Mapping ethnic diversity in highland Northern Vietnam

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Abstract

In this paper we initially present a critical review of a range of ethnological maps produced over the last 130 years for highland northern Vietnam. In particular we illustrate the many difficulties faced when trying to represent mosaics of ethnic highland minority groups on two dimensional maps. Such historical maps included no attempts to bring topographic details into the picture, an idea that would have been virtually impossible anyway, given the cartographic technologies at the time. Yet by not including such details or not representing them clearly, a partial image of these populations has been created that, over time, has become a standardised representation. Therefore, as a more systematic approach to the analysis of these highland minority groups, we present recent attempts to create more functional maps and models for the northern Vietnam province of Lao Cai, using modern cartographic techniques and geographic information systems. Utilising tools such as digital cartography and digital elevation models a wealth of information can be gained which has the potential, amongst other possible uses, to allow for a greater understanding and sensitivity regarding ethnic minority groups in Northern Vietnam, and their use of the local environment.

Introduction

Ever since the initial years of colonial Tonkin – today's northernmost part of Vietnam – colonial officials attempted to identify and locate the various non-Kinh (non-Viet) ethnic groups inhabiting the upland periphery of the Red River delta. The chief motive of these officials was security on the vast frontier with China. This frontier had been controlled nominally by Vietnamese rulers for the few centuries previously, but had also been under the strong influence of the Chinese Empire. Countless bands of roaming 'bandits' criss-crossed the highlands, levying taxes, pillaging villages and trading posts, and entrenching themselves in strategic locations at the crossing of major waterways. For decades they were a thorn in the side of the lowland Vietnamese rulers, to say nothing of the savagery of their demands on the local mountain populations. The French colonial army which took possession of the mountains in the 1885–1895 years – the 'Pacification War' – decided it could not allow such practices to continue. To quench them, as much as to take control over the local mountain populations, the French *Corps expéditionnaire* (Expeditionary Corps) pushed troops in every direction, along every valley and across every pass. By 1896 they had claimed full possession of the frontier, most 'bandit' chiefs had been captured, and a final border agreement made with China (Fourniau, 1989).

With the conquest completed, the predicament of long-term occupation brought new demands for the French and from 1896 onwards the objective of learning more about the indigenous 'tribes' sharing Upper-Tonkin was placed at the top of the agenda by successive French Governor Generals (Michaud, 2000). Orders were issued to study the *montagnards* (mountain dwellers) in the field, with commanding officers instructed to collect ethnological data and them in turn, putting their subalterns on the job. Thus began the production of the first research-based ethnological maps of Upper-Tonkin.

In this paper, we explore a range of these ethnological maps produced over the past century both during and after colonial times. We explain who their producers were, and for what purposes they were drawn. Following the important initial efforts mentioned above, we show that a number of maps were published which have been interpreted, copied, modified and distorted over colonial times. After recognition of the Democratic Republic of Vietnam in 1954 by the international community, some efforts were made to update this material by the Vietnamese, however it will become clear that for a long time, few if any improvements were made on the ancient colonial maps as war deprived the Vietnamese from the time and the means needed to perform this task more successfully.

Throughout all these previous cartographic endeavours, the notable structural flaws inherent in two-dimensional representations remained. In the second part of this article, we therefore illustrate – using recent maps produced for Lao Cai[1] province, Northern Vietnam – how ethnological map-

ping of the region can become far more informative when contemporary cartographic tools are used. A number of authors (see amongst others Lebar *et al.*, 1964; Kunstadter, 1967; Schrock, 1972) have long agreed that topography is a crucial factor which helps shape economic, political and even cultural positions and identity amongst the highland minorities in mainland South-East Asia. Previous mapping endeavours, by either not including it, or not being able to represent it clearly, have projected a truncated image of these populations that over time has become a standardised representation. We conclude that with new cartographic techniques that allow us to reintroduce topographic factors into ethnological mapping, we in turn have the chance to explore far more successfully the linkages amongst humans and their environments, such as those living in the mountainous regions of Northern Vietnam.

Highland Northern Vietnam: The terrain and the people

The northern mountainous region of Vietnam is officially defined today as including eleven provinces. Lao Cai, the province focused upon in more depth in the second part of this paper is one of these (shown in Figure 1), in addition to Tuyen Quang, Ha Giang, Cao Bang, Lang Son, Lai Chau, Yen Bai, Hoa Binh, Bac Thai, Son La, and Quang Ninh (the mountain province of Nghe An could well be added too, but official statistics do not include it). This rugged terrain is ecologically and culturally diverse (McKinnon and Michaud, 2000). In terms of the physical geography it includes a number of large basin areas, such as the Dien Bien Phu basin, several narrow river valleys including the *Lo* (Clear), *Da* (Black) and *Song* (Red) rivers, and mountain ranges, some comprised of granite and others of limestone, separating parallel river valleys (Rambo, 1997).

This mountainous area of eleven provinces encompasses 89,000 km^2 and is home to just over six million people. At only 70 people per km^2, this stands in contrast to the national average density of 195 people per km^2 (Be Viet Dang, 1993, in Rambo, 1997). The social and cultural diversity of the region is shown by the fact that 31 of the officially recognised 54 ethnic groups of Vietnam live in this area, speaking languages that belong to seven distinct linguistic groups (Khong Dien, 1995). The most numerous ethnic populations there in 1993 were as follows (Be Viet Dang, 1993 in Rambo, 1997, p. 6):

> *The Kinh, with 2.5 million people, have the largest population followed by the Tay (1 million), Thai and Nung (600,000 each), Hmong (530,000), Muong (460,000), and Dzao (440,000). Seventeen groups, including the La Hu, Pa Then, Lo Lo and La Ha have populations under 10,000, with the Tho, Ngai, Si La, and Pu Peo having populations of less than 1,000 each.*

Why is there such cultural diversity in the area? Numerous studies on highland minorities in the Southeast Asian Peninsula have stated that the complex settlement patterns of such populations have been – among other factors of course – directly related to altitude. Many of the highlanders in

the south of the Southeast Asian Massif (Lim, 1984) are late migrants, the Tai-speaking groups moved into the region between one and two thousand years ago, whilst other groups shifted more recently (Michaud and Turner, 2000). For most of these, the highlands were all that was left available for them to occupy upon their arrival from the Chinese periphery (De Koninck, 2000). Perhaps as a consequence of this, but also perhaps in remembrance of their more ancient past in China's remote hinterlands, these societies have developed economic practices, political strategies, and cosmologies that reflect their distinctiveness from the populated lowlands and embody their commitment to living at higher altitudes. Altitude and its correlate, orography, have become identity markers for them, two of the essential elements in the representations these societies have of themselves.

Ethnic heterogeneity in the northern highlands is therefore a consequence of the history of the region that triggered numerous movements of populations over the centuries. Such a history has led to the fact that among the 109 districts of the 11 official northern mountainous provinces, 59 have ten ethnic groups or more present, with nine having 15 groups or more. Even among the communes – or *xa*, the smallest administrative unit in Vietnam – there is no real residential segregation, since of the 2,055 communes in the region, 10.9 per cent have seven ethnic groups or more, while virtually none of the ones established on slopes are mono-ethnic (Khong, 1995, pp. 81–86). The heterogeneity within our study province Lao Cai is shown in Figure 2 where, within ten districts, 17 communes have over ten ethnic groups present.

This interpenetration of multiple ethnic groups within the same territorial unit is, according to Khong (1995), characteristic of the Northern mountainous region. Yet, in ethnolinguistic maps of the past, as will be argued next, such information can easily be misinterpreted since the reader is given the feeling that a specific patch of colour corresponds to a distinct and exclusive territory of a corresponding group, as identified in the legend. Whilst it seems apparent that a more specific categorisation system would be of benefit to recognise the diversity of settlement patterns which have taken place during the region's history, past cartographic efforts portraying this region have failed to produce one. To demonstrate this, we turn now to examine a range of maps designed and published between 1869 and 1997.

Ethnological maps of highland Northern Vietnam

Maps of Colonial Upper-Tonkin

It is impossible in a short paper to review the entire body of maps produced under the French regime which aimed to locate and describe the Upper-Tonkin *montagnards*. Many maps found in public publications such as Lunet de Lajonquière's *Carte ethnographique du Tonkin septentrional* (1904) or EFEO's *Carte ethnolinguistique* (1949) are syntheses of several smaller maps produced in the field at scales and with degrees of precision that vary considerably due to
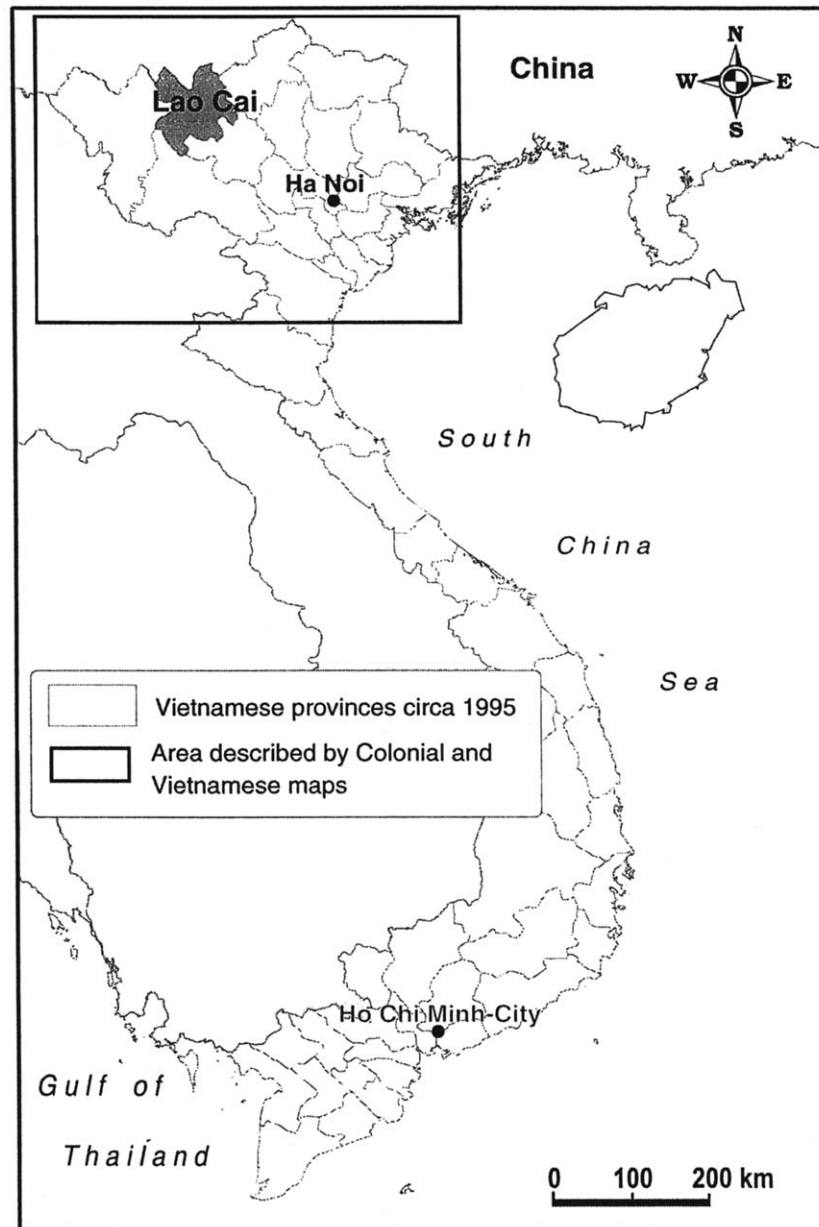
Figure 1. Region of focus in the colonial and post-colonial maps included in this paper, and the province of Lao Cai. *Source*: National Center for Human and Social Science Research, Hanoi, Vietnam, 1994. *Production*: Yann Roche.

the skills and motivations of their particular authors. A number of these early versions still exist in colonial archives in France. Also, numerous 'ethnological' maps can be found among colonial administrative correspondence. Facing such variety, disparity in size, methods, authorship or circumstances of production, we have limited this presentation to some of the most significant published maps – that is, those that have had a significant impact on academic readership and that have been regularly quoted in subsequent publications – and among these, we have prioritised those with the most detailed ethnological representations. Due to the fact that such maps were originally produced at different scales and used different projections, the black and white copies reproduced here have been edited to roughly focus on the northern part of the country, as shown in Figure 1.

1869, The Garnier and Doudart de Lagrée expedition. This map (*Carte générale de l'Indo-Chine*, no scale) was produced over fifteen years before the French military set foot permanently in Northern Tonkin. From the 1860s to the 1890s most maps were related to exploring new navigable routes into Southern China. The 1869 Garnier map, detailed in Figure 3, was produced as an outcome of the Garnier and Doudart De Lagrée Expedition which travelled up the Mekong between 1862 and 1867 (Garnier, 1873). This map is not properly speaking ethnological. It is included here as a starting point to show the extent of Western knowledge/ignorance at that time regarding the northern Vietnam highlands, labelled on the map as *régions inexplorées* (unexplored regions). Its only ethnological contribution was that sporadically, albeit outside northern Vietnam, ethnonyms were written roughly where the said groups were believed
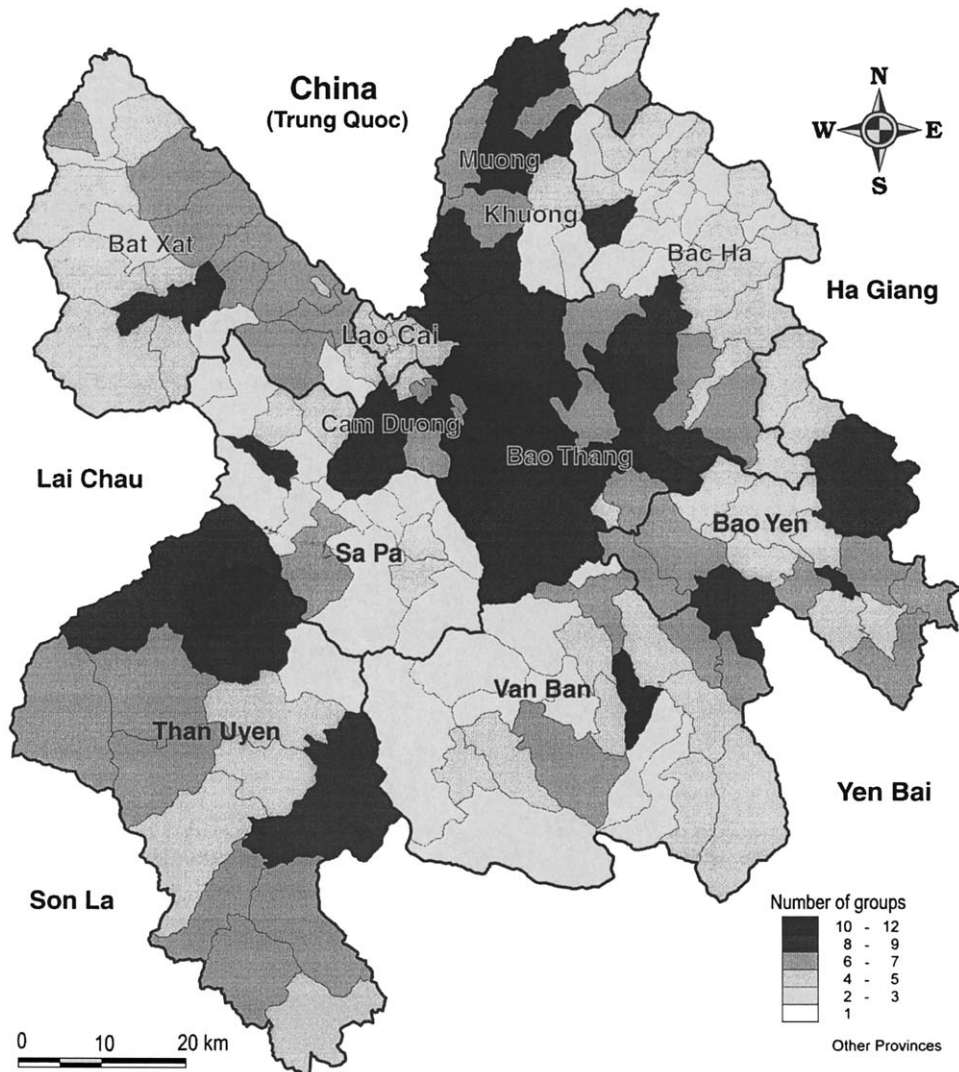
Figure 2. Number of Ethnic Groups in Lao Cai Communes, 1989. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1994. *Production*: Yann Roche. For colour images of this and a selection of the other maps in this paper please refer to http://www.geog.mcgill.ca/faculty/turner/vietnam.html

to dwell, but with no further details provided. Rivers are the main features, and very sketchy representations of mountain ranges also appear.

1904, The Lunet de Lajonquière reports. After their initial occupation of Upper-Tonkin, the French military observed that it was inhabited by a mosaic of peoples. They quickly developed an understanding of the significance of having accurate information regarding these ethnic groups. In the course of short but intensive ethnographic surveys in 1898 and 1903, intended to gather the necessary information to secure friendly relations with local populations in such a strategic region, many written reports were produced. With these reports, ethnic maps appeared as a useful complement.

Then, in 1904 a summary map with far greater ethnographic detail than had been seen before for this region (Figure 4) was created. This was an outcome of the most important ever French ethnographic survey of the Sino-Vietnamese border area, and more specifically, of the populations living on the Upper-Tonkin side of the border (Lunet

de Lajonquière, 1904, 1906). The survey was conducted by military officers posted in each of the then four military territories. From their observations in the field and interviews through interpreters, reports and large scale handmade maps were gathered by the individual commanders in each of these territories. The commanders then edited and sent their versions of the reports and maps to the Commander in Chief, Lunet de Lajonquière who merged the information together in a substantial report to the colonial authorities in 1904 which included the famous '*Carte ethnographique du Tonkin septentrional*' (Lunet de Lajonquière, 1904; 1:1,000,000). The map, roughly 40 cm by 20 cm in size, shows hydrography, borders, and towns. It also displays colour-coded areas following the ethnic categories as they were conceptualised at the time, showing a total of 27 distinct groups, some of them clustered along linguistic families (in particular the *Tai* and the *Man*). Beyond the Chinese border however, only the rivers were drawn, leaving out the fact that many of these groups' dwelling areas extended beyond Tonkin.
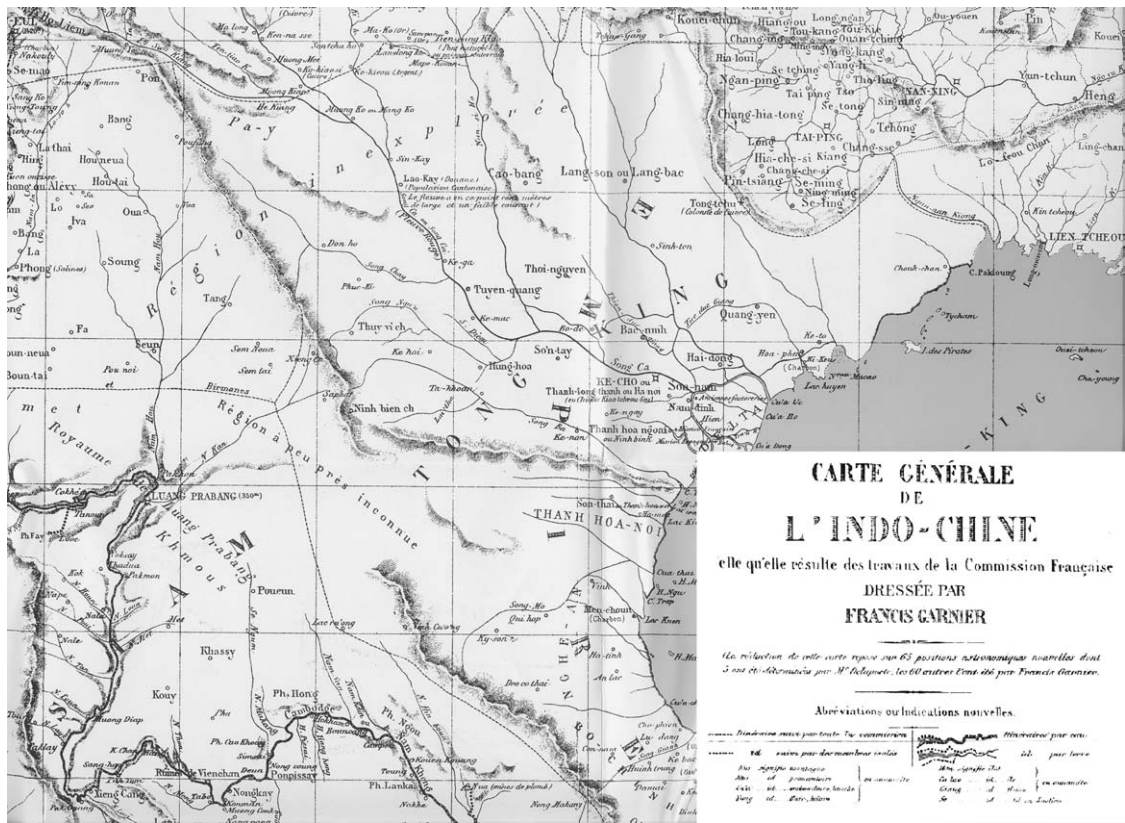
Figure 3. Garnier's 1869 *Carte générale de l'Indo-Chine*. *Source*: Garnier (1873).
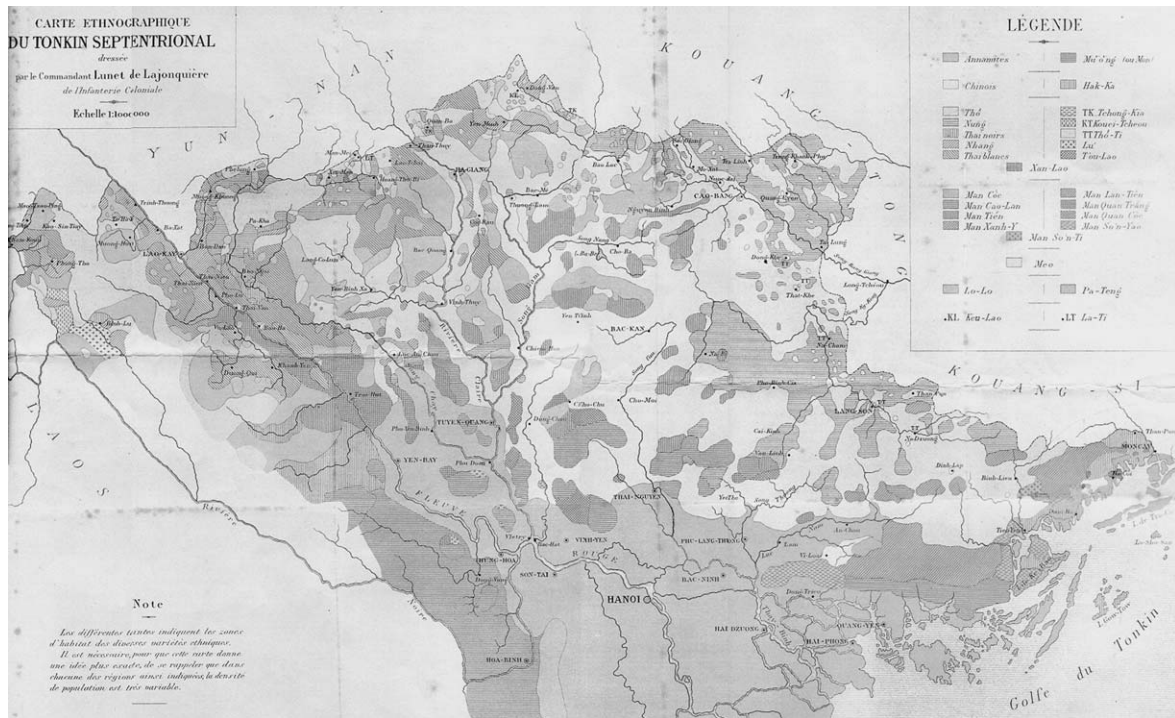

Figure 4. Lunet de Lajonquière's 1904 map. *Source*: Lunet de Lajonquière (1904).

1909, The C-L Gallois Atlas. Using statistics from *Annuaire général de l'Indochine* – an official publication on the administrative, commercial and military state of the colony – Gallois produced in 1909 a complete atlas of Indochina including one ethnological map of Tonkin (*Carte ethnographique*, 1:1,750,000). This map shows the same technical features as the Lunet de Lajonquière map plus roads and administrative divisions, and is also colour-coded to depict the ethnic groups. In addition, within one colour area, subgroups are indicated by their name printed in red where they reside. In total, the Gallois map comprises five linguistic groups – including the Kinh – and a dozen sub-groups. Yet, it is perhaps because of its smaller scale (1:1,750,000 as compared to 1:1,000,000) that it is far weaker in ethnological detail compared to the earlier Lunet de Lajonquière map.

1931, Teston and Percheron's administrative compendium. The Maurice Teston and Ernest Percheron massive compendium of French Indochina, published in 1931, includes one ethnological map of nearly the whole of the Southeast Asia Peninsula, a part of which is shown in Figure 6 (*Carte ethno-linguistique*, no scale). The map is located within the chapter on ethnic groups in Indochina, takes a page, and constitutes a visual summary of the information contained in the text. Like Gallois' map, it was not based on new field work but merged together various unnamed secondary sources available in 1931. In addition to the same features as the preceding two maps minus the roads and the national administrative divisions – no doubt due to the sheer coverage of the map – the Teston and Percheron map breaks new grounds on two accounts: it extends its colour-coded areas beyond borders, including most of southwest China and eastern Thailand; and whilst like Gallois' it shows names of subgroups printed over the colour zones, it includes additional information with a sense of the demographic importance of each group reflected in four different sizes of fonts. Moreover, this representation is more exhaustive with 34 ethno-linguistic groups represented individually with a colour and clustered within five language families: *Môn-Khmer*, *Malayo-polysienne*[sic], *Thai*, *Tibéto-birmane*, *Méo* plus Chinese. Unfortunately, no sources are provided to support these divisions.

1949, Ecole française d'Extrême-Orient. The 1949 *Ecole française d'Extrême-Orient* map – though the actual authorship as written on the map lies with the Geographical Service of Indochina – shown in Figure 7, stands alone, with no explanatory text to accompany it. The precise sources for the information included in it therefore remain unknown. Nevertheless, if one considers the detail of this *Carte ethnolinguistique*, its complexity, its size (by far the largest of those produced over colonial times at 60 cm by 83 cm on a 1:2,000,000 scale), and its originalities compared to the ethnological maps that preceded it, it is probably fair to assume that not only maps published earlier but also a number of new administrative reports and demographic data were used in its production (although we have not unearthed archival evidence for this). The numerous specialists active

within the EFEO at the time must have made a contribution too. It is probably the most detailed and precise map of the ethnolinguistic groups of French Indochina ever produced by the French.

1953, Condominas' transcription of the EFEO 1949 map. This black and white map takes two pages in the second volume of *Ethnologie de l'Union française* (Leroi-Gourhan and Poirier, 1953). It acts as an important link between its acknowledged source, the 1949 EFEO ethnolonguistic map – which anthropologist Georges Condominas transcribed from its original colour coding into monochrome patterns – and some of the next generation of post-colonial maps produced by the Vietnamese, for which features shown on this map served as a model. In terms of the location of ethnic groups, Condominas' map simply copies the 1949 map without significant alteration apart from the necessary use of various patterns to replace the original colours. Condominas however took a few liberties with the model. Reducing the map from its sizeable original to this two-page format, roughly 40 cm by 20 cm in size (scale of approximately 1:7,500,000), the deletion of a number of features was inevitable. As a result, hundreds of place names disappeared, as did a number of ethnonyms on the map, the road and railway networks, innumerable details in the intricacy of hydrography and location of groups, and the linguistically mixed areas. The key was changed too, and the language groups were redeployed according to a different – yet unexplained – logic which still, nevertheless, yielded roughly the same number of distinct entities.

Some general comments on the cartography from colonial times are required here. First, all of the maps shown until now were the result of one or another form of colonial agency aiming at controlling the newly conquered territory and its peoples. In true military tradition, locating peoples on maps was a necessary step to exert power over their destiny. Military resources were readily available to accomplish this task, and the earliest of these maps reveal clear strategic and military purposes since the key elements included were directly related to orders given down the French military chain of command. Then, the colony's security under control and the borders well guarded, the task of mapping ethnicity was subsequently passed onto the colonial administration, in particular to the *Service géographique de l'Indochine*. Building on the initial military productions and copying its main achievements, the latter maps could in addition use colonial statistics and censuses conducted – at least that was the theory – on a yearly basis. Authors of these administrative maps were thus official cartographers hired by the state and aiming primarily at satisfying the state's need for information regarding the exploitation of resources and the management of peoples.

Naming peoples was in itself an issue requiring broad agreement amongst contributors to a given cartographic venture, or, in the lack of one, an editor would be asked to standardize ethnonyms across the board. This need for ethnolinguistical expertise explains the importance of the part played by the scholarly body *Ecole française d'Extrême-Orient*,

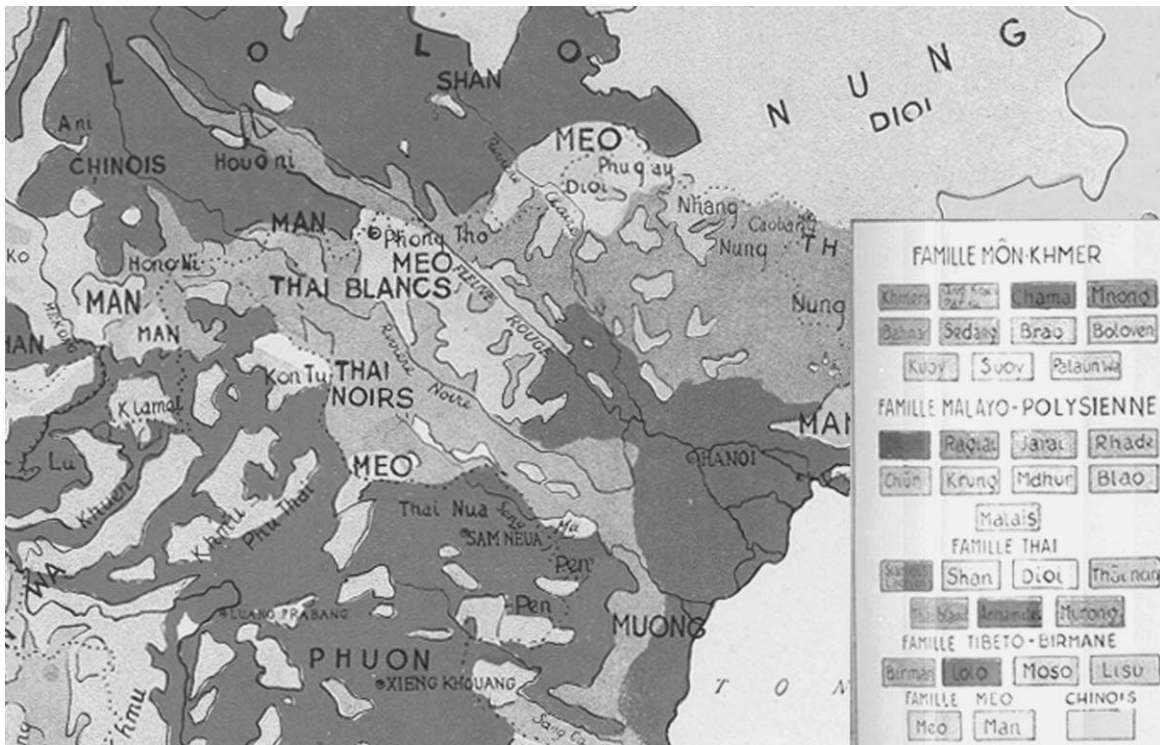*Figure 5.* Gallois' 1909 ethnographic map. *Source*: Gallois (1909).

Figure 6. Teston and Percheron's 1931 map. *Source*: Teston and Percheron (1931).

Figure 7. Extract from the Ecole française d'Extrême-Orient 1949 map. *Source*: Ecole française d'Extrême-Orient (1949).

whose members contributed to the elaboration of several of these colonial ethnological maps. Generally speaking, the ethnonyms used in the colonial maps reflected the most favoured linguistical hypothesis that was needed to support the state's strategy of alliance with certain friendly groups while promoting division amongst other less well-controlled groups. One of many direct consequences of this 'divide and rule' approach was the early separation of the uplands from the lowlands in 1891, when in administrative terms the mountainous regions became 'Military Territories' under total military control, and the rest of the delta was cut into provinces under civilian administration (Teston and Percheron, 1931).

As mentioned earlier, the maps shown here have all been published. But this should certainly not be taken as meaning that the publishers' intentions were to inform a large public. The type of publications that included these maps was highly specific, appealing chiefly to colonial administrators and scholars. While it cannot be doubted that the former were colonial agents, the latter also were linked to the colonial apparatus in more than one way. Consequently, those maps and their readers were all resolutely located within the colonial system and their production reflects a specific mind frame.

Post-Colonial maps

Influenced by policies on minorities in the USSR and China, and not unlike the French colonial administrators before them, the communist regime based in Hanoi had political interests in studying and mapping this ethnic mosaic of highland minority people. Until 1975, whilst they had critical priorities in connection with the ongoing war,

Vietnamese ethnic cartography primarily relied on material gathered by the French. Between 1975 and 1979 however, under ethnological guidance from the USSR, Vietnamese state ethnologists conducted their first national survey and produced the official number of 54 nationalities in the re-united Republic. All maps produced after that date and made public respected that figure and official ethnonyms, and little editing was possible. Yet more recently, under the influence of *Doi Moi*, or the Renovation movement, and with a relative relaxation of the socialist dogma on minorities, Vietnamese ethnologists have designed increasingly accurate, original material on the mountainous regions, home to 'National Minority' ethnic groups (Khong Dien, 1995). We consider here four post-colonial maps, one that reflects the situation before 1975, one showing the influence of the decision to adopt a national figure of 54 ethnic minorities, and two recent ones in which political relaxation combines with better technological tools.

1968, The 'Vietnamese Studies' series. Published both in French and English since the early 1960s, the journal *Vietnamese Studies* has conveyed the State's official position on a number of topics including ethnology. Within its 1968 special issue on the 'National Minorities' was an A4-size black and white 'Ethnographic map of the Democratic Republic of Vietnam', a sample of which is shown in Figure 9 (Viet, 1968, scale of approximately 1:3,000,000). Typically, there is no indication of the sources used to put this representation together. In its appearance, the map bears similarities with the Condominas interpretation of the 1949 EFEO map in terms of the general features depicted, yet instead of patterns, numbers are used to identify the groups within a given
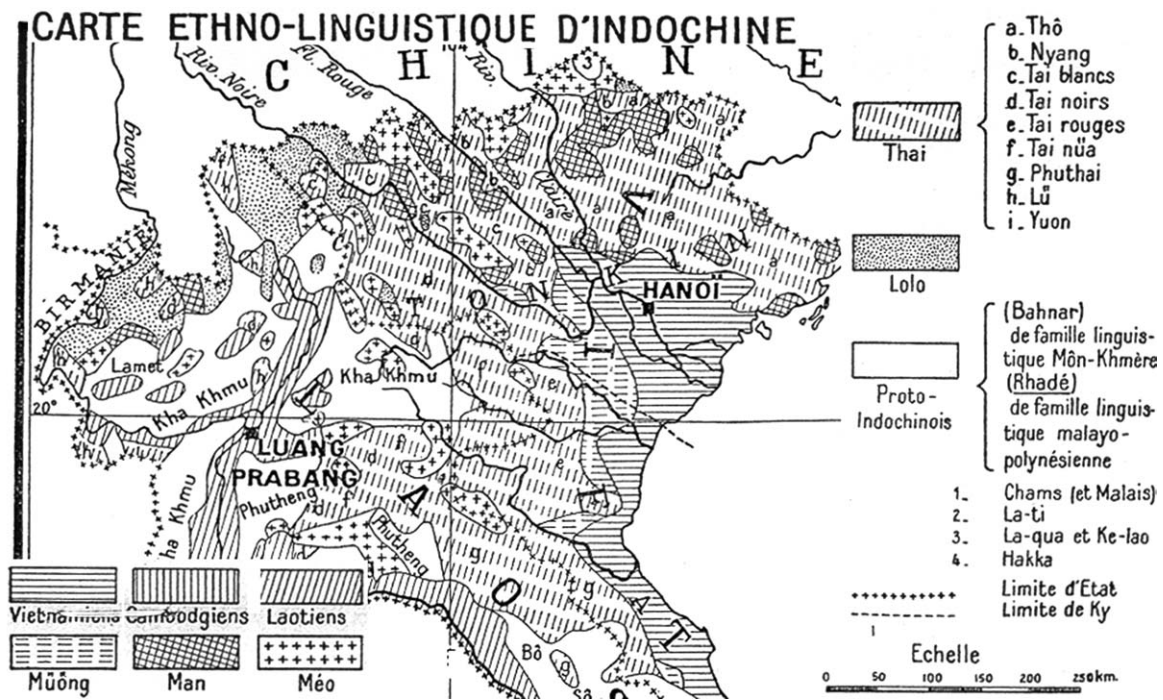
Figure 8. Extract from Condominas' transcription of the EFEO 1949 map. *Source*: Leroi-Gourhan and Poirier (1953).

area. These numbers refer to a seven-group key without reference to ethnolinguistics other than distinguishing the Kinh by a specific pattern and lumping together the 'Other minorities' in a black category. However, the ethnonyms used and the actual location of the eight main groups on the map overlap more closely with the original 1949 EFEO map rather than Condominas' one, suggesting that the former rather than the latter could have served as a starting point.

1993, The 'Ethnic Minorities in Vietnam' Series. Another channel diffusing an official ethnographic map of northern montagnards was the *Ethnic minorities in Vietnam* book by Dang, Chu and Luu, published since at least 1984 with re-editions in 1993 and 2000.[2] The size (23 cm by 34 cm, no scale) and layout are very similar to Condominas' map with black and white patterns, as shown in Figure 10, instead of figures like in the preceding *Vietnamese Studies* map. At times, this 1993 map even uses comparable patterns to Condominas' 1953 map for the same groups and areas. However, there are dozens of different patterns added to the Dang, Chu and Luu map as opposed to nine for the Condominas map, resulting in far more detail. This is attributable to the fact that after 1979 the unified country and the official number of 54 minorities had to be reflected in such a national map. Therefore, each of these was dutifully recorded and indicated either with a distinct pattern for the larger groups (31 of them) or with a simple symbol (seven groups), or simply a number for the remaining sixteen smaller groups. Accordingly, the key for the 1993 map gives a much more detailed division of ethnolinguistic groups than for the rather basic 1968 map in the same series – which it must be said only covered the north. Instead, the 1993 key has three main linguistic families: Austro-Asiatic (with subgroups Viet-Muong, Mon-Khome, Tay-Thai, Meo-Dao,

and mixed), Austronesian, and Sino-Tibetan (with Han and Tibeto-Burman). Again, no source is given to underpin this 'new' ethnolinguistic division.

1993, An Atlas of Vietnam by Vu and Taillard. A French-Vietnamese joint research effort and publication, *An Atlas of Vietnam* presents thematic cartography of a number of socio-economic aspects of modern Vietnam, based on computerised techniques using colour codes. This combination constitutes a clear improvement in the representation of diversity. The maps are accompanied by a one-paragraph analysis which unfortunately does not disclose the origin of the data nor the source of the ethnolinguistic divisions put to use. Most probably, it is the 1989 national census. The atlas shows in fact a dozen small national maps giving details on each of seven ethnolinguistic groups (Viet-Muong, Chinese, Tay-Thai, Hmong-Dao, Tibeto-Burmese, Mon-Khmer, and Austronesian) grouped by two pairs of two on one page (20 cm × 16 cm, no scale), one map in a pair showing distribution, the other showing distribution changes between 1979 and 1989 for each group. The smallest spatial unit here is the province, and each province bears only one uniform colour, reducing severely the complexity at the local level.

More interestingly, the atlas also offers a synthesis map showing the distribution of all seven ethnolinguistic groups at the national level (20 cm × 8 cm, scale 1:12,500,000). An extract from this map is shown in Figure 11. Due to the overwhelming amount of visual information squeezed into such a small space, no specific features other than the outline of the country's boundaries appear. This map still represents the spatial distribution of single variables like all the older maps, but this time with the additional precision of hatch-lines indicating the periphery of each ethnolinguistic group, where two groups overlap. Intricacies in the spatial location
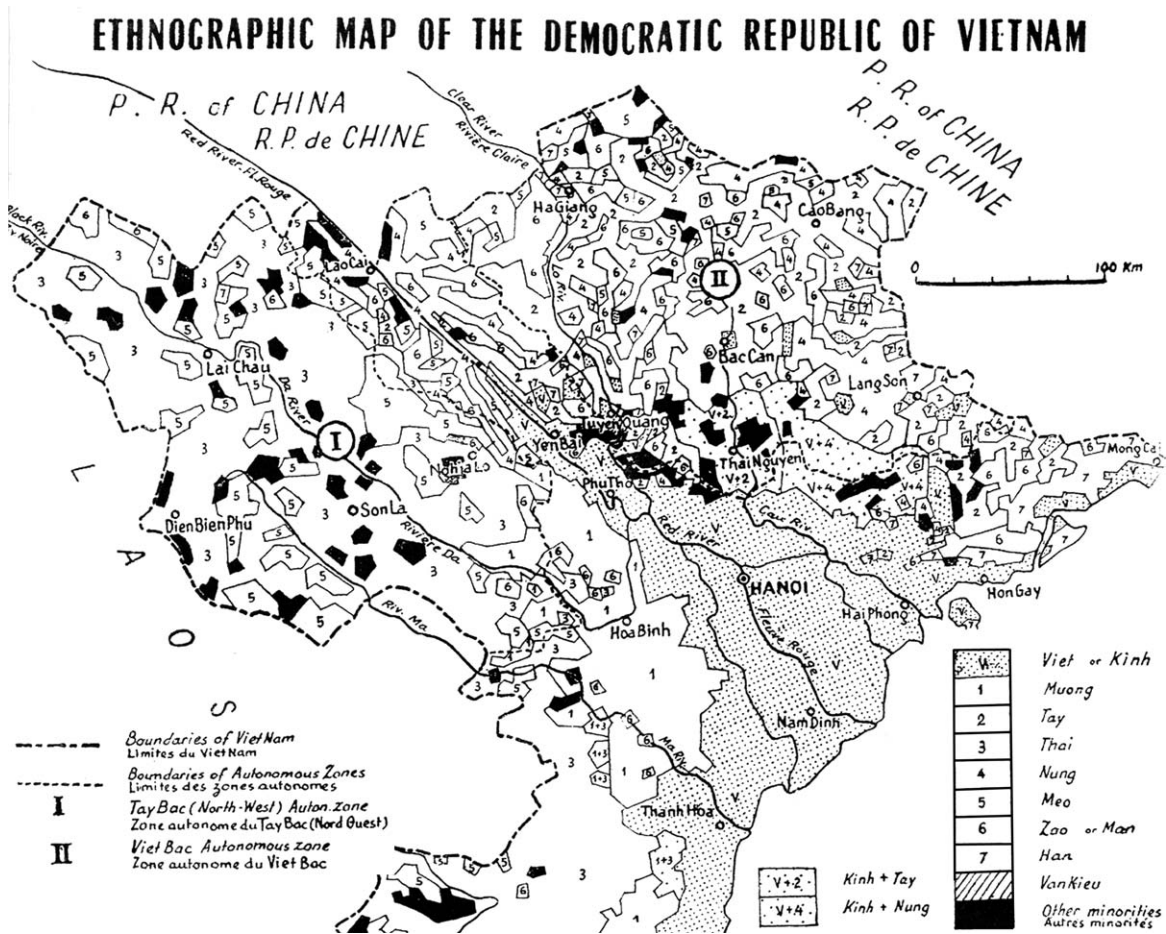
Figure 9. A sample of the 1968 'Ethnographic map of the Democratic Republic of Vietnam'. *Source*: Viet (1968).

Figure 10. A sample of the 1993 'Ethnolinguistic map of Vietnam'. *Source*: Dang *et al.*, (1993).

of groups suggest that provincial limits were not the criteria used as for the other ethnolinguistic maps in the same book. The source given for this synthesis map is the Vietnamese Institute of Ethnography, which is also responsible for the production of the 1993 'Ethnic minorities in Vietnam' series. The Vu and Taillard map thus simply appears to be a computerised version of the official 1993 Ethnolinguistic map of Vietnam, yet one that is not bound by the obligation to show each of the official 54 National Minorities.

1997, Vietnam Museum of Ethnography. The final map included in our discussion is the most recent ethnographic map of Vietnam known to us. Produced by the state Museum of Ethnography and using colour-codes, it is part of a series of maps putting to use data collected during the 1989 national census. Its published version is 10 cm by 10 cm (scale of approximately 1:5,000,000 for the north). With such a small scale, the authors chose to divide the country in two, four maps showing the north and two the south, while focusing on one language family at a time (five groups: Thai-Kadai, Hmong-Yao, Tibeto-Burman, Mon-Khmer, and Austronesian, the latter with two maps). Again, the source for this ethnolinguistic division is not mentioned. Forty-one groups are represented on these maps and seven more are mentioned in the text (a total of 48, thus again parting from the official version of 54 National Minorities still found then in other official publications). On these separate maps, comparisons between groups sharing neighbouring territories, let alone living in the same territory, is made difficult, as Figure 12, the map for the Hmong, Yao and Pathen groups, illustrates. As for the Vu and Taillard map (1993), hatchlines are used to show where two groups overlap, as on the sample below. In addition, provincial borders are indicated, with the name of each province written on the map, an improvement on the Vu and Taillard map. Finally, unlike all the previous maps, the maps produced by the Museum of Ethnography include some altitude contour lines, though even with a magnifying glass we had no success in trying to read them.

Going through difficult times, under the continuous stress of war, post-colonial northern Vietnamese ethnologists and cartographers initially relied heavily on colonial productions, with little changes in both form and content, as well as no significant alteration to the political imperatives of territorial and social control. After 1975 and the unification of the country under a centralized communist regime, state ethnologists and cartographers were made to incorporate details made necessary by post-war government policies regarding ethnic minorities, such as the official number of 54 National Minorities. Only very recently, thanks to the liberalization of the *Doi Moi* period, have political changes meant that different priorities such as academic anthropological and linguistical research could be addressed. Thus some improvements on past, fully state-controlled mapping endeavours have been possible, as is reflected in international collaboration such as the one involving Vu and Taillard.

As opposed to the colonial maps presented in the previous section however, publications in state-controlled medias were aiming at a wide audience of specialists and non-specialist alike. This was a political decision aiming at diffusing within Vietnam, as well as internationally, a stable portrait of the ethnic situation in the country, a statement that internally 'all was well' on that front. Regarding this propagandist strategy, many authors have noted that a clear influence can be traced back to the 'brother' countries of USSR and China.
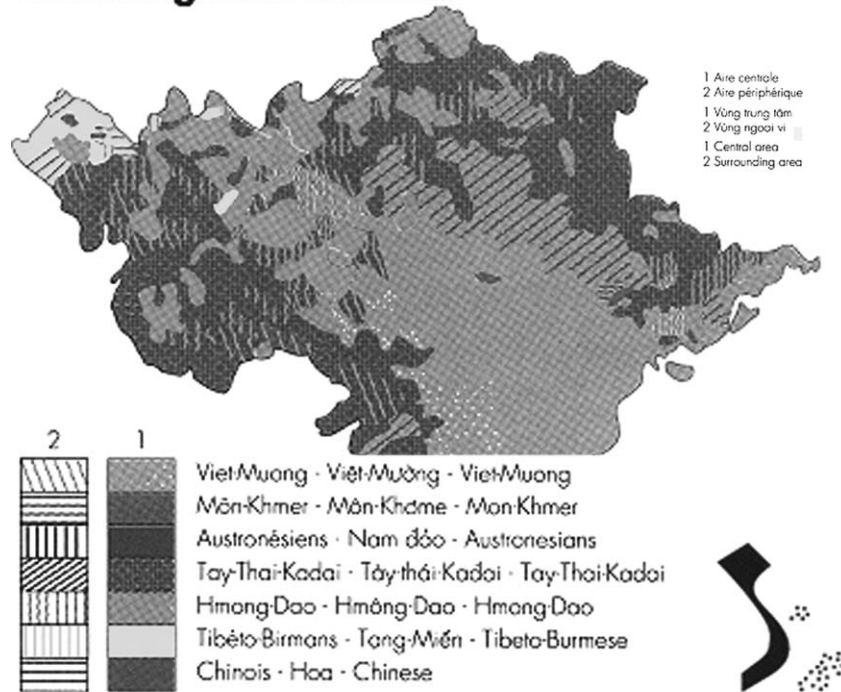
A mapping critique

All the maps discussed above, as well as all other ones known to us but not included here for reasons already mentioned, have very specific and telling characteristics in common. Perhaps the most striking feature is that nearly all ignore orography, thus leaving out major elements of topography such as elevation and slope. Ironically, the 1997 map, the only one caring to explicitly include this dimension in its representation, makes this element barely legible in the printed version made available to the public. Otherwise, the only indirect indications of elevation are rivers, which give an initial idea of the lower terrain in a specific region, and borders, which suggest higher terrain, often range crests. No clear relationships between people and specific landscapes can therefore be suggested by examining these maps. There is no way to communicate to the reader the fact that specific groups or subgroups live at certain altitudes, occupy different ecological niches and, accordingly, undertake specific types of lumbering, gathering and agriculture.

Secondly, apart from the rare double-feature over a given area, the notion of ethnic heterogeneity on the terrain is totally lost as one-colour or one-pattern zones conceal the possibility of several groups dwelling in one area. This standardisation also fails to reveal the unavoidable uneven demographic density. Thirdly, the very small scale of even the most detailed of these maps precludes us from concluding anything meaningful at the administrative levels smaller than the province – namely the districts, communes, villages and hamlets.

Finally, we are often left in the dark regarding the sources of demographic and linguistic data put to use to produce these maps, and the mode of collection of such data (even the 1989 census used remote sensing methods for the isolated areas). In fact, only the 1904 Lunet de Lajonquière map is accompanied by a document providing substantial answers to such questions. This is an important concern as the origin and the logic of the taxonomies on which each map is based is crucial. In mountainous mainland Southeast Asia, naming is a tricky game and we are still far from agreement regarding who is called what, and why so. Absence of sources on this dimension is a near-fatal flaw making several elements of these maps unusable.

In an effort to break the vicious circle into which mapping ethnic north Vietnam has slipped then, we offer in the second part of this article a novel contribution to the ethnological cartography of mountainous northern Vietnam. This was undertaken over a three-year research phase, involving anthropological and geographical assessments and analyses. This work has been carried out in the Bac Ha and Sa Pa districts, Lao Cai province, Northern Vietnam, with the aim

Les familles ethnolinguistiques
Các họ ngữ hệ - tộc người
Ethnolinguistic families

1 Aire centrale
2 Aire périphérique
1 Vùng trung tâm
2 Vùng ngoại vi
1 Central area
2 Surrounding area

2	1	
		Viet-Muong · Việt-Mường · Viet-Muong
		Môn-Khmer · Môn-Khơme · Mon-Khmer
		Austronésiens · Nam đảo · Austronesians
		Tay-Thai-Kadai · Tày-thái-Kadai · Tay-Thai-Kadai
		Hmong-Dao · Hmông-Dao · Hmong-Dao
		Tibéto-Birmans · Tạng-Miến · Tibeto-Burmese
		Chinois · Hoa · Chinese

Sources: Institut d'Ethnographie, 1990, CNSS
Tài liệu gốc: Viện Dân tộc học, 1990, TTKHXHNVQG
Source: Ethnographic Institute, 1990, CNSS

Figure 11. A sample of the 1993 'Ethnolinguistic families' map. *Source*: Vu and Taillard (1993).

Yao
Hmong
Pathen
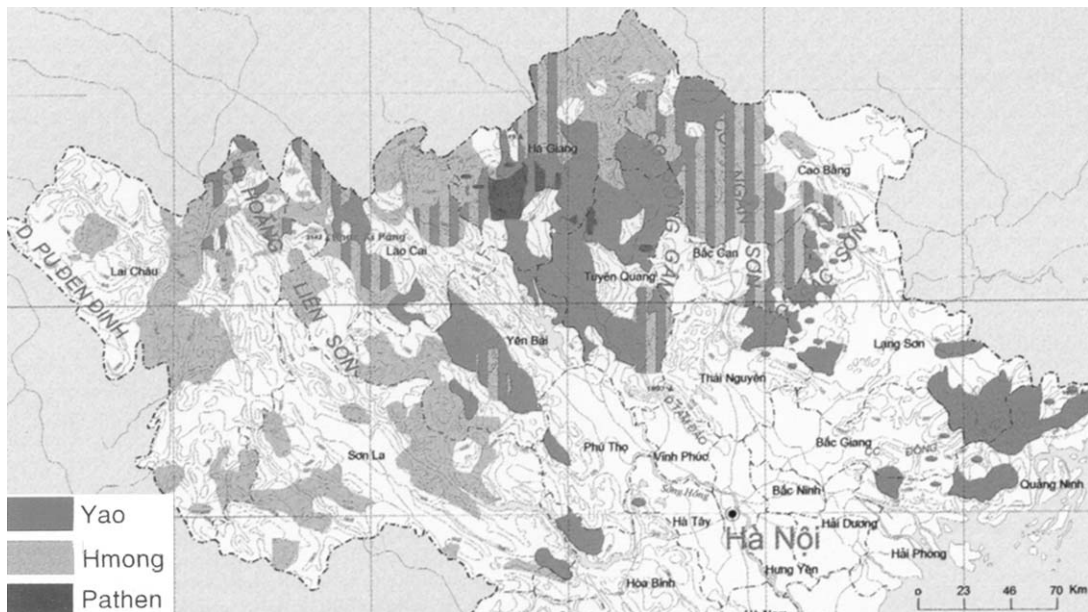
Figure 12. A sample of the Vietnam Museum of Ethnology maps. *Source*: Vietnam Museum of Ethnology (1997, p. 44.)

of gaining more detailed information regarding the relationships between ethnic minority groups and their environment in these areas.[3] We use sections of that research here as an illustration of what can be done to avoid the major pitfalls of the past we have just seen, whilst also describing the data collection and data interpretation challenges that we faced.

Expanding ethnological cartography: An illustration in Lao Cai province

Data collection

Data collection represents an initial and major challenge to the creation of specialist maps, and this is especially true in Vietnam. As the French military recognised early on, knowledge about the exact location and composition of ethnic groups is a sensitive issue, particularly in the remote areas close to the border with China. Not surprisingly therefore, official permits to undertake ethnic-oriented surveys are more difficult to obtain today then, for instance, in colonial times prior to 1946, not only for foreign researchers but also for local ethnologists and geographers. In fact, in the case of foreigners, when such permits are granted, they usually entail various obligations, including the inclusion of an official observer within the team. Field research is therefore heavily influenced by the presence of an official from Hanoi, whose attendance is regarded somewhat suspiciously not only among the highlanders interviewed in the field, but also among provincial as well as district and communal Kinh officials. As a result, much of the available data tends to be gained from official censuses instead, or alternatively from surveys conducted by authorised Vietnamese researchers. Even these data however are often very difficult to obtain.

The scale of the data collection can also be a problem (Stonich, 1996). Currently, most ethnic-oriented information takes the province (*tinh*) as its analytical unit, yet as we can see in Taillard's map (Figure 11) this level of analysis is far too broad to give a meaningful picture of ethnic diversity in the field. It is possible to find some information at the district (*huyen*) level which is more precise, but not yet satisfactory. Therefore, the first useful level of *official* data collection is at the commune (*xa*) level. However, in reality the most homogeneous and hence most useful level is the hamlet (*ban*) or village. Unfortunately, due to the rugged terrain, the remoteness of some hamlets and the ever present political issues, data collection at this level is very difficult to achieve both for foreign and local researchers, and to date, ethnic data at the *ban* level, if they have been collected, are not readily available to non-Vietnamese and non-authorised researchers for the northern mountainous region (Roche and Michaud, 2000).

The recently produced maps we present here combine data from a variety of sources. Physical data as well as the administrative boundaries of 1994 were provided by the Vietnamese General Department of Land Administration (DLA), for the National Geographic Information Systems (GIS) Project. The demographic data for the provincial and district levels were obtained from this same DLA database, which sourced the information initially as from the *Vietnam Statistical Yearbook*, 1994. The demographic data for the commune level are from the 1989 census, also published in the *Vietnam Statistical Yearbook* in 1994. In addition, the maps draw on demographic and cultural data collected in 1999 at the commune level by researchers from the National Centre for Social Sciences and Humanities in Hanoi working with the authors. Ethnic denominations for these maps reflect accordingly the official Vietnamese position as of 1999. For colour images of these maps please refer to http://www.geog.mcgill.ca/faculty/turner/vietnam.html

The cartographer's predicament: Representing data

The misinterpretation of data due to the technical problems of visual representation, or its 'under-representation' due to the scales used being too small, are also key concerns. For instance, in such maps as EFEO (1949) and Vietnam Museum of Ethnology (1997), the interpenetration of two groups on a common territory was represented with hatchlines, unwillingly suggesting that the two groups were present in the same proportion, which is seldom the case. This can be seen in Figure 12, around the town of Lao Cai, for instance. If Yao and Hmong groups were present in the proportions of, say, two-thirds to one-third, this type of visual representation would be clearly misleading. If other groups were also present in the area in significant numbers, it becomes impossible to produce a readable map, and the problem of accurately depicting the proportions of each group is made even more difficult to resolve.

From the cartographer's point of view, such a phenomenon is being represented on a qualitative scale of measurement, meaning there is no order, just shades of distinctions between the observations. This means that the only appropriate mappings tools, called 'visual variables', that can be used for mapping are different shapes, orientation and colour (or hue) (Bertin, 1967). The variable 'ethnic group' is also a zonal or spatial phenomenon, so that different colours, patterns or orientation in the patterns can be applied for 'zones' or territories. Hamlets can also be represented using symbols, providing one knows their exact location. Yet this is not readily available information in the case of the northern Vietnamese mountainous region.

Whilst experimenting with such visual variables, the following Figure 13, showing the ethnic composition of Lao Cai province at the district level, illustrates some of the mapping challenges facing the cartographer. Whilst the pie-charts express much more accurately the ethnic composition of each district than traditional cartographic attempts presented earlier in this article, they cannot be used for a classic ethnological map associating a dwelling zone with a given group.

With the data which have been gathered to date some more promising representations are possible. Figure 14 shows the 12 ethnic groups present in Lao Cai province as a whole, in association with the commune where they dwell. Yet again, such use of a one-colour code per group creates a colourful and complex patchwork – a '*psychedelic nightmare*' to use Rambo's words (1997, p. 8) – but remains
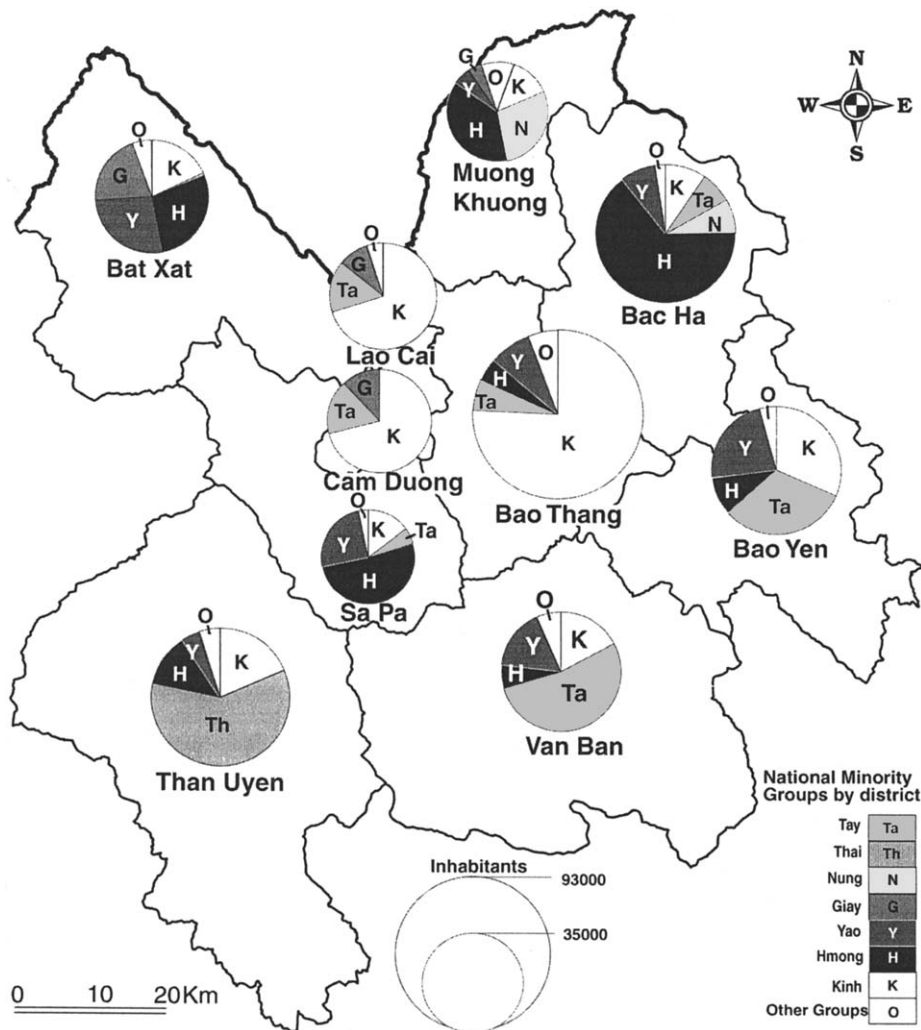
Figure 13. Ethnic composition of Lao Cai Province at the district level. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1994. *Production*: Yann Roche.

mute on the diversity within the smallest units. The only benefit here is that it represents findings from data collected at the commune level, the smallest level possible to date in this province, and allows shared identity thanks to specific colours (such as Dao-Kinh for instance).

In a slightly different approach and for a smaller area, let us consider the distribution of the Hmong, Yao (the two main ethnic groups) and Kinh (lowland Vietnamese) in Bac Ha and Sa Pa districts, shown in Figure 15. In this representation, again with data at the commune level, comparative spatial distribution and density analyses are possible amongst the three groups, adding useful information to the bigger picture.

Yet in the end, and despite some interesting uses for new maps such as these, the sheer number of difficulties facing the cartographer, beyond the initial problems surrounding data acquisition, show that the limitations of traditional two-dimensional paper maps make efficient cartography of ethnic groups in relation to their environment almost impossible to achieve in a satisfactory fashion. In an attempt to overcome this predicament, we turn now to examine additional tools provided by digital cartography and digital elevation models, which offer innovative means by which to represent such phenomena and help overcome some of these limitations.

Three-dimensional (3D) mapping in Northern Vietnam

It has become clear that many of the weaknesses of the maps detailing ethnicity in mountainous northern Vietnam, as shown in the first section of this paper, are connected to the constraints of traditional cartography. In particular, there has been a chronic lack of visual connection between people's locations and the distinct topographic features of the landscape, especially relief. Indeed, the ability to represent a complex social phenomenon over a common area is restricted due, in part, to the limitations of the human eye in perceiving complex visual messages beyond a certain threshold.

By using digital mapping and Geographic Information Systems (GIS), it is possible to go several steps further, towards a dynamic cartography that can take into account physical environment variables both qualitatively and quantitatively. Digital cartography also allows one to modify the visualisation scale (Longley *et al.*, 2001). When the map
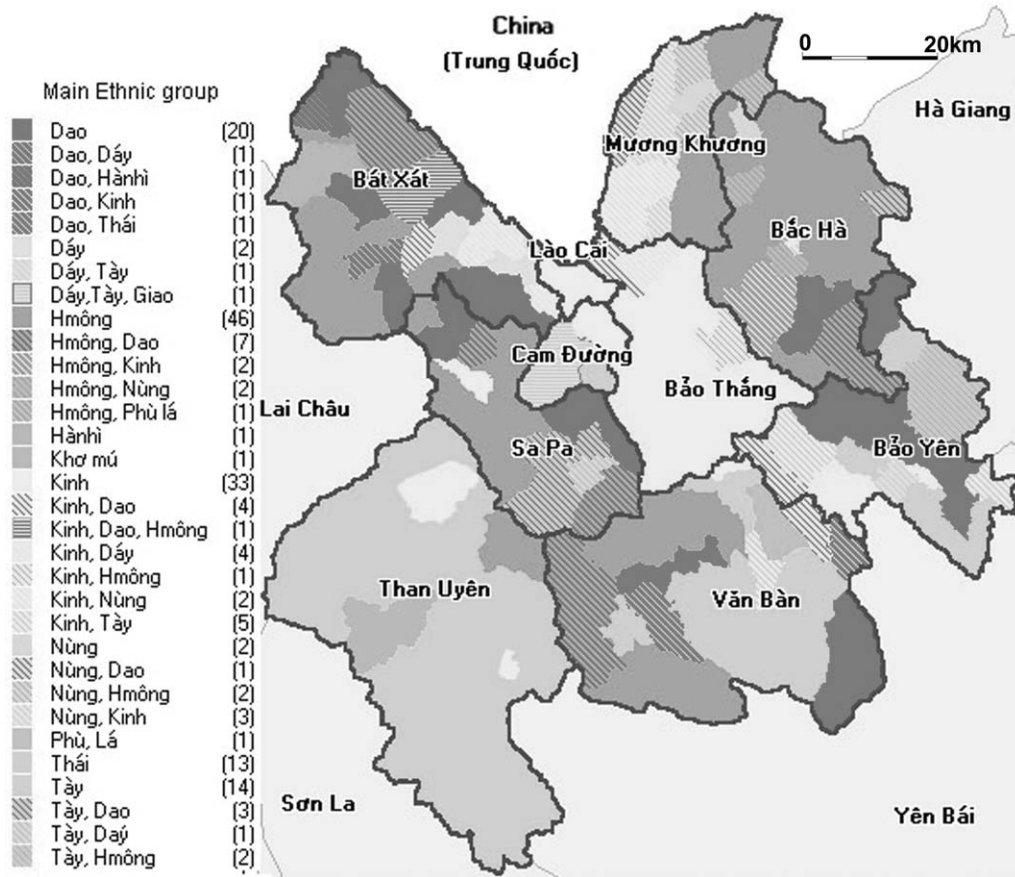
Figure 14. Ethnic Diversity of Lao Cai communes, 1989. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1994. *Production*: Yann Roche.

seems to become unreadable because of the large amount of information represented, the reader can 'zoom in' and examine in greater detail a specific area, displayed on cue, of course dependent on the information being actually available in the map. Another interesting asset of this kind of cartography is the possibility to 'interrogate' the map. For instance, one can click on the box in the legend corresponding to a specific ethnic group. That group's territory is then highlighted on the computer screen, with or without other groups, depending on the needs of the user. Moreover, using the query functions of the GIS software, a reader can use a dialog box to ask for a specific percentage of a given group to be displayed, for instance all the communes in which the Tay group are present in a proportion greater than 20 per cent.

The first step to this integration is to build a Digital Elevation Model (DEM). In our research, contour lines have been digitised using data from topographic maps, and then translated into a format readable by digital mapping software – in this case *MapInfo*. Once completed, a first representation of what the relief looks like in the study region is produced. It can then be overlapped, drawn and saved as shown in Figure 16. Intervals between the elevation lines can be defined by the cartographer, putting more or less emphasis on topography and testing the readability of the representation, which is already a great improvement compared with traditional two-dimensional maps. A preliminary analysis of

this specific map reveals a number of steep slopes, in particular those related to the Hoang Lien range, the highest range shown on the map. This range has a barrier effect that means that to the east the climate is cool and humid with a high occurrence of cloud and fog, whilst the west is dryer. The Red/Song River valley is also distinct to the east of the mountain range.

However, the Digital Elevation Model itself is much more than a digitised version of elevation contour lines. Once these contours are acquired, a user of *Vertical Mapper*, a 3D modelling utility working inside *MapInfo*, has the ability to use the points that constitute the lines and their elevation values, to create a grid, calculating for each cell of the resulting grid an interpolated elevation value (Burrough and McDonnell, 1998). Since this grid covers the whole study area, it is possible to proceed to a 3D visualisation of the topography, as well as to calculate for each point of the region represented what the slope, the orientation, the other points visible from that point are, and much more.

It then becomes possible, providing that the DEM is accurate, to calculate what percentage of a province lies in a given range of altitudes, slopes, orientation, and so on. One of the advantages of a DEM is that provided it is properly geo-referenced it can be connected to human variables, that are 'draped' over the topographic base. A clear representation of the spatial concurrence between the two phenomena is then produced. Figure 17 shows one of the many possible
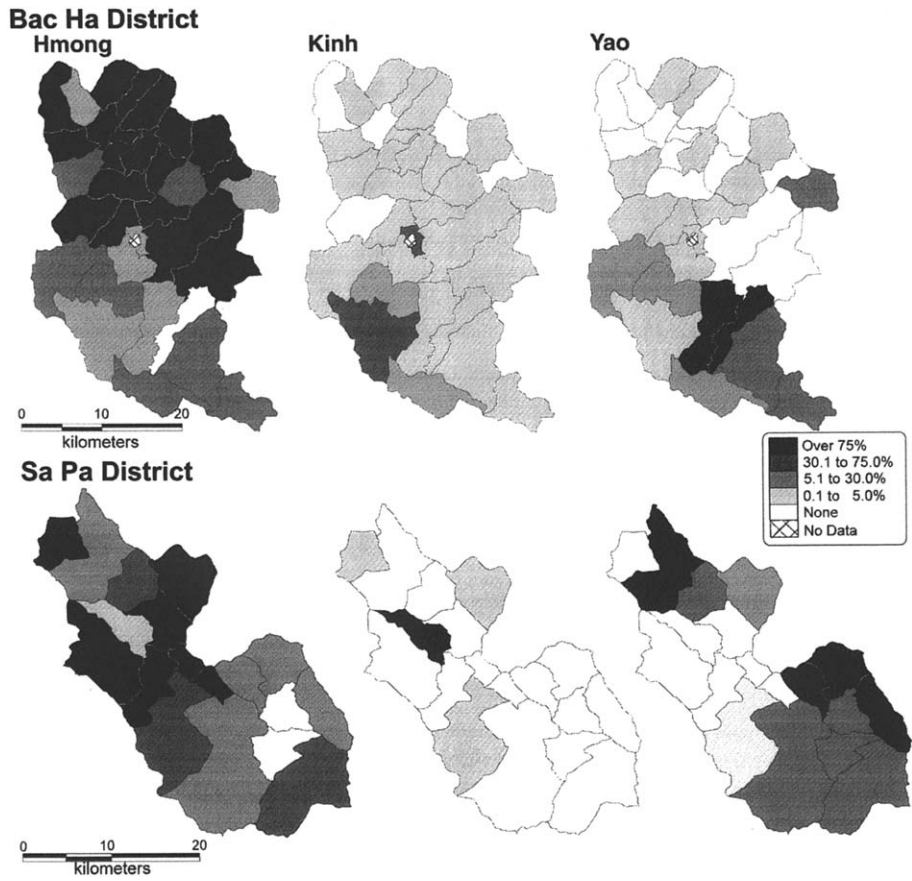
Figure 15. Ethnic composition of two districts at the commune level. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1994. *Production*: Yann Roche.
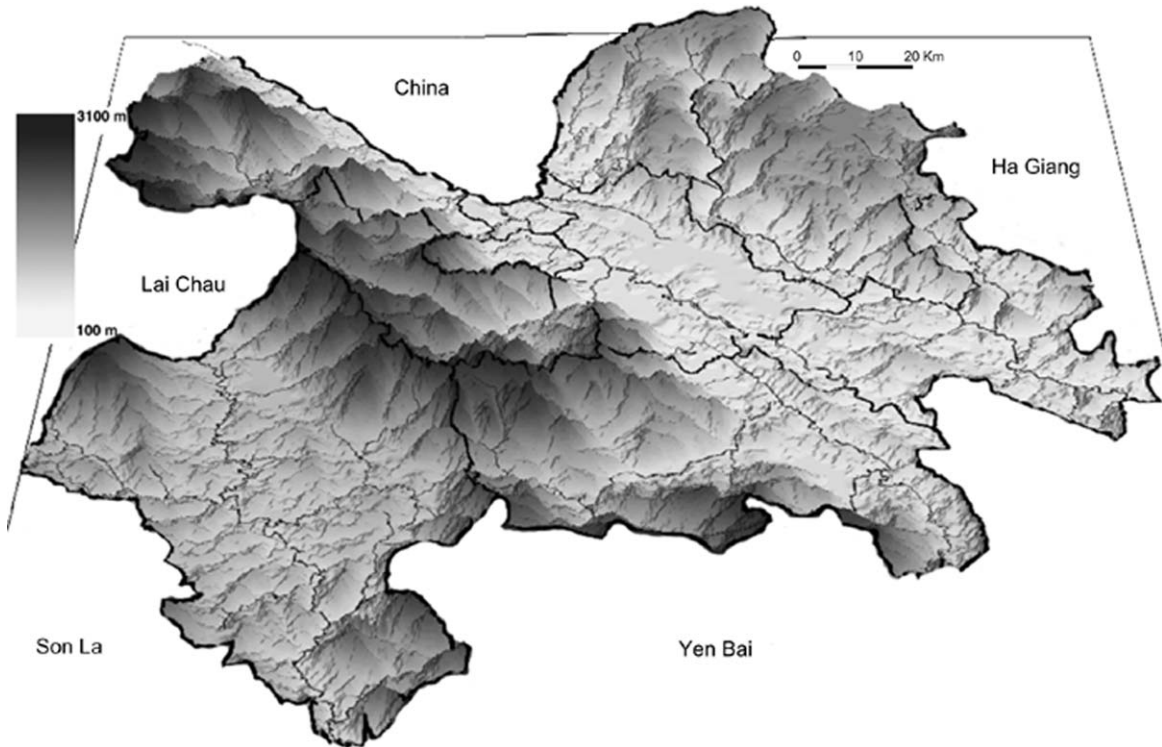

Figure 16. 3D representation of Lao Cai province. *Source*: Data from General Department of Land Administration, 1994. *Production*: Yann Roche.
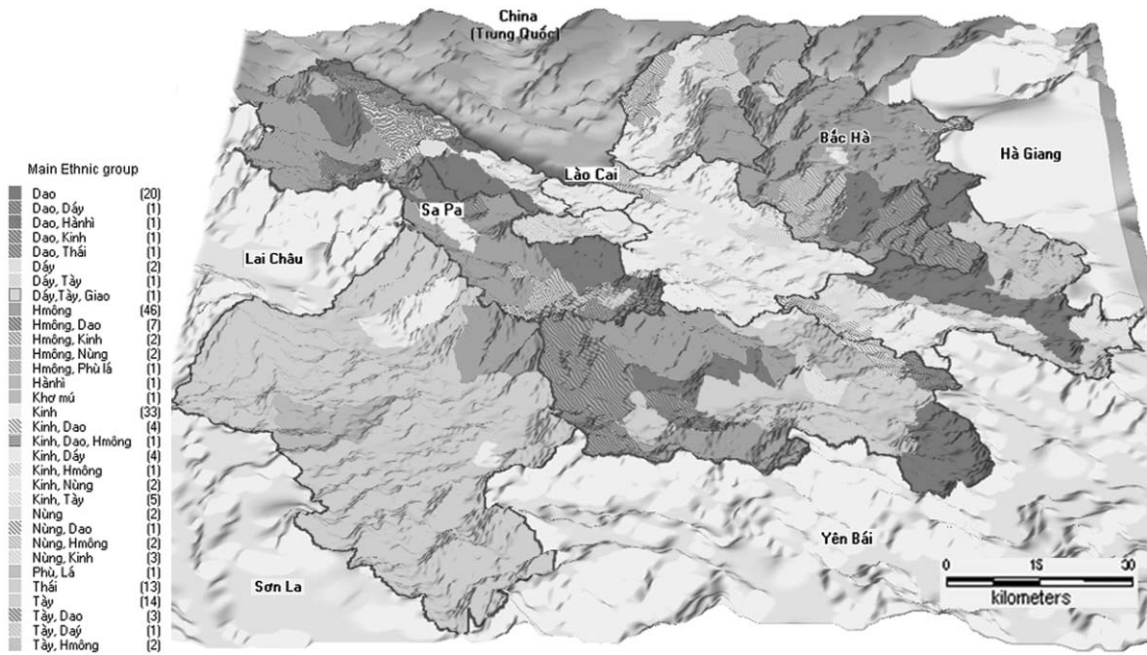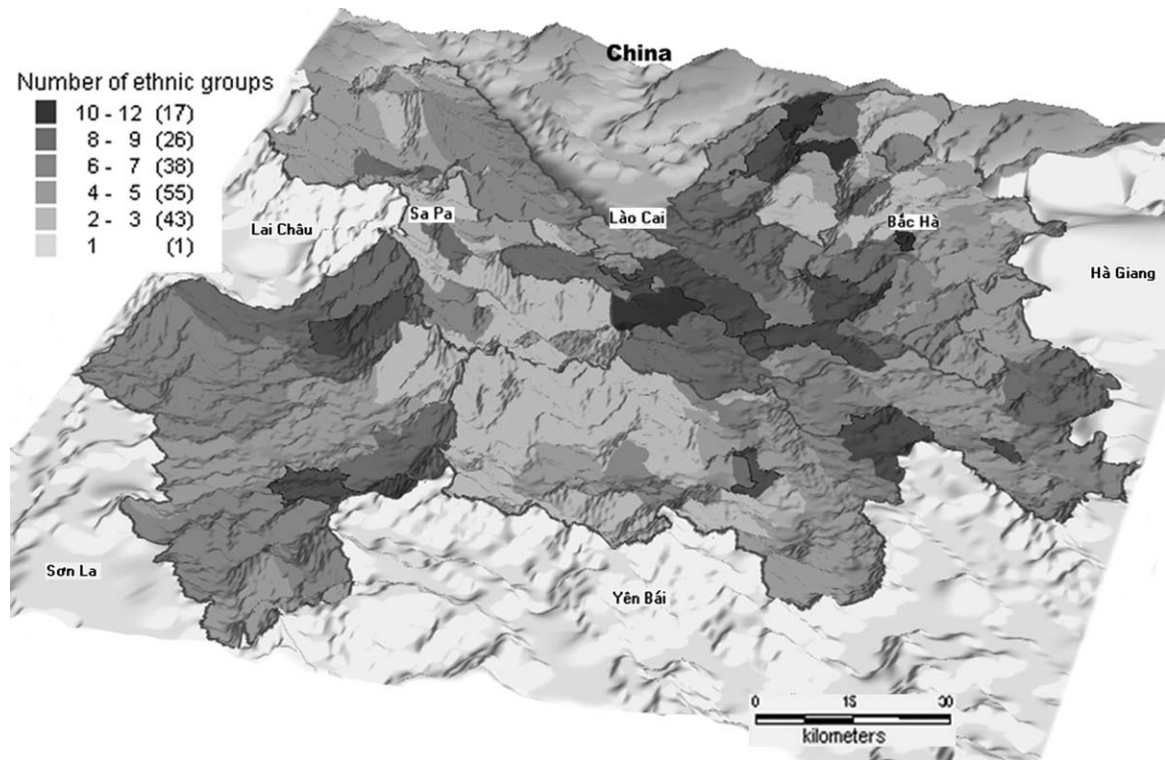
Figure 17. 3D Image of the Ethnic Diversity of the Lao Cai Communes, 1989. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1989. *Production*: Yann Roche.

Figure 18. 3D Image of the Ethnic Groups in Lao Cai Province, 1989. *Source*: Data from General Department of Land Administration, and National Center for Human and Social Science Research, Hanoi, Vietnam, 1989. *Production*: Yann Roche.

3D representations of Lao Cai, detailing the ethnic diversity in the communes and the topographic nature of the areas where they are located.

In brief – space does not permit a detailed ethnic analysis to be undertaken here – this visual representation of Lao Cai shows a strong relationship between the Kinh and topography, with the Kinh population predominately located along the Red/Song River valley in the lowlands.

In turn, as one moves higher in altitude the majority populations turn to be those of ethnic minorities, for example in Sa Pa and Bac Ha it is the Hmong who dominate, whilst in Van Ban it is the Tay. Needless to say, researchers in the field were already aware of this distinction by altitude. The interest here is not to herald this a 'novelty' but to be able to represent this phenomena visually for other readers to immediately realise the connections and proceed further in their

analysis, thus making this type of representation a powerful tool for education and comparative research (Goodchild, 1996).

Exploring further the possibilities of 3D mapping, Figure 18 shows a new, enhanced version of Figure 2, that gave the numbers of different ethnic groups per commune for the whole of the Lao Cai province. Once overlapped with the 3D digitalised model, it becomes apparent that the pattern of greatest heterogeneity of ethnic groups seems not to correlate with altitude only but also with slopes facing southwest. There are several ways to interpret this fact, which it is not our aim to detail here. Suffice to point out that such a map now allows the observer to realise this at a glance. In sum, enhanced visual representations of the relationships between various ethnic groups and their environments are one of the obvious benefits to be gained from such digital ethnological cartography.

Conclusion

In this analysis of the ways in which ethnological maps have been produced for mountainous northern Vietnam over approximately the last 130 years, we have shown that two-dimensional representations of ethnic groups in Northern Vietnam will always carry structural flaws projecting an incomplete portrayal of these populations. Having stressed that topography is a factor which helps shape economic, political and even cultural positions and identity amongst the highland minorities, the importance of trying to provide accurate, and more informative representations of these groups in their environment is obviously valuable. Objections have been raised before to analyses linking the social development of specific cultural groups to their physical environment, due to the argument that such associations could lead, if uninformed by other variables, to a degree of geographical determinism (Noyes, 1994) or ecological fallacy (Goodchild, 1996). Our argument here is not to over-emphasise the influence of topography on human behaviour, but rather to re-insert it into visual representations of highland minorities in their environment (see Nyerges and Green, 2000, for similar work).

With recent illustrations we have detailed how digital cartography and digital elevation models allow us to represent human groups and their local environments in ways that have not been possible before in studies of northern Vietnam. As McGwire *et al.* (1996, p. 97) assert, '*a GIS-based approach would allow maps of parameters relating to resource distribution and environmental characteristics to be compared to a rich and growing record of field observations.*' Indeed, using these techniques and applications, a wealth of information is gained which has the potential, amongst other possible uses, to improve effectiveness in the natural resource management of a specific area, even a specific slope (Mellac, 2001). This is provided however, that one keeps in mind concerns regarding data collection and dangers of misinterpretation and misrepresentation, which all continue to play a fundamental role in the ability of researchers to aggregate data and display it in a consequential manner.

References

Bertin J., 1967: *Sémiologie graphique I.* Mouton, Paris.

Burrough, P.A. and Mcdonnell R.A., 1998: *Principles Of Geographical Information Systems.* Oxford University Press, Oxford.

Dang N.V., Chu T.S. and Luu H., 1993: *Ethnic Minorities Of Vietnam.* The Gioi, Hanoi.

De Koninck R., 2000: The theory and practice of frontier development: Vietnam's contribution. *Asia Pacific Viewpoint* **41** (1): 7–22.

Ecole Française d'Extrême-Orient, 1949: *Carte ethnolinguistique au 1:2,000,000ème.* Under The Supervision Of E.F.E.O., Hanoi: Service Géographique De L'indochine.

Fourniau C., 1989: La Frontière sino-vietnamienne et le face à face franco-chinois à l'époque de la conquête du Tonkin. In: Lafont P.B. (ed.), *Les Frontière du Vietnam.* pp. 84–108. L'Harmattan, Paris.

Gallois C.L., 1909: *Atlas général De l'Indochine française.* Imprimerie D'extrême-Orient, Hanoi-Haiphong.

Garnier F., 1873: *Album pittoresque*, (first part of) *Atlas du voyage d'exploration en Indo-Chine.* Librairie Hachette, Paris.

Goodchild M.F., 1996: Geographic Information Systems and spatial analysis in The social sciences. In: Alderderfer M. and Maschner H.D.G. (eds), *Anthropology, Space, And Geographic Information Systems.* pp. 241-250. Oxford University Press, New York.

Khong Dien, 1995: *Demography Of The National Minorities Of Vietnam.* National Press In Foreign Languages, Hanoi.

Kunstadter P. (ed.), 1967: *Southeast Asian Tribes, Minorities And Nations.* Princeton University Press, Princeton NJ.

Lebar F.M., Hickey G.H. and Musgrave J.K. (eds), 1964: *Ethnic Groups Of Mainland Southeast Asia.* Human Relations Area Files, Yale University Press, New Haven Conn.

Leroi-Gourhan A. and Poirier J. 1953: *Ethnologie de l'Union française (Territoires extérieurs). Tome second: Asie, Océanie, Amérique.* Presses universitaires de France, Paris.

Lim J.-J., 1984: *Territorial Power Domains, Southeast Asia, And China. The Geo-Strategy of an Overarching Massif.* Institute of Southeast Asian Studies, Singapore; and Australian National University.

Longley P.A., Goodchild M.F., Maguire D.J. and Rhind D.W., 2001: *Geographic Information Systems and Science.* Wiley, Chichester.

Lunet de Lajonquière, E. 1904: *Ethnographie des territoires militaires.* F.H. Schneider, Hanoi.

Lunet de Lajonquière, E. 1906: *Ethnographie du Tonkin Septentrional.* F.H. Schneider, Hanoi and Paris.

Mcgwire K., Chagnon N.A. and Carias C.B. 1996: Empirical And Methodological Problems in Developing a GIS Database for Yanomamo Tribesmen Located in Remote Areas. In: Alderderfer M. and Maschner H.D.G. (eds), *Anthropology, Space, And Geographic Information Systems.* pp. 97–106. Oxford University Press, New York.

McKinnon J. and Michaud J. 2000: Presentation. Montagnard domain in the South-East Asian Massif. In: Jean Michaud (ed.), *Turbulent Times and Enduring Peoples. The Mountain Minorities of the South-East Asian Massif.* pp. 1–25. Curzon Press, London.

Mellac M., 2001: *Des forêts sans partage. Dynamique de l'espace et utilisation des ressources dans un district de montagne au Nord Viêt Nam.* Phd Dissertation. Université de Bordeaux, France.

Michaud J., 2000: A historical panorama of the Montagnards in Northern Vietnam under French rule. In: Michaud J. (ed), *Turbulent Times And Enduring Peoples. The Mountain Minorities of the South-East Asian Massif.* pp. 51–76. Curzon Press, London.

Michaud J. and Turner S., 2000: A Montagnard Marketplace. Sa Pa, Lao Cai Province, Vietnam. *Asia Pacific Viewpoint* **41**(1): 84–99.

Noyes J.K., 1994: The natives in their places: 'Ethnographic cartography' and the representation of autonomous spaces in Ovamboland, German South West Africa. *History and Anthropology* **8**: 237–264.

Nyerges A.E. and Green G.M., 2000: The ethnography of landscape: GIS and remote sensing in the study of forest change in West African Guinea Savanna. *American Anthropologist* **102** (2): 271–289.

Rambo A.T., 1997: Development trends in Vietnam's Northern Mountain Region. In: D. Donovan, A.T. Rambo, J. Fox and Cuc Le Trong (eds), *Development Trends In Vietnam's Northern Mountainous Region.* pp. 5–52. National Political Publishing House, Hanoi.

Roche Y. and Michaud J., 2000: Mapping ethnic groups in Lao Cai Province, Vietnam. Research Note. *Asia Pacific Viewpoint* **41** (1): 101–110.

Schrock J.L. *et al.*, 1972: *Minority groups in North Vietnam. Ethnographic Study Series.* Headquarters of the Department of the Army, Washington D.C.

Stonich S., 1996: 'Integrating Socioeconomic and Geographic Information Systems: A methodology for rural development and agricultural policy design. In: Alderderfer M. and Maschner H.D.G. (eds), *Anthropology, Space, and Geographic Information Systems.* pp. 78–96. Oxford University Press, New York.

Teston E. and Percheron M. 1931: *L'Indochine moderne: encyclopédie administrative, touristique, artistique et économique.* Librairie de France, Paris.

Viet C., 1968: National minorities and nationality policy in the DRV. *Vietnamese Studies* **15**: 3–24.

Vietnam Museum of Ethnology, 1997: *Vietnam Museum of Ethnology.* Tran Phu Printing, Ho Chi Minh-City.

Vu T.L. and C. Taillard, 1993: *An Atlas of Vietnam*. Reclus, Montpellier.

Endnotes

[1] Purely for technical reasons, Vietnamese diacritics are omitted from this text.

[2] Curiously, the 2000 edition, for the first time, does not include a version of the official ethnographic map of Vietnam, but instead has a simplistic numerical key to the 54 ethnic groups put on a blank and crude outline of Vietnam.

[3] 'Ethnic and Cultural Cartography of Montagnards in Northern Vietnam. Pilot-Study in Lao Cai Province', funded by the Social Science and Humanities Research Council of Canada (1998–2001).