International Urban Cooperation Asia
Muar Climate Action Plan: Knowledge Sharing

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About Muar

Basic Profile / Key Features

Population: 281,500 (2017)
Land Area: 1,392 km^2
Economy: Industry, Tourism

Muar, also known as **Bandar Maharani**, is a district located in the northwest of Johor, Malaysia's southernmost state. The District sits on the banks of the Muar river and next to the strait of Malacca, and has **historically been a commercial center of the region**.

Muar is a **royal town of Johor** and a **popular attraction for tourist**. The city is also home to the **major producer of Malaysian made furniture**.

Climate Change and Muar

	Current Observation	Projection for 2030	Projection for 2050	Reference - Assumption Remarks
Average Annual Temperature	26.2 ℃	27.1 ℃ (+3.3%)	27.7 ℃ (+5.7%)	Southern Region (NC3 & BUR2, 2018, pg. 87)
Average Annual Rainfall	1,891 mm	1,998 mm (+5.6%)	2,068 mm (+9.4%)	Southern Region (NC3 & BUR2, 2018, pg. 87)
Average Mean Annual Flow	55 cm	69 cm (+25.4%)	70 cm (+26.5%)	Muar River Basin (NC3 & BUR2, 2018, pg. 89)
Flood Prone Areas	302.2 km²	456 km² (+50.9%)	500.6 km² (+65.7%)	Muar Flood Prone Basin (NC3 & BUR2, 2018, pg. 91)
Range of Maximum Sea Level Values (Coastline)	0.99 - 1.30 m	1.07 - 1.37 m	1.15 - 1.45 m	Johor West (NC3 & BUR2, 2018, pg. 95)

Main Effects of Climate Change on Muar

Climate Hazards	Risk Level	Future Trend	Affected Sectors	Vulnerable Population	Social Impact
Monsoon	Medium High	⬆	Food and agriculture; Tourism; Emergency services.	Low-income households.	Increased demand for public services.
Forest Fire	Medium	⬆	Food and agriculture; Environment, biodiversity, forestry; Tourism; Public Health; Emergency services.	Indigenous population.	Increased incidence and prevalence of disease and illness; Increased demand for healthcare services.
Flood (Flash, River, Coastal)	Medium High	⬆	Water supply & sanitation; Transportation; Waste management; Public Health; Emergency services.	Children & youth; Elderly; Low-income households.	Increased demand for public services; Loss and damage.
	Medium	⬆	Water supply & sanitation; Food and agriculture; Waste management; Environment, biodiversity, forestry; Emergency services; Land use planning.	Persons with disabilities; Low-income households.	Increased demand for public services; Increased demand for healthcare services; Increased resource demand; Loss and damage.
	Low	⬆	Water supply & sanitation; Food and agriculture; Environment, biodiversity, forestry; Land use planning.	Low-income households; Persons living in sub-standard housing.	Increased demand for public services.
Salt Water Intrusion	Medium High	⬆	Water supply & sanitation; Food and agriculture; Environment, biodiversity, forestry Land use planning.	Low-income households.	Increased resource demand; Increase in soil salinity
Vector-borne Disease	Medium	⬄	Industrial; Commercial; Residential; Public Health.	Children & youth; Elderly; Persons with chronic diseases.	Increased demand for public services; Increased demand for healthcare services; Increased risk to already vulnerable populations.

Muar's Contribution to Climate Change
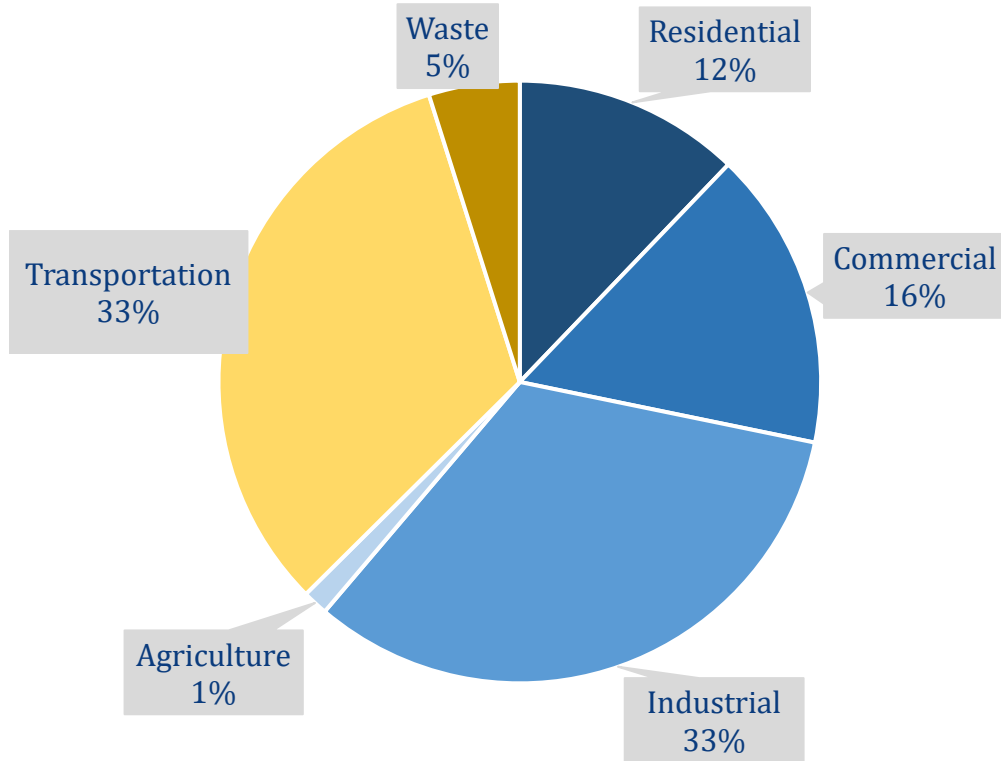
Total GHG Emissions (2017) (ktCO2eq)

1,620

GHG Emissions per Capita (tCO$_2$eq)

5.8

GHG Emissions per unit land area (km^2)

1,164

Mitigation Target

63% emission intensity reduction by 2030 compared to base year 2010

Adaptation Goals

Monsoon, Flood (Flash, River, Coastal)

Goal 1 Reduce property damage due to **monsoon and flooding by 50%** by 2030 compared to 2017

Salt Water Intrusion

Goal 2 To achieve **zero shutdown of water treatment plant** by maintaining salinity of Muar River below 0.5ppt (part per thousand) at the intake point

Forest Fire

Goal 3 Minimise the occurrence of human-induced **forest fire by 30%** by 2030 compared to 2017 level

Vector-borne Disease

Goal 4 Reduce the number of **dengue cases by 50%** by 2030 compared to 2017 level

THEME BASED ACTIONS

1. **Sustainable Energy and Industry**

2. **Smart Growth**

3. **Conservation of Biodiversity** (Waterfront, Forest)

4. **Resilient Low Carbon Community**

(Education, Community Action, Local Agenda 21)

Sustainable Energy and Industry

This strategy is important as industry and service industry (institution and tourism) are the main engine of growth for Muar.

Decoupling the economic growth and CO_2 emission is vital for Muar to pursue rural urbanisation to ensure a balance development to ensure Maharani Royal town, Bukit Bakri industrial hub and Pagoh education hub to cater for rapid urbanisation and trickle down to surrounding existing local settlement like Parit Jawa, Bukit Pasir, Bukit Kepong, Bukit Naning and Parit Bakar.

Muar designated as regional centre spearheading Northern Johor economic corridor for development

Energy sector and industry is main emitters.

Sustainable Energy and Industry

Action	Benefits	Responsible department	Key partners	Timeline 2020-2025	2025-2030
I1: Promote the use of waste from industrial (i.e. wood chips) and agricultural activities for generating biomass energy	Mitigation	Engineering Department	SEDA, TNB		»»
I2: Establish Muar Furniture Park as a model for industrial symbiosis and circular economy	Primarily Mitigation	Department of Development and Landscape Planning	MTIB, MFA, JCorp, BPENJ, InvestJohor, SEDA, DOE		»»
I6 Promote compost from food and agro-waste (Waste to Wealth)	Mitigation	Department of Development and Landscape Planning	SWM, JPSPN, DOE	»»	
I7 Integrate material recycling facility with transfer station in Bukit Bakri	Mitigation	Department of Development and Landscape Planning	SWM, JPSPN, DOE	»»	

OUR CHALLENGES

1

SHORTAGE OF STAFF

Most of MPM activities focus on routine administration on development control, licensing, enforcement, public health and hygiene. No spare staff for carbon emission activities

2

LACK OF DATA

Base data for adaptation goals is insufficient.

Data related to climate change especially driver of carbon emission are limited. MPM has limited data especially in inventory energy consumption by sector /categories or disaggregate data

3

PUBLIC AWARENESS/ BUY IN

Climate change issues are not easy to explain and many of impact may not be direct or immediate to the people of Muar

LESSONS LEARNED

1 **IMPROVED AWARENESS AMONG STAKEHOLDERS ON CLIMATE CHANGE**

General public appreciate more on climate change after FGD - learning the impact weather disaster is associated with climate change.

3 **CRVA AND CIRIS MODELLING**

Ability to appreciate how data collection are then be used in estimating GHG emission for MPM

2 **SUSTAINABILITY SOLUTIONS**

Importance of conserving natural resources of river, coastal and forest. They are key for both climate mitigation and adaptation

NEXT STEPS

1 ENHANCING CCCWG (CLIMATE CHANGE WORKING GROUP)

Need to have formal CCCWG (under the CAP process) dealing with both climate mitigation and adaptation.

2 ROADMAP FOR IMPLEMENTATION

Identify projects, partner and implementer for immediate/future implementation

3 SECURING GAP FUNDING AND OTHER SOURCES

Follow up on proposed solar project on Bukit Bakri landfill site application for GCOM GAP funding.