

# The Danube Region

M. Breiling

The DANUBE Region: Current Role of the European  
Water Framework Directive and Possible Role of  
European Landscape Directive.

Meinhard Breiling

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## Structure of Presentation

- Part 1: Introduction to Danube Region, Water and Landscape.
- Part 2: Flashlights on Serbia, Romania, Moldova
- Part 3: Understanding Frameworks of Water and Landscape and their Role in Regional Sustainability

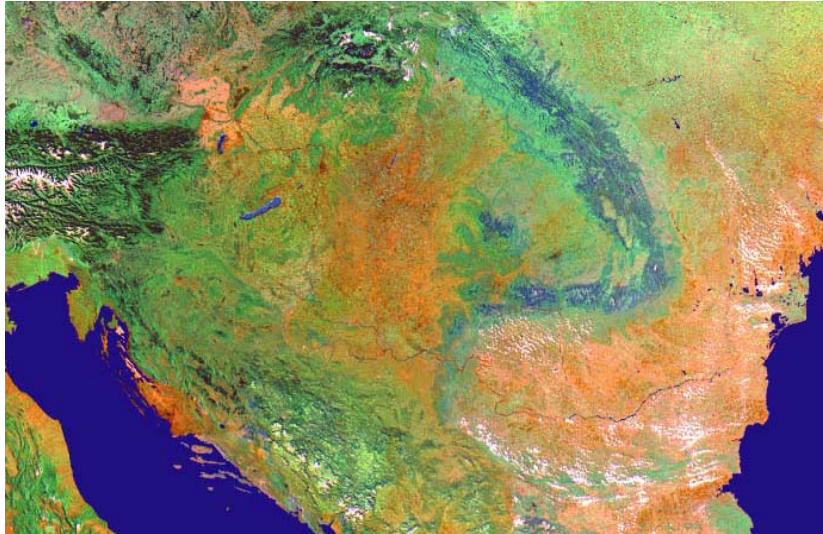
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## Why I am interested in this topic?

- Many planning problems are influenced via WFD
  - Common guidelines instead of individual ones!
  - Supervising diploma works directed to water framework directive
- Former general secretary of IAD, International Association for Danube Research (2000-2006)
  - Water quality map on sapro-biological base
  - Sturgeon Action plan
- Consultative Role of TUW in European Landscape Convention
  - An initiative of Council of Europe
  - Based on Organisation of Local Authorities in Europe
  - A Connection to EU-WFD can be made.
- Main questions for next years
  - What is a good standard of water quality?
  - How to improve the ecological quality of water bodies?
  - How to bring in the European landscape convention?

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## Danube Region



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## Different Conditions Within Danube Basin From Mountains.....



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.....to flatlands (sometimes floodlands)



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## Danube Region Physical Properties

- 22nd largest river basin with 815,000 km<sup>2</sup>
- 27th longest river with 2850 km
- 0.2% of global surface
- 0.5% of global landscape

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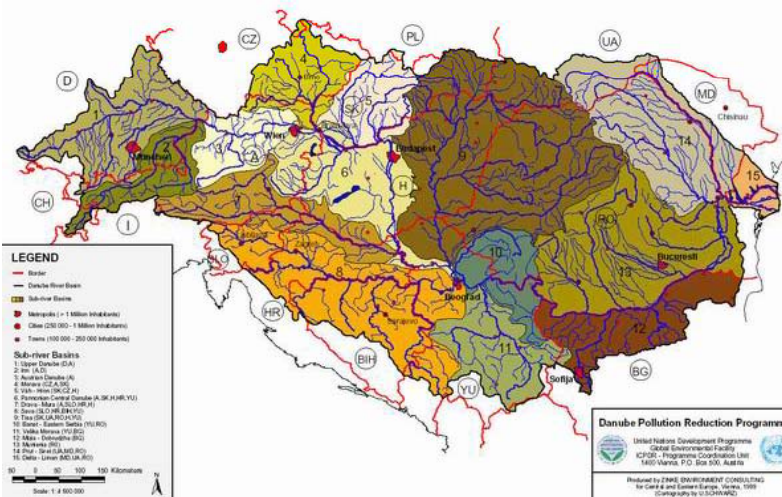
# Waterflow in Danube Region

- 550 km<sup>3</sup> water equivalent precipitation
  - 0.5% of global precipitation
  - 680 mm average precipitation
- 280 km<sup>3</sup> evapotranspiration
  - 0.4% of global evapotranspiration
  - 9° C average annual ± 10° C monthly variations
- 270 km<sup>3</sup> river runoff
  - 0.7% of global run off
  - 6,400 m<sup>3</sup> mean discharge per second
  - 19 million tons sediments
  - 60 million tons sediments dissolved

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## 15 smaller sub-watersheds of Danube River

### Danube Sub-river Basins



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## Danube Region Population Properties & Water Demand

- Some 90 million inhabitants
  - 1.5% of global population
  - < 100 per km<sup>2</sup>
  - < 600 l per day and person freshwater demand
- 20 km<sup>3</sup> water for human uses
  - Less than 5% of precipitation
  - Less than 10% of river run-off
  - Seasonal distribution can be a problem
    - Drought in many areas of Danube river basin e.g. in 2000
    - Flood events in many areas of Danube river basin e.g. in 2002

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## Danube Region Contrasts

- Income Disparity
  - 30,000 US\$ in Switzerland (1999)
  - 500 US\$ in Molavia (1999)
  - Appr. 60 times within Danube Region
  - Appr. 4 times within European Union
- Three subregions
  - Upstream A, Ch, D
  - Central CR, SLO, SK, HU, CRO
  - Downstream BiH, BUL, MOL, RO, UKR, YU

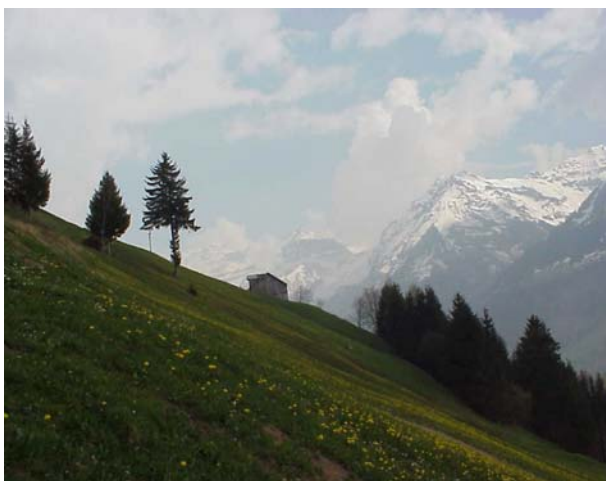
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## Danube Region

- Danube Region includes
  - Mountainous landscapes
  - Coastal landscapes
  - Rural landscapes
  - Fluvial landscapes
- Water defines type of landscape
  - shape of water bodies
  - flows of water

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## Mountain Landscapes



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## Coastal Landscapes



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## Agricultural Landscapes



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## Fluvial Landscapes



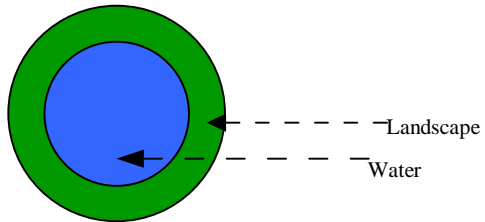
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## Actors in Planning Landscape & Water

- Individuals Using the Land
- Administration
- Science, Art, Intrest Groups

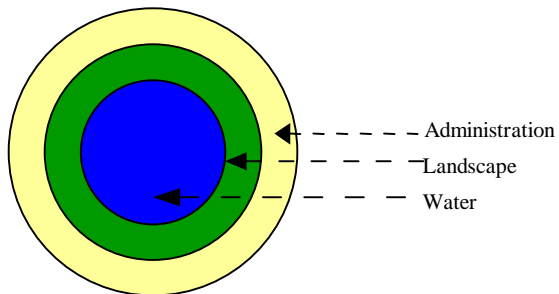
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## Landscape and Water (1)



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## Landscape and Water (2)



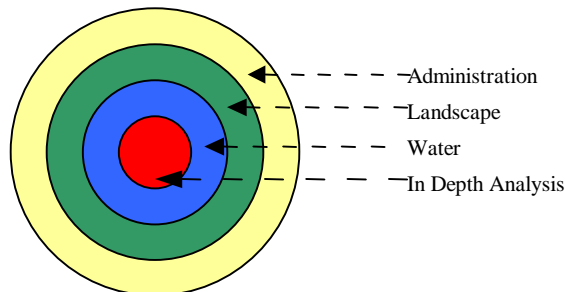
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## Relation Landscape, Water, Administration

- Administrative levels
  - Danube Region, European Union;
    - European Water Directive
    - ICPDR coordinating office
  - Sub-riverbasins, National and Provincial/State Laws
    - Specification of European Water Directive
  - Municipalities
    - Landscape Convention (Council of Europe), Hot spots of EWD

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## Landscape and Water (3)



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## In Depth Analysis

- Science
  - General laws criterion
- Arts
  - Uniqueness criterion
    - cultural heritage, individual expressions
- Influence on
  - administration
  - public opinion
  - development

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## Facts of E15

(Data 2000-03)

| EU 15 Countries | Area in km <sup>2</sup> | Population       | Density km <sup>2</sup> | Per caput inco. | Per ha income | BIP in 1,000,0€  | Share in BIP of |
|-----------------|-------------------------|------------------|-------------------------|-----------------|---------------|------------------|-----------------|
| Austria         | 83858                   | 8098000          | 97                      | 25220           | 24354         | 204232           | 2.48%           |
| Belgium         | 32545                   | 10252000         | 315                     | 24540           | 77303         | 251584           | 3.06%           |
| Danmark         | 43096                   | 5340000          | 124                     | 32280           | 39998         | 172375           | 2.09%           |
| Finnland        | 338144                  | 5180000          | 15                      | 25130           | 3850          | 130173           | 1.58%           |
| France          | 543965                  | 58850000         | 108                     | 24090           | 26062         | 1417697          | 17.22%          |
| Germany         | 357022                  | 82150000         | 230                     | 25120           | 57801         | 2063608          | 25.07%          |
| Greece          | 131957                  | 10560000         | 80                      | 11960           | 9571          | 126298           | 1.53%           |
| Great Britain   | 242910                  | 59739000         | 246                     | 24430           | 60081         | 1459424          | 17.73%          |
| Ireland         | 70273                   | 3794000          | 54                      | 22660           | 12234         | 85972            | 1.04%           |
| Italy           | 301336                  | 57679000         | 191                     | 20160           | 38588         | 1162809          | 14.12%          |
| Luxemburg       | 2586                    | 438000           | 169                     | 42060           | 71239         | 18422            | 0.22%           |
| Netherlands     | 41526                   | 15919000         | 383                     | 24970           | 95723         | 397497           | 4.83%           |
| Portugal        | 92345                   | 10010000         | 108                     | 11120           | 12054         | 111311           | 1.35%           |
| Sweden          | 449964                  | 8869000          | 20                      | 27140           | 5349          | 240705           | 2.92%           |
| Spain           | 504782                  | 39450000         | 78                      | 15080           | 11785         | 594906           | 7.23%           |
| <b>Summe</b>    | <b>3152451</b>          | <b>368230000</b> | <b>117</b>              | <b>0</b>        | <b>0</b>      | <b>8232780.8</b> | <b>100.00%</b>  |

Source: Fischer Weltatlas 2003; Data from 2000;

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## Facts of Danube Region

(Data 2000-03)

| Danube Countries            | Area in km <sup>2</sup> | Population       | Density k  | Per caput inc. in US\$ | Per ha income US\$ | BIP in 1,000,000 US\$ | Share in BIP   |
|-----------------------------|-------------------------|------------------|------------|------------------------|--------------------|-----------------------|----------------|
| Austria                     | 83858                   | 8098000          | 97         | 25220                  | 24354              | 204232                | 7.28%          |
| Bosnien-Herzegowina         | 51129                   | 3923000          | 77         | 1230                   | 344                | 4825                  | 0.17%          |
| Bulgaria                    | 110994                  | 8167000          | 74         | 1520                   | 1118               | 12414                 | 0.44%          |
| Croatia                     | 56542                   | 4460000          | 79         | 4620                   | 3644               | 20605                 | 0.73%          |
| Czech Republic              | 78866                   | 10273000         | 130        | 5250                   | 6839               | 53933                 | 1.92%          |
| Germany                     | 357022                  | 82150000         | 230        | 25120                  | 57801              | 2063608               | 73.58%         |
| Hungary                     | 93030                   | 10022000         | 108        | 4710                   | 5074               | 47204                 | 1.68%          |
| Moldova                     | 33800                   | 4264000          | 126        | 400                    | 505                | 1706                  | 0.06%          |
| Rumania                     | 238391                  | 22435000         | 94         | 1670                   | 1572               | 37466                 | 1.34%          |
| Serbia and Crna Gora        | 102173                  | 10616000         | 104        | 940                    | 977                | 9979                  | 0.36%          |
| Slovakia                    | 49034                   | 5402000          | 110        | 3700                   | 4076               | 19987                 | 0.71%          |
| Slovenia                    | 20253                   | 1988000          | 98         | 10050                  | 9865               | 19979                 | 0.71%          |
| Switzerland                 | 41285                   | 7180000          | 174        | 38140                  | 66330              | 273845                | 9.76%          |
| Ukraine                     | 603700                  | 49600000         | 82         | 700                    | 575                | 34720                 | 1.24%          |
| <b>All Danube countries</b> | <b>1920077</b>          | <b>228578000</b> | <b>119</b> | <b>0</b>               | <b>0</b>           | <b>2804503.85</b>     | <b>100.00%</b> |

Source: Fischer Weltatmanach 2003; Data from 2000;

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## Flashlight: Serbia

- Serbia, Montenegro, Kosovo today (2009) three individual states
  - The map refers to situation in 2005, when the three states were united
  - The three states were reminder of former Yugoslavia
    - Counter development to EU
    - Ever more borders
  - Still difficult political situation inside
  - Income levels far beyond 1990 levels
- Population: 10,655,774
- Land Area: 102,173 km<sup>2</sup>
  - arable land: 36%
- Some of the best agricultural soils
  - No starvation, even during war
  - Large areas would qualify for organic farming



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### Overcoming Consequences of War



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### Some of Europe's best soils



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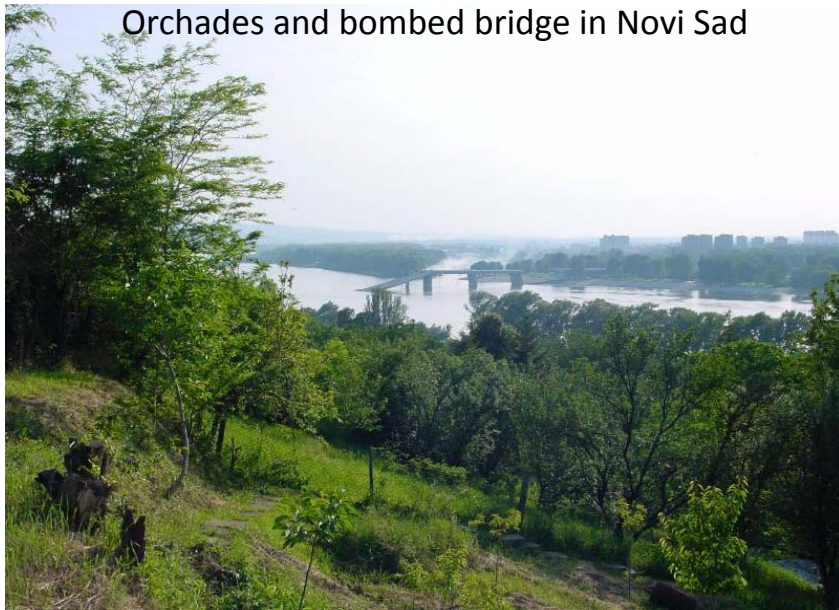


A small farmhouse



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Orchards and bombed bridge in Novi Sad



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### Fisherman along the Danube



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### Good Potential for Tourism



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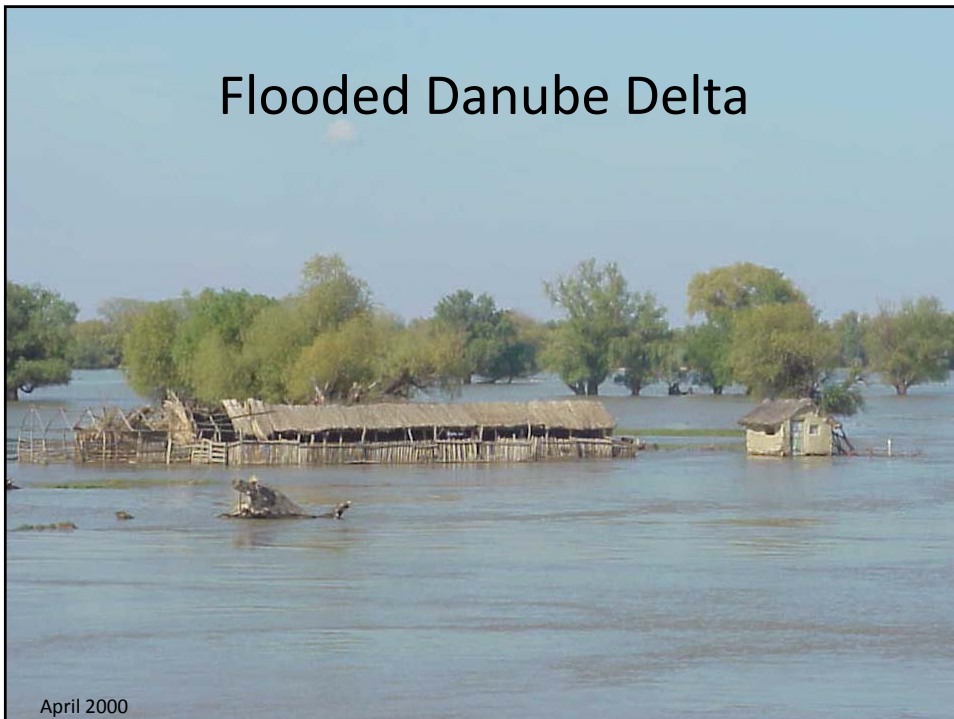
## Flashlight Romania

- Population: 22 million
- Land area: 237,500km<sup>2</sup>
  - Water 3%
  - Arable land 41%
    - Irrigated 30% of arable
- Entered EU in 2007
- Entered NATO in 2004



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## Flooded Danube Delta



April 2000

## Sturgeon Program

- Migrating anadromous sturgeon research at Danube Delta Institute
  - Lead bio-indicator of ecological quality in Danube region
  - Extinct in Upper Danube due to Iron Gates (I+II)
    - Disturbed eco-morphology in upper Danube
    - Endangered in Lower Danube Countries due to enormous prices on black market



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## Danube Delta National Park



- No roads
  - Boats for transportation
- Enormous biodiversity
  - Currently chicken flue as major threat

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## Danube Delta National Park, Land Use



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## Tulcea



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## Bird Flue Virus: Still alive?



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## Flashlight: Moldova

- Population: 4.5 million
- Land Area: 33,843km<sup>2</sup>
  - Water 1.5%
  - Arable land 53.3%
    - Irrigated 20% of arable
- Follower State of former U.S.S.R.
  - Poorest country in Europe
    - Over 50% agricultural GDP
  - Majority Moldovians (Rumanian),
  - Minority Russian, Ukrainian,
    - Transnistria Conflict



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## Main Road to Chisinau



Empty roads  
No money for gasoline  
Winter start, Nov. 2004  
One client can save the day  
This day she had at least two.  
Widely subsistence agriculture  
> 50 km from centres  
unprofitable

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## Moldova Agriculture



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Taraulia Artificial Irrigation Lake



Conflict Agriculture Wetlands



## Excursion to Prut (Danube Tributary)



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## The End of the Goose



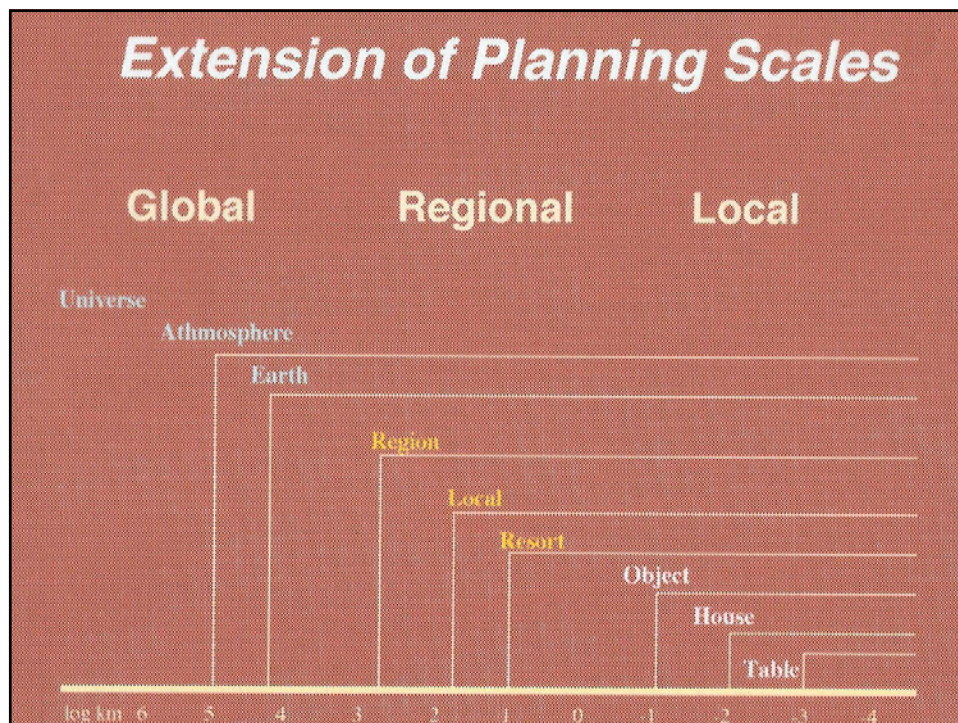
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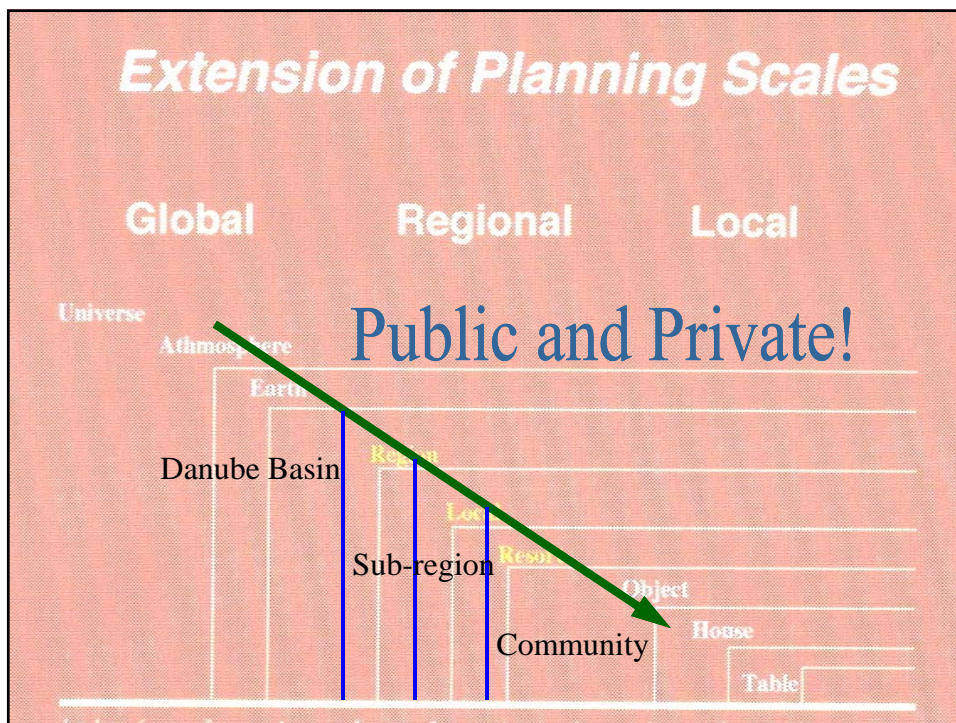
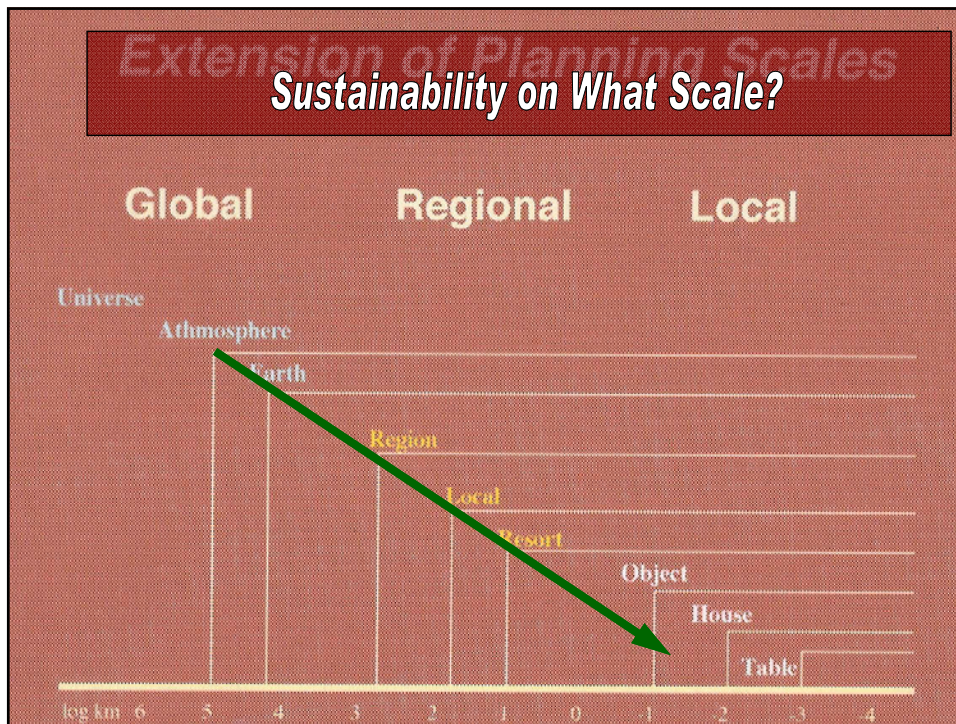
## Aim: Regional Sustainability

- Global, regional and local dimension of sustainability
  - Large contrast within Danube region
- Focus on Landscape and Water
  - European Landscape Convention (2000)
  - European Water Directive (2000)

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## Recommandations

- Combine European water directive with European Landscape Convention to achieve more overall sustainability
  - Best practice approaches need frameworks for upscaling
  - Water directive has legal standing, basis for downscaling
  - Landscape convention has the „local level“ that is needed to make an impact

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## Discussion

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