# KHON KAEN
# THAILAND

*www.amazing-thailand.com/ khon-kaen.html*

## UCRSEA

The Urban Climate Resilience in Southeast Asia Partnership (UCRSEA) is a five year-program led by the Thailand Environment Institute and the University of Toronto in collaboration with academics, researchers, civil society workers, government officials and students from the Mekong Region and Canada.

As Southeast Asia is one of the most rapidly urbanizing regions of the word with increasingly apparent threats from climate change, UCRSEA recognizes that cities in the region face changing risks and vulnerabilities. The program aims to advance the understanding of contemporary urbanization in Southeast Asian cities, build bodies of knowledge that will contribute to policy change, and provide spaces for informed public dialogue.

UCRSEA activities are concentrated in eight cities. The city briefs serve as an introduction to the UCRSEA focus cities and summary of our preliminary findings. Each of the eight cities was chosen because it was a secondary city with important regional connections facing challenges from both urbanization and climate change.

As the project progresses, UCRSEA will release subsequent versions of the city briefs that reflect our updated research findings and share our improved understanding of the implications and interactions of urbanization and climate change.

## CITY DESCRIPTION

Khon Kaen is one of the four major cities of Isan, Thailand and is located in Khon Kaen province, the second largest of Thailand's Northeastern provinces. With its strategic location as part of the East-West Economic corridor (EWEC) that links Myanmar, Thailand, Lao PDR and Vietnam, Khon Kaen is undergoing rapid urbanization and is expected to become the leading export centre for trade and the new transport hub in the Northeast. The push for Khon Kaen to become a regional city following the ***"Growth Poles"*** theory to reduce pressures on Bangkok has brought new development opportunities and investment into the city, including tourism promotions and a 'green' industrial processing centre. At the same time, natural disasters and emerging resource stresses pose major threats. New construction, resource exploitation and land use changes put pressure on the province's limited capacity to deal with increased waste, noise, water and air pollution, coupled with key natural disasters such as droughts, flood, storms and fires.

## URBANIZATION AND REGIONALIZATION

Khon Kaen is bisected by Highway 2 (also known as the "Friendship Highway") linking Bangkok with the northeast and Vientiane in the Lao PDR, and the multi-lane Highway 209 of the EWEC. The Government of Thailand had endorsed it as the leading export centre for trade in the Indochina region. The expansion of transport infrastructure, such as the bypass road, can create problems for local communities by blocking waterways. This has resulted, particularly during heavy monsoonal rains, in the repeated flooding of communities and paddy fields in the eastern part of Khon Kaen city.

The population of Khon Kaen province is expected to increase from 1,747,542 in 2005 to 1,822,869 in year 2030. It is projected that Khon Kaen will experience an annual growth of 1.01% per year in the future. However, these numbers do not take into account unregistered residents of Khon Kaen city, which includes both domestic and international migrant workers who have come in search of jobs. Much of the population increase is due to either migrant workers from other parts of the country, or local farmers selling their lands to speculators and developers and then moving into the city to take up wage labour or other development related work. Urbanisation contributes to the shift in livelihoods away from traditional agricultural practices into construction and other forms of day labour provided by industrial plants and the tourism industry.

Khon Kaen currently struggles with critical administrative and governance gaps. For managing the urban areas, the local administrative system for Khon Kaen province is divided into smaller administrative zones such as city and sub-district municipalities. However, the expanding impacts from Khon Kaen's urbanization cascade from one level to another and have surpassed the capacity of the city municipality and its administrative zones to deal with these impacts. This results in system failure and/or inefficiency. For example, Khon Kaen does not have a safe or hygienic system of waste disposal. The city's solid waste is collected and dumped without either treatment or proper management on a piece of rural land in the northern suburb of the city. The failure of local or provincial government to address this issue is a severe vulnerability for the local people.

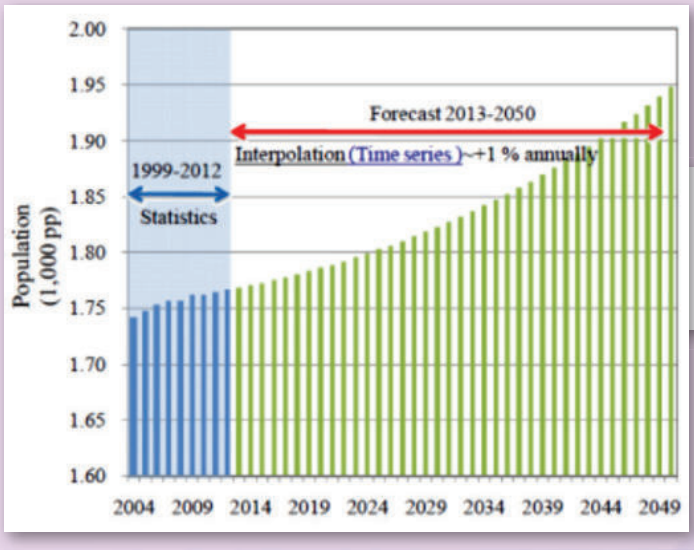


Figure *Estimated population of Khon Kaen ( Source: National Statistic Office, Thailand)*

## CLIMATE CHALLENGES

The northeast of Thailand is notorious for droughts that, together with poor quality soil, have contributed to high levels of poverty. Figure 1 shows the average annual rainfall of northeast region. Though overall rainfall in this region is low, floods can occur in some places, particularly in the lowlands during the monsoon season. For Khon Kaen, the statistics of average rainfall show great variation over the past decade. The highest precipitation recorded by the meteorological station of Khon Kaen was in 2003, 2008 and 2011 (Promphakping et al., 2016).

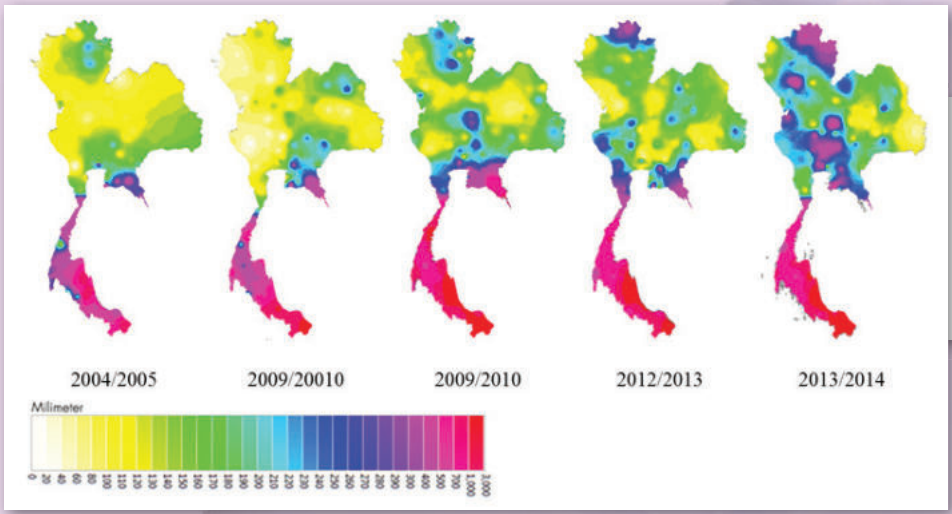


Figure *1 The average rainfall during the dry season in Thailand (source: www. thaiwater.net)*

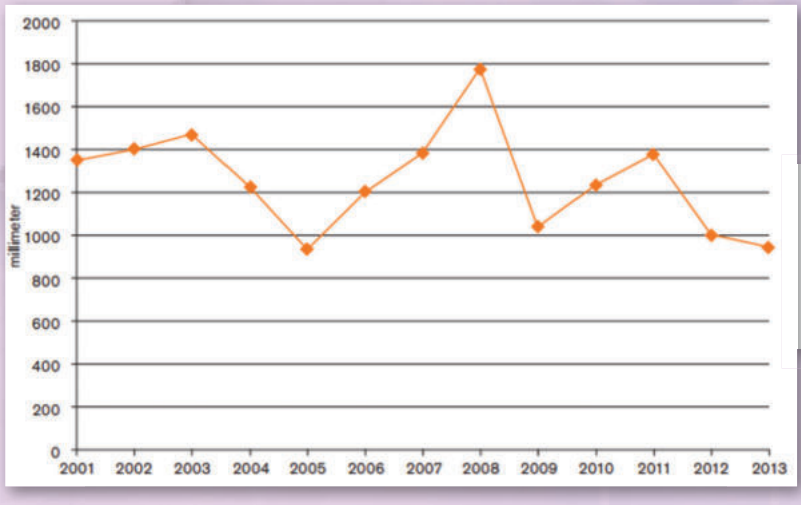


Figure *2 The average rainfall in Khon Kaen province (2001-2013) ((Promphakping et al., 2016).*

Climate change has contributed to a shorter rainy season that begins later than in previous years. The hot season is longer and the cold season is warmer. The lack of rain during the rainy season coupled with unusually long and hot summers leads to increased drought and water shortages. When it does rain, it is often in the form of severe storms that cause flash floods due to the arid ground and increase of concrete and blocked waterways caused by urban development[1].

Khon Kaen's government has limited capacity to deal with increased industrial and municipal waste, water shortages and air pollution because they do not consider climate change while making their recommendations. Additionally, there is a limited amount of climate change data available for Khon Kaen. Future research should be done to build a body of climate change data for the region.

[1]"Changes in Temperature and Rainfall over Thailand under Climate Change, 2016."
Climatological Center, Meteorological Department. Technical Document No. 551–577. 3/01/2016

# URBAN CLIMATE VULNERABILITY

Khon Kaen has become a key economic meeting point as part of the EWEC, and a target for regional urbanization and industry growth to reduce the congestion and pollution of Bangkok. Major development projects, such as building and expanding roads, railway networks, industrial zones, resident and commercial projects supported by a flow of domestic and foreign investment, are a driving force behind the changes in the natural and ecological landscape. Khon Kaen has become a centre for meetings and conventions, transportation and logistics, and 'green' industrial processing for the region.

Drawn by the promise of an urban centre rich in jobs, new residents are continually moving into the city. Some individuals may benefit from increased career options, but those prospects are not available for all, especially poor and migrating individuals. The increasing population of the city means that housing is more difficult to find and new settlements have been found in unsafe areas, sometimes blocking waterways. This could cause an increase in flooding for the entire city, as well as placing the settlement itself at risk of significant flood damage.

Additionally, the increasing urban population of Khon Kaen has put a stress on the transportation system. Recently the traffic congestion during the rush hour has increased, following the trends of primary cities like Bangkok, and has caused an increase of air pollution in the city. A mass transit light rail system powered by electricity and connected to an intercity railway network is being constructed to reduce urban congestion. The system was initiated as a joint project between the private sector and the local municipality office to enhance the capacity of the city to deal with urban vulnerability. This project shows that Khon Kaen has started attempting to build resilience by implementing an adaptation project. However, it has also displaced multiple poor communities along the proposed path of the rail line, destabilizing families and making them more vulnerable to poverty and income loss. The Khon Kaen light rail line illustrates the complexities of urban resilience building as it accidentally created new vulnerabilities while attempting to resolve others.

In Khon Kaen, there are multiple levels of national, regional and local government operating in both overlapping and distinct jurisdictions. However, the effects of urbanization and climate change are interconnected and spread across multiple jurisdiction. Past studies have shown that there has been a lack of effective governance and communication between various levels of government. This leaves the local communities of Khon Kaen vulnerable to negative effects of both urbanization and climate change as the authorities cannot help them effectively.

*http://phongnapha.multiply.com*

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