Geophysical Research Abstracts
Vol. 18, EGU2016-6687, 2016
EGU General Assembly 2016

Conceptional Considerations to Energy Balance and Global Warming Potential of Soil Bioengineering Structures

Magdalena von der Thannen (1), Roman Paratscha (2), Roman Smutny (2), Thomas Lampalzer (3), Alfred Strauss (2), and Hans Peter Rauch (1)

(1) University of Natural Resources and Life Sciences, Institute of Soil Bioengineering and Landscape Construction, Department of Civil Engineering and Natural Hazards, Vienna, Austria (magdalena.von-der-thannen@boku.ac.at), (2) University of Natural Resources and Life Sciences, Institute of Structural Engineering, Department of Civil Engineering and Natural Hazards, Vienna, Austria, (3) Austrian Service for Torrent and Avalanche Control, Wr. Neustadt, Austria

Nowadays there is a high demand on engineering solutions considering not only technical aspects but also ecological and aesthetic values. In this context soil bioengineering techniques are often used as standalone solutions or in combination with conventional engineering structures. It is a construction technique that uses biological components for hydraulic and civil engineering solutions. In general it pursues the same objectives as conventional civil engineering structures. Currently the used assessment methods for soil bioengineering structures are referencing technically, ecologically and socio-economically. In a modern engineering approach additionally, environmental impacts and potential added values should be considered. The research project E-Protect aims at developing Environmental Life Cycle Assessment (LCA) models for this special field of alpine protective constructions. Both, the Cumulative Energy Demand (CED) and the Global Warming Potential (GWP) should be considered in an Environmental LCA over the whole life cycle of an engineering structure. The life cycle itself can be divided into three phases: the construction phase, the use phase and the end of life phase. The paper represents a concept to apply an Environmental LCA model for soil bioengineering structures. Beside the construction phase of these structures particular attention will be given to the use phase. It is not only important in terms of engineering effects but also plays an important role for positive carbon footprint due to the growing plants of soil bioengineering structures in contrast to conventional structures. Innovative Environmental LCA models will be applied to soil bioengineering structures which provide a new transparency for the responsible planners and stakeholders, by pointing out the total consumption of resources in all construction phases and components.