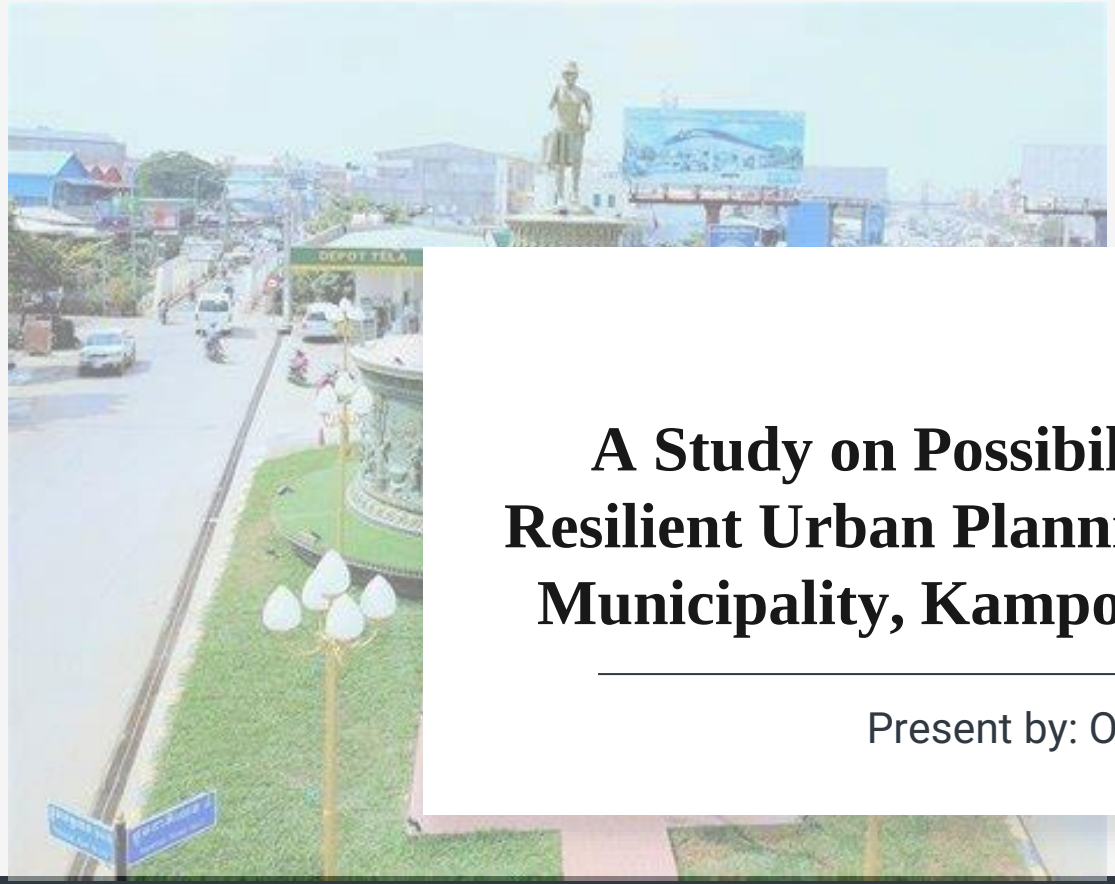
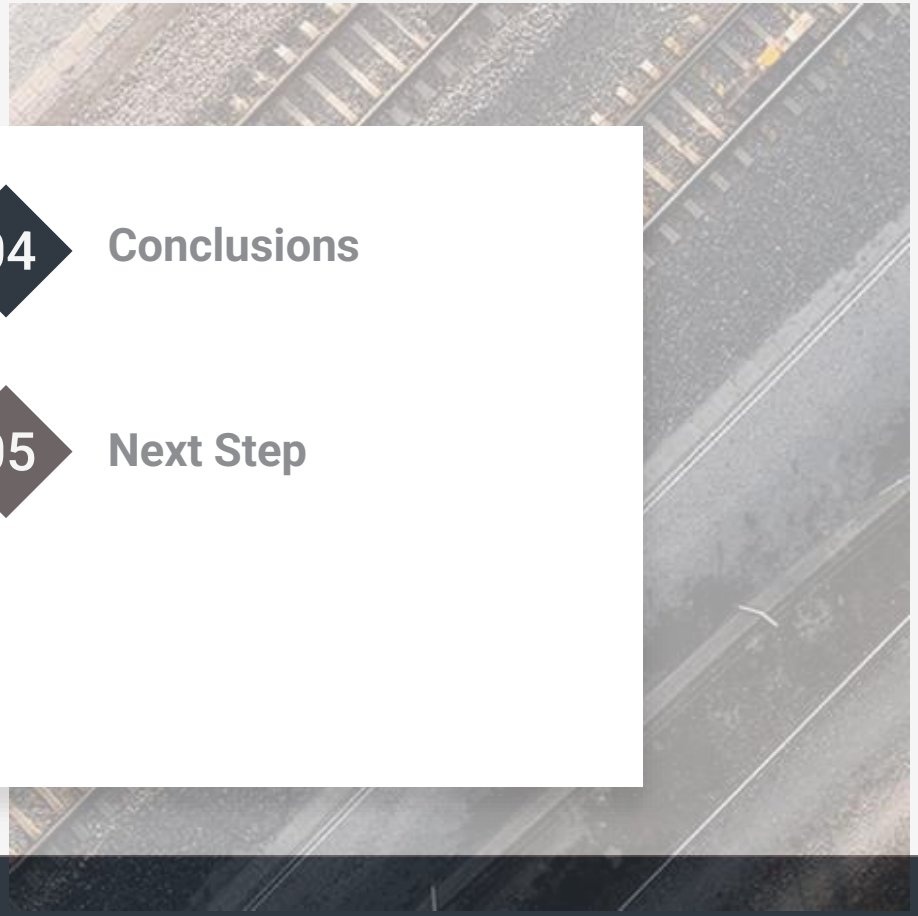


A Study on Possibility for Climate-Resilient Urban Planning in Chbar Morn Municipality, Kampong Speu Province

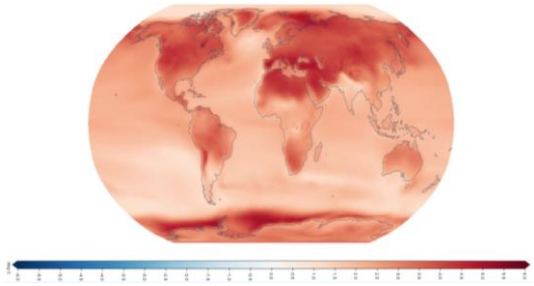
Present by: Oeng Eavhong

Table of contents

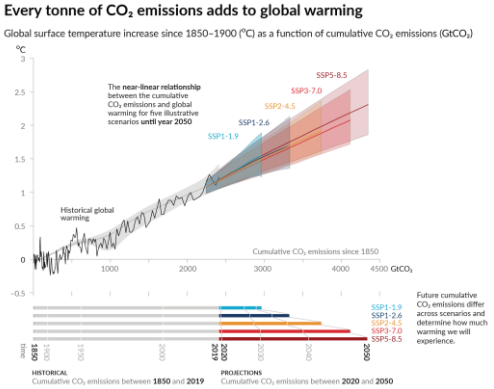


Introduction

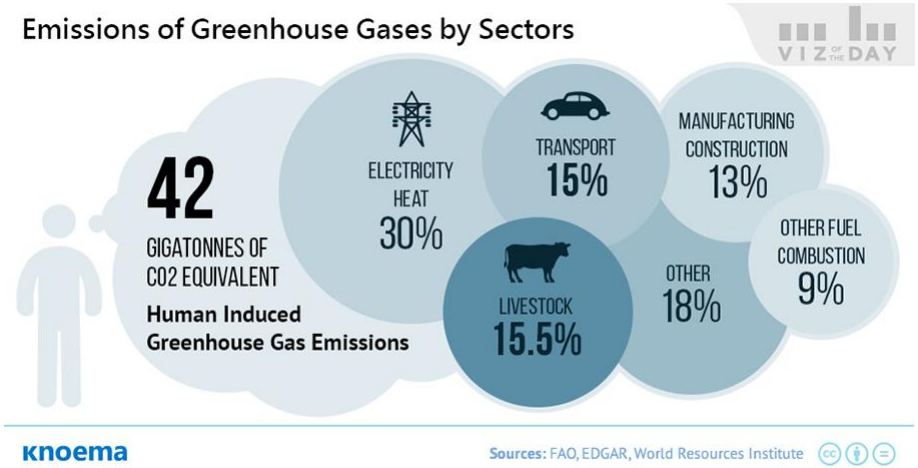
- The world has changed, global warming is here.
- Rising temperature causing rising problem such as; heatwave, drought, storms, and floods.
- One of the many reasons that the world is hotter, is due to human activities.



IPPC Climate Change Report



Introduction



- According to the World Bank, urban area and City can produce 75% of greenhouse gas even though occupied 2% of the land area.
- The densely populated areas generate significant demand, such as travel, electricity, industry, and food, all of which contribute to global warming.

What about in Cambodia?

- Cities climate risk is influenced by the hazards they are exposed to, and the vulnerability of the city's assets and population to those hazards.
- Cambodia has experiencing rapid development in recent decades. However those development always have side effect.
- Chbar Morn municipality of Kampong Speu province has faced harsh disasters, affecting thousands of people.

Objectives

Estimate the change in Land Surface Temperature in 20 years

01

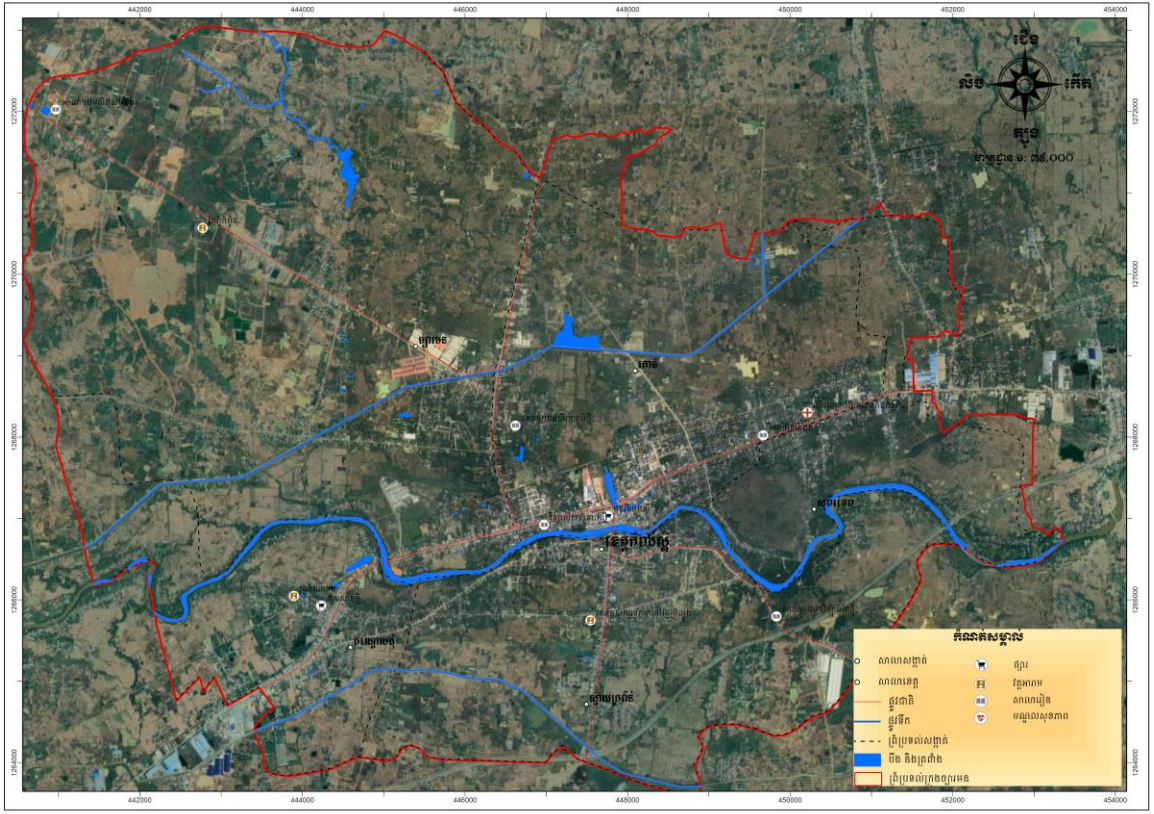
Identify the possibility of integrating the climate change adaptation in the municipality's master plan **(Next Step)**

03

02

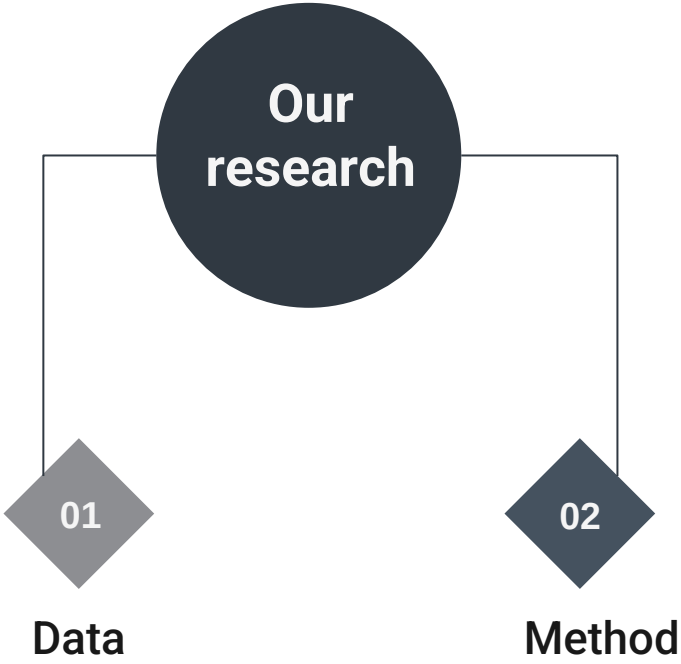
Identifying the other related harzards and conduct a Climate Risk Assement

Study area



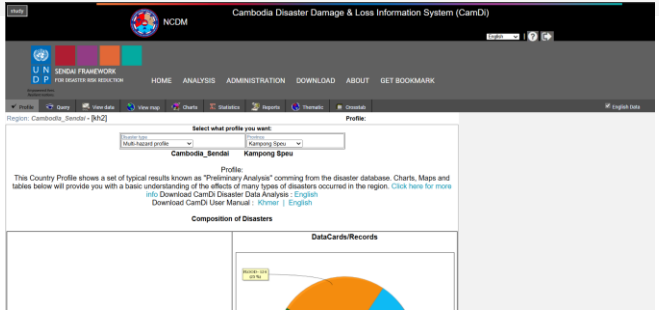
- According to National Institute of Statistics (NIS), Chbar Morn population has reached 9 705.
- It covered 50.1km^2 and have 5 commune include; Kandaol Dom, Roka Thum, Sopoar Tep, and Svay Kravan

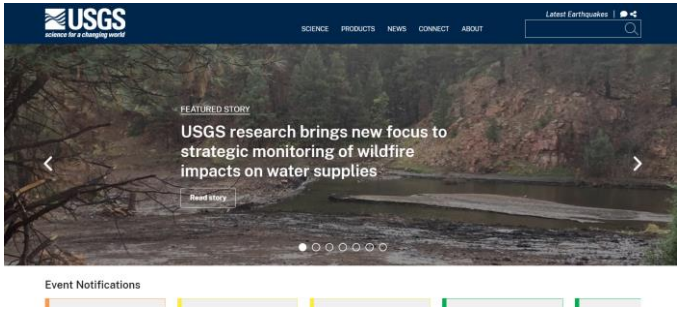
Methodology

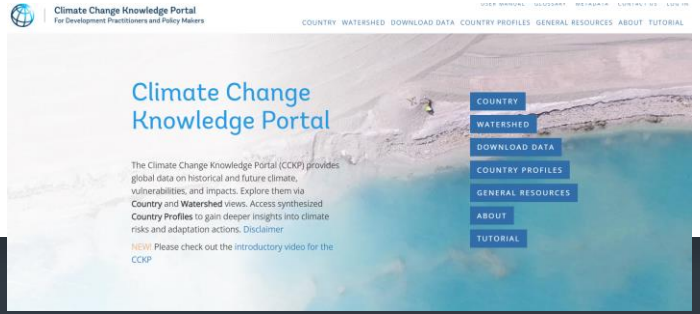


Data

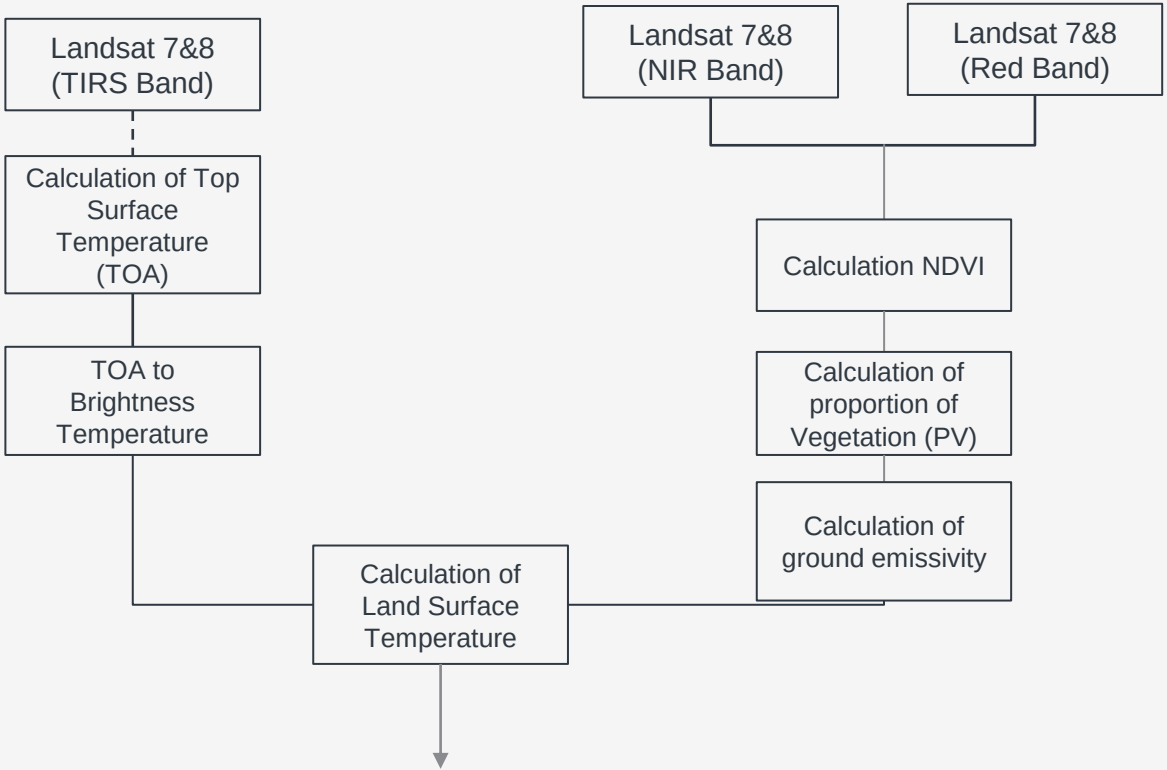
No	Data	Sources
1	Landsat 7 (2003), Landsat8 (2023)	• https://earthexplorer.usgs.gov/
2	Climate Hazard	• DesInventar - Profile (ncdm.gov.kh) • https://www.emdat.be/
3	Future Projection	• https://climateknowledgeportal.worldbank.org/







Calculating LST



(El Garouani et al, 2021)

Climate Risk Assessment

- This objective was conducted via Climate Risk Assessment

what is the Climate Risk Assessment?

- Climate Risk Assessment, is a method that seeks to understand the likelihood of climate-related hazards, and the potential impact of these hazard on cities and their inhabitants, environment, and economy.

CRA	=	**Hazard** (likelihood)	x	**Impact** (Social + Economic + Environment)

Hazard (likelihood) Identifies probability intensity and timescale of key current and future climate hazard in Chbar Morn.

Climate Risk Assessment

CRA	=	**Hazard** (likelihood)	x	**Impact** (Social + Economic + Environment)

Hazard Assessment

- Determine the relevant Climate hazard in Chbar Morn
- Analyze historical trends and events for these hazard
- Analyze future projections for these hazard for different scenarios

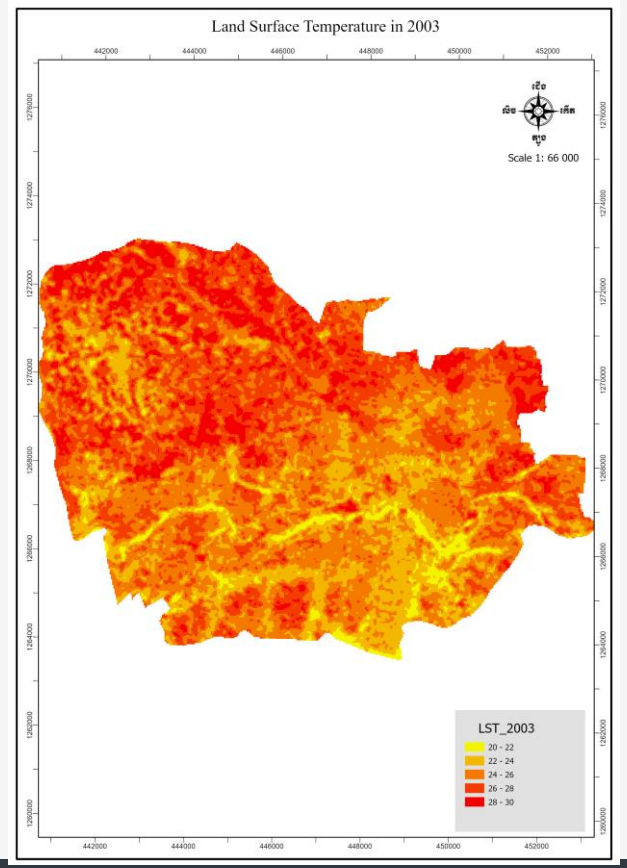
Impact Assessment

- Analyze non-Climate Trends, e.g. demographic, and socio-economic
- Assess the different (spatial) impacts related to the hazard, Positive or negative
- Priorities the identified Impact with Stakeholders

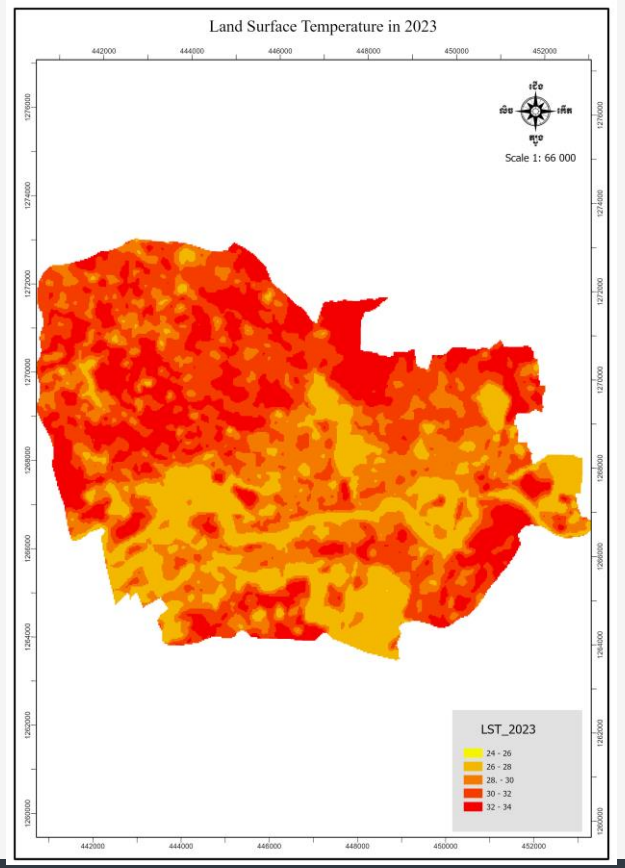
Key informant interviews

- This objective aimed to interview local government, and elders to understand more about climate hazards and their impacts/risks, as well as the master plan of Chbar Morn municipality.
- In this section, we focus on 3 main questions;
    - Questions related to climate change in Chbar Morn
    - Questions related to master plan development
    - Prioritize the impact of natural disasters

Objective 1 (Result)



Map of LST in 2003

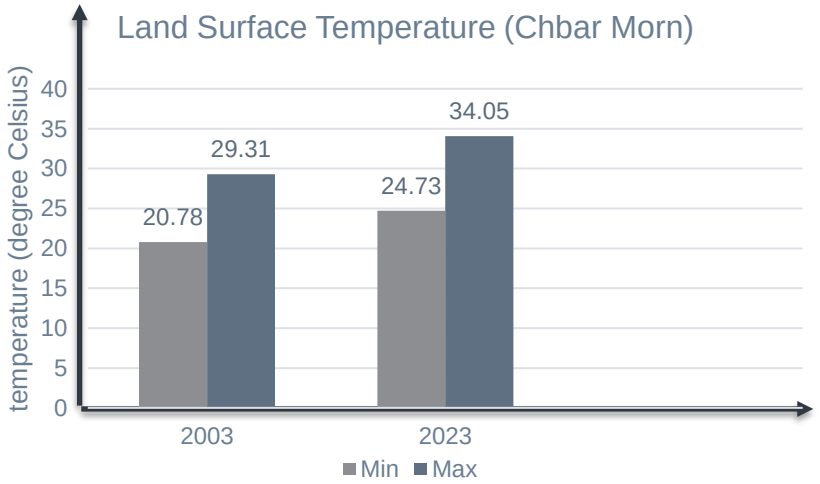


Map of LST in 2023

Objective 1 (Result)

According to the finding, between 2003 and 2023 LST in Chbar Morn has increased from 29.31 Celsius in 2003 to 34.05 Celsius in 2023.

- This increase in LST prove that there can be more heatwave effects in Chbar Morn as well.

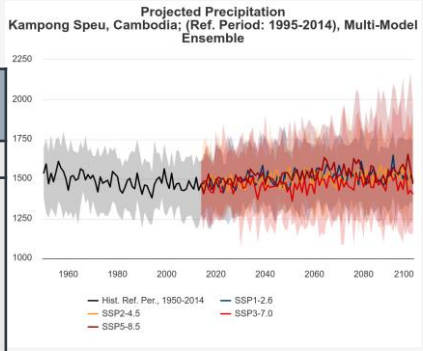


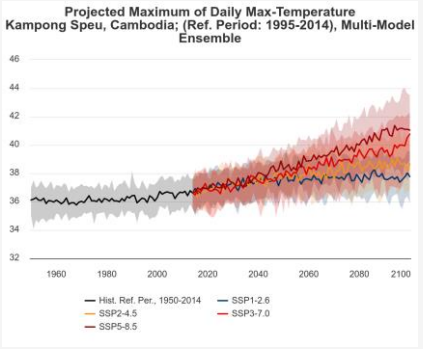
Objective 2 (Result)

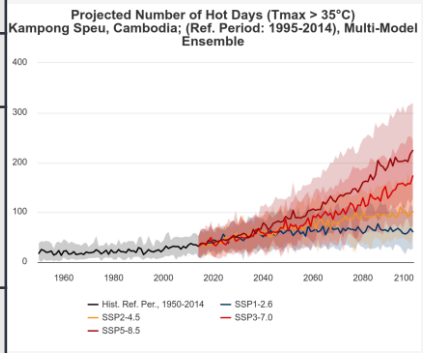
Hazard Assessment					
Climate theme	**Hazard Subtype**	**Sector**	**Date**	**Impact on**	**Description**
Flood	Heavy Rain	Social/ Economic/ Environment	2003-2023	Infrastructure	Over 20 years, floods have damaged road over 200 000 meters, and over 3100 house.
	Mass Movement			Inhabitance	Over 4 000 house damaged and destroyed in 2003-2023 period
	Riverine Flood/ Flash Flood			Crops	Crops round 17 000 Ha has destroyed and affected on 2000 Households in 20 years.
Storm	Tropical cyclone			Lost of life	At least 11 people died due to storms in Chbar Morn
Drought	Water Scaring			Health	Over 600 000 people starving in the period of 2003-2023
	Mass Movement			Food shortages	
	Wild Fire			Water Shortages	
Heat wave	Extreme hot day			High electricity consumption	Due to high temperature it leads to high demand on electricity and causes the bill raise

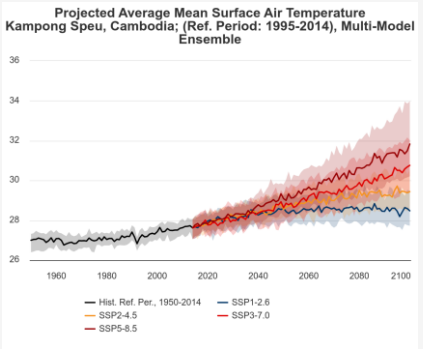
Objective 2 (Result)

Qualification of Climate Hazard for Historical trends and future projections			
Hazard theme	Hazard	Historical trends	Future Projections
Floods	Riverine flood	Frequently	More Frequently
	Flash flood		
	Flood (General)		
	Monsoon floods		
Drought	Water Scarcity	Frequently	More Frequently
	Food Shortage		
Cyclone	Tropical Cyclone	Often	More Frequently
	Cyclone (General)	Frequently	
	Thunder Storm		
Heat wave	Urban Heat Island	Frequently	More Frequently
	Extreme Hot day		
	Heat Wave		









https://climateknowledgeportal.worldbank.org/

Objective 2 (Result)

Risk Assessment

Conclusions

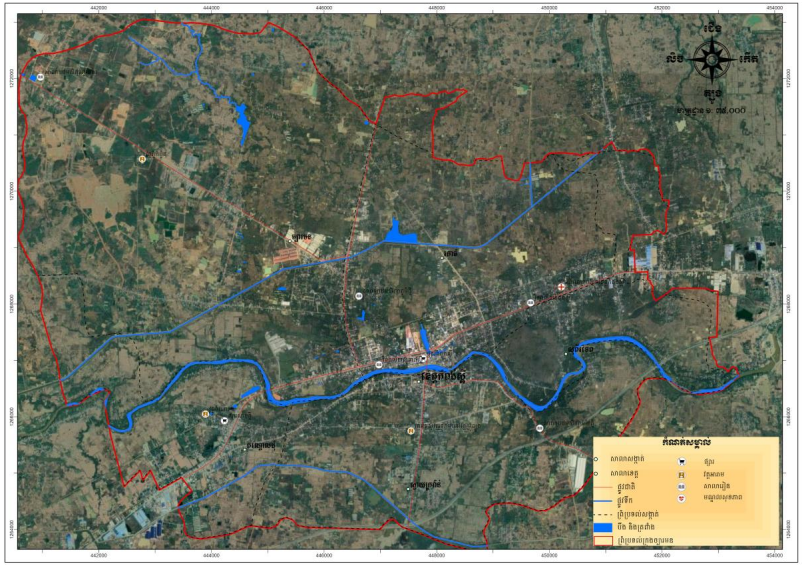
- In last 20 years, LST has increased over 5 degrees Celsius which can be marked as high and can impact on citizens
- Not to mention, other climate hazards also occur and affect Chbar Morn municipality including floods, storms and droughts
- Based on future climate projection, intensity and frequency of climate hazards will increase

Next Step

- We will conduct survey with local government officers who has experiences working on Chbar Morn Municipality Master Plan
- Try to understand the making process of Master Plan in Chbar Morn
- Try to implement the Climate Risk Assessment step to technical officer
- Review the process of Master Planning of Char Morn municipality
- Develop a framework for incorporating climate risk into the master plan

Next Step

- **Hazard Mapping** help response to the right place and type of climate disaster commonly occur in Chbar Morn.
- By let local government mark on the map it will help us understand more and help develop framework effectively



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Thanks