

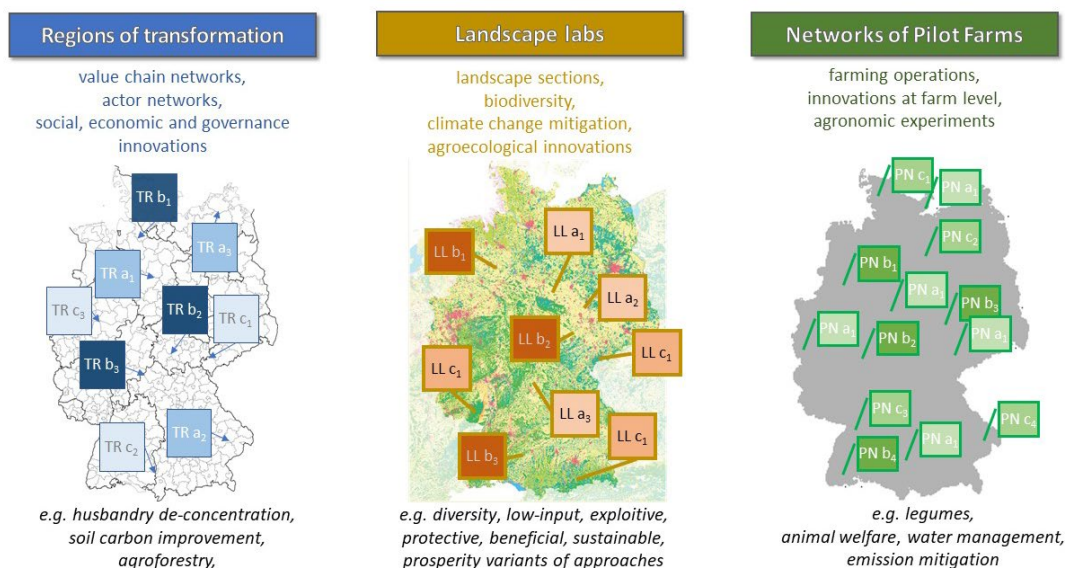
Research infrastructures for the transformation of agriculture: *inclusive – participatory – transformative*

The Governing Board of DAFA

Climate change, trade flows, regulations, diseases and, after all, societal demands challenge the agricultural sector also in spatial dimensions at local to global levels. **A suitable reaction of agriculture to these pressures requires innovations that are suitable in practice and transformative. To this end, researchers need an infrastructure that allows both, joint experimentation by farmers and researchers at different scales, and statistically valid evaluations of the effect of measures in practice. The infrastructure must be set up for the long term (longer than the usual funding period for projects), so that reliable input for modelling, benchmarking and knowledge transfer can be generated, putting long-term planning for agriculture, policy and society on solid grounds.**

A long-term, successful implementation requires three components that correspond to different scales and modes of action: regions (*terroirs*), landscape sections, and farming enterprises for innovation. For some questions, the research approaches and experimental variants must be coordinated across the three components (data collection and provision, methods, analyses). This new infrastructure can integrate suitable existing networks, landscape labs and farms.

The proposed infrastructure should be considered a new type of research facility. Here, the research infrastructure is conceived similar to large-scale research facilities like astronomic observatories or particle accelerators that are used in whole for experimentation. Research groups can access them after application to extend existing trial set-ups with experiments. A governing board representing research, practice, and civil society orchestrates the whole research infrastructure, ensuring linkages and deciding the core and long-term trial set-ups. For impact analyses, it is necessary to establish permanently a coordinated and comprehensive monitoring as complementary research, using all options of digital communication, data collection and data processing.



Characterization of components

■ Regions of transformation

Regions of transformation provide opportunities to test and to compare **strategies for moving agriculture** to greater sustainability. Regional contexts may affect fundamental changes in the mode of operation of agriculture. These effects must be assessed in different regions that reflect various concerns.

Experimental unit: agricultural region – defined by spatial pattern and agricultural structure

Goals: e.g. establishment of regional value chains; more tightly closed nutrient cycles by regional linking of animal and plant production

Number: depending on available funds but at least one region of transformation per type of agricultural region (e.g. region of intensive animal production, low mountains, agricultural grassland, intensive crop production).

Selection: applications by interested regions, criteria: potential of realization and urgency to act.

Examples: Eco model region Rhön-Grabfeld; eco village Sieben Linden (extended to a whole region); Region of transformation Lausitz

■ Landscape laboratories

Landscape laboratories serve as **living labs** for assessments of landscape-level changes to structural processes. As part of the infrastructure, processes or structures at landscape level are manipulated, probing access is made available, regular surveys are being conducted and data are collected and made available. Research groups can apply with projects for using the infrastructure for complementing assessments.

Experimental unit: e.g. administrative communities or collectives of (agricultural) enterprises; test areas at landscape level

Goals: e.g. structuring cropping systems for biodiversity; storage of surface water in the terrain for irrigation; consistent digitalization of farm operations and administration

Number: several units with similar questions per region of transformation or per comparative class

Selection: Application of interested actors, criteria: potential of realization, urgency to act, gain of knowledge

Examples: AgroSpaceLabo Quillow, FInAL-project, Landscape of Industrial Nature North, Living Labs of energy transition

■ Pilot-farm networks

The focus is on **agricultural enterprises**. They participate actively and immediately in the selection, implementation, and assessment of measures that will be developed. Research takes place in intensive exchanges between researchers and farmers on the farm. The extended field of actors will be involved (extension, authorities NGOs, value chain). Being an infrastructure, the networks are open for assessment of additional questions.

Experimental unit: individual agricultural enterprises (farms)

Questions: e.g. adaptation of keeping of animals; more diverse crop rotations

Number: several farms having the same aim

Selection: Application of interested actors, criteria: potential of realization, urgency to act, gain of knowledge

Example: Pilot Farm Network

The additional value of such an infrastructure results from arriving in a faster and more efficient way at recommendations that have been tested in practice and are scientifically sound in order to further the development of agriculture and agricultural landscapes.