

Theme 4: Partnerships: Governance of transitions

Session 1-8

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Influential visualizations for a circular biobased economy

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Digital visualizations for a transition to a circular biobased economy can be further developed in order to better integrate academic knowledge, the concerns, interests, and experiential knowledge of stakeholders and citizens (Holmgren et al., 2020, Devadason, 2011, Jasanoff et al., 2013). There is a trend to be discerned – to include stakeholders, citizens, and decision makers in the creation of new models, and visualizations (Metze, 2020). Their inclusion is aimed for in order to make the visualization tools more accurate, adaptive, or inclusive. Still, these studies are mostly working within a linear knowledge model ((Turnhout, et al, 2013). In a linear knowledge model, visualizations provide a form and style of science communication and are communication tools to address a ‘knowledge gaps’ from the public: make them more aware, better inform them. Although better informing is one role visualizations may play, many other studies demonstrate that a knowledge deficit is usually not the issue. The public that is concerned and involved in environmental policy and planning issues does gather knowledge, gets access to information. However, very often they will argue based on counter-facts, make use of uncertainties, ambiguity, and controversies within the academic world (Metze, 2017, Oreskes, N., & Conway, 2010, Sarewitz, 2004). The challenge for visualizations studies is to move beyond the idea that more and better information through visualizations will improve environmental policies and planning. Scholars in data-visualization should make even more use of the participatory concepts and methods developed in the second largest strand of literature on visualizations in knowledge-cocreation and participatory planning (see below). In this cocreation literature, the linear model is replaced with a dialogue mode, and the role of scientists is not only to produce and communicate about their knowledge; but to also listen to society and engage in conversations in order to better integration of different. In this panel we invite papers that further explore the role of all sorts of visualizations -data visualizations, found images, photographs, but also visualizations in serious games. We aim to bring together researchers that explore, conceptualize and study empirically the role these visuals about transitions – and specifically a transition to a circular economy, play in cocreation processes, policy and political decision making, public opinion formation, public understanding of science, but also for policy learning, and responsible research and innovation.

NOTE: this session is only open to poster submissions (orals will be all invited).

Seaweed: From revolution to mainstream

Closing the gap: seaweed as the missing link between land and sea in a circular agriculture system

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Seaweed gets more and more interest as an emerging new green resource. There is broad potential in application, from food and feed to pharmaceutical application, and the cultivation of seaweeds has potential positive effects on ecosystem quality. Recent work has shown that seaweed can aid in closing the gap of a circular agriculture system by absorbing the nutrients from terrestrial effluents and bringing them back from sea to land.

Helping seaweed achieve its full potential not only requires that various actors inside and outside the value chain work together but asks for new institutional arrangements that can be realized through partnerships between public authorities, the private and the non-profit sectors and research organizations. The Safe Seaweed Coalition, introduced in this session, is exemplary of new partnerships established to support the development of this promising resource and drive transition.

This session will point out critical issues, including but not limited to safety, for seaweed to be part of a circular bioeconomy and discuss how partnerships can help address these issues. The proposed session aims at bringing together internal and external knowledge on seaweed, with perspectives from academia, NGO, philanthropy and industry. The discussions will contribute to the development of the sector, accelerated by a call for international collaboration and knowledge sharing.

Wageningen University & Research has developed a broad and thorough knowledge base on this topic as well as a large network globally. The One-WUR vision is a key driver throughout the workshop where inhouse expertise and networks will be shared with the participants of the symposium. This will be done by presenting the potential of seaweed for a circular economy as well as questioning the routes necessary to unlock this potential and become impactful.

Food system transitions in deltas under pressure

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Deltas world-wide are increasingly under pressure. They form a dynamic link between land and water, fresh and saline environments, connecting the natural environment with production systems organized by human intervention. Deltas are among the most productive agriculture and aquaculture areas, while at the same time they face challenges of urbanization, flooding, drought, cyclones, sea level rise, salinity intrusion and subsidence. It is evident that changes in deltas are occurring in an ever more rapid pace: climate change as well as development-driven changes entail that the food system must change towards higher sustainability and resilience while simultaneously meeting increasing demands for food production. Not only the number of people in deltas are increasing, but also their diets are changing (more protein, opportunities for livestock and aquaculture) as are the risks (e.g. emerging diseases, supply chain risks) for and constraints (reduced environmental impact) on production. This session focuses on scientific insights aiming at better understanding the driving forces and interventions needed to bring about the transition to a more sustainable and resilient food system in deltas.

NOTE: this session is only open to poster submissions (orals will be all invited).

Novel protein sources

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Alternative and novel protein sources are urgently needed to meet the increasing demand for plant-based and animal protein for the world's growing population. Traditional meat production requires a lot of space and natural resources. Alternative, sustainable protein sources, such as insects, macro- and micro-algae, fungi, alternative grains and legumes can contribute to a solution to tackle this problem and to make the food chain more circular. Wageningen University & Research is investigating the potential of alternative protein sources for human food and animal feed. In the transition to a circular food system many governance challenges may arise related to the novel protein sources. Questions that are needed to be answered are for example; how can novel protein sources contribute to a circular food system? What kind of transitions are needed for this? Transitions are not only regulatory changes but also for example transitions by social and appreciating initiatives. Different aspects which are important in the different stages of the production or supply chains of novel proteins will be addressed in this session. Aspects like, food or feed safety, consumer acceptance, use of residual streams, optimal production, and processing of novel proteins will be discussed. Researchers on novel protein sources in relation to a circular food system are invited to submit their abstracts to this session. Novel protein sources could be insects, algae, fungi, alternative grains, legumes etc., linking to circularity. Governance challenges related to food or feed safety, consumer acceptance, use of residual streams, optimal production, processing of novel proteins need to be addressed in the presentations.

Local and circular valorization of urban biowaste – challenges and benefits for more resilient cities

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The purpose of this session is to explore how local and circular valorization of urban biowaste can improve cities' resilience by closing the loop with food production, energy consumption and urban environment (soils, urban vegetation, etc.). Organizational, economic and social models as well as technical solutions for sustainable establishment of such local and circular concept will be explored. The annual average growth rate of world population is about 1% whereas it reaches 1.9% in urban areas. The urban population is expected to reach 6.7 billion in 2050 representing 68% of the total world population. This growing urbanization results in an increasing energy and food demand and produces high amounts of municipal solid waste. This puts environmental, economic

and social pressure on urban centres. Organic waste represents a large part of the urban municipal waste mass: 14 to 47% depending on the European countries; more than 60% in developing countries. This organic waste can generate odour, GHG emissions, leachate and sanitary problems. However, it also represents a great resource for renewable energy production and also for providing agronomic added-value products (amendments, organic fertilizers, biopesticides, etc.) needed for agricultural production. Thus an optimized and effective scheme of management for urban organic waste is essential to bring urban development to fully sustainable dynamics in terms of material, organic products, organic waste and energy flows within the urban area as well as between urban and rural areas. Social, economic and environmental contexts call for the development of systems based on circular economy, including management of biowaste (local biorefineries and compost producers). These systems do not necessarily need to be based on centralised, industrial size, production tools. The experiments reported by Zero Waste Europe demonstrate that new strategies of organic waste management with a better involvement of citizens and a better communication among stakeholders can contribute to improve recycling rates, with a boost of local employment. As a consequence local and decentralized models for urban biowaste management and valorization are gaining interest. Presentations in this session may present researches on new local and circular concepts for urban biowaste valorization. They may deal with the environmental, economic and social assessment of such concepts but also with the organizational and technical solutions (collection, transformation processes, value and use of the biobased products) associated with these concepts. Tools to establish and plan new urban biowaste management schemes may be exposed. Finally, regulatory, sanitary and other bottlenecks and lock-ins may be addressed.

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Food Connects: Food systems as drivers of circular cities

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The urgency: Circular urban food systems

The world is rapidly urbanizing. By 2050 it is estimated that two thirds of the world's population will be urban and almost 80% of food will be consumed in the cities. The unsustainability of these urban food systems, such as consumption, production and resource use practices are already evident today. Urban areas at present show fragile rural-urban food systems, which are challenged by changing demography due to migration and rural-urban linkages.

Cities create enormous amounts of waste, deplete non-renewable resources, degrade soils, pollute water and air, and reduce biodiversity at alarming rates. Cities need circular food systems that are founded on regenerative principles with minimal losses of

resources to water, air and soil erosion, and maximum reuse and recycling, while creating healthy crops and animal welfare. These food systems should secure enough healthy food for everyone. Inclusion of all people in the development of these urban food systems is crucial to its success. We are convinced a food system approach, based on systems thinking can be the driver towards circular cities. With a food system approach, different dimensions are better understood, making it possible to work towards systemic changes and target interventions at different scales and across sectors. The food systems approach connects different aspects like diets, culture, economy, equity and sustainability. Food connects!

Aims of the scientific session: In this scientific session we discuss the latest insights from ongoing research and projects which places the food system as a driver for circular cities. We kindly invite the scientific and professional community to join and submit abstracts for papers to be presented during the session. We suggest the following subtopics: systems thinking, design approach, food systems, urban-rural interactions, equity, inclusiveness, transition pathways and leadership. We propose the following subjects: (i) Circular urban food systems for food and nutrition security: how to reduce natural resource use while avoiding trade-offs in pursuing different objectives of food system transformation. (ii) Governance in rural-urban food system settings: challenges and possible governance arrangements for healthy, inclusive and sustainable food systems. (iii) Improving access to nutritious food in urban contexts: ensuring social embedding of technical solutions (e.g. food fortification and reducing food waste).

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Circular textiles

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The academic session would be to promote exchange of research and debate on ways to better assess and monitor the footprint of textile production. If we want as a world to be completely fossil free by 2050, we need to have good instruments to assess our current footprint, and even more instruments to monitor the footprint of consumption of clothing, production of textiles and extraction of raw materials, including the use of energy, water and chemicals. Recent studies for the Dutch government have demonstrated the lack of longitudinal data. The textile strategy of the EU has also highlighted the importance of better statistics. Currently research and policy is very much based on anecdotal data, simulations and approximations. Examples are the 8000 liter water needed to make 1 kilo of cotton, the environmental impact of leather production, the impact of fast fashion on textile consumption, the impact of re-use, resell and refurbish of clothing on overall textile consumption. While this type of information may fuel a call for action, it is limited to choose strategies for change and to monitor the effect of those strategies.

The session would focus on papers presenting methods and evidence on better understanding aspects of the impact of textile production from agricultural economics to consumer studies, including industrial aspects. The session wants to present both papers

focusing on reduction of the footprint of consumption in developed and in developing countries. There is particular interest for studies focusing on cotton, on feedstocks for biobased fibres and on the quantitative impact of re-use and recycling. The session excludes papers based on anecdotal data and on one-off research, but wishes to select papers based on longitudinal data (or in the development of longitudinal data), on consumer panels, on long term value chain data. It may also serve to present results of studies and research on tracing value chains (e.g. through remote sensing, blockchain etc...). Finally research on sustainable labelling or other codes of conducts is welcome, as long as they present and inform about long term change and the possibility to monitor trends in the future.

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Governing products towards circularity

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As a response to the unsustainable, conventional 'take-make-dispose' economic model, the European Commission and several other actors envision to make Europe a circular economy. The systemic and disruptive changes required for such a transformation will not take place without significant changes in existing regulatory structures. Less clear is, however, what these changes will be in practice.

Whilst there may be limits to setting effective policies to directly constrain the use of virgin raw materials, high hopes have been placed on governing on upstream phases such as product design, durability and service development. Compared to the bulk of existing regulation targeting end-of-life phases such as waste management and recycling, these goals are much closer to the core of production and consumption systems. Consequently, it may also be more problematic for legislators to directly regulate the environmental impacts of production and consumption for economic reasons.

In this scientific session we will discuss recent developments in this policy area: how can product policies enhance environmentally sustainable circularity? What kind of policies are needed to make products more circular? How could and should current instruments such as the Ecodesign Directive or various Extended Producer Responsibility systems be developed? Presentations in this session may analyse individual initiatives, existing instruments or wider regulatory strategies for sustainable governance towards circularity.