LAO CAI
VIETNAM

UCRSEA

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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

Lao Cai is an urbanizing city in the mountainous borderlands of northwest Vietnam. The city is strategically important because of its location on the Haiphong railway to Yunnan province, China. A new highway passes through Lao Cai to connect Hanoi and Kunming, China's regional centre, and facilitate increased trade and economic development. An airport is also planned to open in Lao Cai in 2020. Regional investments include economic and industrial zones, a railway line upgrading project, a Fansipan cable car, and new hotels to boost tourism. In Lao Cai, land use changes as a result of the construction of new infrastructure, coupled with upstream deforestation, have created major resource stress in the region. The city's urbanization exacerbates risks of flash flooding, landslides and water shortages that the city already faces. Climate change compounds these challenges with more intense storms and longer dry periods. Urban climate resilience is important in Lao Cai as the city faces existing hazards that are complicated by climate change impacts and urbanization.

URBANIZATION AND REGIONALIZATION

The Vietnamese government has requested a project, named the VIET NAM MEDIUM CITES DEVELOPMENT PROJECT (MCDP), to support the development of three cities: Lao Cai (Lao Cai province), Phu Ly (Ha Nam province) and Vinh (Nghe An province). The objectives of the program are to develop an improved infrastructure framework in these three cities, including urban infrastructure for residential areas, water supply and environmental improvements, road upgrades and capacity building in urban management. This project will support the improvement of living conditions of inhabitants, especially in the poor areas, and the economic development of all three cities. The project aims to contribute to poverty reduction and sustainable development of all three provinces.

Lao Cai is a northern mountainous province bordering China with a diverse ethnic minority population. Lao Cai city was established in 2004, 350 km far away from Hanoi, the capital. It is 229.67 km2, about 3.6% of the whole province area. In 2008, the population of Lao Cai citywas 95,956 people, about 16.7% of the whole province. The population density is about 418 people per km2, 4.5 times greater than the density of Lao Cai province and 1.6 times that of the whole country. Approximately 12% of the city is classified as low income (World Bank, 2011).

In the future, the population of Lao Cai city will continue to experience large increases due to immigration. It is expected that the population growth rate will reach 5% in the 2010–2020 period, and 3% in the 2020–2030 period. At this rate, the population of Lao Cai city will increase to about 200,000 people by 2020 and 300,000 by 2030.

Figure *Key North–South Economic Corridor Provinces/ Areas and Growth and/ or Border Nodes (ADB, 2010)*

Since Lao Cai province was reestablished in 2004, it has experienced rapid urbanization, particularly in Lao Caicity. In November 2014 Lao Cai was officially recognized as a Level 2 City. There have been a range of construction projects carried out focusing on urban infrastructure and residential areas.

Lao Cai city is one of the few mountainous provinces in Vietnam with well-developed transportation networks consisting of roads, railways and waterways. An airport is also to be completed in the next five years. The city is connected by road, rail and river transport links with Hanoi to the northwest (340 kilometres) and to Yunnan province in China. Within the province, road links exist to Sapa and Bac Ha. The Haiphong railway to Yunnan is of strategic importance.

There are four national highways totalling 400 km, provincial roads of about 300 km and 1,000 km of village roads. The Hanoi – Lao Cai Railway is 296 km (184 mi), of which 62 km (39 mi) are in the province, and links to Chinese railways at the border. Plans for a high-speed rail link between Hanoi and Lao Cai are being investigated by the Ministry of Transport and the Asian Development Bank. This is expected to create a high-speed rail corridor from Kunming–Lao Cai –Hanoi–Haiphong.

Lao Cai city is designated as an important link in bilateral trade with China since it is directly across the border from Hekou in Yunnan province.The city is considered to be a critical stop on the Eastern Sub corridor of North South Economic Corridor (Nanning–Ha Noi) (see Figure 1).

CLIMATE CHALLENGES

The Northern Mountain region of Vietnam is characterized by high variation in terms of topography, climate and biodiversity. The region can be divided into three different altitudinal zones: (i) high mountain (upland) zone, (ii) the mid elevation zone and (iii) low mountain (lowland) zone. Lao Cai has complex topography, which results in different climatic zones. Most of the areas within the province are 300 meters to 1,000 meters above the sea level.

Based on data from 1994 to 2012, the average temperature in Lao Cai is rising by an average rate of 0.1 to 1.5 degrees Celsius per decade. Abnormal heat waves and cold waves have also been happening with increased frequency such as a cold wave in 2008 which lasted over a month and killed thousands of livestock, and the 2012 heat wave of over 40 degrees Celsius that lasted seven continuous days (see figure below).[1]

Total annual precipitation is decreasing. However, most of the decreases impact the hot and dry summer months. This dry season is also increasing in length, which can cause severe drought. Precipitation in the wet season is actually increasing, leading to more severe inundations and flooding.[2]

Climate change impacts on the area are reflected through changes in the mean temperature and annual rainfall, as well as the rising occurrence of extreme weather events, such as increased flash floods, landslides, and changing patterns of precipitation. These weather events create new challenges for local residents such as water shortages and property damage.

Lao Cai has experienced climate-related disasters infrequently. The Red River, which runs through the center of the city, has been known to flood but the city traditionally had sufficient natural protection to minimize the flood damage.

[1, 2]Lao Cai core working group of M–BRACE project (2014). Climate Action Plan for Lao Cai city Responding to Climate Change from 2014–2020 and Visioning to 2030. Lao Cai, Vietnam: Institute for Social and Environmental Transition–International.

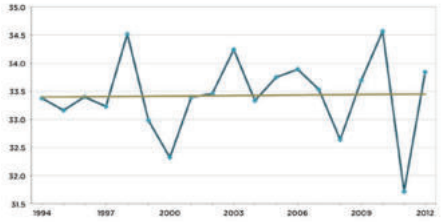
URBAN CLIMATE VULNERABILITY

Due to Lao Cai's position as a trade gateway to China on the North-South Economic Corridor, the city is experiencing rapid growth, urbanization and a steady stream of migrants. Consequently, the city is in the midst of a transition, and the people who move to the city are also in transition, changing their livelihoods and style of living. The rapid increase in population will place increasing stress on resources such as housing, waste disposal and clean water availability. Historically, Lao Cai has not had much damage from flooding or other natural disasters. However, some of the current development is constructed such that it blocks existing floodways, and has increased the city's vulnerability to flooding and flood damage.

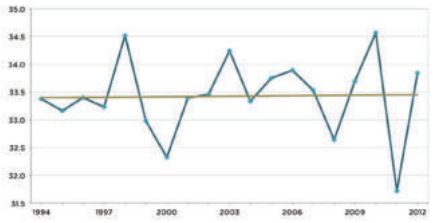
As the city continues to grow, it will continue to put increasing stress on the local resources, such as land, water and waste disposal facilities. Future research in Lao Cai should focus on the local government's effectiveness in regulating the activities of large development companies, and the effect of the increased transportation infrastructure in facilitating both urbanization and migration. Additionally, research could focus on the ways in which urbanization increases the vulnerability of the city to climate related incidents and what local stakeholders can do to combat that trend.

CHANGES OF TEMPERATURE IN LAO CAI CITY
PERIOD 1994-2012*

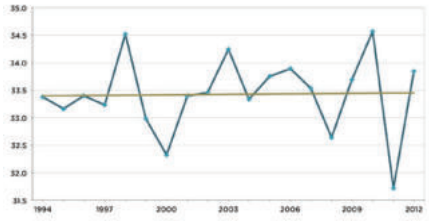
(a) Maximum temperature



(b) Minimum temperature



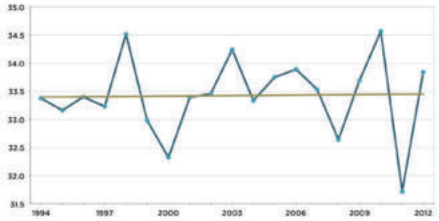
(c) Average temperature



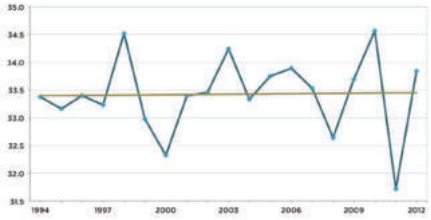
* Source: Lao Cai Hydro-meteorological Forecasting Center

PRECIPITATION IN LAO CAI CITY
PERIOD 1994-2012*

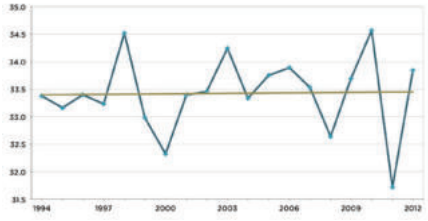
(a) Maximum temperature



(b) Minimum temperature



(c) Average temperature



* Source: Lao Cai Hydro-meteorological Forecasting Center

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