FREEK COLOMBIJN

Introduction
On the road

A road paved with good intentions

In many circles, the beneficial effect of new roads on the development of less-developed countries goes largely unquestioned.[1] Development agencies aim to bring about positive effects through construction of new roads and repair of dilapidated roads. An Asian Development Bank (ADB) recommendation of a proposed loan for work on primary roads in Cambodia calls road repair 'top priority'. It claims that the beneficiaries will be: 'farmers in rural areas; consumers in urban areas; truckers, bus and taxi operators, and other road users; traders involved with domestic commerce; local contractors; and people employed in tourism and supporting industries' (ADB 1999:21). The Cambodian Ministry of Planning expects poor households to profit the most. Broadened roads are seen as improving safety for cyclists and 'non-traffic-related uses made of roads in Cambodia, and in many other parts of Southeast Asia. These include socializing, crop processing, temporary storage and flood refuge for both humans and livestock.' (ADB 1999:22.) The recommendation of a proposed loan to Indonesia expresses similar optimism that rehabilitated roads and bridges will 'facilitat[e] economic recovery' after the Asian Crisis of 1997. 'The Project will support pro-poor growth by providing the poor with employment opportunities and better access to markets, and health and education facilities' (ADB 2000a:iv). 'The Project is not expected to be subject

1 I would like to acknowledge the invaluable help of several people and organizations. Leslie Y. Boon helped with checking the references of each article, and Rivke Jaffe checked the language of the non-native speakers of English. Despite their considerable and much appreciated contribution, I alone remain responsible for editing this volume. I also owe much to the organizations that co-financed the workshop 'The impact of new roads on urban and regional development in Southeast Asia; anthropological and historical perspectives' (Leiden, 2-3 August 2001), of which this issue is the outcome. In alphabetical order they are: the Research School CNWS of Leiden University, the International Institute for Asian Studies (IIAS), the Leids Universiteitsfonds (LUF), and the Council for Social Sciences of the Netherlands Organization for Scientific Research (NWO).

to any significant technical, economic, or environmental risks' (ADB 2000a: 29). According to the Director-General of Highways in Indonesia, the road network has played an important role in 'national economic development', and has been shown to 'balance regional development, improve people's living standards, accelerate social development and improve international relationship[s]' (Dirjen Bina Marga 1992:2). Taking these great expectations and good intentions into account, it is not surprising that roads have played a key role in national five-year development plans in Indonesia, Malaysia, the Philippines, and Thailand (Leinbach 1989a; Seah 1978). In Vietnam, the official slogan of a development programme for swidden cultivators is 'roads-gardens-forests' (Salemink 2000:134).

Ordinary people seem to be just as enthusiastic about roads as policy-makers. After 25 meetings during which Laotian villagers had discussed an ADB project, '[i]n general, villagers were very positive in their desire to see their roads upgraded' (ADB 2000b:25). As one Indonesian cultural expert explained to me, Malay people consider roads in general to be a good thing. Apart from their practical value, roads are symbols of development (*pembangunan*, a highly valued concept in Indonesia), civilization, and knowledge. A Malay proverb is '*kasih ibu sepanjang jalan*' ('the love of a mother is as long as a road', that is, endless). Perhaps this can be reversed: roads are as good as maternal love.

Although the beneficial effects of new roads are seldom questioned, actually they should be closely examined. Studies undertaken outside Southeast Asia suggest that, despite an average increase in agricultural output, roads have serious negative side effects on forests and human health. A critical report by the Food and Agriculture Organisation and the International Technical Tropical Timber Association with the eloquent subtitle *Road to development or road to construction?* states that tropical 'forest roads have economic advantages, but endanger the environment. [...] The forest road networks are both good and evil at the same time!' (FAO 1999:1-2.) In Brazil, deforestation follows the Trans-Amazon Highway. For various reasons, roads have devastating effects on the Indian communities that, prior to road construction, lived in relative isolation. After the Trans-Amazon Highway reached their territory, one tribe lost 45 per cent of its people within one year, while the Nambiquara population, famous through the writings of Claude Lévi-Strauss, was reduced from 20,000 to 650 (Hecht and Cockburn 1990:56, 157). The World Bank has also become aware of the fact that roads, while 'intended to improve the economic and social welfare of people', 'for all the positive effects [may also have] significant negative impacts on nearby communities and the natural environment', which must be – in World Bank terminology – 'mitigated' (Tsunokawa and Hoban 1997:xvi).

Roads can also be harmful socially. In Nigeria, Gina Porter found that after intense paved road construction, off-road communities became more isolated and social inequality increased. Off-road markets are dying, which is especially harmful to small growers with restricted mobility; women and the elderly are more likely to fall into this category. In times of economic contraction, when vehicle operators want to save on spare parts, transport services are restricted to the best-maintained roads and even some of the roadside villages become isolated. When people migrate to roadside villages, off-road villages become less viable locations for clinics and schools. Roadside villages are confronted with an increase in land appropriation, prostitution, highway robbery, accidents where pedestrians are killed by cars, and general social disruption (Porter 1997). A comparative study in Uganda, Zambia, and Nepal could find no solid links between improved road conditions and poverty alleviation, despite government intentions in that direction (Robinson and Stiedl 2001:60). Decisions on where and how to invest in roads are often made on the wrong grounds. Roads often deteriorate quickly, because, for several reasons, the management of maintenance is more complex than the management of construction. The affordability of maintenance is often not considered when a network is constructed (Robinson and Stiedl 2001:55, 58). In Nigeria the trajectories of new roads are influenced by politicians who arrange road access for areas where they are angling for support (Porter 1997: 72). A critical World Bank report sums up the social problems: the bypassed community, the community split by a road, culture shock, reduced convenience of traditional modes of transport, resettlement of people making way for road construction, the introduction of new diseases and alcohol abuse to indigenous peoples, loss of a traditional sense of identity, violation of traditionally exercised land rights, damage to cultural heritage, and impact on the aesthetics of the landscape (Tsunokawa and Hoban 1997:113-53).

Jonathan Rigg (1997:172) has noted for Southeast Asia that: '[p]erhaps because it is so self-evident, there has been comparatively little work undertaken on the role of transport in economic development'. The undesirable ecological, health, and social effects, along with the political aberrations observed in African countries, and in Nepal and Brazil, strongly suggest that the role of roads is not at all self-evident, while even the economic benefits are not always obvious. A long decision-taking process precedes construction work; once the construction of a road is underway, the work may be stalled or halted, and after a road has been completed it stimulates people to seize the opportunity to adopt new patterns of behaviour and forces others out of previous customs, against their will. At each stage, before, during, and after construction of a new road, the road leads to intense social interaction. If only because of this, roads are worthy of the attention of social scientists. Each of the dozen articles in this issue of *Bijdragen* is an example of how roads can

be made the focus of inquiry. Together they demonstrate that roads form an interesting topic for anthropological, sociological, geographical, or historical research. One aim of this special issue is to place roads higher on the agenda of a larger number of scholars.

The central research question of this issue is: What has the social impact of roads in Southeast Asia been? The term 'social impact' is interpreted broadly here, and the articles also deal with cultural, economic, political, and environmental aspects of society. I have no pretension of giving more than the beginnings of an answer to this question here, though I could build on the articles of Jonathan Rigg and Terry McGee, who give interesting overviews of the impact of roads in, respectively, rural and urban settings. At this point, I merely wish to point out the main recurrent themes and surprising findings. Before doing so, I shall first briefly address the state of roads in Southeast Asia and then summarize the contributions.

Roads in Southeast Asia: still a long way to go

In the past, roads did not play a prominent role in Southeast Asia. There are at least three explanations for the historically undeveloped state of roads in the region. First, the predominant vegetation type in Southeast Asia, tropical rainforest, formed a major obstacle to road construction. Second, tropical torrents damaged the existing roads, causing landslides, washing away bridges, or at least causing slipperiness. In addition – to add some local colour – elephants and buffaloes ruined forest roads by making potholes in them (Van Hasselt and Snelleman 1881:65, 164, 188, 332). Third, the big rivers of mainland Southeast Asia (the Irawaddy, the Chao Phraya, and the Mekong), the dozens of smaller rivers, and the seas and straits surrounding insular Southeast Asia provided any number of cheap transportation routes. A map showing the major routes during the age of commerce (fifteenth to seventeenth centuries) displays almost only sailing routes. The few major land routes are short cuts between sailing routes, for instance across the Isthmus of Kra, or between the upper reaches of the Chao Phraya and the Mekong. A comparison with Europe in the thirteenth century, where the costs of overland transport were twenty times higher than those for transport by sea, is instructive (Reid 1993:53, 60).

In the nineteenth century, the colonial states began to upgrade the rudimentary road system in order to improve revenue collection and increase the mobility of troops enforcing law and order. The Catholic mission built roads in the Philippines. The desire to export bulk agricultural products and mining products was a further reason for the imperial states, followed by Thailand, to construct roads (and railways) in the late colonial period. The

routes these roads followed were determined by the demands of Western capital. By the 1930s, roads had become the dominant modes of transportation, at the expense of waterways and railways. During the Japanese occupation in the Second World War and during post-war independence struggles, roads were either no longer maintained or actively destroyed, causing a contraction of the road networks. By the 1960s, the basic road networks were in place again.[2] However, Cambodia, struck by the Vietnam War, saw almost all of its bridges destroyed in the 1970s (ADB 1999:3), while similar damage must have been done to the road network in Vietnam and Laos. In 1985, a third of the total length of roads in Indonesia was in poor condition, according to official standards (Dick and Forbes 1992:267).

Since the 1960s, roads have played a prominent role in national development plans. In the 1970s and 1980s, in Indonesia, Malaysia, the Philippines, and Thailand, between ten and eighteen per cent of development budgets was spent on transport, mainly on roads. Between 1975 and 1985, about one-tenth of World Bank assistance to these four countries was for transport. During most of the period 1975-1985, the share of transportation-communication loans in the total of Asian Development Bank loans was in the range of ten to twenty per cent. Further financial assistance for road construction came from the Japan International Cooperation Agency (JICA), the United States Agency for International Development (USAID), and other bilateral programmes (Leinbach 1989a:37-50; Seah 1978).

There is considerable variation in the state of the road network (Tables 1 and 2). There is also strong variation in the composition of the stock of registered vehicles (Table 3); this fact alone indicates that roads are used differently across Southeast Asia. A road in Brunei, where almost every vehicle is a passenger car, looks different from one in Thailand, where most vehicles are motorbikes; in the Philippines one in five vehicles is a public bus, while in the Lao People's Democratic Republic, there are almost as many trucks as there are private cars and public buses together.

Social studies of the roads in Southeast Asia that give more body to this historical overview are few and far between, but a number of works should be mentioned. An early example is Marion Ward's study of the Rigo road in Papua New Guinea; two years after the road's completion, she noted only positive economic effects resulting from improved accessibility (Ward 1970). Leinbach and Chia (1989) give the most comprehensive study of roads in relation to other modes of transport, using a development paradigm. Dick and Forbes's article (1992) is in the same vein, but gives more information on the variety of vehicles (for Indonesia only). Peter Kunstadter (2000) ana-

2 Kaur 1985; Knaap 1989; Leinbach 1989b; Tejon 1982.

Table 1. Size of road networks in Southeast Asia, 1996

	Brunei	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Total length (km)	1,503	378,081	22,323	46,260	28,570	160,970	3,073	225,623	59,122
Length of paved roads (km)	1,185	378,081	3,503	39,647	9,837	27,619	2,988	46,600	5,709
Road density (m/km^2)	260	199	94	140	42	537	4,956	440	178
Road density (m/person)	4.93	1.92	4.65	2.09	0.63	2.31	0.83	3.82	0.80

Sources: Length of (paved) roads: ASEAN Secretariat (2001); road density has been calculated using figures for the total length of roads, area, and population size taken from the World Bank 2002.

Table 2. Size of road networks in Southeast Asia, 1931, 1971, 1983, and 1996 (in kilometres)

	Indonesia		Malaysia		Philippines		Singapore		Thailand	
	total	paved	total	paved	total	paved	total	paved	total	paved
1931	44,021		4,735	4,250						
1971	84,270	n.d.	23,484	n.d.	73,532	n.d.	1,973	n.d.	26,635	n.d.
1983	164,343	67,380	40,435	27,049	155,671	19,816	2,568	2,369	159,618	30,093
1996	378,081	378,081	46,260	39,647	160,970	27,619	3,073	2,988	225,623	46,600

Sources: 1931: Kaur (1985:97) and Knaap (1989:81); 1971: Seah (1978:12); 1983: Leinbach and Chia (1989:244); 1996: ASEAN Secretariat (2001); figures for Malaysia in 1931 actually concern Malaya in 1930.

Table 3. Number of registered vehicles in Southeast Asia, 1996

	Brunei	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Total vehicles	177,599	14,530,095	183,250	759,511	361,011	2,904,487	668,304	16,093,896	41,442
Passenger cars (%)	84	17	9	42	48	n.d.	54	10	7
Buses (%)	0	4	7	1	5	19	4	1	0
Trucks (%)	9	10	14	9	13	n.d.	19	4	20
Motorbikes (%)	6	70	70	48	33	n.d.	22	86	74

Source: ASEAN Secretariat 2001; percentage motorbikes is percentage of registered vehicles other than passenger cars, buses, and trucks.

lyses the interplay between road construction and agricultural innovation in Hmong villages (Thailand), where the highland roads enabled the transport of bulky agricultural inputs and cash crops. Independent variables in his analysis include travel time and year of completion of the road nearest to the village. Three richer studies are by Trankell (1993), Wadley (1998), and Seah (1978).

In perhaps the most profound study, Ing-Britt Trankell (1993) studied the socio-economic effects of the upgrading of a dust road to an all-weather road in the Lao People's Democratic Republic. Logging had already proved to have an adverse effect on hunting, gathering, and swidden and sawah cultivation, and these effects were amplified by the road construction. Other undesirable effects were a rise in land prices, a more pronounced differentiation of landholding, and a growing proportion of landless peasants near the road. The roads were designed for long-distance transport and did not serve short-distance needs, such as those related to the carrying of water to the house by women, or going to the fields. In two years' time, a predominantly subsistence economy changed into an economy based on market relations. Informal cooperation in the village was replaced by a system of paid employment.

Reed Wadley (1998) presents the effects of a road in West Kalimantan. For a while, the Indonesian government postponed road construction in order to keep the local population isolated, until the national government had achieved firmer military and political control over the area, which was considered rebellious. At that point, using inside information on the route the planned road was to take, the local elite bought deeded land from a longhouse in order to speculate on price increases of the land. Every time road-building operations passed through a ritually prohibited area, construction was halted while a special ritual to allow work to proceed was performed. When the road was finally in place, it turned out that people still often preferred the old trails and the river, because of the lack of bridges and the muddy condition of the road. The new road reinforced the frontier nature of Kapuas Hulu and threatened the surrounding forest reserve. With all the newcomers and loggers, increased insecurity about land tenure of forestland spurred locals to accelerate the conversion of forest to rubber and other tree crops, which the government recognizes as markers of property claims.

A little-known masterpiece is Seah Chee Meow's (1978) overview of road infrastructure in ASEAN countries. She nicely sums up the premises underlying most of the articles in this issue. An important point, deviating from the good-for-all developmental perspective, is that the various agencies involved have conflicting as well as complementary interests. In the ASEAN countries, these agencies are commonly those involved in budget allocation, revenue generation, public works, communications, planning, public housing, public utilities, and defence, not to mention the many vested interests of non-government parties. The agencies do not always function harmoniously. Seah

makes the rare but insightful observation that roads, apart from bringing rural areas into the market, also aggravate problems in the cities, by channelling people from rural areas to cities.

Abstracts

This special issue's set of articles is opened by Jonathan Rigg. Rigg poses the basic question of why Southeast Asian governments build roads to connect outlying areas to the centre of the state. A political motive, which he mentions without further analysis, is to integrate marginal people into the political mainstream and to enhance the mobility of security forces. An economic motive is market integration, aimed at bringing development to people living at the state's fringes. This economic motive is criticized radically by the claim that roads do not develop marginal people, but, conversely, place previously self-reliant people in a marginal position in mainstream society. Thus, roads, imposed on people from the outside, are seen as creating poverty. However, using material from the Lao People's Democratic Republic and Thailand, Rigg reaches the conclusion that nowadays, for marginal people, problems no longer come from the outside. Problems such as population pressure on scarce local resources emerge from within their isolated society. Under these difficult local conditions, the road literally becomes an escape route from a non-viable subsistence economy to the market. More than anyone else, Rigg tries to give a balanced answer to the core question: Are roads good or bad for people?

After Rigg's contribution the order of the articles roughly follows the route most travellers take: from the mega-city to the frontier of the expansionist economy in the forest. This order is also similar to the general direction in which road networks are extended, but is a reversal of the stages an individual road goes through: from a multilane asphalt road back to a narrow dirt road. Presenting the whole range of roads in one volume, from an elevated mega-city motorway to the dust road in a forest, is, I believe, unique in road studies.

Terry Mc Gee is the first of three authors writing about the impact of roads on urban morphology. He gives a general sketch of the development of mega-urban regions, and then focuses on the extended metropolitan regions of Kuala Lumpur, Bangkok, and Jakarta. Urban space is shaped by a restructuring of the economy and the replacement of one existing land use by another, as well as by transportation and popular resistance. He concludes by stating that a research agenda for roads has yet to be worked out.

Haryo Winarso shows that, contrary to conventional wisdom, the location of new towns built in the Extended Metropolitan Region of Jakarta is not determined by access to main roads. Real estate developers prefer land

far away from the centre because it gives the highest profit margin: it is the cheapest to buy, but after development is almost equally expensive as real estate nearer to Jakarta. The corollary is that, afterwards, big investments must be made to connect the new towns with Jakarta; the developers happily leave it to the government to invest in new roads necessary to solve traffic problems which they themselves created.

Johan Silas argues that the development of Jakarta is exceptional, because of the disproportionate investment in the national capital. With the current economic crisis and the trend of regional decentralization of state revenues, the maintenance of the Jakarta toll roads at an acceptable standard and the viability of the new towns around Jakarta are at risk. The development of Surabaya, Indonesia's second city, is much more typical of Indonesia than is that of Jakarta. Silas lists the effects of toll roads in Surabaya and arrives at the conclusion that the network of smaller roads connects towns in the Extended Metropolitan Region just as well as the toll road does.

Wolfram Lorenz takes us from urban form to the behaviour of urban residents. His is the only article that does not look at roads as infrastructure, but focuses only on the flow of people. With a mixture of amusement and amazement, he observed traffic in Yogyakarta (Java). The flow of traffic is clearly structured, though not so much by formal rules, which are reminiscent of traffic regulations current in Europe, as by informal rules of conduct. The key to understanding the informal rules is through a hierarchy of power and the way in which people communicate power positions.

The next three articles describe the development of urban-rural road connections using a long-term perspective. Peter J.M. Nas and Pratiwo start by presenting the nineteenth-century pros and cons of the famous, or rather notorious, Grote Postweg (Great Mail Road), the child of Governor-General Daendels, spanning Java from west to east. They then analyse how the Grote Postweg determined the orthogonality (spatial configuration) of Java's towns. From a north-south orientation, following the rivers to the sea, the spatial configuration of the towns was changed to an east-west orientation. New settlements and ribbon development have been other effects of the Grote Postweg. The Grote Postweg lives on in the collective memory of the people.

Gusti Asnan describes the development of the transportation routes between the highland and the coast of West Sumatra. In early times, the connection consisted of footpaths, along which markets and market towns developed. In the nineteenth century, the Dutch colonial forces began to build roads (with forced labour) in order to enhance their military control and facilitate the conveyance of coffee, the main cash crop from the highlands, to the coastal ports. Asnan describes the development of the hardware (the roads) and the software (the modes of transportation). The development of roads stimulated a cultural exchange between the coast and the interior.

The pattern of mobility changed from highland-coast migration to rural-urban migration.

Freek Colombijn analyses how the Pekanbaru-Dumai road opened up a large part of the province of Riau (on the east side of Sumatra). The road, like later side roads, was built by the oil company, Caltex, in order to make access to its rigs possible. Once the roads were in place, they were used by loggers, plantations, transmigration projects, small industries, and spontaneous migrants, roughly in that order. Riau has become a frontier area, where each party thinks of his or her own short-term profits, ignoring the long-term viability of the society as a whole. Tensions between different interest groups emerge each time a new road is opened. Sometimes groups try to prevent the construction of a new road or blockade an existing road.

The last four papers deal with the responses of 'roadless' peoples to roads entering their world. Nathan Porath picks up the thread of Colombijn's article and describes how the Sakai, an indigenous people living in the forest, adapted to the Pekanbaru-Dumai road.[3] Robbed of much of their land, and missing out on most economic opportunities offered by the road, the Sakai are the road's victims. At the same time they have also learned how to exploit the road by begging, and selling fish or forest animals to drivers. By displaying their poverty, the Sakai deliberately provoke a response from the embarrassed local authorities or Caltex staff. As a result, social differentiation in Sakai communities has increased. Porath also gives numerous very readable illustrations of cultural adaptations to the road.

Vishvajit Pandya presents the case of the Jarwas on the Andaman Islands (India), who are in many respects remarkably similar to the Sakai. The Indian government brought the Jarwas together in a reserve, which was accessible only by boat. The construction of the Andaman Trunk Road, which leads through the reserve, initially led to an increase in hostile confrontations, but it also brought tourists to the area. The Jarwas, who were represented by tourists and government officials as 'primitives', have responded by presenting themselves as either 'primitives' or 'ex-primitives', according to the situation. They prefer to forage along the roadside, receiving presents from the government or money from tourists in return for being photographed, instead of hunting and gathering in the forest.

Jill Windle systematically compares the social effects of new roads in three remote regions in Sarawak. Where households retained control over their natural resources, the new road has offered new opportunities for development. Where households had to give up some of their control over resources, for instance by putting their land into a joint scheme with a big

[3] The word 'Sakai', which is considered an insult in Malaysia, has become an ethnic term for them in Indonesia.

plantation, they have been swallowed up by the wider society, becoming vulnerable to market uncertainties. Roads have made life in rural communities more complex, with more income options to choose from, more ways to spend money and the subsequent burden of financial management, exposure to new ideas from urban centres, and worries about outsider-thieves and the poor condition of the roads.

Eben Kirksey and Kiki van Bilsen end this special issue with an article on Mee articulations and the Trans-Papua Highway (West Papua). The Mee are a Papua group that was already mobile before this road was built. The road has stimulated subsistence strategies in several ways. For instance, making a field in a roadside plot selectively logged by a timber company saves time. Yet, according to many Mee, the road promotes degeneration: diseases have skyrocketed, noise and logging drive animals farther into the forest, and the Indonesian state has been attempting to extend its control over the Mee. People call the highway the 'State Road' and see it as related to state authority. The Free Papua Organization has contested the state by maintaining control of sections of the road. With Kirksey and Van Bilsen we return to political motives for state road construction, noted at the outset by Jonathan Rigg, thus completing the circle.

Breaking ground

The set of articles in this volume does not form a sufficiently substantial basis for solid conclusions. However, a number of empirical generalizations emerge, which form interesting themes worth being addressed in further studies. Where available, other literature is used to support the generalizations based on the articles in this volume.

The first generalization is that roads are seen as positive by the responsible government. In all honesty, this point is obvious to the point of being obtuse, for why on earth would someone take the trouble to construct a road if it were not deemed a positive thing? What is less trivial, however, is the occasional, seemingly blind enthusiasm for new roads, leading to the stubborn zeal that is necessary when constructing a road against the odds. This was already apparent in the earliest examples of Daendels' Grote Postweg and the colonial road network in West Sumatra. Where such conviction is absent, for example where villagers in Laos and Kalimantan have alternative ways of transport and do not give top priority to repairing local roads, roads quickly fall into disrepair. Provincial and national roads become more and more dilapidated when the necessary funds are not reserved for their repair. Roads deteriorate because of landslides caused by heavy rainfall and the rugged terrain, because the road becomes overgrown with secondary vege-

tation, or because the trucks are too heavy for the surface.[4]

The second theme is Rigg's question: what do roads do to previously relatively isolated people? Or, in Windle's words: do roads bring envelopment or development? No unanimous opinion is reached on this point. Rigg, Asnan, and Trankell (1993:90) conclude that roads provide market opportunities that allow villagers in Thailand, Indonesia (in the nineteenth century), and Laos to escape from subsistence agriculture. Villagers produce cash crops for the market, commute to town for off-farm employment, or do piecework brought to the village; 'without roads many of these changes would have been impossible or economically impractical' (Kunstadter 2000:169). Porath and Pandya, on the other hand, are less optimistic about the opportunities gained by villages reached by a new road. Windle concludes for Sarawak that much depends on the degree of control people retain over their resources. Whether or not isolated people profit from market integration might also be related to the time passed since the construction of the road: short-term marginalization might be compensated for by long-term economic incentives. The last word on this topic has yet to be spoken.

The third, and more surprising, generalization is that peripheral people profit from the road in other ways than through production for the market. Kirksey and Van Bilsen note that the Trans-Papua Highway stimulates subsistence production. Not only is it easier to make a field in a selectively logged roadside plot; the microclimate of the road is also favourable to edible animals such as grasshoppers. Moreover, hunters feel more comfortable shooting birds and wild pigs from the safety of a road than when they have to follow them into the dangerous forest.[5] Sakai collect items fallen or thrown from vehicles and put them to their own use. The Sakai and the Jarwas have learned how to exploit their '(ex-)primitiveness'. They display their primitiveness in order to force government officials to provide social programmes and they ask money for being photographed in (quasi) traditional attire. Sakai used to stop cars to beg; some Sakai still do, but nowadays claim the money is for the construction of their village mosque. A famous Sakai shaman saw his income increase when urbanites started soliciting his supernatural help on day-trips made by car. Jarwas block the road and demand that buses and other vehicles take

4 ADB 2000b:4; Seah 1978:10; Trankell 1993:68; Wadley 1998. One example may serve to illustrate the impact of damages to roads. In Kalimantan the number of potholes in intercity roads increased by 25 per cent in one month (June 2001). Travel time on several routes doubled; dozens of buses went out of operation because the risk of getting stuck was too great and intercity transportation was left to smaller delivery vans (Toyota Kijang), which charged two-and-a-half times the usual fare (*Kompas* 8-6-2001, 11-6-2001).

5 Wild elephants may also profit from the new microclimate; in Laos it was expected that they would travel along the road as tasty young vegetation becomes available along the edges (ADB 2000b:8).

them on board and carry them to the place where they wish to be dropped off. Another very important point is that roads introduce people to new ideas and stimulate them to become 'modern'. Sakai enjoy the experience of their bodies moving at a speed they thought was reserved only for spirits.

The fourth generalization, and here there is less disagreement, is that it is outsiders who profit most from new roads. The successive waves of new users, the expansion into presumably empty land, and the relevance of transport axes are all strongly reminiscent of the powerful image of a frontier society drawn by Frederick Jackson Turner (1920) of the American West in 1893. In fact, Turner found that there were a number of successive frontiers, each relating to a different economic activity, and each preparing the ground for the next frontier. As moving on was an essential feature of the frontier, the development of transportation was crucial. A similar process took place in the Amazon, where loggers supplied the initial infrastructure for an invasion of colonists and ranchers, turning supposedly uninhabited forestland into pasture. 'The building of roads through "empty" forests [in the Amazon] usually resulted in surprised surveyors and Indians discovering each other, in mutual dismay' (Hecht and Cockburn 1990:157-8; see also Pichón 1996). The underlying principle with the expansion of successive frontiers is that land-use patterns reflect the distance to markets and related transport costs. This principle, first formulated by the nineteenth-century German geographer Von Thünen, results in three or four zones, from closed forest to intensive agriculture (Cleuren 2001:28-33, 44-8; Persoon and Wakker 2002:4-6). Among the articles in this volume, Colombijn is most explicit in describing the frontier quality of the new road in Sumatra. A certain lawlessness, with its corollary, highway robbery, forms part of the opportunism characterizing the frontier. The behaviour most typical of the frontier, however, is economic opportunism: the run for short-term profits and the lack of readiness to invest in sustainable production. An undiplomatic diplomat predicted that a bridge across the river Mekong 'will make it easier for the Thais to rape and devastate Laos' (Trankell 1993:2). The main victim of this opportunism is the forest, which brings us to the next point.

The fifth generalization is the very strong causality between new roads and deforestation. As has been stated bluntly of the Trans-Amazon Highway: '[a]ll along here deforestation follows the road. [...] With each road comes forest destruction on each side.' (Hecht and Cockburn 1990:56.) A direct impact of road construction is that forest must make room for roads,[6] but

[6] Other undesirable direct ecological consequences of road construction include excessive stream sedimentation; water flow obstruction; soil erosion alongside roads; danger of landslides in steep areas; disturbance of breeding areas or migration routes of animals; and compression of soil structure (FAO 1999:7; see also Tsunokawa and Hoban 1997).

more important is the indirect impact, namely that roads provide access to the forests alongside the road. As soon as there is a road, logging starts, after which the successive waves of entrepreneurs inevitably enter the frontier, as in, for instance, Riau and West Papua (see further ADB 2000b:4; FAO 1999:8). In West Papua, South Korean companies signed a contract with the Indonesian government to improve the Trans-Papua Highway in exchange for logging rights on both sides of the road. A World Bank report on the state of the environment in Indonesia states that 'the construction of a new road through protection forest acts as an open invitation for illegal logging' (World Bank 2001:21). In Sumatra, the World Bank came to the sensible conclusion of stopping investment in a road leading through Taman Nasional Kerinci Seblat (National Reserve Kerinci Seblat); the half-finished road was blocked by a huge chunk of cement (*Sinar* 24-5-1997). The FAO (1999:12) believes that '[d]emolishing bridges is easy and effective' in stopping illegal logging. However, the examples Colombijn gives for Riau suggest that blocked roads and demolished bridges will quickly be used again by loggers and that illegal loggers make their own roads. His conclusion is that the only effective way to stop this logging is a total ban on road construction in or near virgin forests; an extension of the road network should only be allowed in forests where there are roads already (since such forests are already doomed anyway). As Francisco Pichón (1996:364) has recommended in the case of the Amazon, 'government policy must ensure that new road construction is designed to intensify the use of existing accessible land, rather than expanding the road network'.

The sixth point is that roads produce not only a new, often deforested landscape but a new soundscape as well. In Laos, Trankell (1993:59) remarks that 'heavy transports of timber trucks went on all night – making sleep as well as conversation almost impossible' (Trankell 1993:59; see also ADB 2000b:7). The Trans-Papua Highway is also characterized by noise. The Pekanbaru-Dumai road in Sumatra introduced new sounds, imitations of which are found in the onomatopoeia *kereke-kereke-kerek* (the sound of spiked tyres) and *bu'de'um de'um* (vroom vroom).

The seventh point is that roads have an impact on the landscape of disease. Kirksey and Van Bilsen report that after the construction of the Trans-Papua Highway, disease skyrocketed. Roads change the prevalence of diseases and the direction in which contagious diseases are spread. In the nineteenth century the creation of roads in Kalimantan exacerbated malaria (Knapen 2001: 159, 162). Sexually transmitted diseases, including AIDS, can be linked to road construction. It is believed that truck drivers and construction workers are likely vectors of these diseases (Tsunokawa and Hoban 1997:166). And the rate of deadly traffic accidents is high, far exceeding rates in Western countries.

The eighth generalization, one that is well known, is that security forces welcome roads that facilitate logistic support in controlling scattered insurgent groups. The ability to link scattered communities affects the acceptance of political authority, or legitimacy, of the central state (Seah 1978:5-6). The Trans-Papua Highway became both the scene of and the prize in armed struggle. The Sakai enjoyed a measure of autonomy before roads were built. West Sumatra was subjugated by colonial forces following indigenous tracks. In East Timor, the Indonesian army built a network of roads as a way to fight the insurgents there. But even José Ramos-Horta, Foreign Minister of the independent East Timorese government, admitted that 'in fairness', there were economic intentions as well, and that today the roads are useful for the circulation of goods (Colombijn 2001:4). Roads to Hmong villages in Thailand were constructed for political motives: as counter-insurgency against the communists, to put an infrastructure in place so that bulky cash crops replacing poppy production could be marketed, and to extend government control of forest and watershed resources (Kunstadter 2000:167-8).

So far the only impact discussed has been that of new roads in inaccessible regions, but of course roads also make an impact on towns and cities. The ninth generalization is the change of orthogonality and cosmology. The shift from rivers to roads as avenues of transportation is common knowledge, but the impact of this shift on the urban space is less known. In Semarang (north Java), all urban functions were formerly concentrated along the river, but after the construction of the Grote Postweg, many functions moved to this road or to parallel and side roads.[7] The town of Demak was not oriented towards the river, but towards the central square (*alun-alun*), where the princely palace constituted a cosmic centre; here, the road, lined with ordinary (secular) shops, cut the square into two halves and reduced the prince's cosmic power. In Chinese cosmology the roads became the new 'breath of life': the entrance of one Chinese temple was moved from the seaside to the road, and other new temples were erected on the streetside. Similar processes could be observed, for instance, on Sumatra in Pekanbaru and Palembang. Palembang used to have an elongated form, spreading along both banks of the Musi River. After the development of a road network the city grew inland, and this process was hastened by the construction of the first bridge spanning the river (1965). Rivulets emptying in the Musi were reclaimed and paved as roads. The vernacular *limas* houses were turned; while they had earlier faced the river and rivulets, they now faced the road (Taal in press). Bangkok also made the changeover from water to road transport. When the king moved his palace (the old sacred centre of the city) and simultane-

[7] Sakai used to position themselves geographically using an upstream-downstream idiom; nowadays they do so using a Pekanbaru-Dumai orientation.

ously constructed a 'procession road' lined with palaces, temples, and public buildings (but not shops or ordinary residences), the sacred urban cosmology changed to 'a "modern" capital city' (Evers and Korff 2000:85). Related to this point is the emergence of entirely new settlements along roads, a common process that only becomes visible when one adopts the long-term perspective of Asnan, or of Nas and Pratiwo.

Linked to the ninth point is the tenth generalization that, contrary to what one would expect intuitively, toll roads and motorways, the kings of roads, do not have an overly large impact on urban form. Although transportation in general plays a role in Mc Gee's analysis of the rise of Extended Metropolitan Regions, motorways are hardly given explicit mention, except when it comes to connecting the airport with the city core. Winarso demonstrates that the location of big housing projects around Jakarta is *not* determined by accessibility; roads are only planned after the locational decision has been taken. Silas predicts that in the present protracted economic crisis, maintenance of the motorways around Jakarta may become problematic. In Surabaya, arterial and ring roads have as much of an impact on urban extension as do toll roads, and a preference for living in settlements with easy access to toll roads was not encountered. I believe that the reason for the limited impact of toll roads and motorways on urban morphology is that they function like railways, with a limited number of entrance and exit points, while only a few types of vehicles are allowed. Motorways lack precisely those qualities that determine why, of all conduits of transport, ordinary roads affect people most: their general-purpose capacity, the theoretical access at all points of the road, and the wide range of available transport modes (Seah 1978:6). Motorways are also unlike ordinary roads in a symbolic sense: a successful middle-class citizen entering Jakarta's elevated motorways both literally and socially leaves behind the crowded streets of the lower class (Kusno 2000: 110). Of course an important spatial effect of motorways is that urban wards (usually slums) must be demolished in order to make room for them. While it may be regrettable where this is done forcibly, the construction of such roads would be almost impossible otherwise. In Bangkok a six-lane thoroughfare built to reduce traffic congestion stops abruptly at the spot where a man refused to sell his property, a massage parlour (Evers and Korff 2000: 216).

The remaining points apply to both urban and rural roads. The eleventh generalization is the role private interests play in road construction. This goes deeper than the rather obvious question of who gets paid to build a road. The Grote Postweg became the stake in a political rivalry between Daendels and Engelhard, a Dutch civil servant who had been bypassed by Daendels. In nineteenth-century West Sumatra, Dutch officials received a promotion when they successfully constructed roads, regardless of whether the road served

any purpose; and from what I have seen of it, the same principle applies to the Indonesian Ministry of Public Works today. Nowadays, East Timor is full of roads leading nowhere, built because Indonesian officials had the habit of awarding useless building contracts to road builders in return for bribes (*NRC Handelsblad* 18/19-5-2002). In Kalimantan, conversely, a much-needed road has not been completed, because the reserved funds keep disappearing into private pockets (*Kompas* 8-6-2001). In Padang, traditional leaders made a bypass road feasible in return for some drinks and a handful of cookies and the state's recognition of their informal leadership (Colombijn 1994:286-8).

The twelfth generalization is that power, rather than formal regulations, determines the use of roads. Examples abound. This principle was analysed in detail by Wolfram Lorenz with regard to the traffic rules of Yogyakarta. Siti Hardiyanti Rukmana ('Tutut') gained control over the toll roads around Jakarta through the backing of her father, former President Suharto. When power slipped from Suharto's hands in May 1998, the tollbooths were among the first objects to fall victim to the rage of the common people. In West Sumatra, the Dutch colonial state used its power to cut off traffic to uncolonized eastern Sumatra and redirect trade to its headquarters on the west coast. In Riau and West Papua, civil servants and other people erect temporary tollbooths in order to extort money illegally. Ordinary people block roads in Riau in order to take unwilling companies hostage and force concessions from them. An unequal power relationship also lies at the root of government attempts in the mega-cities to clear the main roads of street vendors and slow forms of public transport.

The thirteenth point is the symbolic meaning roads have. The Trans-Papua Highway is considered the 'State Road' by Papuas, and in that context the name has a negative connotation. In West Papua roads were seen symbolically as kinship networks linking geographically separated patrilineal groups. Footpaths in West Sumatra connected related matrilineages in a similar manner. For the Sakai, the Pekanbaru-Dumai road is part of a landscape of development; simply living along the road gives the Sakai a feeling of progress without any actual rise in living standards necessarily taking place. Because of the symbolic power of roads, street names, symbols in themselves, become important. Streets were renamed after the transfer from European colonial, to Japanese, and then to independent rule. Recently, one of the first things the East Timorese Transitional Administration did in the context of nation building, after they began to administer their own country, was to change the name of one of Dili's main streets to Avenida dos Direitos Humanos (Human Rights Avenue) (Colombijn 2001). Anti-government activists all over the world have used ceremonial avenues as the perfect ground for protest marches challenging the state. Roads are also used in a metaphorical sense. For example, in the novel *Djalan tak ada udjung* (The road has no end)

by Mochtar Lubis (1971, originally published in 1952) the road is something positive. According to Anthony Johns, the road in Lubis's novel stands for the protagonist's 'coming to terms with himself, learning to live with fear, his besetting weakness. [...] [T]he road also represents his psychological journey to the recovery of his virility. In this Isa [the protagonist] is not just Isa the man, but a symbol of Indonesia, unable to mobilize its energies.' (Johns 1968: 8.) Isa represents the fear of a whole generation (Chambert-Loir 1974:148-50). At the end of the novel, however, '*dia [Isa] tahu pula, bahwa baginja djalan baru mulai*' (Lubis 1971:139): Isa [Indonesia] does not find itself on a road with no end, but has just started off on the road.[8]

The fourteenth and last point, noted only by Pandya, and by Kirksey and Van Bilsen, is that studies of roads demand a partially new methodology. The classic ethnological study, circumscribed in space and time, of 'my village' or 'my urban quarter' is no longer possible. The tested methodology of intensive participant observation of face-to-face communities is impossible in 'travelling cultures'. On and along the road, many, though not all, contacts are ephemeral. The elongated shape of the research object, perhaps hundreds of kilometres long, requires a variant of a 'multi-sited ethnography'. The researchers stay in transit places, a hotel – or rather a motel – or the intercity night bus, instead of finding a base (Clifford 1997:1-39, 52-91; Frey 1998:232; Marcus 1995). Since this point is only of concern for anthropologists in the field, I shall not go into it further here.

To end on a different note, social scientists have spent a great deal more attention on the temporal than on the spatial context of human behaviour. Social changes are the preferred topic of study, while studies of static situations are almost taboo. This focus on process is reflected in the currently popular use of gerunds in book titles (*Writing culture*, *Seeing like a state*). The focus on changes over the course of time is fine, as long as the spatial context of human behaviour is not ignored. All behaviour takes place in a three-dimensional space and quite often space is a key factor, restricting options for human behaviour. But scholarly attention for the spatial context of human behaviour should not be at the expense of the temporal dimension either. Space and time come together in the concept of mobility: the movement of people, of goods, and, especially where modern modes of communication have not been fully developed, of news and ideas. Roads have the capacity

[8] The metaphorical power of roads is also invoked by scholars. For example, Leiden University's library catalogue includes 720 books with the word 'road(s)' in the title, 168 books with 'crossroad(s)', and two books with 'roadmap'; these words are almost never used in the literal sense, and almost always with a positive connotation (*on the road to* ...). There were too many hits with the title word 'way(s)' for the online catalogue to list. The book titles were counted on 17 July 2002.

to enhance the mobility of people, goods, and news; therefore they have an enormous social impact. Roads are worthy of our scholarly attention.

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