Integration of Climate Change Adaptation into Urban and Coastal Zone Planning in Vietnam: Implications for developing countries

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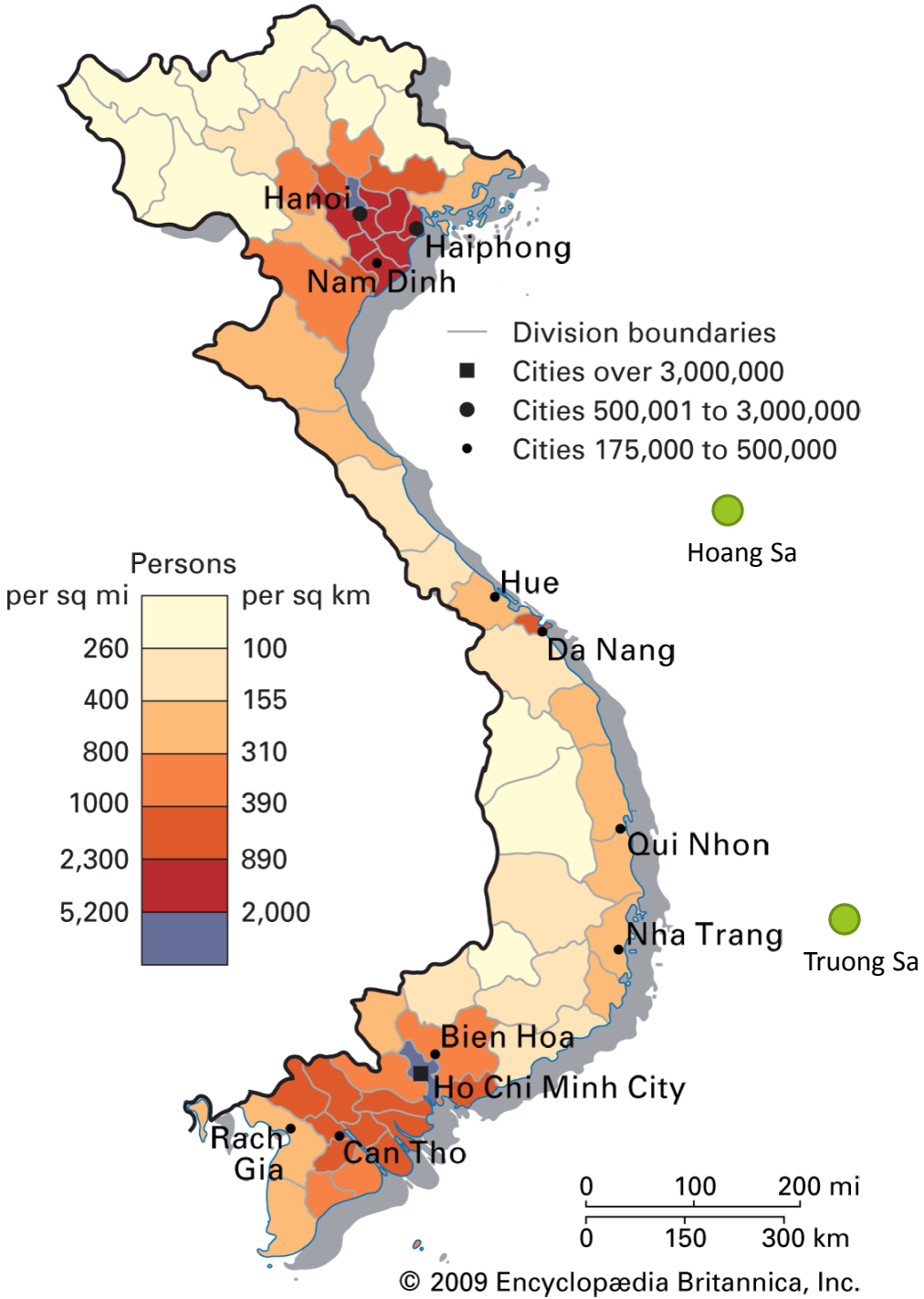
Overview of Vietnam and climate change

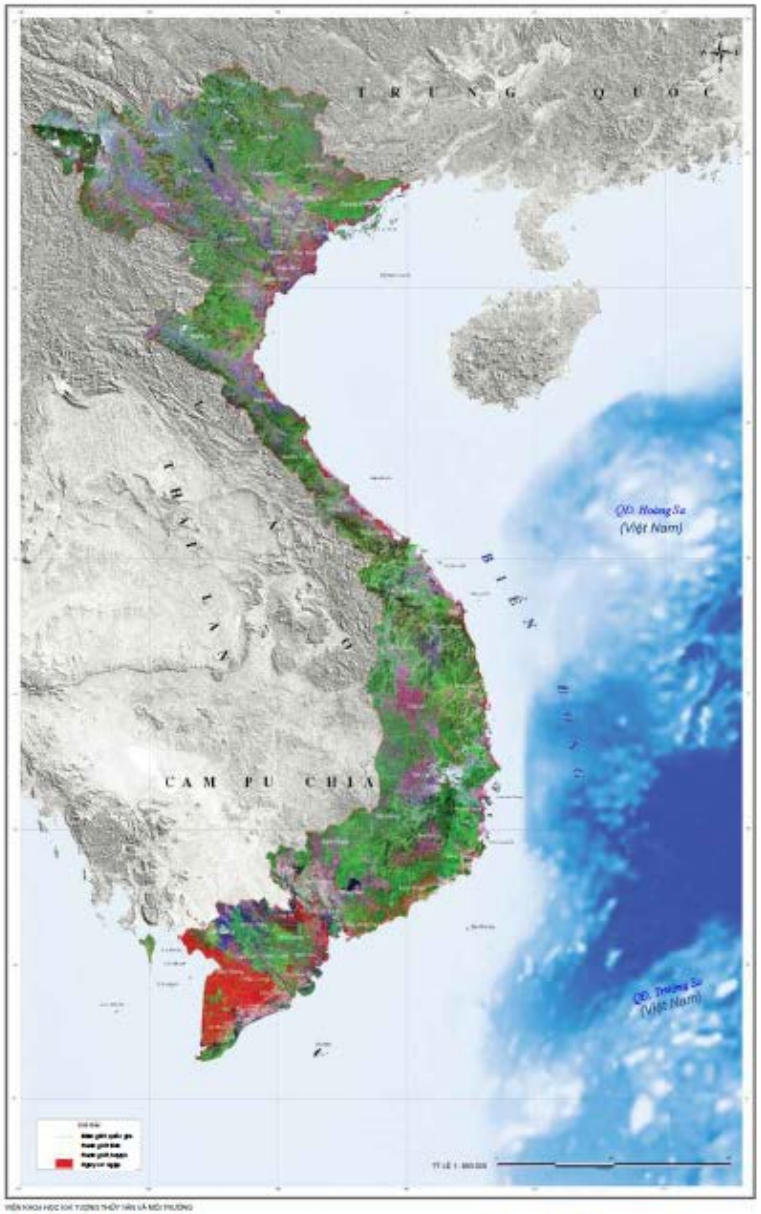


- Vietnam is a country in the Southeast Asia. The country is bordered to the North by China, to the West by Laos, to the South West by Cambodia, and to the east by the East Sea - (with approx. 3260 km coastline).

- The coast of Vietnam can be divided into 3 regions: North, Central and South

- With an estimated over 90 million inhabitants (2011), Vietnam is the 13th-most-populous country in the world, and the eighth-most-populous country in Asia

- Vietnam has 63 provinces, of which 28 are coastal provinces with over 50% of the total population



Hình 4.1. Bản đồ nguy cơ ngập khu vực ven biển Việt Nam ứng với mực nước biển dâng 1m

Climate change scenarios of Vietnam

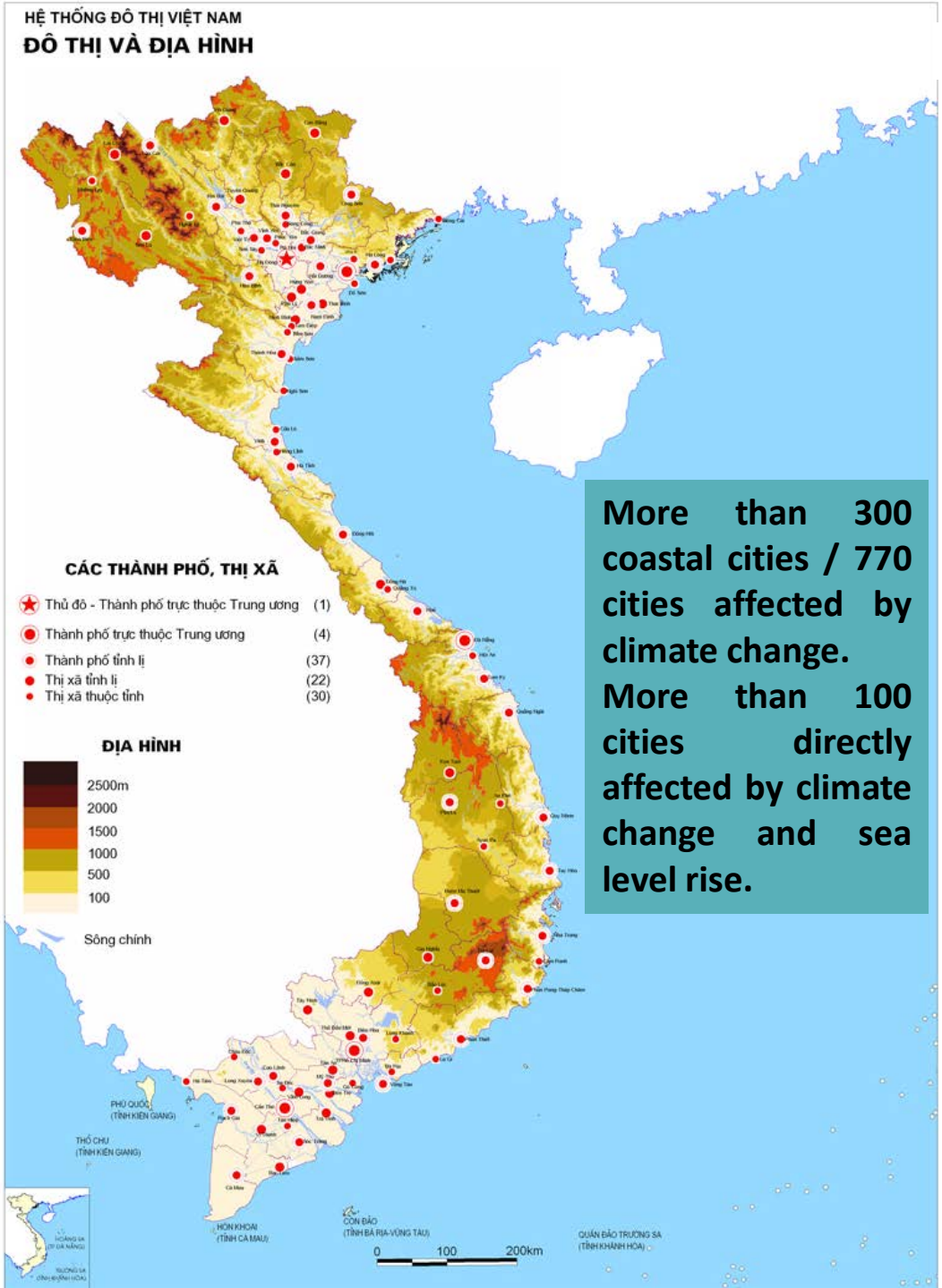
Vietnam is one in four countries most affected by climate extreme event (COP 15, Copenhagen)

Sea level rise scenarios

SLR Scenario (m)	Inundated Area (km^2)	(%)	Population Affected (Mill)	(%)
0.25	6,237	1.9	2.0	2.4
0.5	14,034	4.2	4.7	5.7
1	30,116	9.1	13	16
1.5	40,242	12	20	24
2	45,479	14	25	30
3	50,908	15	30	36
4	53,909	16	34	41
5	57,447	17	37	45

Source: Tran Thuc

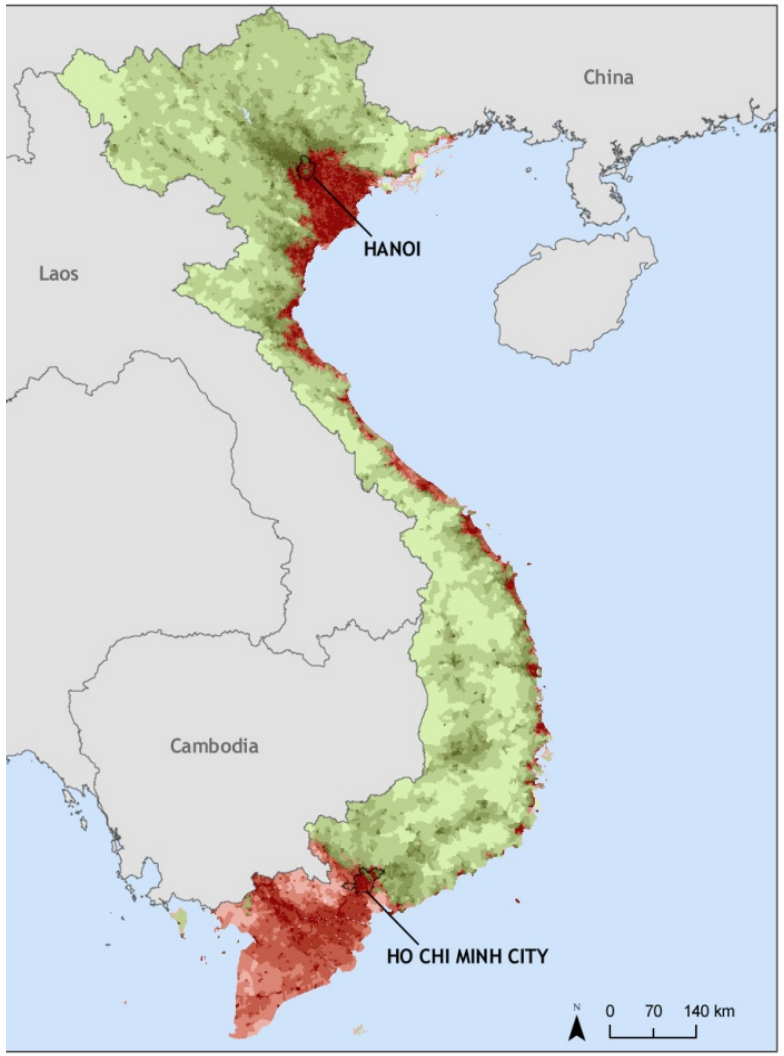
Decision *No. 158/2008/QD-TTg dated 02/12/2008* approving the national target program in response to climate change.



More than 300 coastal cities / 770 cities affected by climate change.

More than 100 cities directly affected by climate change and sea level rise.

Population density in coastal zone



Population Density within and outside of a 10 meter low elevation coastal zone (LECZ), 2000

Persons per sq km	<25	25-100	100-250	250-500	500-1,000	>1,000
within LECZ						
outside LECZ						

largest urban areas ——

CIESIN, Columbia University, 2007
http://sedac.ciesin.columbia.edu/gpw/lecz.jsp

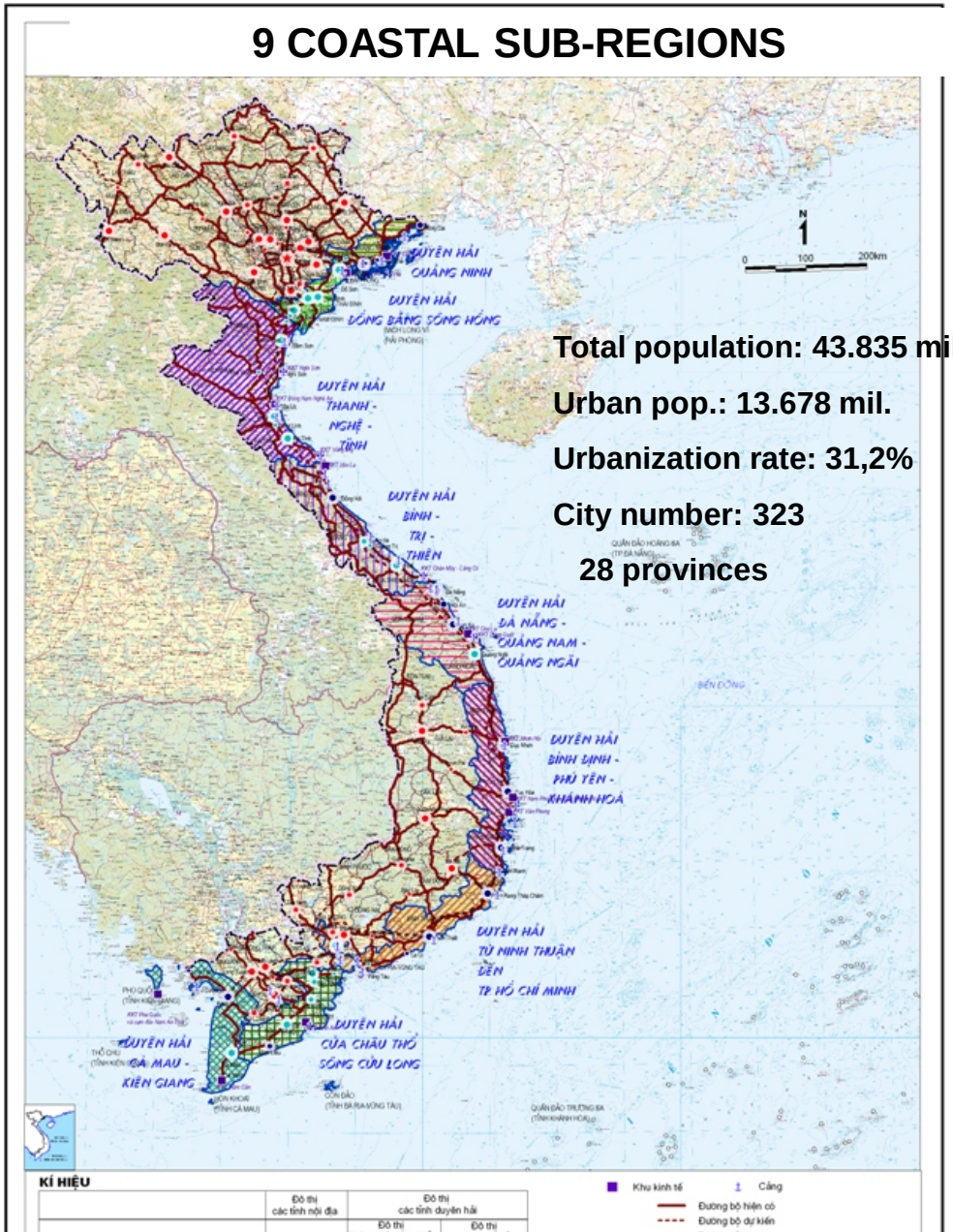
OVERVIEW OF COASTAL URBAN SPATIAL DEVELOPMENT IN VIETNAM

Vietnamese coastal sub-regions:

* Northern coastal region:
(1) Coastal Quang Ninh
(2) Coastal plain of the Red River.

* Central Coastal Region :
(3) Coastal Thanh Nghe Tinh
(4) Coastal Binh Tri Thien
(5) Coastal Da Nang - Quang Nam - Quang Ngai
(6) Coastal Binh Dinh - Phu Yen - Khanh Hoa.

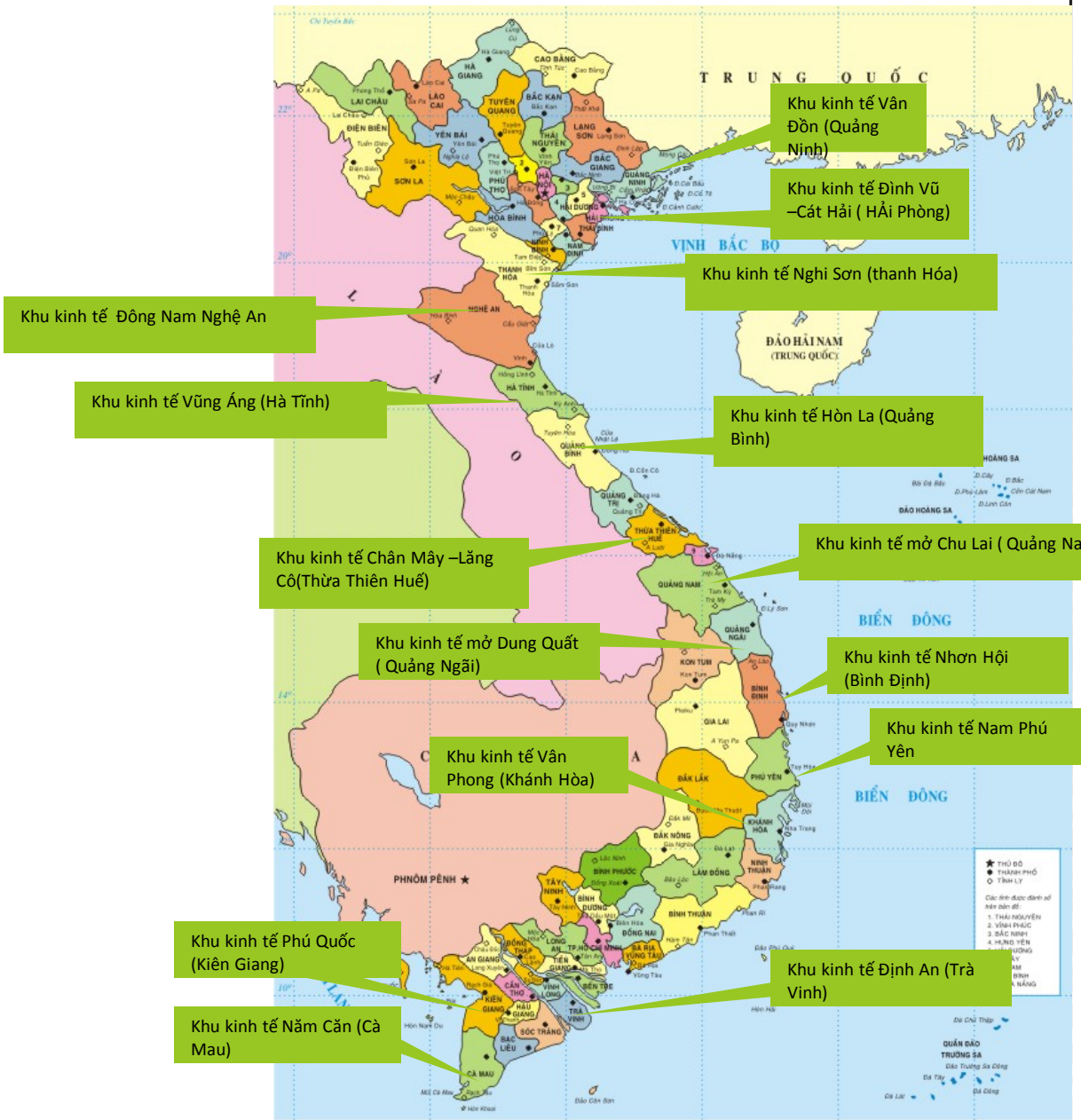
* Southern Coastal Region:
(7) Coastal Ninh Thuan - Vietnam
(8) Coast of the Mekong Delta
(9) West Coastal Ca Mau-Kien Giang.



OVERVIEW OF COASTAL URBAN SPATIAL DEVELOPMENT IN VIETNAM

coastal urban planning & development trends

- The new urban areas are built on the coast, especially 15 coastal economic zones motivating marine economic development.



OVERVIEW OF COASTAL URBAN SPATIAL DEVELOPMENT IN VIETNAM

Trends in planning coastal urban development

-**Strong development toward to the sea:** cities and towns are located on the coast, some urban areas expand to the sea due to land constraints

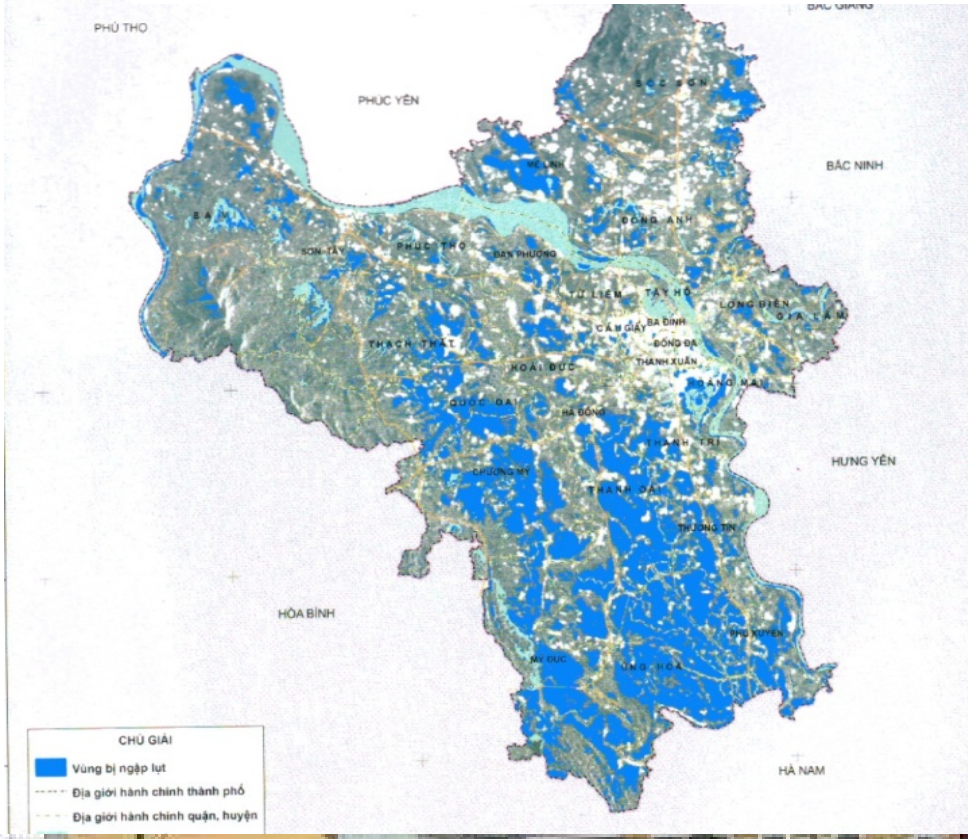
Increased vulnerability of coastal urban system as a result of sea level rise, climate change and related disasters.

CLIMATE CHANGE IMPACTS

Flood and Inundation is the most significant impact in cities affecting sustainable urban development

Increased frequency and severity of flooding in areas with increased precipitation.

Inundated area in Hanoi 7/11/2008



Inundation in Hanoi

Inundation in Hochiminh city

Affecting the structural characteristics of urban natural frame:

- Change the topography, urban geomorphology.

- Resource Depletion: reduced land, reduced freshwater reserves.

- Change the coastal urban ecosystems.

Changes in natural resources and coastal ecosystems

Erosion, landslides causing loss of land

Floods in Mekong delta

CLIMATE CHANGE IMPACTS

Damaging coastal areas

Mekong Delta is one of the most heavily damaged areas due to the impact of climate change and sea level rise.

Sea level rise and high waves cause erosion in the estuaries in Nha Mat district, Bac Lieu city

CLIMATE CHANGE IMPACTS

Western bank (Khanh Tien commune, U Minh district, Ca Mau province) was heavily sliced due to climate change impacts

Sea level rise phenomenon will inundate many low-lying areas

CLIMATE CHANGE IMPACTS

Affect the structure of urban space (industrial parks, residential areas, center of urban areas ...)

CLIMATE CHANGE IMPACTS

Affect the technical network and urban social infrastructure

- Overload of drainage systems and waste water treatment.

- Change the water space, green parks and squares.

- Break down the infrastructure system (buildings, factories, transportation, ports

- Impact of urban underground space

Floods in Quang Nam

Floods in Can Tho

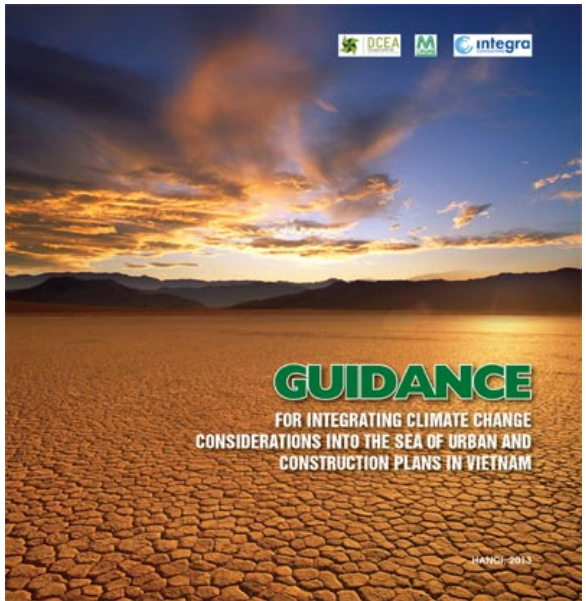
Floods in Da Nang

Floods in Mekong Delta

Lessons learned

Current problems of spatial planning in Vietnam in relation to climate change considerations

- Climatic, hydrological factors etc., the inputs for planning process are still **based on statistical** data only, without considerations of future climate change scenarios and its uncertainties
- **Combined and centralized** drainage, sewage system and treatment plants
- **Evacuation zones** are not yet taken into account in spatial planning
- Protection of coastal cities is mainly based on **structural measures** (dyke, sea wall system)
- Lack of **tools** for climate change integration into planning
- **Limited awareness and capacity** of climate change integration into planning
- Lack of technical **guidance** for climate change integration



Lessons learned

- **Mechanism for data sharing and public access:**
  - Lack of, or difficulty in accessing basic data on climate change.
  - Data fragment
- **Harmonization of time horizons between conventional planning and climate change adaptation planning**
  - Conventional Plans typically have a time horizon of 15-30 years and understanding of impacts/risks is based on what is currently happening.
  - CC adaptation planning calls for understanding of longer term changes in 50-100 years.

Lessons Learned

- **Sufficient Finance for climate change adaptation**

  - Difficult to implement adaptation locally due to resource limitations.

  - Importance of flexible implementation: i.e. not only structural protection.

- **Supportive and integrated policy framework.**

  - Climate change objectives in regional plans often ambiguous.

  - Difficulty when considering adaptation in an integrated manner given the fragmentation of responsibility in planning implementation.

Implications for developing countries based on the case of Vietnam

Implications and Suggestions

- Vulnerability assessments can guide land use, urban design and infrastructure planning.
- Geographic information systems (GIS) plays an important role in multi-stakeholder and community engagement, and in visualizing adaptation scenarios
- Guidelines for adaptation planning must make the public interest clear, identify the relative costs and intended beneficiaries, and determine how such decisions should be made.
- Extreme events are becoming the new benchmarks for risk management
- Adaptation as a means of achieving urban development goals

Implications and Suggestions

- Planners will need to reflect on how land use and infrastructure decisions balance mitigation and adaptation goals; development, sustainability and risk management goals, and public and private interest
- Planning for adaptation will only be effective if land use planners become more skilled in linking their work to the decisions of other actors
- Climate adaptation is a continuing process
- Historical flood return frequencies are no longer accurate
- Multiple planning measures will be needed for adaptation and mitigation
- Local planning responses will require flexibility, innovation and creativity

Implications and Suggestions

- Protective infrastructure is important in urban areas, but it can also increase risk
- Planning for adaptation means greater attention to “green infrastructure”: strengthen ecosystems and the services they provide
- Infrastructure planning in potentially vulnerable areas should include localized risk assessment for alternative future climate conditions: based on scenarios of both future events and of future urban development conditions
- Changes to infrastructure planning and design also require new institutional arrangements.

Thank you for listening!