

The earth listens only if you listen to it first

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In certain alpine valleys, as in many southern or island rural areas, agronomic knowledge has never been purely technical. It is based on observation, experience, and close attention to the signals of the land and animals. Knowing how to read the gait of a cow, the smell of hay, the color of the sky: this is practical, concrete knowledge, developed through years of coexistence with the environment. Knowledge that doesn't need to be idealized, but recognized and integrated. It is knowledge that comes from the body and the landscape.

A plains farmer who works the land independently, with limited resources, can now access advanced agronomic knowledge without having to bear prohibitive costs for ongoing technical consultancy. This doesn't mean the agronomist disappears—on the contrary, their role remains central but must be reinvented. Even those with little money should be able to

dialogue with an agronomist, and technologies like AI can become intermediary tools, bridges, to expand the scope of their intervention. A new working method is needed, where the agronomist works alongside the AI, verifies, corrects, and above all translates automated responses into concrete, sustainable actions. In this alliance—between human knowledge and computational knowledge—lies real innovation: no one replaces anyone, but each contributes their expertise to the resilience of the territory.

Today, however, something has changed. The democratization of agronomic knowledge—a big word, but a concrete reality—is opening new scenarios, where even those working just a few hectares, without consultants or funding, can get fast, reliable, scientifically based answers. They do so by asking an artificial intelligence. Not a generic one, but one trained on hundreds of thousands of agronomic documents, satellite data, soil maps, weather patterns.

This is made possible by explainable AI (XAI), a branch of artificial intelligence that makes algorithm decisions understandable and transparent. It's not enough for AI to give an answer—it must also explain how it arrived there. But for this to make sense, we must move away from the model where AI is a closed oracle, licensed by those who hold the power to build it, train it, and make it speak. Farmers and breeders cannot be mere users of someone else's platforms. They must become co-protagonists in the process, participating in building the intelligence they use, contributing their own data, questions, and criteria. Agricultural AI cannot be a voice from above. It must be a tool in service of a community that thinks, chooses, and acts independently.

This transition isn't only about adopting new technologies. It's a redefinition of power relations. In traditional agricultural models, advanced agronomic knowledge is the privilege of those who can afford a consultant, access a research center, or interact with a technical cooperative. The others—the majority—are not simply left out; they must rely on informal networks, trial and error, orally transmitted experience, empirical observation. It is resilient knowledge, but often fragmented and isolated, and not always enough to withstand the impact of new climate, regulatory, or market challenges.

With generative AI, this inequality is being chipped away. Information becomes accessible, timely, and adapted to the local context. The small producer growing olives on a hillside can better understand olive fruit fly risk and decide accordingly. The transhumant shepherd can know how the weather will change in the next ten days and choose where to move the

herds. That's no small thing. Because less information asymmetry means more autonomy. More bargaining power, more freedom to choose. More strength to stay.

Symbiotic Knowledge: Between Roots and Networks

It's not about replacing traditional knowledge with algorithms. It's about making them symbiotic. Making them feed each other. Letting observation rooted in the territory and machine computation meet, contaminate, and correct each other. A relational, not mechanical, knowledge. Where technology does not replace the land, but listens to its signals through those who have always cultivated it. Building an agricultural intelligence that combines the observation of those who preserve and care for tradition, field experience, and the computational capacity of AI. Knowledge that doesn't erase manual skill, but strengthens it with new possibilities.

Explainable AI (XAI) plays a crucial role in this. Because it gives the farmer control over decisions. It doesn't just say "irrigate," it explains: "because the soil moisture is at 18%, the average temperature will be 29°C, and there's a risk of water stress in the next four days." It doesn't impose, it shows. And so, you remain the subject, not the object, of the digital transformation.

The Learning Community

In many areas of the world—and increasingly in our valleys—agricultural knowledge is no longer transmitted only vertically (from agronomist to farmer) or horizontally (from farmer to farmer). A hybrid model must emerge, where technology does not replace but supports local networks.

Agricultural communities become systems of distributed learning, where AI provides data and simulations, but the final decision goes through discussion, observation, and trust. The farmer does not act alone: they share information, compare experiences, adapt the AI's output to their microclimate, their olive grove, their family history.

This integration strengthens not only productivity but also the sense of community. Collective use of AI tools can become an opportunity to rebuild bonds: in consortia, cooperatives, informal groups exchanging tips and mistakes. Technology works better when it is situated, participatory, and contextualized.

And here the issue broadens. If agricultural knowledge is a common good, then AI should be too. Open, accessible, trained on local data, and governed by communities. Not owned by a few, but a shared tool for territorial self-determination.

It's Not the Future—It's the Present

This is not science fiction. In Kenya, India, Brazil—but also in the Alps, the Apennines, and the Mediterranean, where the experience of Rural Hack is helping a lot—initiatives are spreading that put agronomic knowledge in the hands of those who cultivate. They do so with simple tools, friendly interfaces, chatbots that speak the local language. They do so by integrating climate data, field observations, and oral traditions. This is the new frontier: not centralized knowledge, but shared knowledge. A new ecology of knowledge, where AI is no longer the center, but one node among many.

And so, the question changes. It's not whether artificial intelligence should enter the fields. But which AI, with what data, for whom and with whom. The answer must include stories, dialects, silences, the whispered advice passed between barns and fields. Only then can technology help us stay. And cultivate not only grain, but also the bond between those who care for the land and those who inhabit it.

Fonte: <https://www.ruralhack.org/en/ai-agriculture-listening-to-the-land/>