

Comments on IPCC Special Report on Climate Change and Land

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In order to change cultivation systems to more sustainable, plant nutrients must be recycled in a sustainable way.

Materials originating in plants, animals and microorganisms shall be called RENEWABLE ORGANIC MATERIALS, unlike organic materials derived from fossil raw materials (coal, oil, natural gas) which should be called FOSSIL ORGANIC MATERIALS.

If the world is to succeed in claiming soil degradation, unsustainable management of RENEWABLE ORGANIC MATERIALS in waste and wastewater must be radically changed to sustainable.

RENEWABLE ORGANIC MATERIAL contains bioenergy that is the sun's radiant energy converted and stored in plants during photosynthesis. The plants are primary producers and need access to at least 16 essential elements for growth and development.

Essential plant nutrients ordered by weight percent of the plant's dry matter are: carbon (C), oxygen (O), hydrogen (H), nitrogen (N), potassium (K), calcium (Ca), magnesium (Mg), phosphorus (P), sulfur (S), chlorine (Cl), boron (B), manganese (Mn), zinc (Zn), copper (Cu) and molybdenum (Mo), according to Sune Pettersson (*Kunliga skogs- och lantbruksakademi tidskrift. Suppl. 16.1984*). The plants receive elements carbon (C), oxygen (O) and hydrogen (H) from carbon dioxide (CO₂) and water (H₂O) while the other elements must be found in cultivated soils and horticultural substrates.

RENEWABLE ORGANIC MATERIALS should be used first and foremost with cascading systems in bio-based economy, which means that residual products or waste from one process can become raw material for another. Finally, the waste should go without creating emissions to decentralized high-tech biogas plants where it will be converted into biogas containing energy-rich methane and biofertilizers containing both bioenergy and plant nutrients in partially transformed organic structures and in microorganisms.

Unfortunately, at present, biogas plants often lack hygienic working environment and process techniques are poorly adapted to microorganisms that perform bioconversion. All technology must support biological processes, otherwise problems with health, environment and climate will be worsened.

Carbon capture in a sustainable way and supporting actions for biodiversity in cultivated soils is only possible with sustainable cultivation using sustainably recycled plant nutrients in organic fertilizers from biogas plants connected to modern logistics system avoiding emissions.

Emissions from waste and wastewater treatment cause environmental damage and big financial losses. **Using technology that supports biological processes in all of society's activities will have a tremendous positive impact on health, the environment and the climate.**

Proposals that need to be transformed into the requirements of citizens to decision makers can be found on www.biotransform.eu.