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Spotlight

Land management 4.0 – Added value through artificial intelligence

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The advance of digitization is present in all areas of life and work. Particularly in agriculture, the process is already well advanced, the trend towards "hi-tech" in full swing with precision farming and self-driving vehicles. Land management, too, has been fundamentally changed by digitization in the last decades, and will continued to be so. Land management is much more than the official reallocation of fields or other areas. Many of society's megatrends influence land management: globalisation, climate change, urbanisation, the new mobility, coalescing of technologies and the all-embracing digitization together all directly affect land use.

What opportunities are therefore now offered by digitization for land management and, above all, for the land reallocation procedures of the future? The procedures involved in reallocation and regrouping of pieces of land requires much time, involving great deliberation over periods of years, sometimes decades. Digitization offers a way of accelerating the process. Automated procedures are plannable, more transparent, faster and more secure in a legal sense.

Taking the lead from the official definition of "Industry 4.0", Land Reallocation 4.0 could mean: Land reallocation will be given more precision and practicality through applying modern information and communication technologies. With such support, land area management could be self-organised to the greatest extent. Human beings with regard to their requirements for land and soil could communicate and cooperate directly with each other within Land Reallocation 4.0. This networking would mean the end of optimising just one single planning step at a time, instead enabling all aspects of land area redistribution and reallocation within a single procedure. Additionally, the network could embrace all phases of land management from the initial concept, through planning, land acquisition and associated compensation through to entry of details into the cadastre and land registry. In future, the human hand will need to intervene only in critical situations, e.g. to adjust for perhaps ethical (or interpersonal) problems.

If, at this point, we take a visionary glance into the future, we can see flexible processes increasingly steered by the users. In other words, an "agile" land area management. Farmers, nature protectionists, communities and, in a completely general sense, "land users" all become actors in this role, with a system-based process steering the reallocation of land according to their respective aims. The "Land Reallocation" remains in the background, only being referred to where legal standards must be fulfilled. This situation is easy to imagine as we already know such processes in industry and services, where "agile project management" has already arrived. For instance, in purchasing procedures,

in logistics, in food production – everywhere we find processes that, to the greatest extent, are left to proceed on their own.

Today, we stand at the beginning of the level 4.0 in land management. In just a few years we will have a system of redistribution and rapidity of land use alteration for farmland that, even at this stage, we cannot imagine. A "convenience cadastre" arranged entirely according to user, e.g. farmer, requirements would, in an automated system, regulate price according to supply and demand. Market fluctuations would be more rapidly, and more easily, identified. The voluntary exchange of land simplified. In this case, the land owner stands less in the foreground and instead the use of the land and soil.

For instance, depending on the region in the state of Hesse, between 50 and 90 per cent of farmland is not cultivated by the owner of the land. Therefore, all the more sensible in the first place is the regrouping of land areas farmed by a single business and optimising ownership accordingly – with artificial intelligence, a clear "must" for the future in land management.

In the Encyclical „Laudato si' On Care For Our Common Home" Pope Francis writes: "The principle of the subordination of private property to the universal destination of goods, and thus the right of everyone to their use, is (...) the first principle of the whole ethical and social order."

In this sense, lies the opportunity for Land Reallocation 4.0 to redefine land area mainly according to its use and to establish this use in a flexible manner oriented on user requirements. With artificial intelligence this basic aim of land reallocation is much better achieved, namely as stated in §1 FlurG: Contributing to improvement of production and work conditions in agriculture and forestry.

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