



Urbanization in the Bangkok Metropolitan region: trends, drivers and challenges

งานวิจัย ด้านการรับมือของเมืองกับการเปลี่ยนแปลงสภาพภูมิอากาศ Urban Climate Resilience Research

ภายใต้โครงการเครือข่ายเมืองในเอเชียเพื่อรับมือกับการเปลี่ยนแปลงสภาพภูมิอากาศ
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สนับสนุนทุนวิจัยโดย
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วัตถุประสงค์

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- 2) ด้านความเปราะบางของคนเมือง (People centred/Vulnerability)
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และถอดบทเรียนเป็น 9 กรณีศึกษา รวมถึงเน้นความสำคัญในการส่งเสริมและผลักดันงานวิจัยทั้ง 3 ด้านนี้ไปสู่งานวิจัยในระดับมหาวิทยาลัย และงานวิจัยในระดับชาติ ซึ่งจะเป็นอีกทางหนึ่งที่จะสนับสนุนการสร้างการรับมือของเมืองต่อการเปลี่ยนแปลงสภาพภูมิอากาศที่เหมาะสมและยั่งยืนต่อไป



Bart Lambregts, PhD

Lecturer, Faculty of Architecture, Kasetsart University

50 Paholyothin Road, Jatujak, Bangkok 10900, Thailand

B.Lambregts@uva.nl

Bart Lambregts is post-doc researcher with the Amsterdam Institute for Social Science Research (AISSR), University of Amsterdam, and lectures urban planning at the Faculty of Architecture, Kasetsart University, in Bangkok.



Urbanization in the Bangkok Metropolitan region: trends, drivers and challenges

Bart Lambregts¹, Tanapon Panthasen and Supanita Manchareem



Urbanization is rapidly changing the face of Thailand and generates important challenges of various kinds. While ever more places across Thailand experience urbanization –and not infrequently rapid urbanization – the process and its consequences remain most manifest in the Bangkok Metropolitan Region (BMR). This paper presents an overview of recent urbanization trends in the Bangkok Metropolitan Region (BMR) and explores the associated environmental challenges. It looks into population and land use dynamics and trends in economic production and consumption, and investigates the forces that fuel urbanization. It finds that while migration-led population growth in the BMR remains strong, it is notably the tendency among BMR inhabitants to live together in smaller households that nourishes demand for residential space. In economic terms, the city of Bangkok increasingly emerges as the trade and services centre for a region that remains pre-occupied with manufacturing goods. Consumption, meanwhile, is no longer predestined to take place in the centre of Bangkok. Shopping facilities in the suburban areas are mushrooming and Bangkokians also increasingly seem to enjoy spending their steadily increasing incomes beyond BMR boundaries. Similarly, it is no longer only the road network that spatially guides urban development; the region's expanding mass transit system has started making an impact as well.

While driving forces and guiding elements gradually change, a remaining constant is that urbanization in the BMR continues to proceed in ways that are hardly sustainable. Residential, commercial and industrial developments in the outer areas continue to increase the region's vulnerability to floods and they continue to promote car-dependency. Simultaneously, the ongoing densification in Bangkok itself reduces the city's capacity to deal with heavy rainfall and keeps adding to the urban heat island effect (the city is warming at a rapid rate). The latter tends to reinforce itself as it increases the demand for cooling which in turn generates more residual heat. It is also a bane for the promotion of non-motorized mobility in the city. Adding to the environmental woes are the city's and region's inadequate dealings with waste water and solid waste. Only a small percentage of both categories is treated and disposed of in sustainable ways. The bulk is simply dumped and allowed to slowly poison both water and land based eco-systems, and jeopardize the communities and practices that depend on them.

Among stakeholders from various domains these problems and challenges are well understood, and so are the factors that underlie them. Ideas, plans and proposals to address them, moreover, have been tabled and discussed on various occasions. However, the same stakeholders have not yet been able to carry into effect the required changes in the ways urbanization in the BMR is guided and performed. To effectuate these changes is perhaps the greatest challenge related to urbanization (in the BMR) of all.

¹Corresponding author. Division of Urban and Environmental Planning, Faculty of Architecture, Kasetsart University, 50 Paholyothin Road, Jatujak, Bangkok 10900, Thailand. E: b.lambregts@uva.nl; T: +66(0)873359898.



Urbanization, the transformative process representing change from ‘rural’ to ‘urban’ is rapidly altering the face of Thailand. With Thailand’s urbanization rate still being relatively low (Figure 1), the potential for further urbanization is substantial. The process currently receives surprisingly little policy attention and takes place largely unmanaged. This may need to change, given that urbanization affects the functioning of societies and how they relate to their environment in far-reaching ways. With regard to the latter, events such as Central Thailand’s Great Flood of 2011, the structural pollution problems plaguing many parts of the Bangkok Metropolitan Region, and the 2014 landfill fire in Samut Prakan demonstrate how closely intertwined processes of urbanization and the creation of vulnerability to natural (or man-made) events have become and how dangerous and costly further disregard for urbanization and the challenges it brings forth, could be.

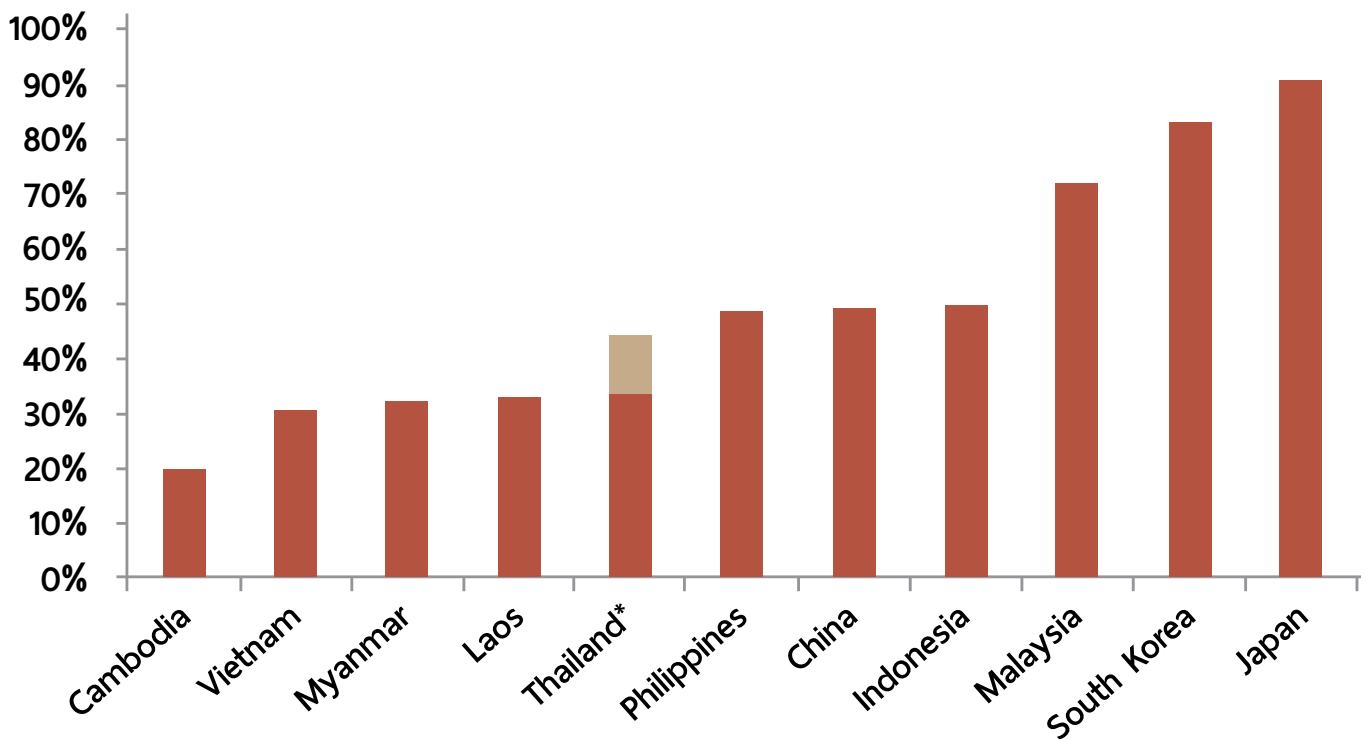


Figure 1: Thailand’s urbanisation level in a comparative perspective (2010)

Data source: United Nations Population Division, 2014.

* The UN Population Division sets Thailand’s urbanisation level at 33.7 %. This is likely to be an underestimate (Alkema et al., 2012). Thailand’s 2010 Population and Housing census reports that 44.2% of Thailand’s population lives in ‘municipal’ (i.e. non-rural) areas.

This paper aims to contribute to the development of a deeper understanding of the challenges produced by urbanization in Thailand. It does so by looking at the country's most urbanized area, the Bangkok Metropolitan Region (BMR). More in particular the study looks into the question how Bangkok's recent transformation from a riverside city into a sprawling metropolitan region has redefined its relation with the environment and created new vulnerabilities, also but not exclusively in the face of climate change. In terms of outcomes the study identifies the environmental challenges generated by the rapid urbanization of the BMR and draws attention to some of the more urgent governance issues in need of address.

The insights developed in this paper ought to be of interest in particular to those who actively are or aspire to become involved in the management of Thailand's towns and cities and environmental resources. This includes local, regional, and national government agencies concerned with the provision of urban services and the management of environmental resources, civic organizations devoted to the improvement of urban services delivery and environmental resources management, and private sector organizations involved in shaping the country's towns and cities (e.g. developers of various kinds of real estate, industrial investors or their representatives, etc.). Ideally, all would benefit from a more thoughtful and strategic management of the ongoing and inevitable urbanization process.

The current case study for the Bangkok Metropolitan Region was accomplished within the framework of a larger research programme initiated and managed by the Thailand Environment Institute (TEI) in co-operation with the International Institute for Environment and Development (IIED). This programme aims to identify and raise awareness about Thailand's urban challenges and is itself part of again a larger study and awareness-raising effort organized around the question 'What is urban climate resilience in the Thai Context' under the ACCCRN framework (Asian Cities Climate Change Resilience Network). The study was carried out by the Division of Urban and Environmental Planning of Kasetsart University's Faculty of Architecture.

Data for the study was sourced from several relevant statistical repositories (e.g. Thailand's National Statistical Office, the NESDB, the World Bank and others), existing (academic) articles and reports, from media reports, and from local experts and stakeholders in the BMR's urbanization process. To engage with the latter the researchers organized a roundtable discussion in which the participants (see Annex A) spent the better part of a day exchanging experiences and views on the contemporary drivers of urbanization in the BMR, the challenges produced by urbanization in the BMR, and the complexities involved in governing urbanization in the BMR.

The current paper reports the findings in four steps. First, we take a look at how urbanisation currently proceeds in the BMR, paying attention to changes in the region's demography, land use, economy and consumption patterns. Next, we take stock of the forces that have been and are driving urbanization in the BMR. Which actors and factors are fuelling the urbanization process, and who or what determines in which directions the city grows? We then proceed with a qualitative assessment of the vulnerabilities created by the rapid urbanization of the BMR, with a focus on vulnerabilities that relate to natural and climate-related events and changes. Fourth and finally, we turn to the challenge this all represents for urban and metropolitan governance. What does it take to gain more control of the processes taking place and properly address the associated challenges?



Recent urbanization trends in the Bangkok Metropolitan Region

This section takes stock of some of the more consequential urbanisation trends in the BMR. It of course looks at recent population and land use developments – commonly understood as two of the most telling dimensions of urbanization – but also pays attention to changes in the ways people live, the ways they work, the ways they play and consume. In each of these domains, Bangkok and the BMR at large have seen dramatic changes taking place over the years.



Recent population dynamics in the BMR

Bangkok's impressive growth story is well known and described. Its development, in less than 250 years, from a modest riverside settlement to a sprawling metropolis of millions has been recorded on various occasions (e.g. Askew, 2002; Webster, 2004). A bit of an issue is how many millions exactly make up this sprawling metropolis today. The answer much depends on how one draws the boundaries of Bangkok and whether or not one takes into account the sizable population of unregistered inhabitants. A Google Earth's view on Bangkok quickly reveals that the city's built-up area today stretches far beyond Bangkok's administrative boundaries and consumes substantial parts of the surrounding provinces of Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakhon and Nakhon Pathom (also known as Bangkok's 'vicinity'). While the registered population of Bangkok alone stood at 5.7 million in 2010 (BMA Statistical Profile 2010), the total registered population of the Bangkok Metropolitan Region (Bangkok and the five neighbouring provinces listed above) reached 10.3 million in the same year (NSO Thailand, 2013). These numbers, however, exclude several hundreds of thousands of foreign (labour) migrants and expatriates and several millions of domestic migrants from other parts of Thailand who reside more or less permanently in the area but without being formally registered as inhabitants. The decennial 'Population and Housing Census' performed by Thailand's National Statistical Office claims that it does account for these and puts the 2010 population of Bangkok and the BMR at respectively 8.3 and 14.6 million (NSO Thailand, Population and Housing Census data), a whopping over 40% more than the registered population. Figure 2 shows the development of the registered and census population for Bangkok (BMA) and the BMR over time. Strong growth is the common denominator, with exception of the registered population of the BMA after 1980, which has remained fairly stable over the past three decades. Interesting to see as well is that the registered and census populations for both the BMA and the BMR started to diverge significantly only after 2000, suggesting that the first decade of the new millennium saw an unusually big influx of unregistered residents to both the BMA and the surrounding provinces². A comparison of the population development (census data) of the BMA with that of its five surrounding provinces (the vicinity) shows that growth in the BMA outpaced growth in its vicinity until ca. 1990, and that after 1990, when the trek to the suburbs by Bangkok's middle class accelerated and a new generation of 'suburban' industrial estates created ample manufacturing jobs attracting new waves of labour migrants, growth was faster in the vicinity (Figure 3). Bangkok itself, however, continued to grow as well throughout these years.

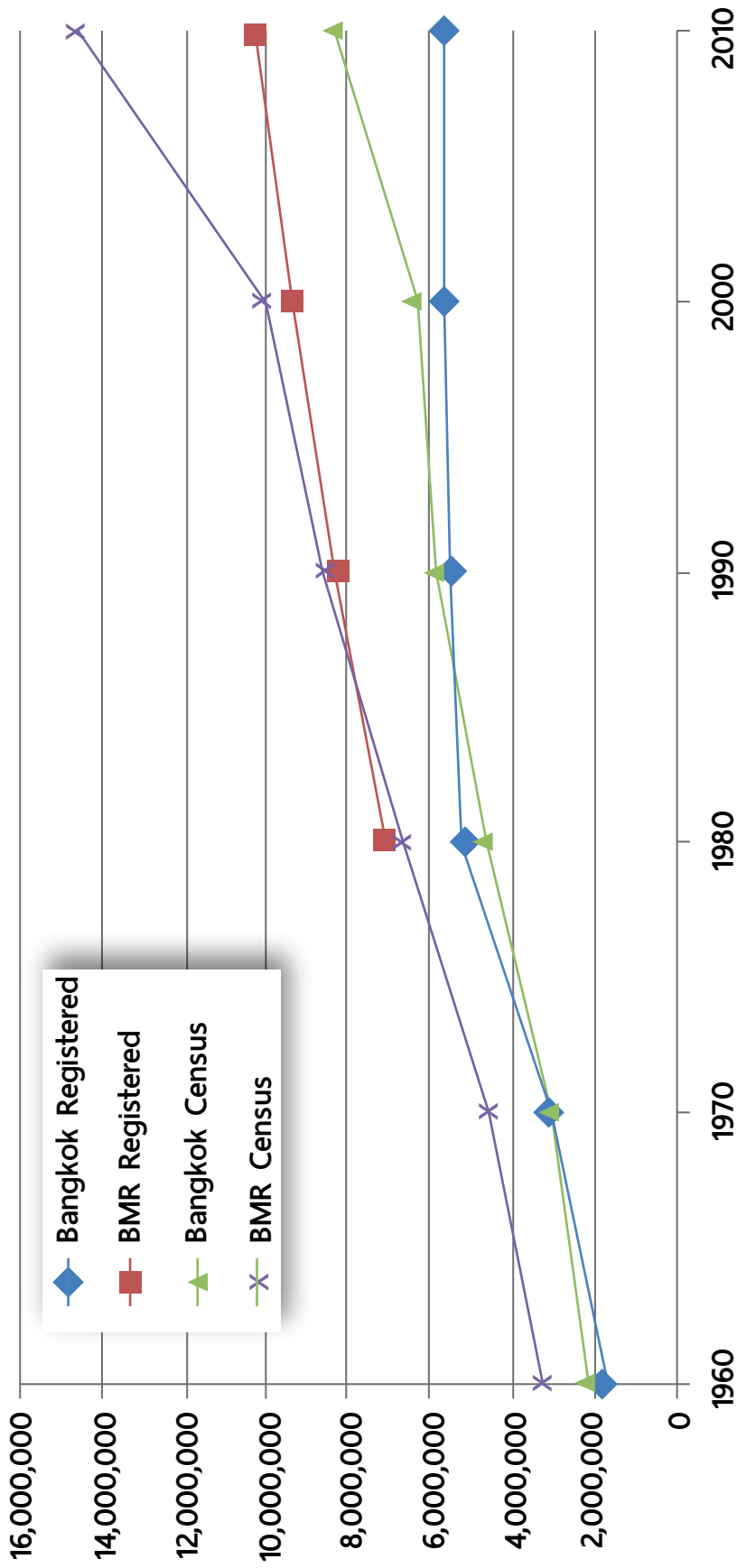


Figure 2: Registered and Census populations for Bangkok and the BMR 1960-2010
 Data sources: BMA Statistical Profile and NSO Population and Housing Census.

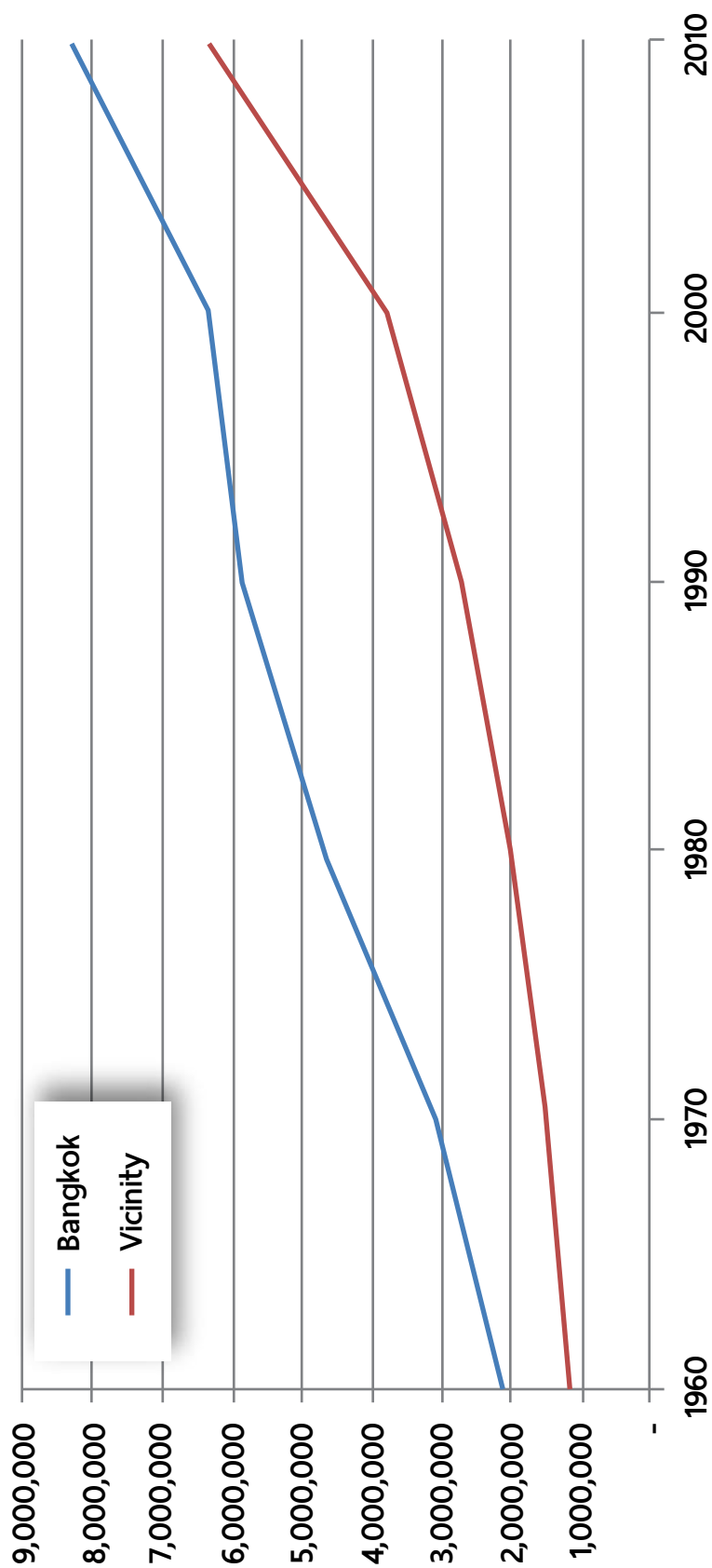


Figure 3: Population growth in Bangkok and the neighbouring provinces 1960-2010
 Data source: NSO Population and Housing Census.

Perhaps more impressive than the population growth still is the expansion of Bangkok's land area over time. What started as a compact riverside settlement has grown into an impressive mass of urbanity sprawling in every possible direction and on both sides of the Chao Phraya river (Figure 4). Bangkok's urban and suburban expanse currently covers an area measuring some 60km from north to south (roughly from Navanakorn Industrial Estate till the southern port area) and some 50km from west to east (roughly from Om Noi to Lad Krabang) (Figure 5). While Bangkok's population between 1850 and 2002 increased about 60 times, the city's built-up area in the same period increased no less than 230 times (Table 1). The average density, in result, has gradually decreased, from 276 persons per hectare in 1850 to 73 persons per hectare in 2002, obviously mainly thanks to the low-density building patterns dominating the suburban areas of Bangkok. The ongoing transformation process at the city's perimeter is radical, and insightfully described by amongst others Askew (2002) and Noparatnaraporn and King (2007). Usually it starts with the construction of a new road. This makes adjacent land interesting for development and increases its value. Farmers and other landowners get tempted to sell (parts of) their land to investors and developers. If the latter consider the time ripe, site preparation starts and houses get built, often in the shape of low density gated communities offering detached housing for the middle and upper income classes (a.k.a. moobans) but also in the form of cheaper and higher density projects consisting of multi-storey townhouses, small apartment complexes or barrack-style housing for lower income groups and migrant labourers. When the newly-built houses fill up, commercial functions emerge (mostly retail and mostly along the bigger roads) and if the area starts to pack sufficient purchasing power, the inevitable shopping malls will arrive as well. Traffic, in the process, becomes more voluminous and, as the area fills up, often soon becomes a problem, also because decent public transport often is hardly or not provided. Such development often proceeds in a leap-frog fashion, consuming some pieces of land while leaving others untouched. The resulting pattern is one characterized by fragmentation: a patchwork of different land uses where different identities simultaneously mingle, compete, and oppress each other, and where the next new development is never far away.

²An effect that likely relates to the 'Tom Yum Kung' crisis of 1997-98, which led large numbers of labour migrants to return to their place of origin (Webster, 2004), resulting in slightly subdued growth in census population between 1990 and 2000, and in propped up growth figures between 2000 and 2010, when many of them returned to the BMR again. An alternative explanation could be that the 2010 census was more inclusive than its predecessors.

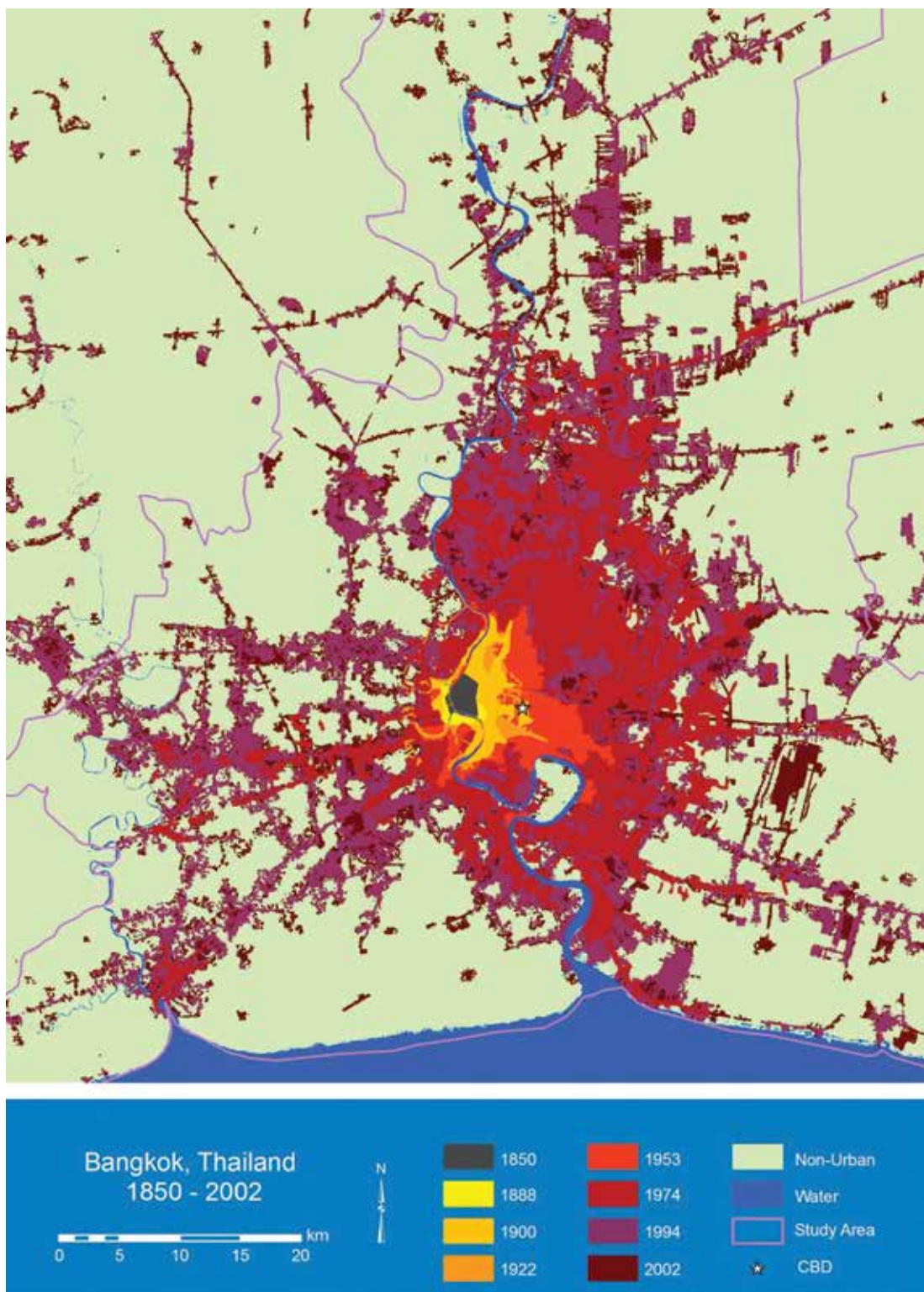


Figure 4: Bangkok’s spatial expansion over time

Source: Angel et al., 2010 (an animation is available on youtube: <http://www.youtube.com/watch?v=z9pJcdoRL7k&list=PLZY-m159uzQNc7H5UCCXh4c4TKdCeaNt>)

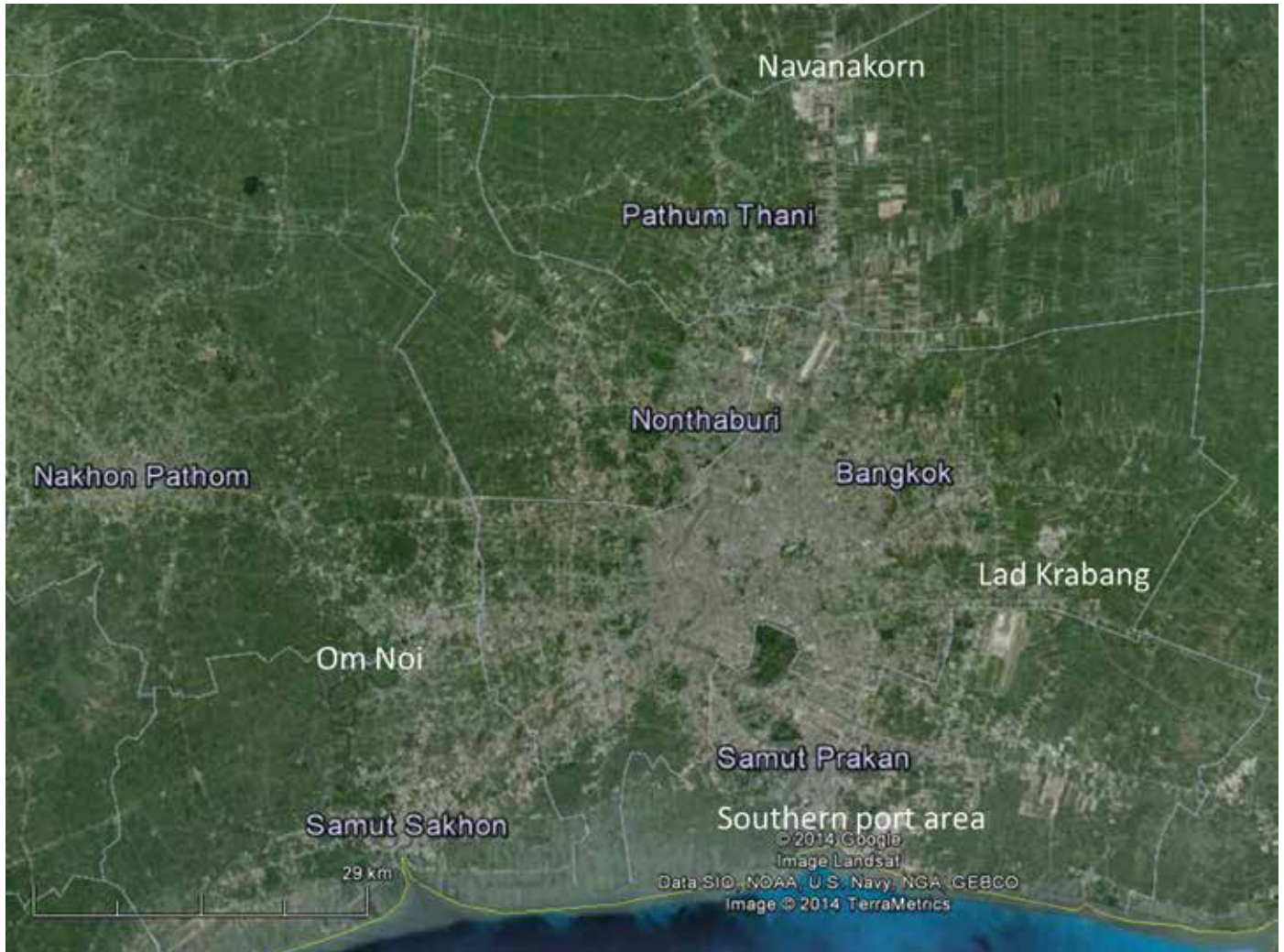


Figure 5: Current built-up area in the BMR

Source: Google Earth

Table 1: Bangkok’s population, urbanized area and density 1850-2002

Year	Population	Urbanized area (hectares)	Density persons per hectare)
1850	160,000	580	276
1888	359,075	970	370
1900	600,000	3,480	172
1922	1,174,442	4,750	247
1953	1,560,520	10,500	149
1974	3,213,407	52,180	62
1984	5,158,434	96,500	53
1994	8,238,697	88,688	93
2002	9,761,697	133,515	73

Source: Angel et al., 2010.

But also within Bangkok city proper change is a given. Plots that have long remained idle finally get developed, other plots get redeveloped after old structures have gone obsolete, buildings are refurbished, functions change, and so on – it is a seemingly never-ending process. Cranes, construction crews and construction traffic are noticeable throughout the entire city, the only exception (to a certain degree) being the old centre – Rattanakosin Island – which is under an effectively enforced conservation policy. Change these days is most visible in areas that currently are or in the near future will be serviced by the mass transit system. Here, rapid intensification of land use is taking place as the market has come to understand the value of mass transit accessibility in a city where many roads are heavily congested for most of the day during virtually all days of the week.



Changes in the way people live together

Over the past decades, in Thailand at large and in Bangkok and the BMR in particular, very significant changes have occurred in the ways people live and live together. Substantial has been the decrease in the average household size: from 5.2 persons per household in 1980 to 3.1 in 2010 for Thailand as a whole. In Bangkok and the BMR the average household size is lower still: 2.7 in 2010 (NSO Thailand, Population and

Housing Census data). As a result, the total number of households has increased much faster than the population itself. Whereas between 1990 and 2010 the BMR's census population increased by about 70%, the number of households in the area increased by almost 170% (from roughly 2.0 to 5.3 million). A rapidly increasing number of these are one-person households (22.3% in the Central region in 2010, up from 6.6% in 1990 according to NSO Census data, with the numbers for Bangkok likely being a bit higher). In close connection, the fertility rate has come down substantially as well: from 2.1 in 1990 to 1.3 in 2010 for the Central Region (NSO Thailand, Population and Housing Census data), with the figures for Bangkok likely being lower still. Declining fertility rates in combination with improvements in longevity have turned Thailand into an ageing society (UNFPA, 2006). However, the ongoing inflow of young adolescents enrolling in Bangkok's many universities or arriving in search of work, keep the population of the BMR relatively young (IPSR, 2006). Migration towards the BMR continues unabated: for the Central Region at large in 2010 Census 14.4% of the population mentioned that they had migrated to the area during the previous five years, up from 9.0 and 11.5% in respectively 1990 and 2000. No sign of a slowdown.



Changes in the way people work

While the search for work has remained an important motivational constant for those migrating towards the BMR, the nature of work itself in the area has changed substantially too. Economic growth in the region, with the exception of a few years, has been robust for decades, both in Bangkok and in the neighbouring provinces. Bangkok's economy, measured in terms of Gross Regional Product (GRP) currently measures about twice the size of the economy of its five neighbouring provinces combined (NESDB, 2012). This gap, however, is gradually getting smaller. Between 1996 and 2011 GRP growth in Bangkok amounted to about 100% while the GRP of the five neighbouring provinces grew by circa 150%. GRP per capita is also higher in Bangkok than in the neighbouring provinces, about 60%. Here the gap is not closing, on the contrary. Between 1996 and 2011 GRP per capita growth was stronger in Bangkok (56%) than in the neighbouring provinces (33%), a result of the stronger population growth in the latter (see above). The BMR's dominance in the Thai economic landscape is still impressive, but gradually declining. In 1995, no less than 52% of the country's Gross Product was produced in the BMR. In 2012 this was down to 'only' 44%. Between 1995 and 2012 basically every other region saw its regional economy growing faster than the BMR, with the Eastern region leading the pack (NESDB, 2012). Figure 6 shows the composition of the economies of Bangkok and the five surrounding provinces combined, both for the period 1995-1997 and for the period 2010-2012. Clearly visible are the strong orientation of the vicinity economy towards manufacturing (accounting for over 50% of the GRP) and the more diversified structure of Bangkok's economy. Bangkok, in terms of GRP, is first of all a city of commerce (23% of GRP) but also boasts a sizable producer services industry (24%), a well-developed logistics industry (11%) and still a good share of manufacturing (14% of the city's GRP). It is also obvious that the volume of services production in the vicinity provinces, with the exception of logistics services, dwarves in comparison to services production in Bangkok itself. The overall division of labour between the two is clear: Bangkok's

neighbouring provinces produce the goods, and Bangkok manages the trade and provides the services. Production growth meanwhile has been strong basically across the board, with Bangkok’s construction industry being the only sector showing decline (the industry’s glory days prior to the 1997/98 collapse never fully returned). The fastest growing industries in Bangkok are found in the domain of services production: public administration (including defence and social security) and real estate, renting and business activities. These two sectors showed very strong growth in the neighbouring provinces as well, but here it was the transport, storage and communications sector that grew strongest, supported by the opening of Suvarnabhumi airport in Samut Prakan.

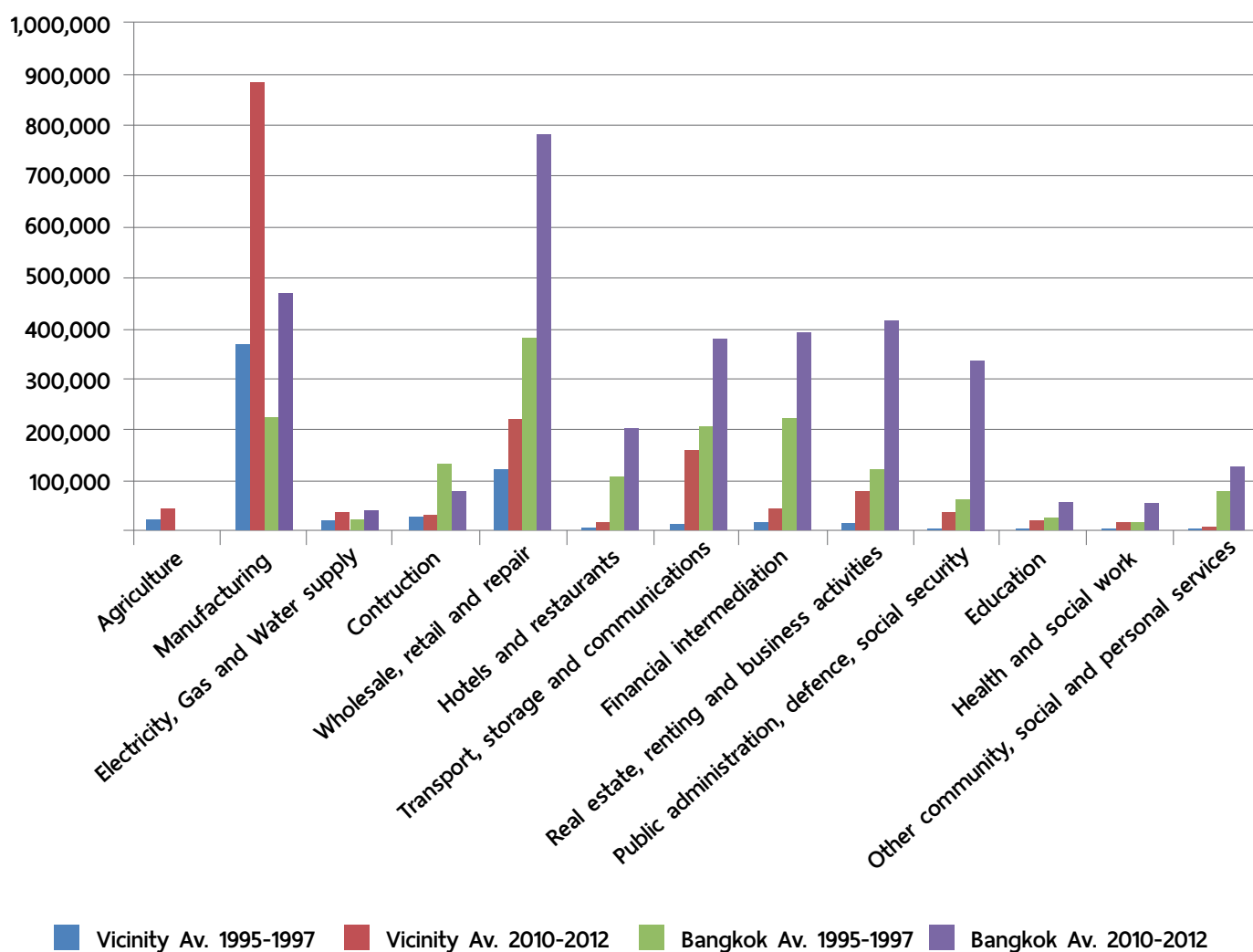


Figure 6: Sectoral breakdown of the economy of Bangkok and its neighbouring provinces, measured by contribution to Gross Provincial Product at current market prices in million baht

Source: Calculated using NESDB Gross Provincial Product statistics, various years.

Another significant change over the years relates to the changing role of women in the urban economy. While their participation rate in the labour process during the past years has been consistently high (around 70% for Bangkok), women increasingly manage to secure jobs in higher level and better paid occupations. According to the 2013/3 labour force survey, 34.1% of Bangkok's working women were employed as either legislators, senior officials, managers, professionals, technicians and associate professionals (NSO Thailand, labour force survey data), up from 29.6% in 2007 and much more than the national figure of 15.4% (for 2013/3). This hints at the 'professionalization' of Bangkok's female labour force and also means that increasing numbers of women in the city have jobs that render them financially independent, which creates degrees of freedom in other domains of life as well (e.g. reflected in lower marriage rates, more people remaining single for a longer period of time, etc.).

In conjunction with Bangkok's gradual transformation towards a more advanced, services-oriented economy, the city's labour force has become more educated as well. Today, about 40% of Bangkok's labour force has enjoyed tertiary education, up from 32% in 2007 and compared to circa 17% for Thailand as a whole (NSO Thailand, labour force survey data), with women now to be more likely to enrol in tertiary education than men (WEF, 2012).



Evolving consumption patterns and preferences

More time spent in education, in combination with increased access to (global) information via internet, television, and social networks makes for a more richly informed citizenry. Add to these increased levels of wealth and purchasing powers and there is another major factor fuelling change: peoples' consumptive desires and consumer behaviour. In the BMR, as elsewhere, increased aspirations and increased financial powers (Figure 7) to actually realize such aspirations have led to dramatic changes in amongst others citizens' leisure activities, housing preferences, travel behaviour, and energy consumption.

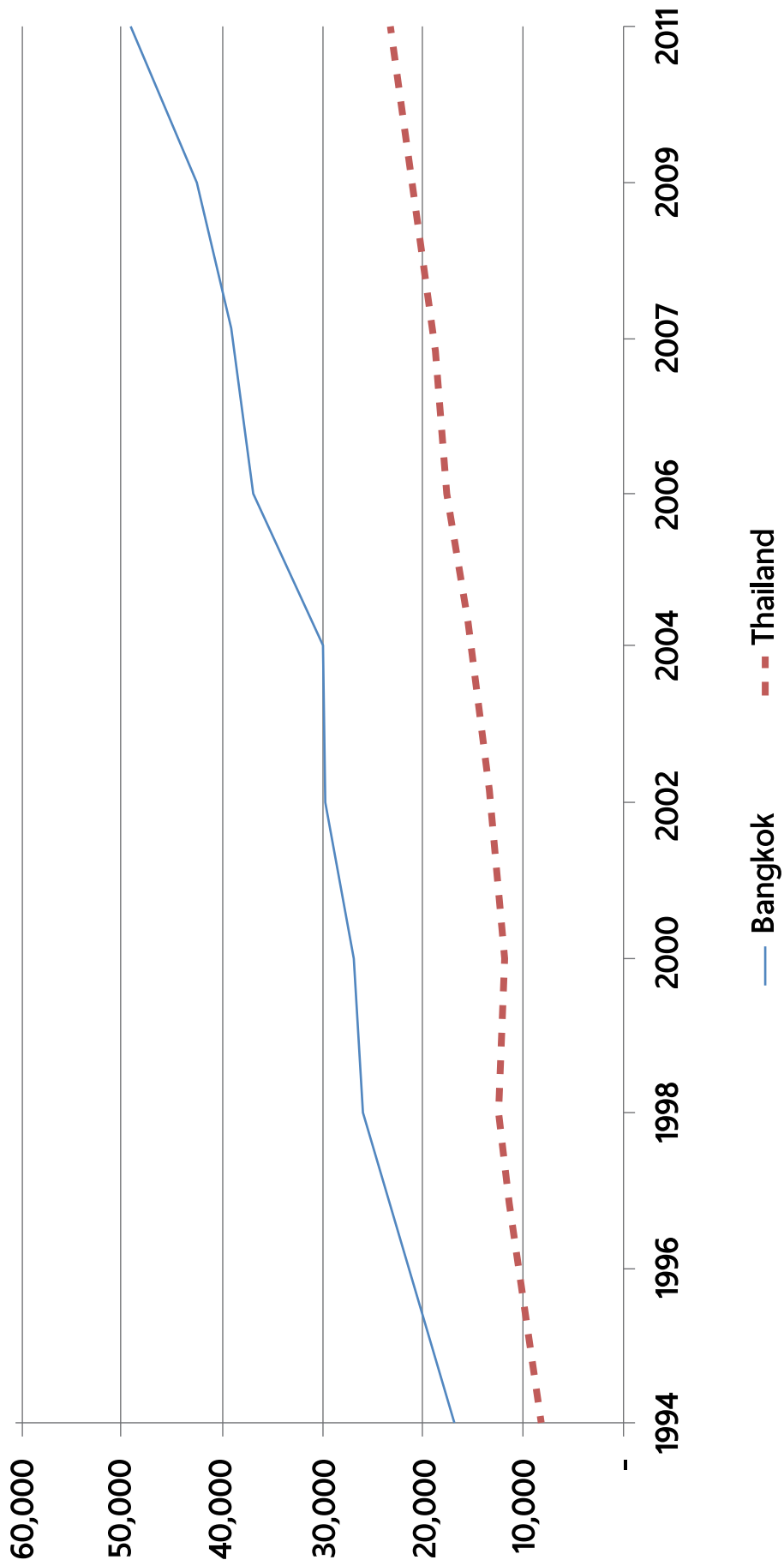


Figure 7: Development of monthly household income in Bangkok and Thailand 1994-2011 (in Thai Baht)

Source: NSO, The Household Socio - Economic Survey, various years.

As for leisure, the fact that retail space increased by more than 50% from 2004 to 2013 (CBRE Thailand, 2013), suggests that ‘shopping’ is still a popular pastime for many Bangkokians. The past decade or so has seen retail space being added in central parts of the city but even more so in the outer parts, where suburban purchasing power has continued to accumulate. A large number of new hypermarkets, shopping malls, and, popular of late, community malls have emerged along the main roads leading out of Bangkok and along the ring roads in between, producing a more decentralized or polycentric retail landscape in the BMR. Another consequential leisure development is the increasing appetite among Bangkokians for day and weekend trips ‘out of town’. Most weekends, and especially long weekends see thousands and thousands of urbanites leaving the city in search of a different environment and/or an outdoor experience. Attractive or otherwise interesting areas within two or three hours driving distance around Bangkok, such as KhaoYai, and the Cha-am - Hua Hin area, have experienced remarkable real estate booms (resorts, condo’s, landed homes) mainly catering to demand coming from the BMR. Since the arrival of cheap domestic flights around 2005, this effect has become noticeable elsewhere in the country as well.

One could be led to think that Bangkokians’ desire to spend leisure time either in malls or out of town in resort-style environments holds some relation with the fact that so many of them today live in one- or two-room apartments in high-rise buildings (or condominiums). These make for uncomplicated living during working days, but offer little ‘space to live’ during non-working days. Condos are, after the dismal years of the Tom Yam Kung crisis and its aftermath, once again front-running the urban housing market. With inner city land prices rendering landed housing forms unaffordable for all but the truly wealthy, condos basically offer the only form of affordable and acceptable (as they, unlike shophouses and other cheap low-rise rental accommodation, appeal to images of modernity and urbanity) housing for notably the younger cohorts of the urban middle class in the more central parts of the city and along the mass transit lines. Condos enable inner city office workers to shorten their commutes and to use the time saved to chase urban life. In addition to these, there are also those who work in the city, have a house in the suburbs and use condos as a pied-à-tier in the city for working days to reduce time wasted in traffic. As such, condos represent a cornerstone in the ‘survival strategies’ of various groups of BMR-dwellers and they will probably continue to do so as long as urban land prices remain duly high and travel in the BMR generally a torment.

The other type of housing in high demand is the detached, landed, single family home. These typically get built as part of larger housing projects (or moobans) away from the city centre where land prices still fit middle income housing budgets. Often walled, gated, orderly and homogeneous (Wissink et al, 2006) they offer the Thai version of the ‘suburban dream’ to the BMR’s middle class population and represent the antithesis to life in the unruly city. Since moobans offer low-density housing and typically get developed in a leap-frog fashion, they probably are the main responsible for Bangkok’s spatial expansion in recent decades. While condos thrive there were office jobs are plenty (e.g. Sathorn, Silom, Sukhumvit) and along the mass transit lines, and as such, at least in theory, reduce car dependency, moobans rather have the opposite effect. It is the rise of car-ownership and car-mobility throughout the decades that has made this particular form of suburban housing possible and it is car-dependence that it promotes. Poorly served by public transport (if at all) and often relatively isolated from any service or other function (e.g. schools, shops, places of work) the

inhabitants usually have no other choice than to use cars to reach their destinations. With many inhabitants of moobans holding office jobs in central Bangkok, typical and heavy suburban to downtown commuter flows are the result. The absence of alternative transport possibilities (bicycle infrastructure beyond the walls of the mooban often is also non-existent) encourages households to have more than one car: one for the household member who commutes, and another one for other household members for them to manage their daily mobility needs (which may include commuting as well). It is no wonder then that vehicle ownership in the BMR has risen enormously throughout the years. Currently there are about 7.5 million vehicles registered in the BMR (the bulk of them cars and motorbikes), almost twice as much in 1998 (Land Transport Department) and equal to one vehicle for every two inhabitants (using the Census population). Vehicle ownership and use is not only high in the suburbs but also in the city itself. With alternative modes of transport either not serviced with adequate infrastructure (walking and cycling), or hardly attractive (the outdated bus system), or too limited in reach and scope (the mass transit system) many city inhabitants choose the convenience of private motorized transport as soon as they can afford it (and enjoy the social status upgrade that it brings in the process).

Obviously, the above three key trends in consumption (i.e. the shift towards private motorized mobility, the preference for modern high-rise urban and low-density suburban housing, and the continued/increasing popularity of ‘mall-life’ and out-of-town weekend tripping) come with a cost. Section 4 deals with that. First, we take a closer look at the forces that drive many of the above changes.



What is driving urbanization in the BMR today?

The drivers of urbanization are many and, moreover constantly changing (Satterthwaite, 2007). Some drivers primarily affect the magnitude and the speed of urban change, while others notably determine the (spatial) direction in which urbanisation proceeds. In this section we briefly discuss what we believe are today’s most important drivers of the urbanization process in the Bangkok Metropolitan Region. We subsequently address drivers in the domains of demography, economy, consumer preferences and policy making.



Demographic drivers

The previous section taught us that the population of the BMR is still growing, with growth being produced notably by immigration and, given the low fertility rate, much less so by natural reproduction. Population growth creates demand for housing, mobility and other amenities, supports the expansion of retail and other consumer services, and thus fuels urbanization. However, a perhaps stronger demographic driver of urbanization in the BMR in the recent past has been, and probably currently still is, the declining average household size. More people nowadays live alone or in nuclear families instead of extended families, which has led the

number of households to increase at a much faster rate than the population itself. The impact of this is most clearly visible in the development of the number of housing units in the BMR (Table 2). While between 1990 and 2010 the Census population increased by about 70%, the number of housing units more than doubled, with great consequences for the city's need for space.

Table 2: Population and housing stock increase 1990-2010

	BMR Census Population	BMR registered houses
1990	8,589,900	2,060,000*
2000	10,159,100	3,292,442
2010	14,626,225	4,451,540

* Estimation based on DPA data for 1993 and house production between 1990 and 1993 as cited in Kojima (2013).

Data sources: NSO Population and Housing Census (population) and Department of Provincial Administration (DPA), Ministry of Interior (registered houses).

⁴A development that can already be observed along the northern corridor (VipawadeeRangsit and Pahonyothin Roads) where various knowledge-intensive (IT, research, education) service providers have settled in recent years. The decentralization of services production is also a trend that has been observed elsewhere in the world (see e.g. Garreau, 1991), and it would seem only a matter of time before the trend becomes more manifest in the BMR.

⁵Reliable information about their number is hard to find. Based on work permits issued there were around 65,000 of them in Bangkok halfway 2013 (Bangkok Post, 2013). Real numbers are probably higher.



Economic drivers

While notably the rise of manufacturing in the BMR was a key driver of urbanisation in the 1970s and 1980s (attracting large numbers of labour migrants from the provinces and fuelling the growth of the Bangkok middle class) it since then has come to be complemented by the expansion of the services industry (see also Webster, 2004). Section 2 (Figure 7) showed that manufacturing is still the main game in town in the neighbouring provinces but that commerce, trade and services are the largest and fastest growing industries in Bangkok. This two-faceted growth trajectory provides fuel for continuation of the urbanisation process both within the core (Bangkok) and in the periphery (the neighbouring provinces).

Urbanisation within the core articulates itself through processes of modernisation and commercialisation. Prestigious office towers replace obsolete workshops, gleaming shopping malls push aside traditional markets and stylish high-rise condominium towers take the place of old shophouses and cheap rentals to provide the latest generations of white collar and creative workers with contemporary, urban housing. It's a transformative process that continuously changes the appearance of the city (Bangkok becoming an increasingly 'vertical' city), alters the main functions of the city (Bangkok increasingly becoming a place of consumption) and leads to densification.

In the periphery, ongoing growth in manufacturing continues to create job opportunities for little and semi-skilled labour and thus maintains the attractiveness of the region for labour migrants. It fuels the production and reproduction of the 'industrial' urban landscape so familiar to this part of Thailand, dominated by a wide variety of production places (sometimes organized in industrial estates but more often spread across the landscape), low-cost housing facilities and low-cost retail spaces. Yet, as noted in the previous section, the encroaching middle and higher income housing estates and the purchasing power they bring are attracting new, higher-end commercial developments and eventually should also make the neighbouring provinces a more attractive location for services producing firms⁴ as this is where increasingly substantive numbers of their (potential) employees live.



Consumptive drivers

Part of the wealth accumulated by households in Bangkok and the BMR (Figure 7 above) is set to work to further the process of urbanization. If such wealth is employed to acquire auto-mobility and a pleasant home in the suburbs, an important contribution to urbanization in the BMR has been made. In addition and as mentioned above, it is also the increase of household wealth that fuels the ongoing expansion of retail space across the entire region.

However, it is not only local consumptive demand and preferences that matter in this respect. Bangkok receives millions of tourists and visitors each year who need a place to stay and spend substantial amounts of money on food, shopping and a variety of personal services. They contribute to the viability of up-scale

shopping malls and provide ample business opportunities in the hotel and restaurant business and the provision of personal services. As Figure 6 shows, it is Bangkok (and notably the city's inner parts) that benefits most from this conversion of consumer wealth into (commercial) urban amenities.

The impact of Bangkok's expat population⁵ on the urbanisation process is not totally insignificant but likely of a (much) lower order than the contributions made by both the local and the tourist populations.



Drivers related to infrastructure and mobility

The development of a metropolitan network of main roads in combination with the rise of auto-mobility has enabled and given direction to the spread of Bangkok far into its neighbouring provinces. These roads still affect to a large extent the directions into which urbanization spreads most quickly and most persuasively (i.e. along Pahonyothin Road in northern direction, along Rama II road in south-western direction, along PhetKasem and Borommarachachonnani Roads in western direction, and along Motorway 7 in eastern direction, see also Figure 5 above). The fairly recent completion of the southern part of the Outer Ring Road has now also opened up for development the low-lying coastal zone directly south of Bangkok. With car-ownership (e.g. via the first car buyers scheme) and car use (e.g. via fuel subsidies) still being promoted, 'the roads' are not likely to lose much of their relevance in the BMR's urbanization saga soon.

Yet, the days of their monopolistic rule seem to be numbered. The proposed and in places already materialising expansion of the city's mass transit system into the periphery, is about to add a second driver and a pointer for development. By bringing the mass transit system to the periphery, travel between periphery and the core (Bangkok) will become less cumbersome, which is likely to encourage more people to trade the congested core for the more appealing suburban environs. Whereas the roads, in the absence of effective spatial planning policies notably provoked urbanization in the form of ribbon development, the expansion of the mass transit system is more likely to result in a more nodal form of urbanization, especially when principles of transport oriented development (TOD) were to be applied in the process, with concentrations of development around the mass transit stations (strings of pearls instead of ribbons). The layout of the future mass transit network (Figure 8) is likely to tell us much about where in the near and mid-term future development will be most manifest.

Meanwhile, within Bangkok especially, a growing interest in non-motorized mobility can be observed (cycling notably). While it is still a small development, it may become part of a drive towards more sustainable urban development.

แนวเส้นทางขนส่งมวลชนระบบรางในเขตกรุงเทพมหานครและปริมณฑล

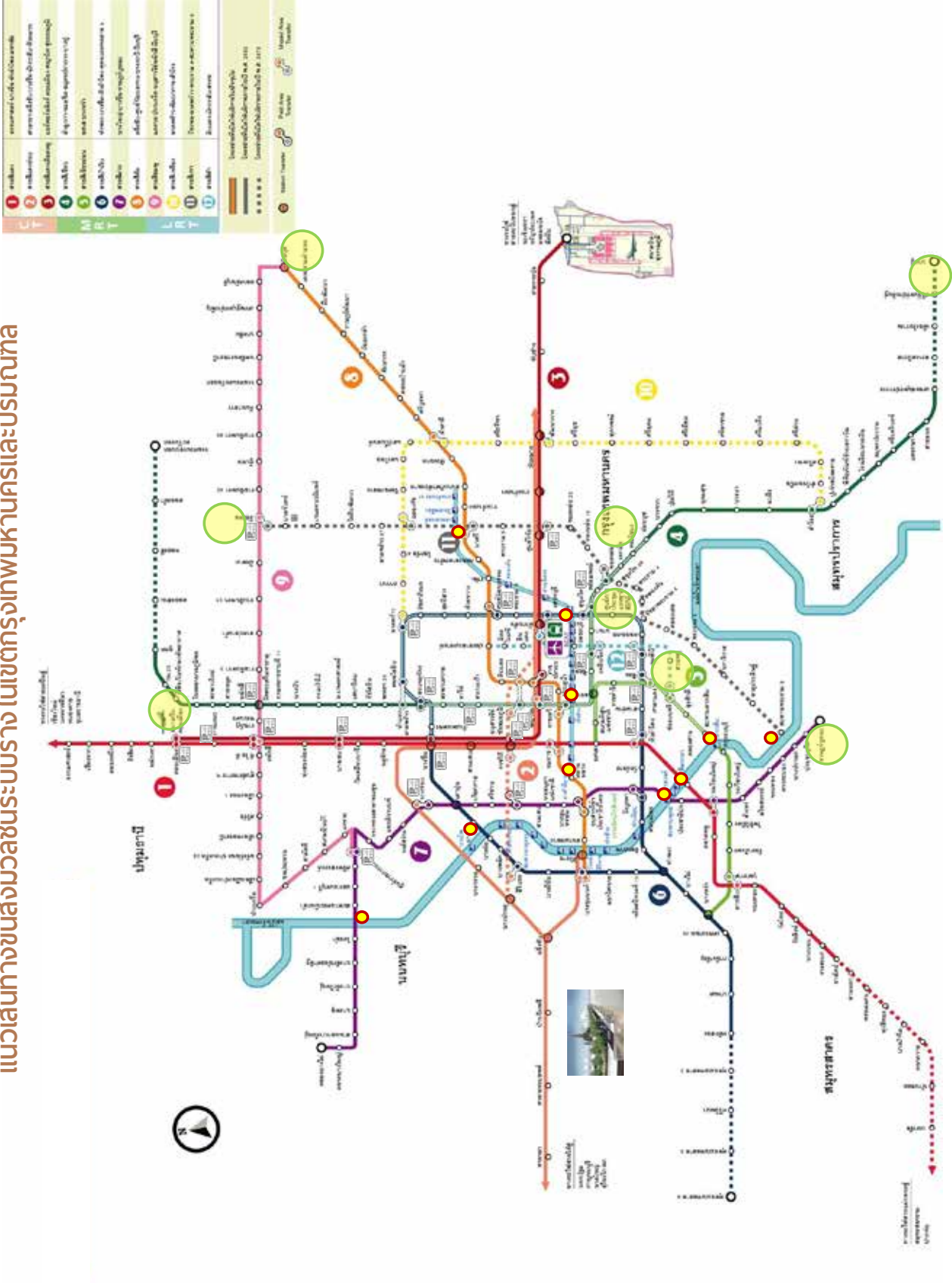


Figure 8: Mass Rapid Transit Master Plan for the BMR (M-Map, source: OTP, 2010)

Whereas spatial policies (in addition to other types of policy) may affect the magnitude and direction of urban development in places, their role should probably be judged limited in Bangkok and the BMR (as well as Thailand at large). Perhaps the most influential have been national government's efforts to promote the Eastern Seaboard as an alternative location (alternative to the BMR that is) for (foreign) investment in manufacturing and logistics. Without these efforts, the BMR's economic dominance and primacy would probably have been even more pronounced. Within the BMR, it is notably transport infrastructure policy that makes a difference, as discussed above. Spatial visions and plans have been made for Bangkok and the BMR (Figure 9), but for many reasons have been largely ineffective in directing urban development (Ratanawaraha, 2010). The Comprehensive Plans that govern land use in Bangkok and each of the five neighbouring provinces are not very effective in directing development either. They rather represent periodically updated snapshots of the actual state of affairs on the ground than responsive, forward looking planning documents. And while Comprehensive Plans do intend to prescribe by what intensity development ought to take place in different areas, enforcement issues undermine their effectiveness.

Another factor contributing to the limited influence of local and regional authorities in spatial development and urbanization processes relates to the lack of financial and legal resources among such actors to either initiate certain development or encourage (or coerce) private actors to move in specific ways (Ratanawaraha, 2010).

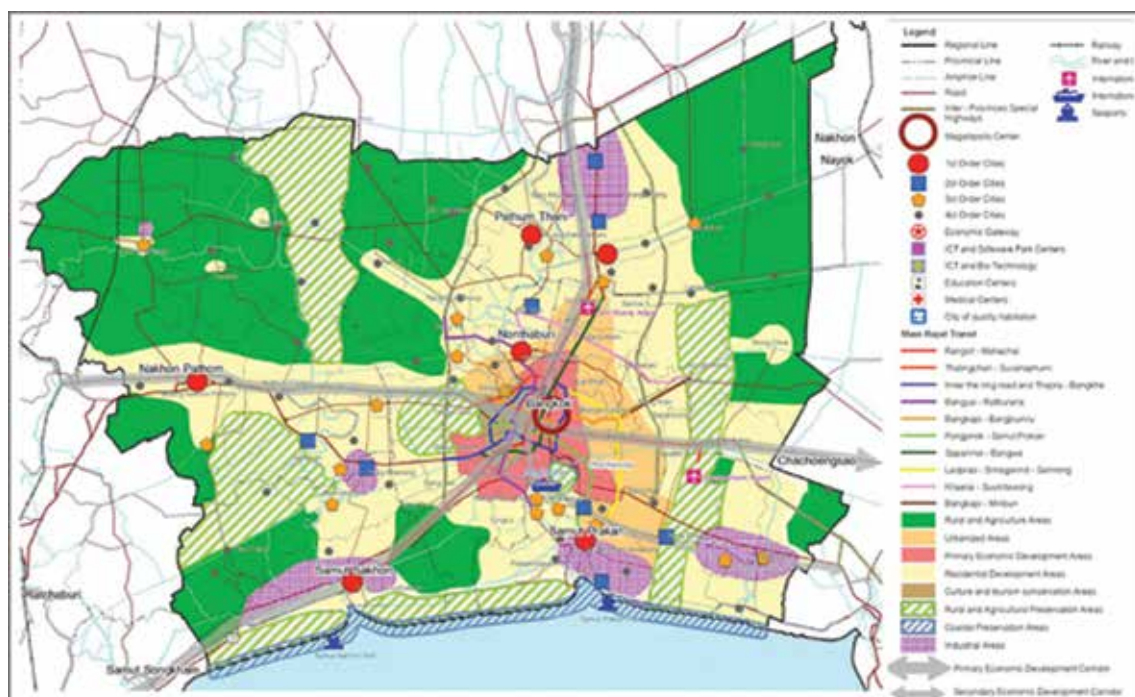


Figure 9: The Bangkok and Vicinities regional plan map for 2057 (source: Department of Public Works, Town & Country Planning, 2007)



Environmental challenges created by urbanization in the BMR

The rapid urbanization of the Bangkok Metropolitan Region produces a great variety of challenges as well as opportunities in various domains, including the social, the economic and the environmental. They are too many to comprehensively discuss within the scope of this paper. Taking into account the framework within this study is performed (Section 1) in this section we therefore focus on the environmental challenges and more in particular on the vulnerabilities that urbanization in the BMR creates in relation to natural events and climate-related changes. We distinguish between three types of vulnerabilities: 1) vulnerabilities stemming from Bangkok's location; 2) vulnerabilities that are produced by the BMR's particular urban characteristics and that are mainly felt locally; and 3) vulnerabilities that are produced by the BMR's urbanization but that are felt notably elsewhere, beyond the (administrative) boundaries of the BMR.



Vulnerabilities resulting from Bangkok's location

There are several vulnerabilities created simply by Bangkok's (growing) physical presence in the lower part of the Chao Phraya river delta and a stone's throw away from the Gulf of Thailand. With the delta historically being prone to seasonal flooding and with the threat of sea level rise induced by global warming, it is obvious that Bangkok and the BMR are located in a very vulnerable place. Vulnerability is even further increased by the fact that Bangkok drastically limits the natural overflow area of the Chao Phraya river (it essentially creates a bottleneck) and thus, simply by its presence, increases the potential severity of flood events in the wider area. This became painfully clear during the big flood of 2011, when floodwaters from the north found a great obstacle on their way to the Gulf in Bangkok's built-up mass and flood defence infrastructure, resulting in a very severe and protracted flood situation in the areas north of the city (Nonthaburi, PathumThani, and Ayutthaya notably). And with urban development still spreading into these areas, the volume of people and (economic) assets exposed to (severe) flood threats continues to increase.

Simultaneously, Bangkok's location practically right on the shore of the Gulf of Thailand, in combination with its minimal elevation (much of the city is located only just above sea level) and the absence of any natural or manmade coastal defence makes it very vulnerably for both incidental storm surges and the anticipated slow but persistent rise of the sea water level (Intergovernmental Panel on Climate Change, 2013). Luckily, the upper part of the Gulf of Thailand only very infrequently gets visited by tropical storms or typhoons (Thai Meteorological Department, 2011). However, it is not impossible that this will change under the influence of climate change (ADB, 2009). Sea level rise is more likely to become a problem for Bangkok in the mid and

long-term future. While sea level rise itself proceeds only slowly, Bangkok's tendency to sink severely aggravates the threat. Land subsidence rates vary across Bangkok's and over time, and the process has different causes (which include groundwater extraction and soil compression under the weight of the city). This renders the making of exact predictions about future subsidence rates a difficult enterprise. However, visible fact is that (much of) Bangkok is still sinking (Phien-wej et al., 2006) and that in consequence the city's vulnerability to any kind of flood threat (be it sea or river induced) continues to increase.

Another, at first sight less spectacular but yet serious challenge caused by the combination of sea level rise, ground water extraction and land subsidence is salt water intrusion. This concerns both the salinization of groundwater in the coastal zone with far-reaching impacts on agricultural production in this area, and the upstream advance of salt and brackish water in the Chao Phraya River in the dry season when the river's discharge is low. Early in 2014 this phenomenon even presented a threat to Bangkok's drinking water production (The Nation, 2014a).



Locally felt vulnerabilities produced by the BMR's particular urban characteristics

Bangkok's dense core and sprawling suburbs produce a set of environmental challenges that manifest themselves mainly at the local and regional level. These notably relate to the massive building volume found in the core in combination with lack of green space; the car- and motorbike dependency created by the lack of adequate public transport, the poor conditions for non-motorized transport and the sprawl-like mode of suburbanization; and the enormous volumes of solid and liquid waste produced by the city's population and firms without there being adequate waste disposal facilities.

The city of Bangkok represents an enormous conglomeration of concrete and asphalt. Building density is high and green space of any substantial size is extremely scarce. While the virtual absence of substantive and publicly accessible green space is a bane for city residents' outdoor leisure aspirations it also has detrimental effects on the city's temperature regime and on the city's capacity to deal with the heavy tropical rainstorms that frequently pass by. According to the Bangkok Assessment Report on Climate Change (BMA et al., 2009) average air temperatures in Bangkok have been on the rise since at least the 1960s. Between 1961 and 2007 the average maximum (or daytime) temperature has risen by 1°C, and the average minimum (or night time) temperature over the same period increased by more than 2°C. The number of days with the temperature reaching 35°C or more increased from about 30 on average per year in the 1960s to about 70 per year between 2000 and 2007 (BMA et al., 2009). The measured increase in the average maximum and especially the average minimum temperatures for Bangkok are substantially higher than the observed rise in

mean temperature for Thailand at large (about 0.5°C between 1980 and 2007 (BMA et al., 2009). The difference most likely is produced by the so-called ‘urban heat island effect’: the tendency for urban areas, especially dense urban areas to be warmer than their surroundings due to the heat absorbing and retaining capacity of such materials as concrete and asphalt and the residual heat produced by the city’s energy consumption (EPA, 2008). In a related study Srivanit et al. (2012) found that the mean land surface temperature in Bangkok (BMA) between 1994 and 2009 has increased from about 26 to almost 40°C, caused by a tripling of the built-up area and a near 50% reduction of vegetated space during that period. According to the authors, the difference between the average land surface temperature of Bangkok’s urban heat island area and that of rural area in 2009 amounted to a whopping 11.5°C (ibid., p. 250). Sadly, an urban heat island tends to reinforce itself, especially in a tropical climate. Warming of the urban environment increases the demand for cooling and strengthens peoples’ preference for motorized and air-conditioned means of transport. This leads to an increase in energy consumption, which in turn produces more residual heat, and leads to a further strengthening of the heat island effect, etc. In addition, an urban climate becoming increasingly hostile to spending time outdoor is likely to weaken citizens’ relationship with the outdoor environment, which in turn may lead to indifference toward issues regarding the quality of the urban environment and, for instance, conservation of remaining green space. It provides pro-development forces with a convenient argument: if people do not like to spend time outside, why should we invest in the conservation and creation of usable urban outdoor space?

The same characteristic (Bangkok’s surface being overwhelmingly paved and built upon) also makes the city vulnerable to rainstorm-induced floods. Rainwater hardly has a chance to filter into the ground and must be dealt with almost entirely by the city’s rainwater drainage system, which in its current state is only partly capable of dealing with the at times massive downpours that frequent the city in the wet season.

Previous sections have already commented upon the condition of mobility in Bangkok and the role it has played (and still plays) in the development of the metropolis. Fact is that the current, extended layout of the city, the as yet limited reach of the mass transit system and the largely unfavourable conditions for non-motorized transport (Lambrechts& Panthasen, 2013) make that most inhabitants of Bangkok and the BMR are highly dependent on individual, motorized modes of transport (i.e. motorbikes and cars). This situation creates various environmental and health issues including air and noise pollution, and makes the functioning of the metropolis vulnerable to potential major changes in the availability and price of fuel. Recent (global) increases in the cost of fuel have affected the functioning of some of America’s sprawling cities in the sense that for many the cost of commuting between faraway suburbs and the city centre has become unsustainable, forcing them to adjust in various ways (Karlenzig, 2010). Given the considerable commuting distance many people in the BMR face and given the relative small financial margins many people live by, similar issues may surface in the BMR as well if fuel costs increase further.

The about 14 million inhabitants and tens of thousands of enterprises produce enormous volumes of liquid and solid waste that need proper treatment if they are not to burden the local and regional environment to unsustainable and dangerous degrees. Unfortunately, the current state of waste treatment, for both solid waste and wastewater, can hardly be labelled as ‘proper’ . The problems are long-known and plans to address the situation have repeatedly been tabled. However, so far little progress has been made with their implementation and enforcement. The ongoing contamination of both the land and the marine environment not only hurts the environment itself (plant and animal life) but also poses a threat for food supply (fishery in the Gulf and agriculture in the region) and thus human health. The region recently received a strong wake-up call when a fire raged for days at a solid waste dumpsite in SamutPrakan, just south of Bangkok. The southerly wind blew hazardous smoke across easterly parts of the city for several days forcing nearby residents to evacuate and others to keep doors and windows shut. In its aftermath the suspicion surfaced that illegal dumping of possibly hazardous waste had been going on at the site (Bangkok Post, 2014), which if true would be a rather worrisome finding given that the BMR is home to perhaps dozens of waste dumps that operate under the same, less than watertight regulatory framework and enforcement practice (Thai PBS, 2014; The Nation, 2014b).



Supra-regional vulnerabilities created by urbanization in the BMR

The BMR’s environmental footprint stretches way beyond its administrative borders. Several of the above-mentioned types of waste and pollutants are carried by either the wind, sea currents or trucks to destinations elsewhere in Thailand and perhaps even beyond, possibly affecting the lives and livelihoods of people who may have little connection with the BMR otherwise. But probably of even bigger consequence is the BMR’s need for various kinds of resources to fuel its day-by-day functioning and continuous expansion. Water, power, fuel, food, construction materials: the BMR consumes enormous volumes of each of them, and they are all largely or completely sourced from elsewhere: elsewhere in Thailand, elsewhere in the region (e.g. Laos, Myanmar), or elsewhere in the world. And while the BMR’s hunger for resources creates business and livelihood opportunities for economies and communities elsewhere, the unfortunate fact that the extraction and or production of the resources not always happens in a sustainable way, also produces environmental issues and vulnerabilities in these faraway places. Bangkok’s water needs and the high weight that is assigned to meeting it, for instance, increase upstream farmers’ vulnerability to drought (as in cases of drought, scarce water resources will rather be used to supply the inhabitants and industries of the BMR than

to provide farmers with irrigation water). Likewise, the high importance attributed to keeping at least inner Bangkok dry in times of floods, aggravates flood impacts in upstream areas, also beyond the boundaries of the BMR. Sometimes, such vulnerabilities link back straight to Bangkok and the BMR. For instance, unsustainable timber extraction in the northern parts of the Chao Phraya River basin for the BMR market increases flood risks in the basin, and thus for the BMR as well. Along the same line it can be argued that Bangkok's appetite for upcountry leisure space (be that in the form of resorts or second homes) creates new vulnerabilities, also for Bangkok itself, when such space is created in environmentally unwise ways, as would be the case when resorts or second homes are developed at the expense of forested lands.



The challenge for the future: governing urbanization more effectively

As the above has made clear, urbanization in the BMR has various drivers. A complication is that many of these drivers are not easily managed or controlled by local or even regional actors: that what fuels them may be either beyond the influence of local actors (e.g. global economic trends), or practically uncontrollable (e.g. the demographic and societal changes leading to diminishing household size). Yet, as cities such as Copenhagen, Curitiba and Singapore demonstrate, it is to a reasonable degree possible to manage the more physical processes of urbanisation and pave the way for more sustainable outcomes (see e.g. Economist Intelligence Unit, 2012). With regard to the sustainability of the urbanization process in Bangkok and the BMR, Section 4 made clear that there is still an enormous world to win. The big question obviously is: how? Enter the issue of urban/metropolitan governance, the central theme of this fifth and final section.

Typically, cities and metropolitan regions are co-produced by a multitude of actors. These can be thought to belong to the public, the private and the civic sectors. Ideally, there would be an assertive civic sector that continuously asks and pushes for betterment of the urban environment (broadly defined), that itself is willing to contribute to betterment by behaving responsibly, and that understands and accepts that a better urban living environment comes at a financial cost. In addition, there would be a responsive public sector: a sector that understands the importance of the issues at stake and that has the capacity and willingness to do what it takes to indeed enhance the quality of the urban environment and pave the way for sustainable urban development. Finally, there would be an equally responsive private sector that also comprehends the importance of the issues at stake and understands that there are important long-term gains to be reaped, and that (hence) pro-actively contributes to the creation of sustainable urban development processes and outcomes.

Of course, the real world is often less than ideal. In the BMR urbanization so far has proceeded with relative little public sector oversight and with relatively little organised civic involvement (Ratanawaraha, 2010). Admittedly, government's transport infrastructure plans and investments in the past have been and currently are consequential in spatially directing urban development, and at a higher level government-led efforts to develop the eastern Seaboard have probably somewhat dampened the absolute growth of the BMR, but otherwise it is safe to state that urbanization in the BMR has been physically accommodated and to a large degree shaped predominantly by the private sector, with domestic and international firms locating and shaping economic space and residential space being created in a give-and-take between corporate developers and private households in the role of consumers.

One could argue moreover that so far, most of those who have played key roles in the making of the BMR have not always aimed for the most sustainable outcomes but more often than not followed the path of least resistance. The spatial direction and the form that (sub) urbanization in the BMR has taken has predominantly been determined by the availability, affordability and accessibility of land in tandem with consumer preferences (notably those of the middle class). The continuous and largely unchecked search by investors and developers for low-hanging fruit has produced the – from a sustainability perspective – inefficient ribbon and leapfrog type of development that characterises much of the BMR. This has made the region highly dependent on individual motorized mobility and, since it happened with apparent disregard for flood risks, has created large-scale flood-related vulnerabilities. Similarly, easy-way-out strategies have also been applied in the field of waste disposal (normally seen as a public sector responsibility). Instead of investing in proper wastewater treatment and solid waste disposal facilities (and their maintenance), the burden is largely passed on to the environment (marine and land-based), undermining the quality of the region's natural resources and creating health threats to its inhabitants. Within the city-centre itself, the failure to negotiate a reasonable balance between paved and unpaved (or green) functions presents another example where the harder but more sustainable way is evaded, with a substantial urban heat island, vulnerability to floods, and reduced quality of life for residents as the unfortunate results. Basically, all sectors are to blame for the less than sustainable state of affairs: the civic sector for not calling more convincingly for improvement, the public sector for not developing the capacity to organise and materialise betterment, and the private sector for continuing on the road of least resistance and not using its superior resources (e.g. in terms of knowledge, creativity, and organizing capacity) to lead the way to a more sustainable mode of urban development in the BMR.

Yet, there exist some hopeful signs. From the civic sector, calls for more sustainable urban development initiatives are getting more frequent and louder. Examples include citizen groups asking for better provisions for non-motorized modes of transport (i.e. walking and cycling), other groups that strive for the conservation of trees and the expansion of urban green space (e.g. the Makasan Hope initiative), yet other groups that are working to keep Bang Krachao, Bangkok's last 'green lung' as green as possible, and there are more initiatives emerging on a frequent basis aimed at making the city a more liveable place. Simultaneously, the public sector, in Bangkok mainly represented by the BMA does seem to become more responsive to such calls. Awareness that Bangkok needs to change tack and enter a more sustainable urban development trajectory

over the years has become more deeply rooted in the organisation and the willingness to act on it seems to be getting stronger as well, witness for instance attempts to create more public parks, to free (road) space for cycling and to formulate a disaster risk management plan. In addition, more advanced planning and urban development concepts such as transit oriented development (TOD) and smart growth are finding their way to spatial plans and policies, the latest BMA Comprehensive Plan being a good example. The organisation's capacity to effectively materialize change, however, still lags behind, handicapped as it is by, amongst others, ineffective planning and development tools, insufficient human and financial resources, and a mind-set or culture that seems to value containment or the keeping of the status-quo over development. The private sector, meanwhile, fully comprehends that if Bangkok and the BMR and thus the region's real estate business are to prosper in the ASEAN Economic Community and in a globalising world, the quality of the city's living environment must be enhanced and the region's vulnerability to various environmental threats (ranging from floods to hazardous landfill fires) must be reduced. Private sector actors (e.g. developers, architects) seem generally willing to be part of the solution and have the capacity to do so. Recent years have seen the establishment and growth of various platforms and networks where practitioners, academics and occasionally also government officials share and advance their knowledge about more advanced and sustainable urban development concepts and practices. For instance, the Smart Growth Thailand network, established in 2011, now involves almost 5,000 planners, urban designers and architects from all over Thailand and has an important knowledge generating and knowledge diffusing function. Yet, too often private sector players either see good intentions being frustrated by unhelpful planning laws and building regulations or prefer to wait for the government to show the way. In result, many of them persist in old routines, which, as illustrated above, are not always compatible with ideas of sustainability and the reduction of vulnerability.

Despite the presence of such 'green shoots' it is too early to say that all will be well if the situation is just given enough time. The remaining obstacles to more sustainable urban development practices becoming mainstream are formidable.

As for the civic sector, while it is getting more vocal and starting to play a more constructive role in Bangkok, it remains largely quiet and passive in the other parts of the BMR. Even in Bangkok it concerns a rather small number of people who are willing to think about and work for change. The large majority remains on the side-lines and in their role as consumers continue to make choices that undermine sustainability and increase vulnerability. For instance, demand for houses in flood-prone areas has remained high, even after the great flood of 2011, and the first car buyers scheme run by the PTP government in 2012/13 was also a great success (measured by the number of cars purchased that is) in Bangkok and the BMR. In addition, waste production and energy and water consumption per capita reportedly are also still on the increase or at least not decreasing (water and waste) (ADB & National University of Singapore, 2012; Chiemchaisriet al., 2007; Phdungsilp, 2011), meaning that apparently few city-dwellers make serious efforts (behavioural changes) to reduce their personal ecological footprints. All-in-all there is still a long road ahead – a road that should be paved with activities such as awareness raising, education and incentive management – before the BMR's civic sector will start to resemble the ideal image of a pro-sustainability civic sector described earlier in this section.

In the public sector, it is not so much awareness and knowledge that are lacking but rather the capacity to convert these into appropriate action (in those fields where the public sector itself carries responsibilities) and guidance (in fields where private sector actors tend to hold the executive powers). The former manifests itself in underperformance in such activities as wastewater treatment, solid waste disposal, horizontal and vertical plan coordination, plan integration, and plan and law enforcement. The latter makes itself felt especially in the absence of a clear and coordinated vision on how Bangkok and the BMR preferably ought to develop and how and where urban growth should be accommodated, and in the failure to update laws and regulations so as to make them suitable for use in today's dynamic development context and supportive of the making of sustainable transitions. In brief, one could say that the public sector's toolbox for managing urban development is not fit for the job and, more importantly, that the sector appears incapable of developing better tools for itself. In doing so it not only short-changes itself, but also prohibits the private sector from playing a more constructive role in making Bangkok and the BMR a more liveable and less vulnerable place.

These problems are known, and have been known for several if not many years at least (Krongkaew, 1996; Ratanawaraha, 2010). It is also long understood that in order to address these problems certain things (laws, rules, regulations, incentives, practices, and structures) should change. Ideas, suggestions and proposals for change – including sensible ones – have been tabled by think-tanks, committees, and study groups on many occasions, but seldom have such initiatives been followed by efforts to actually realize change. It is an intriguing situation: virtually everyone understands there are serious problems and challenges, virtually everybody agrees that they ought to be addressed, most people have a sense of what needs to be done, but in the end hardly anything happens. Apparently, good sense is overruled by forces and factors that work in a different direction and produce enormous inertia or resistance to change, be they political and economic forces that stand to benefit from continuation of the existing status quo, or flaws in the institutional set-up that impede the implementation of change. Progress can only be made if these factors or forces are more clearly identified and more thoroughly addressed. Of all challenges related to urbanization in the BMR (and Thailand at large) this may well be the greatest and the most critical.



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Annex A: Roundtable Participants

	Participant	Position	Organization
1	Ms. Pranee Nantasenamat	Senior Expert in Town and Country planning	Department of Public Works and Town & Country Planning, Ministry of the Interior
2	Mr. Atip Bijanonda	Board Director and President	Board of Trade of Thailand (TCC) and Housing Business Association
3	Mr. Samma Kitsin	Director-general	Real Estate Information Center (REIC)
4	Mr. Andrew Gulbrandson	Manager Research and Consultancy	JLL - Jones Lang LaSalle
5	Ms. Oraya Sutabutr	Coordinator	Big Trees Project
6	Mr. Akhom Vephasayanant	Chairman	Thai City Planners Society
7	Dr. Eggarin Anukulyudhathon	Associate Professor in Urban and Environmental Planning	Div. of Urban and Environmental Planning, Faculty of Architecture, Kasetsart University
8	Dr. Lertwit Rangsirak	Associate Professor in Spatial Planning	Div. of Urban and Environmental Planning, Faculty of Architecture, Kasetsart University
9	Mr. Prasong Owlarn	Honorary President and Advisor	Housing Business Association
10	Mr. Asawin Pichayayotin	Board Director	Supalai PCL
11	Ms. Anusara Phosri	Assistance Programme Officer	Thailand Environment Institute (TEI)
12	Ms. Krongjit Kitikard	Senior Programme Officer	Thailand Environment Institute (TEI)
13	Dr. Tanapon Panthasen	Head of Division	Div. of Urban and Environmental Planning, Faculty of Architecture, Kasetsart University
14	Dr. Bart Lambregts	Lecturer and Chair of the Roundtable	Div. of Urban and Environmental Planning, Faculty of Architecture, Kasetsart University