

An aerial photograph of a tropical island, likely in the Pacific, showing a dark landmass surrounded by a white sandy beach and a shallow turquoise lagoon. The water transitions to a deep blue as it extends into the open ocean. The sky is a clear, bright blue with some light, wispy clouds near the horizon.

**Eco Asia**

**Impacts of Climate Change and  
Adaptation in Asia and the Pacific**

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# 1. Introduction

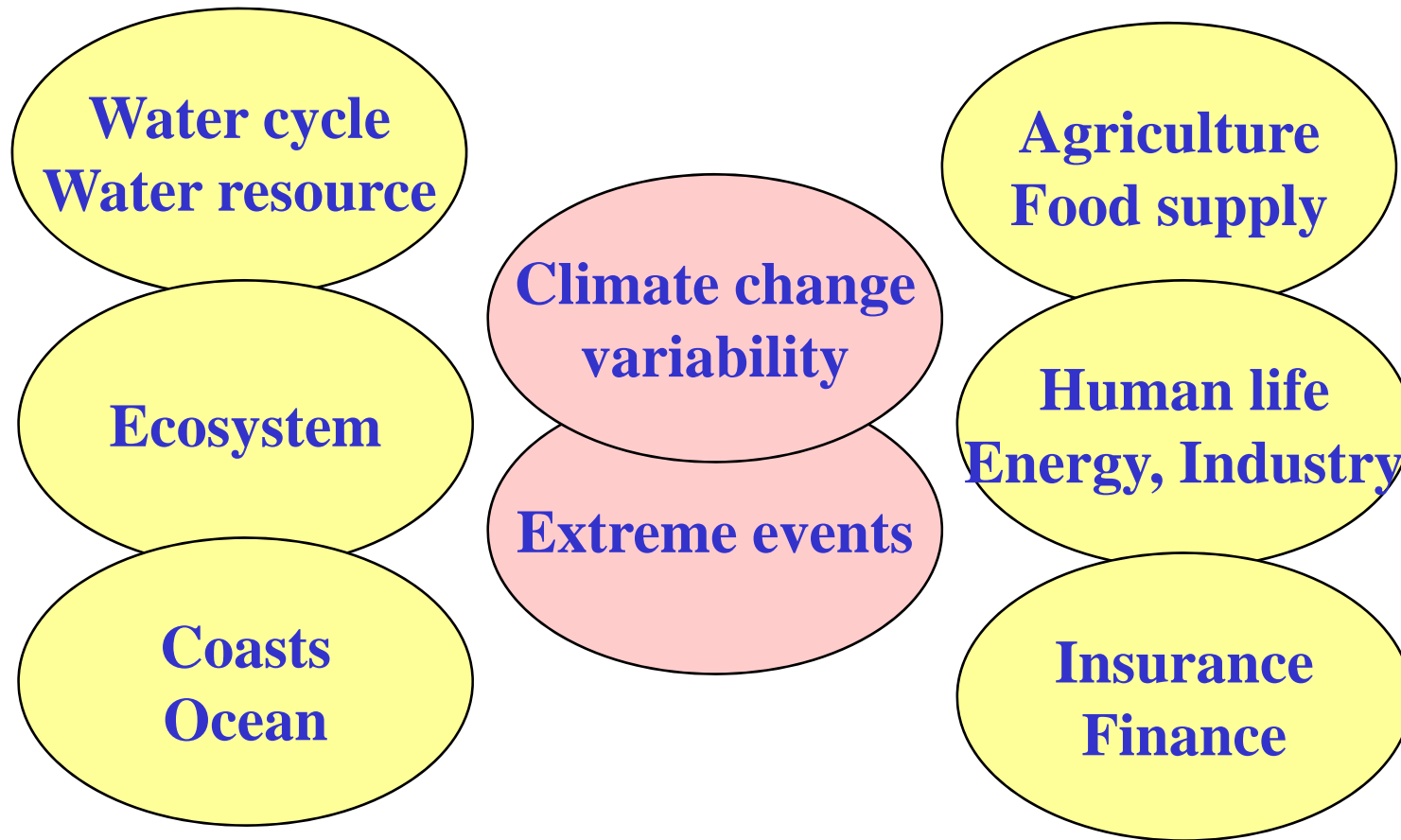
We know that global warming has already been occurring, and that it will be accelerated in the 21st century.

The impacts of climate change may be quite dangerous and impose costly damages. It will be a major obstacle to sustainable development of many countries.

This presentation will look at the following issues:

- What impacts would happen on Asia and the Pacific.
- How to respond to this issue?  
There are two responses, mitigation and adaptation, but how to combine them?

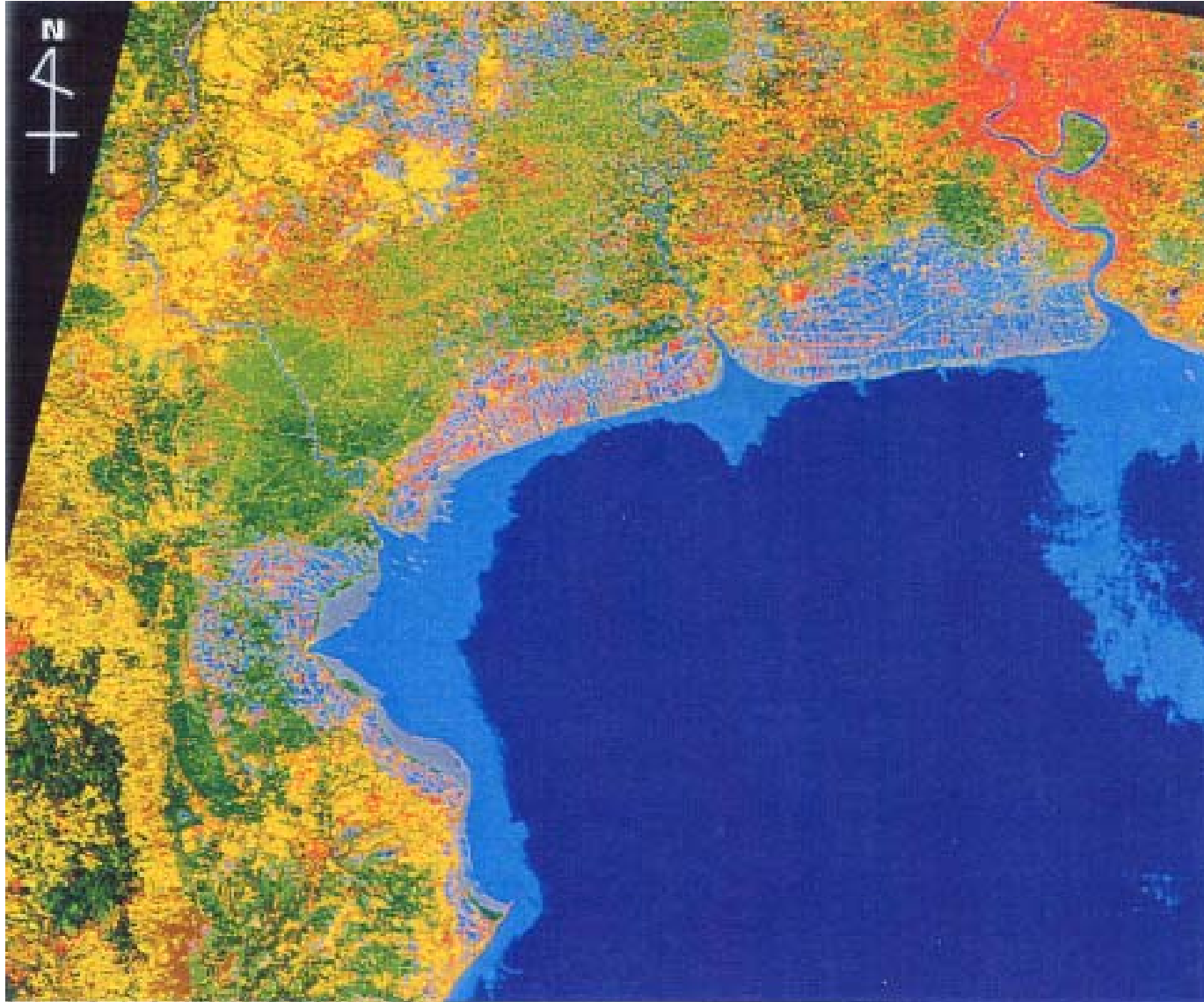
## 2. Impacts of Climate Change in Asia and the Pacific



# Erosion of Mangrove in Thailand



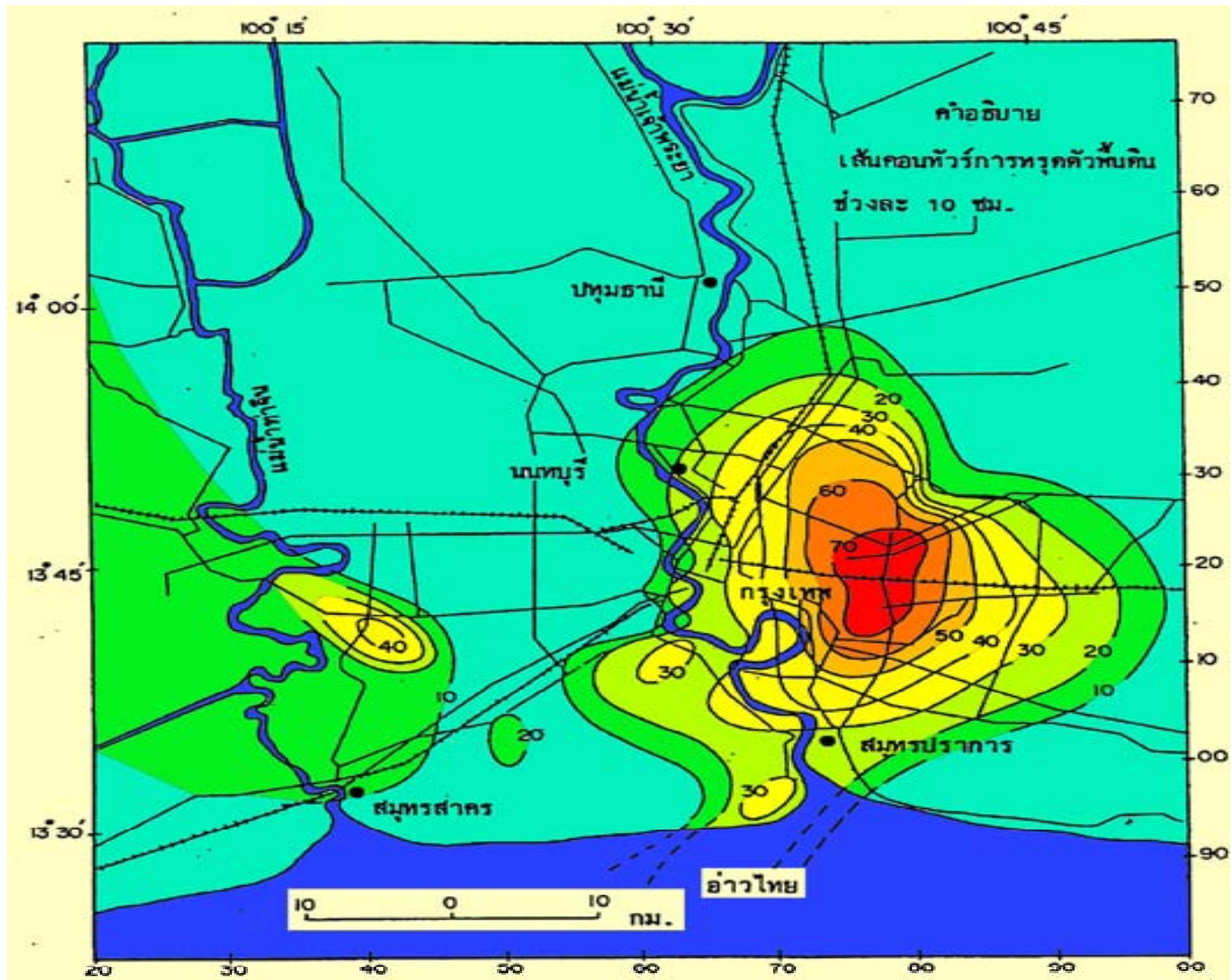
# Satellite image around river mouth of Chaophraya





Erosion at the front

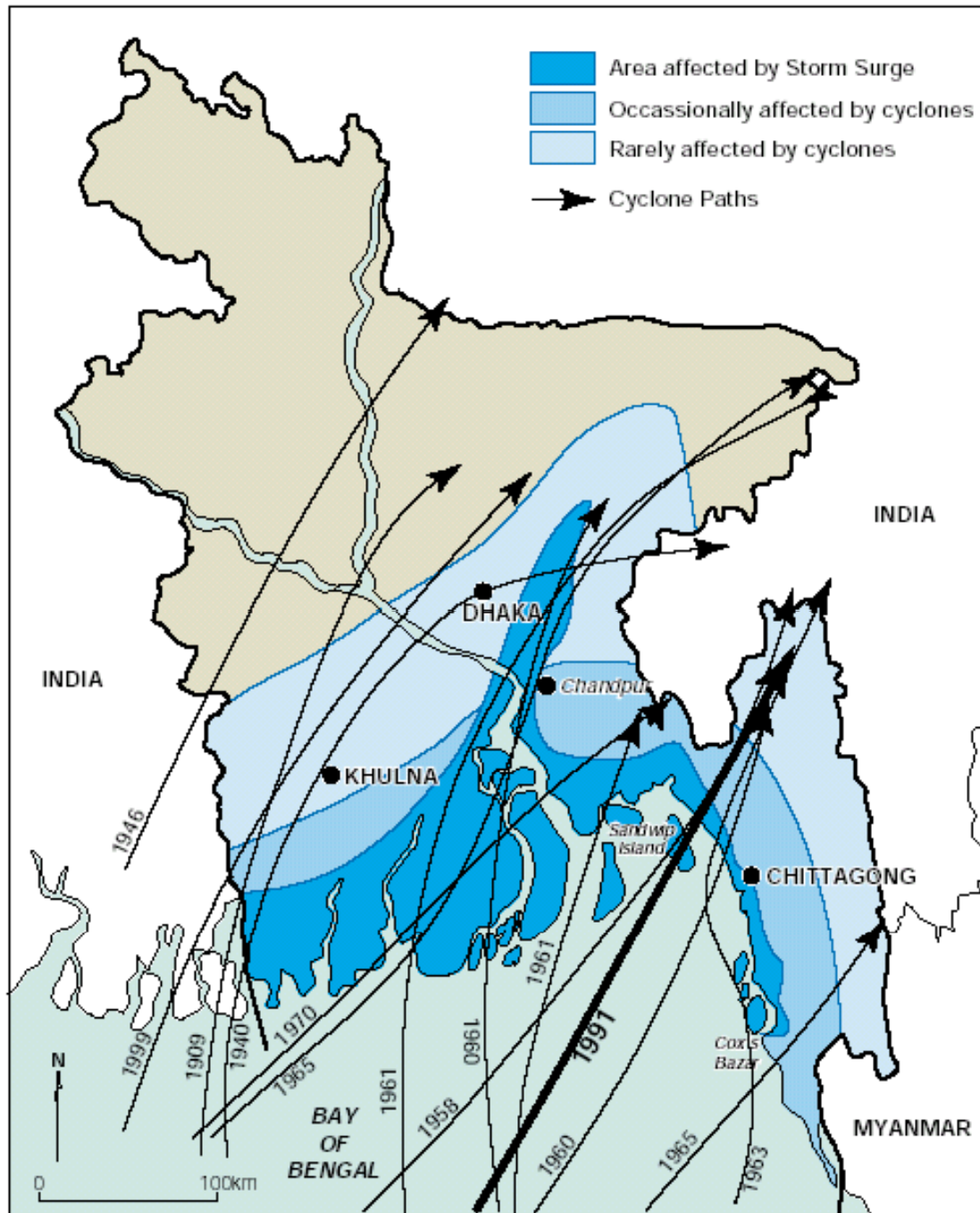




Ground Subsidence in Bangkok Source:Somkid(2002)



# Tropical Cyclones in Bangladesh



## History of Cyclone Damages

Date	Max Wind (m/s)	Max Wind Radius (km)	Storm surge (m)	Casualties (people)
30 Oct 1960	57.5	74	4.57-69.10	5,179
9 May 1961	40.8	64	2.44-3.05	11,468
28 May 1963	55.6	74	4.27-5.18	11,520
11 May 1965	58.1	74	3.66	19,279
31 May 1965	44.7	64	6.10-7.62	12,000
23 Oct 1966	40.3	64	6-6.67	850
12 Nov 1970	61.7	74	6.10-9.14	500,000
24 Nov 1974	44.7	64	2.8-5.2	200
9 Nov 1983	33.3	64	3.05-4.57	11,069?
25 May 1985	42.5	64	3.05-4.57	11,069?
29 Nov 1988	44.4	64	1.52-3.05	5708
29 Apr 1991	62.5	74	6.10-7.62	138,000
25 Nov 1995	58.3	74	-	650
19 May 1997	55.6	74	4.6	126
26 May 1997	41.7	74	3.0	70
16 May 1998	45.8	74	1.83-2.44	-

# Combining Early Warning and Hard Measures

## Cyclone Shelter (Chittagong Port City )



Evacuation Road to a Cyclone Shelter  
(South-west coastal region of Bangladesh )

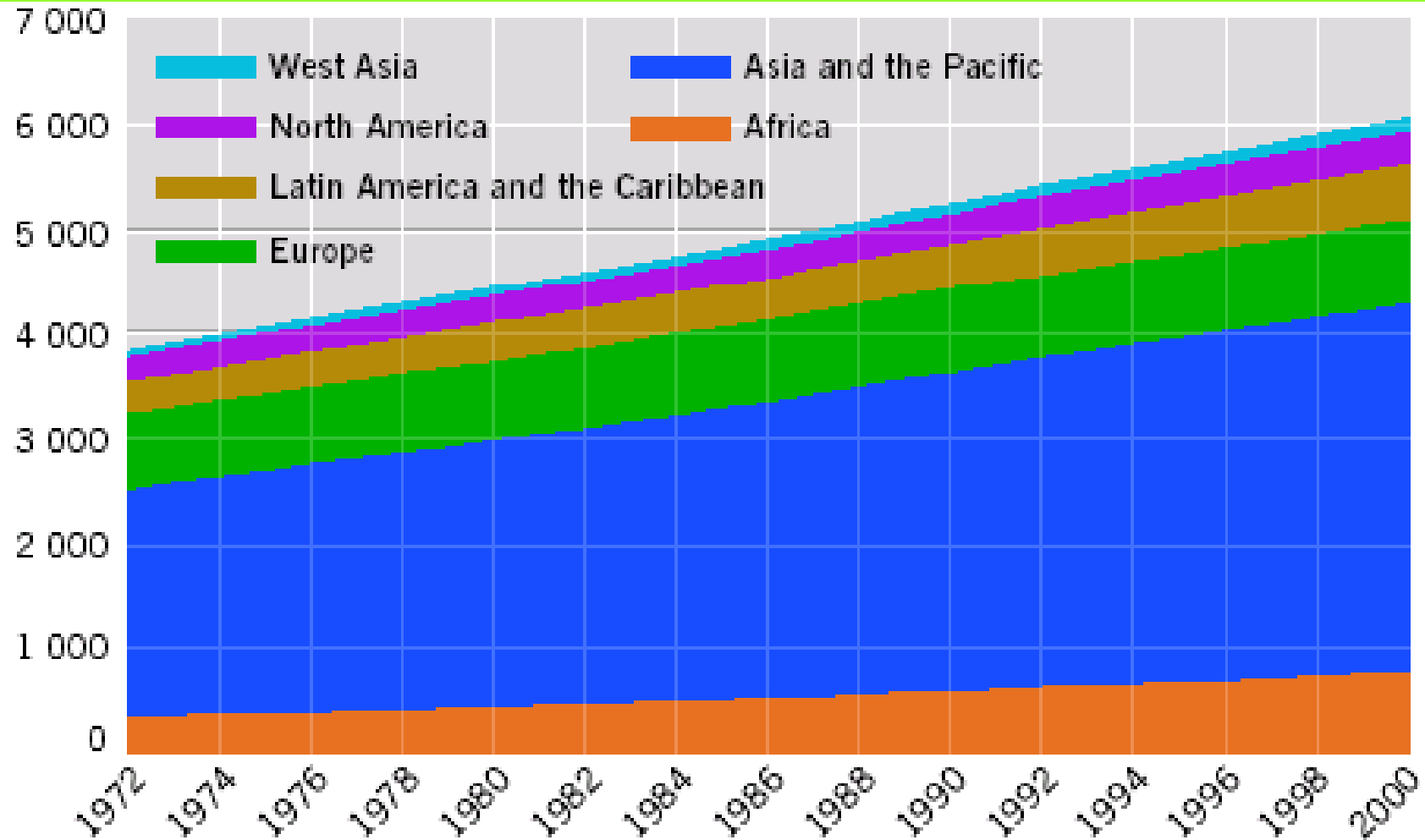


## Coastal Aforestation

(Cox's Bazar Beach in the south-east costal region )

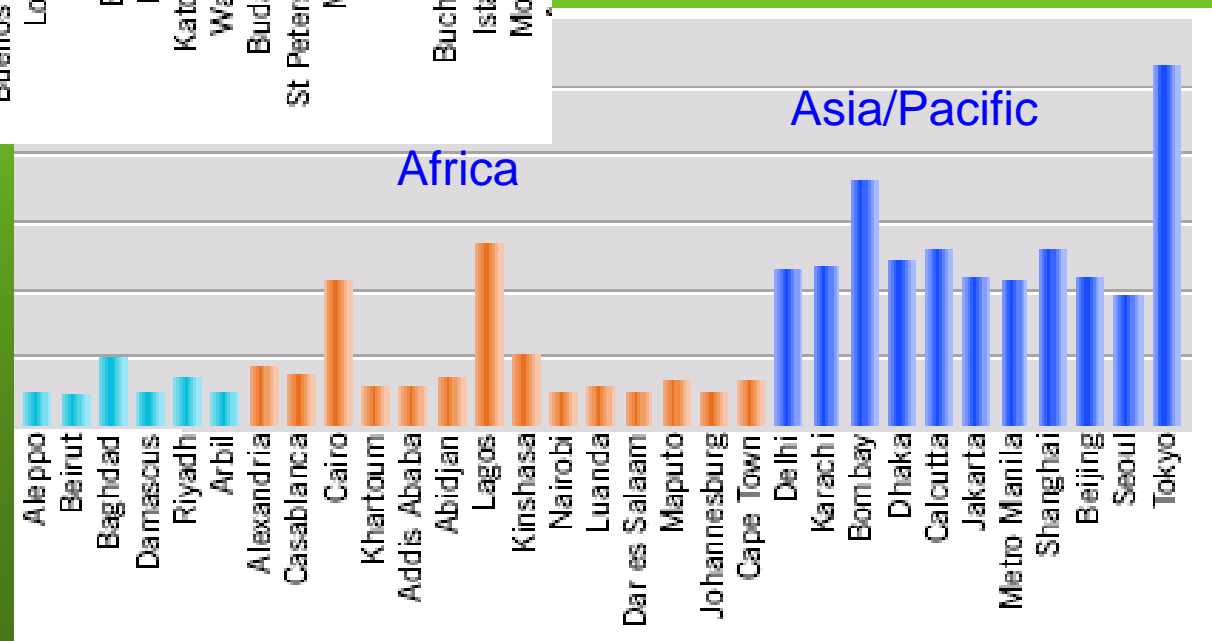
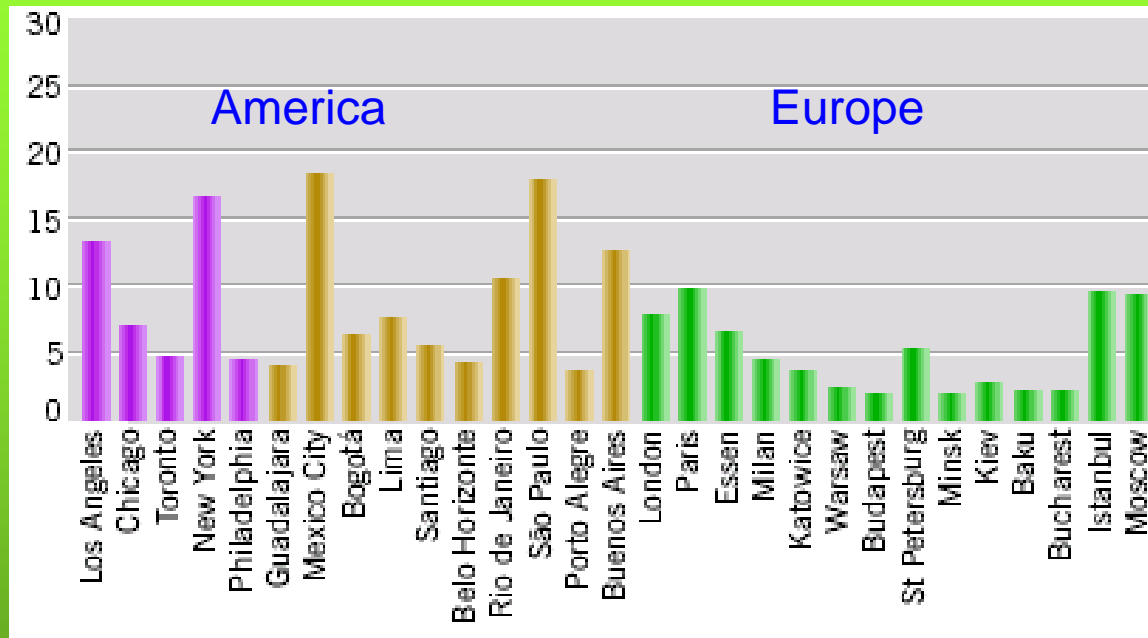


# Population Growth



World population is currently growing at 77 million a year, with two-thirds of the growth in Asia and the Pacific

# Mega Cities in the World



# Small Islands in the Pacific

## Funafuti Atoll, Tuvalu







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Navuti Village, Moturiki Island,  
Fiji



Community-level adaptation in Fiji

Retreat - setback



## Retreat - set-up



# 3. Adaptation to address climate change

## <Two Responses to Climate Change>

**Mitigation** : Reducing GHGs emission to stabilize their atmospheric concentrations.

**Adaptation**: Adjustment of natural and human systems to cope with warmer world, which can reduce adverse impacts of climate change enhance beneficial impacts.

- A portfolio of adaptation and mitigation is the only way to diminish the risks associated with climate change.

## Key Issues on Adaptation (1)

1. As developing countries are already vulnerable to the current climatic conditions, win-win approach is effective to developing countries.
  - “Win-win” means to be effective both to the present vulnerability and future impacts.  
Increase of their responsive ability to the current disasters will also strengthen their preparedness and resilience to the impacts of future climate change.

## Key Issues on Adaptation (2)

2. The success of adaptation depends on the adaptive capacity of each country and local community.
  - Enhancing adaptive capacity (i.e. resilience) to the current climate variability and future climate change is one of the most important goals of an adaptation policy.
  - From this viewpoint, it is also important to utilize and enhance the local and indigenous knowledge. It is a major challenge to incorporate the traditional knowledge and technologies in modern science and technology.



## Key Issues on Adaptation (3)

### 3. Human security and sustainable development

- Adaptation to improve society's resilience to climate change and human security also constitutes an important policy towards achieving sustainable development.
- Adaptation is not a single policy, but a comprehensive approach to be addressed in the context of development policies, such as poverty reduction, agricultural development, water resources development and disaster prevention. (Mainstreaming adaptation)

## Key Issues on Adaptation (4)

4. The real world is under multiple stresses.
  - Global warming is not the only constraint to the society. Human society also faces other problems. e.g. environmental pollution, loss of biodiversity, changes in land use due to economic development, population growth and economic globalization.
  - As adaptation to climate change has co-benefits to other stresses, it will be a measure to ensure the safer societies and healthy basis for future development. In this sense, adaptation is a major component of the policy toward sustainable development.

## Key Issues on Adaptation (5)

5. International Cooperation is important for adaptation. Under the UNFCCC and the Kyoto Protocol, there are funding mechanisms for adaptation such as Adaptation Fund, but the expected amount is limited.
- Therefore, the role of the official development assistance (ODA) for adaptation is likely to increase.

Item	amount per year	Estimated portion climate sensitive	Estimated costs of adaptation	Total per year (USD 2000)
ODA & Concessional Finance	\$100B	40%	10 to 20%	\$4B to \$8B
FDI	\$160B	10%	10 to 20%	\$2B to \$3B
Gross Domestic Investment	\$1500B	2 to 10%	10 to 20%	\$3B to \$30B
<b>Total International finance</b>				<b>\$6B to \$11B</b>
<b>Total adaptation finance</b>				<b>\$9B to \$41B</b>
<b>Cost of additional impacts</b>				<b>\$40B</b> <b>(\$10B to \$100B)</b>

**Thank you very much for your attention.**

