

använda importerade fodermedel som, vi inte vet om, eller kanske redan vet bidrar med stora negativa miljöeffekter i andra delar av världen. Inom konventionell djurhållning används stora mängder soja och palmfrökaka m.m. som har både ekologiska och sociala konsekvenser som inte skulle vara acceptabla om de förekom i Sverige. Om man kopplar ihop vårt jordbruk med hela världen är det inte OK, oavsett om det ger bättre foderutnyttjande, mindre växtnäringssläckage och bättre djurhälsa. Lösningarna på eventuella problem om man utgår från det första perspektivet måste hittas lokalt genom ekologisk inpassning, andra fodermedel m.m. Där kan jag som ekologisk forskare bidra.

3. Om vi tror att vi i framtiden kommer att

hitta ny billig energi som kan ersätta olja eller om vi inte tror det (eller ens vill det). Liksom hur stor tilltro vi har till teknikens möjligheter att lösa de stora miljöproblemen.

Detta avgör om man anser att de stora lösningarna skulle kunna finnas i GMO, storleksrationalisering, ett jordbruk som bygger på att använda kemiska bekämpningsmedel med precision och att det är där som den stora mängden forskningsmedel ska satsas. Eller om man istället ställer sin förhoppning till forskning kring ekologiska lösningar, där t.ex. diversitet och lokal anpassning är två viktiga redskap som kräver en helt annan typ av forskningsunderstöd.

Jag delar ambitionen att med min forskning bidra till mer hållbara livsmedelssystem med många konventio-

nella lantbruksforskare, men utifrån min värdegrund och omvärldsanalys är det rimligare att utgå från ett lantbruk som bygger på etiska principer om kretslopp, naturlighet, försiktighet och rättvisa än ett lantbruk som bygger på kontroll och teknisk precision, systematisk användning av kemiska bekämpningsmedel och stora mängder inköpt gödsel.

Jag tror dock att det är bra att det finns forskare med en annan ansats än min egen därför att så väl i naturen som i forskningen är mångfald bra. ■

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## Enhancing R&D in organic agriculture – with what type of learning?

*“Knowledge creation” is a metaphor for learning that deserves special attention when designing developmental activities for organic farming, says the author of this article, Laura Seppänen.*

A variety of actors take part in maintaining and developing organic food and farming, but generally the best recognised actors in this sense are found in research and development (R&D). If developing the organic sector is viewed as learning, then what is the basis for understanding learning? This basis undoubtedly affects how we design and organise developmental activities such as education, advisory services and research. The three metaphors for learning, examined by Hakkarainen et al. (2004), are briefly described below and evaluated in the light of characteristics and challenges of organic agriculture. The three metaphors to learning are: 1) knowledge acquisition, 2) participation,

and 3) knowledge creation. It is concluded that all the metaphors are needed, but knowledge creation deserves special attention in designing developmental activities in organic farming.

### Learning as knowledge acquisition

The *acquisition metaphor* is most common, and views learning as a process in which knowledge is transmitted into an individual actor. It is the inner knowledge capacity and structures of the mind that are of interest here. Mind can be seen as a container, and learning is a process that fills the empty vessel with knowledge. The traditional form of agricultural extension, a transfer of tech-

nology (TOT) model, is one illustration of this metaphor.

The acquisition metaphor often assumes that knowledge is ready and given. Attention is not paid to situations in which knowledge is used. Ecological principles, administrative rules for organic farming and other ‘facts’ to be learnt show learning in the light of knowledge acquisition.

### Learning as participation

The *metaphor of participation* emphasizes the role of social communities in learning. Through participation, people learn to become full members of a community, and simultaneously they re-shape their identities. Knowledge, according to this view, does not exist only in the individual’s mind, but rather it is one dimension of cultural participation.

Both values and practices in organic agriculture differ from those in conventional farming, and thus we often can speak about an organic community into which newcomers join (learn) by participation. Networks and partnerships are of importance here. Although organic agriculture is now being institutionalized, it is still seen to maintain its own value-based, movement kind of activism, which emphasizes learning as participation. But with cultural practices, the focus of this metaphor is on managing existing knowledge of the community, without aiming at conceptual or social changes. Farmers are often viewed as the most important sources of knowledge about organic agriculture, since universities have limited experience in research in this area.

### Learning as knowledge creation

Although both of the previous metaphors may include certain innovative elements, neither of them consciously focus on the *creation and enhancing of new knowledge*. The aim of the third metaphor is both to create new knowledge and to develop corresponding social practices. The interest lies in those processes, practices and tools that encourage new knowledge and innovation.

Organic farming is often diverse and location specific and relies on complex ecological processes, which makes it very knowledge-intensive. Organic agriculture also needs to face many challenges in a dynamic way, and thus the metaphor of knowledge creation suits well. Also the actual knowledge society emphasizes the need of knowledge creation. In it, learning means collective striving towards understanding and developing a certain issue. A community is organised around a common object for developing it. There are many theories and models for knowledge creation which mostly emphasize the mediating character of

concepts, material tools and practices.

This is not to say that knowledge acquisition and participation have no role in organic agriculture. Yet enhancing knowledge creation means that attention is paid to diversity of perspectives and learning tools. They can be tables, figures, measurement devices, and especially hands-on activities, and often many of them are needed. Models or other types of presentations of the state-of-the-art practices, or activities that help actors articulate their desired goals, can facilitate the knowledge-creation process. See Seppänen and Francis (2006) for case examples of networks, participation and knowledge creation.

The three metaphors have different roles in R&D. Knowledge acquisition is necessary for complementing the individual's current knowledge base. With participation, learning may be seen as a process in which new actors gradually become full members of the organic food and farming community. This is also essential, where there are ambitious national goals for organic food production and sales, but

the funds for new programs are still scarce. Because of the dynamic character of organic agriculture, perhaps the biggest challenge in organic agriculture is to learn to develop techniques and practices further by reshaping them or creating new ones. This can be achieved through knowledge creation. ■

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### Literature

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## Bok om långliggande fältförsök

ISO FAR – den internationella organisationen för forskning inom ekologiskt lantbruk – har börjat ge ut en vetenskaplig rapportserie där den första volymen handlar om långliggande fältförsök i ekologiskt lantbruk. Den innehåller information om tolv utvalda långtidsförsök under skilda förhållanden i Tyskland, USA, Italien, Danmark, Schweiz, Österrike och Israel. Varje försök har sitt unika upplägg, men gemensamt är syftet att undersöka ekologiskt lantbruks specifika karaktär när det gäller jordbördighet samt skördarnas storlek och kvalitet. ■

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UUSI KIRJALLISUUS

*Raupp, Joachim, Carola Pekrun, Meike Oltmanns, Ulrich Köpke (Eds.)*

### Long Term Field Experiments in Organic Farming

ISO FAR Scientific Series No 1. 2006. Verlag Dr. Köster, Berlin, Germany  
Mer info: [www.isofar.org/publications/scientific-01.html](http://www.isofar.org/publications/scientific-01.html)