

RECYCLING: THE WORLD PERCEPTION

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The unsustainable consumption of the earth's annual resources already by autumn should be turned towards a balance between consumption and production. Uncontrolled environmental pollution and climate change further pose challenges to sustainable development to ensure safe living environment for humans, and future generations. Waste earlier dumped in oceans or landfills are already partly transformed to new valuable raw materials and products. Separate collection and treatment is at least partly organized for several waste fractions, such as food, paper, textile, plastic, rubber, residues from agriculture and forestry, electronics, glass, metal and construction materials. Simultaneously new challenges have arisen, such as soils may be losing organic matter whilst huge ash quantities are stored as hazardous waste or distributed in environment, due to increasing organic material incineration for energy purposes, resulting in increased greenhouse gas production. Renewable energy sources should be carefully selected to keep the carbon footprint low. Industrial flue gases (smog), waste chemicals released to surface waters, medicalization, and persistent chemicals spread to environment in low concentrations (heavy metals, pesticides) may cause problems in material recycling. For example, wastewater sludge use in agriculture as a fertilizer is ending due to medicalization and chemical pollution. Though in some developing countries hardly any wastewater treatment occurs, the second generation processes are already under development to replace those based on activated sludge treatment and nitrogen removal by nitrification-denitrification. As phosphorus and nitrogen stocks are running out, they could be separated from wastewater for fertilizers. Grey wastewater would be easier to treat. Closed water and non-renewable material circulations would support the sustainable development. Many of topics related to circular economy are international, which is a challenge for cooperation between authorities of different countries to find sustainable solutions. The economy related to recirculated materials and products is huge, and circular economy produces new work for humans.

Biography

Merja Kontro has completed her PhD from Aalto University (Finland) and Postdoctoral studies from Purdue University (United States) and National Public Health Institute (Finland). She is an Associate Professor in Environmental Biotechnology, and the research is focused on the field of teaching in Environmental Change and Global Sustainability Master's program Bio- and Environmental Technology at the University of Helsinki. Her current research fields are related to Safe Water Resources, Especially Groundwater, Environmental Remediation (pesticides), and Transforming Waste to Valuable Products. Her past research topics include drinking water, wastewater, water-damaged buildings, and aerobic and anaerobic waste treatment. She has more than 86 publications, 60 in reputed journals and books.

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