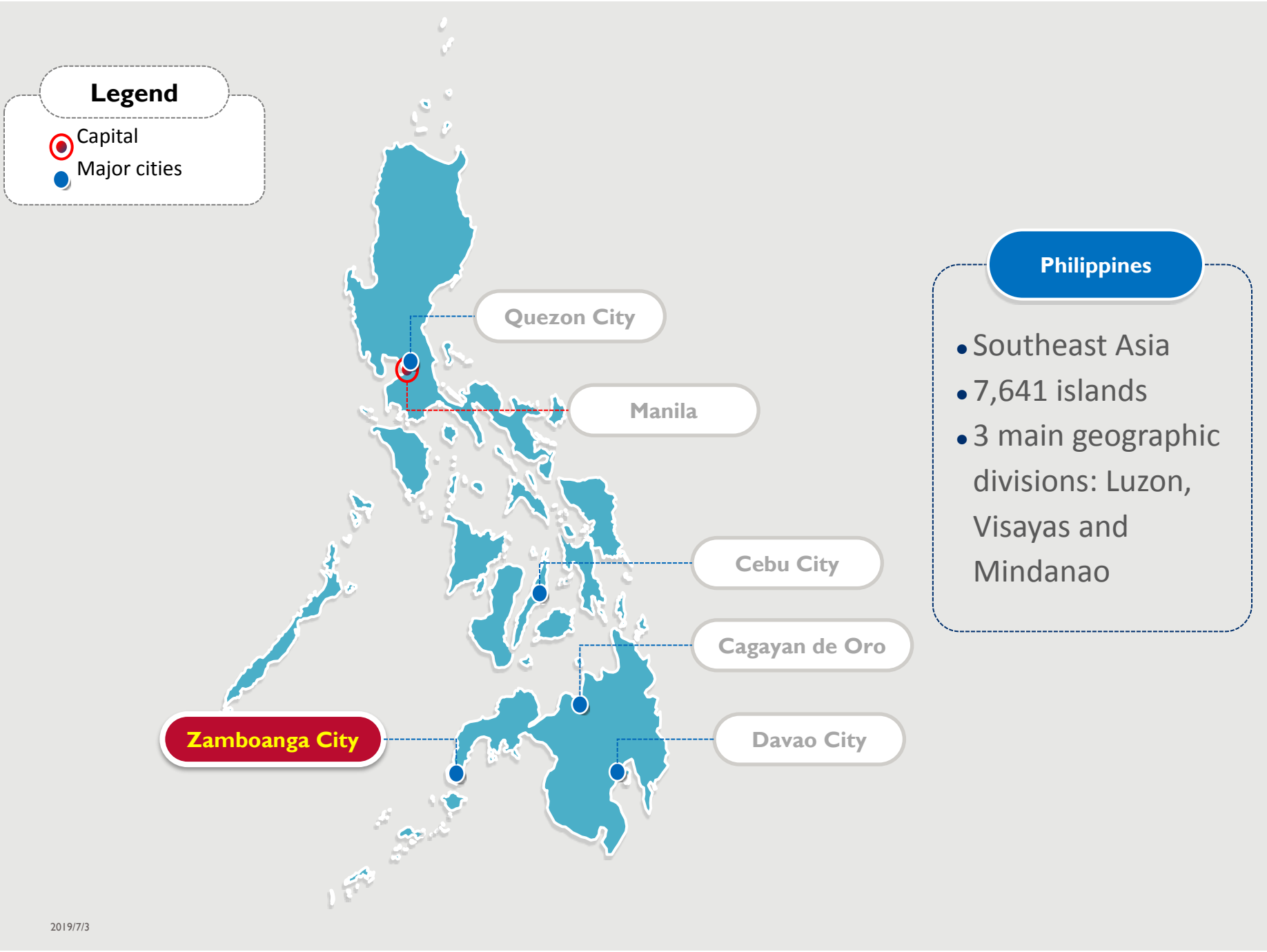
Resilient Cities 2019
10th Anniversary

SUSTAINING WATER RESILIENCE ECOSYSTEMS AMIDST THE IMPACT OF WEATHER PATTERNS CYCLE

Zamboanga City, Philippines


Legend
Capital
Major cities
Quezon City
Manila
Cebu City
Cagayan de Oro
Zamboanga City
Davao City
Philippines
• Southeast Asia
• 7,641 islands
• 3 main geographic divisions: Luzon, Visayas and Mindanao
2019/7/3

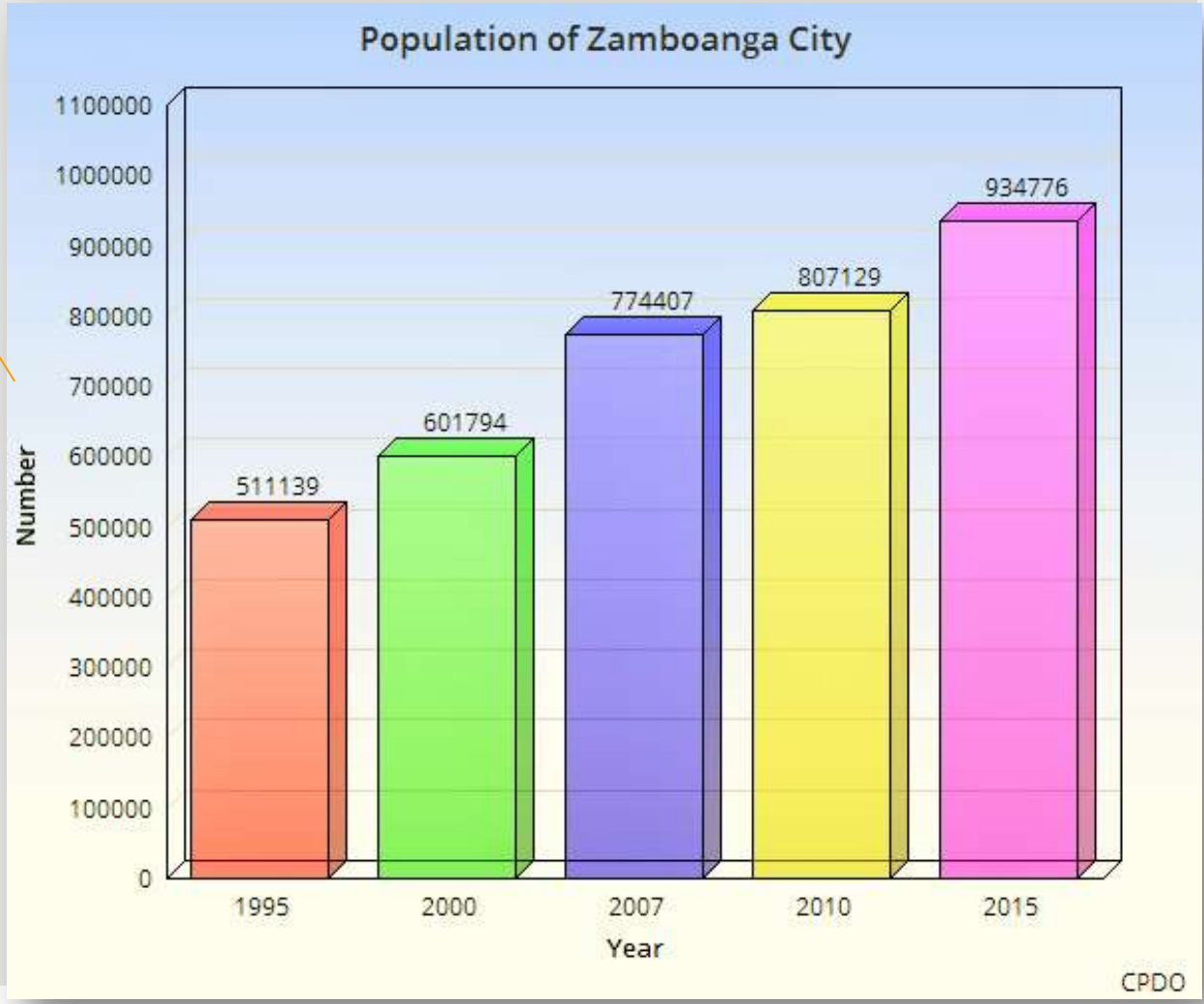
Out of 138 cities, Zamboanga is the 6th biggest city in the Philippines in terms of population

National annual growth rate (2000-2010) 1.90%

AGE DISTRIBUTION

0 - 14 = 34.5% (young dependents)
15 - 64 = 62.2% (working-age)
65 & over = 3.3% (old dependents)

Growth Rate 2.98%



Demography

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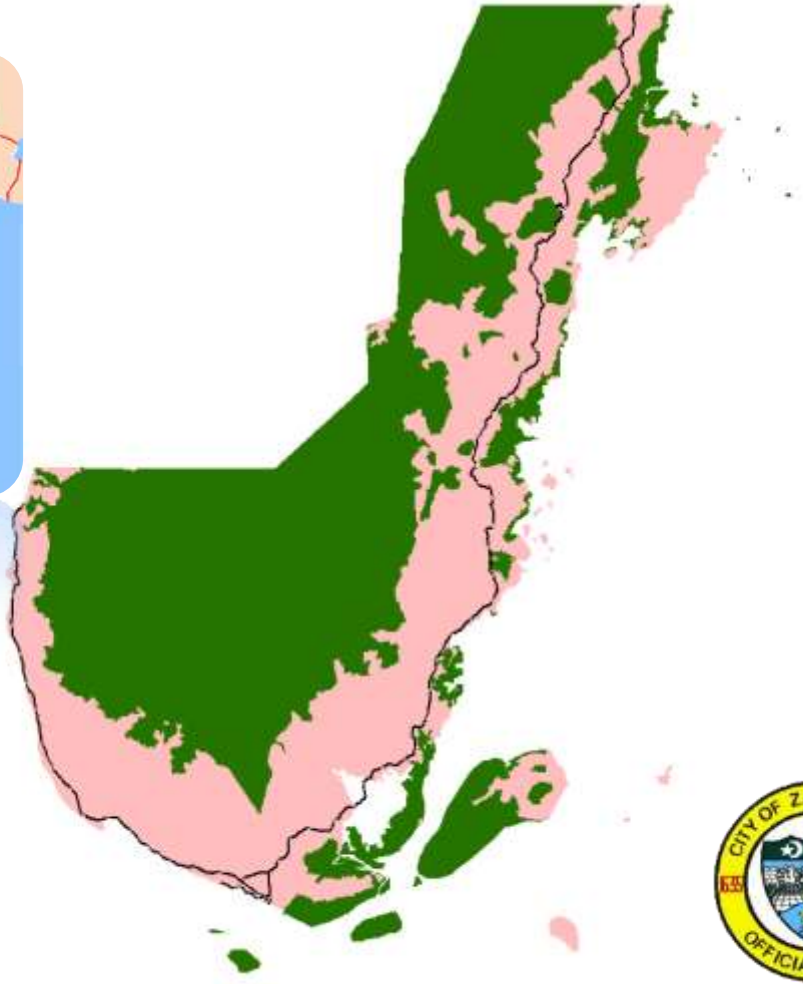
CITY OF ZAMBOANGA 1635 1937 OFFICIAL SEAL

Public Lands	= 88,664 Has.
A & DLands	= 62,366 Has.
Unclassified Public Forest	= 1,789 Has.
TOTAL	**= 152,819 Has.**



Legend

- Alienable and Disposable Lands
- Public Lands
- Unclassified Public Forest

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Drought (dry spell)
caused by El Nino weather phenomenon

High temperature
Low precipitation (rainfall)

The Zamboanga City Council on March 5, 2019 placed it under a state of calamity

El Niño is present in the tropical Pacific and will likely to continue until the April-June 2019 season

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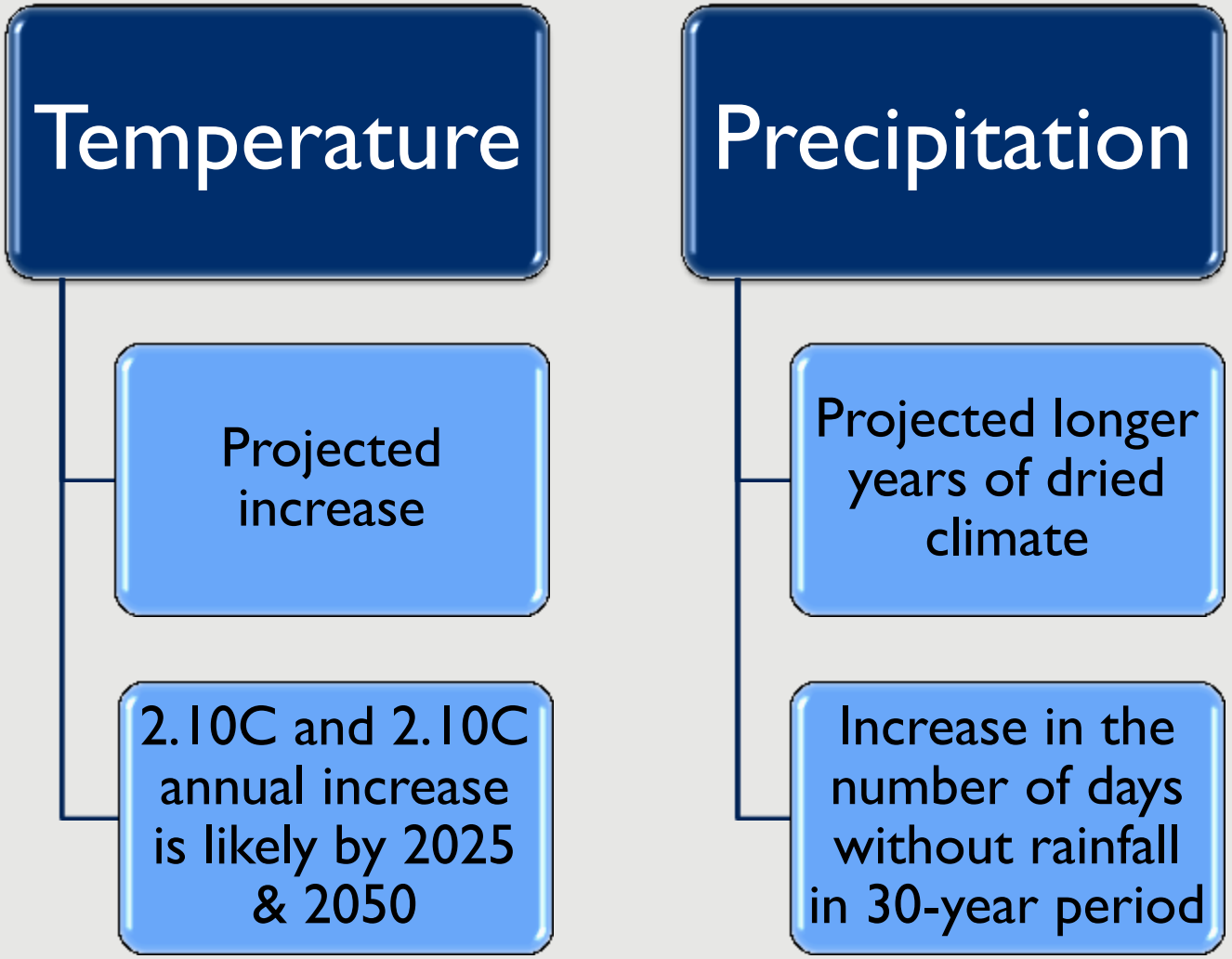
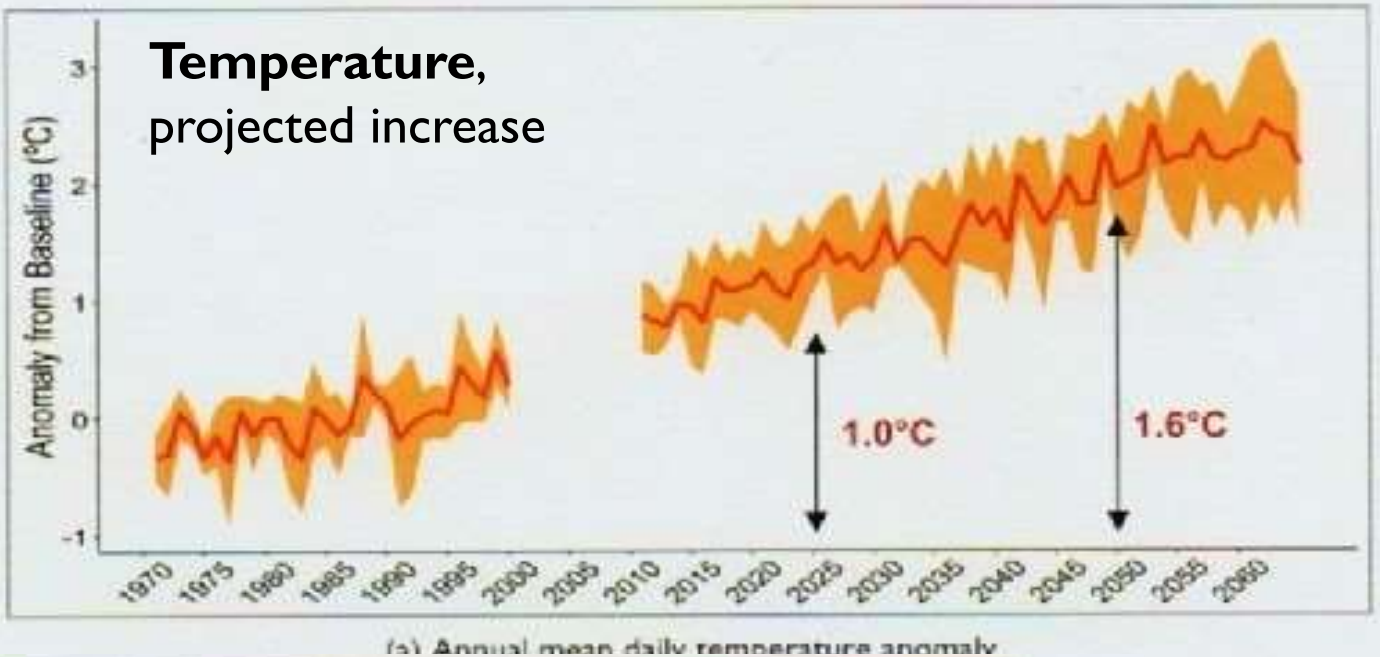
IMPACT OF WEATHER PATTERNS CYCLE

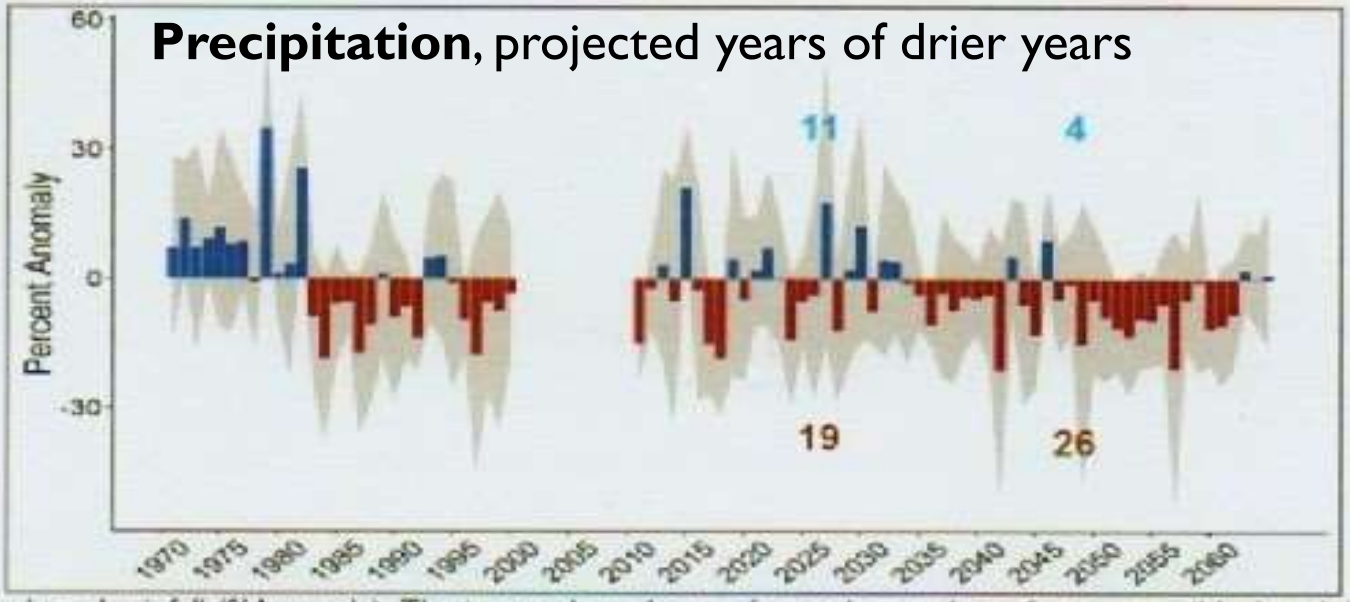


Temperature, projected increase



(a) Annual mean daily temperature anomaly

Precipitation, projected years of drier years



(a) Annual total rainfall (%Anomaly). The inserted numbers refer to the number of wet years (blue) and dry years (brown) for 2025 (first column) and 2050 (second column). The gray shades represents uncertainty.

Temperature, projected increase

- the 2025 mean anomaly from the baseline is +/- 1.20C
- the projected Year 2050 mean difference from the baseline +/- 2.10C
- as high as 2.10C and 2.10C annual increase is likely by 2025 & 2050

Precipitation, projected longer years of drier climate

- the 60-year projection period, shall experience 45 years below average rainfall;
- and possible consecutive droughts due to the impact of climate change
- increase in the number of days without rainfall in 30-year period
- decreased in number of days with a max 20mm of rainfall; and
- indicates increase of moderate rainfall +/- 40mm.

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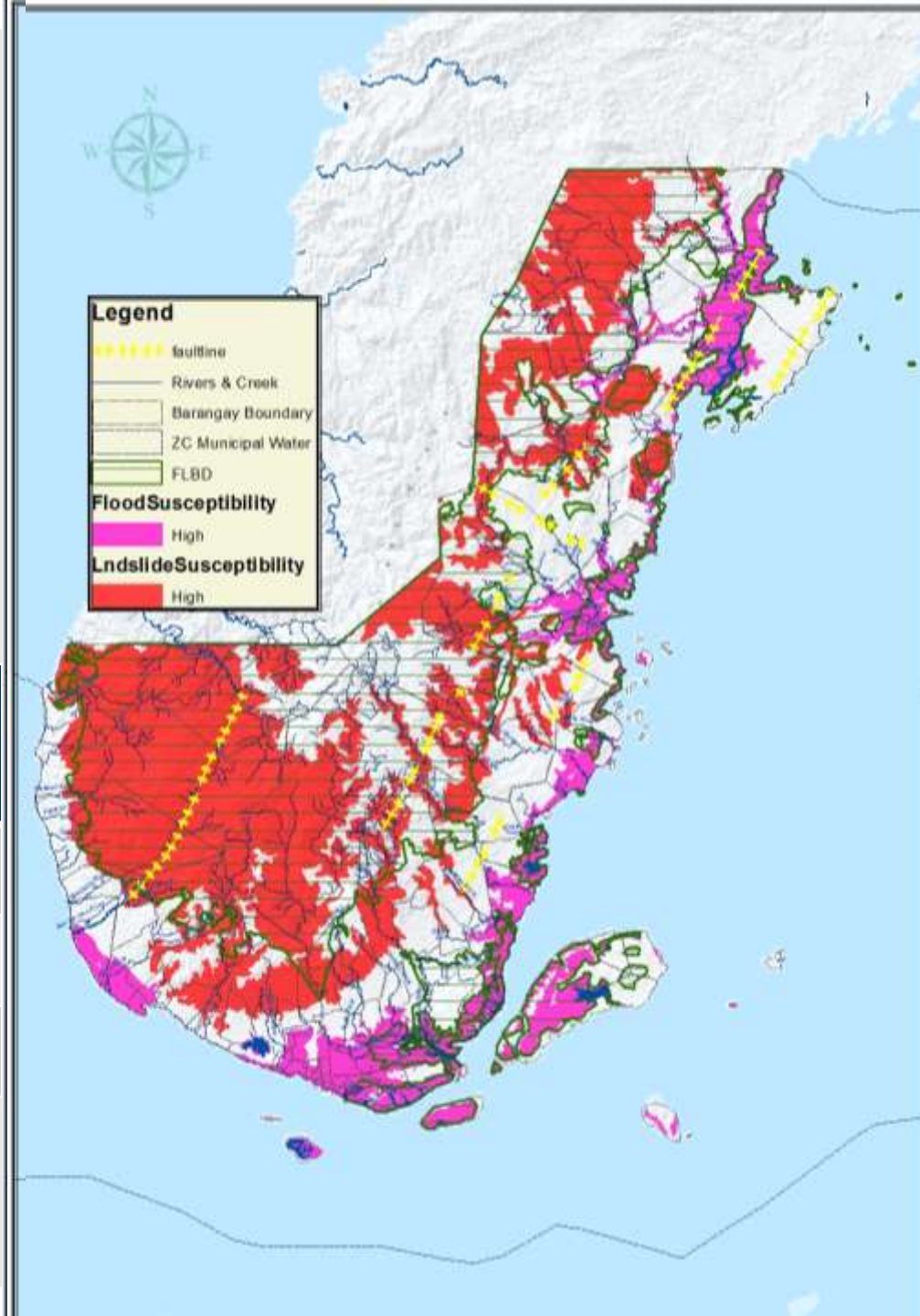
High vulnerability to floods, landslide and fault line

Hazards	Area (Ha)	%
Flooding	18,020	12
Landslide	59,605	39
Total	**77,714**	**51**



Dried river system

Rice field pest infiltration

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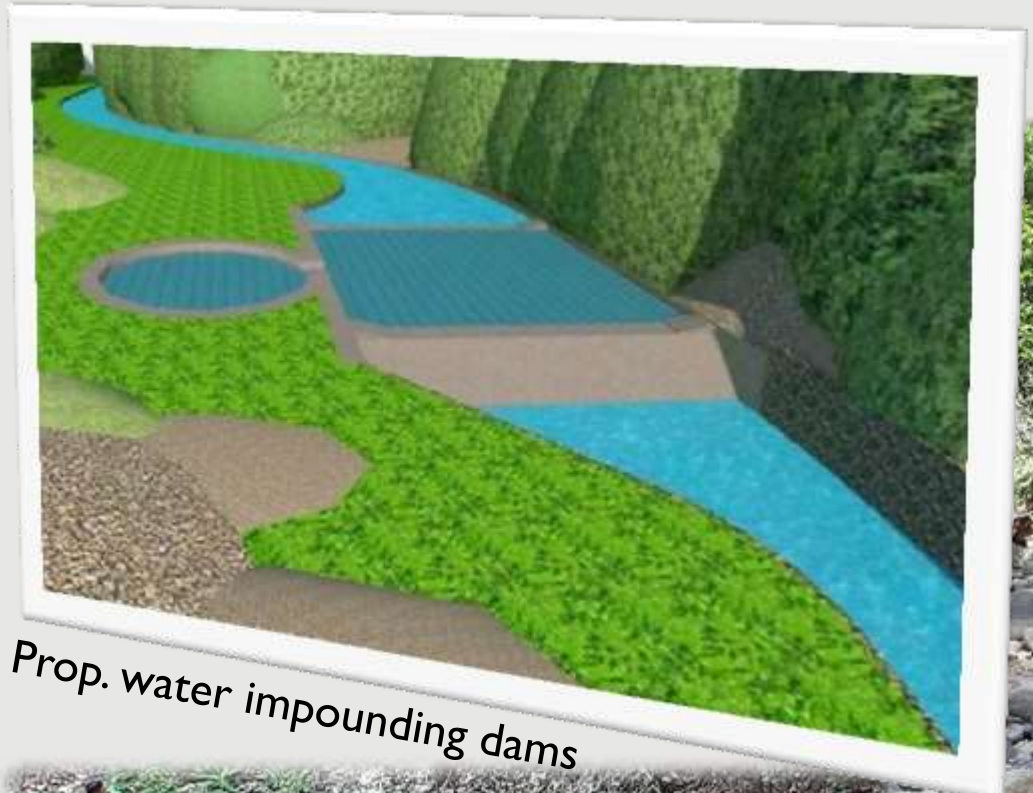

Prop. water impounding dams

Dried watershed rivers

CITY OF ZAMBOANGA
1635 1937
OFFICIAL SEAL

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23 communal irrigation system; of which 6 are in highly critical condition as to its dam water level

467 hectares of crop and fishery damages

8,177 Farmers & Firsherfolks affected

634 With damaged to crops

7,543 Were not able to plant

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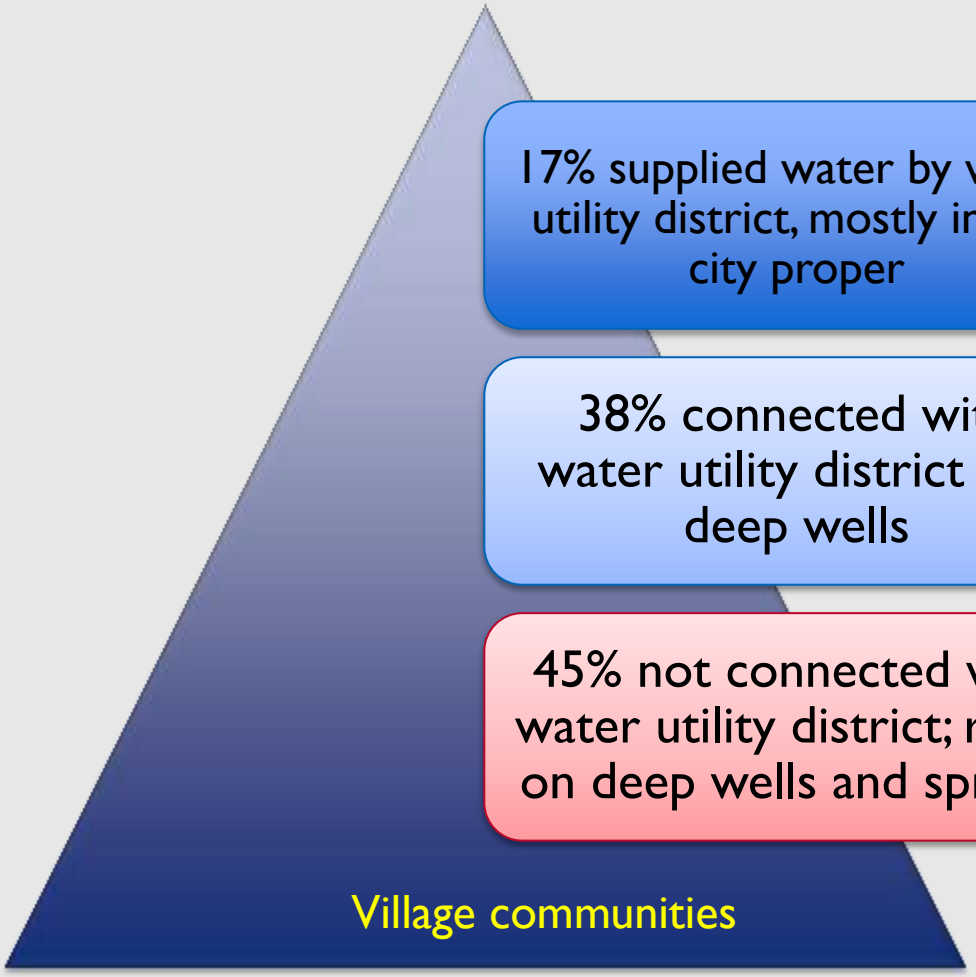
SURFACE WATER IS THE MAIN SOURCE SUPPLY AUGMENTED BY PRODUCTION WELLS AND SPRINGS



Domestic
Government
Commercial

28 % of population served

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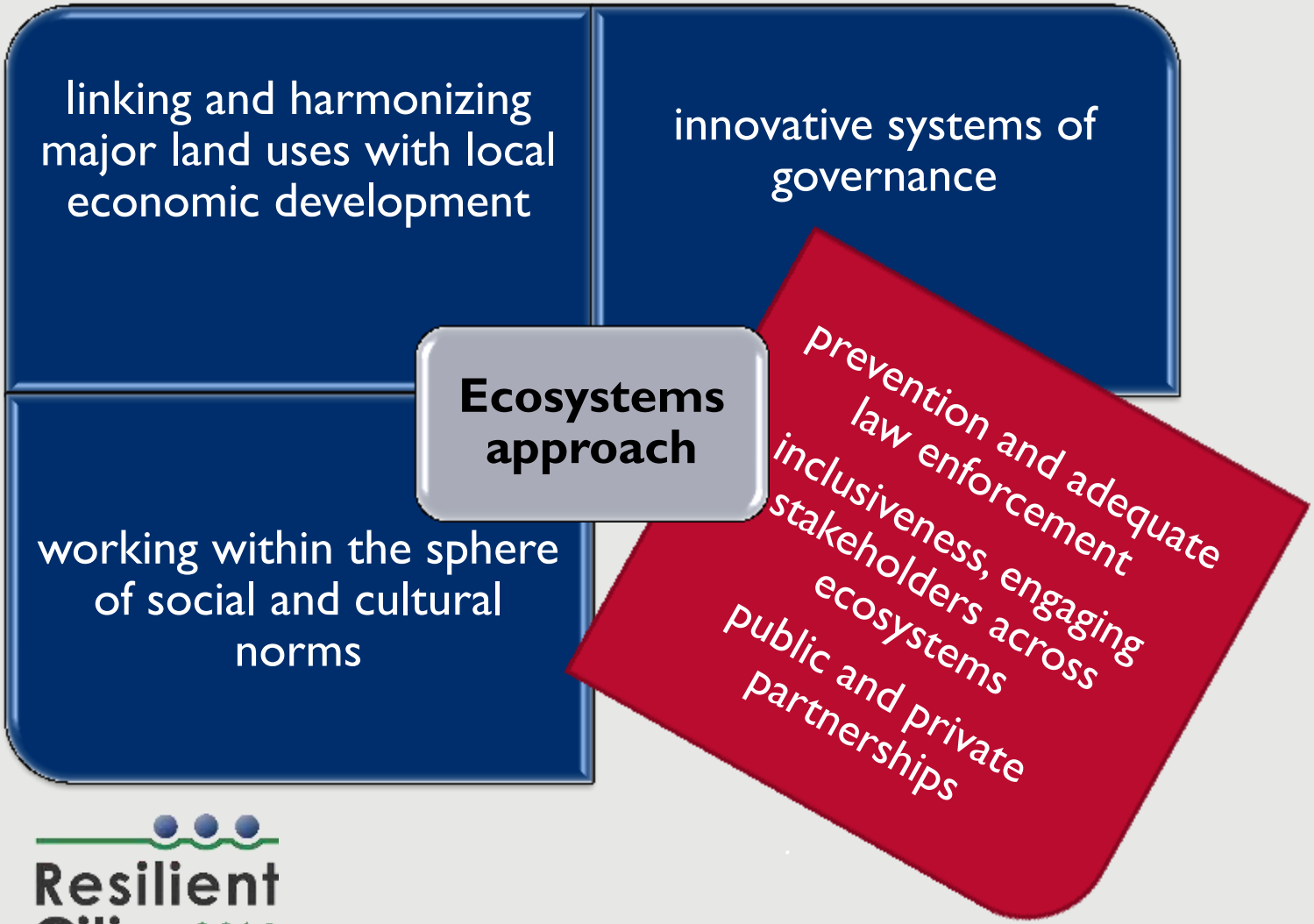
In this changing weather patterns scenario of dry spell, impacts on

Agricultural lands	Fisheries and livestock	Dams
• Damaged crops with low chance of recovery	• Low production • Reported fish kills	• Dried up • Critical conditions due to receding water level below normal

Amidst the impact of changing weather patterns, the City is mandated to sustain the water supply



Current activities are geared towards ecosystems stability

Reforestation within the sphere shared governance of forestlands

Dredging of clogged rivers

Establish green spaces; mixed use amenities

Intermediate interventions

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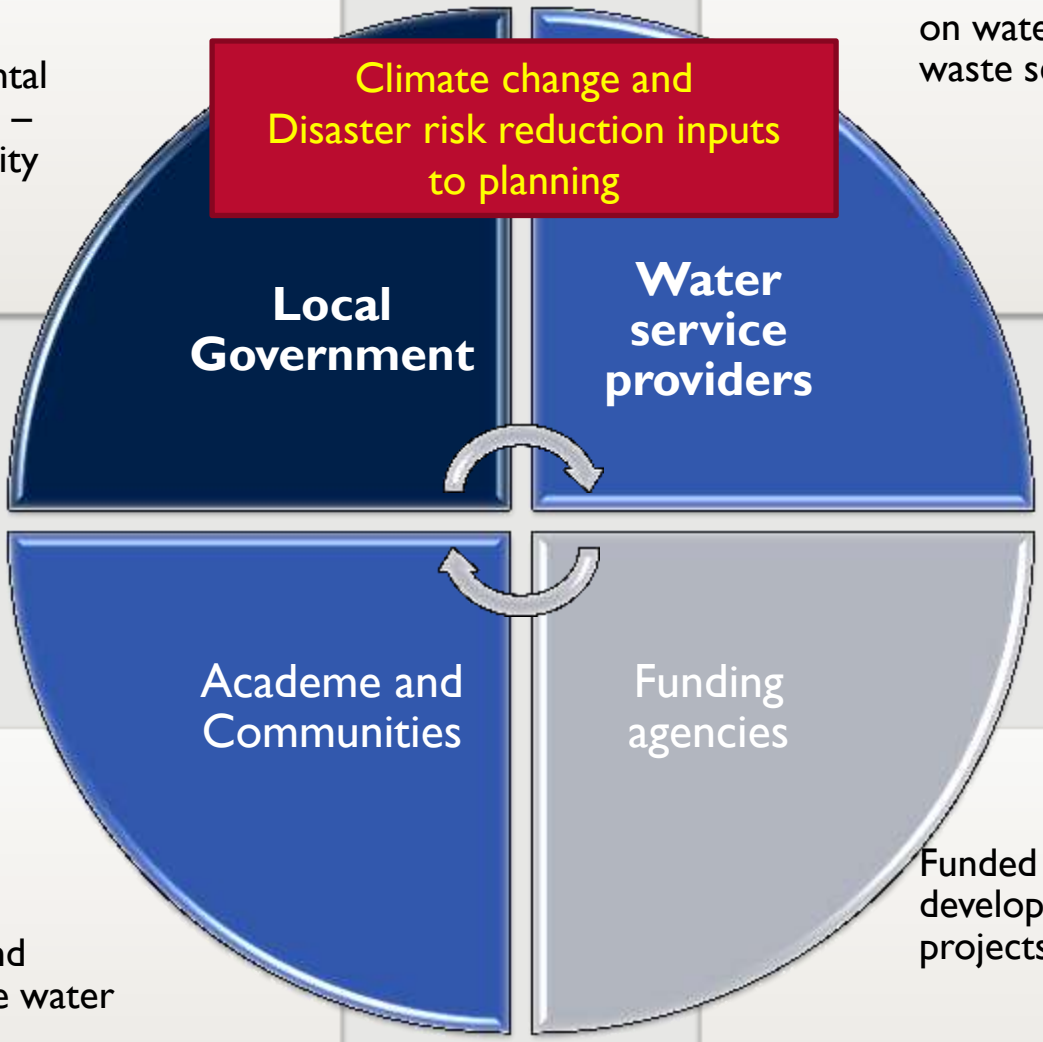
PARTNERSHIPS

- Good local environmental governance – accountability

- Sustainable access on water supply and waste services



- Enhanced awareness
- Reduced and efficient use water

Funded developmental projects

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Zamboanga City, Philippines

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Eduardo M. Bisquera Jr., Ph.D.

Presenter