



# Chapter A5: Overview of basic tools for SEA

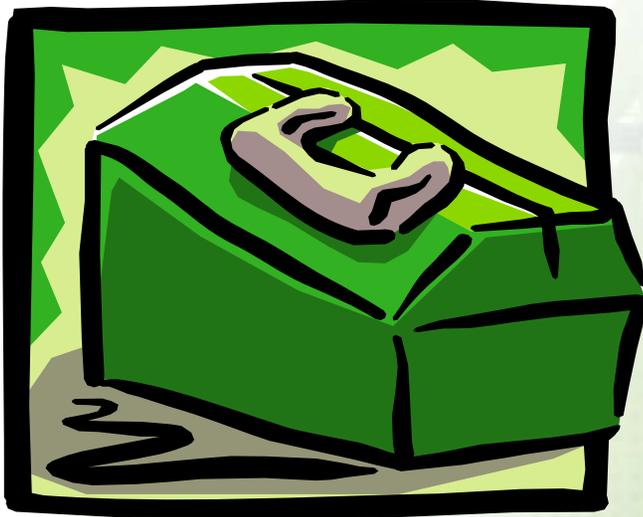
Resource Manual to Support Application of the UNECE Protocol on Strategic Environmental Assessment

draft 26-Apr-07

## A5.1 Contents of the Chapter

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- SEA & P/P making: basic approaches & methodological frameworks
- Analytical approaches & tools
- Participatory approaches & tools



Protocol on SEA



- Introduction
- SEA & P/P making from methodological perspective
- Selecting appropriate tools



- Protocol a procedural framework
  - does not specify how analyses / consultations conducted
- But some Protocol requirements have methodological overtones / content
- No single best methodology for conducting SEA
- Large range of analytical & consultative tools available
- Tools derive from 3 main sources
  - from EIA with adaptations to undertake SEA at required scale & appropriate level of detail
  - from policy analysis / plan evaluation / P/P development with adaptations to provide analysis meeting Protocol requirements
  - from health impact assessment (HIA) to take account of significant effects on human health
- SEA methodology & tools must be appropriate to issues addressed in given P/P
- Approach should be determined as part of scoping



- Protocol applies to certain P/Ps that set framework for development consent
- EIA-derived methods may be used / modified to undertake SEA for P/Ps that initiate specific land uses / projects
  - where cause-effect chain can be readily identified
- Following may be suitable
  - Formal & informal checklists
  - Matrices of impacts
  - Impact networks
  - Case comparisons & collective expert judgements
  - Overlay mapping & geographical information systems (GIS)
  - Predictive modelling
  - Life-cycle assessment
  - Multi-criteria analysis



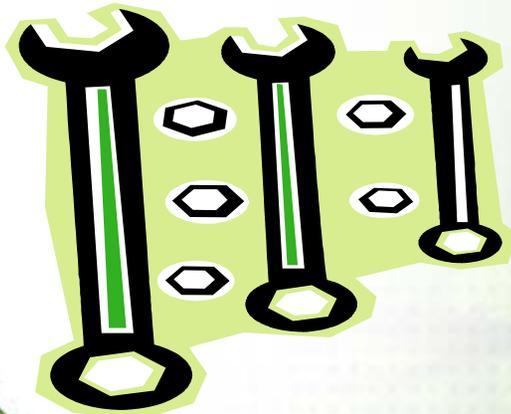
- When environmental effects of P/Ps (or their components) indirect & generalized, tools used in policy appraisal / plan evaluation may be more suitable, e.g.
  - Policy & legal reviews
  - SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, other approaches to mapping of constraints & opportunities
  - Scenario building
  - Matrices of conflicts & synergies
  - Decision trees
  - Trend analysis & extrapolation
  - Simulation modelling
  - Options appraisal
  - Comparative risk assessment



- In many instances a single simple method of assessment may be appropriate for all environmental effects
- When health effects of plans or programmes or particular components of them are important, tools used in HIA may be appropriate, e.g.:
  - Health hazard checklists
  - Qualitative & quantitative risk assessment
  - Surveys of health risk perception
  - Methods & tools for risk characterisation & risk communication
  - Methodologies for rapid assessment of health risk & impacts and of environmental determinants of health impacts
- Recognize the limitations of the DPSEEA (Driving Forces - Pressures - State - Exposure - Effects - Actions) model, notably its complexity & lack of precision



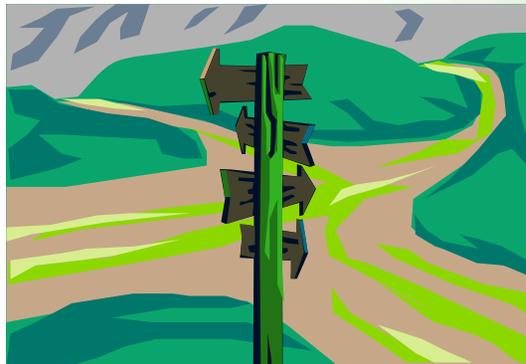
- SEA & P/P making mutually supportive processes with reciprocal functions
- Opportunities to design & adapt SEA analytical & consultative tools on basis of P/P development tools, e.g.
  - Tools for determination of context & key issues (checklists, SWOT, matrices)
  - Tools for developing alternative options (scenario building / objectives-led planning)
  - Tools for assessment of impacts (modelling, GIS, etc.) /
  - Tools comparing options & presenting conclusions (multi-criteria analysis, cost-benefit analysis, etc.)



- Examine which methods used in P/P development can be extended to environmental issues & so deliver information required by Protocol
- Decision on approach & methodology made case-by-case
  - respecting nature of P/P
  - taking into account data & scale
  - looking to add value to decision-making & strengthen P/P-making process
- Examples
  - In SEA of land-use plans, emphasis typically on resource & environmental potentials & constraints of particular area – requires attention to local baseline conditions & ecological effects of proposed changes – using GIS, habitat analysis, vulnerability mapping, etc.
  - In SEA of sector P/Ps, more concerned with aggregate effects, e.g. on air quality /carbon emissions (Kyoto Protocol targets), using simulation models



- To help guide selection of optimal approach to integrating use of SEA tools with those used to develop P/P
  - Analyze logic behind development of specific P/P & analytical tools & stakeholder-involvement techniques applied
  - Determine tools & techniques used in P/P-making process that may provide information required by Protocol
    - consider how may need adapt them
  - Determine needs for additional analyses & consultations within SEA process
    - choose appropriate tools



- Methods & tools affect
  - quality of information in P/P making & decision-making
  - effectiveness of process
- No single 'best' methodology
- Use simplest tool consistent with task
  - avoid overcomplicating analyses
- More advanced methods sometimes needed to generate information / predict impact (e.g. traffic simulation models for road-building programme)
- Adapt selected tools to data & scale to cope with temporal & spatial dimensions of likely effects



- Address uncertainties due to
  - limited knowledge of cause-effect relations
  - insufficient data
  - unknown development trends that may significantly influence development of given sector / territory
- Information provided through various tools
  - decision-relevant
  - clarify trade-offs at stake
  - recommend practicable options giving best environmental pay off
    - mitigating adverse effects
    - enhancing positive effects



## A5.3 Overview of basic analytical tools

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- Framework draws on methods from
  - EIA
  - Policy appraisal
  - health impact assessment
- List of tools not exhaustive
- Can be adapted to particular P/P context, depending on
  - logic of P/P-making process
  - nature of issues to be addressed
- Tools by task
  - Determination of scope
  - Analysis of context & baseline
  - Contribution to development & comparison of alternatives



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- **Determination of scope**
- Scoping identifies & determines important issues to be assessed
- Long list of concerns
  - ➔ Short list of potentially significant issues
- Need methods to
  - scope environmental dimensions of specific P/Ps
  - identify issues requiring attention
  - identify issues affected significantly when implementing proposal



- Appropriate **scoping** tools
  - Policy & legal reviews
  - Collective expert judgements
  - Checklists
  - Matrices of impacts & conflicts / synergies
  - SWOT analysis
  - Overlay maps & GIS
  - Decision trees & impact networks
  - Life-cycle assessment
- Often not appropriate / possible / necessary to address all environmental effects of P/P within SEA
  - but must give reasons why!
- Assessment against indicators / guiding questions may be enough



- **Analysis of context & baseline**
- Purpose is to establish reference point for assessing effects of P/P
- Involves describing current state of the environment & outlining likely evolution without P/P
- Analyze & extrapolate trends in evolution of the state of the environment in territory / sector concerned
- Baseline analyses usually rely on existing data
- Numerous tools to obtain data, e.g.:
  - Surveys of local environmental quality
  - Progress reports on implementation of environmental policy objectives & standards
  - Trends in headline environmental indicators
  - Health surveys



- **Contribution to development & comparison of alternatives**
- Environmental report to identify, describe & evaluate likely significant environmental effects of implementing P/P & its reasonable alternatives (art. 7)
- SEA potentially important in identifying & generating reasonable alternatives, beginning in scoping
- Comparison of effects of major alternatives represents crucial step in SEA for contributing to quality of P/P making in support of the environment & sustainable development



- Key tools for developing **alternatives** include
  - Collective expert judgement
  - Overlay maps & GIS
  - Scenario building
  - Modelling
  - Life-cycle assessment
- Formulation of alternatives central to integrating environmental considerations into P/P making in SEA
- First identify range of alternatives meeting P/P objectives & include
  - ‘do nothing alternative’
  - possibly, best practicable environmental option (BPEO)
- Summarize their environmental aspects
- BPEO helps clarify environmental trade-offs at stake, & basis for choice



- All **alternatives** can be analyzed & mutually compared in terms of their effects or contribution to attainment of relevant P/P objectives
- So development of alternatives normally closely interlinked to assessment of their effects
- Some analytical tools used to develop alternatives can also be used to predict their effects, e.g.
  - Collective expert judgment
  - Matrices of impacts & conflicts / synergies
  - Trend analyses & extrapolation
  - Overlay maps & GIS
  - Life-cycle assessment
  - Predictive modelling



- Easiest means of comparing key options for decision-making is to describe & present clearly
  - key positive impacts (benefits)
  - key negative impacts (problems or risks)
- This description also required in non-technical summary
- Other tools for comparison of options
  - Matrices
  - Overlay maps & GIS
  - Multi-criteria analysis
  - Cost-benefit analysis
  - Life-cycle assessment
- High uncertainty so do sensitivity analysis
  - helps test effect of changed assumptions
  - yields insights into robustness of assessment
- Most common tools outlined below
  - described in detail in *Annex A5.2*



## A5.3 (cont'd) Overview of analytical tools

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Analytical tool	Application within the SEA process					Key features				
	Identification of issues and impacts	Analysis context and baseline	Contributing to development of alternatives	Assessment of impacts	Comparing options for decision-making	Demand for data	Cost and time requirements	Transparency for public	Ability to cope with uncertainties	Ability to address health issues
Environmental scan, and legal and policy reviews	✓	✓				○	\$	☺		XX
SWOT analysis	✓	✓			✓	○	\$	☺	•	XX
Checklists	✓					○	\$	☺	•	X
Matrices	✓		✓	✓	✓	○	\$	☺	•	X
Decision trees, impact networks	✓	✓			✓	○	\$	☺		XX
Overlay maps and GIS	✓	✓	✓	✓	✓	○○	\$\$	☺		X
Trends analysis or extrapolation		✓		✓		○	\$	☺	•	X
Collective expert judgement	✓	✓	✓	✓	✓	○	\$	☺	•	XX
Modelling			✓	✓		○○	\$\$	☺	•	X
Scenario building	✓		✓			○○	\$\$	☺	•	XX
Life-cycle Assessment	✓	✓	✓	✓	✓	○○	\$\$	☹		
Cost/Benefit Analysis			✓	✓	✓	○○	\$\$	☹		
Multi-criteria analysis			✓	✓	✓	○○	\$\$	☹	•	X

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## A5.4 Overview of basic public participation tools

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- Protocol defines basic requirements for public access to information & consultation
- Provisions appear very similar to EIA but
  - scale, scope & range of some SEAs may make practical public participation arrangements very different from EIA
  - SEA likely to attract different publics
- Complex nature of some SEAs calls for use of techniques
  - for focused problem-solving debate
  - not just problem exposure
- Important challenge for SEA practice



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## A5.4 (cont'd) Overview of public participation tools

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- To avoid confusing the public with too many opportunities for participation, tools should provide single public participation process serving SEA & P/P-making purposes
- Tools may
  - Provide information
  - Gather comments
  - Engage the public concerned in collaborative problem solving
- Many public participation tools
- Techniques often differ with minor adaptations
- Most common tools outlined below
  - described in detail in *Annex A5.2*



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- Inadequate resources & capabilities of disadvantaged groups & individuals may limit their participation
  - Give attention to selecting appropriate public participation techniques to facilitate their inputs
- If chosen tools are difficult to use by disadvantaged, danger is that only better-resourced groups & individuals participate
  - Their views may not necessarily raise all public concerns



# A5.4 (cont'd) Overview of public participation tools

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Public participation tool	Enables ...			Key features		
	Provision of information	Gathering of comments	Collaborative problem solving	Usual cost of application	Problem-solving ability	Ease of commenting
Range of printed material inviting comments	✓	✓		\$		☺
Displays and Exhibits	✓	✓		\$		☺
Staffed displays and exhibits	✓	✓	✓	\$\$	•	☺
Information hotline	✓	✓		\$		☺
Internet/web-based consultations	✓	✓	✓	\$	•	☺
Questionnaires and response sheets		✓		\$\$		☺
Surveys		✓		\$\$		☺
Public hearings	✓	✓		\$		☺
Workshops	✓	✓	✓	\$	••	☺
Advisory committee	✓	✓	✓	\$	••	☺

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