

Setting the Context

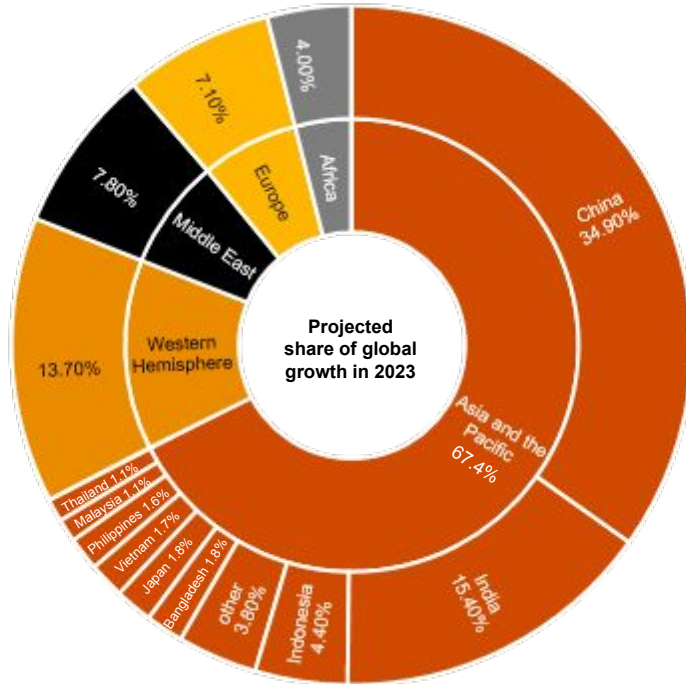
Resilience Framework for Asian Coastal Cities: Environment, Equity and Sustainability

Global Coastal Cities Summit, Mumbai

May 2023



Asia's contribution to global GDP is on the rise



Source:

[1] [Asia Poised to Drive Global Economic Growth, Boosted by China's Reopening](#)

[2] [The Future is Asian](#)

[3] [World Population Review](#)



Asia contains 30% of the world's landmass and a coastline of 220,266 km – largest in the world.

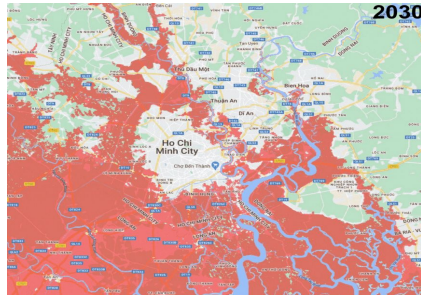


Asia contributes to 45% to the global GDP as of 2023, and is likely to exceed 50% by 2050

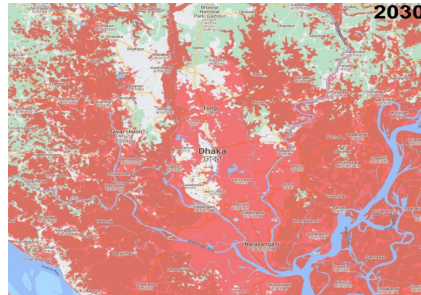


60% of the world's population are living in Asia

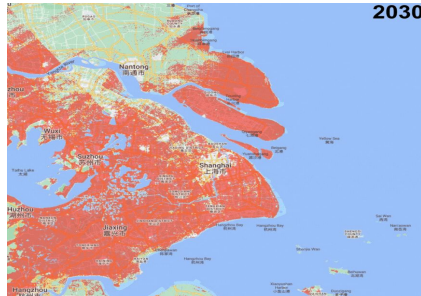
Economic hotspots in Asia have increasing flood footprints



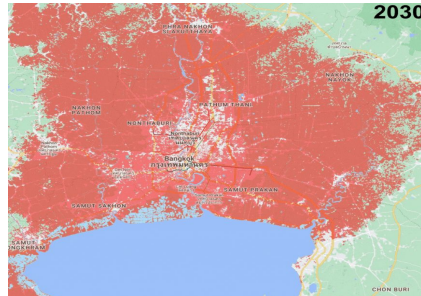
Ho Chi Minh City



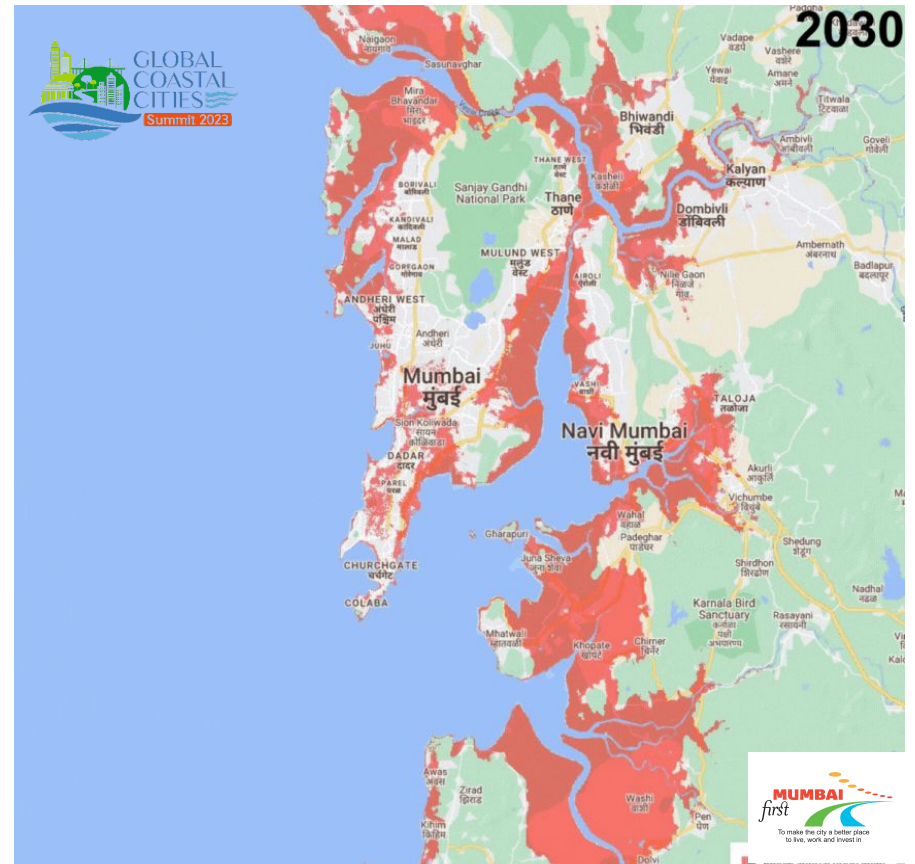
Dhaka



Shanghai



Bangkok



Mumbai

Source:
[1] [Climate Central coastal risk screening tool](#)

Mumbai's 'RiskScape'



FLOODING

About **50km of Mumbai Metropolitan Region coastline** is at '**severe threat**' flooding. There are **386 waterlogging spots** across Mumbai



TROPICAL CYCLONES

The city witnessed **18 cyclones** within a time period of 10 years (2011-2021), 11 of these were in 2019, 2020 and 2021



HEATWAVES

Between 1973 and 2020, **10 heatwaves and two extreme heatwave** events were observed.



LANDSLIDE

Mumbai has **291 spots landslide prone zones**, heavily populated by slums, most of them are in the eastern suburbs

Source:

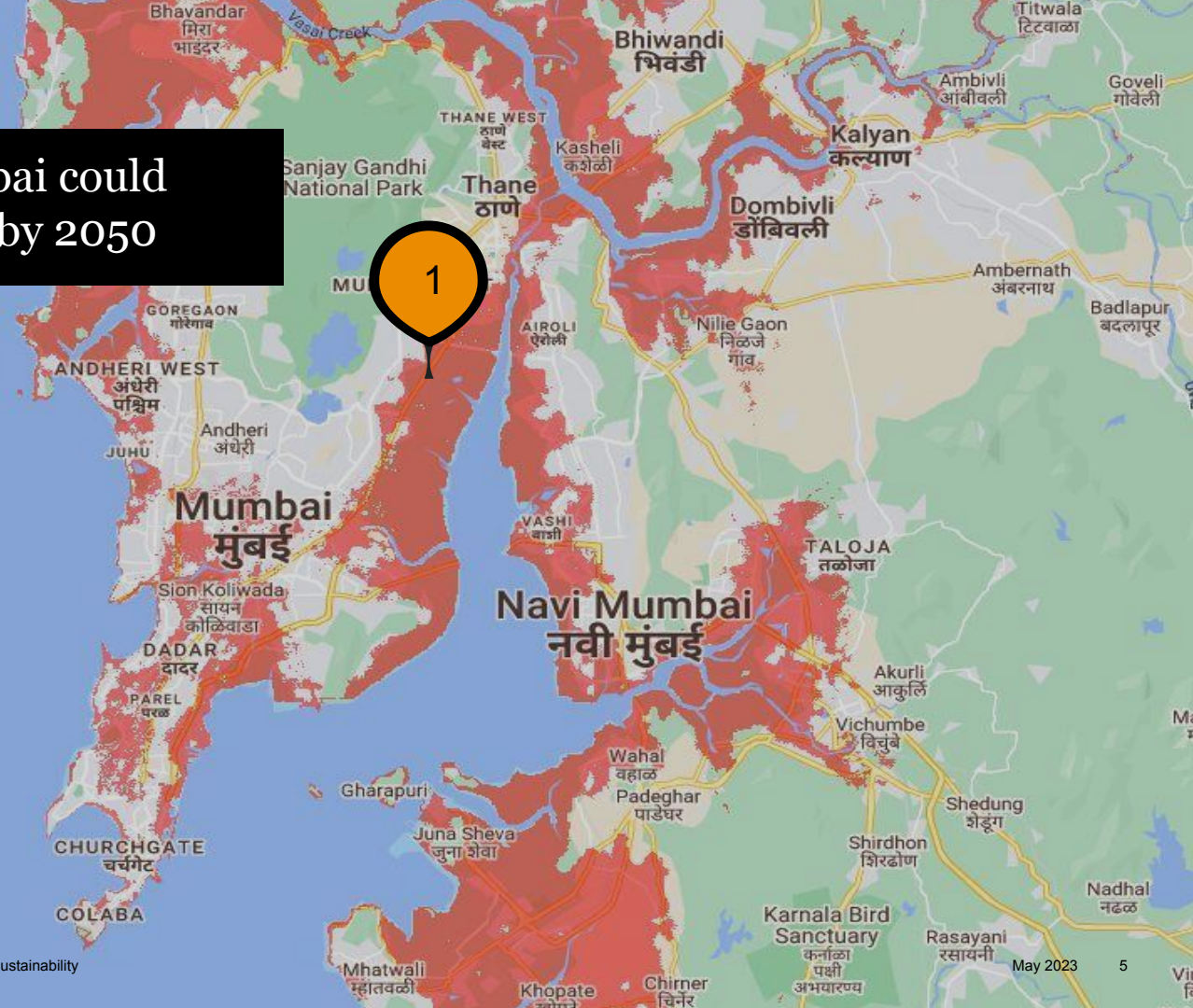
[1] India Meteorological Department

[2] Climate and Air Pollution Vulnerability Assessment for Mumbai, India; Mumbai Climate Action Plan, March 2022

Critical landmarks in Mumbai could face severe climatic threats by 2050



Parts of Eastern Express Highway

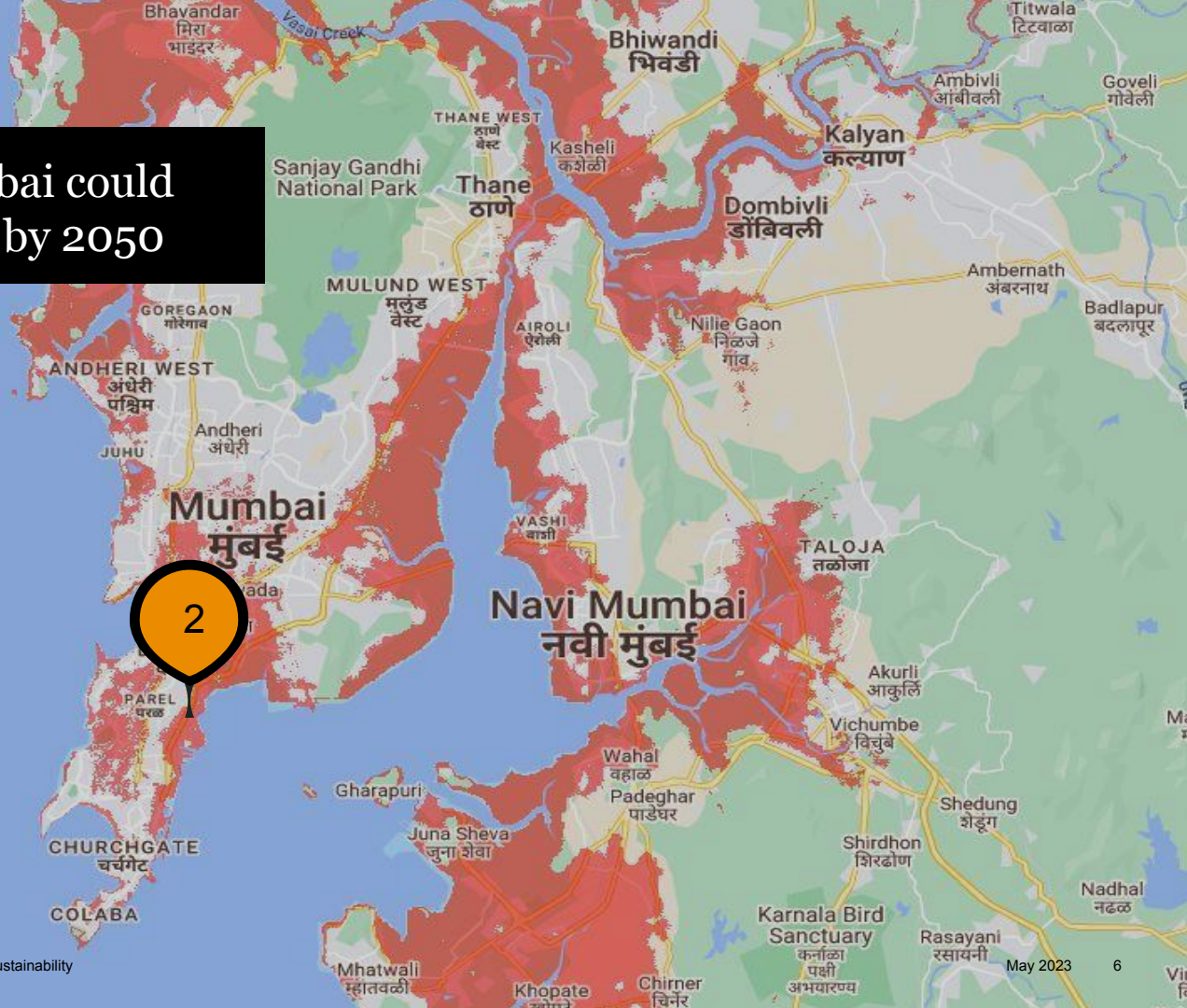


Source: [1] [Climate Central coastal risk screening tool](#)

Critical landmarks in Mumbai could face severe climatic threats by 2050



Mumbai Port trust area



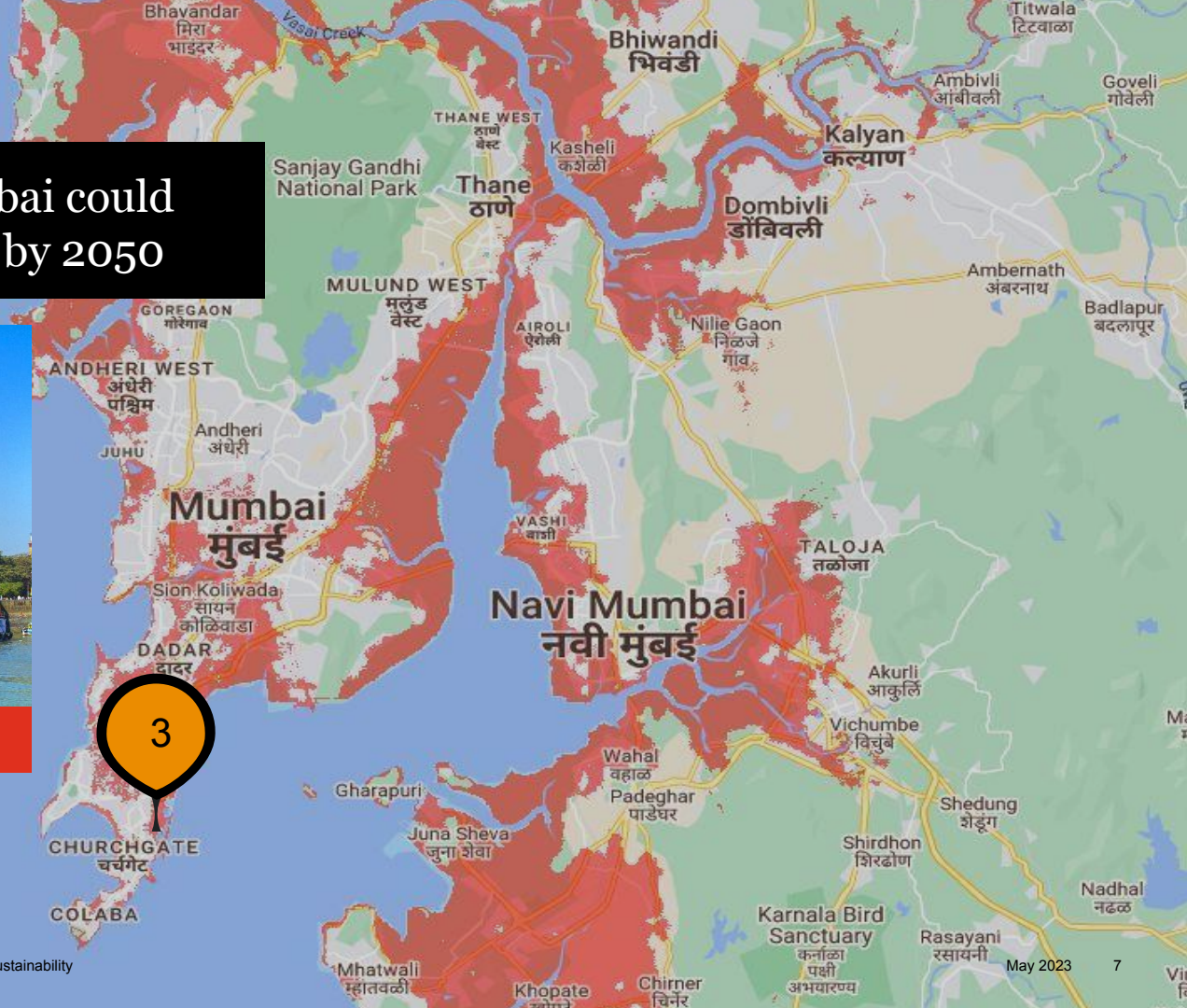
Source:
 [1] [Climate Central coastal risk screening tool](#)

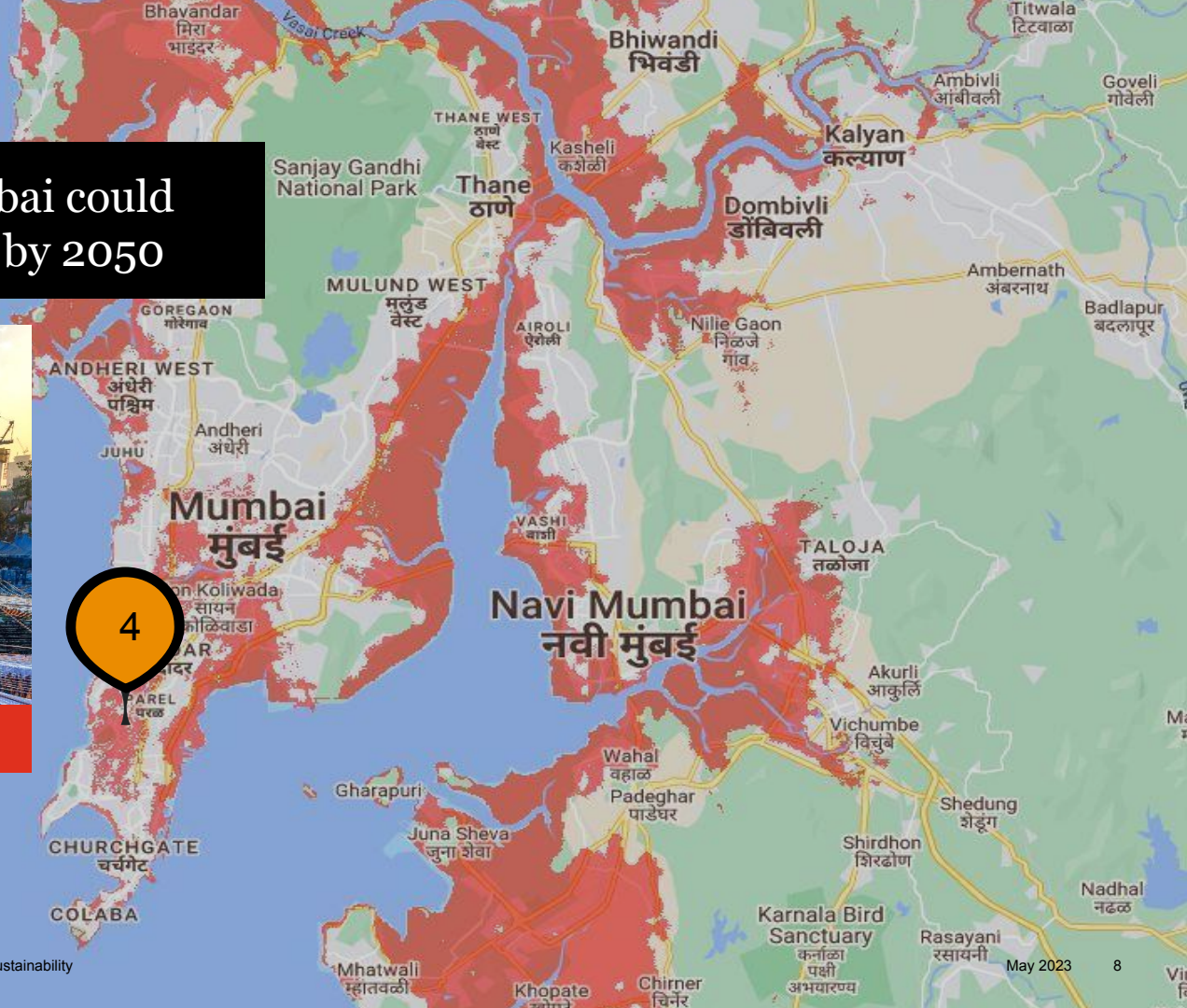
Critical landmarks in Mumbai could face severe climatic threats by 2050



Gateway of India

Source:
 [1] [Climate Central coastal risk screening tool](#)





Critical landmarks in Mumbai could face severe climatic threats by 2050



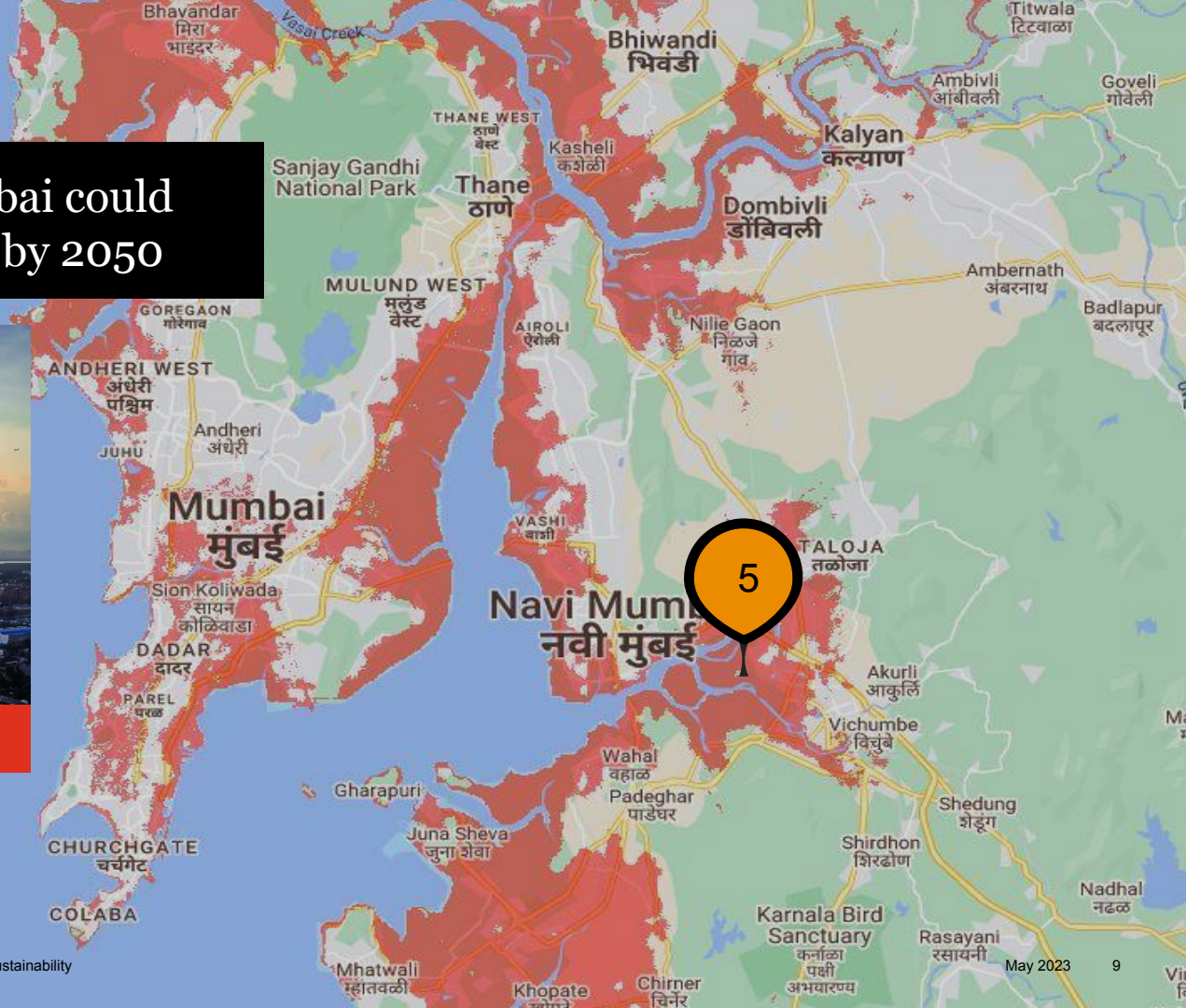
Dhobi ghat

Source:
[1] [Climate Central coastal risk screening tool](#)

Critical landmarks in Mumbai could face severe climatic threats by 2050



Navi Mumbai Airport site

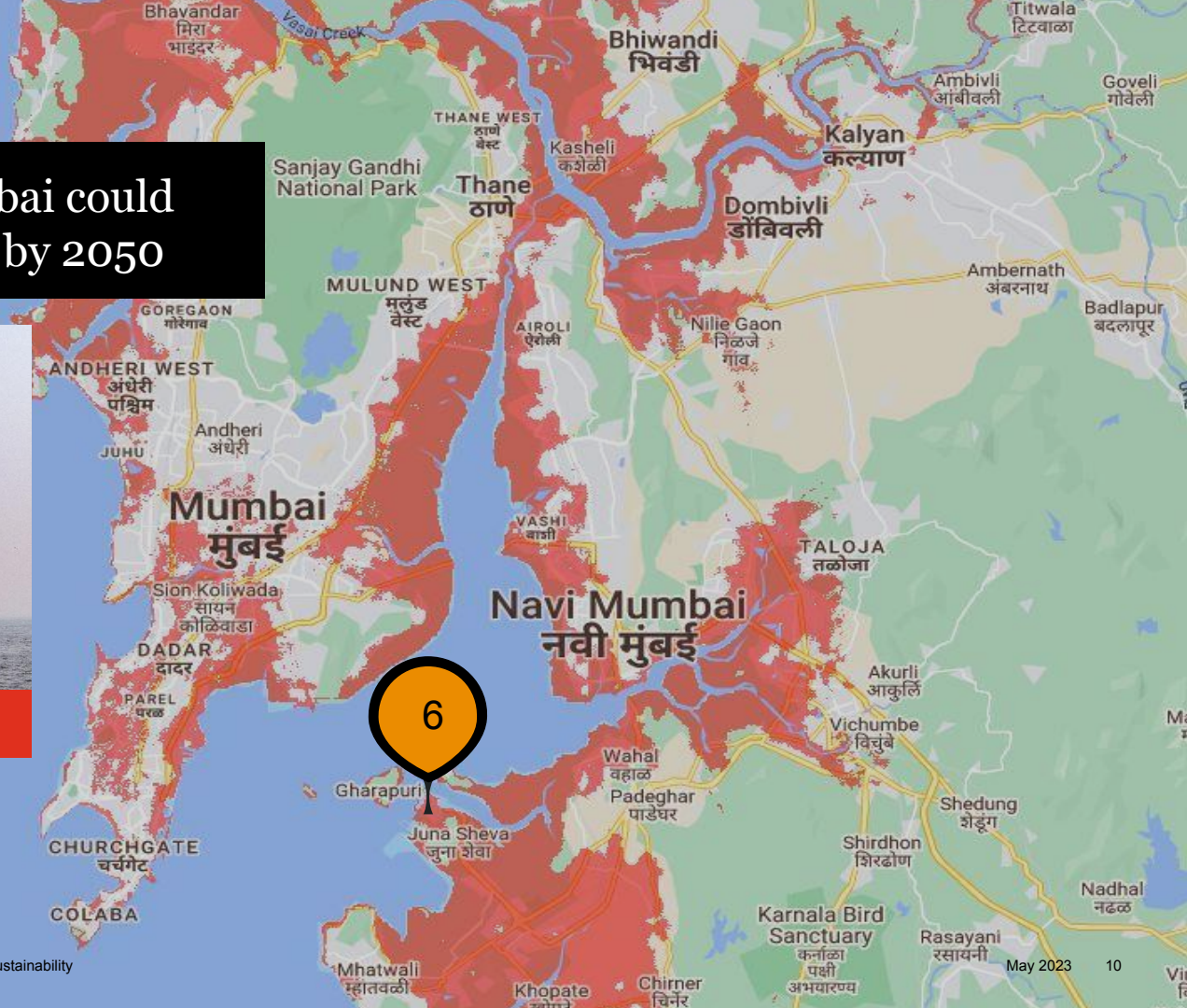


Source:
[1] [Climate Central coastal risk screening tool](#)

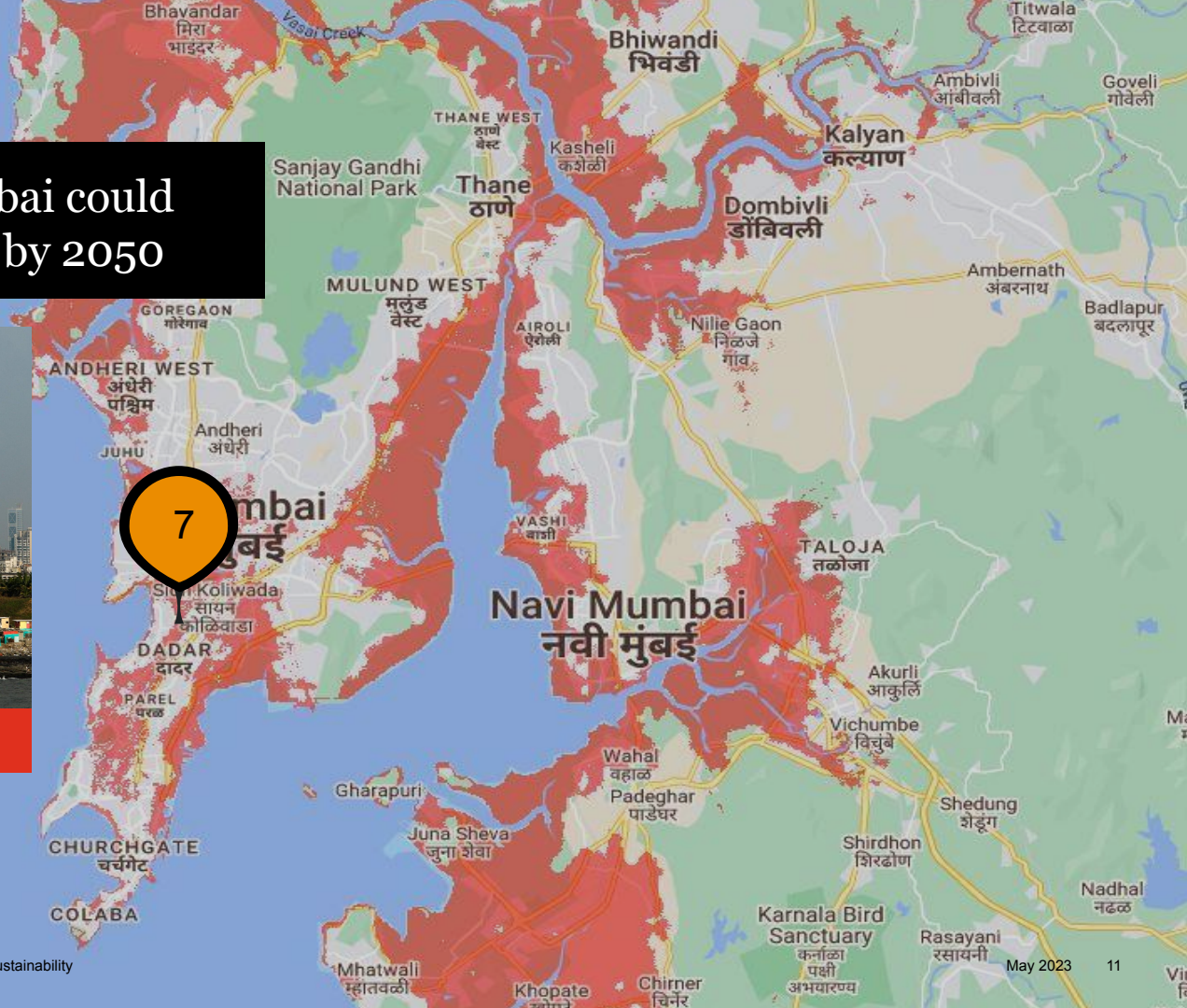
Critical landmarks in Mumbai could face severe climatic threats by 2050



Jawaharlal Nehru Port Trust



Source:
[1] [Climate Central coastal risk screening tool](#)



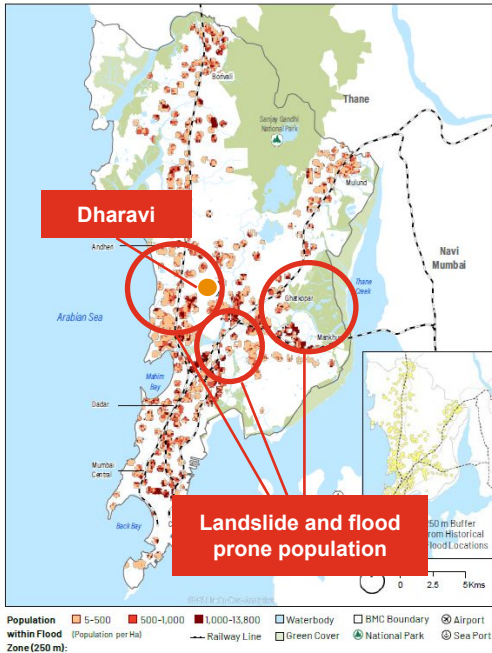
Critical landmarks in Mumbai could face severe climatic threats by 2050



Low lying informal settlements

Source:
[1] [Climate Central coastal risk screening tool](#)

The disadvantaged face a multitude of overlapping climate risks



Source:

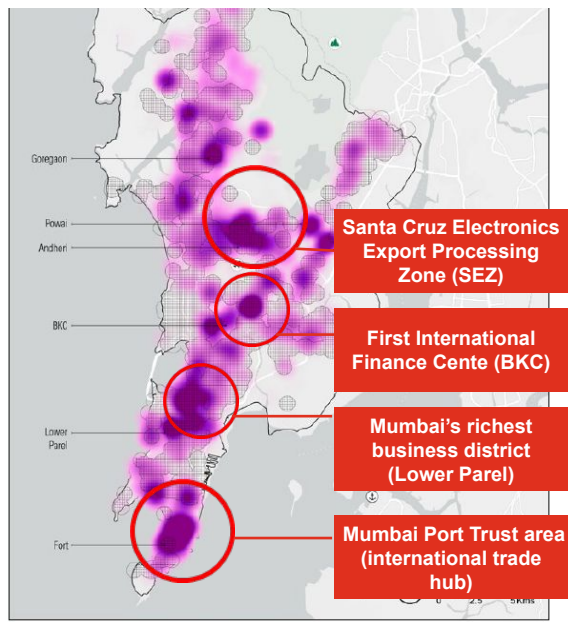
[1] Climate and Air Pollution Vulnerability Assessment for Mumbai, India, March 2022



> **42% of Mumbai's 12 million people live in slums**, where access to toilets and safe sanitation routinely become a matter of life and death.

> Majority of the informal settlements are located within a **250m buffer from flooding hotspots**

Businesses in increasing risk scenarios may lead to higher livelihood loss



Source:

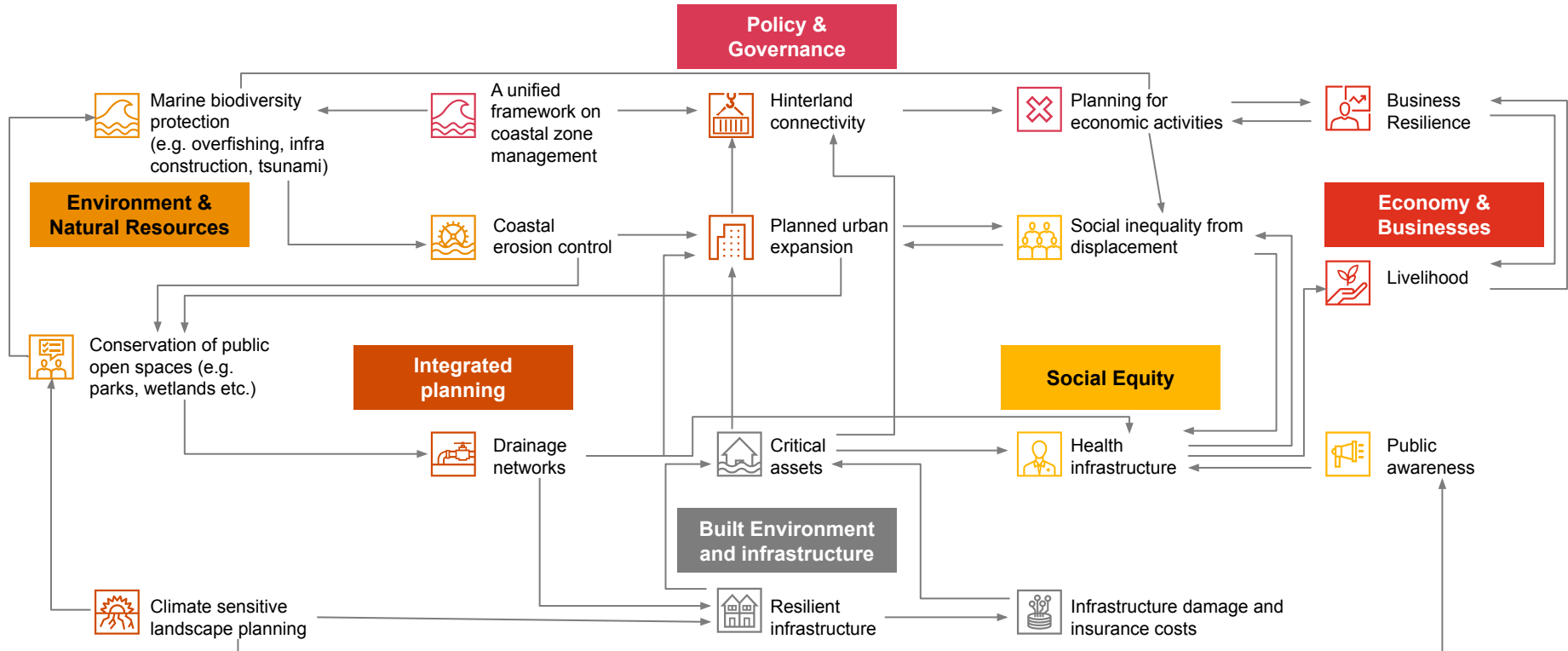
[1] Climate and Air Pollution Vulnerability Assessment for Mumbai, India, March 2022



> Mumbai is expected to lose **25.32 sq.km.** of urban land area per 1 meter increase in sea-level.

> **69% of employees** form large industrial and commercial establishments work only **500m away from flood hotspots.**

6 Building Blocks of 'Coastal Cities Resilient Framework'



What to expect from today's sessions?

Collaborative session

- Imminent risks of Asian coastal cities
- Learning from Asia
- Intersectionality and cross-boundary approaches



Partnering for Resilience

- Challenges faced by critical infrastructure
- Port cities
- Best practices in infrastructure resilience



Implementing Resilience

- Approach in implementing resilient infrastructure
- Resilient communities
- Global best practices in Mumbai context



Catalyzing investments

- Proactive measures of global businesses
- Leveraging philanthropy
- Corporate financing models for coastal resilience projects

Thank you

Data Classification: DC0 (Public)

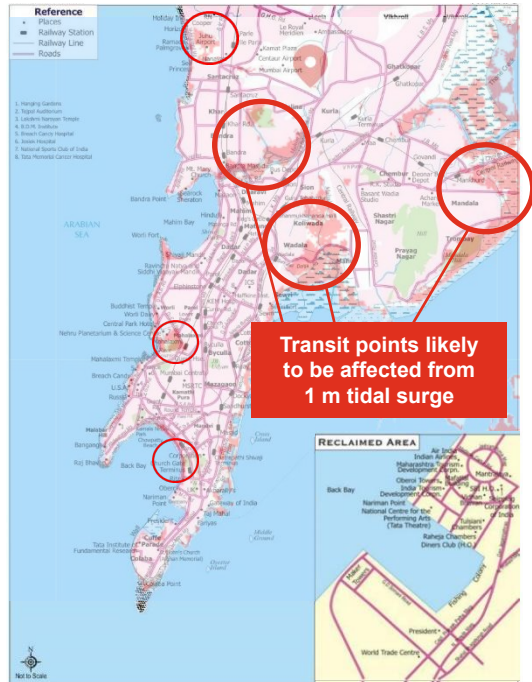
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Infrastructure assets are highly impacted from coastal risks

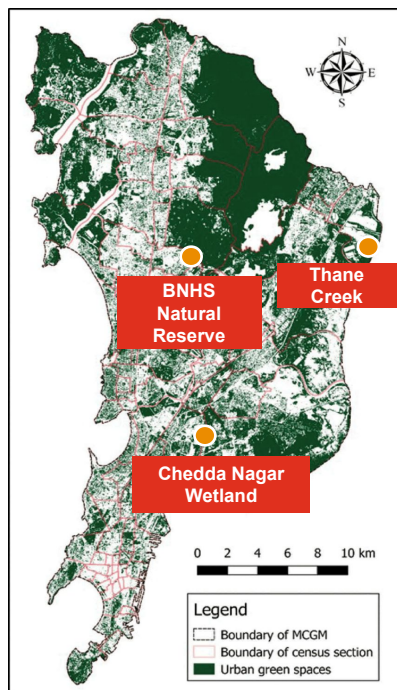


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[1] Climate and Air Pollution Vulnerability Assessment for Mumbai, India, March 2022

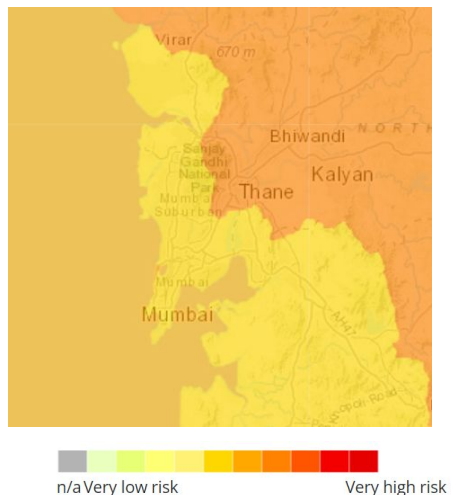


- > During a flood event, **Mumbai's population which can access a mass transit station within 1 km is reduced from 60.5% to 36.6%.**
- > Main transit points to be submerged in 1m rise of sea level above the high tide line – **Koliwada, Bandra, Darga Rd, Mankhurd, Juhu, Churchgate**

Deteriorating green spaces, imply increased emissions and climate risks



Ecosystem condition of Mumbai in 2022



A hectare of mangrove forest can store **3,754 tons of carbon**, equivalent of taking over 2,650 cars off the road for a year.



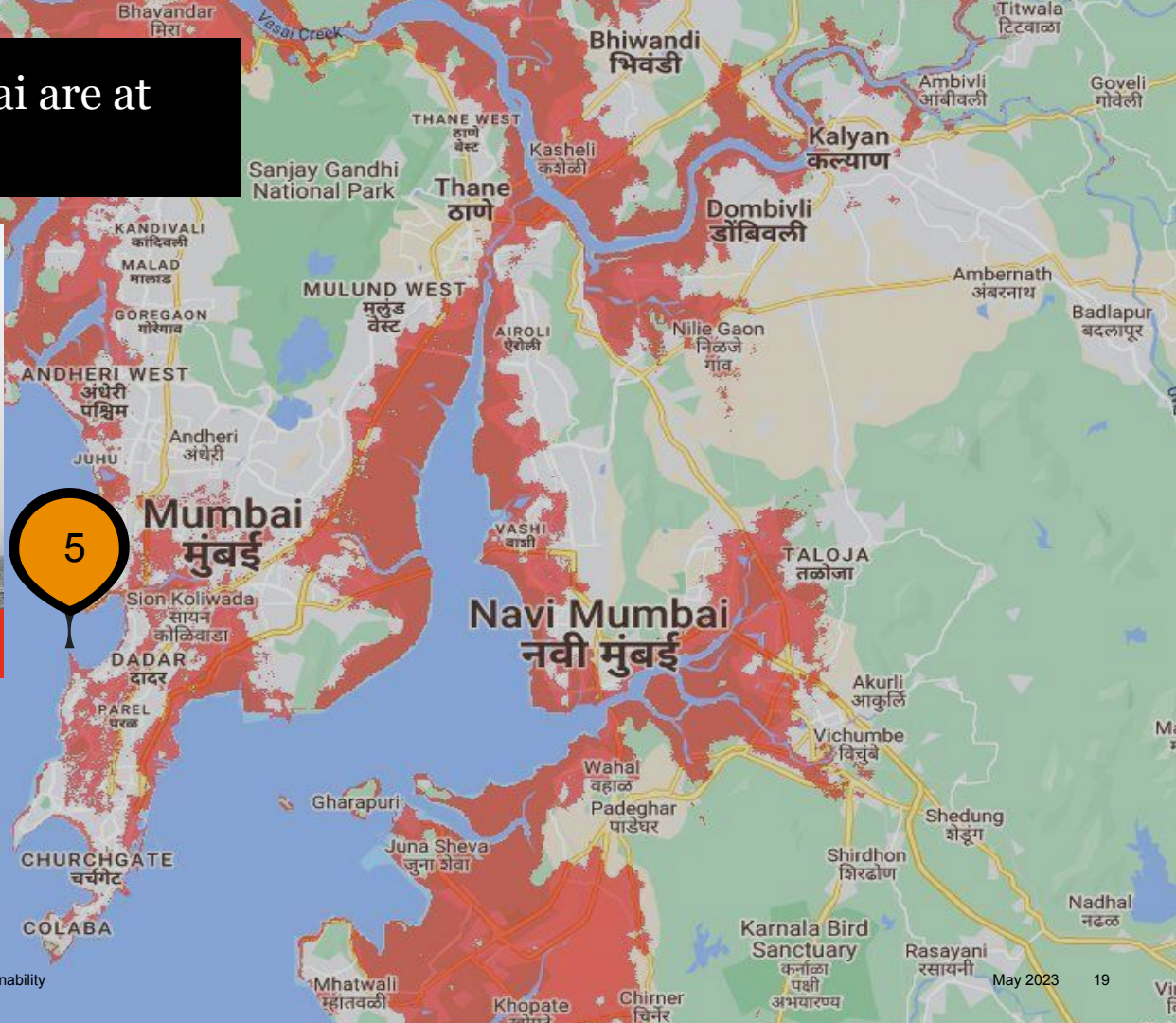
Mumbai lost **325.05 ha of mangroves** between 2018-2021.

Source:
[1] WWF Risk Filter, 2023

Critical landmarks in Mumbai are at risk



Bandra Worli Sea Link



Source:
[1] [Climate Central coastal risk screening tool](#)