

Preface

Over the past ten years, I have seen first-hand how digital technology can inform our decisions without ever being a substitute for those who practice agriculture from day to day. This conviction—forged through field experience and diverse collaborations with farmers, researchers, engineers, and public policymakers worldwide—forms the basis of my perspective on the role that digital technology can play in service of a more resilient, sustainable, and fair agriculture.

The promises of innovation are many, but one observation stands out: a gap remains between what we are capable of designing and what stakeholders actually adopt in the field. The challenge is not merely to innovate, but to create the conditions for use: trust, support, perceived value, simplicity, governance, and training. An innovation only has impact when it is adopted, adapted, and sustainably integrated into practices and decisions. This is where the transition from potential to impact truly takes place.

This requires responsible research and innovation, mindful of social, environmental, and economic consequences. Responsible, because it is accountable to society and the living world: they must anticipate, protect, and remain answerable. Responsible, because technological progress that weakens, excludes, or obscures is not progress—even when it leverages tools as powerful as artificial intelligence.

Digital technology can be a factor for inclusion, but it can also widen inequalities faster than it bridges them if access, skills, and equity are not designed in from the start. Reducing the digital divide is not a secondary objective; it is a condition for sustainability, efficiency, and fairness. We do not build the future with only a portion of the stakeholders, nor by assuming that technology will impose itself.

This is where the humanities and social sciences come in. They remind us that no technology changes practices by its presence alone. Understanding usage, barriers, perceptions, incentives, stakeholder logic, and power dynamics is necessary to transform potential into actual adoption. Without them, data is deaf, models are blind, and solutions are flawed. Taking usage into account is even more vital in the Global South, where smallholder family farms are in the majority and sit at the heart of food security and territorial resilience. Digital tools will only be relevant there if they adapt to the diversity of farms, socio-economic contexts, and local knowledge.

This is where #DigitAg has made a unique contribution: by creating a common language between disciplines, linking sensors with behaviours, algorithms with usage, and models with territories. Ten years of work have produced not only tools and knowledge but have also structured a community that learns, shares, adjusts and cooperates. This interdisciplinarity is the prerequisite for useful, appropriate and adopted innovation.

It is also with this vision that open innovation initiatives like OccitANum were born within #DigitAg, bringing together researchers, farmers, companies, public actors,

and citizens to co-construct digital solutions for the agroecological transition. These experiments prove that open, frugal and regional innovation can be a driver of inclusion, trust and uptake.

This book recounts the ten-year journey of #DigitAg, which began at a time when precision agriculture was the most advanced form of agricultural digitalisation. This path continued with the democratisation of the Internet of Things (IoT) and dedicated applications for agriculture and value chains, stimulated by entrepreneurial fervour and the creation of numerous startups. It continues today with the rise of artificial intelligence (AI), revitalised by the promises of generative AI. Artificial intelligence can offer considerable advances, such as those described in this book (facilitating large-scale phenotyping, early detection of water stress, or analysing satellite imagery time series), but its value depends on the context, the quality of the data, and how it is used. It is neither a shortcut nor a guarantee of results; it is a powerful force, but one at the service of a human, scientific and societal project.

As artificial intelligence further accelerates technological cycles, this book reminds us that no solution will replace listening, cooperation, responsibility and discernment. This is the guiding principle of the roadmap on digitalisation and AI innovation led by the FAO, which in April 2025 brought together a hundred experts and aims precisely to transform intentions into tangible results by creating the conditions for a responsible, inclusive, and useful AI for all.

The success of this transformation also relies on enlightened public policies capable of framing digitalisation to guarantee equity, transparency and sustainability. Our challenge is therefore not to innovate faster, but to innovate with meaning, with method, and with everyone.

I hope these pages inspire, through the use of real-life practical examples, those who want to close the gap between intentions and results and make digital technology and AI a lever for autonomy, resilience and trust. The task is immense, but the course is clear: to put innovation at the service of the living world, local areas and communities, and not the other way around. The path lies ahead of us, and it can only be travelled together.

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