

~ CALL FOR FULL PROJECT PROPOSAL ~

The Circular Food Systems network within the Integrative Research Group of the Global Research Alliance on Agricultural Greenhouse Gases (GRA-IRG-CFS)

In order to explore the potential of circular food systems (CFS) as a way to contribute to food security while reducing greenhouse gas emissions, the Integrative Research Group (IRG) of the Global Research Alliance (GRA) has taken the lead to setup a global CFS network, where knowledge on CFS can be shared, developed, and disseminated. The network aims to mobilise agricultural scientists working from the field to the regional level to explore circularity within agri-food systems.

Circular Food Systems

Circular food systems are food systems in which waste streams are minimized and inevitable waste is utilized in processes of production of food, energy, or non-food products. Such circular food systems apply practices and technologies that minimize the input of finite resources (e.g., phosphate rock, fossil fuel, and land), encourage the use of regenerative ones (e.g., wind and solar energy), prevent leakage of natural resources from the food system (e.g., nitrogen, phosphorus), and stimulate recycling of inevitable resource losses in a way that adds the highest value to the food system^{1,2}.

Muscat et al. (2021)³, established five ecological principles to guide biomass use in a circular economy: (i) save and regenerate the health of (agro-)ecosystems; (ii) avoid non-essential products and the waste of essential ones; (iii) prioritize biomass streams for basic human needs; (iv) utilize and recycle byproducts of (agro-)ecosystems; and (v) using renewable energy while minimizing overall energy use. These principles are indicative of strategic developments towards circularity and should be adjusted to the local contexts and local policies.

For circular agri-food systems to become the norm, it is key to evaluate the interventions with a system thinking approach that focuses on the entire food system, rather than only using on-farm or value chain approaches. Since "*the whole is greater than the sum of parts*", we need combined top-down and bottom-up whole-system approaches that look at individual parts of the food system as elements of an integrated entity considering not only the sum of the food system's components but also the interaction between them. Thus, the study of synergies and trade-offs of the different practices and interventions should be performed at different level of the food systems. It is true, however, that considering all these connections could be overwhelming and include them will take time. Thus, they should be incorporated step by step.

In addition, it is important to create an awareness of the socio-economic and environmental benefits that arise from circularity and the differences that exists between closing the loops at local, regional, or global levels (i.e., scale issues) and between the short term versus long-term goals (i.e., temporal issues). For this awareness to be effective and to guide transition towards a circular system, we need metrics. Such metrics must capture resource and energy use efficiency, such as land-use ratio, food-feed competition, and nutrient use efficiency.

¹ de Boer, I.J. and van Ittersum, M.K., 2018. *Circularity in agricultural production*. Wageningen University & Research.

² Van Zanten, H.H., Van Ittersum, M.K. and De Boer, I.J., 2019. The role of farm animals in a circular food system. *Global Food Security*, 21, pp.18-22.

³ Muscat, A., de Olde, E.M., Ripoll-Bosch, R., Van Zanten, H.H., Metze, T.A., Termeer, C.J., van Ittersum, M.K. and de Boer, I.J., 2021. Principles, drivers and opportunities of a circular bioeconomy. *Nature Food*, 2(8), pp.561-566.

Call for full project proposal

We now invite to **submit a full project proposal** to develop indicators to measure circularity at different levels of the food system. This proposal should be submitted on *November 15th, 2022*. The organising committee will select 2 or 3 project proposal (2x 150.000 € or 3x 100.000 €). Information about selection of the proposal can be expected around *December 5th, 2022*.

Criteria for funding proposal

- The scientific quality of the objectives, methodology, and expected indicators.
- Focus on applying indicators at different scales (e.g., product, farm, region) and evaluate trade-offs that may occur with indicator sets at different levels.
- Discuss how the indicators could be implemented and compare on available indicators for circularity (e.g., LUR, HDPR).
- Learn from the indicators, e.g., how indicators from circularity can be linked with others socio-economic and environmental benefits.
- Feasibility on performing the project from January 2023 to 31 December 2023.
- Demonstrate a system perspective.
- Link circularity to food security and GHG mitigation.
- Include a discussion on how the practices align with principles of circularity.
- Share knowledge with ERA-net projects.
- Collaboration between organizations and regional initiatives is encouraged.

Format of the proposal

The project proposal of max. 2500 words.

1. Title of the project
2. Applicants
3. Project description: State of the art, objectives, methodology, activities, expected outputs
4. Timeframe and budget
5. Organisation of project
6. Expected follow-up activities

Full project proposal should be submitted no later than November 15th, 2022, 2022, 10:00AM (CET), through: CFSNetwork@wur.nl