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Digitalisation and just transition - Editorial

Digitalisation, agriculture, forestry and rural areas: methodological questions and research insights in a “just transition” perspective

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Digitalisation is increasingly portrayed as an important driver of change in rural areas and agriculture, together and in close combination with the ecological transition. International and European development organisations’ efforts to foster digital-led transformations are growing considerably, in terms of financial resources, knowledge support and policy guidance (i.e. EU From Farm to Fork Strategy, Biodiversity Strategy). Digital connectivity and digital technologies are considered key enablers for food security improvement, bioeconomy growth, natural resources management, tourism development, energy production, climate change mitigation, and for supporting on-farm activities and the agrifood value chain. The benefits envisioned range from teleworking and e-services to biodiversity and land control, precision agriculture and inputs optimisation, animal welfare, farm work quality, access to markets, quality control and food traceability.

While academic debates and empirical research on the topic are increasing, they remain somewhat limited. Further research is necessary to assess the opportunities and limits of the efforts put into this prospect of change and to understand the criteria that need to be met in order to achieve the identified goals. Additional research is also required to explore the constraints, risks and contradictions connected to the tools, investment capacities and knowledge required, as well as to shed light on the potential dependency patterns and inequalities that might be fostered by digitalisation. Furthermore, it is crucial to embed the analysis of digital transformation and policy programmes in the broader context of socio-economic transformations of food regimes, changes in governance of the global value chain and the impacts of crises and shocks on food security.

Ongoing debates on the role of digital technologies in support of development goals heavily focus on the issue of “sustainability” but are often confined into narrow sectoral approaches. Analyses intending to critically examine the impacts of digital-driven transformations concerning ecological transition requirements should rigorously account for various variables,

including actors, locations, resources, relationships and institutions. It is imperative to acknowledge that the integration of digital technologies into agriculture, forestry and rural areas does not inherently lead to positive sustainability outcomes.

Following this premise, the special issue suggests the necessity to explore digitalisation processes in local contexts from a “just transition” perspective aimed at ensuring that the shift towards more sustainable systems does not disproportionately harm certain groups, individuals or communities. Within this perspective, the articles included in the special issue pose methodological questions and propose frameworks to empirically explore the specificities of the different rural contexts, the challenges faced by local actors and their creative responses. Attention is also devoted to the potential of the diverse digitalisation strategies in terms of participation and conflict, bottom-up adoption, data access and control.

The initial article by Maura Benegiamo, Alessandra Corrado and Marco Fama reads agricultural digitalisation as a political and ecological process influenced by multiple dynamics, both global and local. Accordingly, the authors propose a theoretical-methodological framework inspired by the “just transition” perspective for equipping empirical research on digital agriculture with a more critical and comprehensive understanding of local contexts. As the authors suggest, the “just transition” approach can provide valuable insights into the socio-ecological impact of agricultural digitalisation. Furthermore, it can support the formulation of helpful policy recommendations.

A complementary perspective is developed in the article by Sabrina Arcuri, Gianluca Brunori and Silvia Rolandi, which builds on two European Horizon 2020 projects that adopt multi-actor approaches to inform research, practices and policies. The authors propose a conceptual framework encompassing three main domains of intervention: the digital divide (that is the difference in access to, and use of, information and communication technologies between urban and rural areas); the attractiveness of rural areas; and rural governance. For each of these domains, they provide case study examples showing the importance of recognising both the potential benefits of digital transformation and the critical needs that must be addressed to ensure equitable access and opportunities for all individuals, within and beyond rural areas.

The third contribution, by Mikelis Grivins and Emils Kilis, focuses on the barriers (socio-cultural, technical, economic, regulatory-institutional) that farmers encounter when implementing new digital solutions, exploring three cases in Latvia’s beef farming sector. The

article highlights the multiple creative strategies that farmers adopt for dealing with their practical challenges, often combining new solutions with existing practices and routines. In line with the two previous articles, the authors underline the importance of exploring the responses adopted at local level from a broader perspective focussed on pre-existing issues that may hinder digitalisation and its access to most vulnerable groups.

The last article, by Cristián Alarcón, shifts attention to the “politics of data”. This term is used to illustrate the possibilities for “data innovations from below”, i.e. the production and management of environmental data by citizens, associations and movements in support of struggles related to biodiversity, land and forests, in contrast with “data innovations from above”, as in the case of data production linked to productivity-oriented forestry. This case study highlights different capacities and possibilities stemming from digitalisation and the related process of datafication (intended as the growing and intensive process of data generation). By analysing the Swedish Species Observation System (*Artportalen*), the author shows that digitalisation can serve as a means to intensify forestry operations and the use of forests or, conversely, to strengthen citizens and civil society participation in the sustainable management and monitoring of biodiversity or land uses. The outcome will depend on a set of factors that can be more comprehensively grasped through the lens of a “just transition” perspective, much like the results of the various strategies scrutinised by Grivins and Kilis.

In conclusion, all four articles emphasise the importance of conducting additional empirical research supported by appropriate frameworks enabling a more nuanced understanding of local contexts, while also retaining a wider perspective focused on the socio-ecological impact that digitalisation has on agriculture, forestry and rural areas in general.