**Memo of MAGIC Lunchtime Seminar: A new perspective on Water-Energy-Food Systems, in support of Sustainable Development Goal 2**

**Thursday 21st November 2019, Scotland House, Brussels. 12:45 -14:15**. **Report by Kerry Waylen**

This seminar was hosted by 3 researchers at the James Hutton Institute: Keith Matthews, Kerry Waylen and Alba Juarez-Bourke, drawing on work carried out with other colleagues in the James Hutton Institute and the Autonomous University of Barcelona. There were 15 attendees; one person from an environmental NGO, and the rest from various sections of the European Commission: DG Agri, DG RTD, DG DevCo, DG Clima, and EASME. Some but not all attendees had some prior knowledge of the MAGIC project.

**Rationale for seminar:** There is growing recognition that we need systemic approaches to understanding and managing our world, in order to achieve the Sustainable Development Goals (SDGs). See for example, the new commission’s mandate for a food systems strategy from ‘farm to fork’ and a growing emphasis on the circular economy. To achieve this, new tools and approaches may be needed. This was the rationale for this meeting. It had three aims: (1) to explain the basic principles of a ‘Societal Metabolism Analysis’, (2) to illustrate its application to European Agri-Food systems, and (3) to discuss questions on the method, the findings, and any implications perceived for policy or other change.

The meeting commenced, after lunch, with the following agenda. The set of slides that were presented at this meeting are available as the top of the list of outputs on <https://www.hutton.ac.uk/research/projects/magic>

**Agenda**

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| 12:45 – 13:15 | **Welcome & Introductions**Overview of MAGIC projectExplanation of Societal metabolism approachQueries about method |
| 13:15 – 13:45 | **A new perspective on SDG2 via Societal Metabolism Analysis**Analysing agricultural sustainability in terms of environmental flows within EUAnalysing agricultural sustainability in terms of consequences beyond the EUConsidering nutrition, food security & hunger |
| 13:45 – 14:15 | **Discussion** Queries and discussion on method and its application to SDG2Implications for understanding and governing agri-food systems |

**Information presented by researchers:** The researchers presented a brief precis of the MAGIC project (<https://magic-nexus.eu/>), which responds to a call to work on the ‘Water-Energy-Food-(Environment) Nexus’. MAGIC has a focus on how EU policies are linked together and to climate and sustainability goals, and the implications for the nexus.

Societal Metabolism analysis is a method that allows analysis of the metabolic patterns and interconnections of different systems. Central concepts are ‘fund’ and ‘flows’ of societal and environmental resources. In MAGIC, for any specific activity or system, the pattern of key flows and funds is represented in a ‘processor’ that can be connected with other processors in sequential pathways. The results of social metabolism-based analysis always characterise the state of the systems in terms of extent variables (e.g. land area,) and also intensity variables (e.g. rate of flow of water). Deciding what processes to represent, and how, depends on the question or problem to be analysed. For more information about societal metabolism analysis and MuSIASEM please see <http://magic-nexus.eu/documents/introducing-societal-metabolism-analysis-%E2%80%98musiasem>. Within MAGIC, societal metabolism is deployed within a broader process of reflection and stakeholder engagement that is called ‘Quantitative Story-Telling’. As such, the seminar’s focus on SDG2 arose from this process, and reflected prior engagement, interviews, discussion and analysis of policy documents, to identify salient themes and challenges.

The data presented result from a societal metabolism analysis of the pressures and impacts on the environment associated with agricultural production pathways. The presentation highlighted that some agricultural systems may be associated with adverse consequences for pollinator potential, soil erosion and water quality. The presentation also explored the consequences of interconnections and dependencies on countries outside of the EU, by considering the inputs associated with imported inputs to agriculture. These inputs reflect embodied energy, water etc. used in systems outside of the EU. The consequences of re-internalising all these inputs was explored (e.g. growing all livestock feed within the EU), showing that large areas of land would be needed which may impact SDG15 and other societal goals. There would also be social consequences, not least in terms of workload. Lastly, the presentation discussed how commodities, supply chains and nutrition could also be considered and connected as part of a societal metabolism approach. The researchers finished by presenting what they perceived as the general implications of this work, and asked the participants for their views on implications, and any other feedback.

**Discussion topics:** Various points were raised, with different questions and positions held by different participants:

* Requests for researchers to present more specific and policy-relevant implications.
* Suggestion for researchers to discuss implications with other societal groups that may be needed to achieve change (e.g. general society, politicians).
* Interest in understanding prior examples of how a societal metabolism approach has been useful and achieved policy impact.
* Curiosity about the pros and cons of this approach versus other methods such as Life Cycle Analysis.
* A desire to build understanding of the whole agri-food system through to consumption (i.e. ‘from field to fork’) rather than focusing just on the supply from agricultural farming systems.

**Next steps:** These discussions and questions were captured by detailed notes, with the consent of participants. This feedback – and any received subsequently from feedback forms given to participants – will be incorporated in the report of this work related to SDG2, a report that will be produced in March 2020. We also plan to discuss related ideas during Green Week 2020, and these ideas may also inform subsequent academic outputs. No outputs will contain individual names and any illustrative quotes will not be attributable to any individual.

Please contact Kerry.Waylen@hutton.ac.uk for more information about our work, its implications, or to discuss the method and other possible applications. For more information about our project you can also visit <http://magic-nexus.eu/>