

# KOH KONG CAMBODIA



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## CITY DESCRIPTION

**Koh Kong** is a coastal city in the southwest of Cambodia. Located in Koh Kong province, which borders Thailand, and is home to part of the Cardamom Mountains, great natural resources and large protected areas, Koh Kong is seen as the regional core of connectivity with Thailand, Phnom Penh and other provinces. Key regional investments in Koh Kong are threefold: 1) a special economic zone (SEZ) and industrialised zone connected to Thailand, 2) world class eco-tourism, and 3) oil and gasoline exploration. Urbanization is occurring at a rapid pace as infrastructure such as roads, bridges, drainage systems, hotels and a SEZ are under development. Even though hydropower is expected to make Koh Kong the battery of Cambodia, Koh Kong still lacks clean water and electricity. Storms and droughts are also key challenges. Knowledge and capacity building in climate change vulnerability assessment and urban development planning in Koh Kong can be transferred to other cities in the region, particularly those in coastal provinces



## 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 world 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.

## URBANIZATION AND REGIONALIZATION

➡ Koh Kong is a vital area for the establishment of development projects such as a coastal zone development project, special economic zone, and high power development project. The mentioned projects were invested in by both of national and international agencies and are intended to contribute to raising the living standard for local people by increasing employment opportunity, providing high wage and an improved education system.

➡ In 2011, 43% of the province's population lived in urban areas. Infrastructure, especially transportation systems, is an advantage of the city because it is now accessible by public transportation such as bus and taxi. However, other infrastructures such as electricity and water supplies are still a deficit and depend on neighbouring countries. Therefore, the Lower Russey Chrum and Attay hydropower plants are being constructed to supply energy at the provincial and town levels. Hydropower development has been in place and it is envisioned that hydropower in this region, mostly from Cardamom mountain, will provide energy security for Cambodia.

➡ Koh Kong borders Thailand at Cham Yeam City. The report of immigration shows that 46,000 people have crossed the border in 2010 and it estimated that 50% of the traffic is international.

➡ Key resource challenges includes economic land concessions. Currently there are around 17 ELCs with an estimated 170,000 ha of resorts and hotels, and SEZ development by Chinese Union Development. 38,000 ha was converted from previously protected areas (part of cardamom mountain).

## CLIMATE CHALLENGES

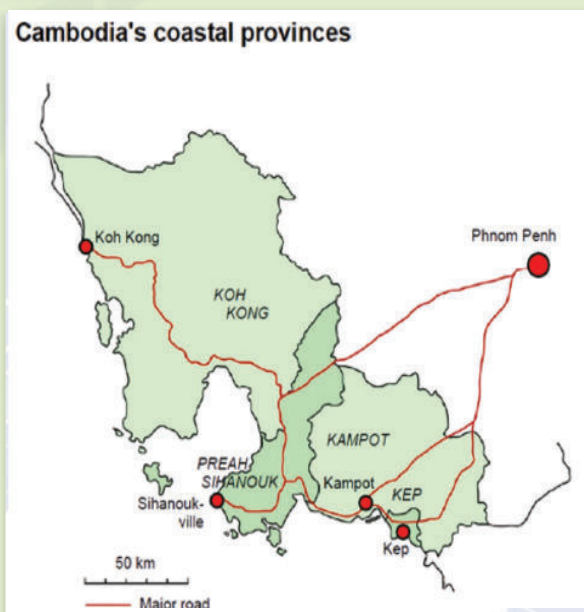


Figure 1 Cambodia Coastal line (Vina, 2015)

Koh Kong is a coastal province: area 11,008 km<sup>2</sup>, 126,092 people (2012). It consists of 29 communities. The province has faced hydro metrological issues such as storm and drought. Koh Kong is highly dependent on fishery and sea resources as well as paddy rice fields.

In Koh Kong is threatened by impacts of climate impacts such as (1) seawater intrusion, high tides and sea-level rise; (2) storms and storm surges; (3) heavy rain and flooding; and (4) drought and water stress.

The annual temperature in Koh Kong is projected to increase by about 0.7 to 1.0 degrees Celsius by 2025, and continue to rise throughout the century. Maximum and minimum

temperatures are projected to increase by about 2 and 1.9 degrees Celcius respectively by 2025, and will also continue rising throughout the century<sup>1</sup>.

Increased storm frequency due to climate change has increased the intensity of damage to houses and infrastructure. Associated storm surges speed up coastline erosion and contribute to the loss of mangrove forests. The number of fishing days and income is also highly affected by more frequent storms. Flash flooding due to heavy rainfall destroys crops in low-lying areas. Irregularities in rainfall patterns such as a dry spell early in rainy season or a shortened rainy season reduce crop productivity; hence the food security situation in the area could be further aggravated. Prolonged and increased drought conditions together with high temperatures pose another stress on the water supply and increase health-related problems.

<sup>1</sup>Climate Change Impact Modeling and vulnerability Assessments for Koh Kong and Monduliri Provinces in Cambodia (2014)

To fully understand the vulnerability of local communities to climate change, non-climate concerns in the target area should also be considered, such as (1) decline in coastal and marine resources, (2) weak fisheries resource management and the introduction of modern fishing equipment, (3) sand dredging and mining, (4) deforestation, especially mangrove forests, (5) market fluctuations, and (6) other changes in economic development over time (i.e. economic land concessions, hydropower development).

The main climate risks identified for Koh Kong are seawater intrusion and storms. Seawater intrusion and high tides flood paddy land and destroy crops, as well as causing water stress by reducing the supply of fresh water. Storms prevent fishing activities and destroy houses and infrastructure. Heavy summer rainfall also destroys crops and reduces productivity of aquaculture. Drought due to high temperature and lack of rainfall in April to May further reduces water supplies, affecting crops and animal health. Storms in summer also destroy crops and cut off access to forest areas and health services.

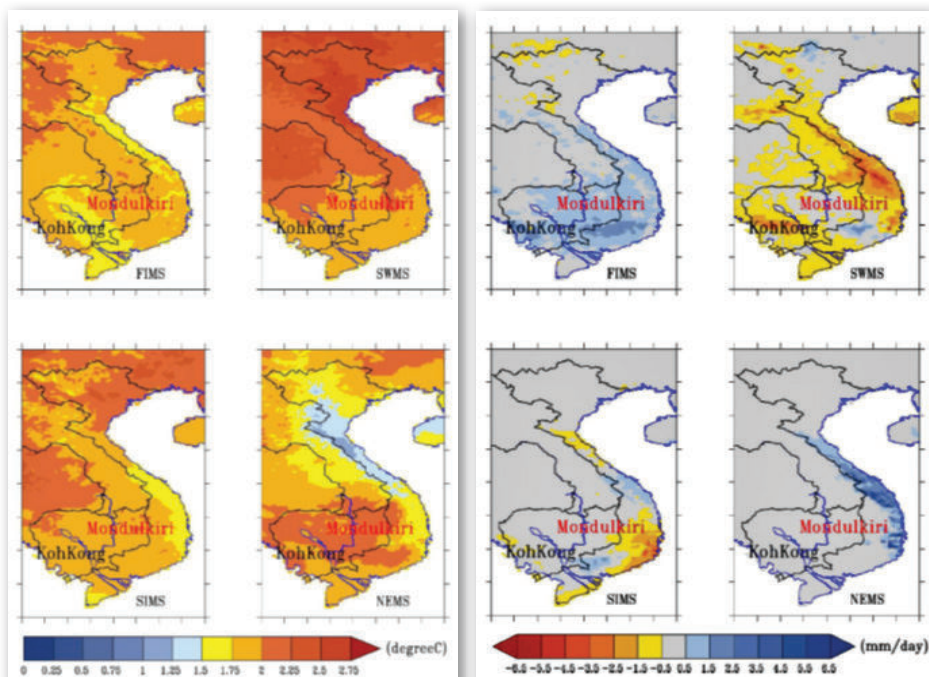


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## URBAN CLIMATE VULNERABILITY

The coastal provinces of Cambodia are highly vulnerable to climate change. The volatile coastal weather affects social welfare (and public health), economic growth (and livelihoods), and unique habitats and ecosystems. Certain local ecosystems, such as mangrove swamps, help mitigate the impact of severe weather on the coast. However, due to urban expansion and commercial land concession, many protected areas are under threat of being repurposed into industrial or tourist related property.

**FIMS:** First Intermonsoon Season (April-May)  
**SWMS:** Southwest Monsoon Season (June-September)  
**SIMS:** Second Intermonsoon Season (October-November)  
**NEMS:** Northeast Monsoon Season (December-March)



**Figure A** Maximum temperature increases (oC) for the 20 year period centred on 2055 relative to a 1980-1999 base line for four seasons for RCP8.5

**Figure B** Changes in rainfall (mm/day) for the 20 year period centred on 2055 relative to a 1980-1999 base line for four seasons for RCP8.5

**Source:** Climate Change Impact Modeling and vulnerability Assessments for Koh Kong and Mondulakiri Provinces in Cambodia (2014)



This would not only degrade the local ecosystems, it would also make Koh Kong city and the surrounding areas more vulnerable to seawater intrusion and storm damage. Therefore, it is especially important that both developers and the local government take climate change into consideration when planning the future of the city.

Several large development projects in the works near Koh Kong city have the potential to drastically change both the physical and social landscape of the region. The construction of a hydropower plant is an advantage for local people in the city in terms of diversity of employment; it presents an alternative in an economy that previously depended on the fishery sector. The development of transportation networks to support the hydropower plant also supports the delivery products into the city and makes it easier for local residents to navigate the region. However, due to the geography of the city, the construction of hydropower plants will increase the vulnerability of the area to flooding, especially after the water direction and ecosystem have changed following the construction of the hydropower plant. Additionally, the hydropower plant has the potential to drastically alter the local fish population, and thus the local stakeholders who depend on the fishery industry will be increasingly vulnerable to poverty and loss of their livelihood.

Additionally, population growth driven by urbanization and the coveting of natural resources is putting pressure on Koh Kong's resources. For example, poachers and better equipped fishers from Thailand are perceived to be depleting fish stocks and using harmful fishing techniques, such as sand dredging, which affects the breeding of sea life. There is no governmental regulation or control over these issues and that represents a vulnerability for local populations.

Thus far, there is no research that covers the effects of urbanization, such as the hydropower plant, on local fishing communities. Future studies might consider the relationship between urbanization and livelihoods of local and how local communities respond to both climate change and urbanization induced challenges.

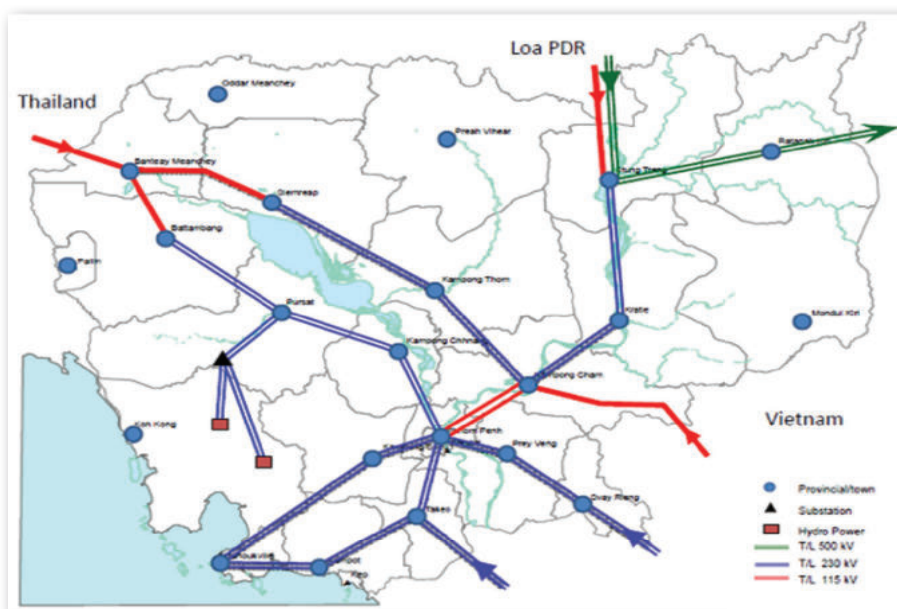


Figure 2 Hydropower plant in Koh kong province

Source: <https://hub.globalccsinstitute.com/publications>

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