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No rest for the wicked – Interactive geo-information tools for engaging with stakeholders in wicked policy problems

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ITC FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

Introduction: What do we do?

Interactive Decision Support for Group Decision Making and Collaborative Planning

- Interactive planning & decision support tools
- Planning related stakeholder processes
- Evaluate usability and usefulness of tools
- More details: https://www.itc.nl/about-itc/organization/resources-facilities/group-decision-room/

CONTENT

1. Geo-Information tools for addressing wicked policy problems
2. The technology: Maptable PSS
3. Case 1: Energy transition in the Netherlands
4. Case 2: Environmental health inequalities in German cities
5. Conclusions

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1. Spatial planning related activities require participation

- increase the legitimacy of decisions taken
- contribute to the quality of decision-making
- Contribute to learning of stakeholders

Stakeholders: statutory agencies, business & commercial organisations, Housing companies, health and education trusts, neighbouring local, authorities, local citizens, …

Problems

- the usual suspects, professional citizens (Farias and Widmer 2017)
- power relations
- ceremonial activity (Sopanah 2012)

➔ **Geospatial tools**

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GOVERNANCE AS AN ATTEMPT OF STAKEHOLDERS TO STRUCTURE POLICY PROBLEMS

Spatial Knowledge	Policy Goals and Values	
	Consensus among Stakeholders	Dissensus among Stakeholders
Certain (facts and cause–effects)	(1) Tame or structured problems - Debate on technicalities	(3) Moderately structured problems - Participation to debate goals and values
Uncertain (facts and cause–effects)	(2) Moderately structured problems - Participation to debate cause–effects and optimize the collection of facts	(4) Wicked or unstructured problems - Endless debate

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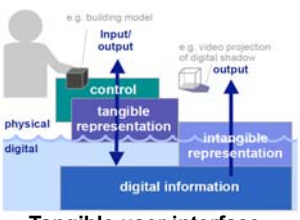
from Georgiadou and Reckien 2018

2. The technology: Maptable PSS

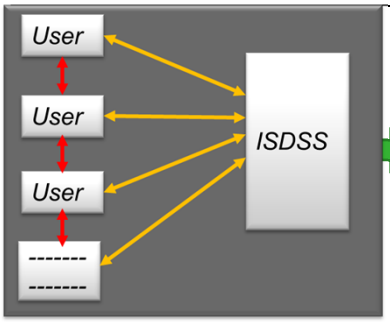
- User-friendly interfaces allow multiple users to provide input and generate real-time output to support negotiated spatial decisions
- Geospatial tools running on the maptable
- 4-6 stakeholders gather around a maptable and work on given tasks or assignments

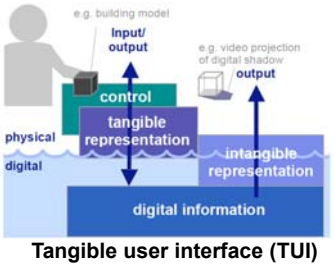


Tangible user interface

From GUI to TUI

Advantages of Tangible User Interfaces (TUI)





Tangible user interface (TUI)

Ishii (2006): TUI

- improve fluidity of user/content interactions
- positive influence for working styles and group dynamics
- enhanced interaction between stakeholder (horizontal environments)

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Shen et al. (2009): Collaborative Tabletop Research and Evaluation. Interfaces and Interactions for Direct-Touch Horizontal Surfaces. Computer Graphics & Applications, 26(5), 36-46.

TYPICAL WORKSHOP SETTING

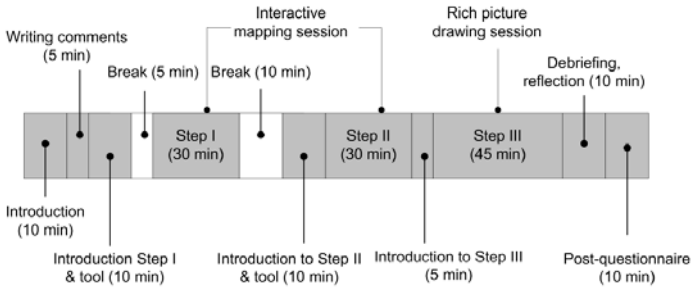

Figure 2. Timeline for the workshop session.

from Shrestha et al. 2017

- Workshop progress/sequence (see above)
- Facilitation and/or moderation provided
- Analysis of workshop results: Questionnaire, Recording (screen/audio), observations, interviews, etc.

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EVALUATION OF MAPTABLE PSS AND PARTICIPATORY PROCESSES

1. Focus on usability of the tool (Russo et al. 2018)
2. Focus on usefulness of the tool: **Effectiveness** (Arciniegas et al. 2012, **Added values** (Pelzer et al. 2014, 2016) **Social learning**

- Most participatory workshops using maptable PSS are done with expert stakeholders, hardly any studies involving layperson

Our research questions

- Do these tools help increasing levels of participation in processes?
- Do they help integrating other (groups of) stakeholders/beneficiaries in processes?
- help overcoming the aforementioned challenges of participation

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FRAMEWORK FOR EVALUATION OF PUBLIC PARTICIPATION INVOLVING A PSS

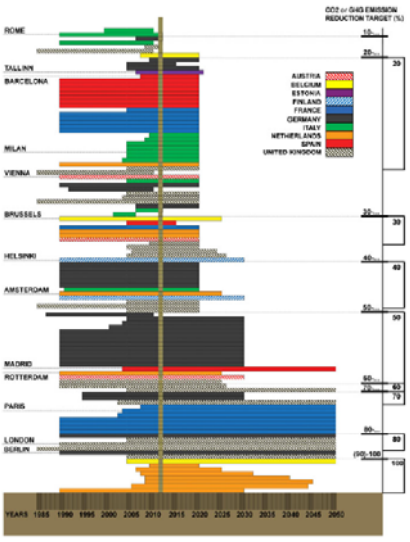
		Evaluation criteria
Participatory Process	Public dialogue	Transparent: information about issues and process is available
		Inclusive: all stakeholders and views are heard and respected
		Fair: no dominating group or person
	Social learning	Raising awareness: participants are informed about issues and stakes, they increase their knowledge about an issue
		single loop learning: changing behaviour to address a challenging situation
		double loop learning: reflecting underlying assumptions and values
Outcomes of participatory process	Issue related outcomes	Issues captured: participants priorities and preferences revealed
		Knowledge integrated: participants tacit/ experiential knowledge is added
		Consensus achieved: acceptable solution found
	Social outcomes	Ownership: participants are committed to the plan
		Mutual understanding: participants understand each other's perspectives and issues
		Community building: development of new collaborations, improved social cohesion

Ref.: Flacke et al. 2019 (Forthcoming)

3. CASE 1: ENERGY TRANSITION IN THE NETHERLANDS

INTERACTIVE GEOSPATIAL TOOL AS A MEDIATOR

Ambitions or large European cities to reduce GHG emissions



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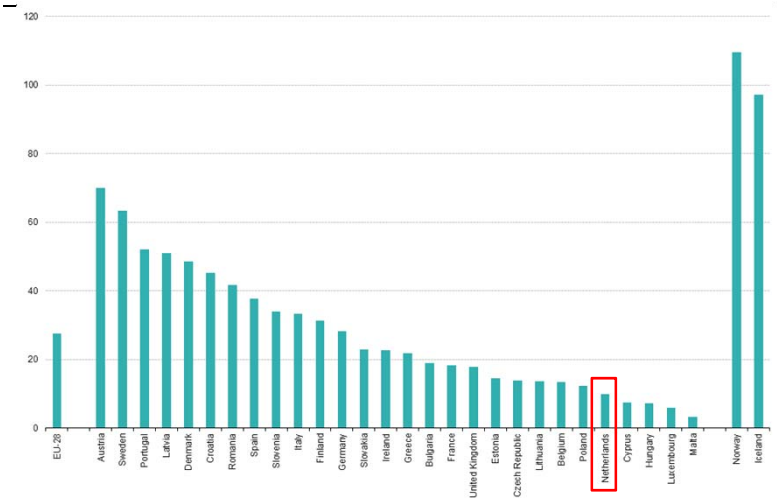
from Reckien et al. 2014

TWO CONTRASTING FINDINGS FOR THE NETHERLANDS

PROPORTION OF ELECTRICITY GENERATED FROM RENEWABLE SOURCES, 2014

(% OF GROSS ELECTRICITY CONSUMPTION)



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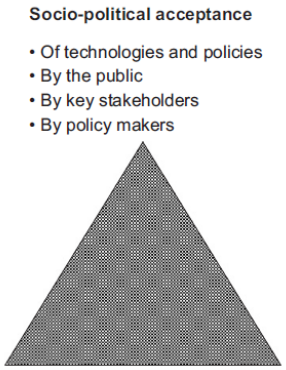
Source: Eurostat (online data code: tsdcc330)

from http://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics

MAIN REASONS FOR LOW IMPLEMENTATION OF RENEWABLE ENERGY SYSTEMS

- limited institutional capacities of local decision makers (Breukers and Wolsink 2007)
- Low level of social acceptance of renewable energy (Devine Wright 2011)



(Wuestenhagen et al. 2007)

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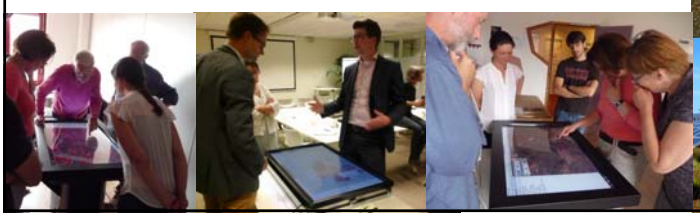
COLLAGE

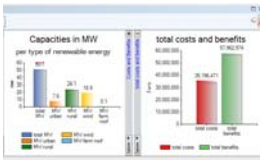
STAKEHOLDER COLLABORATION FOR RENEWABLE ENERGY PLANNING

COLLAGE – COLLABORATIVE LOCATION ALLOCATION GAMING ENVIRONMENT

- Interactive planning support tool for participatory allocation of renewable energy systems within cities/regions
- Workshops done Enschede, Dalfsen, Losser
- Goal: Awareness raising, system understanding



MODEL WORKFLOW

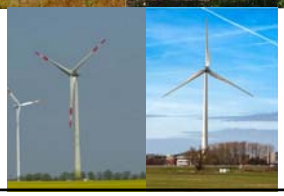


INPUT

- **Solar rooftops of different intensity** (100, 60, 30 %) mapped as building footprints

- **Solar farms** (in- & extensive) 1 ha intensive= 835 MWh/a

- **Wind turbines**
  193 m wind turbine, 8800 MWh/a
  132 m wind turbine, 4400 MWh/a



OUTPUT

- **Total Capacity of Renewable energy** 1MWh/a
- **Land consumption**
- **Costs and benefits**
- **Environmental impacts**
- **…**

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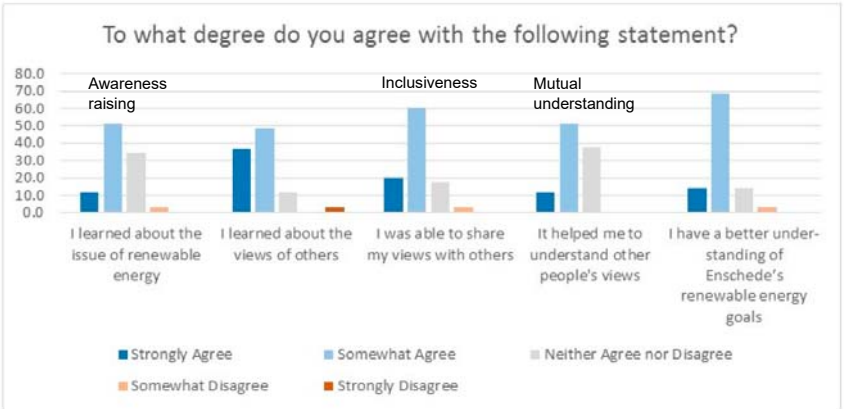
THE COLLAGE-TOOL AS A MEDIATOR



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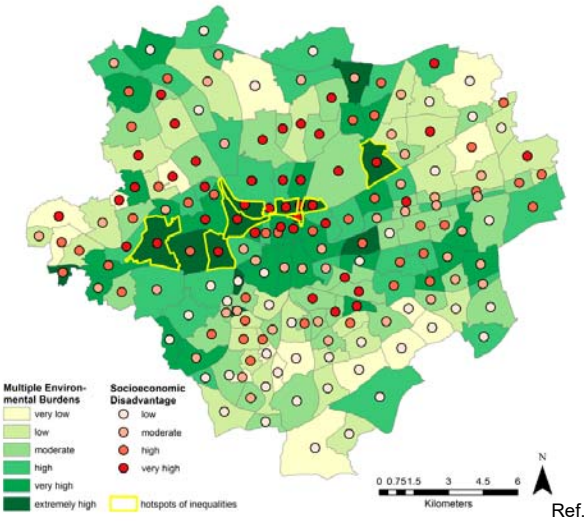
Ref: Flacke and de Boer 2017

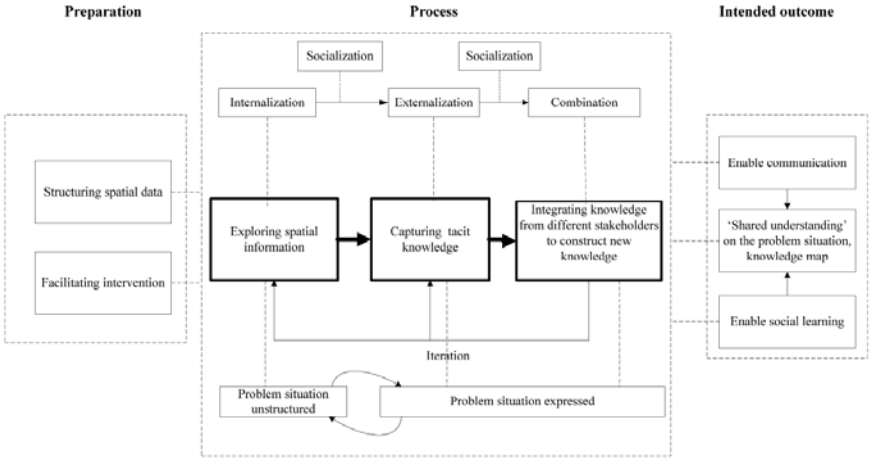
4. CASE 2: ENVIRONMENTAL HEALTH INEQUALITIES IN GERMAN CITIES

SEEING THE PROBEM BEHIND THE PROBLEM (TOOL AS A PROBLEM RECOGNIZER)



Ref.: Flacke et al. 2016

Interactive Spatial Understanding Support System (ISUSS)



RESULTS: KNOWLEDGE MAP

Figure 5. Spatial knowledge map: M1—inequality in accessibility and possibility to extend cycling routes between the northern and southern part of the city; M2—safety concerns; and M3—good accessibility to parks inside the Nordstadt.

Ref. Shrestha et al. 2017

RESULTS: RICH PICTURE

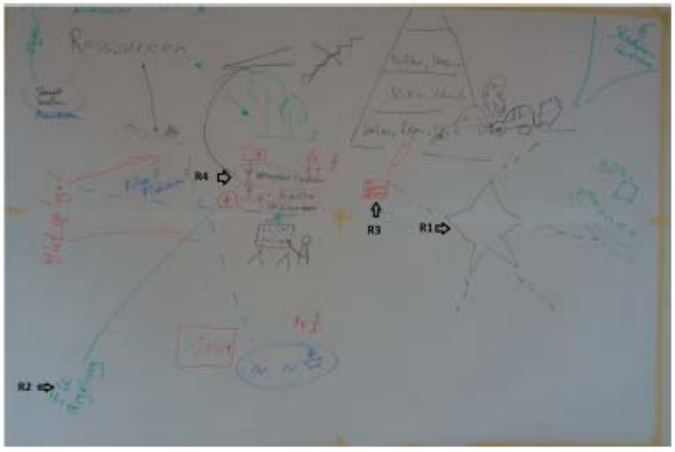


Figure 6. Rich picture: R1—the central square in Nordstadt being linked with different environmental burdens and benefits (e.g., cars causing pollution, green areas as resources); R2—local and supra-regional drivers such as EU directives, rent index, EU health insurance policy not being able to provide proper health insurance to non-German inhabitants coming from other EU-Countries; R3—vehicles coming from other cities for various and even illegal activities, including buying drugs; and R4—different vulnerable groups.

THE ISUSS-TOOL AS A PROBLEM RECOGNIZER

SOME QUOTES FROM THE STAKEHOLDER REFLECTION

co-creation by providing a “dialogue space” where evidence-based discussion is encouraged

[…] because you get together in a different setting [bring different knowledge] and talk about specific issues [that the individual perceive as important], it is something completely different compared to just presenting some statistics on a screen […].

[…] when you use the indicators shown in the maps for discussions in the city council, you discuss based on fact and not about what you believe.

enhanced communication facilitated by the combined use of the interactive maps and the rich picture

Concerning the topics of noise and air pollution it may be sufficient [showing them on the MapTable]. But I see another field, i.e., the field of health insurance. I had the feeling that in the beginning this doesn't fit into the map. But it is relevant when talking about city as a healthy living space. So, I mention it here at the end [showing the rich picture].

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CONCLUDING REMARKS

Does the maptable work as what Star and Griesemer (1999) called a boundary object?

Do such maptable based applications allow to engage with the multitude of stakeholders in a planning processes and give them a voice?

☺

- Workshop participants often enthusiastic
- Maptable useful to stimulate interaction (age dependent)
- Learning processes to be observed

😐

- Tools are hardly used in everyday practice, mostly research related
- participants taking the word gaming too literally
- trust

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The end.
Thank you!

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