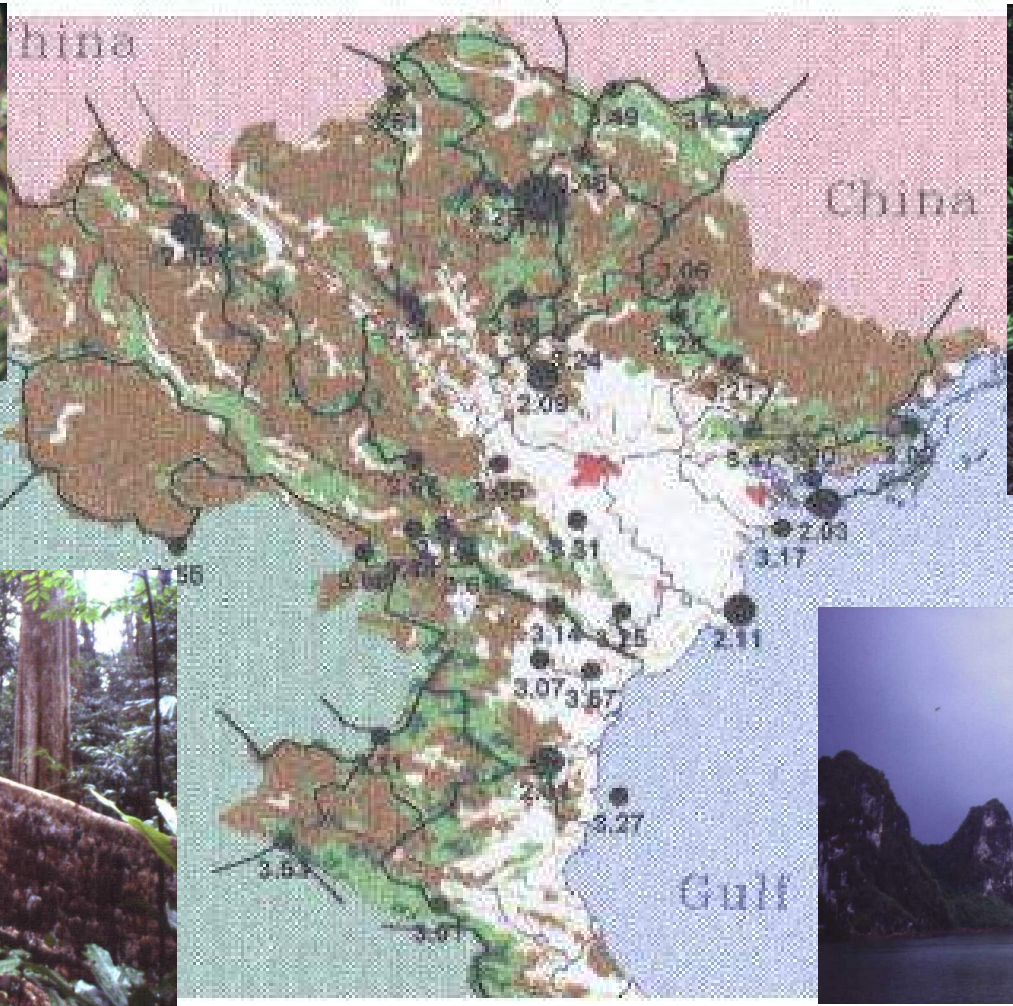
Landscape Ecology - Vietnam

Petr Jelínek

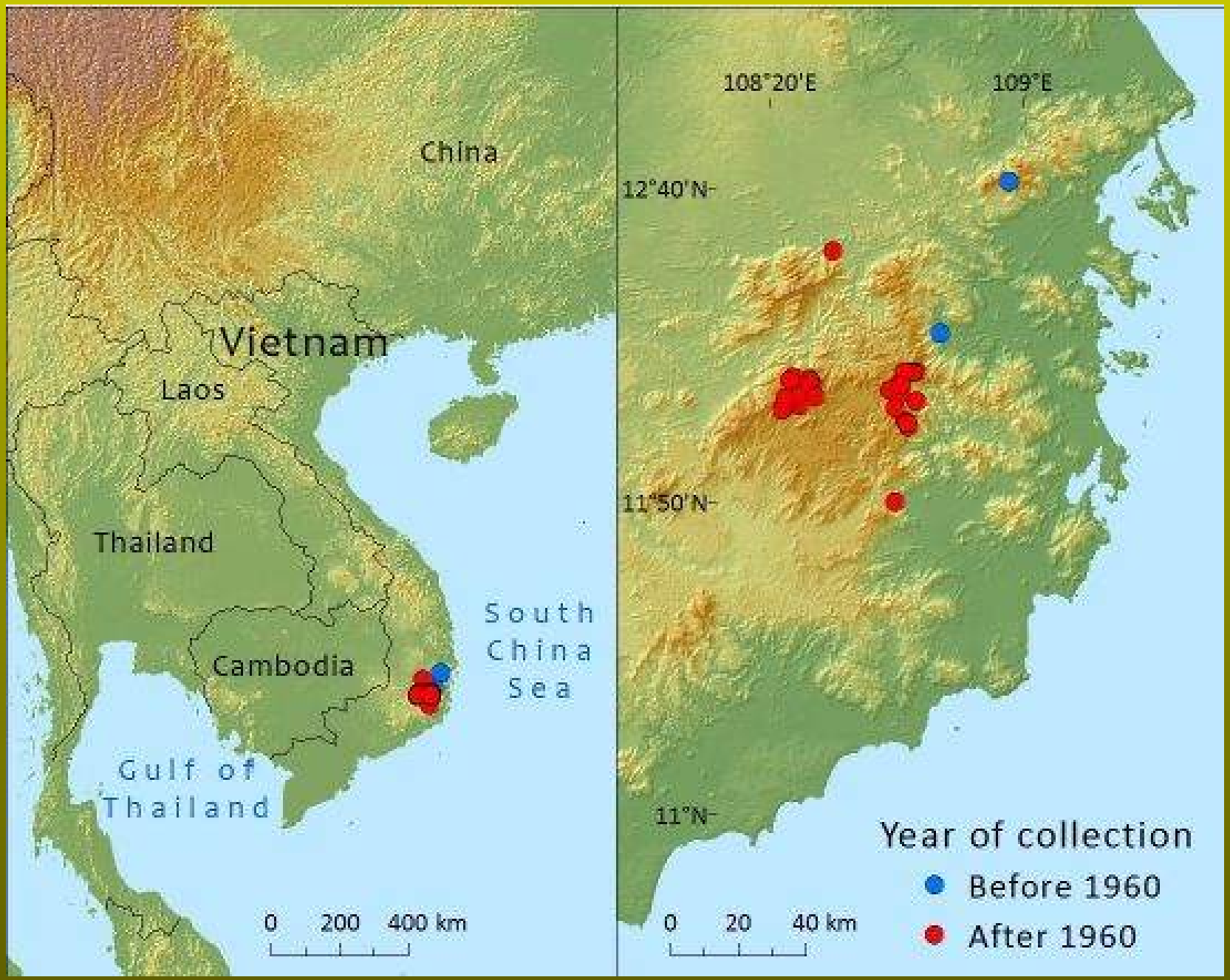
Mendel University Brno, Czech republic

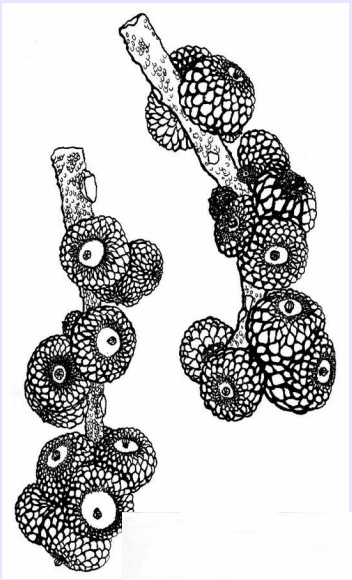


PINUS KREMPFII Lecomte – borovice Krempfova / borovica Krempfova

Autor Roman Businský | 13. 11. 2012

Čeleď: *Pinaceae* Lindl. – borovicovité
Systematické zařazení: *Pinus* L., podrod *Strobus* (D. Don) Lemmon, sekce *Ducampopinus* (A. Chev.) E. Murray (monotypická)

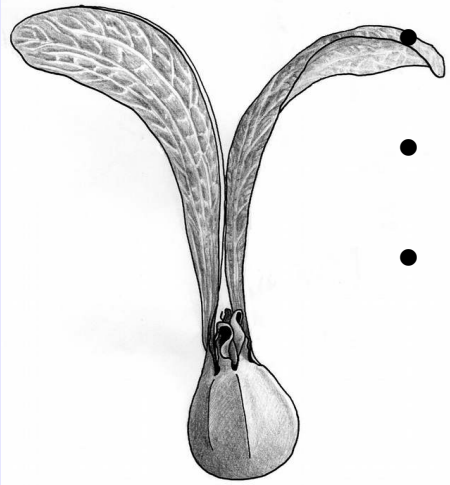

China
Vietnam
Laos
Thailand
Cambodia
South China Sea
Gulf of Thailand
0 200 400 km
108°20'E
109°E
12°40'N
11°50'N
11°N
0 20 40 km
Year of collection
Before 1960
After 1960

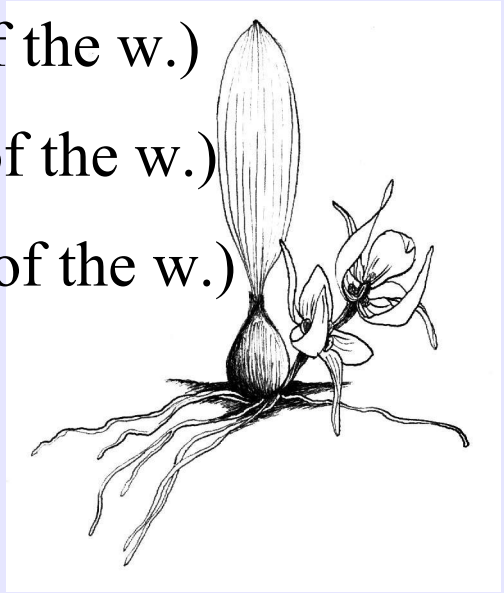


High biodiversity

Between 16 most diverse countries in the world

- 13.776 plant species (6,3 % of the world)
- 7.750 insect species (1% of the w.)
- 840 bird species (9,3% of the w.)
- 310 mammal species (7 of the w.)



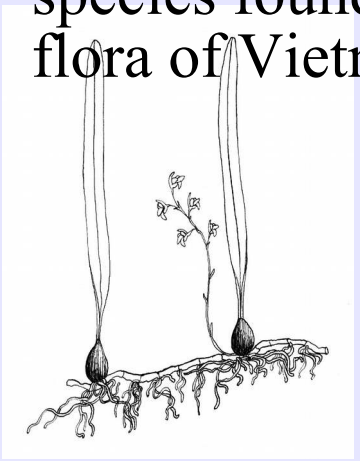


High biodiversity

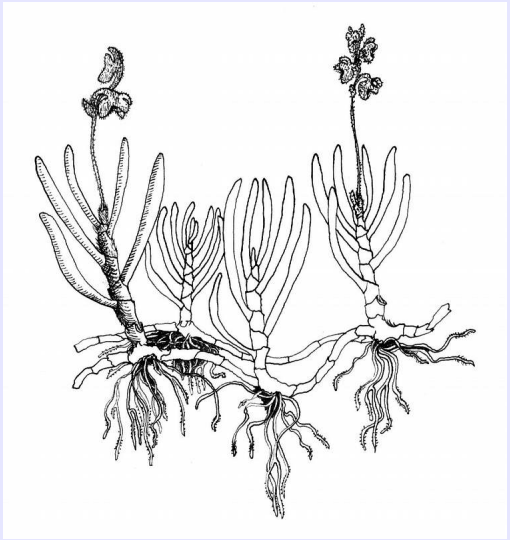
Between 1993 and 2002 were described:

- 13 new genera of plants
- 220 new species of plants
- 30 new subspecies of plants

Also 2 new families, 19 new genera and 70 species found elsewhere were added to native flora of Vietnam



5 new mammals and 3 new bird species described recently



Threat

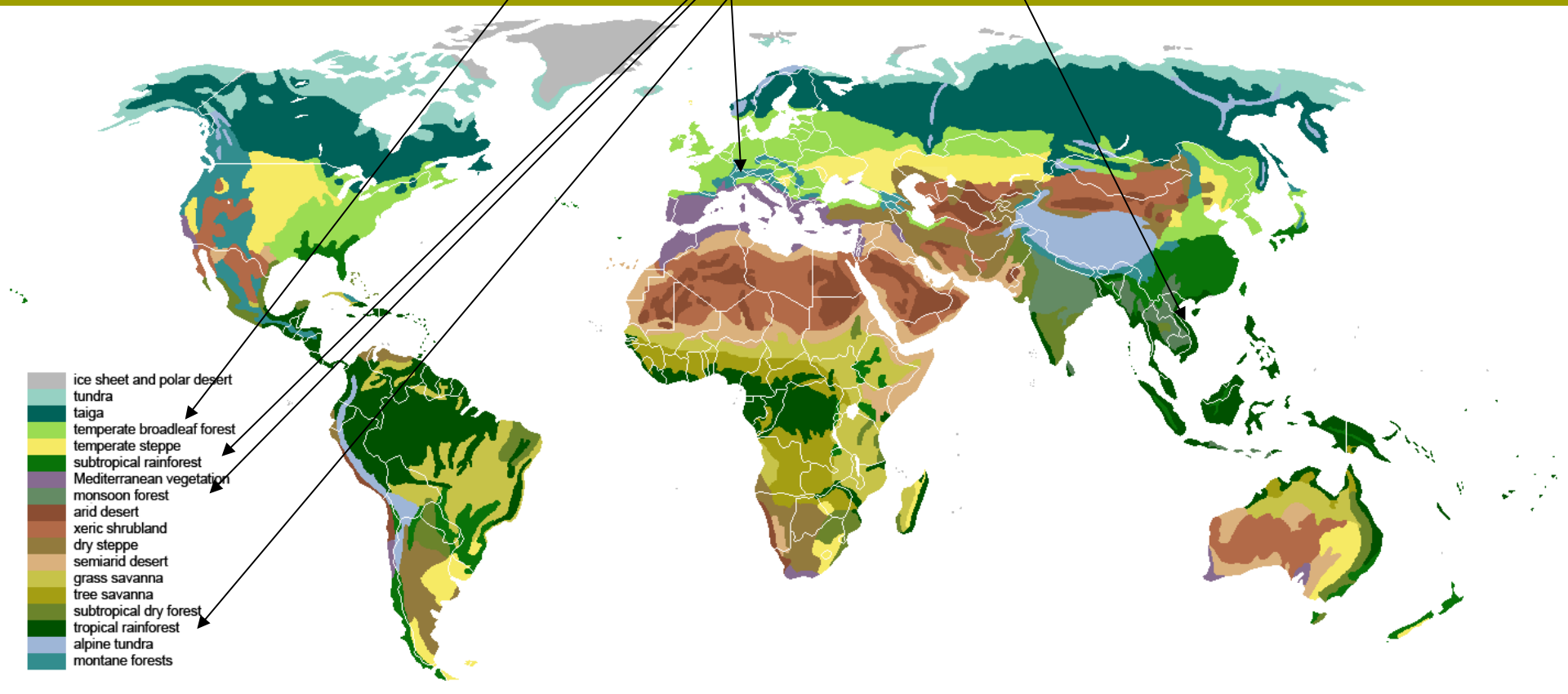
Logging, grazing, coffee plantations, agriculture

Landscape Ecology - Vietnam

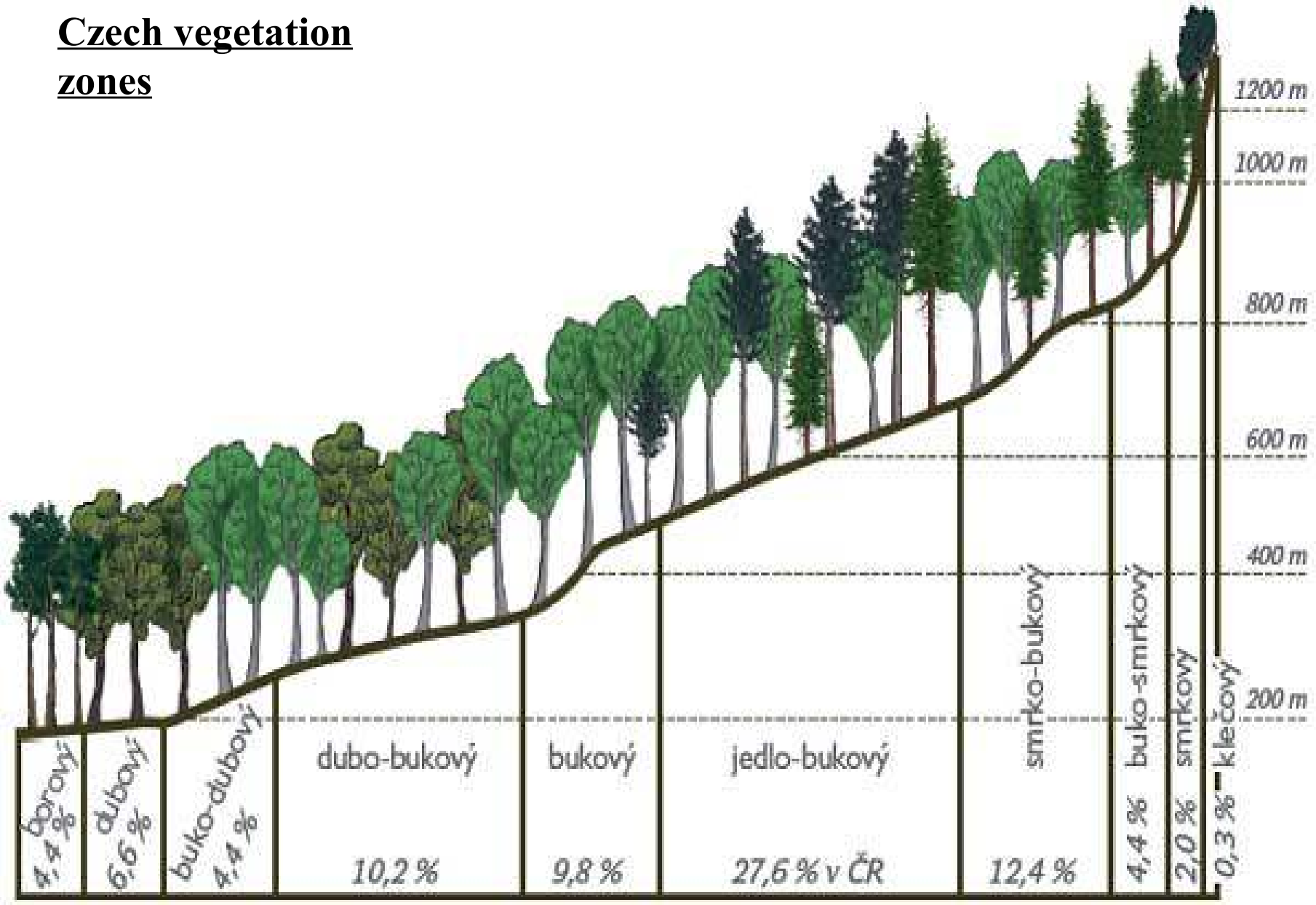
Biomes of - tropical rainforest
- monsoon forest
- subtropical rainforest

Czech republic

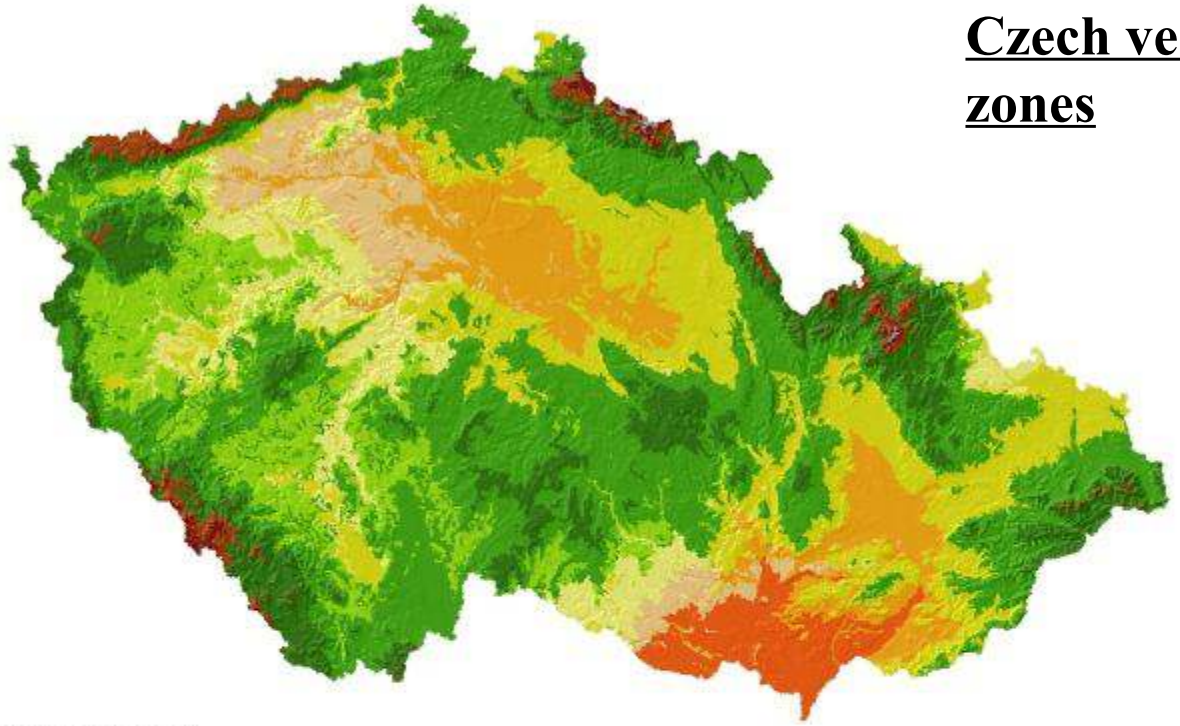
Biome of temperate broadleaf forest



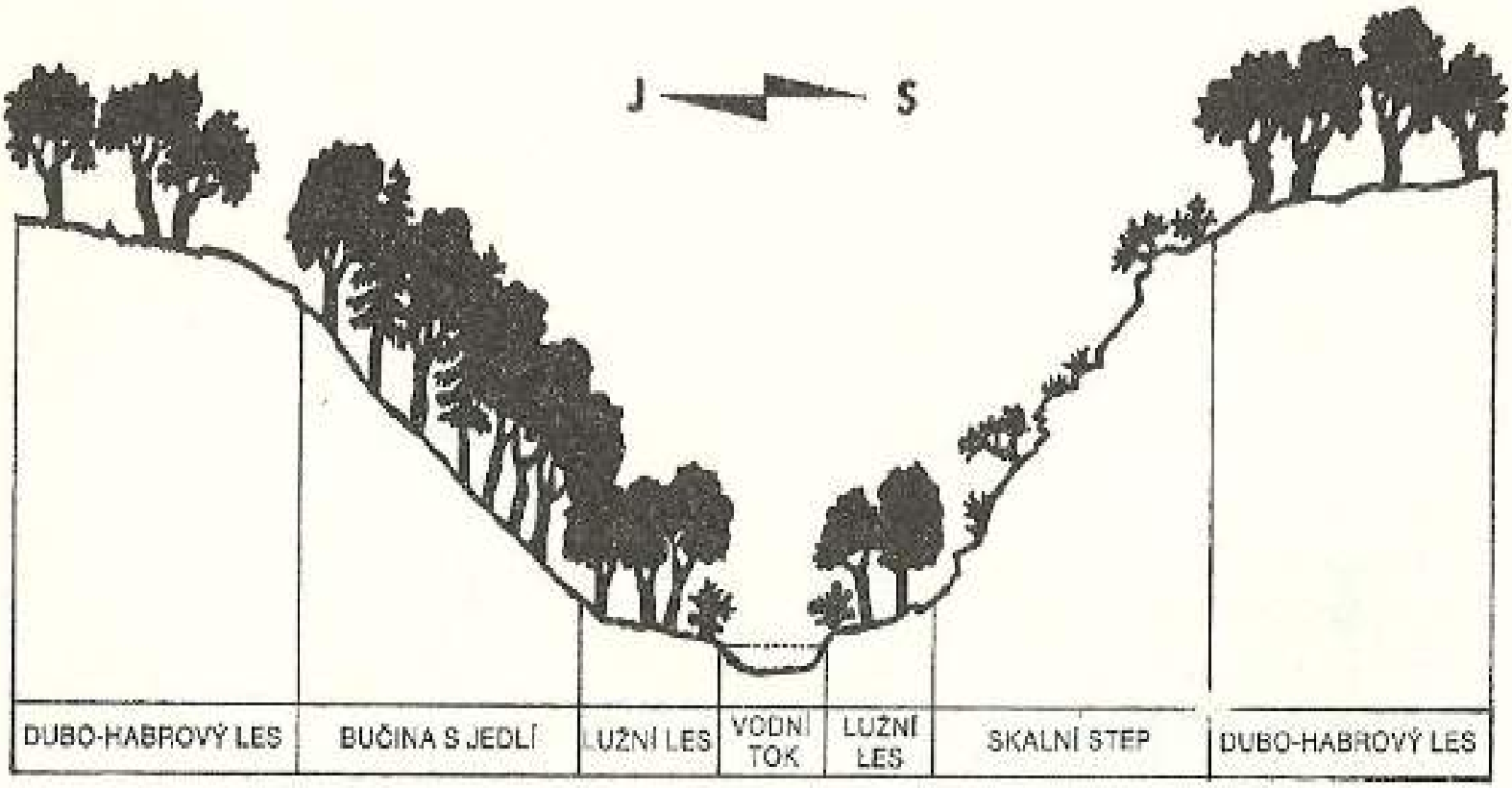
Czech vegetation zones



Czech vegetation zones



Czech republic – slope orientation in lower veg. zones



3. Zařízlutý vodní tok v zarovnané planině v oblasti rozšíření dubo-habrového lesa vytváří různě orientované svahy: jižní osluněné a teplé, s porosty skalní stepi, severní stinné a studené s porosty vlhkomilné bučiny s jedlí; v okolí vodního toku je zvýšenou hladinou spodní vody podmíněn ekosystém lužního lesa. Orig.

Map of potential vegetation of Vietnam

green colour: ***moist forest***

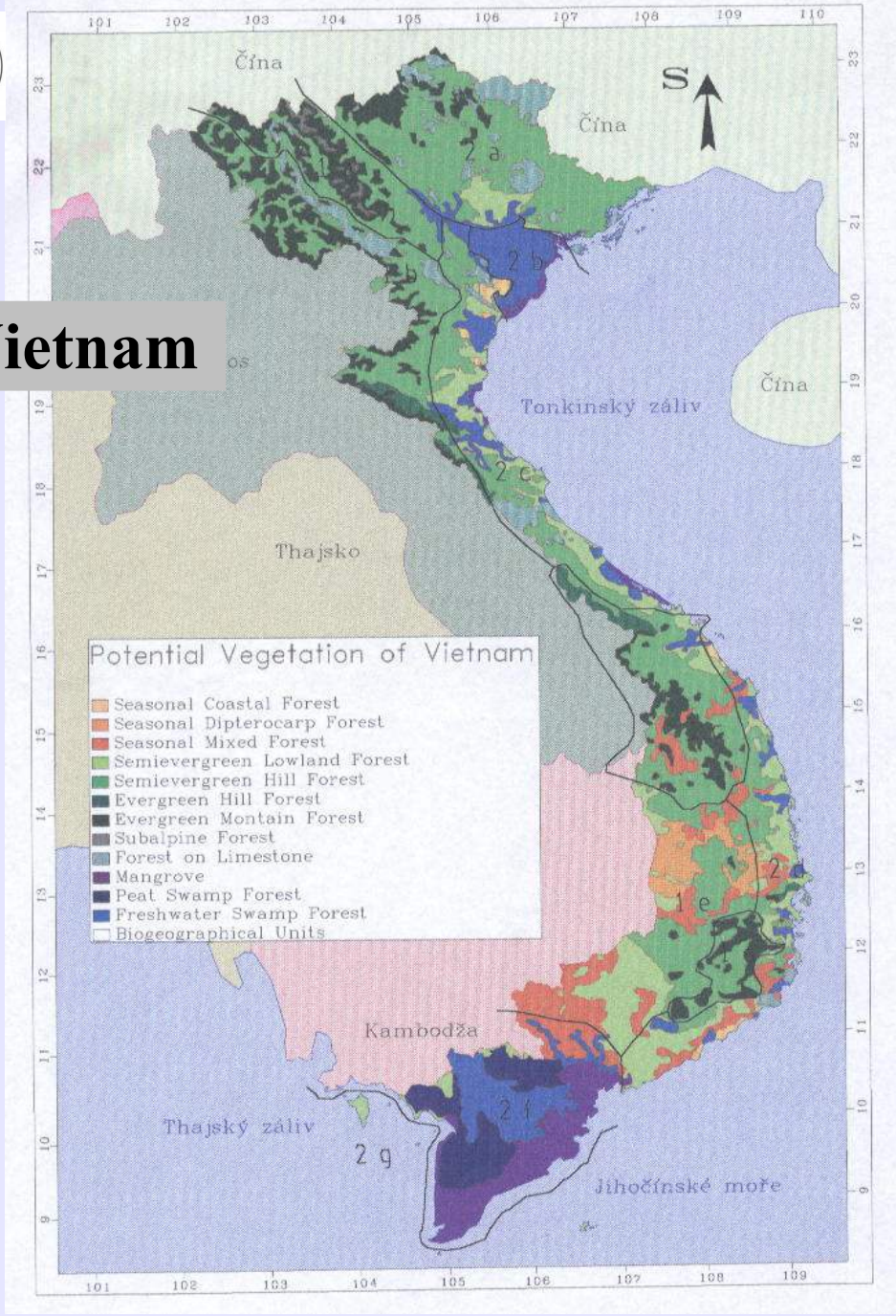
red colour: ***dry forest***

dark blue colour: ***wetlands***

light blue colour: ***limestone veget.***

grey colour: ***subalpine vegetation***

Source: FIPI, GEF map



Asia – azonal ecosystems

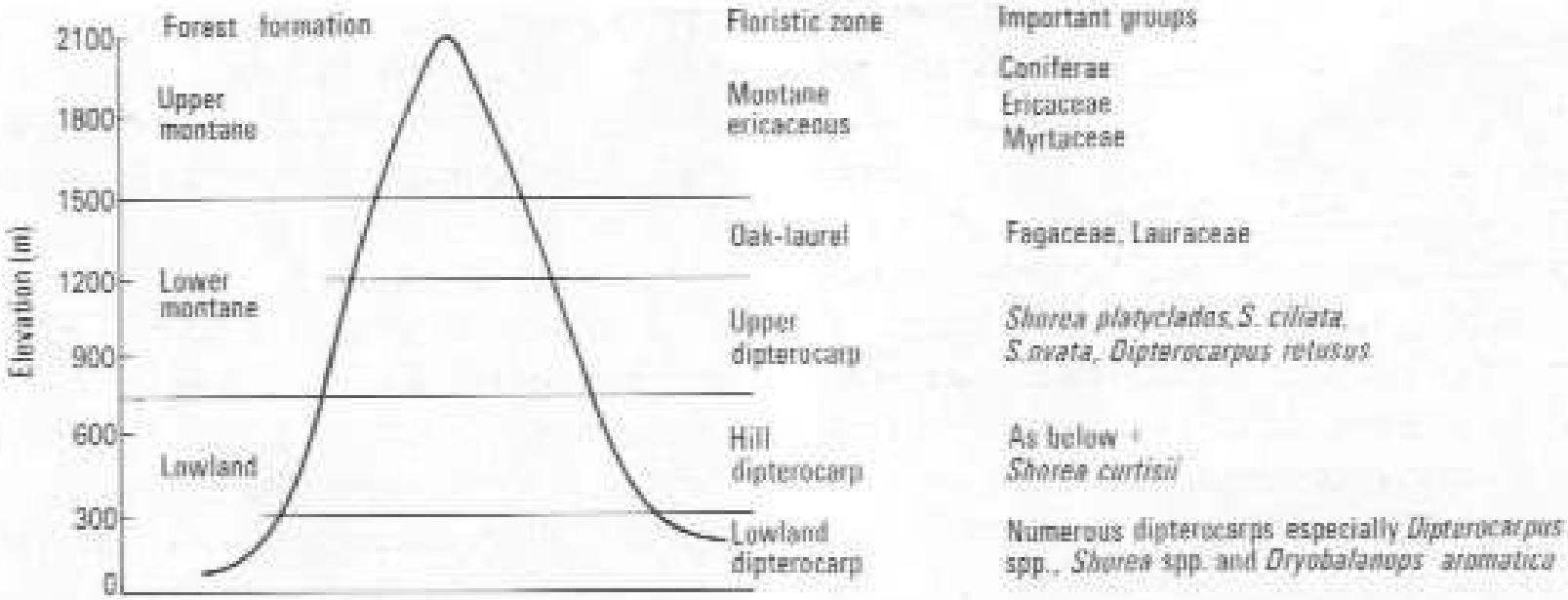


Fig. 2.7. Forest zones on the main mountains of Malaya. (Whitmore 1984a, Fig. 18.1.)

TDL – azonal ecosystems

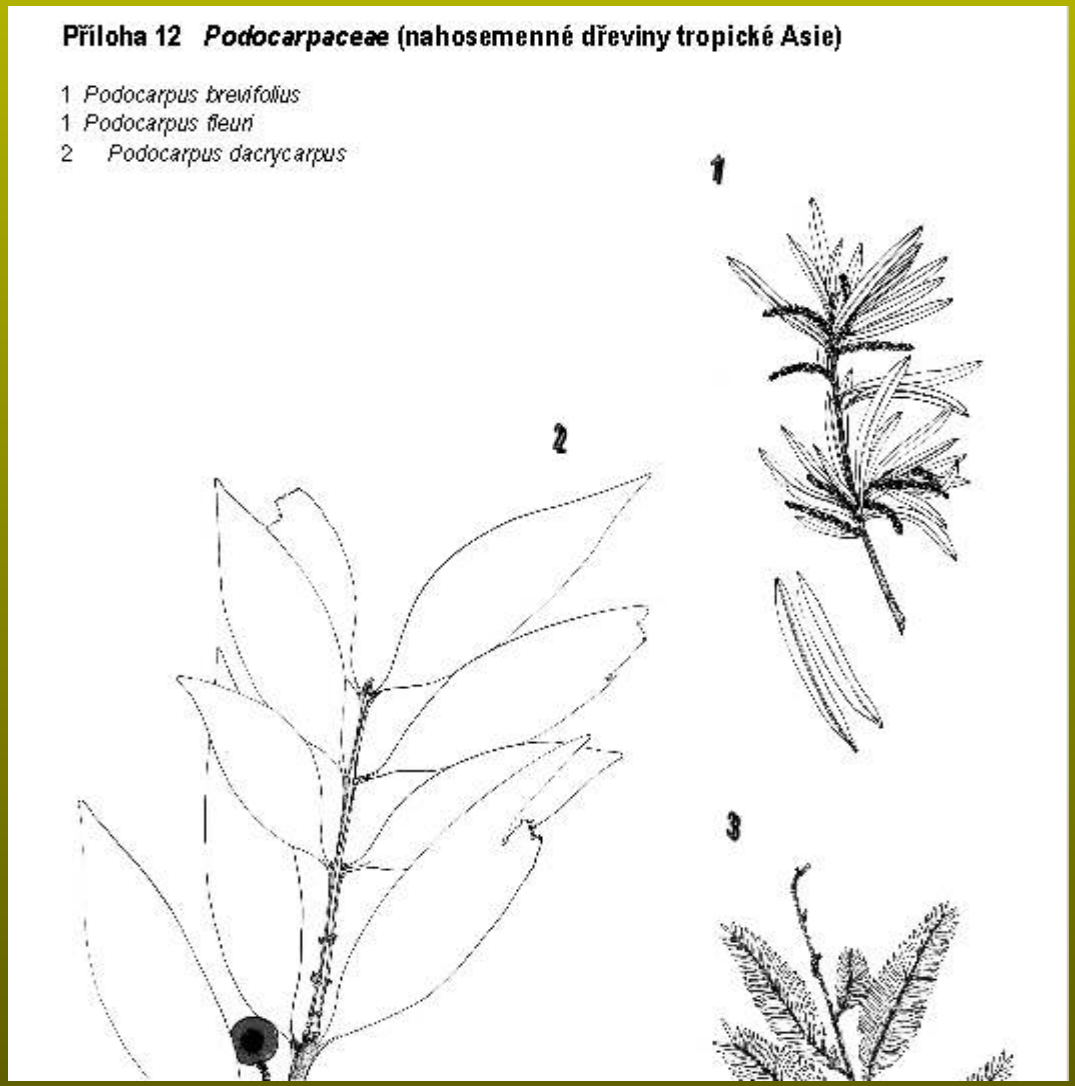
Table 2.1

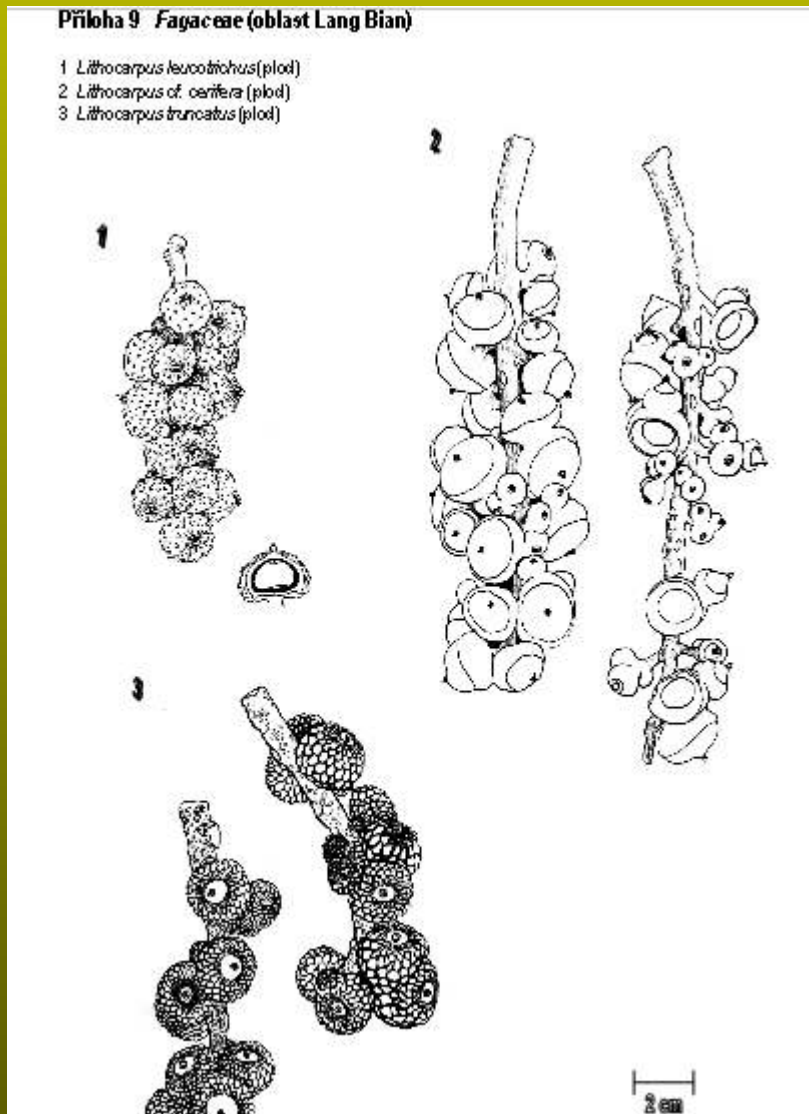
The formations of tropical moist forests

limate	Soil water		Soils	Elevation		Forest formation
easonally y	Strong annual shortage					Monsoon forests (various formations)
	Slight annual shortage					Rain forests: **Semi-evergreen rain forest**
ver-wet erhumid)	Dryland		Zonal (mainly oxisols, ultisols)	Lowlands		**Lowland evergreen rain forest**
				Mountains	(750) 1200–1500 m	**Lower montane rain forest**
					(600) 1500–3000 m (3350) m	**Upper montane rain forest**
					3000 (3350) m to tree-line	Subalpine forest
			Podzolized sands	Mostly lowlands		**Heath forest**
			Limestone	Mostly lowlands		Forest over limestone
			Ultrabasic rocks	Mostly lowlands		Forest over ultrabasics
	Water table high (at least periodically)	Coastal salt water				Beach vegetation Mangrove forest Brackish water forest
		Inland fresh water	Oligotrophic peats			**Peat swamp forest**
			Eutrophic (muck and mineral) soils	±Permanently wet		**Freshwater swamp forest**
				Periodically wet		**Freshwater periodic swamp forest**

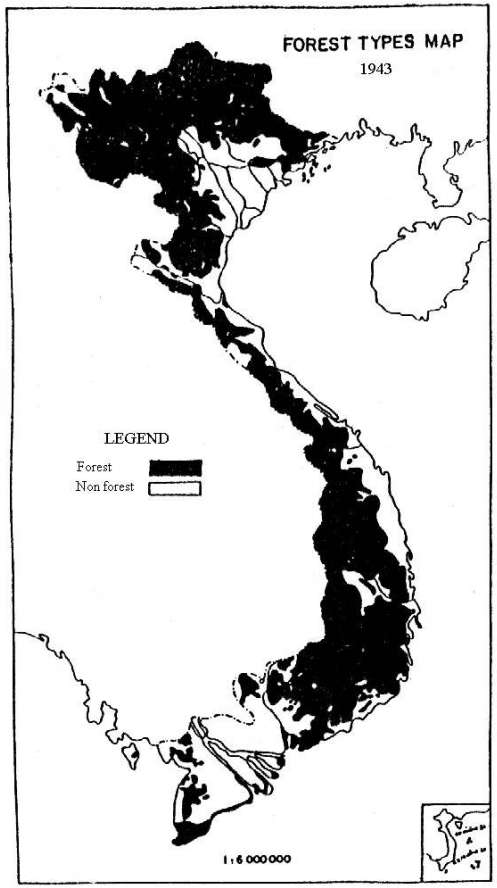
ose shown bold are discussed in the text

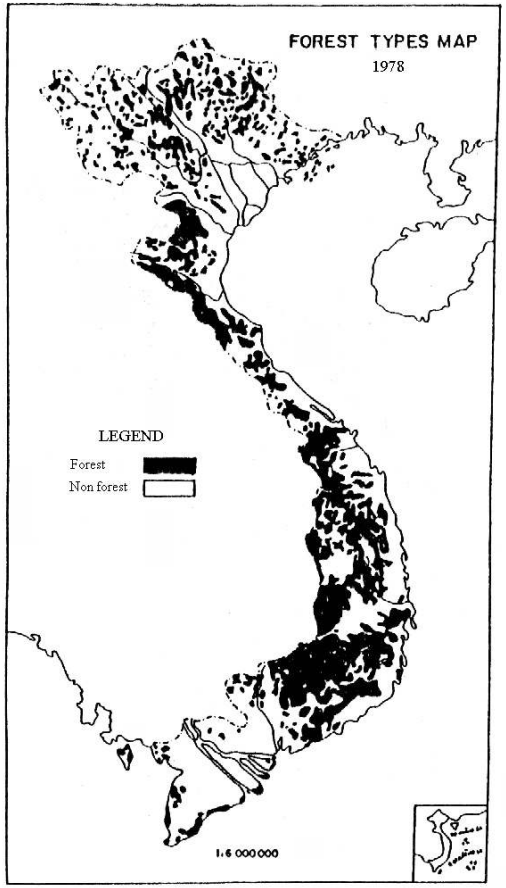
Vietnam – mountain forest with conifersou species (*Pinaceae*, *Podocarpaceae*) and oaks (*Fagaceaceae*)

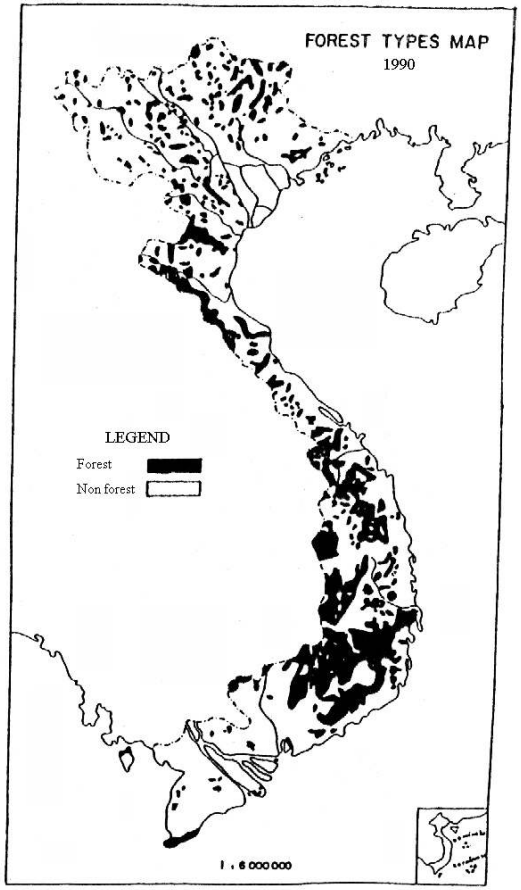




Vietnam deforestation 1943-1990







Obr. 8 Úbytek lesů ve Vietnamu v letech 1943 - 1990 (GEF 1994)

Forest cover changes

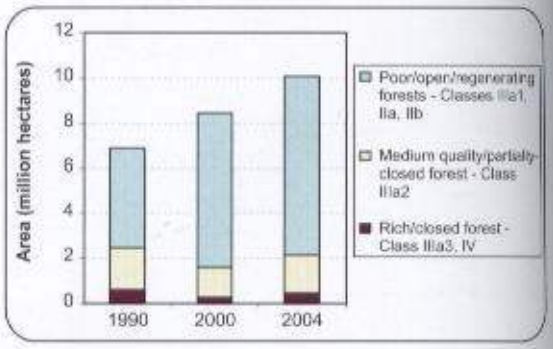
- 1943.....43%
- 1976.....29%
- 1983.....23,6%
- 1990.....28,2%
- 2004.....37,3%
- Plan for 2010.....43%

Source: MARD (Ministry of Agriculture and Rural Development

FAO 2001.....30,2%

UNEP 2005....deforestation - 0,5%/year

Figure 2.1 Changes in Composition of Natural Forests, 1990-2004

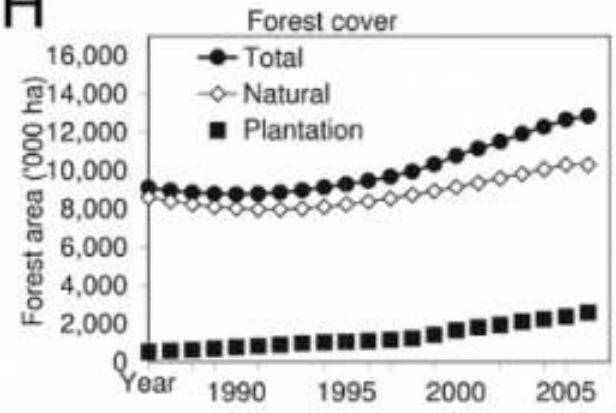


Source: FIPI/ MARD, 2005

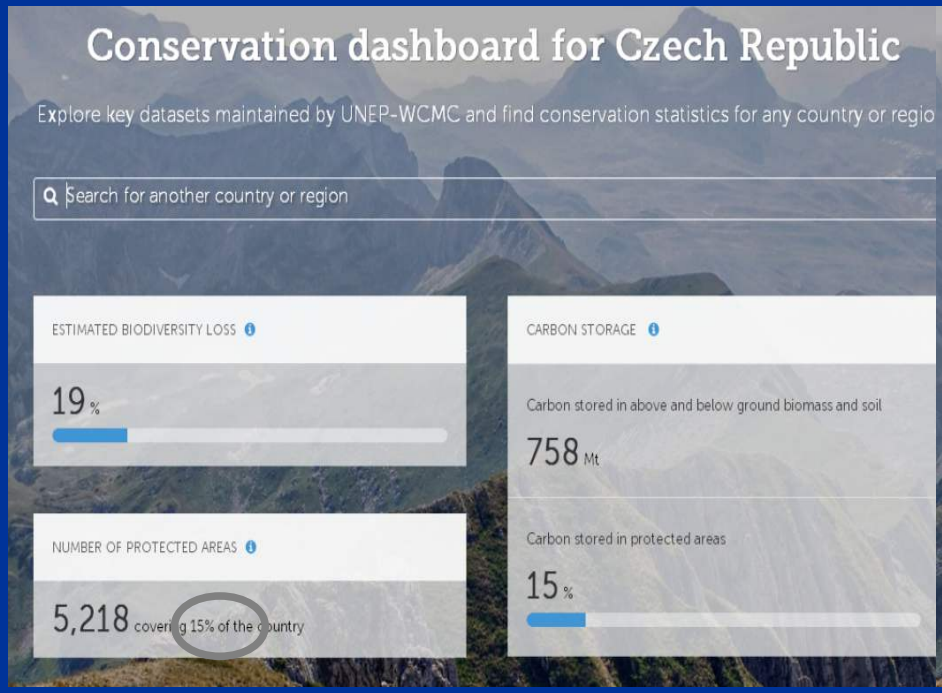
[30] MARD. 2005. National Report to the Fifth Session of the United Nations Forum on Forests. Vietnam, January 2005

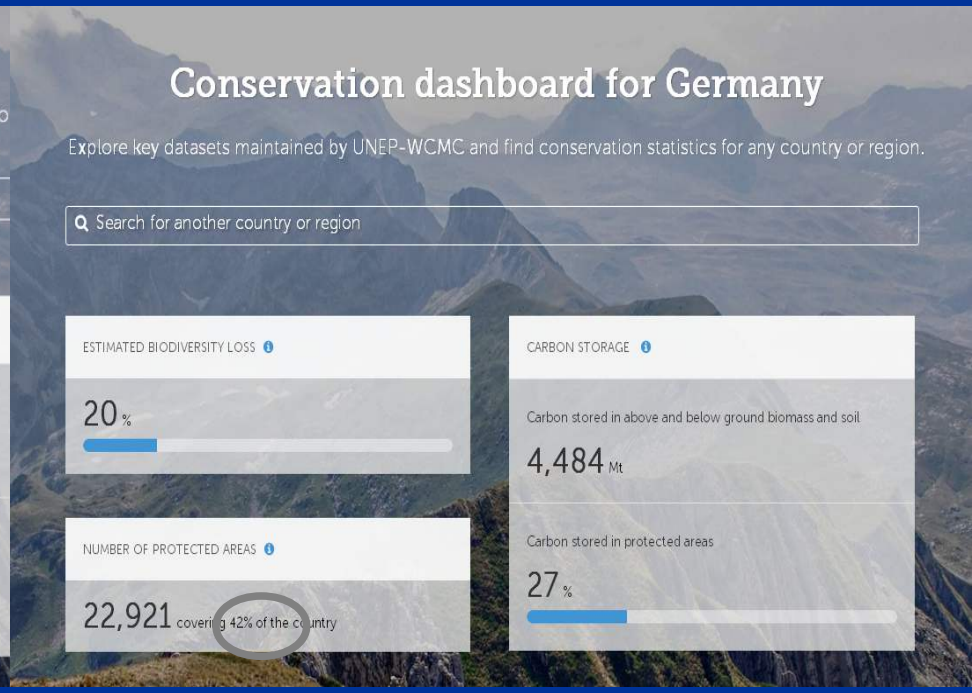
REDD-Monitor: *On the mongabay.com website, Rhett Butler writes that "According to the U.N. Food and Agriculture Organization Vietnam lost a staggering 78 percent of its old-growth forests between 1990 and 2005." Yet a graph in your paper (fig 2H) shows the area of natural forest cover increasing slightly from 1990 to 2005. Could you please explain this apparent discrepancy.*

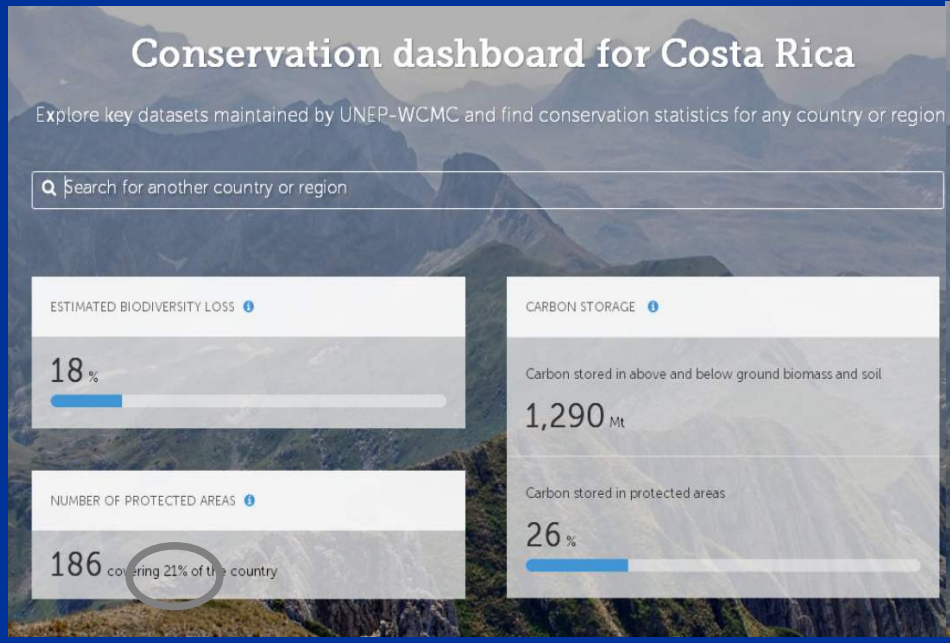
H

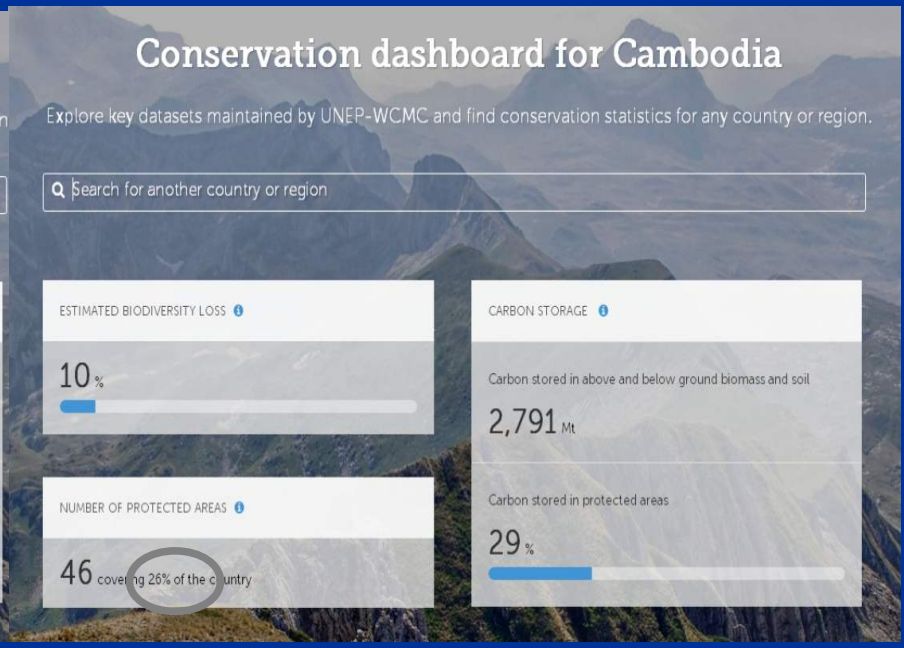


Patrick Meyfroidt: Old-growth forests were indeed still deforested and degraded in Vietnam during this period, mainly in the central highlands, but secondary regrowth expanded during the same period. The total area of natural forests thus increased, although the wood density and the biodiversity richness of Vietnam's forests were still decreasing. This, however, does not mean that the secondary forests in Vietnam have no value for biodiversity, environmental services or cultural or livelihoods aspects. The secondary regrowth may play a role in the preservation of biodiversity of old-growth remnants, and may also contribute to the livelihoods of local people. In the north especially, there are forests which are not included in the "old-growth" category anymore (in the FIPI data used by the FAO) because they have been degraded by logging but nevertheless they are still rich


Conservation dashboard for Czech Republic
Explore key datasets maintained by UNEP-WCMC and find conservation statistics for any country or regio
Search for another country or region
ESTIMATED BIODIVERSITY LOSS
19 %
CARBON STORAGE
Carbon stored in above and below ground biomass and soil
758 Mt
Carbon stored in protected areas
15 %
NUMBER OF PROTECTED AREAS
5,218 covering 15% of the country


Conservation dashboard for Germany
Explore key datasets maintained by UNEP-WCMC and find conservation statistics for any country or region.
Search for another country or region
ESTIMATED BIODIVERSITY LOSS
20 %
CARBON STORAGE
Carbon stored in above and below ground biomass and soil
4,484 Mt
Carbon stored in protected areas
27 %
NUMBER OF PROTECTED AREAS
22,921 covering 42% of the country


Conservation dashboard for Costa Rica
Explore key datasets maintained by UNEP-WCMC and find conservation statistics for any country or region
Search for another country or region
ESTIMATED BIODIVERSITY LOSS
18 %
CARBON STORAGE
Carbon stored in above and below ground biomass and soil
1,290 Mt
Carbon stored in protected areas
26 %
NUMBER OF PROTECTED AREAS
186 covering 21% of the country


Conservation dashboard for Cambodia
Explore key datasets maintained by UNEP-WCMC and find conservation statistics for any country or region.
Search for another country or region
ESTIMATED BIODIVERSITY LOSS
10 %
CARBON STORAGE
Carbon stored in above and below ground biomass and soil
2,791 Mt
Carbon stored in protected areas
29 %
NUMBER OF PROTECTED AREAS
46 covering 26% of the country

protected planet

Viet Nam, Asia

206 Protected Areas

Compare Countries

Protected Areas Value

25,153 km²

21,467 Km² Land - 3,686 Km² Marine

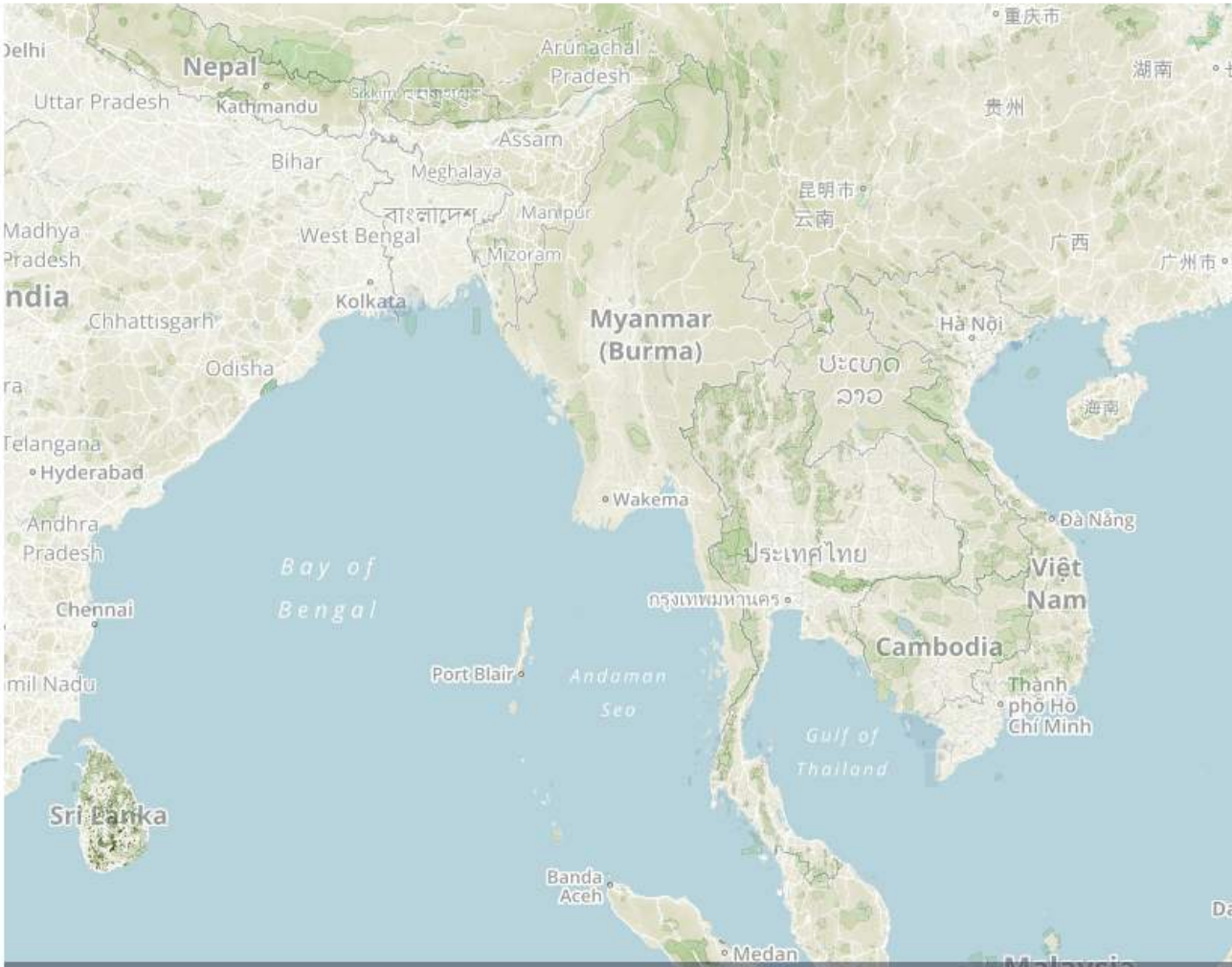
7% Protected

7%	1%
Land Area Protected	Marine Area Protected
329,873 Km² Land Area	660,496 Km² Marine Area
21,467 Km² Protected	3,686 Km² Protected

Conservation Statistics

206 Protected Areas

7% Protected



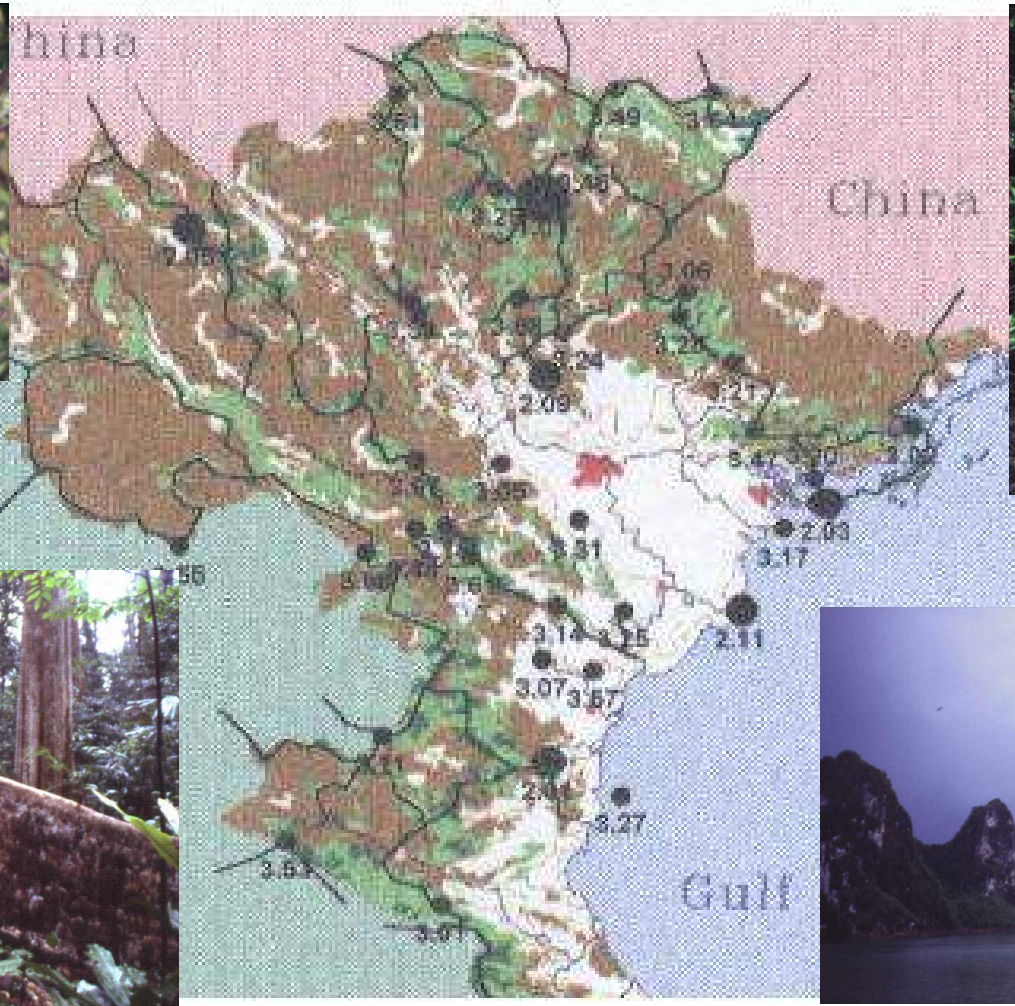
The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Se
city or area or of its authorities, or concerning the delimitation of its frontiers o

Vietnam

30 national parks

2,93% of country

Vietnam – Ecological Network Proposal (Jelinek, 1998)



Methods

The Ecological Network in the Czech (and Slovak) republic

- the idea developed in late mid-eighties
- the first research planting in late eighties
- practically used only after 1992 when the "Nature and Landscape Protection Act" was implemented in Czech republic
- theoretically also applied in late eighties in Cuba (supraregional network of Cuba – Buček, Lacina)

TOPOL GIS used to undertake landuse change analysis

What is Ecological Network?

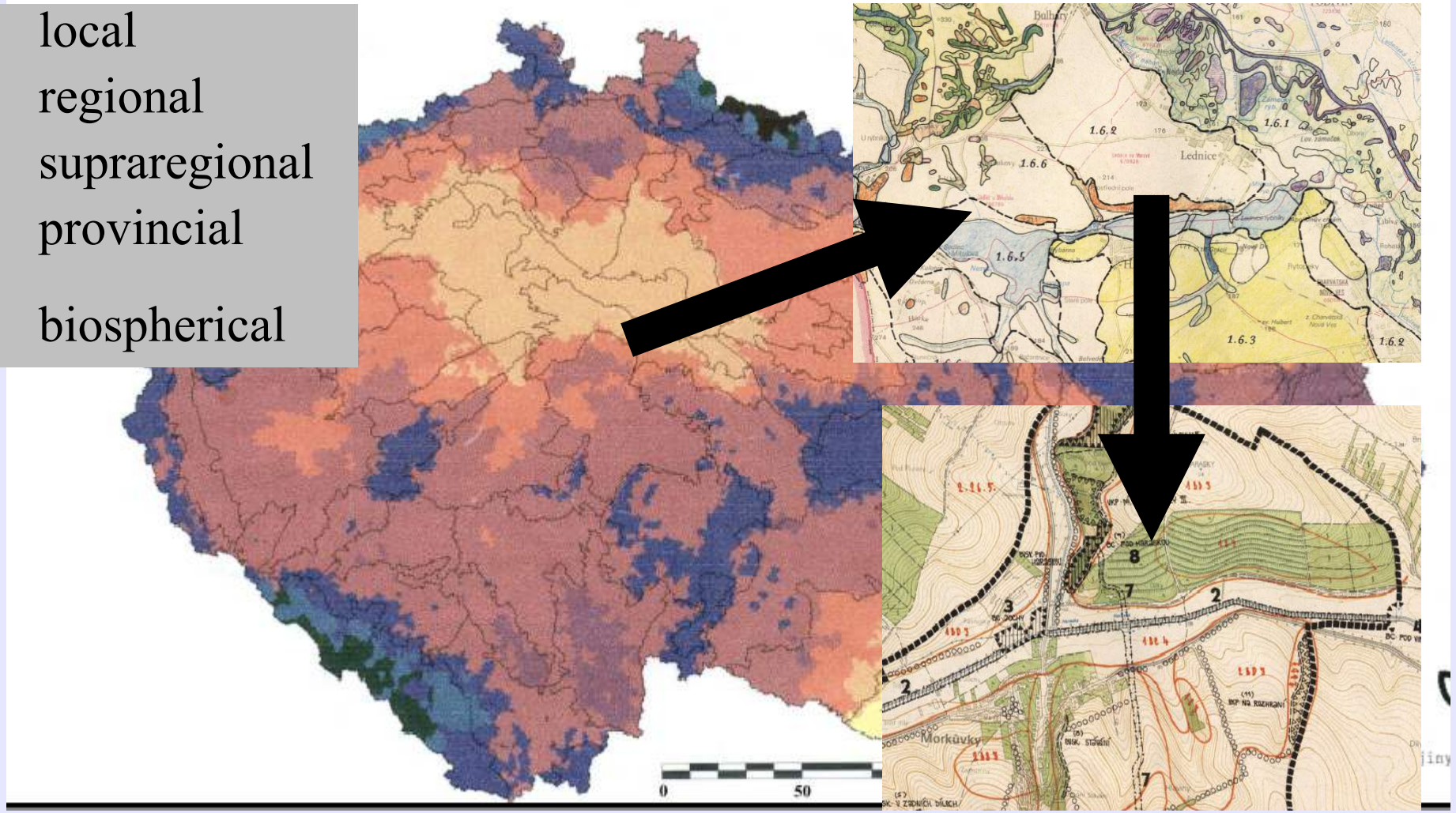
- The shortage of stabilizing elements in the cultural landscape - land surfaces with the natural or near-natural biota brought us to the concept of Ecological Network
- It consists of all the existing but also proposed ecologically significant landscape segments and the conection between them

Ecological Network consist of:

- Biocentres (enables the sustained existence of natural or near – natural biota)
- Biocorridors (enables the migration of biota between the biocentres)
- Buffer zones and interacting elements

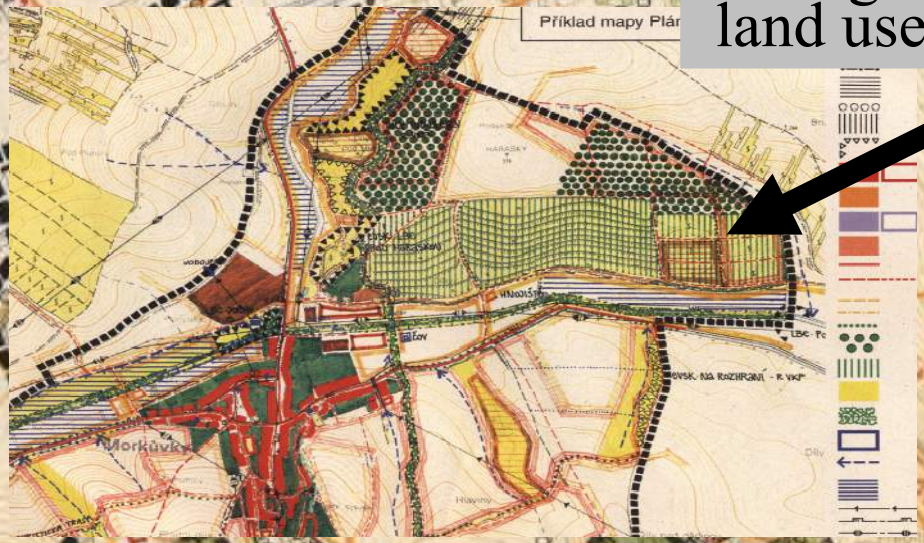
Levels of Ecological Network:

- local
- regional
- supraregional
- provincial
- biospherical

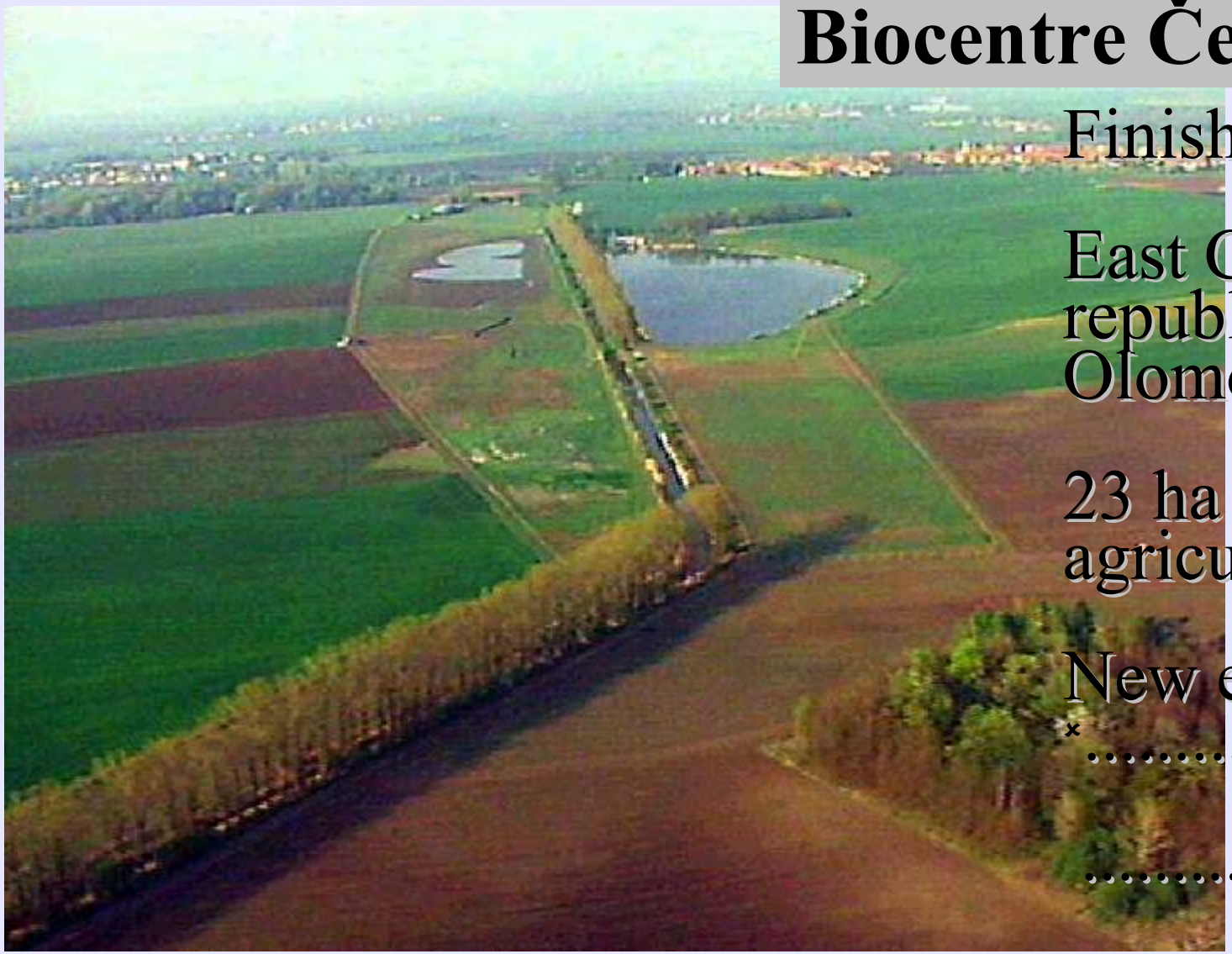


Local ecological network project

Ecological network in the village land use planning



LEGENDA



Biocentre Čehovice

Finished in 2000

East Czech republic near Olomouc

23 ha in former agricultural land

New ecosystems:

- .....forest
- .....grassland
- .....wetland

Vietnam Ecological Network Propsal

1. Map of potential veg.
2. Map of land use
3. Landscape change map
4. Protected areas map

ECOLOGICAL NETWORK

čtvrtohorní aluvia

křídové a svrchnokarbonní usazeniny

kambrické a jurské vápence

pliocenní a čtvrtohorní čediče na nichž se vyvíjejí červené půdy

bazické vyvřelé horniny (gabra, dolerity, peridotolity, serpentiny)

kyselé vyvřelé horniny (granity, ryolity, ruly)

0 40 80 120 160 200 km

Qua

Aïlao

PLATEAU DES BOLOVENS

Bassac

Attopeu

Khong

Binh-dinh

Quinhon

Stung-treng

Siem-reap

Battambang

Lac

Kg. thom

Pursat

Samboc

DARLAC

B. Methuot

Kratié

N'ha Trang

Mékong

PHNOM-PENH

Tay-ninh

Phan Rang

Cap Padaran

Binh-thuan

Bien-hoa

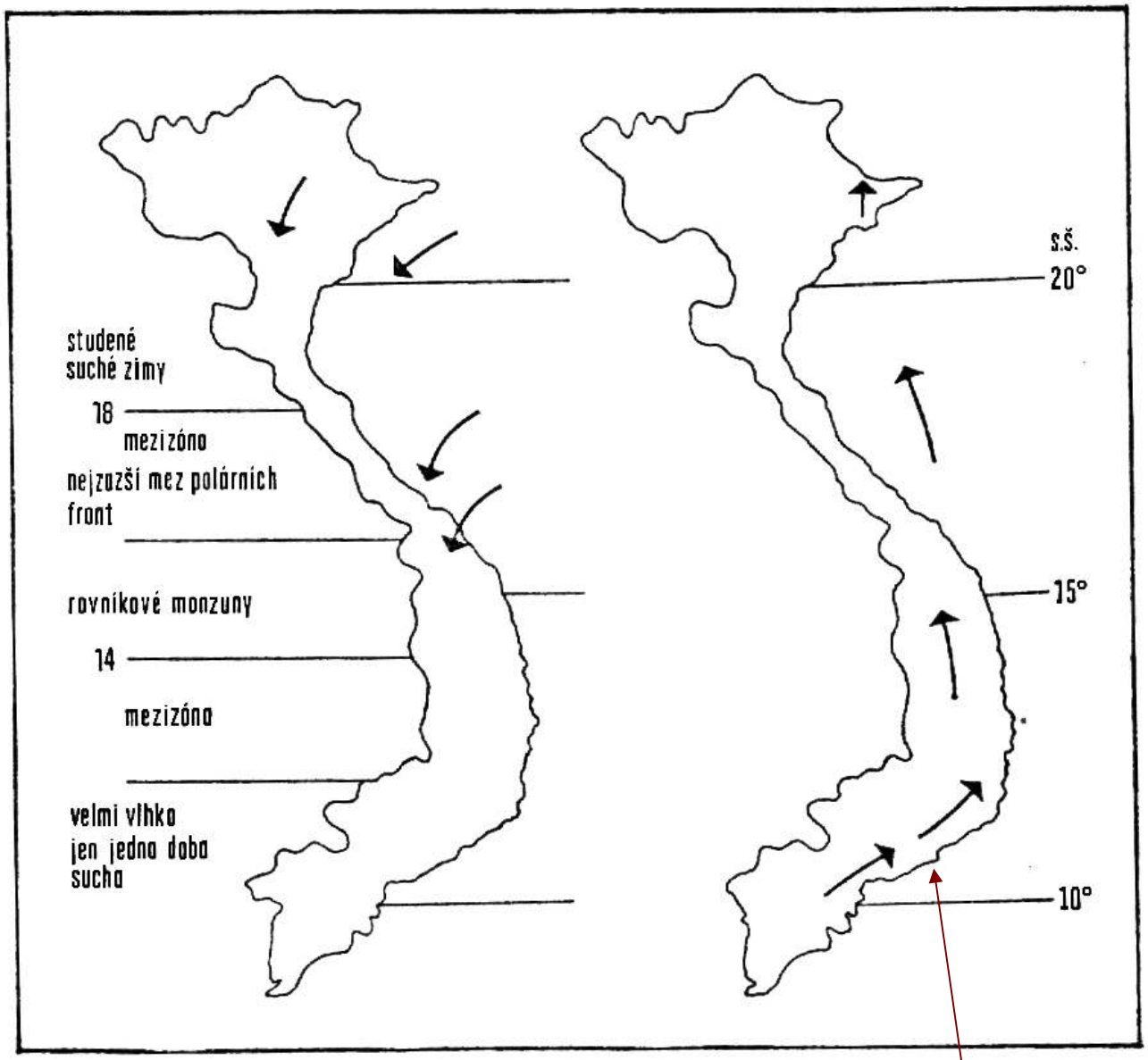
Chaudoc

SAIGON

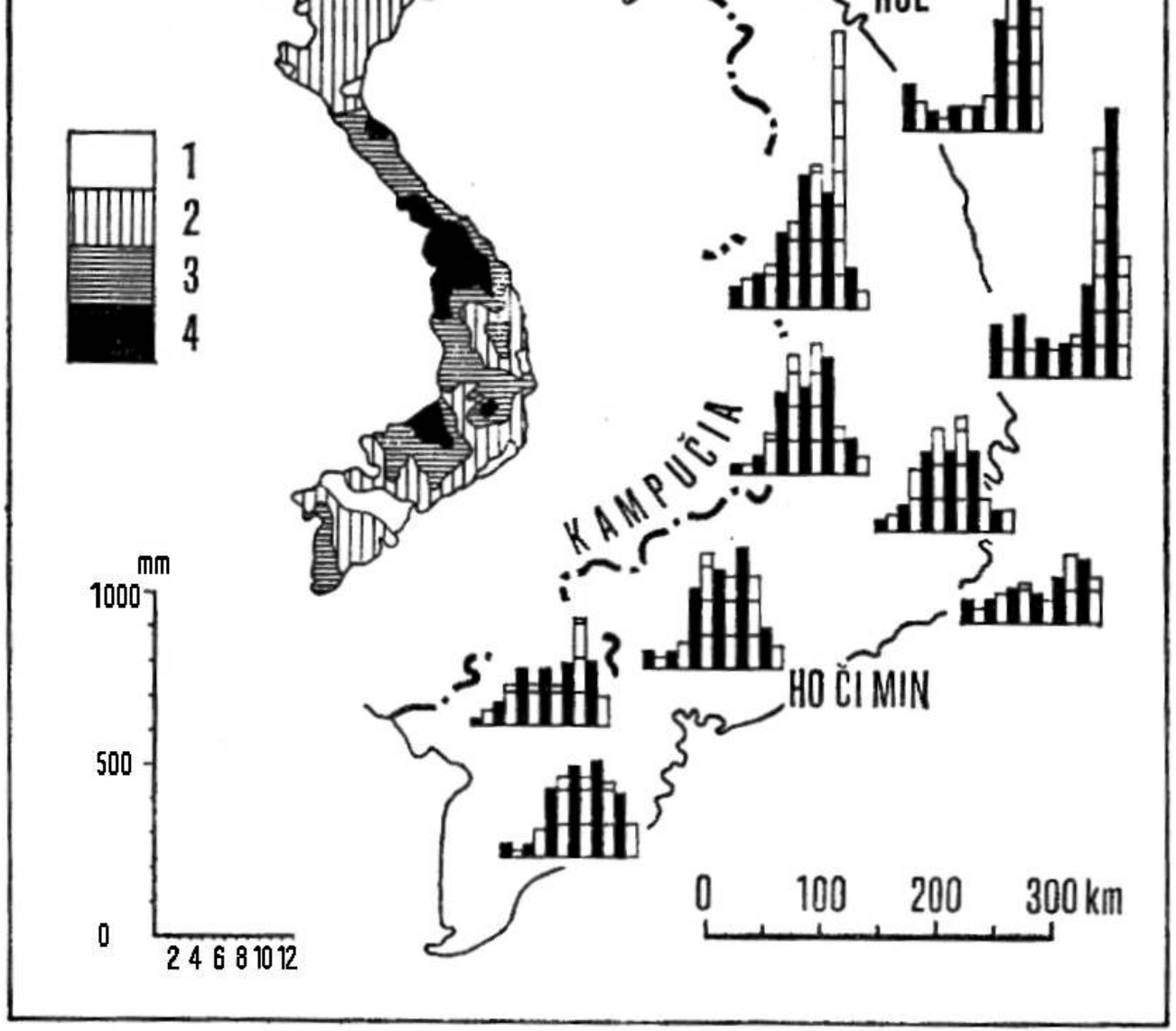
Kampot

Baria

Cap St. Jacques

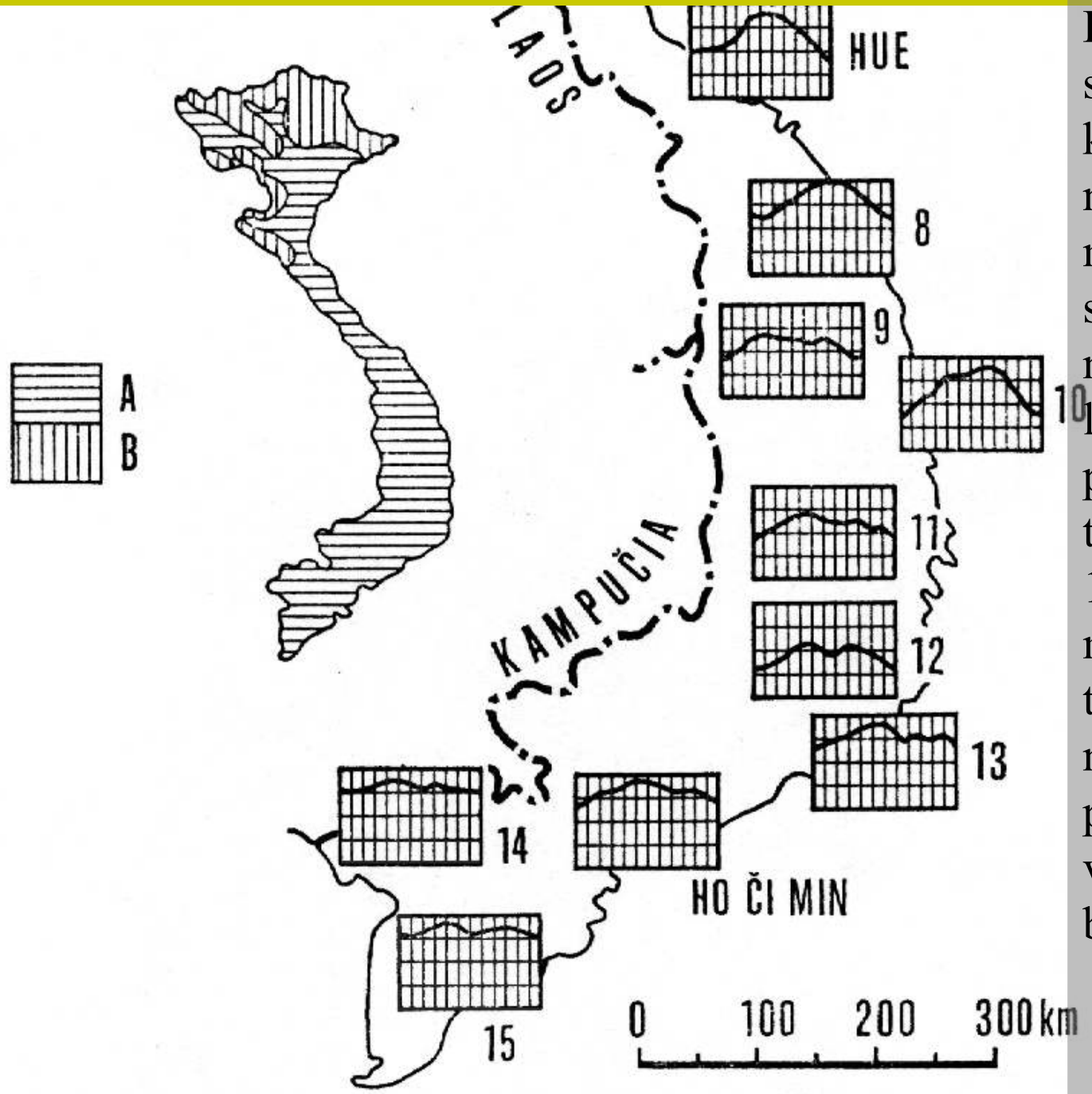


Celá oblast je vystavena působení jihozápadních letních monzunů



Obr. 6 Srážky v jednotlivých měsících roku na týchž stanicích jako na obr. 5. Vlevo - úhrn ročních srážek: 1 - do 1000 mm, 2 - od 1000 do 2000 mm, 3 - od 2000 do 3000 mm, 4 - nad 3000 mm. (Šerý a Votrubec 1988)

1000 až 2000 m n.m. se srážkovým úhrnem asi 1500 - 2000 mm ročně



Průměrné teploty se pohybují kolem 17 C s nejteplejším měsícem květnem s 18,5 C a nejchladnějším lednem s průměrnou teplotou kolem 15.5 C. V zimních měsících může teplota v nejvyšších polohách klesnout výjimečně až na bod mrazu.

Map of potential vegetation of Vietnam

green colour: ***moist forest***

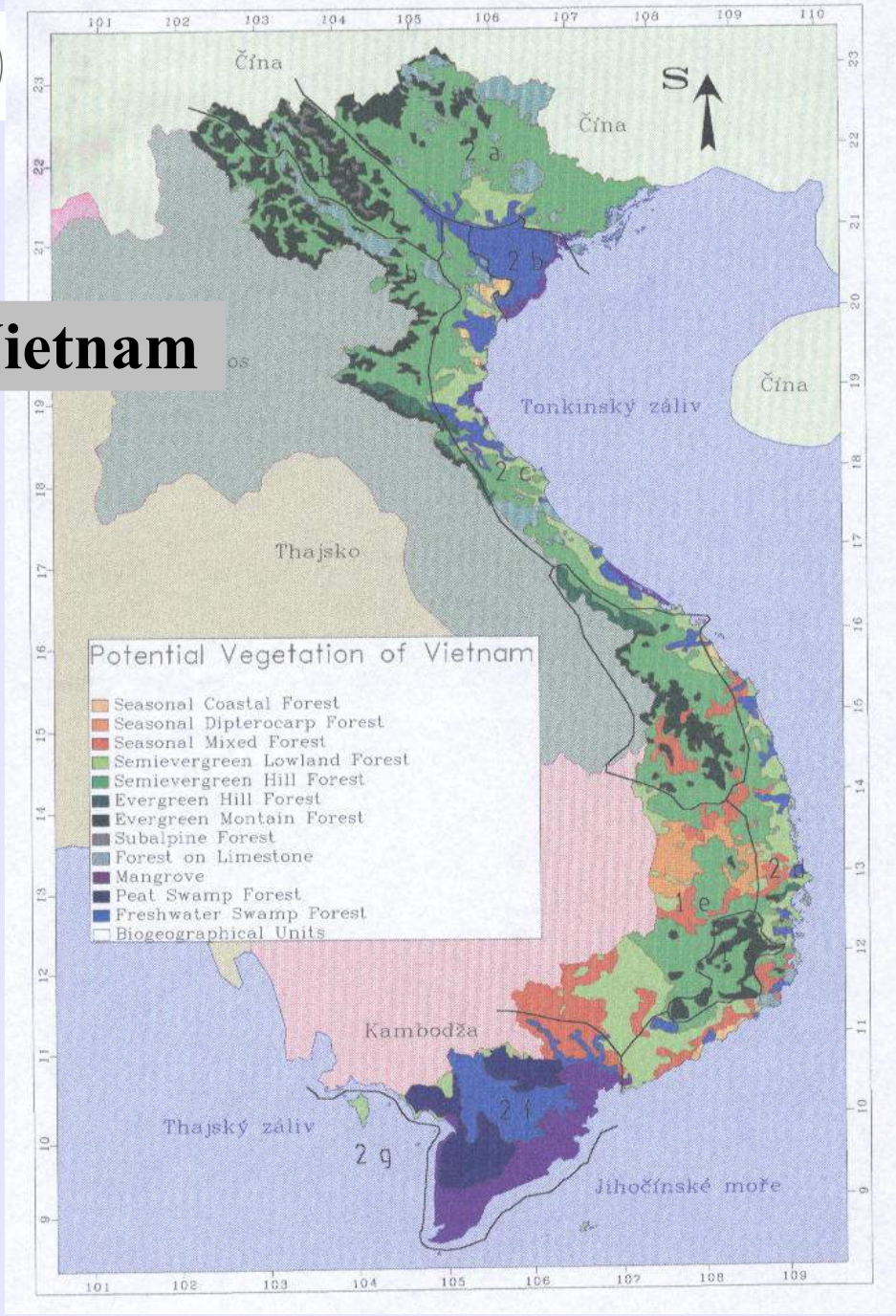
red colour: ***dry forest***

dark blue colour: ***wetlands***

light blue colour: ***limestone veget.***

grey colour: ***subalpine vegetation***

Source: FIPI, GEF map



Land use map of Vietnam

white colour: ***agricultural land***

brown colour: ***abandoned land***

green colour: ***moist forest***

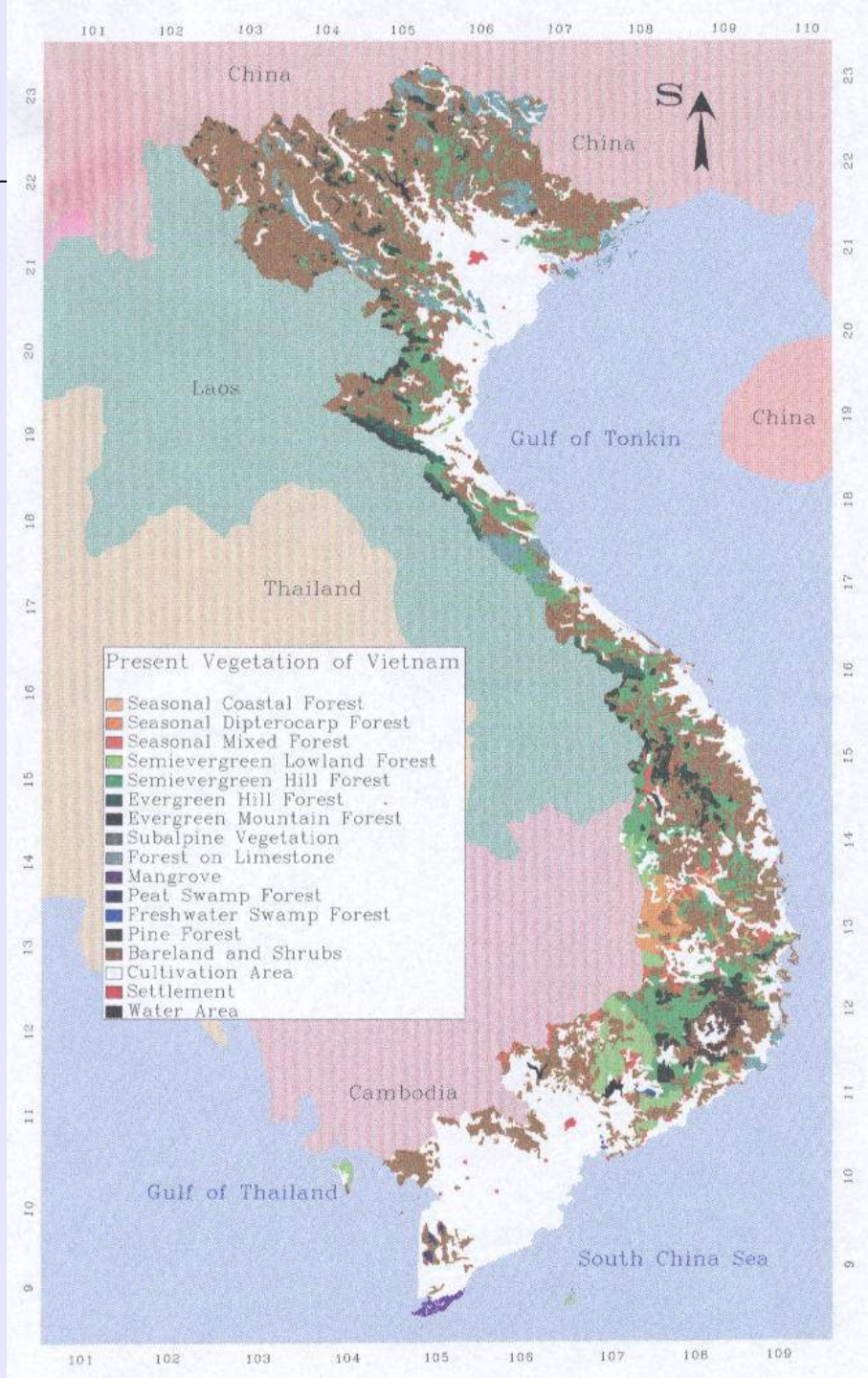
red colour: ***dry forest***

dark blue colour: ***wetlands***

light blue colour: ***limestone veget.***

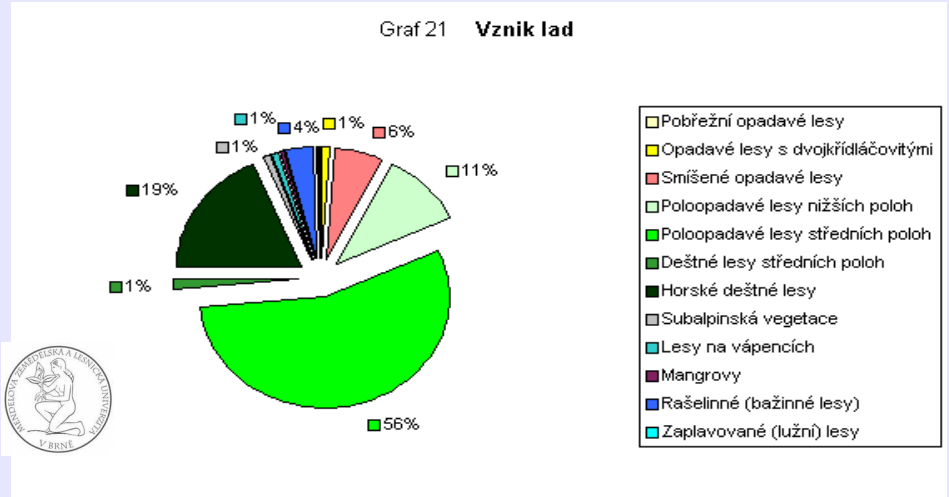
red colour: ***urban area***

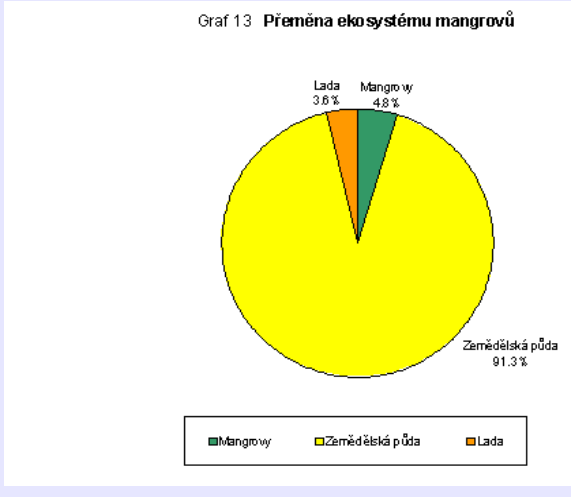
Source: FIPI, GEF map



Land use analysis

		Km2	%
0	Natural communities	22300	6,7
1	Seminatural communities	62900	19
2	Pine monocultures	3100	0,9
3	Abandoned land	132200	39,9
4	Cultivated land	109200	33
5	Reservoirs	800	0,3
6	Urban areas	800	0,3





Landscape change map

7 degree scale of landscape conversion

0 – 2 moreless stable ecosystems

3 – 7 moreless unstable ecosystems

0. dark green colour: ***natural forest***

1. light green colour: ***secondary forest***

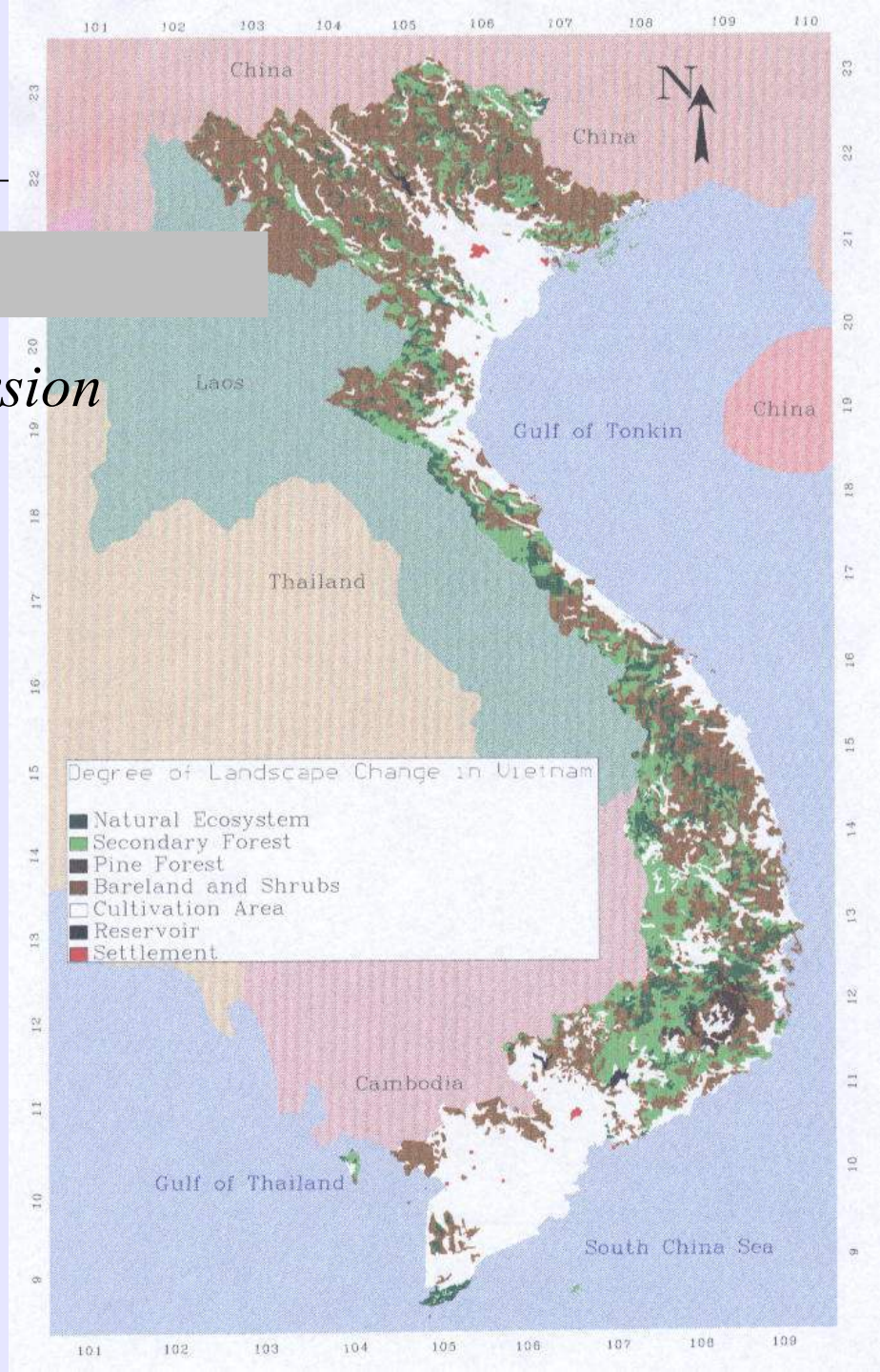
2.dark brown colour***: pine forest***

3.light brown colour: ***abandoned bare land and shrub***

4.white colour***: cultivation area***

5.blue colour: ***reservoir***

6. red colour: ***settlement***



Protected areas system

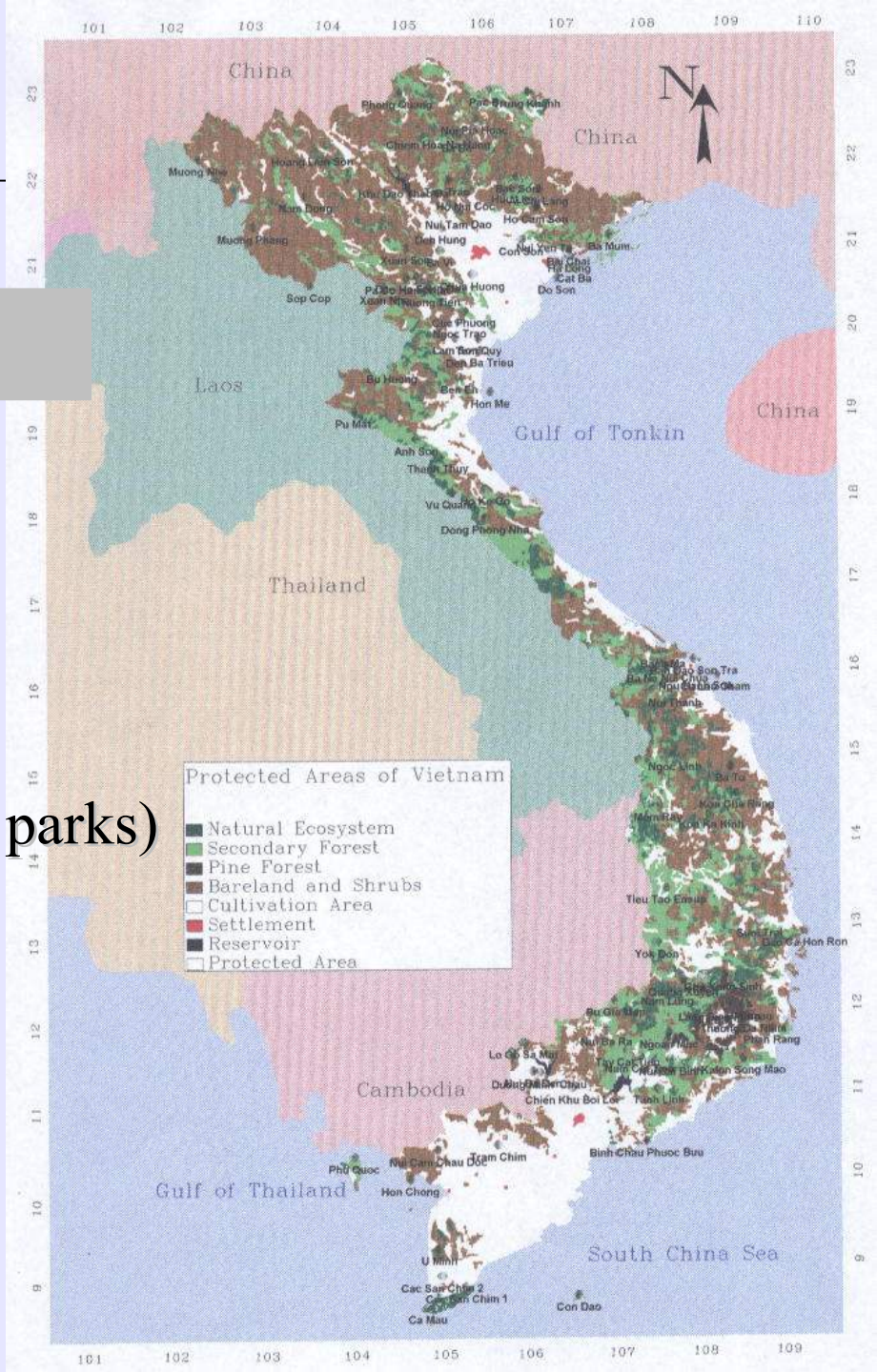
28 national parks

59 nature reserves

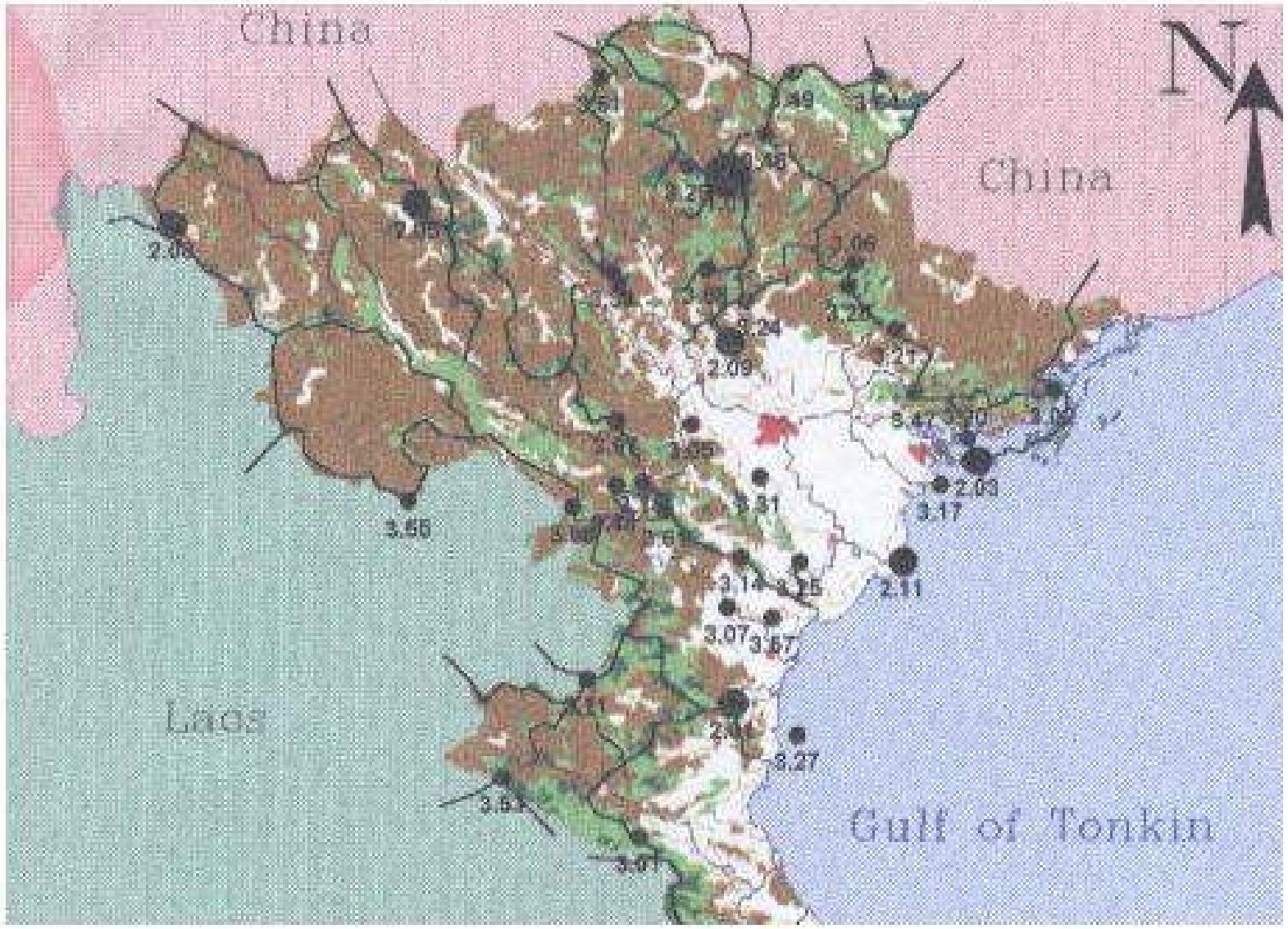
39 landscape protected areas

2 541 675 ha (957 330 ha – national parks)

nearly 7% protected

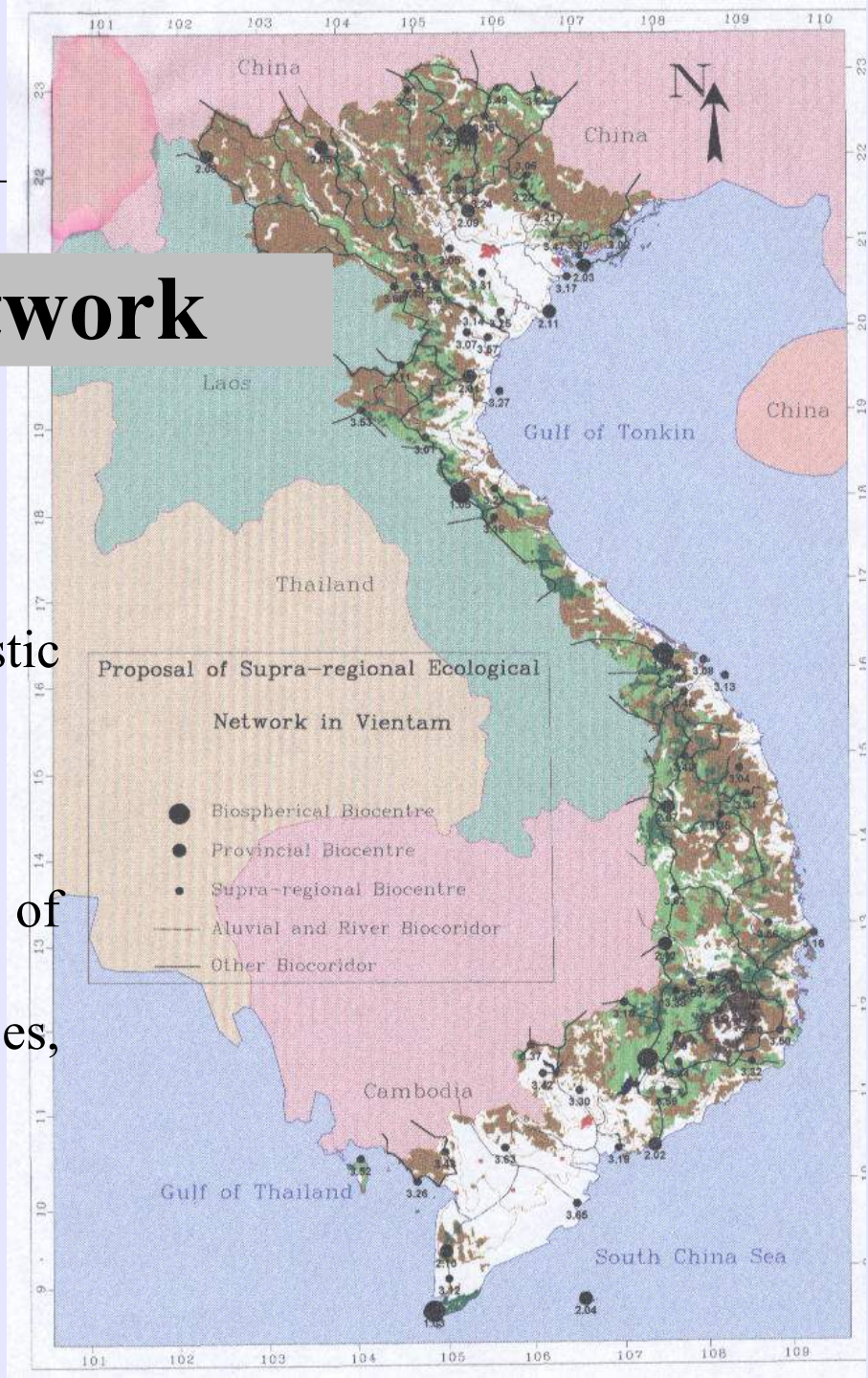


The proposal of the supra-regional ecological network of Vietnam



Proposed ecological network

- Proposed all together 84 biocentres
- 5 biosphere biocentres (characteristic ecosystems of Indochina, min. 100 000 ha
- 12 provincial biocentres (characteristic of individual biogeographical sub-provinces, min. 10 000 ha
- 67 supraregional biocentres



Děkuji za pozornost