



Terra-Preta-Technology as an innovative system component to create circulation oriented, sustainable land use systems

M. Dotterweich (1), J. Böttcher (2), and A. Krieger (3)

(1) University of Mainz, Institute of Geography, Germany (mail@markus-dotterweich.de), (2) areal GmbH – cooperation for sustainable water management, Hofstraße 5, 67822 Hengstbacherhof, Germany (j.boettcher@areal-gmbh.de), (3) IfN - Ingenieurbüro für Nachhaltigkeit, Dorfstr. 71, 15345 Lichtenow, Germany (ae.krieger@gmx.de)

This paper presents current research and application projects on innovative system solutions which are based on the implementation of a regional resource efficient material flow management as well as utilising “Terra-Preta-Technology” as an innovative system component. Terra Preta Substrate (TPS) is a recently developed substance composed of liquid and solid organic matter, including biochar, altered by acid-lactic fermentation. Based on their properties, positive effects on water and nutrient retention, soil microbiological activity, and cation-exchange capacity are expected and currently investigated by different projects. TPS further sequesters carbon and decreases NO₂ emissions from fertilized soils as observed by the use of biochar. The production of TPS is based on a circulation oriented organic waste management system directly adapted to the local available inputs and desired soil amendment properties. The production of TPS is possible with simple box systems for subsistence farming but also on a much larger scale as modular industrial plants for farmers or commercial and municipal waste management companies in sizes from 500 and 50,000 m³. The Terra-Preta-Technology enhances solutions to soil conservation, soil amelioration, humic formation, reduced water consumption, long term carbon sequestration, nutrient retention, containment binding, and to biodiversity on local to a regional scale. The projects also involve research of ancient land management systems to enhance resource efficiency by means of an integrative and transdisciplinary approach.