



**SOLINSA**  
Support of Learning and Innovation  
Networks for Sustainable Agriculture

Agricultural Knowledge Systems In Transition:  
Towards a more effective and efficient support of Learning  
and Innovation Networks for Sustainable Agriculture

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# **NETWORKS IN ANIMAL HUSBANDRY IN THE NETHERLANDS**

## **SOLINSA SHOW CASE REPORT**

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# 1 SUMMARY

This case description focuses on the innovation and learning processes of the 129 networks of the Dutch Networks in Animal Husbandry programme (2004–07) to become more sustainable in farming and entrepreneurship, and on the network facilitation in relation to their characteristics and their relations within the Dutch agricultural knowledge system (AKS), and the extent to which farmers can be more empowered and increase their entrepreneurship skills.

The programme was set up as an experiment to establish whether knowledge would lead to more innovation as a result of improving co-creation through networks. The networks were supported for one or two years through facilitating and the use of knowledge. The programme contributed both to fulfilling their knowledge needs and to the realisation of innovation by the entrepreneurs involved, mostly regarding business processes, organisation and production. Participation in the networks led to enhancing the strategic space of the network members. This means that they learnt more variety in choices, opportunities and own ability to come up with solutions to a certain business problem in order to improve sustainability.

The experienced success and the lessons learnt from the analytical monitoring and evaluation studies contributed to the adoption of networks as an instrument to better match knowledge supply to knowledge demand from farmers, knowledge workers (research, and agricultural advice and education) and policymakers. The programme led to a breakthrough in the Dutch AKS. The participating actors and parties experienced the network approach as successful. The programme led to various spin-off activities that are still running in both projects and in approaches and programmes.

The aim of the programme was to stimulate knowledge and innovation through learning. The goals of the networks included:

- To work on optimising their business strategies.
- To change their business tracks.
- To develop a robust learning network on various topics related to sustainability.
- To develop knowledge to use as a ‘weapon’ in, for example, debating with policymakers.

Specific barriers that the programme faced were the balance between the give-and-take of knowledge by the various participants, the acceptance of this relatively new way of working with knowledge and the cooperation with competitive advisors, and the limited involvement of agricultural (vocational) education. Specific barriers that the networks faced were finding a good balance between the benefits for the group as a whole and for sustainable husbandry, and the benefits for individual network members themselves, the too late involvement of essential parties like policymakers and banks that were necessary to achieve the networks’ goals, loss of priority for the network or less energy among the network members. Most barriers were overcome.

The role of the knowledge facilitator to help the network with developments

turned out to be very important. The term ‘free actor’ was born in the programme, meaning that a network needs an objective guide who has the right technical and process knowledge and skills, affinity with the network and access to relevant stakeholders, and who helps the network to remain strong.

## 2 INTRODUCTION

The Dutch governmental agricultural advisory service was privatised in the late 1980s and the 1990s. Since then, several knowledge workers – that is, agricultural advisors, researchers, farmers’ associations and the agricultural education system – have entered a dynamic environment in which they continuously adapt their strategies and roles, resulting in a quest for an optimal knowledge and innovation infrastructure.

In 2003, awareness was raised amongst researchers and policymakers that, for a more sustainable animal husbandry, it would be necessary to stimulate cooperation between the many actors who will have to engage in a process of knowledge co-creation, or even to recreate the agricultural knowledge system (AKS). In order to bridge the gap between knowledge and animal husbandry, the former ministry of Agriculture, Nature and Food Quality initiated the Networks in Animal Husbandry programme, to be coordinated by Wageningen University and Research (Wielinga & Vrolijk, 2009). In the period 2004–07, an average of 40 networks were assisted each year by 25–35 knowledge workers (both researchers and advisors). They were challenged to step away from their daily routines and to not transfer their knowledge and advice directly to the network, but facilitate the network in their own search for the knowledge required for the various stages of the innovation process. The prerequisite for a network receiving assistance was that the farmers themselves had to take the initiative. Each year, the programme received a subsidy amounting to approximately €2 million to hire in expertise, including facilitators, communication support, scientific analysis of the networks and programme, and programme coordination.

The ministry intended this programme to achieve two aims (Wielinga & Vrolijk, 2009):

- To stimulate innovation for sustainable animal husbandry.
- To empower entrepreneurship in animal husbandry by improving the match between knowledge supply and demand.

The programme was an experiment to establish whether knowledge would lead to more innovation as a result of improving co-creation through networks. The objective was to create a breakthrough on the system level within the AKS.

A total of 129 networks were able to perform under government support through this programme (Bartels, 2009); a number of networks were assisted for longer than one year. The main approach of the programme was as follows (Wielinga & Zaalmink, 2008):

- Entrepreneurs involved in networks in animal husbandry communicated

their ideas for innovation to the ministry.

- The programme provided knowledge facilitation through expertise and communication activities.
- The knowledge workers (researchers and advisors) were embedded in a structure for critical reflection on the networks and methodological support.

Networks were encouraged to involve various chain parties and actors, such as veterinaries, suppliers, the processing industry, retailers, entrepreneurial organisations and NGOs. The selected networks were facilitated for one year, and sometimes even longer. After admission to the programme, a researcher was assigned to each network as facilitator. In the second and third phases of the programme, farm advisors joined the teams of facilitators.

### 3 METHODS

The combined results of the networks, the support from the government and the facilitation by the knowledge workers, made this programme an interesting example of a successful link between agricultural networks and the Dutch AKS. This showcase analysis for the SOLINSA project focused on:

- The innovation and learning processes within the networks, looking at ways of facilitating new and existing networks of farmers and other stakeholders to become more sustainable in animal production.
- Network facilitation in relation to their characteristics and their relations within the AKS, and the extent to which farmers can be more empowered and increase their entrepreneurship skills.

The research questions of this showcase analysis were:

1. What are the global results in terms of innovation, empowering and connections with the Dutch AKS, of the Networks in Animal Husbandry programme after four years of supporting and facilitating networks?
2. What were the goals of the networks?
  - a. Was there a difference between networks in innovation goals and learning goals?
  - b. How did they succeed in achieving their goals?
  - c. What kind of barriers (internal, external) did the networks encounter during their lifecycle, and what happened to these barriers? Are there good practices to be described?
3. What was the role and position of the facilitators; was there a need to facilitate the networks?
  - a. What interventions were necessary during the lifecycle of networks?

A literature study was conducted in order to answer the research questions. The

Networks in Animal Husbandry programme is well documented. It was set up as an experiment, as the ministry wanted to gain insight into and learn from this new approach to matching knowledge and farming. Therefore, an action research team was appointed to assist the facilitators with the language and tools for working with networks. For instance, the team organised regular group meetings of five to seven facilitators to reflect on the experiences they had gained and to plan further action for their networks. The team also analysed what this new network approach could contribute to policy and sector goals, as well as the effect it could have on the current scientific discourse on the innovative capacity of knowledge systems (Wielinga & Vrolijk, 2008).

Both authors of this case study were part of this action research team. They participated in the programme from beginning to end, and wrote analytical scientific articles and reports. At least 15 reports and articles on the programme have been produced, including an external evaluation study on behalf the government (Bartels, 2009). Most of the publications are in Dutch, but there are approximately four scientific articles in English, including a book chapter, individual articles and conference presentations. Furthermore, for this case study additional research was carried out by analysing the learning histories of the networks and by consulting, amongst others, the programme manager, the action research team and facilitators.

## 4 RESULTS

### 4.1 Results on innovation

A network consisted of a minimum of three farmers; there was no maximum. Non-farmers could also join a network. The number and composition of network participants was not, however, monitored. Farming types included dairy, pigs, poultry, goats, rabbits, and mixed groups of animal husbandry and arable farming. The basic duration of support of the networks was one year, but could be extended to two years. The networks produced a wide variety of results. Some examples are (Wielinga & Geerling-Eiff, 2008; Wielinga & Zaalmink, 2008, Teenstra, 2006):

- Techniques and practices: e.g. a prototype for a mobile milking robot that simplifies the strategy to keep cattle in the pasture.
- New markets and products: e.g. developing a marketing chain for horse milk as a quality food supplement.
- Diagnostic tools using the experiences of experts and farmers: e.g. an early warning system for recognising rare but hazardous diseases in pigs.
- Analysis and advisory instruments: e.g. tools for recording and analysing working hours on dairy farms.
- New practices for sustainable production: e.g. a network of dairy farmers developed new practices of producing milk for a special brand of ice



cream, combining high quality production with animal welfare and social responsibility.

- Scaling up efforts: the above network scaled up its practices at a later stage. The concept was adopted by a dairy cooperative for implementation by its 550 members.
- New forms of cooperation: e.g. one network formed a cooperative that bought 200 hectares of agricultural land in order to transform it into a new nature area in interaction with citizens and other actors.
- Stimulating dialogue: several networks started cooperative dialogues with relevant NGOs and other organisations in order to promote farming in combination with nature preservation concerns.
- Influencing rules and regulations: e.g. the rules for preventing a specific disease in sheep did not allow for a proper breeding programme for self-moulting sheep. The network managed to convince policymakers to change the interpretation of government rules.

An evaluation study of the network programme was carried out on behalf of the ministry in 2008–09 (Bartels, 2009). The results show that the programme contributed to innovation by the entrepreneurs involved. An important argument for farmers to engage in the programme was that it fulfilled their knowledge needs. They were satisfied with the quality of the knowledge, the experience and the process facilitation they had been offered. Before the start of the networks, they would have liked to participate more in the type of knowledge and facilitation that was in fact being given to them by the programme.

Of the 25 respondents, 21 stated that the outcome of the network had led to innovation in their way of farming. This mostly involved:

- Process innovation: e.g. a method for optimising the usage of animal feed, a system to detect sow diseases, a risk scan for an animal disease, better methods for processing manure.
- Organisational innovation: e.g. a method for optimising human resource management, a method for investment strategies, the development of a new financing concept.
- Product innovation: e.g. the market introduction of innovative poultry meat, innovative methods to derive energy from biobased material.

Furthermore:

- 8 respondents expected to realise more innovation on their farms after 2008;
- 5 respondents answered that they had already realized economic effects (cost reduction or increase in turnover);
- 12 respondents said that the network's results contributed to improve their way of farming which resulted in positive effects on the environment and animal welfare.

Last, all respondents among the facilitators (N=13) said that participating in the

programme led to advantages for their own (knowledge) organisation.

## 4.2 Empowerment of agricultural entrepreneurs

According to Hubeek, Geerling-Eiff and van Baalen (2006), the programme can be seen as an emancipatory policy experiment. They argue that the programme was introduced to support the enhancement of the ‘strategic space’ of entrepreneurs, by entrepreneurs. The strategic space is defined as the variety of choices and opportunities the entrepreneur can come up with to find a solution to a certain business problem, meaning that entrepreneurs understand and realise their own opportunities for action (Baalen et al., 2004; Geerling-Eiff et al., 2004).

The focus in the approach was on the entrepreneurs articulating their own knowledge needs based on the problems they had identified (Geerling-Eiff et al., 2005). The networks that were supported could be identified as horizontally oriented – for instance, entrepreneurial study clubs, and often consisting of innovators and early adopters (Rogers, 1962) – or vertically oriented, whereby entrepreneurs, supply chain partners and stakeholders were part of the network. The network facilitators (researchers and advisors) acted as knowledge brokers (Klerkx, 2012), assisting entrepreneurs in, for instance, locating financial support, matching knowledge demand and supply, filling knowledge gaps, stimulating interaction with other stakeholders and facilitating group processes.

Examples of increasing the strategic space of entrepreneurs are:

- More awareness of own entrepreneurial problems, resulting in increased willingness to take own action.
- More insight into own and the farm’s capabilities and actions to stimulate sustainable development and innovation.
- More outward orientation and active communication with consumers, citizens and NGOs.
- More insight into policy, bottlenecks and directions for solutions.
- Learning not only to focus on the technical aspects of the farm (the hardware), but also how to deal with entrepreneurial processes (software) and internal and external conditions (orgware), (Dobrov et al., 1979).

This can be illustrated by a quote from a member of one of the networks (Green Collaboration Network):

“The way in which the network is trying to utilise its opportunities with the municipality, electric power companies and entrepreneurs in the recreation sector is unique. If the plans can be put in to practice, this network will be a very good example of successful cooperation between business life in general, the local community, the government and agricultural entrepreneurs”. (Wielinga & Zaalmink, 2008)

### 4.3 Connection with the Dutch AKS

The programme led to a breakthrough in the Dutch AKS. The participating actors and parties experienced the network approach as successful and expressed this to colleagues and policymakers. The positive reactions and the lessons learnt from the numerous analytical studies contributed to the ministry's adoption of several other important network initiatives. Spin-off examples of the programme are:

- A subsidy programme for Networks in Agriculture, which is broader than animal husbandry only and is open to initiatives of both farmers and advisors (since 2008: [www.hetInvloket.nl/onderwerpen/subsidie/dossiers/dossier/praktijknetwerken](http://www.hetInvloket.nl/onderwerpen/subsidie/dossiers/dossier/praktijknetwerken), Blokland et. al., 2013).
- The Dairy Farmers Academy: a project of the Farmers' Union subsidised by the government to stimulate innovation and learning through farmers, by farmers ([www.melkveeacademie.nl](http://www.melkveeacademie.nl)).
- The Virtual Pig Producers Network: this network functions rather like the Dairy Farmers Academy but has a greater focus on web-based information ([www.varkensnet.nl](http://www.varkensnet.nl)).
- The Fisheries Knowledge Groups, in which networks of fishermen and other stakeholders are supported in finding solutions for sustainable fishery ([www.kenniskringenvisserij.nl](http://www.kenniskringenvisserij.nl), Taal en Zaalwinkel, 2011).

Furthermore, Wageningen Business School (now Wageningen Academy, <http://www.wageningenur.nl/nl/Onderwijs-Opleidingen/wageningen-academy-1.htm>) started offering a 3-day course for other and future facilitators to familiarise them with the networking tools used in the programme. Many facilitators and advisory officers have already taken this course. Specific in-company courses have also been organised for advisory organisations.

These examples show that facilitating and subsidies for networking have become important policy measures and knowledge tools. The programme for animal husbandry had an important impact on the adoption of networks as a successful approach to both learning and innovation. Hubeek, Geerling-Eiff and van Baalen (2006) argue that the network programme had three main advantages as a successful type of knowledge demand-driven approach:

- The knowledge development process was directed by the entrepreneurs or their close advisors. They took responsibility for generating the knowledge they needed.
- The knowledge they developed fitted the purposes for which it was developed, namely the entrepreneur and his or her business, because context-specific factors of entrepreneurship were taken into account.
- Relationships were strengthened between knowledge workers and entrepreneurs, partners in the supply chain, and between entrepreneurs and the community (citizens, local NGOs) in which they work and live.

Although it is difficult to find evidence-based proof of impact, Wielinga and Geerling-Eiff (2008) argue that the programme led to better cooperation between researchers, advisory and extension officers, policymakers and farmers.

## 4.4 Goals and objectives

In section 4.1, we described some of the results of the networks. Because of the diversity in the goals of the 129 networks, the list of outputs is a long one. Here, we therefore restrict the description to one exemplary year (2006), which gives an accurate reflection of the generic programme.

In 2006, 39 networks received support (Wielinga & Zaalmink, 2008). The objectives of these networks were to:

- Optimise the business strategy (13x). For example, the Pig Disease Rapid Alert network developed a road map for detecting diseases that can be used by all pig farmers in the Netherlands. This was the technical result. The way that the network members had learnt to gain this knowledge themselves was the learning result.
- Change tracks (12x). For example, the Ko-alitie network defined its own cooperation in cow farming in a more sustainable manner than they were used to within their own farms, including financial and social advantages.
- Develop a learning network to make permanent use of the expertise of others (9x). For example, the Strong Together by a Strong Strategy network found several sustainable strategies for cooperation and came up with a common plan to tackle government legislation regarding manure.
- Collect knowledge as a 'weapon' for competitive aims (5x). For example, the Keeping Hens network gained and developed its own knowledge in order to discuss with the government legislation that restricted keeping poultry in the open air. They managed to convince policymakers to change the legislation to the advantage of the network.

## 4.5 Success in achieving the network's goals

We stated in sections 4.1 and 4.3 that the programme and most of the networks achieved their goals. However, five networks did not achieve good results or their goals. This was caused by a lack of motivation amongst the participants to continue (insufficient energy) or by other issues, such as conflicts within the group. Examples are (Wielinga & Zaalmink, 2008):

- Some farmers expected a more directive approach and knowledge transfer from the facilitator, and could not make the switch to self-organisation.
- The initiator was distracted by other concerns before the other participants had really become partners.

- Conflicts of interests within the group could not be resolved.
- Disappointment in what the results would be for individual members.

## 4.6 Difference between networks in innovation goals and learning goals

There was no particular difference between networks in either innovation or learning goals. On the contrary, the focus of the programme was exactly to stimulate knowledge and innovation through learning. A network had to have this integrated approach in order to receive support, and was one of the most important success factors of the programme (Wielinga & Vrolijk, 2009).

## 4.7 Internal and external barriers of networks

Here, we describe the barriers that were encountered on the programme level and those that were indicated on the network level. We also describe how these barriers can be or were overcome.

Programme level:

- The difference between a participant in the network and an expert was not always clear. Some network members, not all of whom were farmers, thought that their expenses should be reimbursed in return for their input. This problem can be tackled by discussing the matter at the start of a network. If one actor is to bring in more expertise and knowledge than others, he/she should be appropriately compensated.
- After a network was admitted to the programme, a researcher was assigned to it as facilitator. In the second and third phases of the programme, both public and private farm advisors joined the team of facilitators in order to embed the programme in the AKS. For various reasons, however, this was not always accepted by the research management (Wielinga & Zaalmink, 2008). The management of research institutes saw the programme as a source of income for research. They had little understanding that external parties were needed to cooperate and help realise the programme's goals: cooperation with other knowledge workers (advisors and educators) can provide for a more effective and efficient match between knowledge supply and demand, thus providing an upward spiral to better bridge the knowledge gap (Lans et al., 2006; Geerling-Eiff et al., 2007; Beldman et al., 2012). This showed that change in system thinking and acting needs to overcome short-term mind sets on business strategy, not only on the management level but also on the operational level, and a vision on investing in system change for an effective business strategy in the long term.
- In the first year of the programme, eight networks made connections with

agricultural schools (Wielinga & Zaalmink, 2008). However, this mostly concerned the assistance of students. Teachers and schools in general had little involvement. It was later analysed that professionals in education could have made a significant contribution to fulfilling some of the networks' knowledge needs (Wielinga & Vrolijk, 2009).

Network level (Teenstra, 2006):

- A number of networks found it difficult to get a robust grip on realising their network goals. The individual goals of network members could be far apart or expectations differed. Clarifying expectations and expressing own goals and targets in relation to the network activities at the beginning of the network, is essential in order to build trust between the members and to forge a collective focus on the network's aims (in relation to the individual aims).
- In some networks, the participants did not succeed in gaining the commitment of essential parties like local governments or banks that is required in order to achieve the network's goals. It often seemed that these parties were involved too late in the network process. The recommendation is to involve these parties at an early stage of the network.
- After a while, the energy sometimes flowed out of networks. Interventions to generate new energy were: resetting the agenda for roles and activities like working in work groups, new inspiration through new knowledge input, or organising special events, such as taking all network members on an excursion.
- The realisation of concrete innovation seemed to be a bridge too far. It is not difficult for innovating networks to plan and develop innovations, but realising them is a different kind of step, one that requires enterprise and a change in practice, and often has great financial effects. This demands expertise, other kinds of interventions and other types of facilitators. One other reason for such a failure might be that the support was provided for too short a period.

## 4.8 The role and position of the facilitator

The networks did not choose their own facilitators. This choice was made by the programme management and the action research team based on the expertise and preference of each facilitator. The choice was then checked with the network. This procedure prevented networks from bringing in their own 'friends' and ensured that they were facilitated by objective and professional facilitators.

For most of the researchers, the facilitation involved a functional change: instead of conducting in-depth research, they had to help the networkers to fulfil their own knowledge needs. The selection of the facilitators was based on their expressed interest in this type of facilitation, their experience in working with farmers and their research specialism. From the beginning there was much

attention to the 'new job'. The message was: 'Do not bring in knowledge but help the networkers *find* the knowledge they need.' This, however, could be a pitfall. Some researchers fell back into their routine of telling the networkers what to do and brought in too much own knowledge and experience on a particular subject. This could result in the facilitator losing sight of the network's goals. To avoid this, the facilitators were supported by the action research team, which provided the facilitators with train-the-trainer sessions and peer meetings. These sessions had a double function: the results were also used as data for monitoring and evaluating the programme. Based on the experience in the network programme, Wielinga and Zaalmink (2008) conclude that a network facilitator should:

- Continuously optimise a learning environment for the network.
- Encourage the participants to seek the expertise and stakeholders that are needed in order to achieve the network's goals.

By studying the role of the facilitator in the network programme, the term 'free actor' was born (Wielinga & Geerling, 2008; Wielinga & Zaalmink, 2008). A free actor is able to recognise the needs of a network and takes the necessary courses of action to advance the network. A free actor works independently of the network and has the competence to obtain the trust of the members that he/she can help them achieve their goals. The main characteristics of a free actor are that he/she:

- Has knowledge of the subject and aims of the network.
- Has affinity and experience with working with groups.
- Has the required insight into knowledge and innovation processes to steer the network in the right direction by preparing well and taking action.
- Has access to the relevant stakeholders and knowledge workers who can help the network to take further steps.
- Steers the network with energy and ensures that the members in the network are and stay connected with each other. This could also mean changing certain of the network's goals and/or members.

## 4.9 Interventions regarding the lifecycle of networks

The facilitators provided the following interventions so that the networks could take steps towards further development. The interventions can be categorised into three functions:

- The linking function: making connections with actors and expertise outside the network that are needed in order to achieve the network's goals.
- The process function: creating the possibility and the opportunity within the network for its members to learn and explore. An example is organising a bus tour and a visit to an inspiring environment when the

network was temporarily blocked.

- The strategy function: mapping out a strategy that would develop the network further by, for example, stimulating participants to invest, to change their farming practices, or to convince other actors or parties to change.

## 5 CONCLUSION

The Networks in Animal Husbandry programme is interesting as a (SO)LINSA case because it supported entrepreneurial learning networks that:

- Focused on realising innovation for sustainable Dutch animal husbandry.
- Combined diverse cooperating partners such as farmers, chain partners, consumers, citizens, NGOs and policymakers.
- Were facilitated in their knowledge acquisition by advisors, researchers and other knowledge experts so that knowledge and information sharing and learning for innovation could be optimised to achieve sustainable animal husbandry.
- Made a significant contribution to further developing the Dutch AKS.

The composition of the networks varied, broadly based on their history and goals. Most networks started as groups of farmers that were joined by a researcher in the role of facilitator. During the network process, the network was joined by other persons and/or parties, for example veterinarians, feed advisors, accountants, financial advisors, NGOs and citizens. The following influences of the network activities on the AKS were observed:

- Awareness that rather than just tapping the right knowledge source to realise the network's goals, more self-organisation, own activity and learning is required.
- Network activities lower thresholds, making it easier for both network members and knowledge facilitators to make and maintain contacts.
- The step from becoming a user of knowledge to a gainer of knowledge or fellow researcher is the farmer's own responsibility.
- Entrepreneurs became aware that their experience and network activities are valuable to others, and that cooperation and sharing knowledge leads to a return on investment.
- Knowledge co-creation between farmers (entrepreneurs) and researchers/advisors is more important than unilateral knowledge transfer – although there is a lot of very useful knowledge already on the shelf.
- Connectivity between farmers, other parties involved in and around the agricultural chain, NGOs, consumers and citizens is important to improve sustainable animal husbandry in dialogue with its societal environment.



The programme also showed that a free actor as facilitator who has the experience to act and operate, is objective and has the trust of the network members to do what is necessary, plays an important role in helping the network to take the right steps required within the innovation process.

Finally, the facilitation of and subsidies for networking have become important policy measures and knowledge tools. The animal husbandry program has had an important impact on the adoption of networks as a successful approach to both learning and innovation for sustainability by farmers, knowledge workers (in research, education and agricultural advice), policymakers and other stakeholders.

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