Ultimately, much of the Eastern Himalayas are destined to end up adding to the huge fan of sediments that floors the Bay of Bengal. There are many very powerful natural processes such as river down cutting, erosion of slopes, and landslips, that are working vigorously towards this. Much of the landscape of Bhutan is only quasi-stable, and needs only a small trigger to destabilize it and for its surface materials to slip down slope and eventually be washed downstream. Several kinds of human activity can provide the trigger and carry some potential risk. When this kind of change occurs, it is difficult to distinguish between the small anthropogenic trigger, i.e. land degradation as defined above, and the large natural event that was poised and waiting to happen. For example, a substantial landslide at Radhi has been attributed to a single leaking standpipe (Sharma *et al.*, 1998). If this diagnosis was correct, it is clear that the surface material was delicately balanced and was ready for almost any event, no matter how small, to start it sliding.

We therefore do not attempt to distinguish rigorously between anthropogenic degradation and natural processes. Instead we indicate how processes that detract from land's productive capacity can be initiated and/or intensified by human activities.

Land degradation processes are interactive, sequential and cumulative. For instance, quite small depletions of some nutrients may lead to a decrease in soil organic matter. This in turn may weaken the physical structure of the topsoil, making it easier for rainfall and surface runoff to remove it. In this way a relatively minor change in soil chemistry can lead to erosion. Similarly, minor forms of erosion can intensify rapidly, and small rills can grow to large gullies. We indicate the more important of these causative and sequential relationships in Table 1.

Main Types of Land Degradation and Associated Natural Hazards in Bhutan

Table 1 summarises the Semtokha workshop's inventory of the main types of land degradation in Bhutan. Readers requiring more technical detail are referred to WWMP (2002). The following discussion concentrates on the types that are most extensive in rural areas. The other types of degradation in Table 1 do not affect such large areas. However they can be very severe and may be locally important.

Table 1: Types of land degradation in Bhutan (In Situ-Chemical)

1. Soil Type: Depletion of soil Organic Matter			
Effects	Interactions with other types of degradation and natural hazards	Triggering & intensifying human activities	Occurrence in Bhutan
Lighter topsoil colours Reduced soil reserves of moisture & nutrients Reduced crop cover & yields Soil structures weakened Soils harder & more difficult to cultivate Reduced soil biodiversity	Intensifies: - Nutrient depletion - Acidification - Erosion	Some depletion inevitable when forest or grassland converted to arable Offset by organic fertilisers	Most acute on chhushing Also in kamshing or short fallow tseri
2. Soil Type: Depletion of Nutrients			
Deficiency symptoms Reduced crop yields and plant cover Increased susceptibility to pests & diseases (remove)	Intensifies: - Acidification - Erosion	Excess harvest off-takes without fertilizers Burning and wind-blow of ash	Widespread (intensively cultivated areas)

3. Soil Type: Soil Acidification			
Drop in soil pH Possible P, K, Ca & Mg deficiencies Decreased nodulation in legumes	Reduces availability of nutrients & induces deficiencies Possible nitrate contamination of streams	Nutrient depletion (Ca, Mg) Excessive N fertiliser	Less likely in soils with limestone derived from limestone, e.g. Paro Excess urea on some maize and rice No reports so far in Bhutan of nitrate or nitrite toxicity in streams
4. Soil Type: Over-fertilization			
Induced deficiencies of other nutrients	Possible eutrophication or contamination of streams	Excessive P fertiliser (potato and apple crops)	Possible excess P fertiliser applied to apples in W Bhutan Eutrophication unlikely in fast flowing streams. No lakes in Bhutan appear to be vulnerable
5. Soil Type: Industrial & Urban Pollution			

Visible presence of pollutant Land bare & sterile	Pollutant may leach through to streams Bare soil highly vulnerable to surface erosion	Effluents from plants, workshops & urban waste	Not extensive – but some cases around Thimphu & in South
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Table 2: Types of Degradation (In Situ Degradation-Physical)

1. Soil Type: Topsoil capping			
Crust forms on surface Reduced infiltration of rain & irrigation water Delayed or reduced seedling emergence	Increases runoff & surface erosion	Insufficient organic fertilisers Exposure of bare soils during heavy rain	Silty & fine sandy soils vulnerable Land freshly cultivated for kamshing vulnerable Chhushing land protected by surface water
2. Soil Type: Subsoil compaction			
Slower drainage Reduced root growth & yields of crops Increased firmness in upper subsoil	Increases runoff & surface erosion Increased risk of waterlogging	Cattle grazing on wet land Continuous use of standard ploughing tools (same level of depth)	Widespread in chhushing
3. Soil Type: Water logging			
Increased wetness Increased gleying (bluish grey colours) & rust mottling	Increases runoff and surface erosion Increases	Over-irrigation Leaking or broken irrigation	More common on logging roads than public highways

Types of Land Degradation in Bhutan

Reduced yields Increased aquatic & hydrophilic weeds	susceptibility to land slips	channels Blockage of natural drainage lines by roads & other structures	
Degradation involving removal – non-water erosion			
4. Soil Type: Glacial erosion			
Freeze-thaw cracking & rockfalls Glacier scouring & moraines	Provides loose deposits prone to wind and water erosion Moraine or ice dammed lakes burst, cause floods	Natural	Only at altitudes above 5000 m
5. Soil Type: Wind erosion of soil			
Loose bare fine sand deposits Reduced crop & plant yields & cover	Organic matter & nutrients depletion	Cultivation of fine sandy soils in windy conditions	Not extensive – mainly in very windy valleys, e.g. Wangdi
6. Soil Type: Wind erosion of ash			
Surface ash stripped Light coloured bare topsoil exposed Decreased crop yields	Contributes to nutrient depletion May contribute to soil acidification Deposited ash vulnerable to sheet erosion	Panshing and tseri	Not extensive – needs concurrence of fresh ash & strong winds
7. Soil Type: Cultivation erosion (movement of dry soil downslope by repeated cultivation)			

Light coloured subsoil exposed at top of field & deep deposits of dark topsoil deposited at bottom Reduced yields in upper parts of fields	Exposed subsoil & fresh topsoil deposits vulnerable to sheet & rill erosion	Repeated cultivation on steep slopes	Mainly in kamshing, noted in maize in Eastern Bhutan & in potatoes in Phobjika Effects similar to more extensive sheet erosion.
Water (+ gravity) erosion			
8. Soil Type: Splash erosion			
Stone-capped pillars Light coloured subsoil exposed	Increases runoff & sheet & rill erosion Depletion of organic matter (& nutrients) by preferential removal of light organic particles	Bare soil exposed by clearing & cultivation during heavy rainfall.	Fine sandy silty topsoil common in Bhutan are vulnerable Not severe in fields, as premonsoon rainfall is fairly gentle, crop cover substantial by time of heavy rains Moderate severe in spoil heaps
9. Soil Type: Sheet erosion (topsoil particle removal by non-channelled sheet runoff)			
Sheet flow across surface during heavy rain Light coloured subsoil exposed Dark coloured topsoil deposits build up behind obstructions Reduced crop	Light particles moved preferentially - organic matter & nutrient depletion Develops into rills & gullies	Exposure of bare surface during heavy rain Deforestation Forestry & flagpole skidding trails Livestock trails Additional runoff	Sheet runoff not seen often, but reported on some clay-rich soils in Eastern Bhutan Exposure of light subsoil & build up of organic-rich behind obstructions common

Types of Land Degradation in Bhutan

yields & plant cover Increased runoff		from leaking irrigation channels	Effects similar to tillage erosion
10. Soil Type: Rill erosion			
Runoff concentrated in small & temporary streamlets Small (< 0,5 m deep, < 1 m wide) channels (removable by cultivation)	Develops from splash & sheet erosion Develops into gully erosion Organic matter & nutrient depletion	Exposure of loose & bare topsoil during heavy rain Unchecked sheet & splash erosion Skid & stock trails Additional runoff from leaking irrigation channels	Widespread when pre-monsoon rains are heavy
11. Soil Type: Piping erosion (Subsoil pipes parallel to ground surface formed by concentrated seepage flow)			
Subsoil pipes & tunnels Depressions in ground surface	Associated with waterlogging & subsoil compaction	Increased by creation of free faces, e.g. road cuttings, irrigation terrace	Much subsoil seepage, especially in chhushing, but piping not

where pipe roofs collapse Irrigation channels disrupted	Collapse depressions can coalesce to form gullies Concentrated seepage facilitates landslips Subsoil removal gives some nutrient depletion (very little organic matter)	risers Leaking irrigation channels Over-irrigation	extensive
12. Soil Type: Gully erosion (Deep & wide erosion channels)			
Channels 0.5 – 30 m deep, 1 – 100m wide Complete removal of productive land Disruption of irrigation channels & other structures Large volumes of sediment downslope & downstream Lowering of local water table	Develops from rills Head & side walls vulnerable to landslips Fresh sediment vulnerable to further surface erosion Severe depletion of organic matter & nutrients	Unchecked rills Skid & stock trails	Gneissic sandy loams not very erodible Some deep red clays, e.g. Lobeyesa – Punakha, highly erodible & deeply gullied
13. Soil Type: Mass movements (landslips & landslides)			
Deep scar, with steep head- & sidewalls Floor of exposed bedrock or jumbled debris Complete removal of productive land Destruction or	Risk increased by subsoil compaction waterlogging & piping Secondary slides develop in gully walls	Deforestation Free faces, e.g. road cuttings Over-irrigation & other water logging activities	Prolonged & deep saturation increase mass, reduce cohesion & increase landslide risk - highest in South Phyllites & other clay-rich rocks are vulnerable

Types of Land Degradation in Bhutan

disruption of infrastructures			Gneissic soils & weathered rock fairly stable
Large volumes of sediment downslope & downstream			Some slides triggered by earth tremors, even if very small
Lowering of local watertable			
14. Soil Type: Ravines (Large long combined gullies & slides)			
Long deep scar, with steep head- & sidewalls	Develops by extension of landslip by subsequent gulying	Unchecked gullies & landslides	E.g. Shong Ri at Radhi, many examples on South
Floor of exposed bedrock or jumbled debris	and/or	Continuation of land management that caused gully &/or landslip	
Same effects as landslips but on larger scale	Enlargement of gully by secondary landslips		
River processes			
15. Soil Type: Bank erosion			
Complete loss of productive land	Erosion upstream may sharpen hydrograph peaks & make bank erosion more likely	Often natural	Not widespread in Bhutan
Loss or disruption of irrigation other infrastructures		Intensified by removal of bank-side vegetation	But concentrated on productive valley areas
Cut-off slip face	Cliff liable to	Increased local stream-flow from drainage &	

or cliff	gullying & secondary landslips	irrigation runout	
16. Soil Type: Flooding			
Burial of productive topsoil by raw debris Blocks irrigation channels & disrupts other infrastructures	Downstream of severe erosion Deposits easily re-eroded, by further river erosion or by wind	Accentuated by land clearance & erosion upstream	Concentrated in productive valleys, e.g. 1968 flood in Paro (additional information)
Tectonic natural hazards			
17. Soil Type: Earthquakes			
Surface deformation Loss & disruption of structures	Even minor tremors can trigger landslides	Natural Risk possibly marginally increased by heavy loading by e.g. high dams & deep reservoirs	All Himalayas are high risk zones (IV & V) in Indian classification But Bhutan mostly in slightly lower risk zone IV But minor tremors felt moderately frequently Effects possible 100+ km from epicentre
Urban & industrial			

18. Soil Type: Encroachment			
Productive agroforestral land converted to urban, mining or industrial uses	Associated with pollution	Population growth & urbanisation	Mainly Thimphu, Paro, Jakar & in South
19. Soil Type: Pollution			
Productive land degraded by solid, water- or airborne contamination	Special types of chemical or physical degradation	Effluent mismanagement	Mainly Thimphu & South
20. Soil Type: Spoil tipping			
Burial of productive topsoil by raw mining or construction spoil Sediment loading of streams	Bare spoil vulnerable to water & wind erosion Much stream degradation – may be ephemeral Extra loading by spoil can destabilize underlying soil & whole slope liable to landslips	Completely anthropogenic Most acute where spoil tipped ‘over the edge’	Not extensive But HEP & road construction generates large volumes of spoil & stream sediments, e.g. Chhukha Dzongkhag

	Some spoils chemically &/or physically unfavorable to plant growth		
21. Soil Type: Riverbed mining for construction sand & gravel			
Local depressions in river bed	May intensify bed erosion downstream	Completely anthropogenic	Not extensive & probably not significant yet (Extensive in the west and south Main area is Punakha – Wangdi stretch of Puna Tsang Chhu Need to scrutinise sediment budgets & off-takes in future

We follow GLASOD (Oldeman, 1994) in differentiating between processes that degrade the soil *in situ*, i.e. without removal, and those that involve the detachment and removal of soil or weathered rock, i.e. ‘erosion’, in its widest sense.

In situ Degradation

In situ degradation processes and their effects are less spectacular than erosion, and are not always easy to identify. However, they are the most extensive kinds of land degradation in Bhutan. Their effects in reducing agricultural production have not been quantified, but are almost certainly substantial. Although serious, these forms of degradation are mostly reversible, if they are identified before they develop

into erosion, and if sufficient remedial measures are undertaken promptly.

The list starts with *in situ* chemical degradation, which includes decreases in soil organic matter, depletion of nutrients, soil acidification, and pollution (Logan, 1990). The most widespread in Bhutan is the depletion of soil organic matter. Organic matter levels are naturally moderate - high in forest and grassland soils in Bhutan. They are usually substantially reduced when the vegetation is cleared for cropping, and by the repeated disturbance of topsoils when land is cultivated (Francis *et al.*, 2001). The decline is more marked in the intensive soil cultivation associated with basin-irrigated rice (chhushing), than in soils under rainfed cropping (kamshing), orchard or bush fallowing (tseri). As the organic matter is an important soil store for available water and nutrients, the decreases tend to reduce chemical fertility. In addition, because the large and complex soil ecosystems of animals and microbes depend on organic matter, soil biomass and biodiversity decline. The soil organic matter and the various gums produced by the soil inhabitants are important for cementing particles together to form porous and fertile crumbs and other soil structures. Loss of organic matter reduces the strength of these structures, so that the soil's physical fertility and stability are also diminished(remove this line), and the soil becomes more vulnerable to erosion.

The degree of darkening of moist topsoil colours gives an indication of organic matter status. However, care is needed, as small quantities of organic matter can have a disproportionate effect in sandy soils and give quite dark colours, whereas clays may not look particularly dark, even with moderate or high contents of organic matter.

Bhutan has an enviable and still vigorous tradition in the use of organic fertilisers (Norbu, 1997). Multiple benefits derive from sustaining soil organic matter at moderate or high levels, and organic fertilisers should therefore not be seen only as sources of plant nutrients. Chemical fertilisers can supply nutrients (FAO, 1990), but cannot provide the physical

and ecological benefits of organic matter. They should therefore not be used as substitutes for organic fertilisers, and shogshing and related practices need to be kept up.

Nutrient depletion occurs when the nutrients removed by crop harvesting, fire and erosion exceed the inputs from fertilisers, rock weathering, and deposition from the atmosphere. It is sometimes associated with soil acidification. Balanced fertilisation (organic as well as inorganic), mixed cropping, crop rotation, and effective soil conservation can counter nutrient depletion, and soil nutrient fertility can be sustained as long as the soil remains physically stable.

Soil acidification is a particular type of nutrient depletion (Schreier *et al.*, 1995). It occurs when the cationic nutrients (mainly potassium, calcium and magnesium) are depleted, and are replaced by the acidic cations hydrogen and aluminium, which are released from the soil particles. The process occurs naturally, due to leaching by rainfall and is intensified by the natural acids generated during the decomposition of organic matter. Human activities intensify the process by heavy and unreplaced off-takes of the nutrient cations through harvesting and burning. An additional type of agricultural acidification occurs when inorganic nitrogenous fertilisers are applied in excess of the needs and uptake capacity of the crop. The excess nitrogen forms acids in the soils and accelerates the natural leaching of cationic nutrients (Tang *et al.*, 2000). Acidification by nitrogenous fertilisers is not uniformly distributed. It is much affected by the soil's parent rocks, and is absent or negligible in soils derived from limestone. For instance, it is a greater hazard in the gneissic hill soils around Thimphu than in the more calcareous hill soils around Paro (Stoessel, 2001). Over-fertilisation with urea, the most widely used N-fertiliser has been noted in maize in eastern Bhutan, and in rice in other parts of the country.

Other types of chemical degradation occur when different chemical fertilisers are applied in excess of crop needs. The

only other instance of chemical degradation of this type so far observed in Bhutan has been attributed to the over-application of P fertilisers in some apple orchards in western Bhutan. The excess P locks up other nutrients in forms that are not available to crops, and induces deficiencies of zinc and iron.

Very severe types of chemical degradation are caused by pollution with industrial wastes. They are of very limited extent so far in Bhutan, affecting only small areas downslope and downstream of a few industrial plants and workshops. However, they are not easily reversed, and can have far-reaching effects off-site, particularly where the pollutants are spread by contaminated irrigation water.

The two most common types of *in situ* physical land degradation in Bhutan is topsoil capping and subsoil compaction. Like chemical degradation, they are not highly visible and tend to overlook. However, they are quite apparent in the feel of the soils, particularly when ploughing and digging. They are widespread and may reduce the productivity of Bhutan's soils more than is realised. Both of them tend to make soils more liable to erosion.

Capping is the formation of a thin but hard crust on the soil surface, which can delay and even prevent seedling emergence. It is mainly due to the beating action of raindrops on bare soil surfaces, especially where topsoil structures are weakened by depletion of organic matter. It is more likely in silty and fine sandy topsoils, which are widespread in the cultivated lands of Bhutan. It is usually a temporary feature, and is less serious than subsoil compaction.

Compaction arises when the structures in the upper subsoil are weakened, the soil particles are compressed together, and the intervening pore space is reduced (Ghildyal, 1978). It is caused by combinations of reduced organic matter, cultivation when the soil is wet, cattle trampling in wet soils after the rice harvest, and high contents of silt and fine sand. In Bhutan it is reported to be associated with chemical

fertilisers, especially urea. If the urea is used as a substitute for, rather than as a complement to, organic fertilisers, its association with compaction may be indirect, mainly due to reduced organic matter. However there may also be a direct microbial-physical effect due to the stimulation of soil fungi by flushes of available nitrogen. Profuse growth of fungal hyphae on the surfaces of soil structures may render them hydrophobic, making it difficult for water to infiltrate and soften dry clods.

Waterlogging is an *in situ* physical degradation process, which tends to affect limited but widely scattered areas. Poor drainage fills the soil pores with water and reduces the supply of oxygen to plant roots. This has serious negative effects on the productivity of most crops. In mountainous terrain like Bhutan there is the serious additional danger that gullies and landslides can be initiated by impeded or uncontrolled drainage. The disposal of excess water is a crucial element in management for land stability in Bhutan. Waterlogging and slope destabilisation are major problems for engineers designing structures on steep slopes (Anon, 1997). It is of particular concern in places where roads and channels have to be constructed across areas of chhushing, as the soils are artificially saturated by irrigation for long periods.

Degradation Involving Removal of Soil and Weathered Rock

The degradation processes that involve the erosion of soil and underlying weathered rock are visible and familiar. They have impacted the public consciousness much more than the more subtle effects of *in situ* degradation (e.g. Wangdi, 1998). They are less extensive than *in situ* degradation but their effects on site are more damaging. Because of the sediment and runoff that they generate, their off-site effects are also more serious (Carson, 1985). Furthermore, many of the effects are irreversible within human time scales and without great expense.

Wind and ice erosion do occur and are noted in Table 1, but are less important. Water and gravity are the main agents of erosion in Bhutan. The water-gravity combination works in three main ways in Bhutan – rainsplash, runoff, and mass movements.

Rainsplash erosion occurs where heavy rain falls on bare and loose soil surfaces. The fine particles are splashed up and do not fall back evenly. More land downhill than uphill of the source, and this results in an aggregate downslope transfer of surface material. The best indicators in Bhutan of this type of erosion are pillars of soil, up to 20 cm high in places, under stones, logs and any other object that protect the surface against raindrop impact. Capping exacerbates this type of erosion.

Running water detaches individual soil particles and carries them downhill. Virtually all runoff occurs at the surface, and gives rise to surface erosion. However, running water in subsoil cavities also detaches particles and erodes subsoil tunnels or pipes. These do occur in Bhutan, but their extent and severity have not yet been assessed.

Surface runoff starts as being diffuse, and detaches soil particles from all over the slope. This is sheet erosion, and it is not easy to identify. The best indicators are a lightening of the topsoil colours, as the dark low-density organic particles are preferentially detached. The accumulation of fine, loose, dark topsoils on the upper side of cross-slope obstructions, such as banks, trees, roots and boulders also indicate sheet erosion.

As the sheet runoff flows downhill, surface irregularities tend to concentrate it into small streamlets. These are known as rills, and they erode small channels in the surface. Rills are common in arable land, when it is freshly cultivated and bare. They are often ephemeral features, which can be smoothed out by cultivation. However, their removal is temporary and

rills can reappear during succeeding heavy rainstorms, unless the land management is changed.

The less spectacular types of surface erosion, such as rainsplash, sheet and rills, are extensive and probably cause significant losses of potential agricultural production. They may remove only the top few centimetres of the soil, but this material is disproportionately rich in organic matter, nutrients, and water-storing porosity, and its removal greatly depletes soil fertility. Also the removal of the organic matter weakens structural bonding, and makes the freshly exposed soil more susceptible to further erosion. This is positive feedback, by which the erosion processes intensify their continuation.

Rills merge downslope and deepen with time, and eventually enlarge to gullies and ravines. These represent a massive increase in the severity of degradation. The land is not just reduced in productivity - it may be totally obliterated. Gullied land cannot be cultivated or logged, and is difficult to graze. Gullies disrupt channels and other infrastructures.

Surface runoff occurs when rain falls faster than it can infiltrate the soil surface. It is the intensity, rather than the volume, of the rainfall that triggers runoff and surface erosion. Splash erosion is also mainly controlled by rainfall intensity. In Bhutan rainfall intensity is correlated with quantity (Turkelboom *et al.*, 2001), and is highest in the South, which is the zone with the most severe surface erosion.

Soils vary in their vulnerability to surface erosion. Soils derived from gneiss are relatively stable and erode less easily than those from other rocks. Bhutan is fortunate in having a high proportion of gneissic soils. Over much of the country surface erosion is less than expected from the prevailing steep topography. However, the very intense rainfall in the South erodes even gneissic soils. Erosion can be more severe on susceptible soils derived from other rock types. The deep red clays and loam derived from non-gneissic rocks in the

Lobeysa-Punakha area are scarred by many deep gullies. Streams draining from these soils, such as lower Lingmutey Chhu, are coloured bright red after heavy rain, due to their loads of eroded iron-rich clay particles (BSSP, 1999).

Mass movement occurs when soil and weathered rock slip as block, rather than as separate particles. The main factors favouring such slippages are steep slopes and complete saturation by heavy and prolonged rain. Slips may be triggered by earth tremors, even if these are very small (Mitchell *et al.*, 2001). As with surface erosion, rock types vary in their susceptibility to mass movement. Landslips tend to be larger and more frequent on clay-rich rocks, such as phyllite. It has been reported from other parts of the Central and Eastern Himalayas that weathered gneiss and gneissic soils are relatively invulnerable to mass movements (Gupta *et al.*, 1993; Gerrard, 1994). This also appears to be the case in Bhutan. The incidence of landslips is lower than expected from the topography, as shown by the relative stability of steep road cuttings in gneisses along much of the East-West highway. The South is tectonically more active, has the heaviest rainfalls and a high proportion of non-gneissic rocks, and it therefore suffers the most frequent and severe landslips.

It is often where that land mismanagement initiates or intensifies *in situ* degradation and the smaller scale forms of erosion such as sheet and rills. However the origins of larger erosion events, such as gullies, landslides and ravines are less obvious, with human activities often appearing to make minor contributions to then natural dynamics of the landscape. The on-going discussion about the origin of the landslide and ravine at Shong Ri in Radhi (e.g. BSS, 2000) is an example of how different observers interpret the balance between natural inevitability and the effects of land management.

Conclusion

It is hoped that this paper will contribute to the typology of degradation in Bhutan. It does not attempt to be exhaustive on the causes, and it gives no estimates of the extent of the areas affected. It intentionally concentrates only the physical processes and effects, and ignores the social dimensions of degradation.

Another aspect not covered is the perception of some erosion and sedimentation sites as opportunities rather than threats (Stocking & Murnaghan, 2001). Himalayan farmers, including those in Bhutan, are adept at creating agricultural land out of gullies and landslips (Carson, 1992; Gerrard & Gardner, 2000). Examples in Bhutan include the small and ephemeral fields created on the floors of the gullies downslope from Bajo Laxhang, and the sustained rice production on land at Radhi that appears to have been subject to multiple landslips (BSS, 2000).

These omissions need to be made good by further field studies and by interaction with other groups. Eventually, we may perhaps see a 'Land Partnership' in Bhutan, to parallel the recently instituted Water Partnership. Its formation would recognise that the well-being of land and its protection from degradation are important, multi-disciplinary, and multi-Ministry concerns. It could help different groups to see how their work fit into the wider context, and to coordinate their activities.

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AN ANALYSIS OF PEGGED EXCHANGE RATE BETWEEN BHUTAN AND INDIA

*Karma Galey**

Abstract

This paper analyzes the applicability of the theory of optimum currency area to the pegged exchange rate regime between Bhutan and India. Most of the optimum currency criteria hold true for Bhutan and India. The paper then analyzes the implications of establishing a free-floating exchange rate. It outlines the negative consequences and concludes that the present system is optimal. Any attempt to deviate from it will cause economic uncertainties.

Introduction

The financial sector in Bhutan has begun to develop only recently. Bhutan remained closed to the rest of the world till the early 1960s. Until then, there was limited barter trade with India and Tibet. Most internal transactions took the form of barter. Although some historical documents mention the use of coins in Bhutan during the pre-modern period, studies have shown that apart from the coins minted in Bhutan, Indian and Tibetan coins were in circulation. However, barter trade was predominant.

Even after it opened to the outside world in 1961, Bhutan did not have its own banknotes, but transactions were no longer confined to barter. India provided both financial and technical assistance to initiate development activities. Through this assistance, Indian rupees began to circulate in Bhutan. The rupee has been legal tender in Bhutan since then ¹. The use

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¹ For detailed information on coinage and monetization of Bhutanese economy, read "Coinage in Bhutan" in *Journal of Bhutan Studies*, Vol.1, No. 1 (Autumn, 1999) and "Monetisation of Bhutan" in

of money increased with the progress in development activities. A Secretariat of Finance was established in order to facilitate the flow of cash in the country. It was upgraded to a Ministry of Finance in 1968. In that same year, the Bank of Bhutan, which was the first commercial bank, was established. The Bhutanese banknote called Ngultrum (Nu.) was introduced in 1974. In 1975, the Royal Insurance Corporation of Bhutan was established² as the first non-bank financial institution. Developments continued apace. In 1982 the government passed an act that established the Royal Monetary Authority as the country's central bank. In 1988, the Bhutan Development Finance Corporation was established, and in 1993 a capital market came into existence with the opening of the Royal Securities Exchange. The Bhutan National Bank, the first private bank in the country was opened in 1996.

Exchange Rate and Dual Monetary System

Since the introduction of the Ngultrum, the Bhutanese government has pegged it at par with the Indian Rupee. Bhutanese currency has no independent exchange rate vis-à-vis other major currencies of the world. The Ngultrum's exchange rate vis-à-vis some prominent currencies such as the USD or Euro is replicated from the rupee's rate against these currencies. The peg is not an irrevocable one. The Bhutanese government can withdraw from it at any time in favor of its own independent floating exchange rate. It can also decide to peg the Ngultrum to some other currency. This has not happened till now and the exchange regime with India has been maintained for almost thirty years. Another important characteristic of Bhutan's financial sector is the circulation of two currencies. In addition to pegging its currency to the rupee, Bhutan allows free circulation of the

Journal of Bhutan Studies, Vol.2, No. 2 (Winter, 2000), both by Nicholas Rhodes.

² It was mandated with the task of carrying out all forms of insurance business, undertaking commercial and development projects.

rupee in Bhutan. Rupee is accepted as a legal tender. Bhutanese currency is also accepted in those frontier regions of India that have major business transactions with Bhutan. However, it is not accepted in rest of India. Bhutanese do not prefer one currency to the other; Ngultrum and Rupee are equally preferred. While it is hard to provide an accurate estimate, it can be assumed that the volume of rupees that circulate in Bhutan is much lower than Ngultrum. Therefore, in terms of circulation the rupee can be called a subsidiary currency.

Was and Is Pegging a Good Policy for Bhutan?

The crucial question is if this arrangement is beneficial to Bhutan. To answer this question, I will use the theory of optimum currency discussing some of the main economic characteristics of Optimum Currency Areas (OCA) to see if Bhutan's economic conditions satisfy them and therefore support its decision to establish and maintain a pegged exchange rate regime with India.

In his seminal article³ on optimum currency theory (1961), Robert Mundell defines the optimal currency area as a domain within which exchange rates are fixed. His idea of optimum currency theory rests on the existence of a high degree of mobility of factors between countries and regions and between those that experience symmetric shocks from outside shocks such as oil crisis.

Factor Mobility

Free cross-border flow of labor between the countries enables them to smooth out unemployment problems and equalizes wages in different countries and regions. Countries that have free movement of labor between them offer best

³ For those readers interested in the article, it is entitled "A Theory of Optimum Currency Areas" which was published in *The American Economic Review*, Vol. 51, No. 4 (Sep. 1961), pp. 657-665.

circumstances for fixed exchange rates or for currency unions. There is no need to use exchange rate adjustment or other monetary instruments to address the problem of unemployment. Indian workers in Bhutan are required to get Bhutanese work permits. Regulations limiting the duration of employment and the number of Indian workers that Bhutanese firms can hire are strictly enforced. Given these facts, one would tend to think that the mobility of labor between Bhutan and India is limited. However, because the size of the Bhutanese workforce is very small, a large number of Indians are hired to work in Bhutan. The presence of so large a number of Indian workers is an indication that there is some mobility of labor⁴, although the number would be even larger had it not been for these restrictions. Bhutanese workers, on the other hand can move freely in India⁵. Thus, the mobility factor as a determinant for having fixed exchange rate holds only partially true for Bhutan.

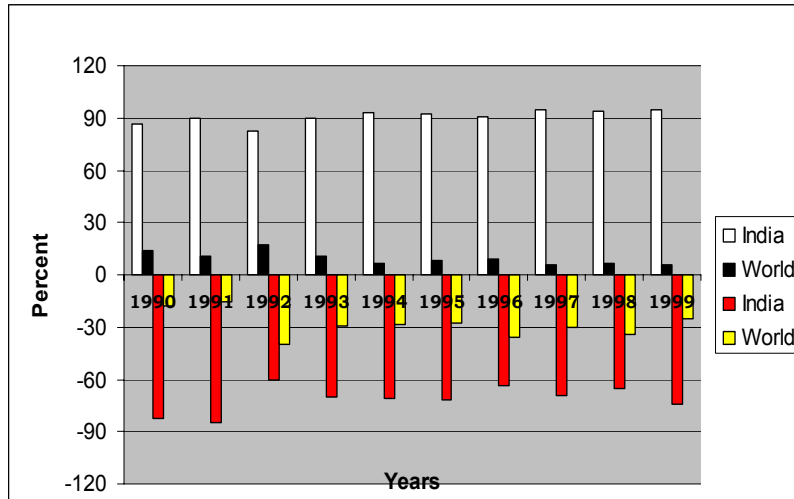
Trade Integration

A country with a high geographic concentration of its international trade will find it convenient to use a common currency in its transactions with its trading partner. This will reduce transaction costs. This criterion also validates Bhutan's decision to peg its exchange rate to the Indian rupee and to allow the circulation of Indian currency within Bhutan's boundaries. As is obvious from the chart below, over 90% of Bhutan's exports go to India and about 70% of its imports come from there. The upper panel of the chart shows the split in Bhutan's exports between India and rest of the world. The lower panel shows their relative in Bhutan's imports.

⁴ No official statistics were accessible at the time of writing this paper but I would estimate that over 50,000 Indians (close to 7% of Bhutan's population) work in Bhutan.

⁵There is no empirical evidence to support this. Because the workforce is so small and the work opportunities are better in Bhutan, Bhutanese rarely go to India to find jobs.

Figure 2: Bhutan's Exports and Imports from India and rest of the world



Source: International Financial Statistics, IMF, 2001

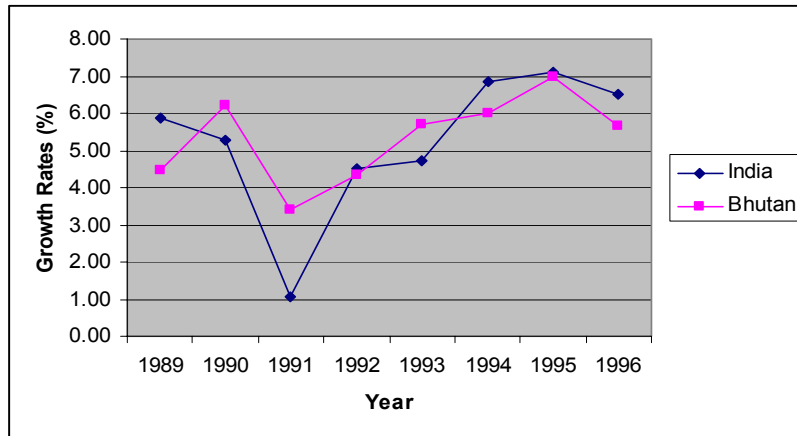
Symmetric Shocks

Countries are said to experience symmetric shocks if external changes like a sharp fall in the supply of oil or other economic goods affect all the countries in a similar way. For example, a sharp fall in the supply of oil could cause a decline in the outputs of various countries in a particular region. Countries facing symmetric shocks make better candidates for an optimum currency area and tend to have pegged or fixed exchange rates. When shocks are highly correlated, a depreciation of one country's currency against the other will not be effective in stabilizing outputs. Since both are experiencing the same shock, both will be induced to devalue and, as they are devaluing at the same time, neither of them would succeed in changing the relative prices of its own goods to make them more competitive in the market.

In order to see if these arguments hold true for Bhutan and India, I have chosen output growth for some years before and

after 1991 for analysis. In 1991, India experienced a balance of payments crisis. Its whole economy suffered from sluggish growth. A host of factors, including its own past policies were held responsible, but the crisis was triggered mainly by the oil shock of 1991. We see in figure 3 that Bhutan and India experienced a symmetric shock. Both experienced a sharp decline in growth of output in 1991 followed a largely similar upward trend thereafter. There is a high degree of correlation between the business cycles of both countries. Thus, prevalence of symmetric shock as a criterion for establishing fixed exchange rate is valid for Bhutan.

Figure 3: GDP growth rates for Bhutan and India



Source: International Finance Statistics, IMF, 2001

The Size and Openness of the Country

Following Mundell's article, Mckinnon (1963) proposed the size of a country and its openness as one of the main factors that facilitate formation of an optimum currency area. A small country is supposed to derive more utility from its currency if it is linked to some other major currency through a fixed exchange rate system. He also put forward the view that the more open a country, the more likely a candidate the country

is for an optimum currency area. He defines openness as a ratio of tradable goods to non-tradable goods. An economy with a higher ratio of tradable to non-tradable goods is considered more open. Economies that are highly open prefer fixed exchange rates. For them, a change in exchange rates will not be accompanied by any significant changes in the real competitiveness of the economy. Such small economies have very little or no influence at all in international trade. Exchange rate changes will not be accompanied by changes in the prices of its tradable goods. Therefore, manipulation of exchange rates will only cause fluctuations in domestic prices and will have no impact on the international competitiveness of the economy. Improvement in the trade balance for small economies can only be achieved by lowering domestic expenditures while maintaining the same level of outputs.

According to this criterion, Bhutan's decision to peg its currency to the rupee is valid. An economy is normally considered small when its influence in international trade is very insignificant. Bhutan's influence in international trade is obviously small or nonexistent. I have validated this idea of "small and open economy" by comparing Bhutan with its main trading partner, India. I have used Stanoeva's idea of smallness.⁶ She measures the relative size of country i (Bhutan in my case) to country j (India) as their GDP ratio at constant price. But I have used the subscripts b and i, for Bhutan and India, respectively. I have used the GDP at factor cost in place of GDP at constant price⁷. I have chosen 1995 as the year of comparison as during this year both the economies grew at a rate of over 7% and experienced an inflation of around 10%. The ratio is very small, as seen below⁸.

$$\text{SIZE}_{bi} = \text{GDP}_{tb} / \text{GDP}_{ti}$$

⁶ <http://sceco.univ-aix.fr/cefi/colloques/stanoeva.pdf>

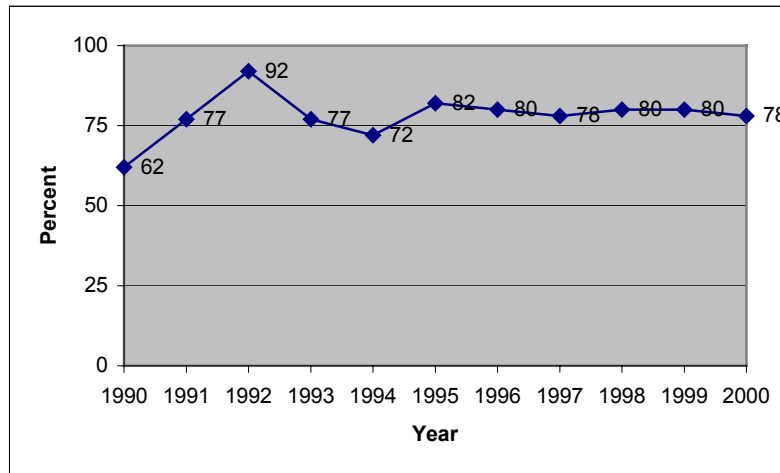
⁷ The GDP figures at constant prices were not readily available. GDP figures cited above are from *International Financial Statistics, IMF, 2001*.

⁸ The GDP figures are in millions of rupees.

$$SIZE_{ij} = 9610.60/10732700 = 0.00089 (0.09\%)$$

For openness, I have chosen the ratio of Bhutan's total trade values (i.e. exports plus imports) to its GDP for the period 1990-99. The ratio is significantly large throughout the period confirming that Bhutan is a highly open economy. This further validates the optimality of the decision that Bhutan has taken to peg its currency.

Figure 1: Trade-GDP Ratio



Source: Compiled from IMF Financial Statistics, 2001

Degree of Product Diversification

Highly diversified economies make better candidates for currency areas than less diversified economies. Diversification provides some insulation against a variety of shocks, thereby not necessitating frequent changes in exchange rates to stabilize the swings in economy arising out of different macroeconomic shocks (pp. 49, Kenen, 1969). Bhutan is not a diversified economy. Agriculture continues to be the dominant sector at over 38%⁹ of its gross domestic product.

⁹ World Development Report, 2000

Over 80% of the population depends on agriculture for employment. However, the export market is dominated by the energy sector. In 1999, electricity constituted over 41% of Bhutan's total exports (Bhutan Trade Statistics, 2000). Given these facts, one can conclude that Bhutan is not a diversified economy. Therefore, Bhutan's decision to peg its currency to the Indian rupee is not valid according to this particular criterion.

Fiscal Integration

A higher level of fiscal integration between countries enables them to weather shocks through endogenous fiscal transfers from a low unemployment to a high unemployment region (Kenen, 1969). Such fiscal integration reduces the cost of fixed exchange rates. This criterion needs some qualification in the case of Bhutan. The country's fiscal policy is linked to that of India's only in the sense that many development activities in Bhutan are executed with assistance from India. When that assistance is not available on time, Bhutan faces some fiscal problems and undertakes some prudent deficit financing. Apart from this, Bhutanese and Indian fiscal policies are totally disconnected from each other. For instance, neither India nor Bhutan makes any fiscal transfers for unemployment problems prevailing in the other. Thus, fiscal integration as a criterion for the pegging of the Ngultrum to the rupee is not valid for Bhutan.

Most, but not all of the economic characteristics discussed in the theory of optimum currency areas appear to apply to the Bhutan-India case. Others require qualification. It can be concluded that the Bhutanese government's decision to peg its currency to the Indian rupee and to allow the rupee to circulate in Bhutan is an optimal policy. However, a qualification to this conclusion needs to be made to drive home the point. It could be argued that the present analysis has been done after Bhutan and India are already in a currency union and that the economic characteristics discussed above are bound to prevail as a result of that

union. These characteristics might not necessarily have existed before 1974 when the peg was introduced. I would argue, however, that the fact that India exclusively financed Bhutan's first two five-year plans and that Bhutan did not have much economic relationship with any other country at that time implies that the economic characteristics supporting a fixed exchange rate would have been in play much before 1974.

Despite apparent advantages, there are also some costs associated with such an exchange rate regime. Bhutan does not have an independent monetary policy, suffers some seignorage losses¹⁰ and its political pride is undermined¹¹. These costs may not necessarily be bad. The costs that Bhutan may have to bear if it were to have a free-floating exchange rate could be much more profound.

A Floating Exchange Rate: Are there any Advantages for Bhutan?

In addition to predominant economic concerns political considerations also play a role in the currency regimes in which countries adopt. Despite the theory of optimum currency areas, most countries seem to own their own currencies (Mussa, 1997, pp. 217). Political factors play an important role even in common currency areas. I will assume, for the sake of argument that the Bhutanese government is going to end the present exchange rate regime and disallow the circulation of Indian currency. It is going to have a free-floating exchange rate of its own. This assumption will allow

¹⁰ It would require the government to print more Ngultrums if there were no free circulation of rupees within Bhutan. The income, in the form of these new notes, would far exceed the cost of printing them. This income is known as Seignorage. So the free circulation of rupees causes some seignorage losses to the government.

¹¹ I have not discussed these costs at length, as they tend to be more or less same across geographical regions and a vast literature on this issue already exists.

us to discuss the potential negative impact of de-pegging the Ngultrum and the Rupee.

In this case, Bhutan would have an independent exchange rate and negative effects of a pegged rate discussed above would disappear. Bhutan's political pride would increase and it would be able to make its own monetary policies. It would be able to earn some revenue in terms of seignorage through the printing of more currency to replace the Indian notes that would stop circulating. While these would be positive consequences of a policy change, the new exchange regime could introduce a host of new costs and complications into the economy.

India would continue to be Bhutan's primary trading partner into the indefinite future. Since the rupee would no longer circulate freely in Bhutan, Bhutanese shoppers would be required to change currency every time they shopped in India. The transaction costs that would emerge could be very high. To the extent that it would be costly to use, a free-floating Bhutanese currency would fail to serve as a convenient medium of exchange. Hundreds of Bhutanese customers shopping in India would no longer be able shop using their own currency. Even if they were able to use the Ngultrum, the Indian shopkeepers would take uncertainties associated with the exchange rate into account and would always try to cover themselves by increasing prices to Bhutanese customers. The latter could suffer substantial welfare loss due to increased transaction costs or due to increased prices.

If the liquidity value of a currency declines, domestic nationals attempt to accumulate foreign bank balances. This happens even if the marginal efficiency of investment within domestic boundaries is greater than outside (Mckinnon, 1963, pp. 722). If the Bhutanese people face increasing transaction costs and other uncertainties from a free floating exchange rate, they would obviously find the liquidity value of the Ngultrum very low and might start opening accounts in

India. This could cause a flight of capital from the country, which in turn would lead to a decline in investments.

Exchange rate uncertainties could also cause a decline in the flow of investments from abroad. This has not been a concern to the Bhutanese economy so far. Foreign direct investments did not exist at all. But now that the government has put in place a Foreign Direct Investment Act and we are trying to open the economy to foreign investors, exchange rate uncertainty should be one of the concerns of Bhutanese policy makers. Economic literature so far has focused on two issues: the impact of exchange rates on investment, and the impact of volatility or uncertainty in exchange rates on the flow of investments. There has been no consensus on either of these issues among economists. Some argue that depreciation of the host country currency increases foreign direct investment and others argue that appreciation of the host currency does the same¹². Similarly, there is no consensus on the impact of volatility of exchange rates on the flow of investment. Cushman (1985) developed a model in which he demonstrated that increased volatility of foreign exchange rates caused an increase in the flow of foreign direct investment. He argued that during periods of exchange rate uncertainty, FDI is preferred to exports as the means of serving the foreign market. In other words, business organizations prefer FDI to export-related activities when the exchange rate is very volatile. But Campa (1993) pointed out that investors are concerned with future expected profits and they postpone their decision to enter or exit as the exchange rate becomes more volatile. He provided empirical proof of

¹² Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach by Kenneth A. Froot and Jeremy C. Stein (in *Quarterly Journal of Economics*, Vol. 106, Issue 4, Nov. 1991); Real Exchange Rate Risk, Expectations, and the Level of Direct Investment by David O. Cushman (in *The Review of Economics and Statistics*, Vol. 67, Issue 2, May, 1985); and Entry by Foreign Firms in the United States Under Exchange Rate Uncertainty by Jose Manuel Campa (in *The Review of Economics and Statistics*, Vol. 75, Issue 4, Nov., 1993)

this argument by showing decline in the flow of investment to the US in wholesale industries, particularly in those where sunk costs of entry were high. Thus, risk neutral firms are deterred from entering foreign markets in the presence of high levels of exchange uncertainty. This view suggests that if a free floating Bhutanese exchange rate turns out to be very volatile, potential foreign investors would be deterred from investing in Bhutan. In that event, our policy of inviting foreign investment into Bhutan would fail and the overall economic development of the country could suffer.

Kenen and Rodrik find that one of the effects of short-term volatility in real exchange rates is the depression of the volume of international trade. If Bhutan's independent exchange rate were unstable, it would have an adverse impact on its international trade. There could also be other effects, perhaps more profound that might arise out of abolishing the currency union. Frankel and Rose conducted an empirical study of the effects of currency unions on trade and output. They found that a currency union increases trade by more than three times and does not cause any diversion of trade away from non-members (Frankel & Rose, 2000). They concluded that every unit of increased trade increases income per capita by more than 1/3 of a percent over a 20-year period and by a more significant amount over the longer run. They conclude that these two effects in turn have a major effect on output. In light of these arguments, it could be argued that Bhutan's withdrawal from the present regime, which is, in effect, a currency union, will result in a decrease in trade, income and output, i.e., we would forego the best economic options available to us.

Conclusion

Bhutan's economic characteristics seem to support the theory of optimum currency area. The current exchange rate regime is, therefore, an ideal policy for Bhutan. Any attempt to deviate from this policy could lead to economic complications. If an independent exchange rate is unstable, a series of

macroeconomic problems would arise, deterring investment and trade; ultimately this would slow the growth of the economy. Unless the Indian rupee becomes unstable, causing economic and political uncertainty in Bhutan, the country should continue to peg its currency to the rupee. Even in such a situation, given the high integration of trade with India, depegging would hardly immunize Bhutan from the effects of fluctuations in the Indian currency. The current exchange rate regime appears to serve Bhutan's interests well.

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