Partnership for Environment and Growth

Programme carried out with the financial assistance of the European Union

Practical application of SEA to the waste management sector of Georgia

SEA Training Workshop 2: Effect Assessment, Mitigation and Monitoring

21 – 22 September 2015
Tbilisi, Georgia

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Analysing Alternatives in SEA: Problems, Possible Approaches

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‘Alternatives’ in the SEA Context

The term “alternative” is not defined in the Protocol on SEA (or in the Directive). Various categories of alternative might be considered:

- An alternative plan or programme to that originally proposed, perhaps meeting the same set of objectives
- Alternative elements within a plan or programme, again perhaps meeting the same set of objectives.
- Types of alternatives might also include alternative locations, land uses, technologies, timing, development paths or even sets of objectives.

The SEA Directive requires description and evaluation of reasonable alternatives and an explanation of the reasons for the final choice “in light of the other reasonable alternatives dealt with.”

‘Zero Alternative’ has to always be described as a basis for further impacts prediction/assessment

Responsibility regarding alternatives

Primarily, ***planning experts*** should develop alternatives as a part of the plan-making

SEA may generate additional alternative options i.e. elaborate new reasonable alternatives or recommend new alternatives to be developed by planning team

However, ***intensive communication and cooperation between planning and SEA teams is essential*** (otherwise integrating SEA suggestions in the plan or programme will not happen)

Formulation of Alternatives (1/2)

Maximising positive effects of the plan

- Optimising proposed measures
- Enhancing cumulative positive effects

Minimising adverse environmental and health effects

- Seeking the best solutions for implementation of development measures
- Minimizing the need of mitigation measures
- Optimizing measures to minimize environmental/health effects
- Alternative locations
- Alternative measures

Formulation of Alternatives (2/2)

Is the proposed development necessary? (Need or demand management options)

How should it be done? (Method or process options)

Where should it go? (Location options)

When should it be implemented? (Timing or sequencing options)

Approach to Evaluation of Alternatives

The predicted effects of alternatives should be:

- compared with likely future evolution as described in baseline analysis and
- compared with each other to provide their ranking from environmental and health effects point of view.

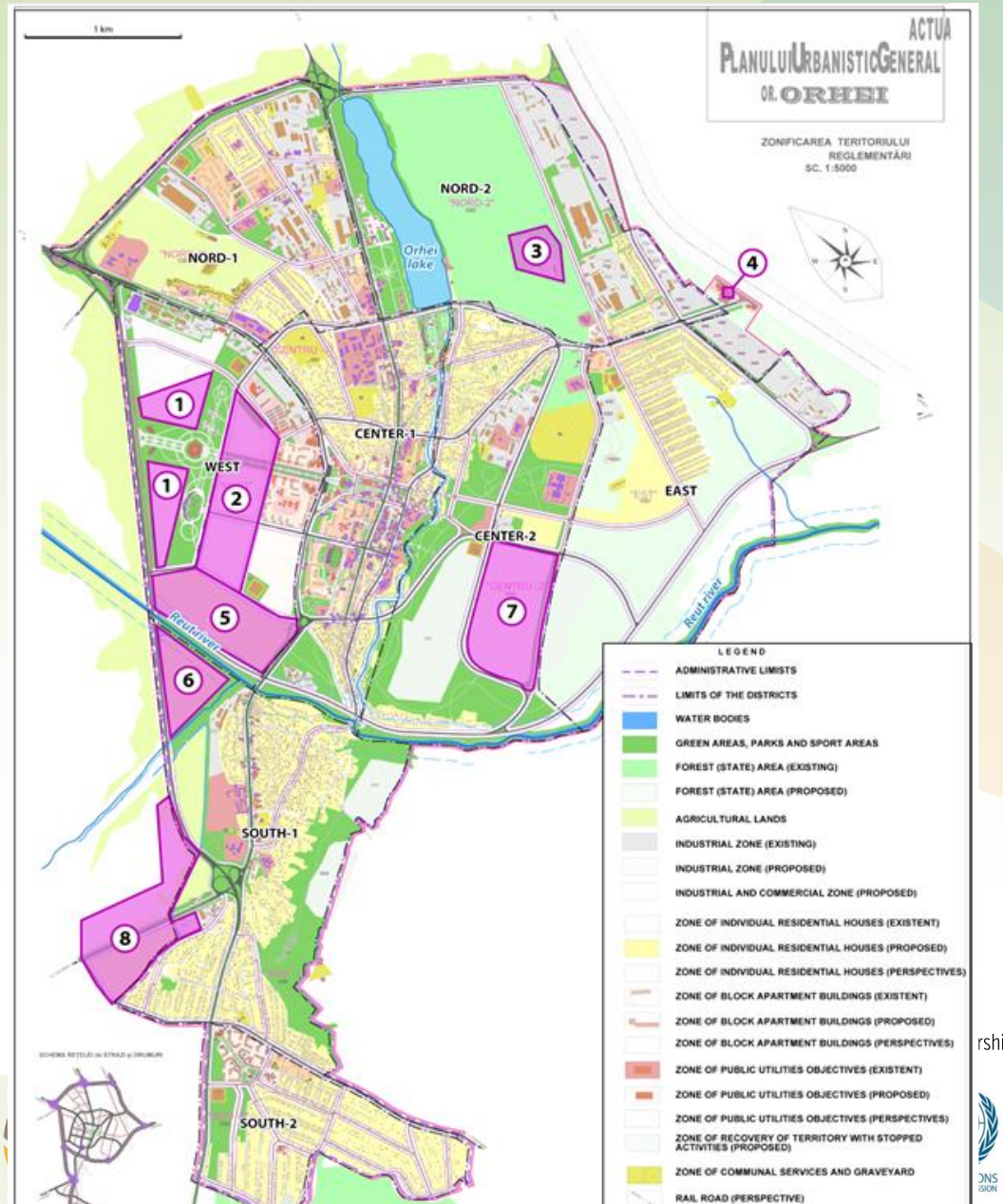
	Alternatives	
Environmental theme	Alternative 1	Alternative 2
Flora and fauna		
Protected area (ha.)	++	+
Disturbance to protected area	+	-
Water		
Surface water quality	+	--
Surface water quantity	+/-	?

Symbols: + positive; - negative; 0 neutral; ? uncertain; + minor; ++ major; +/-both positive and negative

Case example 1:
SEA Master Plan for city of Orhei (2014)

1. "Zero/ no-development option
2. Comparison of the Master Plan Orhei 2015 and Master Plan of 2008;
3. Alternative proposals for the bypass road in the framework of 2015 Master Plan

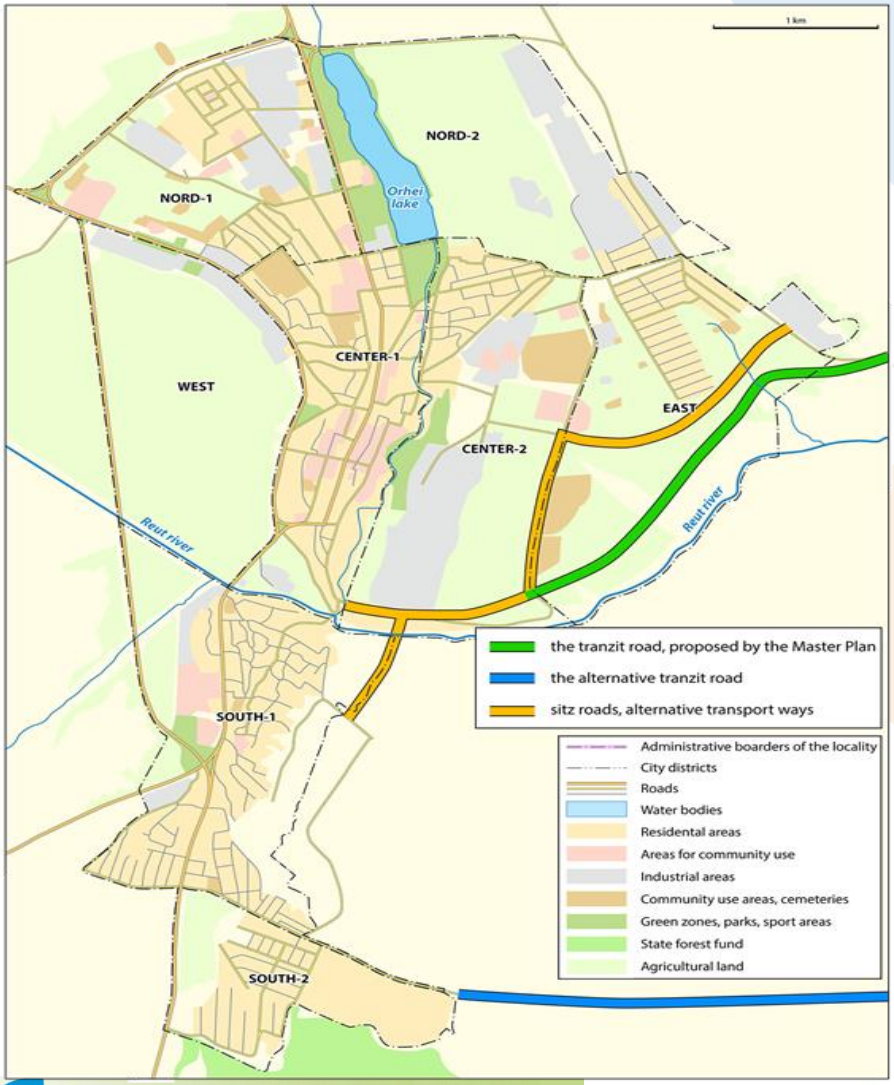
Case example 1(cont´d)



Case example 1(cont´d): Alternative land-use proposals comparison

Nr. of the zone/territory	Functional designation of land of the previous Master Plan 2008	Functional designation of land of the current Master Plan 2015	Impact on the environmental components				Comments (arguments for the selected level of impact (-2,-1,0,+1,+2,?))
			Air	Water	Soil	Biodiversity	
1	2	3	4	5	6	7	8
1	Industrial production zone	Complex recreation zone with sport and touristic elements and water bodies	**+2**	**+1**	**+1**	**+2**	**+1,+2** Elimination of the impact of the pollution from the industrial units on the atmospheric air, reduction of floods, reduction of pollution of water bodies. Due to the collection of funds from the recreation sites improvement of landscape and of recreational functions of the area
2	Zone of living areas with block apartments buildings	Complex recreation zone with sport and touristic elements and water bodies	**+1**	**+1**	**+1**	**+1**	**+1** Elimination of the impact of the pollution from the industrial units on the atmospheric air, reduction of floods, reduction of pollution of water bodies. Due to the collection of funds from the recreation sites improvement of landscape and of recreational functions of the area

Case example 1(cont´d): SEA alternative proposal: road infrastrucutre



Case example 2: SEA for National Waste Management Plan of Montenegro for period 2015-2020 (NWMP)

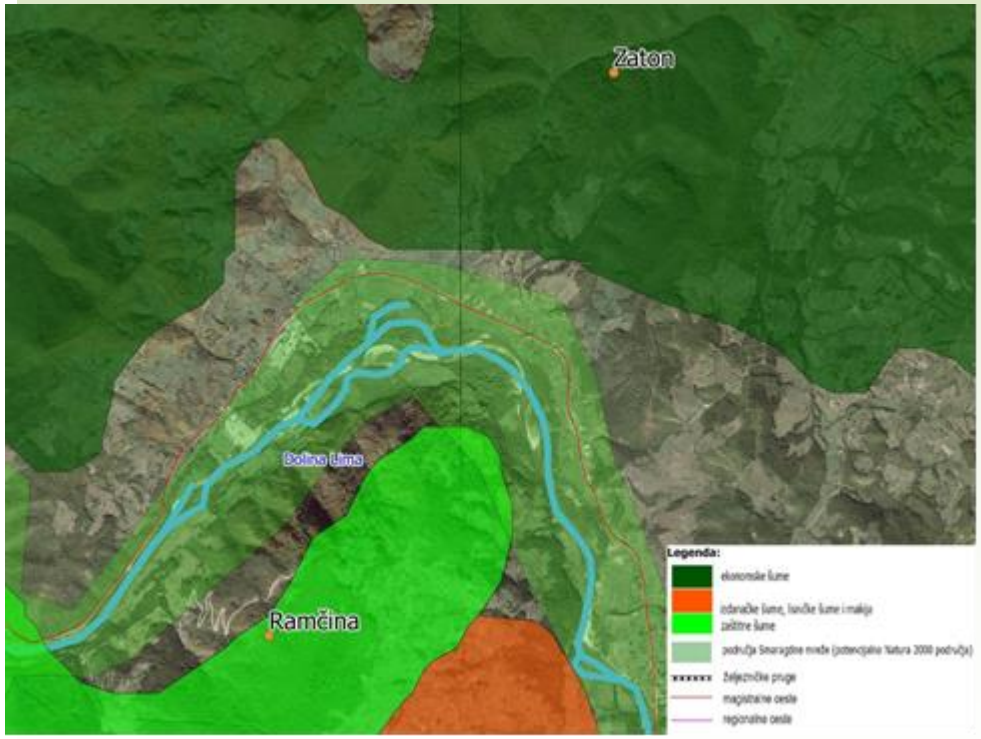
- Original plan: 5 waste management regions with 5 sanitary landfills be constructed. It includes the existing landfill in Podgorica, Bar and proposed landfills in Berane, Nikšić and Herceg Novi

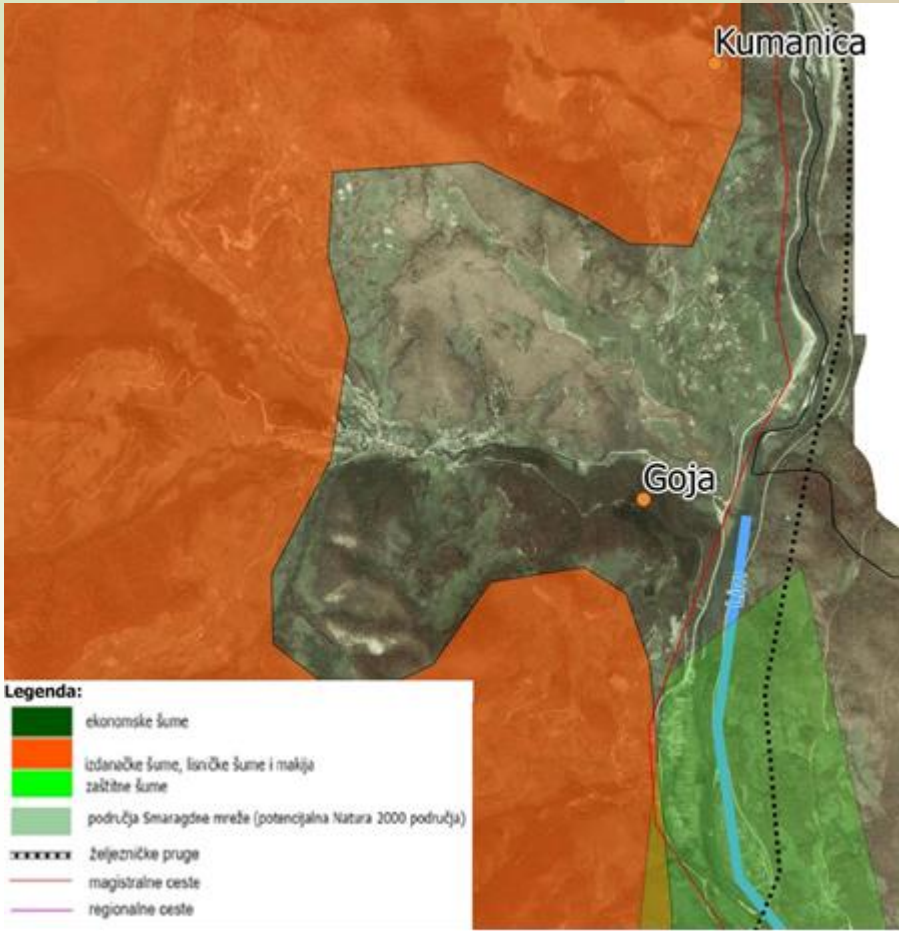
- Alternative 1: 5 waste management regions with 5 sanitary landfills be constructed - it includes 2 existing landfills in Podgorica, Bar and proposed landfills in Bijelo Polje, Nikšić and Herceg Novi.

- Alternative 2: 3 waste management regions with 3 sanitary landfills be constructed - it includes 2 existing landfills in Podgorica, Bar and one proposed landfill in Bijelo Polje for the north region area.

- Alternative 3: 1 waste management region which would cover the entire country and it would also include a thermal waste treatment plant (waste-to-energy plant), which will be located in the municipality that shows initiative regarding the construction of thermal waste treatment and preparation of all necessary conditions.

Case example 2:
Local alternatives





Case example 2: Local alternatives comparison

Note: matrix from the NWMP SEA report to be presented

Impacts / Risks	Sanitary landfill - Bijelo Polje						Clarifications and recommendations (e.g. The best option, mitigation measures)
	Čelinska Kosa 1	Čelinska Kosa 2	Kumanica	Zaton	Ramčina	Goja	
Biological and landscape diversity, protected areas	Close to biocorridor of southeast Dinarides, proximity to the Emerald net Dolina Lima, visible from the mountain routes	Within the Emerald Network of Lim Valley, visible from the road	The vicinity to the Emerald Network, partially visible from the road	proximity to the Emerald Network of Lim Valley	proximity to the Emerald Network of Lim Valley	proximity to the Emerald Network of Lim Valley, seen up close	In terms of biodiversity, the best options are Zaton and Ramčina considering they are outside of the biocorridor and outside the Emerald Network, and the least acceptable is Čelinska Kosa 2 because it is located within the area of the Emerald Network. Given the importance of the landscape, favorable locations are visually hidden and they cannot be seen from frequent traffic routes. Unfavourable locations are Kumanica and Goja.
Population, public health	Rural area	Rural area	Rural area	Rural area	Rural area	Rural area	Since there were no significant differences in the distance from residential buildings (up to 1000 m), the locations are equally favorable. Location Goja is nearest to residential buildings and is considered the least favorable.

Case example 2(cont´d): Comparison of strategic options

Note: original matrix from the NWMP SEA to be presented

Impact / risk	INITIAL PROPOSAL						OPTION 1						OPTION 2	
	Sanitary landfill - Vasov Do (Berane)		Sanitary landfill - Budoš (Nikšić)		Sanitary landfill - Duboki Do (Herceg Novi)		Sanitary landfill - Bijelo Polje (Ramčina, Zaton)		Sanitary landfill - Budoš (Nikšić)		Sanitary landfill - Duboki Do (Herceg Novi)		Sanitary landfi Bijelo Polje (Ramčina, Zat	
	Reg. operation	Accident	Reg. operation	Accident	Reg. operation	Accident	Reg. operation	Accident	Reg. operation	Accident	Reg. operation	Accident	Reg. operation	Acc
Air														
Climate factors														
Water														
Land, soil														
Biological and landscape diversity														
Population, public health														
Cultural heritage														
Material assets														

Case example 3: SEA for Czech Energy Policy (1998)

Alternative A:

- Based on locally available sources of black and brown coal. Limits of coal mining are not enforced.
- No further internalisation of external costs (i.e. carbon tax and energy tax are not introduced).
- Second nuclear power plant partly finalised by 2004-2005.

Alternative B:

- Based on locally available sources of black and brown coal + limits of coal mining are enforced.
- This is compensated by import of electricity and gas.
- Partial internalisations of external costs will trigger changes in structure of existing energy sources.
- More use of energy saving schemes and alternative energy sources will increase as well.
- Growing use of cogeneration units (growth in gas import).
- Second nuclear power plant partly finalised by 2005.

Case example 3: SEA for Czech Energy Policy (1998) (cont´d)

Alternative C:

- Based on energy savings schemes and rapid increase of alternative energy sources.
- Previously established limits of coal mining enforced.
- Second nuclear power plant not finalised.
- Major energy savings in state-own facilities,
- Funding and technical assistance programs for technological changes in private enterprises).
- Alternative energy sources - biomass, small water plants, wind, solar collectors + limited use of photovoltaic cells.
- Energy prices fully internalise external environmental costs – growing use of cogeneration units.

Case example 3: SEA for Czech Energy Policy (1998) (cont´d)

- SEA based on multi-criteria analysis: 25 categories of major impacts – each with one indicator (environemtnal, social, economic)
- Examples of environmental impacts:
  - Air emissions
    - CO2 (tons)
    - CH4 (tons)
    - SO2 – total (tons)
    - SO2 – local (tons)
    - NOX – total (tons)
    - NOX – local (tons)
    - Particulate matters (tons)
  - Annual production of waste
    - Ash from power plants (tons)
    - Unused gypsum (tons)
    - Used nuclear fuel (tons)
    - Radioactive waste (tons)

Case example 3: SEA for Czech Energy Policy (1998) (cont´d)

- Alternative A was used as a baseline - alternatives B and C were compared against alternative A.

- Example - “CO2 emissions”:
  - CO2 emissions for alternative A were classified as 100%,
  - alternative B - 95% of CO2 emissions compared with alternative A,
  - alternative C - 87% CO2 emissions compared with alternative A.

Alternatives C and B score much better on almost all indicators then Alternative A

(the only exception were economic indicators where Alternative A scored best)

Case example 3: SEA for Czech Energy Policy (1998) (cont´d)

- Detailed comparison of alternatives: Multi-criteria analysis

  - A survey among sample of 32 representative respondents to define social importance (weight) of each impact category.

  - Multi-criteria analysis (incl. sensitivity analysis) resulted in very similar conclusion as the original simple analysis of alternatives.

  - MCA however prolonged the SEA process by 3 months – SEA team missed the deadline - final SEA report never considered.

Alternatives: Practical Advice

- When formulating, alternatives should be sufficiently **distinct** to highlight the different environmental implications of each, allowing meaningful comparisons to be made at a strategic level.
- Provide clear ranking of alternatives from the effects point of view.
- Document how the alternatives have been narrowed down and state the reasons for rejecting / selecting certain alternatives.

Questions, comments?

Thank you for your attention!

EaPGREEN Partnership for Environment and Growth
This project is funded by the EU
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