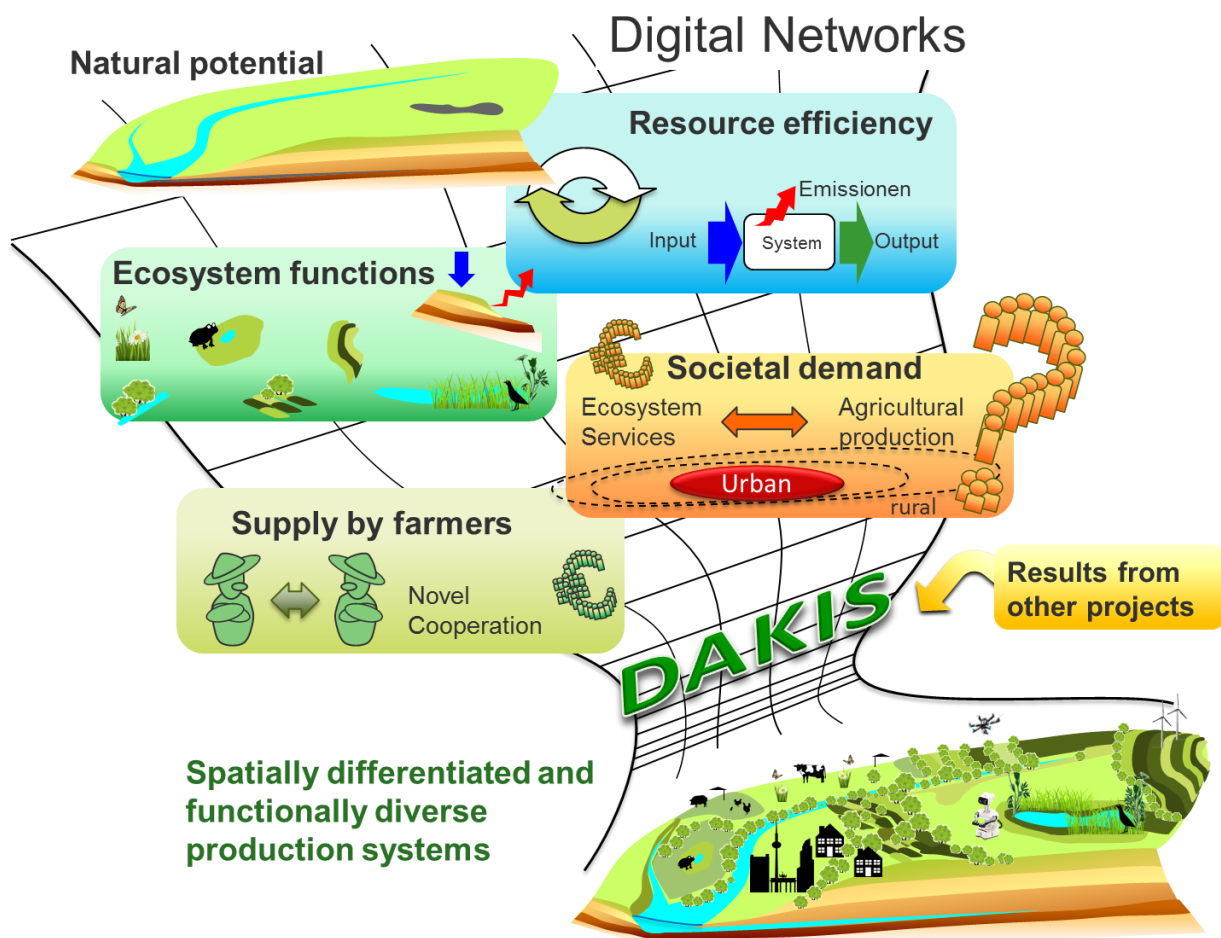


# Digital Agricultural Knowledge and Information System (DAKIS)

## Innovative integration for landscape smart agriculture

Spatially and functionally diversified agricultural Systems of the Future  
can accommodate conflicting, environmental and socio-economic objectives!



### Concept

The **Digital Agricultural Knowledge and Information System (DAKIS)** develops automated small-scale landscape-specific production systems. These systems will be tailored to the demands of society, and effectively integrate requirements for agricultural goods and services into farm planning. This will be achieved via novel and innovative digital information and management machines.

## Objectives

- Incorporate the value of ecosystem services, biodiversity and resource use efficiency in the decision-making process of the farmer.
- Record, forecast and control the site-specific and real-time effects of agricultural activities for the first time.
- Optimise the cropping system towards provision of ecosystem services, promotion of biodiversity and resource use efficiency, depending on the target.
- Develop new orientation targets in business planning and facilitate complex decision-making.
- Create communication channels and methods for the cooperation between farmers, as well as between the producers with consumers and society.

## Test regions



**Brandenburg**

- low precipitation
- large-scale agricultural landscape (Average farm size 346 ha)
- Soil with medium yield potential



(Pictures by Bellingrath-Kimura 2017)

**Bavaria**

- moderate precipitation
- smaller-structured landscape (Average farm size 32 ha)
- Soil with high yield potential

## Project structure

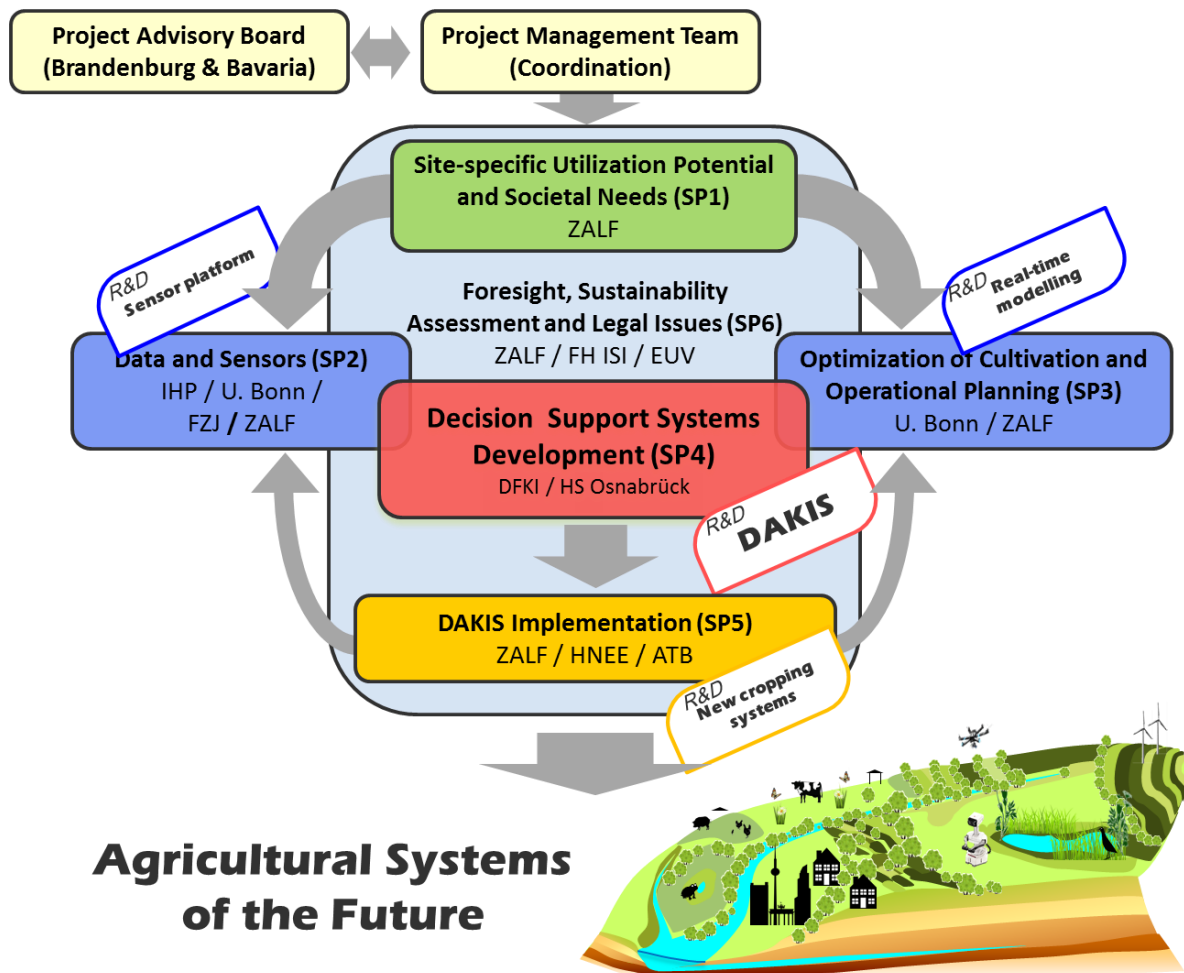
- SP1:** Site-specific utilization potential and societal needs  
Analyse the potentials and requirements of ecosystem services, biodiversity, and resource use efficiency two test regions
- SP2:** Data and Sensors: Real-time Monitoring of Agroecosystems  
Develop Sensors for real-time measurements
- SP3:** Optimization of Cropping and Operational Planning  
Develop models for real-time modelling
- SP4:** Decision Support System Development  
Create the software system "DAKIS"
- SP5:** DAKIS Implementation  
Test small-scale site-specific production systems on the research facilities and implement them in the two test regions
- SP6:** Foresight, Sustainability Assessment and Legal Issues  
Analyse foresight, sustainability and legal aspects of the project

### **Project advisory board**

Consist of stakeholders in the test regions, consult and accompany the project

### **Project coordination**

Coordinate the project and conduct dissemination



### **R&D outcomes**

- Sensor platform (SP2)
- Real-time models (SP3)
- New farming systems (SP5)
- DAKIS system (Whole project)

## Project preparation

### ***Foresight Workshop***

27. and 28. September 2017  
Humboldt University of Berlin (HUB)  
Hannoversche Str. 27 Berlin

### ***Stakeholder Workshop Brandenburg***

16. November 2017  
Eberswalde University for Sustainable Development (HNEE)  
Schicklerstraße 5, 16225 Eberswalde

### ***Stakeholder Workshop North Rhine-Westphalia***

28. November 2017  
University of Bonn (UB)  
Meckenheimer Allee 172, 53115 Bonn

### ***Stakeholder Workshop Bavaria***

6. Dezember 2017  
Bavarian State Research Center for Agriculture (LfL)  
Vöttinger Str. 36, 85354 Freising

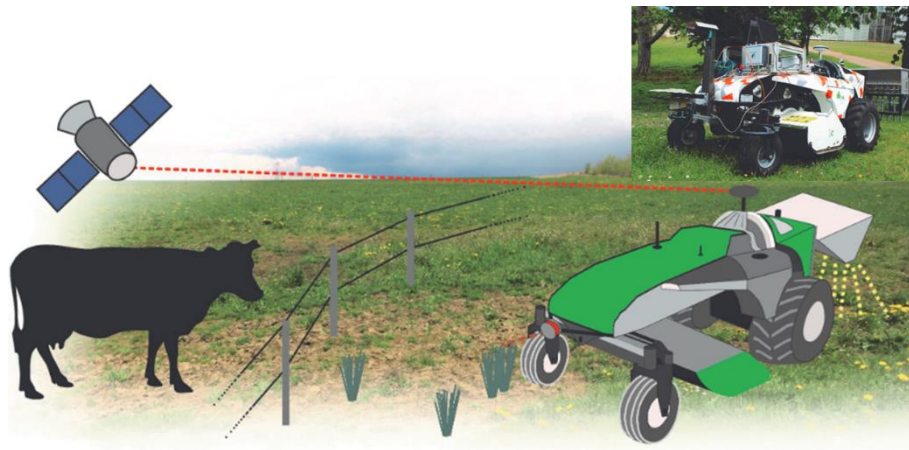
### ***Strong interest from local stakeholders***

- Farmers and Farmers network in Brandenburg and Bavaria
- Schorfheide-Chorin Biosphere Reserve
- Bavarian State Research Center for Agriculture (LfL)
- Smallholder companies



Foresight workshop with various partners





Pasture robot with i-LEED software (LfL Tier und Technik)



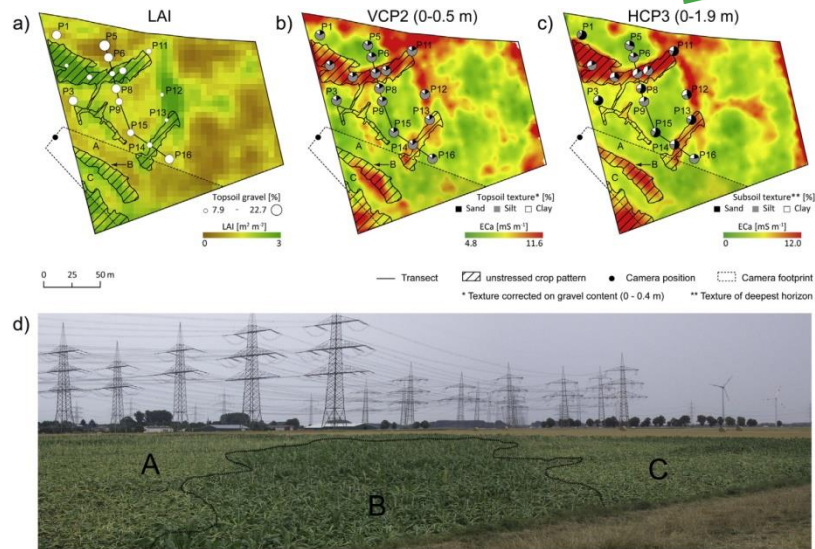
Highlander V70 (RATH Maschinen)



Strip-tillage (ZALF, Müncheberg)



Agroforestry-Model field of HNEE (Brandenburg)



Influence of soil heterogeneity on crop growth  
(by FZJ, Rudolph et al. 2015, Geoderma 241–242: 262-271)

### Project partners

Ten partners with expertise in several disciplines ranging from agronomy to computer science

- ZALF - Leibniz-Centre for Agricultural Landscape Research
- U. Bonn - University of Bonn
- FZJ - Jülich Research Centre
- IHP - Innovations for High Performance Microelectronics
- DFKI - German Research Center for Artificial Intelligence
- HSO – Univ. Applied Sci. Osnabrück
- HNEE - University for Sustainable Development Eberswalde
- ATB - Leibniz Institute for Agricultural Engineering and Bioeconomy
- FH ISI - Fraunhofer Institute for Systems and Innovation Research
- EUV - European Univ. Viadrina

### Project Coordination and contact

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