Natural and technological hazards

- Fields of research and analysis (sample)
  - Natural hazards
    - Floods
    - Landslides/avalanches
    - Forest fires
    - Extreme precipitation
    - Extreme temperatures
  
  - Technological hazards
    - Nuclear power plants
    - Production plants of hazardous goods
    - Hazardous waste deposits

- Not all fields can be elaborated due to lack or unaccessibility of data
Natural and technological hazards

Development of indicators – the case of the flood events

<table>
<thead>
<tr>
<th>Natural and technological hazards</th>
<th>Driving forces</th>
<th>Pressure</th>
<th>State</th>
<th>Impact</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indicators of influence factors on hazards and damage potentials</td>
<td>Indicators of hazards and damage potentials</td>
<td>Indicators of spatial risk / spatial security</td>
<td>Indicators of disaster</td>
<td>Indicators of disaster response / risk management (indicators of prevention, mitigation, preparedness, response, recovery)</td>
</tr>
</tbody>
</table>

**Floods**

- **Growth of population and GDP in areas that have been flooded**
- **Increase of factors that influence floods (e.g. settlement extension, climate change)**
- **Areas that have been flooded**
- **Population density/GDP (in areas that potentially can be flooded)**
- **Combined indicator of Population density/GDP and flooded areas according to flood frequency since 1985**
- **Classification of flooded areas according to flood frequency since 1985**
- **E.g. Building restrictions (retention areas) / safety measures in flooded areas**
Natural and technological hazards

- Dimensions of vulnerability
  - Economic
  - Social
  - Ecological

- Indicators for measuring the damage potential
  - Population density
  - GDP per capita
  - Dependency ratio
  - Education rate
Natural and technological hazards

Large river flood hazards in Europe (NUTS 3)

Luxembourg:
Moderate flood hazard intensity

This map shows the hazard intensity based on average number of large flood events on NUTS 3 level during 1987-2002. Each NUTS3 region has been given an average of the large flood event that fall inside it. To the first class “Very low hazard intensity” only the regions without large flood events are included.
Natural and technological hazards

Flood risk in Europe (NUTS 3)

Luxembourg:
Relatively high flood risk, belonging to category 7.
Natural and technological hazards

Nuclear power plants in Europe (NUTS 3)

Luxembourg: 4-5 reactors
Natural and technological hazards

Luxembourg: relatively high degree of vulnerability, belonging to category IV.
Natural and technological hazards

- Outcome of the project:
  Risk mitigation planning guide (sample)
  - To minimize the impacts of hazards effects
  - To review the hazards of the respective area (region, municipality)
  - To establish goals and objectives
  - To review possible approaches to reduce risk
  - To provide a background document (on the regional level) for local action
Natural and technological hazards

- Policy recommendations (EU level)
  - Better inclusion of risks related to natural and technological hazards in EU policies.
  - More emphasis on prevention and vulnerability reduction through spatial planning.
  - Deliberate use of Structural Funds for risk management.
  - Establish a European Emergency Management Agency (EEMA) for coordinating European risk management efforts.
Natural and technological hazards

Policy recommendations (national, INTERREG)

- Implementation of the Strategic Environmental Assessment directive (2001/42/EC) should be ensured by member states.

- Creation of governance networks to address risk management in regions with special environmental characteristics and related challenges.

- Improve integration and co-operation between spatial planning experts and civil protection authorities.

- Transnational INTERREG areas with common ecological denominators should be used as ‘breeding and testing’ grounds for meso-level risk management programmes.
Natural and technological hazards

- Policy recommendations (regional level)
  - Adopt and implement regional mitigation plans, allowing for “subsidiarity”.
  - Enhance horizontal co-operation between regions and urban areas (e.g. through networks such as Interreg initiatives, EUROCITIES, URBACT etc.) in the fields risk management and civil protection.
  - Enhance public awareness of hazards and public participation in risk reduction efforts.
Natural and technological hazards

Policy recommendations (local, municipal level)

- Adopt local mitigation plans based on the best available knowledge on hazards.
- Accept and enforce the mitigation plan as a guideline for all other municipal activities with a relation to hazard exposure and vulnerability.
ESPON Workshop

ESPON

Project 1.3.2
Central question: What is the influence of the management of natural heritage on spatial development?

- Diagnosis of the principal territorial trends of natural heritage at EU scale
- Cartographic picture of spatial and historic trends
- Development of territorial indicators

Methodology: DPSIR model = Driving Forces, Pressures, States, Impacts, Responses

- Fields of research: agriculture, socio economic and territorial development, infrastructure
Natural heritage

Findings in D&P: Agriculture – Nature

- MACRO:
  - EU policy stimulated land take for intensive use; decreased semi-natural area and biodiversity;
  - CAP reform stimulates rural development: turn of process;

- MESO:
  - National agr. policy strongly dependent from EU policy

- MICRO:
  - International and national agr. policy affect local/regional natural heritage.
Natural heritage

- Findings in D&P: Socio economic and territorial development – Nature

  - MACRO:
    - No European spatial planning, except first attempt of ESDP.

  - MESO:
    - Few coherent national plans.

  - MICRO:
    - Concentrated in local and regional initiatives.
Natural heritage

Findings in D&P: Infrastructure – Nature

MACRO:
- Wide spread accessibility as prerequisite for economic development resulting in ongoing fragmentation.

MESO:
- Facilities for mobility follow urbanisation and enhance further suburbanisation, causing pressure on valuable landscapes.

MICRO:
- Main infrastructure causes fragmentation of semi-natural areas.
- Improved accessibility at the cost of natural values.
Natural heritage

Findings in States:
- Natural heritage consists of remains of nature.

Findings in Impacts:
- During ages a constant decrease of species has taken place.
- The natural heritage is very fragmented.
Natural heritage

Fragmentation index for NUTS 3

Luxembourg:
20 – 50% of natural area is fragmented.
Natural heritage

Percentage semi-natural area compared to urban pressure

Luxembourg:
High urban pressure on relatively high % of natural area cover mainly consisting of agricultural areas and forests.
Natural heritage

Findings in Policy responses

MACRO:
  • Environmental legislation;
  • Birds/Habitat directive, Natura 2000, ESDP;

MESO:
  • Few integral national spatial plans;
  • Growing acknowledgement of importance of integrated plans;

MICRO:
  • Growing need for integrated regional strategic co-ordination.
Natural heritage

- Policy recommendations (sample):
  - Balanced development in corridors
  - Polycentric development in nodes
  - Selective accessibility
  - Priority to old industrial areas
  - International co-ordination
  - Regional development vision
  - Natural values as an asset
  - Etc.
Natural heritage

- Further research issues
  - Complete dataset for trend analyses.
  - Completion and further improvement of used indicators.
  - Identification of potential conflict areas, urban development – ecological network.
  - Nature as an asset for attracting economic activities.
Telecommunication Services and Networks

Main task:

- Uncover, draw together and analyse the data on the supply of and demand for telecommunications.
- Focus of the study is on the *infrastructure* of the information society.
Telecommunication Services and Networks

- **Methodology:**
  - Collecting and analysing quantitative data which was or could be made comparable at various territorial levels.
  - Main data source: study of the household penetration of telecommunications in EU15 at the sub-national level.
  - Reanalysis of the data using socio-economic-geographic categories in order to try and better understand the factors behind differential patterns of telecoms penetration (EU15): Comparison of the uptake levels of regions for telecommunication with
    - their developmental status (Objective 1 and non-Objective 1),
    - their level of GDP,
    - their population density and
    - their degree of urbanisation, and core-periphery location (Pentagon vs non-Pentagon).
Telecommunication Services and Networks

- Results at macro level:
  - North-south divide (strength of the Nordic countries which lead the way in the uptake of almost all technologies)
  - West-east divide
  - The European ‘core-periphery’ distinction (which is apparent across many socio-economic indicators) does not hold for telecommunications.
    - Strength of the ‘Nordic periphery’,
    - In mobile telephony, the ‘Mediterranean’ periphery outpaces the ‘core’
    - Core only leads is in access to Internet backbone networks for large corporate users and Internet Service Providers.
Telecommunication Services and Networks

Luxembourg: The level of telecommunications development is moderately high.
Telecommunication Services and Networks

- Results for Luxembourg:
  - Very high penetration rates for
    - fixed (land) lines
    - cell phones
    - number of PCs
    - internet connections
    - broadband availability
  - Luxembourg is the only central European country with such high rates.
Telecommunication Services and Networks

- Results for Luxembourg:
  - High broadband availability but low broadband usage (BE and NL show high broadband uptake)

<table>
<thead>
<tr>
<th></th>
<th>Category 1 (high)</th>
<th>Category 2</th>
<th>Category 3</th>
<th>Category 4</th>
<th>Category 5</th>
<th>Category 6 (low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed line</td>
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<td>Mobile</td>
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<td>PC</td>
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<td>Internet</td>
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<tr>
<td>Broadband</td>
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</tbody>
</table>

*Luxembourg is national level at NUTS 2
Source: CURDS; based on data drawn from INRA (2004)
Telecommunication Services and Networks

- Policy Issues (*focus on infrastructure*):

Table 6.1: Outline of national government supply-side strategies to increase coverage of broadband in under-served areas through infrastructure investment in EU15

<table>
<thead>
<tr>
<th>Country</th>
<th>Specific supply-side strategy?</th>
<th>Nature of supply-side intervention strategy for under-served areas</th>
<th>Examples of funding and implementation mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg</td>
<td>Yes (✓)</td>
<td>Government is looking at ways of extending connectivity to 6-8% of households which do not have possibility of connecting to broadband</td>
<td>Exploring satellite and UMTS. Use of SF possible</td>
</tr>
</tbody>
</table>
Transport Trends

Three main questions:
- How may the transport network constitute a key factor of a more balanced, more polycentric, more sustainable spatial development?
- How to develop the accessibility to basic services and to knowledge in order to increase the territorial cohesion?
- What will be the consequences of enlargement on the preceding objectives?

Methodology:
- combination of state-of-the-art and newly developed methodologies
Transport Trends

- General results:
  - transport is facilitating social and economic relations
  - transport is generating environmental externalities that reduce and constrain the capability of a given region to attract new activities, as well as to some extent the productivity of the already existing activities
  - accessibility: the classical centre-periphery scheme could not be denied
  - the areas presenting a good accessibility seem to be those which suffer the most from transport externalities

The content of this presentation does not necessarily reflect the opinion of the ESPON Monitoring Committee.
Transport Trends

- Results for Luxembourg:
  - Luxembourg is one of the most accessible regions of Europe, regarding multimodal accessibility it belongs to the above average accessible regions.
  - While motorway density is one of the highest, railway density is of medium value.
  - Luxembourg is situated at one of the main corridors for freight traffic both on road and on rail, but it has no maritime outlet.
Transport Trends

Density of motorways and expressways by population

Luxembourg: shows sufficient motorway and expressway network infrastructure according to its inhabitants.

The content of this presentation does not necessarily reflect the opinion of the ESPON Monitoring Committee.
Transport Trends

Rail density

Luxembourg:
The density of rail lines by population is of medium value.
Transport Trends

Potential accessibility, multimodal

Luxembourg belongs to the regions with clearly above average accessibility.
Transport Trends

Freight traffic

Luxembourg is situated at one of the main corridors for freight traffic both on road and on rail.
Transport Trends

Policy recommendations

- correction of imbalances
- develop short and medium-term policies to adapt the system to transport and infrastructure demand
- reduce emissions
- increase of intermodality to facilitate a modal shift
- speed limit on roads
- transformation of classical railways into freight-dedicated lines
Transport Trends

- Policy recommendations for macro-regions:
  - **Central Area / The Pentagon**
    - *Enable modal shift*
      The central area is suffering from road transport to a very high degree.
    - *Enable European integration*
      The central area is an important territory in the ongoing EU enlargement and integration process.
Transport Trends

Comment:
- The Integrative Transport and Development Concept (Integratives Verkehrs- und Entwicklungskonzept – IVL, 2004) of Luxembourg is one of the current national planning documents regarding transport, infrastructure and trends.
- Some of the aspects mentioned by project 1.2.1 concerning Luxembourg are already included in the concept.