

Zukunft Bau

Abstract of BBSR-research project

Title

Title long version: Rating system “Sustainable Construction Process” in building construction – Development of a system of cause and effect variables for ecological, economic and social assessment of the building construction

Motivation

With the BNB system the federal government already has available a certification system which is applicable as a planning and optimization tool for sustainability assessment throughout the life cycle of buildings. In addition to this, this research project aimed to develop a rating system for building construction that makes the sustainability of secondary, supporting construction processes transparent and accessible for an assessment.

Scope of research

In order to realise the outlined definition of goals, the research project was separated into seven sequential work packages as shown in figure 1.

In *work package 1*, preliminary considerations provided a theoretical basis for the following research. First, the process landscape of the construction process was analyzed and the relevant secondary processes were identified to define the scope of the research topic. An overview over the existing landscape of certification systems for sustainability showed possible linking points for the sustainability rating of secondary processes in the construction process. In this regard, the system boundaries of the topic of research – i.e. the sustainable construction process – were further examined and defined for the following steps of research. An additional element of the preliminary analyses was the consideration of interface options for the integration of the assessment approach in the existing certification landscape. Furthermore, the topic of sustainability was first discussed in general, but then mainly in regard to the special conditions in the construction industry. In this context, the “triple bottom line” approach for sustainability was explained and the status quo of construction specific sustainability definitions was identified. Beside the three categories of ecological, economic and social quality it became necessary to integrate a fourth category which considers organisational and personnel aspects concerning secondary construction processes. The result of these steps is a sustainability definition which is applicable for the rating system “Sustainable Construction Process”.

In *work packages 2 to 4*, the assessment system itself is developed, which can be considered as the core of the research project. For this, the methodological basics for the developments steps of such a target system were discussed. A first step involved the determination of protection and action objectives which form a first substantiation of the construction specific extended and modified “triple bottom line” model. To assess these objectives, they had to be transferred in assessment criteria and extended by quantitative and qualitative indicators and measures. The development of the target system was completed by creating a weighting matrix for the rating system based on the AHP-method.

The theoretically designed draft of the rating system was validated by a pilot phase in *work packages 5 and 6*, in order to reveal deficiencies and possibilities for improvement. For this purpose, the methodology of the pilot phase was explained by defining the objectives of the pilot application, the requirements for the pilot projects and the different steps that need to be taken during the pilot phase. The results of the pilot phase were analyzed on two different levels: First, the results were evaluated and interpreted for each pilot project. Second, more general results were deduced from the pilot phase on the system level and studied in regard to their meaning for the rating system in general.

The last *work package 7* discussed the integration of the rating system in the existing landscape of certification systems, the preconditions for system implementation and how the system can be conducted successfully.

Results and key findings

The rating system „Sustainable Construction Process” offers the comprehensive opportunity to assess the sustainability effects of secondary construction processes. Therefore, the rating system uses a construction specific extended “triple bottom line” model of sustainability, which is the acknowledged basis for all existing German systems for sustainability assessment. The federal government, which is already owner of the BNB system, is capable of integrating the rating system in the existing certification systems on different ways, either by integrating it on a system level or by diversifying the whole landscape of certification systems.

Basic information

Short title: Rating system “Sustainable Construction Process” in building construction

Researcher / Manager: Darmstadt University of Technology, Department of Concrete and Masonry Structures, Prof. Dr.-Ing. C.-A. Graubner (Project management), Dr.-Ing. Sebastian Pohl (Project realisation)

Overall costs: € 89,662.92

Federal Government subsidy: € 59.662,92

Project duration: 19 months

Figures:

Figure 1: flowchart.jpg

Caption: Flowchart of the research project and scope

