Partnerships for sustainability

In 2002, the beer brewer Heineken got together with the Agrarische Unie and farmers in Flevoland, the Netherlands. Together they wanted to explore the possibilities of sustainable barley production. Each of the three partners had their own interests, but also had shared aims. Focusing on soil fertility as essential for developing resilience and sustainability, the partners are still working together.

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The Netherlands, with fertile soils and a moderate climate, is not the first place where you would expect farmers to worry about climate change and resilience. However, it is generally accepted that climate change will have an impact on agriculture in the future. Failure to adapt might affect farm yields, biodiversity and profitability. Sustainable farming systems that are resilient to changing environmental conditions are essential to cover these future challenges. Sustained soil fertility is a key part of such systems, and will help to manage these challenges. With intensive crop rotations, the use of heavy machinery which causes soil compaction, and tightening of regulations, arable farmers in the Netherlands are willing to invest in resilience through building soil fertility.

At the Louis Bolk Institute we work on building resilient farming systems with an organic and sustainable agricultural focus. With our participatory research and extension activities we want to find practical solutions and provide direction for new policy issues which will benefit society. The results of our work are translated into improvements for the agricultural sector. For example, we are involved in a project called Skylark, which accompanies 60 farmers and 10 companies from the food industry to develop sustainable and resilient farming systems in the province of Flevoland.

Working in partnership

In 2002 the beer brewer Heineken initiated this project, together with the Agrarische Unie (a Dutch company supplying seeds and fertilizers) and ten farmers in Flevoland. Together they wanted to explore the possibilities of sustainable barley cultivation and examine what sustainable agricultural production involves in general. While sustainable raw materials were important for Heineken, the Agrarische Unie and the farmers realised they had to become more active to survive in a competitive market place. With the current production methods it would become more and more difficult to maintain yields without increasing inputs even more. The Unie realised that they needed to change from selling inputs and buying grains to becoming independent advisers. For the farmers, sustainability means not only ideals but also an income; including the question of whether a son or daughter will take over the farm in 20 years time. Heineken was able and willing to follow a participatory approach, putting the farmer and his crop rotation in the centre of the approach.

In 2003 the Louis Bolk Institute, along two other organisations, became involved as advisers in exploring sustainable barley production. Initially, just ten farmers were involved in the project. In 2006, building on successes achieved over the previous three years, 50 new farmers joined the project. Farmers saw the need to learn together and from each other. Working together in a wide production chain opened their eyes to new perspectives. Right from the beginning it was clear that a sustainable production could not be limited to a barley crop alone, but that other industries buying from the farms should be involved if a truly sustainable production at the farm level was to be created. In 2006 the Skylark foundation was created, including not only the farmers but also other industrial partners such as Cargill and McCain.

In the project an environment is created in which arable farmers can work effectively and with pleasure on the sustainability of their business. The joint focus on the farmer's crop rotation and his strategy towards a sustainable production environment is central. The farmer himself has a leading role and his sustainability strategy serves as a basis for activities. Based on a long-term vision, an annual farm plan is developed, indicating sustainable practices at the farm level and also indicating the farmers' choices about rotation, use of fertilizers, and soil fertility practices.

Photo: Louis Bolk Institute

Working on soil fertility and structure can improve the sustainability of yields. This well-established onion root is 7 cm deep.

Planning for sustainability

Ten indicators for sustainable agriculture, accepted by the food industry, and underpinned with a limited number of measurements, now highlight the changes made. The set of indicators includes nutrients, crop protection, energy and water on the input side of a farm. On the output side, indicators include product value, local economy, human capital and biodiversity. Soil fertility and soil preservation are considered as the essential basis for development towards resilience and sustainability.

Together with the farmers, a set of 27 baseline measurements was selected for the ten indicators. Based on these measurements and an informal discussion with all participants individually, each participant formulates their annual farm plan and ideas as to how sustainability could be incorporated into their business. The concrete result of these annual discussions is a list of elements that need special attention, as well as activities which work towards sustainability in the following year.

The challenge is achieving a good balance between the different indicators. For example, an activity good for nutrient management might not be positive in terms of the indicator for product value (e.g. increased cost). Therefore activities need to be planned carefully and seen within the context of all ten indicators. In practice, widening a crop rotation from 1:3 to 1:6 crops, means not only improving soil structure, but also lessening the chance of diseases. It will also improve the water holding capacity, and reduce the need for irrigation. For many farmers the relationship between economic sustainability, crop rotation and soil fertility is of the essence. It is difficult to change the crop rotation for improving soil fertility in the future, without being able to estimate the financial consequences properly.

During the whole process the question arises as to how to translate sustainability requirements into tools that can allow us to understand what is happening, and then develop management practices that work at the farm level. With this in mind, we developed a set of tools for translating the main indicators of sustainability into management practices to build resilience at farm level. Some tools were developed for looking at soil fertility, as this is essential for building resilience and having the capacity to adapt to climate change.

Tools

To build resilience and make farmers more aware about how their cropping systems and management is affecting their farming system, a training course on soil fertility was offered to all participating farmers. In this practical field course farmers learned how to visually assess their soil quality, how to optimise soil fertility, how to recognise the effects of crop rotation or soil tillage, the importance and effects of using green manures, crop residues, or other organic materials. For all participants this meant developing their insight into and answers to the following questions, specifically for their own farm: How can you look at your soil? What can you see in your soil? What does this tell you about your farming practices? What does it imply for your farm management? How can you overcome negative effects or improve the positive effects of management on soil fertility? An essential process in the course was moving from visualising the soil and understanding the processes, to making the steps towards actual management practices. These practices are preferably discussed by a group of farmers so that farmer-to-farmer learning can take place.

A second tool we used is a soil scan. In a visit to the farmers involved, the quality of their soil was assessed individually. The soil scan includes a visual soil assessment as well as a minimum set of relatively simple soil chemical and physical characteristics. With this scan, developments in the soil over the years are visualised and form a basis for improving the whole farming system.

In addition to standard laboratory analysis which focuses mainly on nutrients for the next growing season, we evaluated the living soil activity based on a laboratory respiration test. This test, indicating the respiratory activity of the soil life community, also indicates the power of a soil to withstand interruption or adapt to changing environmental conditions. With a more active and diverse soil community, a farming system is also able to withstand environmental changes and suppress soil diseases better, for instance.

At the farm level a very important and useful tool is the computer model called NDICEA. Besides input-output balances used in the project at the farm level to be able to reduce fertilizer inputs, the model gives insight into how to improve crop rotations, reduce nutrient losses, and build long-term soil fertility. It combines a user-friendly interface with rather complex calculations. It was tested over more than ten years within the European context but has also been successfully applied as study material in Pakistan and the U.S.A. Combining application at individual farms and discussing results in groups with an adviser seems the most promising approach.

What are the results?

Before the start of the project, most participants had never had a close look at their soils. During the project, participants became more aware of the fact that a fertile soil is the basis for a resilient and healthy farming system. As one of the participants said: "The most important vitamin for the soil is vitamin A: attention! Dig a hole, take a closer look, feel and assess the situation of your soil and use this easily accessible knowledge as a basis for management practices." During the course of the project other wholesalers and processors became curious and are now participating in the project. They also encourage their farmers to produce in a more sustainable way. Some of the farmers have now switched to organic growing systems.

Another important factor was the open exchange of knowledge and ideas between the different stakeholders. The fact that the whole project was initiated by one of the companies buying their products increased the awareness that sustainability and resilience are important for the future.

Within any multi-stakeholder process, an important factor for success is the participants' increased ability and willingness to work on their own initiative, and take greater responsibility. Participants learn from each other and learn together. The advisers play a key role in facilitating this process and keep challenging the participants.

It is a challenge to transform all indicators into concrete actions at the farm level. Soil fertility, product value and crop protection are indicators farmers pick up and are excited about. We still have a way to go to turn biodiversity and human capital, for instance, into concrete actions on most of the farms.

Sustainability in the industry part of the chain also remains a challenge. Depending on the company we have local, national or international players. From this, ideas vary widely about whether to expand the number of growers, or the willingness to compensate farmers for sustainability. To work on this we have started discussion groups, bringing farmers and the industry together on a specific crop, discussing and exploring the challenges in creating a truly sustainable chain for the produce.

Lessons learned for resilience

Tools like the visual soil scan increased the awareness and problem solving capacities of farmers and have resulted in a more conscious soil management that is able to build resilience. Farmers observed that with more attention and improved soils, crops can tolerate certain conditions better: more and more of the Skylark farmers' irrigation installations are out of work. Others say their crops do better, resulting in more quality products even after an extremely wet period. ■

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