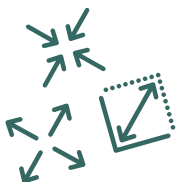


# DIGITAL AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEM

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Also with the help of drones future agricultural production should be economically more efficient and at the same time more ecologically sustainable.



In our vision, the agricultural systems of the future will be spatially and functionally diversified in order to accommodate different, and potentially conflicting, environmental and socio-economic objectives.

The DAKIS project realizes this vision by developing a new decision support system that makes it possible to give an economic value to non-commodity products, such as ecosystem services (ESS) and biodiversity, as the result of agricultural activities. In DAKIS, agricultural activities are planned with the help of real-time digital information from sensors and models and in cooperation among the participating farms. Autonomous, interlinked, small-scale robots flexibly carry out the field work, tailored to market and societal demands. The DAKIS project has the following objectives:

- 1) Integrate biodiversity, ESS, and resource use efficiency into the farm decision-making process. To achieve this, new approaches to the concept of »market value« need to be developed.
- 2) Document, forecast and control the site-specific effects of agricultural activities in real time. To achieve this, new sensors and models need to be developed.
- 3) Optimize the cropping systems towards the provisioning of ESS, the promotion of biodiversity and resource use efficiency, depending on the objectives. To achieve this, we need small-scale site-specific cropping systems implemented by novel robots.

**Agricultural landscapes are torn between diverse demands for the production of food and feed, as well as for the preservation of ecosystem services (ESS) and biodiversity. Small-scale site-adapted measures can make a major contribution to ESS and biodiversity. Labor-intensive and time-consuming measures can be made simple and realizable if planned and carried out using smart information and communication technology (ICT).**

- 4) Optimize general targets in farm planning and for the support of complex decisions. To achieve this, new operational farm models must be developed, which summarize information and allow for short, long and medium-term planning.

- 5) Create new communication channels for the cooperation between farmers, producers and society. We need new types of cooperation to successfully improve ESS, biodiversity, and resource use efficiency across the study regions.

The DAKIS project utilizes the ongoing digitalization to integrate ecosystem services (ESS) and biodiversity into modern planning processes, production and marketing. It thus allows for a new, resource efficient labour organization, provides farms with information and decision support, and promotes cooperation between farmers via the development of a digital platform and interlinked robots. The analysis of the site-specific potential changes the agricultural landscape, for example by island and patch cropping. New concentric usage-type gradients will be drawn around the urban centres. DAKIS makes the ecological performance of agricultural systems more visible and facilitates financial rewards for ESS and biodiversity. DAKIS will focus on two test regions in Brandenburg and Bavaria.

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