Re-Livestock
Interviews – Web content

QUESTIONS FOR ALEJANDRO PARODI, WP coordinator/postdoc, WP 6

WP6 – Re-Design of circular systems

-Introduce yourself, your professional background and your role within the Re-Livestock project

My name is Alejandro Parodi. I work as a postdoctoral researcher at the Farming Systems Ecology group of Wageningen University. My current research focuses on assessing the environmental potential of innovations in the food systems using modelling approaches. In Re-livestock, I am one of the coordinators of WP-6 'Re-design of circular food systems'.

-Describe Re-livestock in 1 sentence

Transdisciplinary project that aims to make the EU livestock sector more resilient to climate change.

-Could you please clarify what is re-design and what are circular systems?

Re-design is the act of changing the way something works, is made, or looks. In the context of food systems, re-design relates to changing the way how we produce and consume our food. Current food production systems substantially affect biodiversity and the global climate, two essential components for life. Given that food production is influenced by demand, the need of making changes not only relies on those producing the food, but also on those consuming it.

Circular food systems are one of the proposed pathways for a new food system. The idea is to optimally use the agricultural land and marine resources to supply a healthy and sustainable diet to humans. The premise is that if we optimally use the current agricultural land, enough healthy food could be available for people and hence we could avoid additional agricultural expansion into natural ecosystems, and even 'free' current agricultural land for nature restoration. Optimally using agricultural lands implies producing the type and quantity of crops and livestock needed to supply humans with a healthy diet with the minimum impact. This involves not only picking the right crops and livestock, but also using all residual streams produced along supply chains (for example, animal manure, crop residues, co-products from food processing, etc.) as inputs for crop, livestock, or energy production. In a circular food system, changes in consumption patterns are

expected, because the diets generated are optimized to reduce environmental impacts, something that is not the case nowadays.

-What are the main activities being carried out within your work package? What tools will you use? (don´t need to detail on the technicalities of the models, but may be mention them and explain what they will do?)

Our working package aims to model how a circular European food system could look like in a warmer planet, and what would be the consequences of such re-design for food security, land use, the climate and nitrogen flows. We mainly work with three computational models. The Circular Food Systems Model (CiFoS) is biophysical model used to explore optimal uses of the available biomass and agricultural lands as well as the consequences that these uses will have for human nutrition and planetary health. The Lund Potsdam Jena managed Land (LPJmL) is a dynamic global vegetation model that simulates the water, carbon, nitrogen and energy fluxes of vegetation, thereby predicting plant growth and productivity under different management and climatic conditions. The Livestock Spatial Allocation Model (LSAM) spatially computes environmental impacts (e.g., water use, greenhouse gas emissions, biodiversity loss and N balance) of livestock production in a given area.

LPJmL will provide data on potential future crop yields in Europe under multiple climate change scenarios. CiFoS will use this crop data to model what crops we should grow and what animals we should keep for being able to produce a healthy and sustainable diet under the different climate change scenarios. The LSAM model will then use CiFoS outputs to spatially assess the impacts on a grid-level.

Finally, based on the modelling outcomes, we plan to develop a serious game that will be played by European stakeholders. The aim is to let them design scenarios for future European food systems based on their visions and interests, and explore via a game setting the feasibilities of such scenarios or the compromises that need to be made in order to make them possible.

-You are exploring how practices and innovations tested in WP1-4 can be combined to enhance circularity of the European livestock sector. Could you explain how these WP are interrelated?

WP2-4 are doing experimental work to test the potential of different innovations at the animal or farm level. For instance, WP2 is assessing the effects of feeding cows with a grass-clover mix on milk productivity. WP3 is exploring the greenhouse gas mitigation potential of animal breeding to reduce enteric methane emissions from cows. WP4 will assess the carbon and nitrogen fluxes of different manure management systems (e.g., composting, liquid-solid separation). What we aim to do is to incorporate part of their experimental outcomes into CiFoS, so we can quantify the effects that these innovations would have when taking a food systems view. Imagine that WP3 finds out that methane enteric emissions from cows can be reduced 20% through breeding. This is definitely a promising result, but to test if such

reduction at the animal level could also lead to large reductions at the food system level, we should consider additional factors such as the quality and quantity of feed that the cows require, and the quantities that will be available in the future. If the future is adverse, perhaps our systems cannot sustain a large number of cows, implying that the 30% methane mitigation potential observed at the animal level, would not lead to significant emission reductions at the food system level. These are the type of assessments we would like to perform with the experimental outcomes of the feeding, breeding and animal husbandry work that our colleagues from WP2-4 are doing. Doing so will allow to identify the innovations with the highest mitigation potential and then to propose a roadmap for their implementation at scale.

-You are going to evaluate how trade flow affect resilience of livestock sector. Could you please explain a little bit more in detail about this?

This is something that will be done still quite some years ahead, but of course I can explain what the plans are. Climate change will likely negatively affect crop production around the globe. This could produce a backlash for the EU livestock sector, which heavily relies on imported feed crops (e.g., soybean). We want to use the LPJmL global outputs to quantify the potential deficit of European feed imports under different climate change scenarios, and then explore what could be done in the European food system to guarantee food security.

-What will be the outcomes and results you expect to obtain from your WP? (these can be technical or other type of innovations, advance in methods and knowledge, recommendations for practices or policies, insights to what may happen in the future so as to guide policies…).

We expect to combine multiple modelling frameworks and transdisciplinary experimental work to build one narrative about the future of food systems in Europe. The publications we will produce not only will have valuable scientific contribution for the field of food systems research, but hopefully will also be useful for the design of policy instruments that aim to make the food system more sustainable.

-What do you think may be the main benefits of Re-Livestock for the sector and for society in general (linking to the WP challenge/s)

I see Re-Livestock as a platform for farmers, trans-disciplinary scientists, and policy makers to exchange views and results about the future of the EU livestock sector. Having these three actors in the same platform is already a win, and I just hope that the main outcomes can be objectively and effectively communicated among the three groups and to society.