

Towards a Sustainable, Circular Bioeconomy: the Role of Innovation, Practice and Policy

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Abstract

The use of natural resources globally has tripled in the last 50 years, and could double again by 2060 if we continue business as usual. Our current linear system highly depends on finite, unsustainable resources, pushing the planet to its limits and increasing inequalities. Also, the demand for food and non-food biomass is increasing rapidly. Current agri-food systems do not capture the maximum value from biological resources to sustain the global population of tomorrow. Bioeconomy policies are part of national low-carbon, non-polluting growth strategies. Today, more than 60 countries have bioeconomy or bioscience related strategies, which aim to harness the power of biological resources, science and technology, and to address different global challenges; providing food, feed, wood-products and furniture, paper, bio-based textiles, bio-chemicals, bio-plastics, bio-pharmaceuticals and bio-energy for a growing population while preserving our natural resources. These strategies, often linked to circular economy programmes, can improve resource use efficiency and the conservation and regeneration of biological resources. While different countries have different systems of measurement, many have estimated that bioeconomy represents 5 - 10% of their national GDP. Agri-food systems transformation is a particularly powerful lever for achieving global goals. They occupy the biggest share of the bioeconomy, employing 1.2 billion people worldwide. They also hold important opportunities for discovery and innovation. For instance, microbiome research can support sustainable agri-food systems that inextricably link healthy soils, to healthy plants and animals, to healthy diets in humans and to a healthy planet. However, agri-food systems are also contributors of GHG emissions, natural resources degradation and social inequalities. This presentation will outline FAO's work on bioeconomy, with a focus on how circular bioeconomy can support the transition to more sustainable food systems at three levels: innovation, policy and practice. Through knowledge products on bioeconomy, which include good practices, policies, tools and indicators, FAO provides guidance to leverage technological bio-innovations, together with institutional and social innovations. Circular bio-innovations and technology play a key role in the shift from an economy based on fossil resources to one based on renewable biological resources. For instance, bio-innovations such as biostimulants to improve plant health and protein produced from waste streams, can contribute to reducing the great problem of food loss and waste. Beyond the technology

itself, science-based data and inclusive governance mechanisms are needed to make the right choices between different policy and investment scenarios of these bio-innovations. FAO works with policy-makers to develop coherent and sustainable bioeconomy strategies and policies that exploit synergies and navigate trade-offs between the agri-food system and other parts of the economy that rely on biological resources. A set of 10 Aspirational Principles and 24 Criteria for Sustainable Bioeconomy has been developed to provide a framework that considers all dimensions of sustainability under bioeconomy strategies and monitoring systems.

Keywords: agri-food systems, bioeconomy