

Towards a framework for the evaluation of climate service and knowledge transfer products within climate and coastal research

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Annual Meeting of the EMS 2017, 7.9.2017, Dublin, Ireland



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Challenge

Socially responsible research and part of applied research aim at **solving real-world problems**.

Thus, aside from **scientific soundness** the principles of **relevance and usability** form important principles of this kind of research.

„The development of climate services (...) requires a transdisciplinary approach of co-design, co-development and co-evaluation“

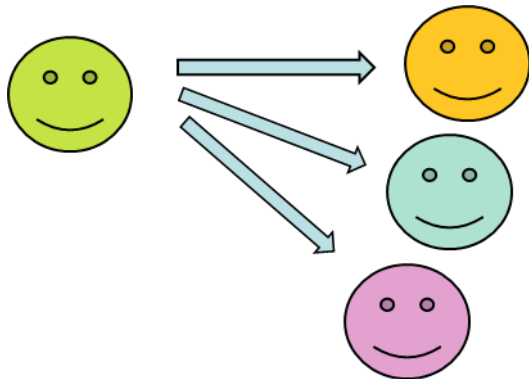
European Commission (2015): Roadmap for Climate Services

Science and practice have to be brought together to enhance successful knowledge transfer and dialogue processes.

Scientific products are to be developed according to user needs.

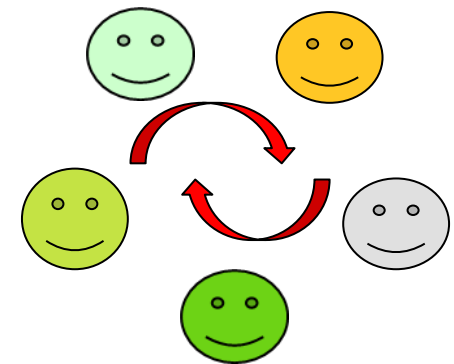
Definitions

The term **knowledge transfer** originally used in a unidirectional meaning: Scientist to scientists, practice, public.



In 2016 broadening by the German “Wissenschaftsrat” (Council of Science and Humanities): Processes of transdisciplinary research as well as the former meaning.

To encompass all sorts of research, the term is being used in the new meaning



The **core idea of transdisciplinarity** is being described in a definition, originating from a conference in Zurich 2000: **“Different academic disciplines working jointly with practitioners to solve a real-world problem”** (quoted after the proceedings: Klein et al. 2001).

Helmholtz Association

Mission: „Contribute to solve grand challenges which face society, science and industry“

Health

Structure and Matter

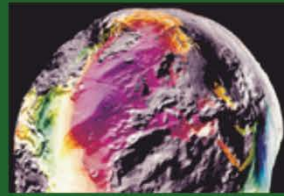
Energy

Earth and Environment

Key Technologies

Aeronautics, Space, Transport

- Five research programs



Geosystem



Marine, Coastal and Polar Systems Programme



Oceans



Atmosphere and Climate Programme



Terrestrial Environment Programme

- Two Research Centres: Alfred Wegener Institute – Helmholtz Centre for Polar and Marine Research and Helmholtz-Zentrum Geesthacht – Centre for Materials and Coastal Research
- Research topic 4: “Bridging Research and Society - products, tools and climate services”

Working group (WG) within Helmholtz Association (Earth and Environment)

Objective

Develop additional criteria for evaluation and respective indicators, appropriate to evaluate knowledge transfer, dialogue processes with stakeholders as well as climate and coastal service activities

Unique activity within
Helmholtz Association

Participants

Scientists of various disciplines within Research Programme PACES II, doing knowledge transfer and/or transdisciplinary research

Helmholtz-Zentrum Geesthacht – Centre for Materials and Coastal Research

- Institute for Coastal Research
- Climate Service Center Germany (GERICS)

Alfred Wegener Institute – Helmholtz Centre for Polar and Marine Research

Organisation

- Five workshops *Jan, Sept, Dez 2016; Jan, Mai 2017*
- External view included by common sessions “Evaluation and quality assurance of climate services, methods, criteria and pitfalls” *EMS, Sept 2016 / Sept 2017*

Activities of the WG (1)

- Continuous exchange with formal working group „knowledge transfer“ of whole Helmholtz Association
- Working paper to sum up the point of departure: *Schuck-Zöller S, Cortekar J, Jacob D (2016): Evaluation transdisziplinärer Forschung und deren Rahmenbedingungen - Vorüberlegungen zur Nutzung im Bereich von Klimaservices*
- Clarification of terms and definitions within the working group as common base
- Categorising of products:
 - Development of tools and methods (e.g., assimilation scheme PDAF)
 - Web information systems (e.g. Impact 2C web atlas, klimaatlas.de, meereisportal.de)
 - Data products (e.g. coasDat)
 - All formats of publications (e.g. assessments, fact sheets)
 - Capacity Building (e.g. training for staff in finance sector)
 - Dialogue and consultation processes (e.g. with mayors)
 - Network activities (e.g. Arctic Dialogue)

Activities of the WG (2)

- Elaboration of criteria and indicators for **output and outcome** (OECD) alongside the different product categories



- Finding: **Evaluation criteria very similar** across the different product categories – differences above all in the weighting of the criteria
- Decision for **standardisation of a few criteria** for **output and outcome** in order to simplify (*tables on the following slights*)
- Results of discussion:
 - In the first step focus on criteria for result (7 for **output** and 5 for **outcome**, postponing **impact**)
 - Each of the **criteria** differentiated in some **indicators**
 - Indicators defined by **assessment questions**, resulting in appropriate **assessment methods**

Criteria and indicators for output (preliminary version)

Criterion	Indicator
Availability	Accessibility, media responsiveness, easy-entry, support for downloads
Visibility, dissemination in target groups	Publications, events and presentations, information material on product, public relations material and activities
Scientific quality, methodological quality	Quality of data, graphic design, level of language, up-to-date, completeness, extent, transparency, reflexivity, reliability, quality assurance
Degree of innovation	Originality
Scaling	Breadth and depth of product
Practical relevance	Coverage of target group, achievement of purpose, usefulness, lucidity, navigation, usability, permanent improvement, rights of use
Strategic potential	Potential for transfer, potential for transformation, strategy for further development

Criteria and indicators for outcome (preliminary version)

Criterion	Indicator
Use	Breadth, depth, frequency and duration of use, suitability for target group, relevance, applicability for education
User satisfaction	Comprehensibility, target achievement, users appreciation, Perception of being up-to-date, estimation of trustability, identification with product
Dissemination, attention	Quotations/references, degree of recognition, intensity of perception, multiplier effect, awards, indirect effects
Users' learning effects	Degree of innovation, improvement of expertise, scientific connectivity, transformation capability
Valorisation	Licensing, operationalisation, transferability

Example: Web platform

	Criterion	Indicator	Assessment question
Output	Scientific quality	Up-to-date	How often are the different sections revised?
		Perception of being up-to-date	Do users think the platform is up-to-date?
		Diversity of perspectives	Are different perspectives considered?
		Transparency of methods	Are all scientific methods well documented?
Outcome	Use	Breadth, depth, frequency, duration	How often, how long is the platform being used? Do users look at all sections, do they follow the links, connecting further information?
		Relevance	Does the portal give answers to the questions users would expect?
	User satisfaction	Identification with the product	Would users recommend the platform to colleagues or friends?

Example: Capacity building product

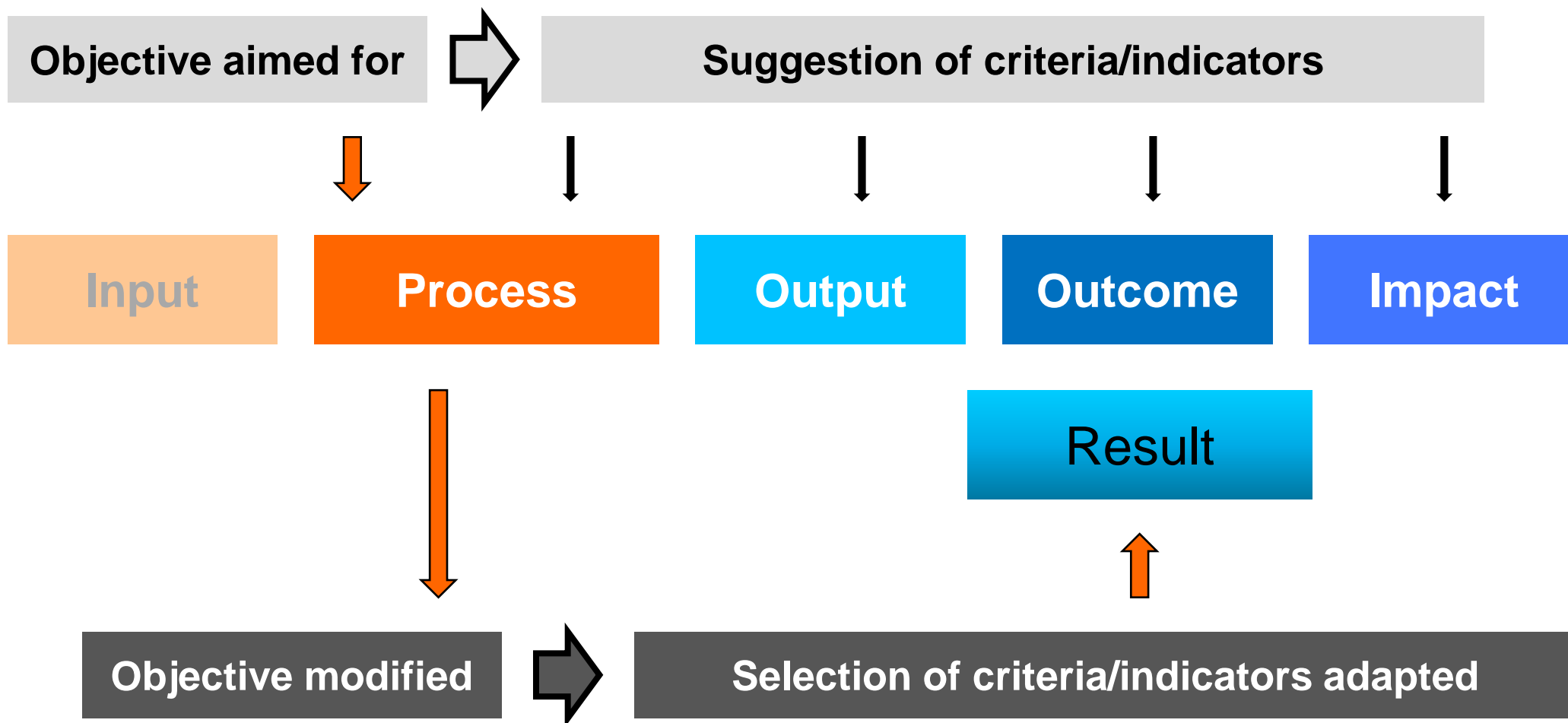
	Criterion	Indicator	Assessment question
Output	Scientific quality	State-of-the-art	Is the training content up-to-date?
		Completeness	Is the training content comprehensive?
		Transparency	Are the limits of provided information disclosed? Are the sources of training content referenced?
	Practical relevance	Coverage of target groups	Is the relevance for the target group assured?
		Usefulness	Does the product help for problem solving?
Outcome	User satisfaction	Perception of training quality	Are the participants satisfied with the content and methods of the training?
		Reliability	Is the product being looked upon as reliable?

Summing up from the WG discussions

- Evaluating **impact** is difficult and needs **accompanying research**
- It is possible to **standardise the criteria** for evaluation across different research fields
- A first preliminary **framework for evaluation** could be designed
- For every product **category** and even every **product** or **project** the weight of the criteria has to be adapted and an individual set of indicators is to be chosen
- **No prioritisation** for quantitative measurement
- It should be possible to evaluate results **qualitatively**
- Describing results by **narratives („story-telling“)** might give an overall impression and a better interpretation

Every evaluation is leaded by the objectives of the product or project. They might have changed during the process of development .

■ The role of product/project objectives



Outlook

- Presentation of results on different conferences (e.g. *EMS 2017, Dublin/Ireland; International Transdisciplinarity Conference 2017, Lüneburg/Germany*)
- Organisation of peer review of working process and results by external and neutral expert (*autumn 2017*)
- Enhance networking on this issue within whole Helmholtz Association (*2018/19*)
- Promote definition of clear project objectives and respective evaluation criteria already with application for funding (*2018/19*)
- Go for criteria to evaluate process of product/project development and care for continuous monitoring (*2018/19*)

References

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