Appendix L

Country Paper: Vietnam

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An author and co-author of various local and international reports and publications, Dr. Ninh has a wide variety of professional experiences related to climate change, especially with UN organizations.

Realizing Challenges, Exploring Opportunities
Proceedings of the International Conference-Workshop on Biodiversity and Climate Change in Southeast Asia: Adaptation and Mitigation
19-20 February 2008 • Sofitel Philippine Plaza Hotel • CCP Complex, Pasay City, Philippines

Climate hazard/disaster profile

•Climate projections:

- Temperature rise
- Sea-level rise (5% land & 10.8% pop. effected if 1m rise of sea level by 2100)
- Increase in the strength, duration and frequency of El Niño, La Niña events
- IOD (Indian Ocean Dipole)
- Increased intensity of tropical cyclones: increased storm surges, precipitation and flooding
- Increased risk of drought
- Increase in heat waves very likely

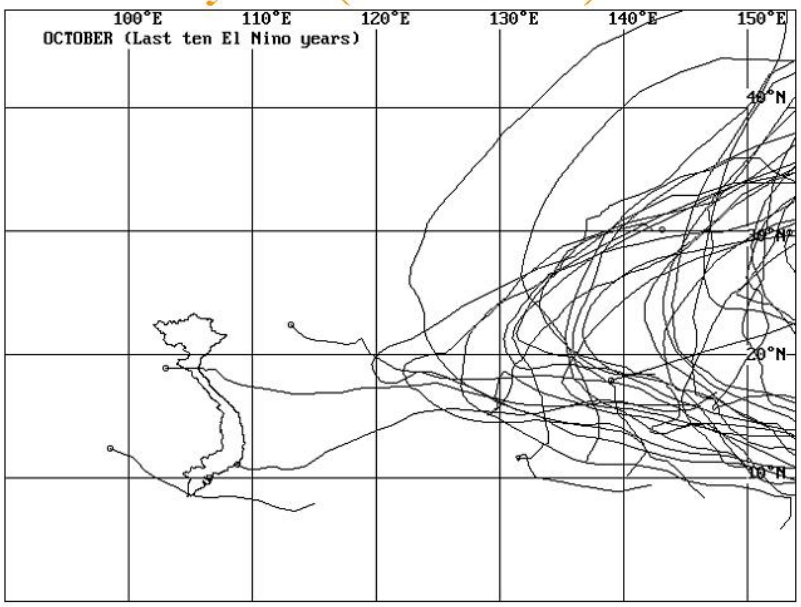
•Impact on livelihoods, national development and economy: storm damage, agriculture, water supply, health

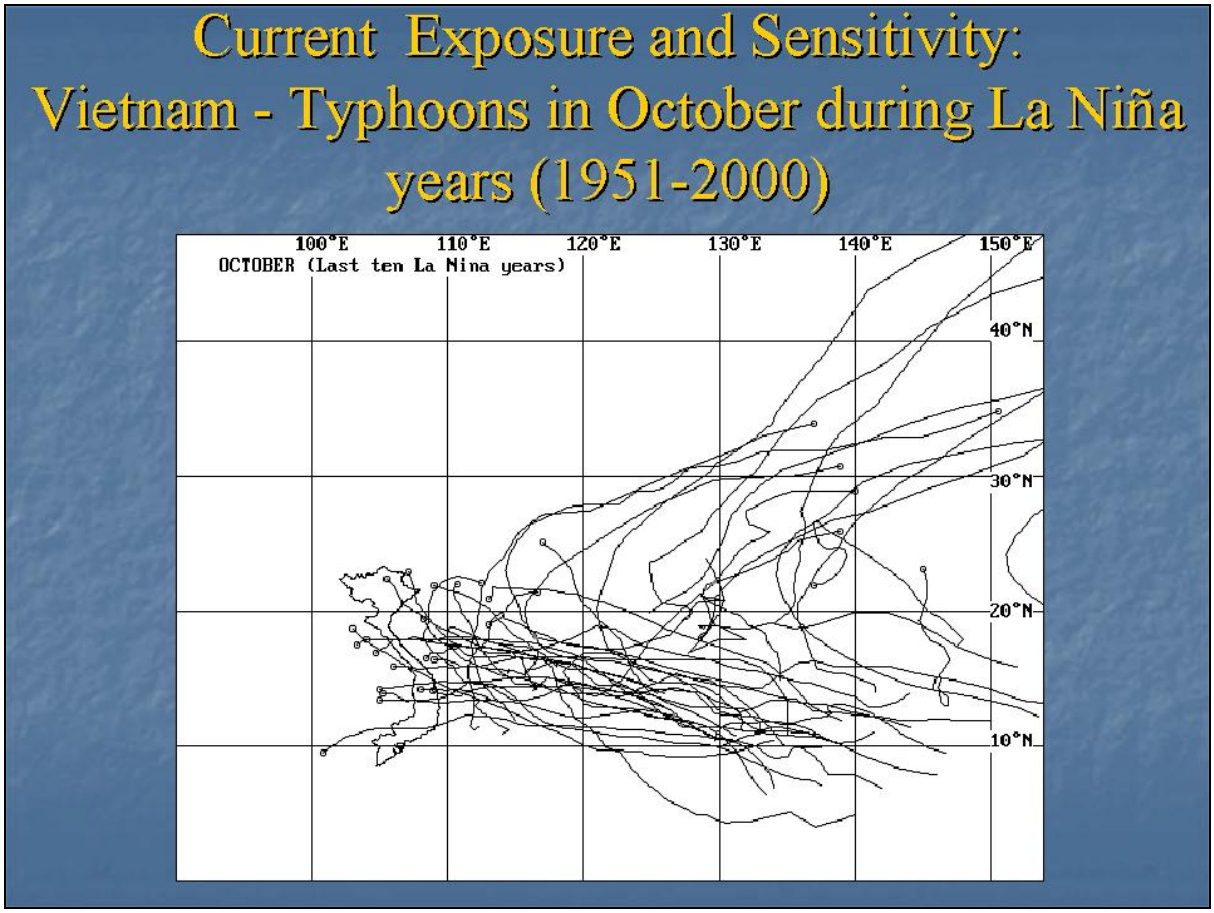
Disasters in different geographic areas and economic zones

Disaster	Geographic Areas and Economic Zones							
	North East and North West	*Red River Delta*	*North central coast*	*South central coast*	*Central highlands*	*Southern North East*	*Mekong River Delta*	*Coastal Economic Zone*
Storm	***	****	****	****	**	***	***	****
Flood	_	****	****	***	***	***	*****	****
Flashflood	***	_	***	***	***	***	*	***
Whirlwind	**	**	**	**	*	**	**	**
Drought	***	*	**	***	**	***	*	***
Desertification	_	_	*	**	**	**	*	**
Saline intrusion	_	*	**	**	*	**	***	**
Inundation	_	***	**	**	_	**	***	***
Landslide	**	**	**	**	*	**	***	**
Storm surge	_	**	**	**	**	**	***	**
Fire	**	*	**	***	_	***	***	***
Industrial and environmental hazard	_	**	**	**	***	***	**	***

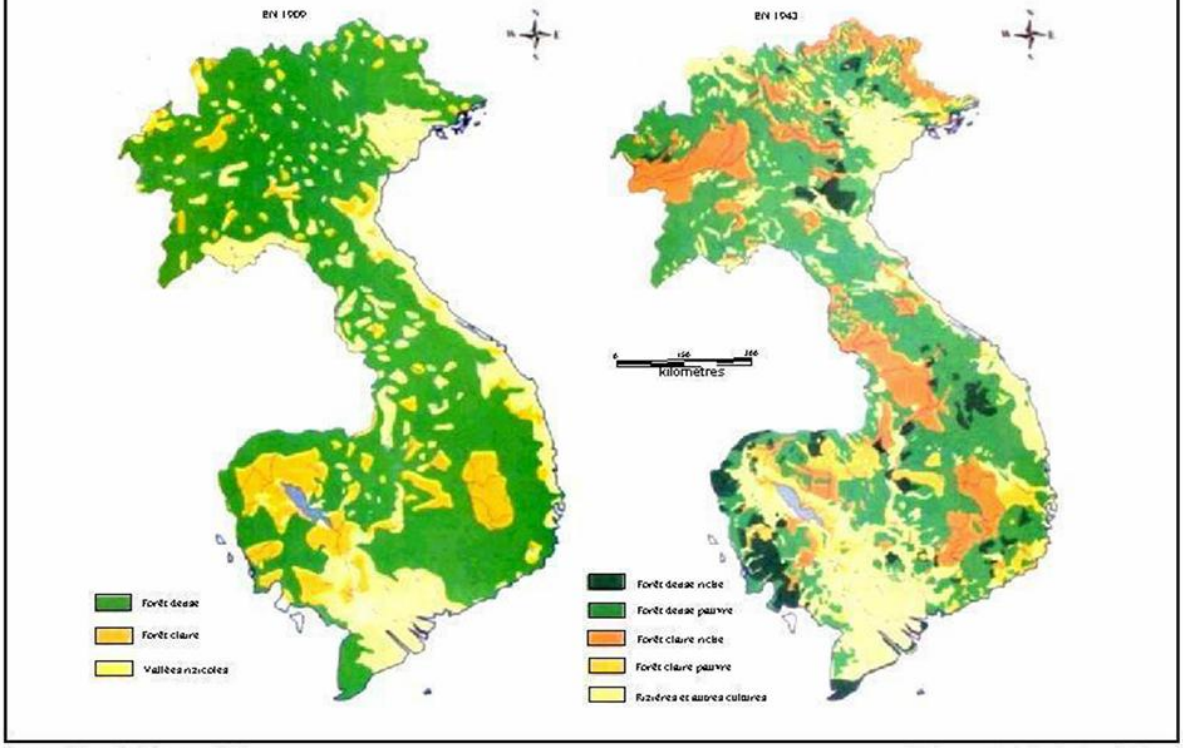

Prone to frequent disasters
Strong wind
Storm surge
Heavy rain
Tornado
Thunder storm
Flash flood
Flood and inudation
Drought

Current Exposure and Sensitivity: Vietnam - Typhoons in October during El Niño years (1951-2000)

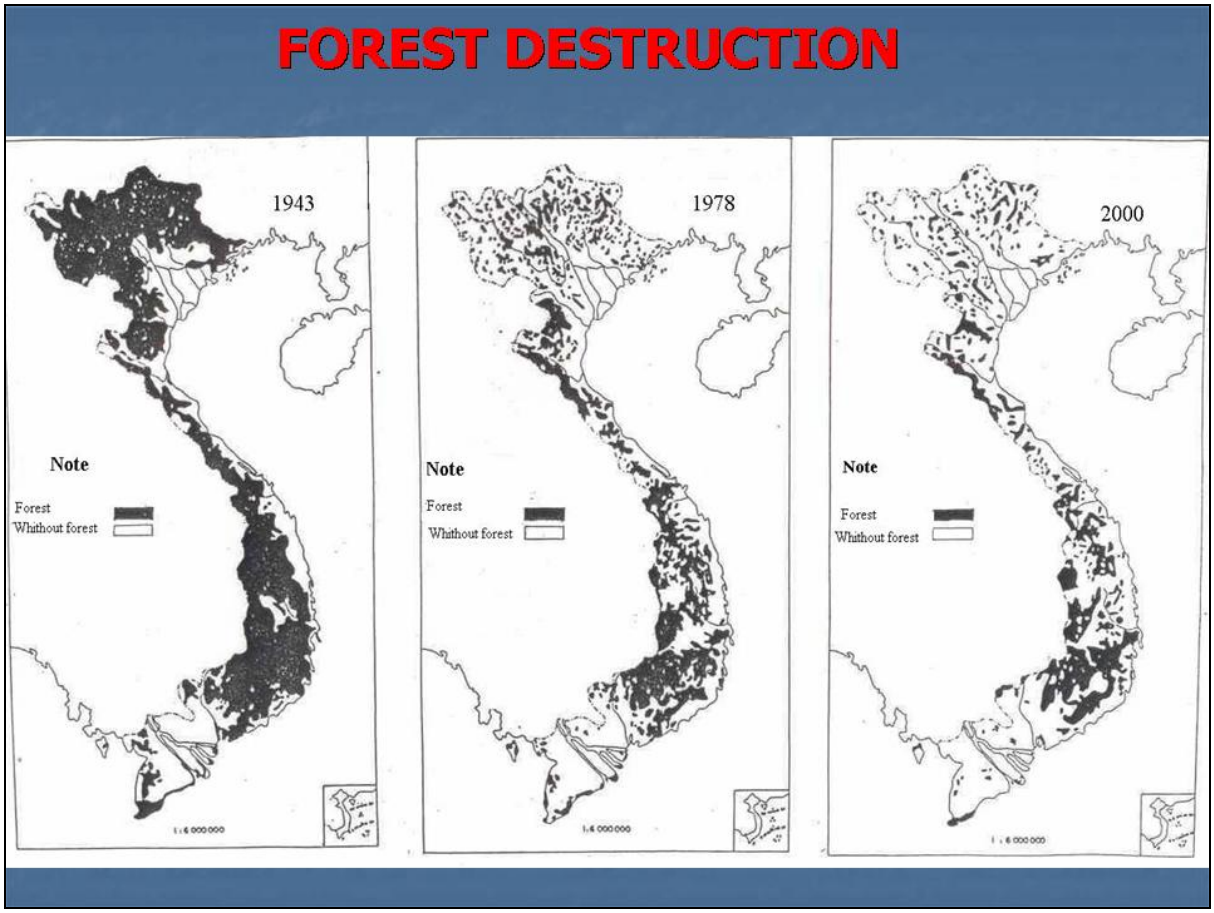


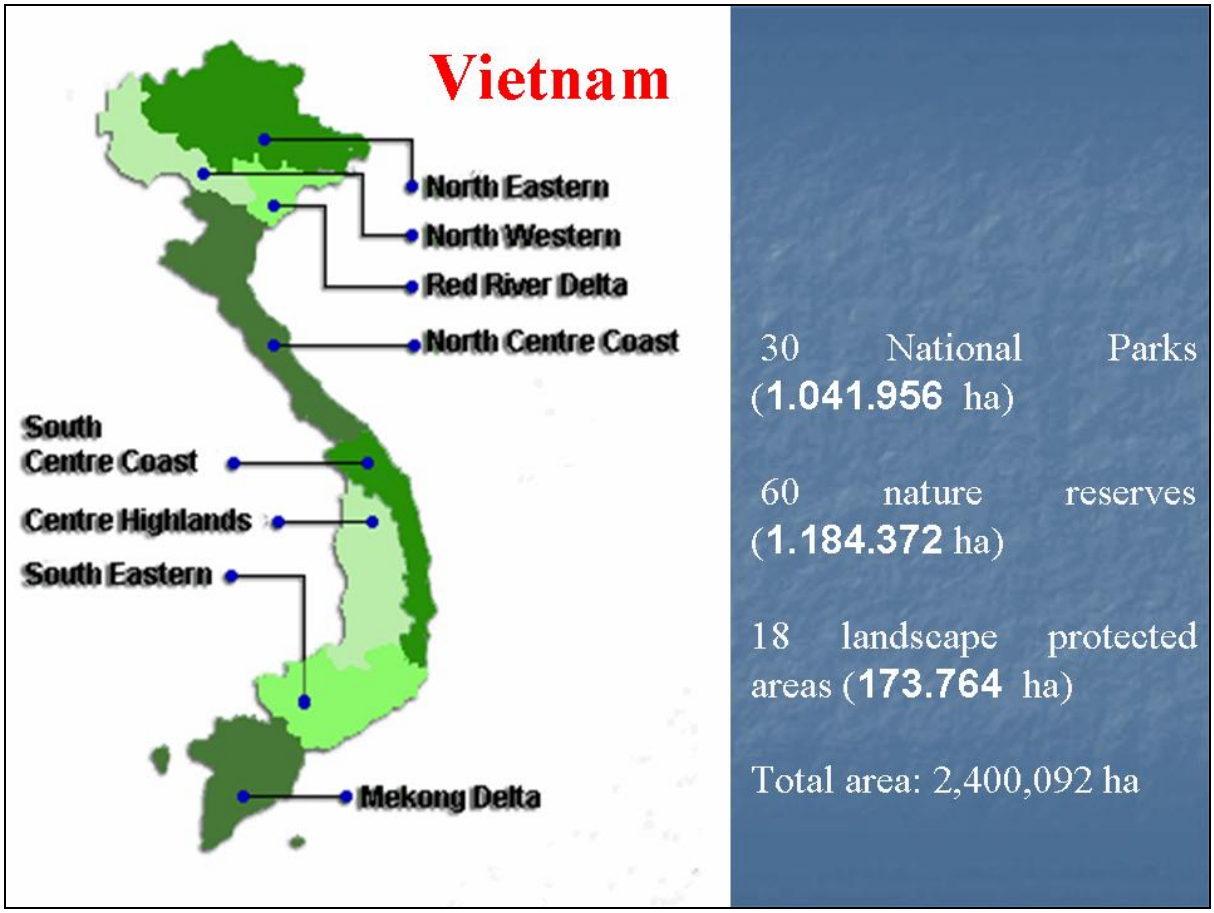

Current Exposure and Sensitivity:
Vietnam - Typhoons in October during La Niña years (1951-2000)
OCTOBER (Last ten La Nina years)
100°E
110°E
120°E
130°E
140°E
150°E
40°N
30°N
20°N
10°N

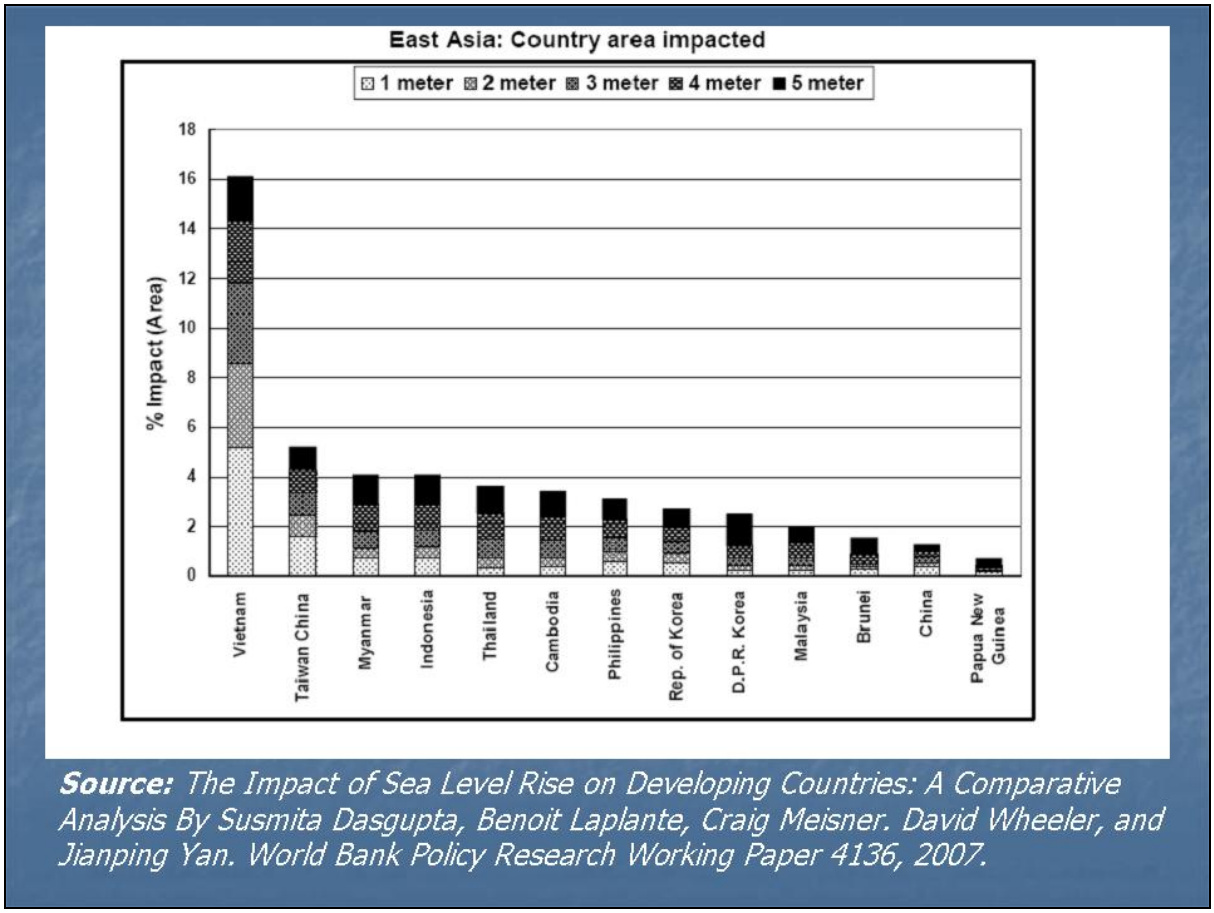
L'Indochine. La couverture forestière en 1909 et 1943.



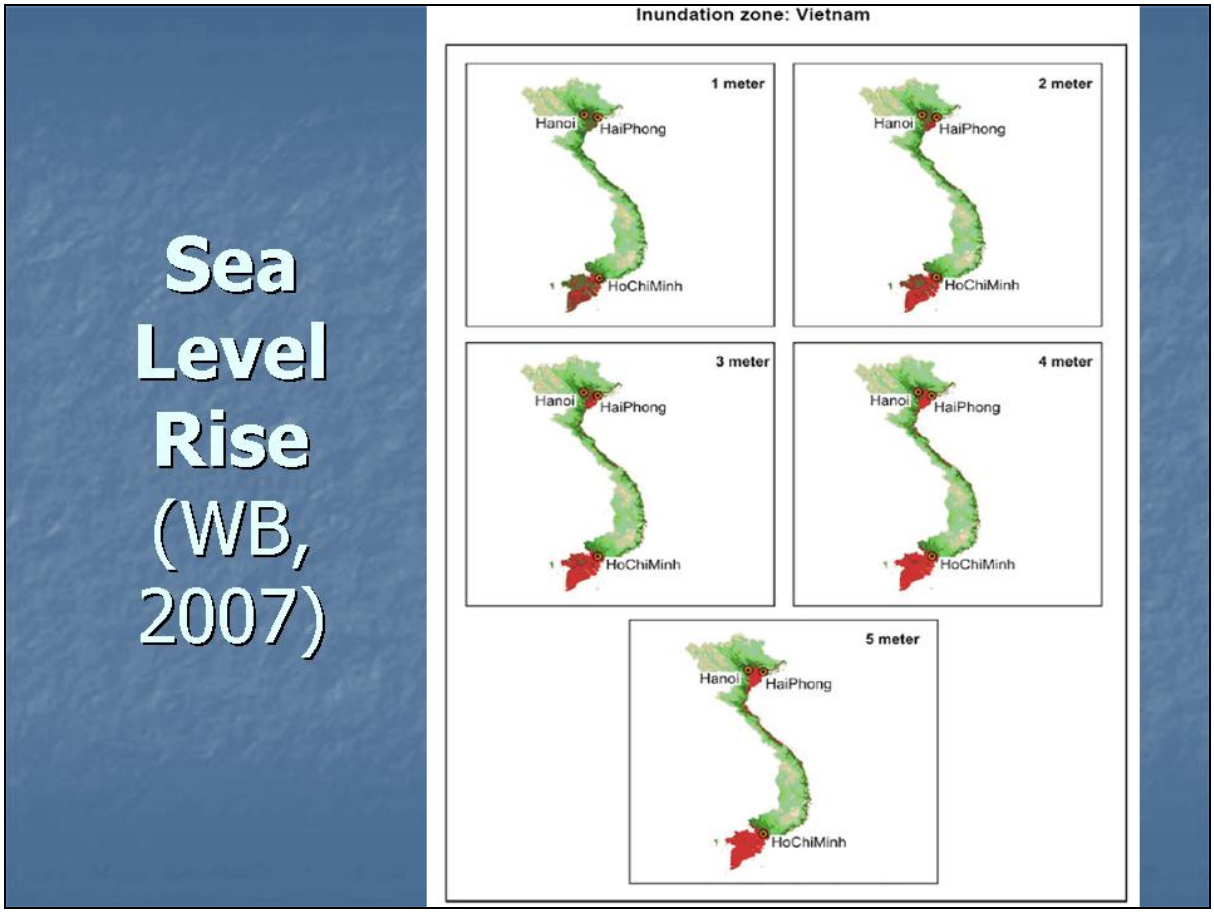
Source : D'après Thomas, 1999.

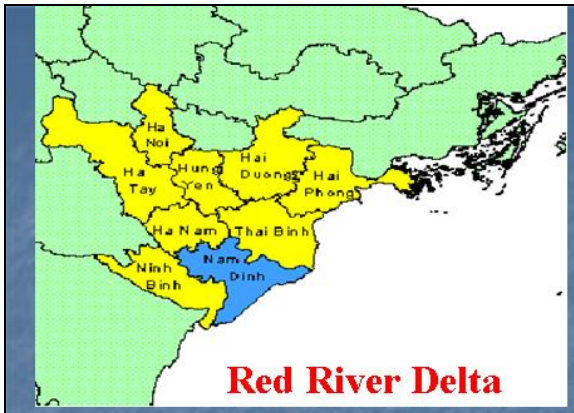

FOREST DESTRUCTION
1943
Note
Forest
Whithout forest
1978
Note
Forest
Whithout forest
2000
Note
Forest
Whithout forest


Vietnam
North Eastern
North Western
Red River Delta
North Centre Coast
South
Centre Coast
Centre Highlands
South Eastern
Mekong Delta
30 National Parks (1.041.956 ha)
60 nature reserves (1.184.372 ha)
18 landscape protected areas (173.764 ha)
Total area: 2,400,092 ha

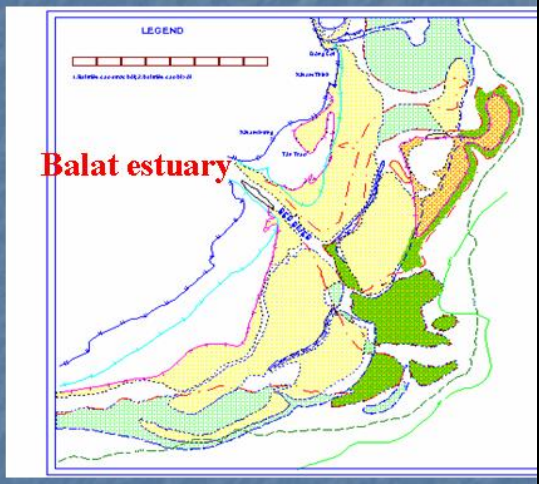


Source: *The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis By Susmita Dasgupta, Benoit Laplante, Craig Meisner. David Wheeler, and Jianping Yan. World Bank Policy Research Working Paper 4136, 2007.*


Sea Level Rise (WB, 2007)
Inundation zone: Vietnam
1 meter
2 meter
3 meter
4 meter
5 meter
Hanoi
HaiPhong
HoChiMinh



Red River is the largest one of Northern Viet Nam:
- Alluvium:117 mill. tons
- A fertile land for agriculture



-Total surface of Balat: 26,397 ha
-Xuan Thuy Ramsar Site (1989): 8,344ha (3,000ha mangroves)
-Funtions: absorb CO2, groundwater recharge and discharge, freshwater supply, climate regulation, biomass export, flood protection, wave & storm prevention, shoreline erosion control, coastline stabilization, maintenance of biodiversity.

Biodiversity

971 species of major terrestrial and aquatic fauna & flora groups

Value species:

Crab: 46
Shrimp: 15
Shellfish: 4
Shipworm: 23
Fish: 52
Bird: 215

Beneficial groups of plants in the mangrove areas

No	Use	Number	%
1	Medicinal plants	111	60.3
2	Wood/fuel wood plants	19	10.3
3	Edible plants	13	7.1
4	Plants for livestock	33	18
5	Plants protect dykes, prevent waves, wind, soil erosion	20	10.9
6	Ornamental plants	17	9.2
7	Other uses: fiber plants, plants for handicrafts, raising bees...	30	16.3


Biodiversity
Migration bird
Periophthalmus schlosseri
Bop fish
Scienap.,

Reducing GHG

15-year-old mangroves absorb
90.24 t CO2/ha/year

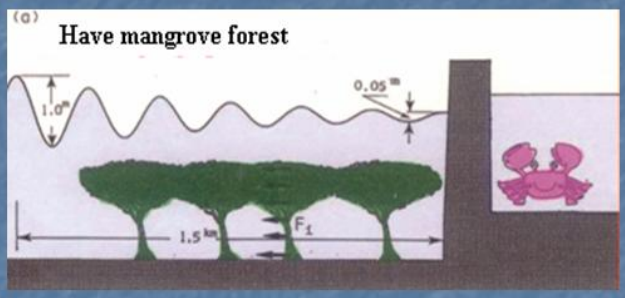
15-year-old rain forest absorb
29.5 tons $CO_{2/}$ ha/year

Global carbon stocks (WBGU, 1998)

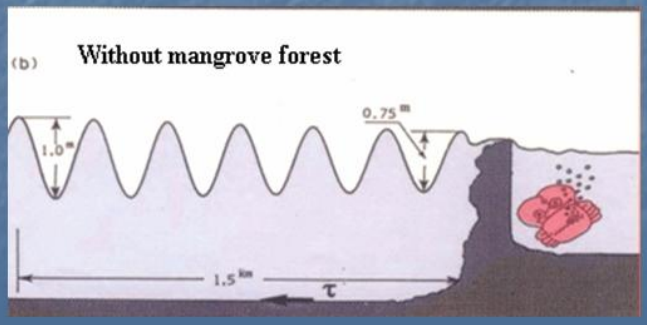
Biome	Area (10^6 km^2)	Carbon Stocks (Gt C)		
		Vegetation	*Soils*	*Total*
Tropical forests	17.6	212	216	428
Temperate forests	10.4	59	100	159
Boreal forests	13.7	88	471	559
Tropical savannas	22.5	66	264	330
Temperate grasslands	12.5	9	295	304
Deserts and semideserts	45.5	8	191	199
Tundra	9.5	6	121	127
Wetlands	3.5	15	225	240
Croplands	16.0	3	128	131
Total	151.2	466	2,011	2,477

Erosion control

Reducing impact due to wave



- When mangrove forest is wide than 1.5km, height wave will reduce from 1m to 0.05m in lagoon coast



- Conversely, height wave is 0.75m and coast is eroded

Dyke protection

- Cost of sea dyke construction 0.7-1.0 to 2.0-2.5 mill.US$/km.
- After strong typhoons in 9/2005 constructing stronger sea dykes would cost US$7-10 mill./km

- Replace cost of mangrove forest for sea dike protection directly, and climate change mitigation indirectly, about $US 5-6 mill./km

Water Purification and Sediment Trapping

Intercepting and assimilate many pollutants

Disintegrate microorganisms

Trees are retained in Mangrove forest of Nam Dinh after storm in 2003

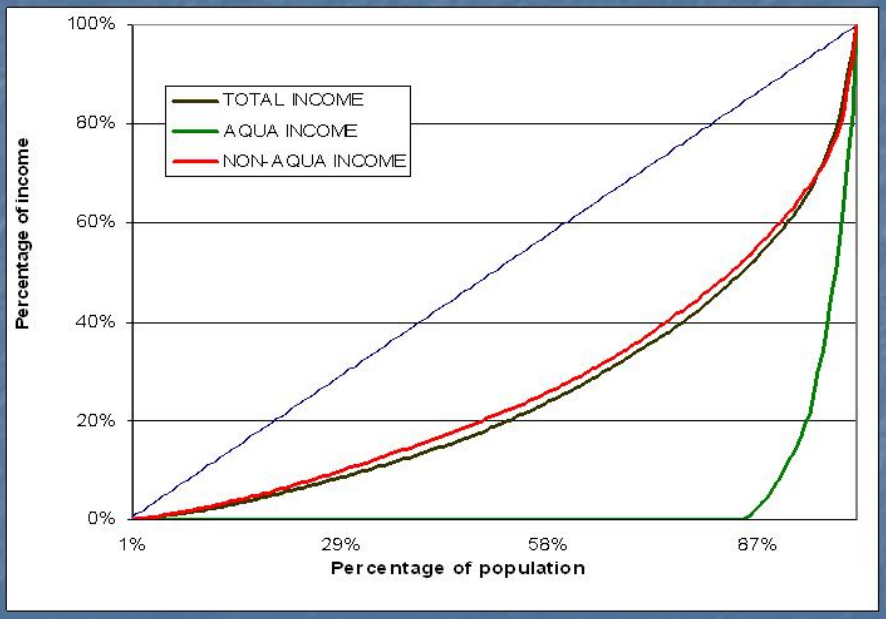
Metal material waste is disintegrated in mangrove forest that become food for organism

Initial economic evaluation

USES	Use Values						Non-Use Value					
	Direct		Indirect		Option		Quasi-Option		Bequest		Existence	
	VND	USD	VND	USD	VND	USD	VND	USD	VND	USD	VND	USD
EXTRACTIVE USE												
Construction Wood	125,800	7.91										
Fuelwood	91,500	5.75										
Aquaculture	16,500,000	1,037.74										
Honey	141,000	8.87										
Marine product picking*	3,120,000	196.23										
Pharmaceutical products	19,000	1.19										
NON-EXTRACTIVE USE												
Tourism/Recreation	18,000	1.13										
Research & Education	VS	VS										
Aesthetic	VS	VS										

ENVIRONMENTAL SERVICES												
Shoreline protection			266,666,667	16,729.56								
Windbreak			VS	VS								
Carbon sequestration			235,313	14.80								
Water purification			VS	VS								
Oxygen release			121,766	7.66								
Aquaculture (pearl)			VS	VS								
Nursery area			VS	VS								
BIOLOGICAL DIVERSITY SERVICES												
Biodiversity					V	VS						
Migratory species			VS	VS								
Endangered Species									VS	VS		
Mangrove Ecosystem											VS	VS
TEV (+) (per ha)	20,015,300	1,259	267,023,746	16,752.02								

Lorenz curves* for measurement and decomposition of inequality



Note: **Lorenz curves were drawn with basis of total income of different decomposed communities.*

Social resilience: Use of remittance income

Categories	Percentage of amount invested	Percentage of hhs invested
Health care	1.0	3.1
Education	5.4	5.2
Necessities	5.9	16.5
Food	7.7	12.4
Breeding	7.8	16.5
Construction	12.7	3.1
Agriculture	15.4	20.6
Saving	44.1	22.7

Vulnerabilities of communities

COMMUNITY VULNERABILITIES	CAUSES OF VULNERABILITIES (SLR – sea level rise; STS - storm surges; DRT – drought; FLD – flooding; CVY – climate variation; DFN – deforestation; OHA- other human activities; FFS – forest fires; TCS – tropical cyclones)								
	SLR	STC	DRT	FLD	CVY	DFN	OHA	FFS	TCS
Loss of land to erosion from the sea	√	√					√		√
Flooding, inundation of land and sedimentation	√	√		√		√	√		√
Lack of water supply (quantity) and poor water quality	√	√	√	√		√	√	√	√
Increased health hazards	√		√	√	√			√	√
Destruction of crops		√	√	√	√			√	√
Loss of biodiversity, and loss of heriage and land values	√	√	√	√	√	√	√	√	√
Damage to community assets	√	√		√				√	√

Policy of natural resources management

- Policy intervention increase resilience
- Poverty reduction must be a priority
- Creation of local employment
- The loss of common property resources (mangroves) denies local people benefit

Government Policy on Biodiversity

- The National Conservation Strategy (1991)
- The National Action Plan on Biodiversity up to 2010 and Orientations Towards 2020 for Implemantation of the Convention on Biodiversity and the Cartagena Protocol on Biosafety (2007)

-National Action Plan for the Protection and Development of Vietnam's mangrove forests until 2015 is designed to add force to mangrove protection, rehabilitation, and wise utilization (UNEP/GEF project Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand) .

Recommendations

Immediate objectives of Action Plan

1. Formulate and complete the legal framework
2. Basically change the perception at every levels
3. Protect rehabilitate, and develop mangroves

- Protect existing mangrove areas, ensure 60-70% mangroves protected.
- By 2015, rehabilitate & develop mangroves would correspond to areas available in Vietnam in 1982 (250,000 ha)

Constraints and challenges

1. Mangrove ecosystems are improperly managed- Lack of legal documents that could institutionalize the mechanism.
2. Lack of policy tools guiding the fishery & economic sectors in the utilization of mangroves.
3. Most of the managers, communities, and local people have a vague perception on the importance and value of mangrove ecosystems.

Constraints and challenges (Cont.)

4. Lack of a sound and empowered intersectoral land-use planning system. Lack of a comprehensive and detailed planning

5. Gaps and weaknesses are found in mangrove ecosystem studies. These create the demand on management and sustainable uses of mangrove ecosystem.

National Target Program in Coping with Climate Change in Vietnam (MONRE, 2008)


THANK YOU FOR YOUR ATTENTION!
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