

DFG GRK 2250 – Mineral-bonded composites for enhanced structural impact safety

C. SCOPE – Doctoral Project C2/I

LIFE CYCLE BASED DECISION-MAKING FOR MATERIALS IN ORGANISATIONS: WHAT CAN WE LEARN FROM SELECTED DECISION SUPPORT TOOLS



1 OBJECTIVES

Review of the concepts sustainability and resilience, the assessment frameworks for impact related context
Developing an eligible framework to evaluate specific GRK materials and processes at early stage
Understand hotspots and drivers of that assessment by case study research
Share preliminary assessment results within GRK

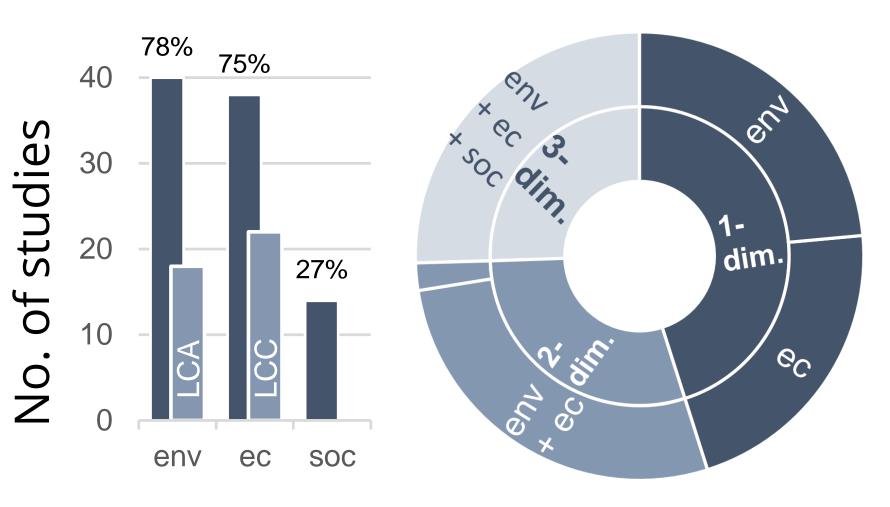
3 RESULTS

Sustainability = economic, environmental, social sphere

Resilience dimensions	Variant 1 Variant 2 Variant n				
Recognition	 Causes Effects on Structure Sustainability 				
Sensemaking	3. Adaptation of the innovation process				
Response	4. Resilient sustainable rocess Organisation				

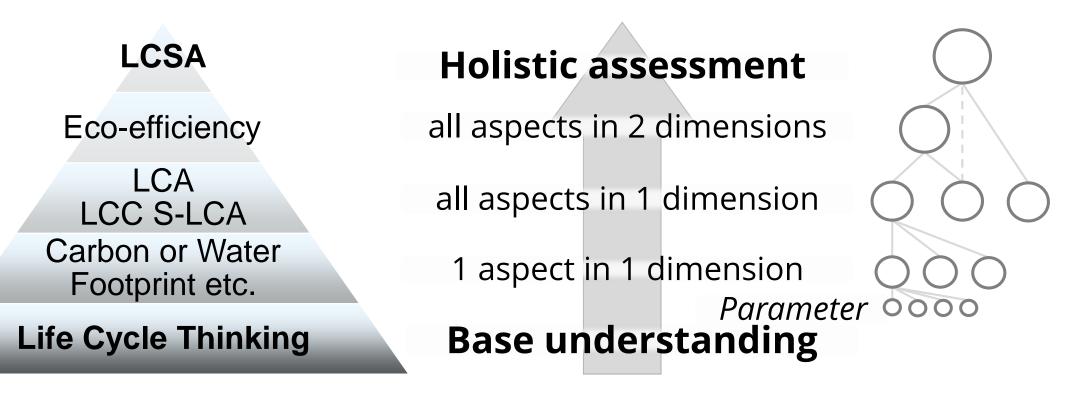


• State of the art in research shows limited holistic sustainability assessments:



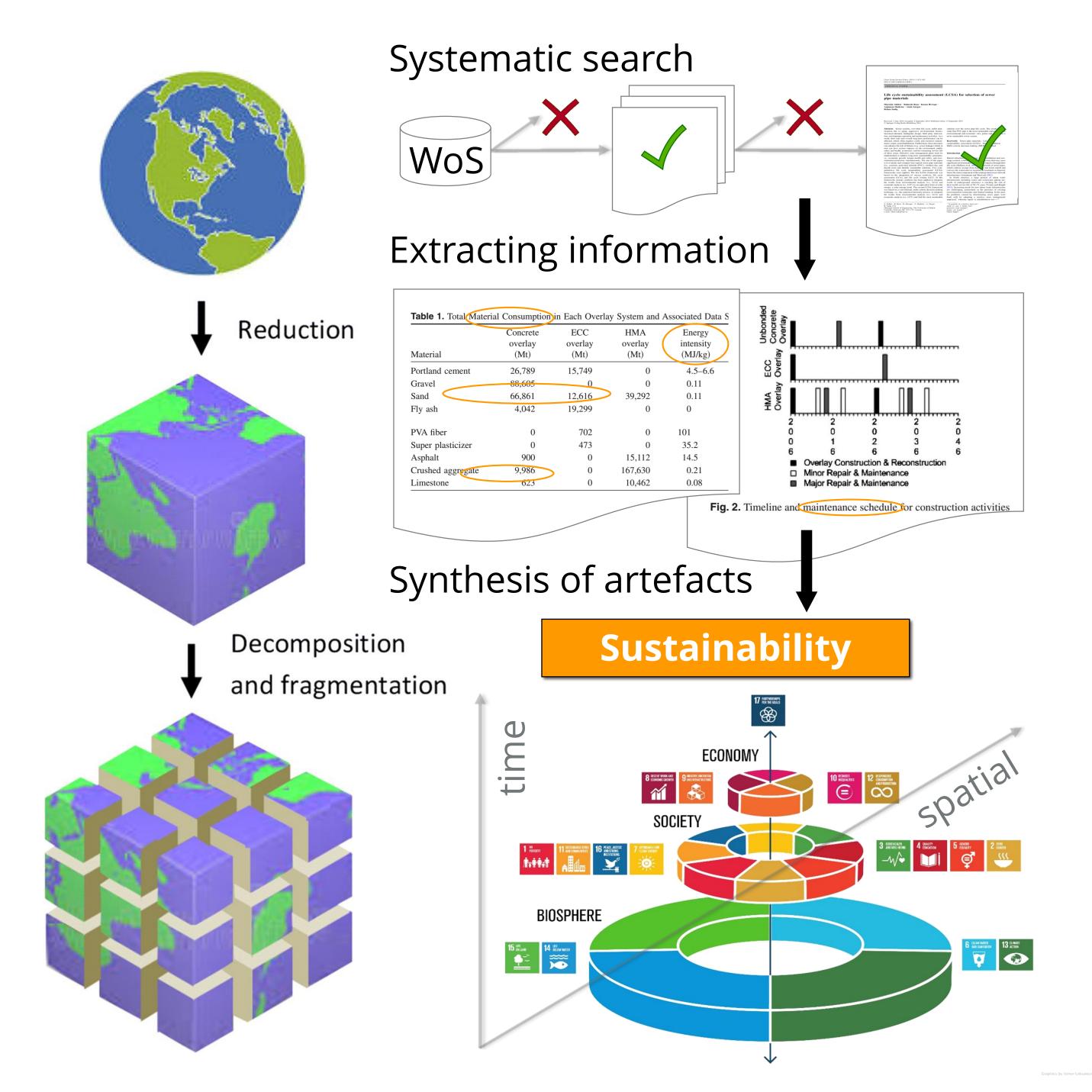
Legend: env = environmental, ec = economic, soc = social, dim. = dimension LCA = life cycle assessment LCC = life cycle Costing S-LCA = social LCA LCSA = life cycle sustainability assess.

Model for assessing sustainability





- Systematic literature review and content analysis
- Conceptualizing a quantitative framework for analysis
- Developing a life cycle assessment as starting point



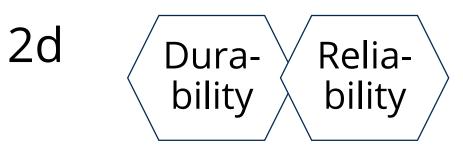
— Valuation level ———— Ag

Aggregation level —

• Expert opinion among GRK colleagues: design process

1th Mechanical safety

Most important objective (standard deviation in ranks: 1.00)



3d

4

Second ranked objectives (standard deviation in ranks: 1.16 / 0.74)

Service Sustain -ability -ability (standard of

Third ranked objectives (standard deviation in ranks: 1.34 / 1.24)

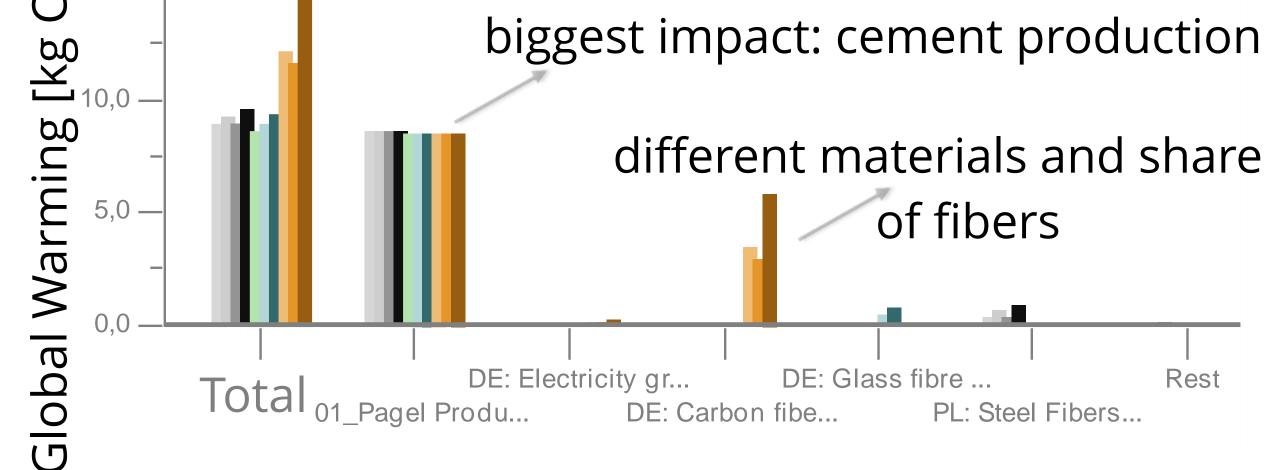
Exemplary life cycle assessment case study application

COLLABORATIONS

• M. HERING (A5/I): case study application for plates Scope et al. Materials (under review)

eq.	BP091	BP097	BP103	BP109	BP_unbewehrt
	BP 019 Glas	BP 232 Glas	BP 223 Carb	BP 001 Carb	BP 046 Carb
O_{1}	15,0 —				

Schematic view of reviewing and conceptualizing stage (sources: van Breugel, 2018; Zhang et al., 2010; Stockholm Resilience Center, 2019; pixabay, 2020)



- E. WÖLFEL (A2/I): feasibility of materials assessment
- I. SALGADO (C2/II): base for sustainability assessments