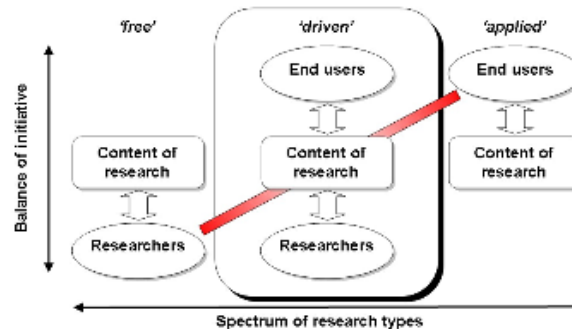


Frame of Reference - How to use it in 'driven' research settings

A large part of hydraulic engineering research is inspired and financed by organisations like governments, port authorities, dredging companies and consultancies, which have an interest in practically relevant and applicable results. In this context, a recurring issue is the effectiveness of the R&D investments. One of the key challenges in demand-driven research is a fundamentally different attitude of researchers and end users towards what is to be considered 'relevant' information. By nature, researchers are inclined to measure the quality of their research by its contribution to the scientific 'state-of-the-art', whereas end users are inclined to measure this quality by its contribution to practical problem solving.

The issue: handling 'driven' research effectively



A spectrum of project types based on the level on specialist and end user involvement

Basically, the two extremes in the spectrum of research drivers are curiosity and practical demand, leading to 'free' and 'applied' research, respectively. 'Free'

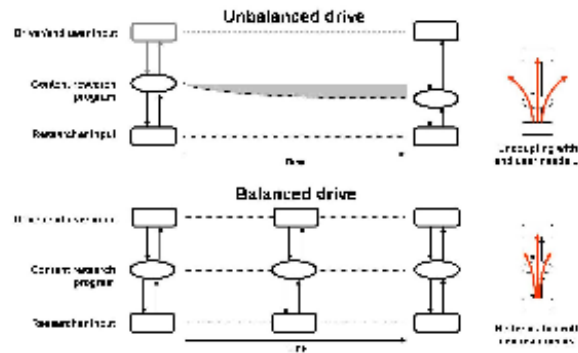
In many hydraulic engineering research projects of this intermediate type, the balance tends to be tilted towards the 'free' end of the spectrum. In the course of such projects, the aforementioned natural difference in attitude between researchers and end users tends to yield research results that are scientifically interesting, but hard or even impossible to use in practice. This phenomenon is commonly referred to as the 'gap' between science and practice.

The CoastView, Conscience, Micore and Building with Nature projects are examples of 'driven' research projects. Proper handling such research context requires three basic skills:

- The (will and) ability of researchers and end users to interact effectively in a process of joint problem definition.
- The (will and) ability to focus ongoing research on this jointly defined problem (effort mainly required from the scientist).
- The (will and) ability to adapt existing procedures and processes in practice to state-of-the-art knowledge (effort mainly required from the end-user).

The Frame of Reference approach brings together these basic skills.

The tool: the frame of reference approach



Balancing specialist and end user input in research settings

A key element in matching science with end user needs is to use the end user's information need as an explicit starting point for knowledge development and

- a strategic management objective;
- an operational management objective; and
- a decision recipe containing:
 1. a quantitative state concept;
 2. a benchmarking procedure;
 3. an intervention procedure; and
 4. an evaluation procedure confronting the operational as well as the strategic objective.

Ideally, all elements of the basic frame of reference need to be made explicit, but in reality compromises have to be made. Identification of the elements that have actually been made explicit reveals so-called 'white spots', representing the remaining information needed to develop a successful and coherent approach. In the course of a research or design process, the frame of reference therefore requires continuous reframing and finetuning.

As a matter of example the Frame of Reference for the Dynamic Preservation policy is presented below:

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The challenge: utilize the frame of reference within 'driven' research settings

Applying the same approach to various problems promotes comparability of the results. Previous applications in the CoastView and Conscience projects have shown that the method actually works and produces useful results. For the CoastView project the final results were described and compared in Van Koningsveld et al. (2007), for the Conscience project in Marchand (2010). For the MICORE project the same was done and published in Ciavola et al. (2011a and 2011b). To further facilitate the practical use of the Frame of Reference a useful template has been developed in the context of the Building with Nature project. Using this template enables convenient summarizing and reuse of the information produced.



Basic Frame of Reference