Workshop 1, The quality of prediction in HIA and organisational constraints

Input for discussion:

- „Sources considered“
- Tentative „building blocks“

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1. Intro: Prediction

- Predicting what? ***Δ health (BoD)*** originating from PPPP; while taking into account: timing of events, and sub-groups affected
- Relevance of predictions in HIA: basis for assisting rational decision-making
- Types of prediction: qualitative (e.g., PPP scenario leading to "better health"), quantitative (e.g., PPP scenario leading to "1000 DALYs" to be lost) …
- Always needed to consider both ***variation*** (i.e., subgroups affected differently) and ***uncertainty*** (due to knowledge limitations)

Quality; constraints

“Quality of prediction”

- Accuracy = conformity to truth; absence of bias; consider-ation of variation (subgroups) and of interaction
- Uncertainty small enough for given HIA and its context

“Organisational constraints”

- Motivation and priority, or lack of
- (Sectoral, inter-level) cooperation, or lack of
- Deadlines
- (Qualified) humanpower available
- Data and information available, accessable
- Infrastructure, etc.

„Schweizer Baugespann“ ~ “Swiss batter boards“

Physical model providing accurate (1:1) predictions of building contours and their visual impact; simple to build; easily understood (Davos, CH, 2001)

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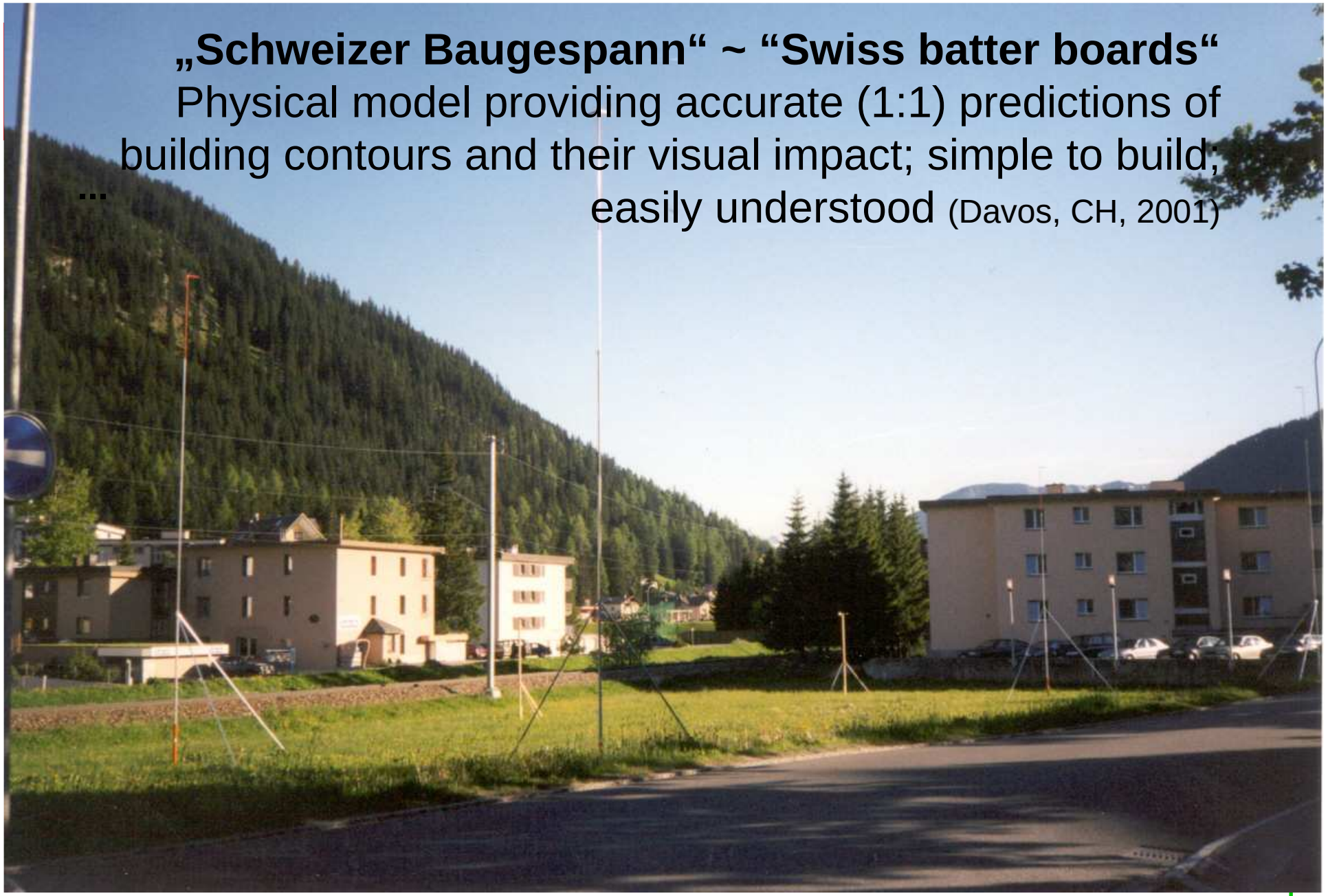


Why are HIA predictions more difficult?

Systems:

- Health, incl. organ systems (e.g. CV, nervous, endocrine…)
- Health determinants, incl. habit syndromes, social / physical environmental systems, incl. networks, media…
- PPPP: Policies, plans, programs, projects, often incl. multitude of components and interrelations, e.g. European Agricultural Policy (CAP), Europ. Employment Strategy (EES)
- Health (care) "systems", sets of intertwined (sub)systems …

Plus other factors, incl. (ethical, practical) limits to experimentation; professional traditions, lack of modeling capacities …

2. Sources considered

Can the following sources shed light on the issue of prediction in HIA?

- Existing HIA guidelines
- EC-funded international HIA projects
- “Family of impact assessments”

2.1 HIA Guides / guidelines

(# guides / guidelines identified)
Australia: 2
Canada (in 4 vol.s)
England: 7
Ireland: 2
New Zealand: 2
Scotland
Sweden: 2
Wales
EU
WHO

Total ≥ 20 guides / guidelines

Ex.: EPHIA guide

A number of different quantitative approaches can be used to estimate the changes of health determinants or to quantify the change in health state health outcomes of some population groups in the future due to a policy's development or implementation. Forecasting, scenario building and mathematical modelling are established methods in other fields. Quantitative data can also be generated using participatory approaches, for example, consensus panels. Health economics approaches, such as cost benefit analysis, 'willingness to pay', can also be employed to quantify the impacts on health.

… Guides / guidelines

Guidelines: prelim conclusions
(based on previous knowledge / use):

In many (most) guidelines:

- the sections on appraisal seem to be among the weakest
- sections on prediction may be ultra-short or missing altogether

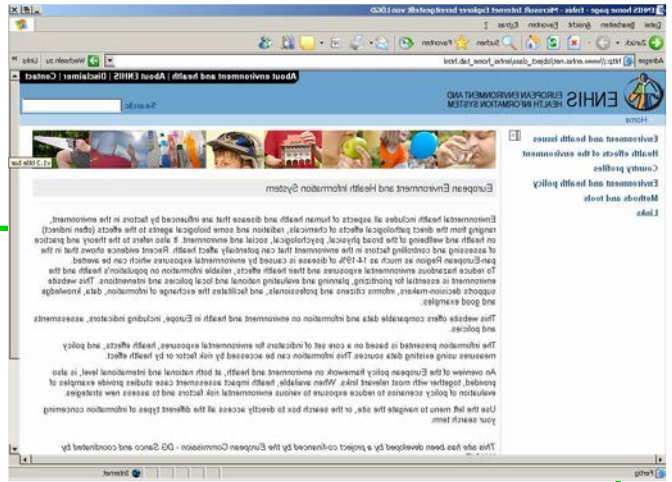
But: still seem worth the effort to be screened systematically…

2.2 Six EC-funded international HIA Projects

1. Air Pollution and Health: European Information System: **APHEIS**, 1999-2003
2. European Policy HIA***:*** **EPHIA**, 2001-2004
3. Promoting and Supporting Integrated Approaches for Health and Sustainable Development at the Local Level across Europe - HIA: **PHASE**, 2003-2005
4. Establishment of Environmental Health Information System Supporting Policy Making: **ENHIS**, **Work package HIA**, 2004-2007
5. The **effectiveness of HIA**, 2004-2007
6. HIA in New Member States and Accession Countries: **HIA NMAC**, 2005-2007

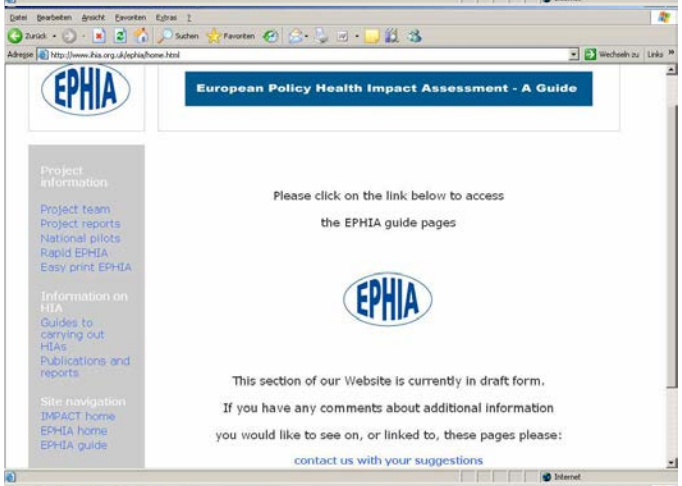
PHASE

2003ff



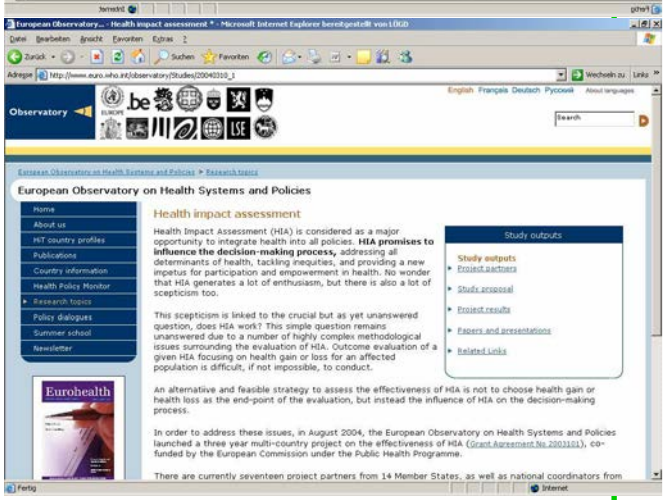
ENHIS, WP HIA

2004ff



EPHIA

2001ff

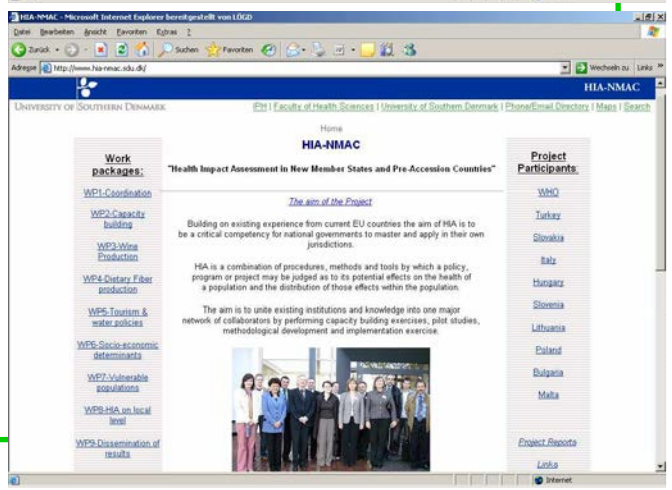


HIA effect.

2005ff

APHEIS

1999ff



HIA NMAC

2005ff

Sample approaches re: prediction

APHEIS:

Quantitative: use of monitoring air pollution; exposure estimation (trends in Europe over time), dose-response estimation, based on meta-analysis of studies, risk assessment: estimation of attributable numbers of persons affected

-> RA type of predictions

EPHIA:

Qualitative: document and literature (content) analyses, group discussions, interviews

Quantitative: profiling of countries and EU; (OR-based) modeling health effects of, e.g., “work flexibility”

-> Integration of approaches for prediction

More sample approaches re: prediction

PHASE:

Qualitative: document and literature analyses, group discussions, interviews

-> qualitative, participatory methods for prediction

ENHIS WP HIA:

Quantitative: exposure estimation; dose-response estimation, risk assessment: estimation of attributable numbers of persons affected

-> RA type of predictions

… 6 HIA projects

HIA projects / prelim conclusions
(based on preliminary cross-project analysis):

The projects provide reasoning on, and examples of:

- RA type of predictions
- qualitative, participatory methods for prediction
- Integration of approaches for prediction

Seem worth the effort to be analysed systematically

2.3 Family of impact assessments (IA)

Google (24 July 2007):
"***impact assessment***" – c. 2,170,000 hits
"***health impact assessment***" – c. 373,000 hits
"***integrated impact assessment***" – c. 34,400 hits

Impact assessments (IA)

Business IA (BIA)
Environmental IA (EIA)
Health IA (HIA)
Health Inequalities IA (HIIA)
Health Systems IA (HSIA)
Integrated IA (IIA)
Race Equality IA (REIA)
Regulatory IA (RIA)
Social IA (SIA)
Socio-Economic IA (SEA)
Strategic Environmental (I)A (SE(I)A)
(Trade) Sustainability IA (SIA)

Related assessments (A):
Health Needs A (HNA)
Health Technology A (HTA)
Life Cycle A
(Quantitative) Risk A
(Q/RA)
Technology A (TA)
Vulnerability A

Chapter 7: Predicting Environmental Impacts

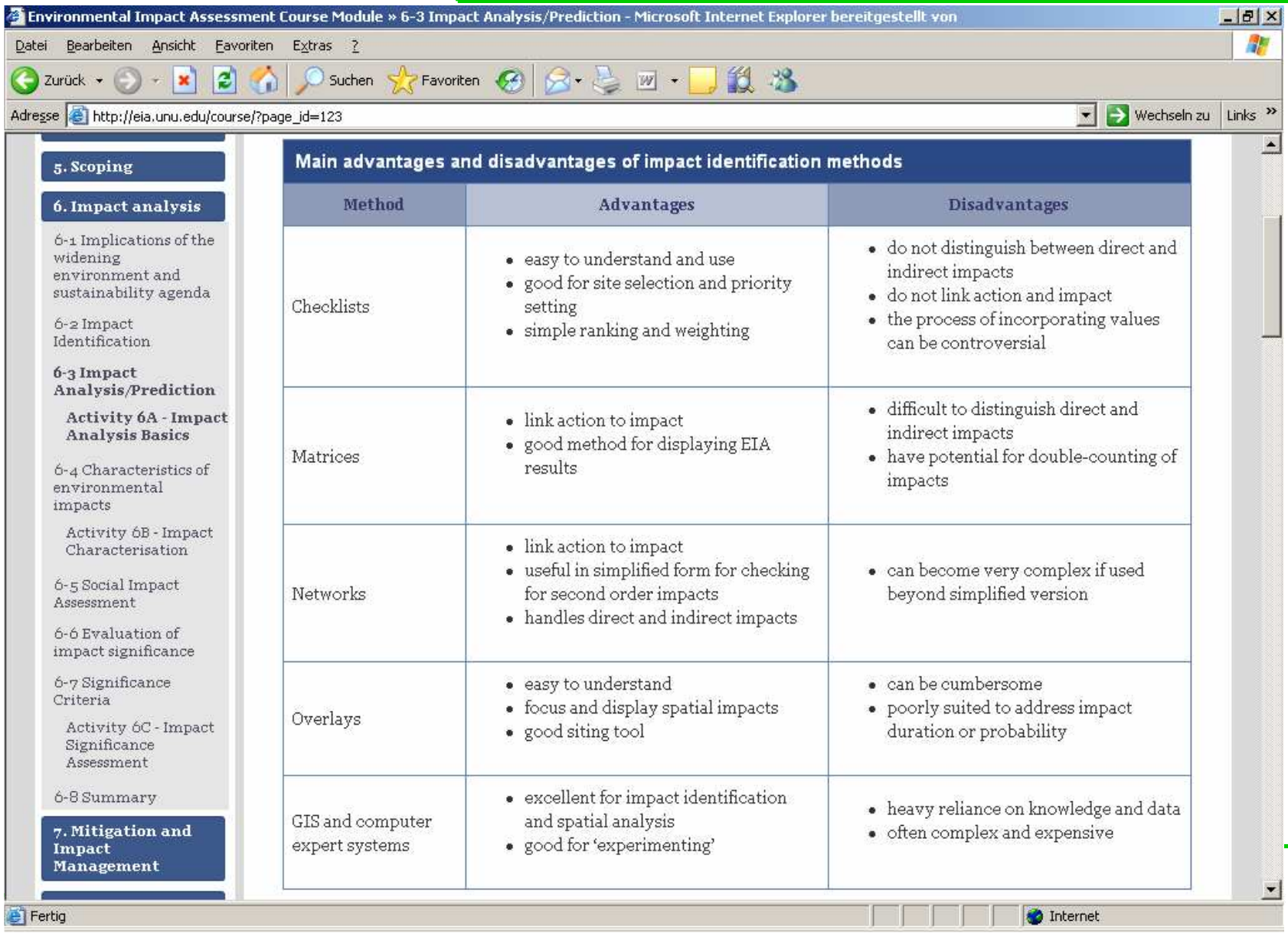
Impact Prediction
Basic Requirements of Impact Predictions
Accuracy and Precision
Techniques for Impact Prediction
Mechanistic Models
Statistical Models
Balance Models
Experimental Techniques
Analogue Techniques
Judgemental Techniques
Predicting Impacts on the Biophysical Environment
What to Predict
Techniques
Challenges to Impact Prediction
Addressing Uncertainty in Impact Prediction
Verifiable Impact Predictions

EIA book publication:

B. Noble, U Saskatchewan (2005): Introduction to EIA - Guide to Principles and Practice. Oxford U Press

UNU: EIA course

Module 6-3: „Impact Analysis/Prediction“



Main advantages and disadvantages of impact identification methods

Method	Advantages	Disadvantages
Checklists	• easy to understand and use • good for site selection and priority setting • simple ranking and weighting	• do not distinguish between direct and indirect impacts • do not link action and impact • the process of incorporating values can be controversial
Matrices	• link action to impact • good method for displaying EIA results	• difficult to distinguish direct and indirect impacts • have potential for double-counting of impacts
Networks	• link action to impact • useful in simplified form for checking for second order impacts • handles direct and indirect impacts	• can become very complex if used beyond simplified version
Overlays	• easy to understand • focus and display spatial impacts • good siting tool	• can be cumbersome • poorly suited to address impact duration or probability
GIS and computer expert systems	• excellent for impact identification and spatial analysis • good for ‘experimenting’	• heavy reliance on knowledge and data • often complex and expensive

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… familily of IAs

IAs: prelim conclusions

(based on accidental knowledge of some IAs, espec. EIA):

- Practice apparently leaning more towards the “UNU” side compared that of EIA guide from Saskatchewan
- but: multitude of concepts and methods available

Seem worth the effort to be analysed systematically

side remark

loegd institute joined the German EIA association (UVP-Gesellschaft)
-> started to cooperate on H in EIA, inc. discussion of concepts, data, methods

3. Tentative building blocks

Building blocks for high-quality predictions:

- integration of approaches, incl. literature reviews, stakeholder opinions / participation and mathe-matical modeling (classical and probabilistic)
- pathway diagrams, e.g. extended DPSEEA model
- existing comprehensive data systems, e.g. ENHIS information system

4. Discussion: Quality of predictions

Each HIA takes place in a specific ***context*** determining both:
- the level of "quality" ***needed*** in a given HIA, and
- the level of "quality" ***achievable*** in a given HIA

Context determining the quality ***needed*** includes***:***
- type / "size" of PPPP
- # persons affected
- conceivable consequences (on BoD, other), incl. duration, reversability, (in)equity of distribution …

Context determining the quality ***achievable*** includes:
- resources (humanpower, finance…) available
- information access, cooperation
- deadlines / time constraints …

Uncertainty of predictions = a fact of life, cf. weather forecasts, financial investments…

(cf. “certainty”: ± with simple mechanical devices, eclipses of sun and moon, “Baugespann”)

Options:

- Decomposition of complexity, espec. via causal pathways (incl. „exposure“)
- More „causal“ knowledge about the system(s) -> better chances for „quality“ predictions
- „Standard“ predictions (e.g. demographic change) = helpful for predictions in HIA