



Food and Agriculture Organization  
of the United Nations

# Innovations in financing mechanisms for demand-driven agricultural advisory services



## Evolution of the Danish Model



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## Abbreviations

DAAS	Danish Agricultural Advisory Service
DKK	Danish Kroner
EEC	European Economic Community
GDP	Gross Domestic Product
GTS	Advanced Technology Group
ICT	Information and Communication Technology
IT	Information Technology
LIK	Landbrugets Informationskontor [Agriculture Information Office]
OEEC	Organisation for European Economic Co-operation
UK	United Kingdom
US	United States
USA	United States of America
USD	United States Dollars
VFL	Videncentret for Landbrug [Knowledge Centre for Agriculture]





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Overall coordination and advice was provided by Magdalena Blum, Extension Systems Officer, of the Research and Extension Unit in FAO, who commissioned the Danish and the other three case studies.





## Preface

The Research and Extension Unit (DDNR) of FAO has undertaken a series of case studies on the reform of extension systems in the past decade and the shift towards innovative financing systems for extension. The studies have focused on the relations between the empowerment of farmers and their organizations, their new roles in the advisory systems and the innovative financial mechanisms in extension required to achieve effective pluralistic and demand-led extension and advisory systems with quality services being relevant for small male and female producers.

Four case studies of different modalities of innovative financing mechanisms were undertaken:

**Danish Agricultural Advisory Services, evolution of the Danish model.** The study describes the historic development of the Danish Agricultural Advisory Services (DAAS). This is the case of a national advisory system owned and managed by the farmer organizations and financed with public subsidies combined with farmer/user payments, gradually developed to full user payment.

**Agricultural Services and Producer Organizations Support Programme (PSAOP) from Senegal** is the case of reforms towards decentralised demand-led services with structures, procedures and finances for farmers' demand, negotiation and contracting of advisory services. The farmer organizations were the main drivers of this reform process. Both the supply and demand side are supported with public funding.

**Financing advisory services for family farmers in Chile.** The study describes the programmes of the Institute for Agricultural Development (INDAP) from Chile (1978-2014). The case shows the development of a pluralistic system for extension and advisory services. The system uses competitive grants provided by Government combined with users' financial contribution to the costs of the services.

**Nariño Dairy Products Cooperative (COLACTEOS) in Colombia** is a case of producers' cooperative based advisory services as embedded services fully financed through their own processing and marketing activities. A team of advisors is hired by the cooperative for regular services; while other services are contracted on a short term basis.

Furthermore, a synthesis was established with a conceptual framework for analysis used to develop a synthesis of the experiences from the four case studies. The synthesis also supplements the cases with a literature review on other cases of similar financing mechanisms and draws conclusions and recommendations.



# 1. Introduction

Given the reform of extension systems in the past decade and the shift towards innovation systems, the case presented here of the Danish Agricultural Advisory Service (DAAS) is the result of a study on the links and relations between the empowerment of farmers and their organizations, their evolving roles in advisory systems, and the innovative financial mechanisms in extension, especially pull-mechanisms. It looks at the effectiveness and impact of the demand-led advisory systems, and advice and accountability of advisory services to small-scale male and female producers. The objective of the study is to illustrate the Danish case of farmer led development of agricultural advisory services and draw out lessons learned from this that can relate to other countries engaged in reforming their advisory services.

During the 1970s and 1980s, the extension systems in most countries have largely been public systems, funded and implemented by government. With the decreasing support for the “Training and Visit” system, new non-public providers have emerged in contexts where civil society and the private sector could develop, and the financing of agricultural and rural extension could be diversified. However, funding for advisory services by the public sector remains crucial to fight poverty and ensure food security, although delivery was and is increasingly transferred to the service providers of civil society and the private sector. In order to achieve demand-led extension services, a change in the funding mechanism is required. Different mechanisms are illustrated by the Neuchâtel Initiative Group (2008), but little is known about country experiences. This series of studies will provide examples of alternative financing, including direct financial support of the demand side of extension, i.e. the farmer organizations.

In this picture, the Danish case provides a unique example of a long-term farmer led development of agricultural advisory services, where public funds have been used to assist farmer organizations in developing their own services as these funds have complemented user payment of the services. The case also provides an example of gradual development towards full user payment and the results of such.

The present document illustrates the Danish case and traces the historical and political factors that made this possible. It describes how the advisory services influenced the capacity development in and empowerment of the farmer organizations, the content and quality of the services and the accountability towards the farmers of agricultural advisory services and draws out lessons learned from this that can relate to other countries engaged in reforming their advisory services.

The methodology for this study is based on a review of relevant literature both historical and contemporary as well as analysis of existing data on the flow of finances. The study has moreover involved testimonies from interviews with key players and stakeholder with the relevant knowledge about the system now and before in order to get an appropriate assessment of the gradual development and its results, impacts and constraints. The study has furthermore been discussed with and reviewed for correctness by a resource person with thorough knowledge from the implementation of the advisory service and innovation system.





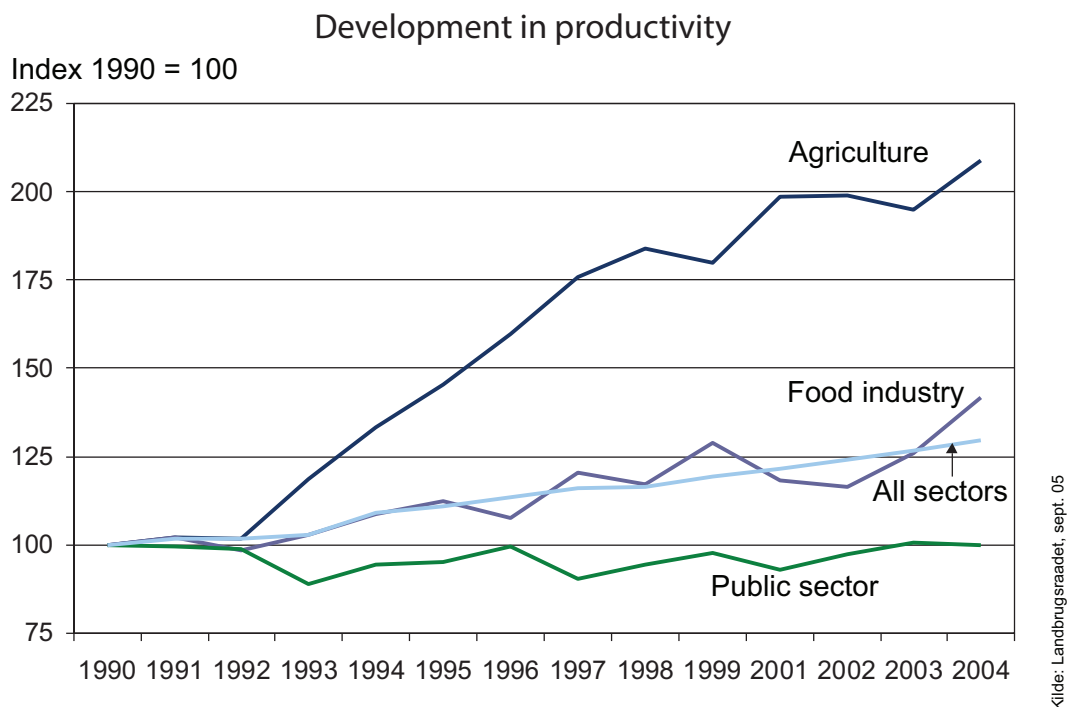
## 2. Danish Agriculture – a result of farmer-led development

### 2.1. A few facts about Denmark

Denmark is a small Nordic country, with an area of only 43 000 km<sup>2</sup> and 5.5 million inhabitants, of which 7% are farm owners or employed in the agricultural sector. Agricultural exports comprises 12.5% of total exports from Denmark, and agriculture contributes 3% of the Danish Gross Domestic Product (GDP).

Denmark is a highly developed country with a strong economy. The GDP in 2011 was US\$ 30 687 per caput. Danish society is characterized by high incomes as well as a high degree of social equality, trust and quality of governance. The politico-economic system is often called the Danish Welfare System, and was founded in the 1930s. The main principles are that all citizens have equal right to a long list of services. Education and health services are, for example, free for everybody. As a curiosity, two recent independent studies of different populations' "happiness" found that the Danish populace was the happiest in the world (Helliwell et al., 2012).

**Figure 1. Development of productivity in different trades in Denmark**



SOURCE: Data from Danish Agricultural Council, 2005.



What is particularly remarkable and unique about the development of the Danish society and the economy is that while most other developed countries has built their economies on industrialization, the Danish development has basically been founded on agriculture. The bad economic crisis in Europe in the late 1800's and beginning of the 1900's that led to massive migration from several European countries did not have the same impact in Denmark. The very early land reform policies and the farmer led development of agricultural cooperatives that were able to reach favourable markets for livestock produce such as dairy produce (butter and cheese) and pork in neighbouring countries provided opportunities for farmers as well as for peasant small-scale producers to make a living from their own farms and created employment in the dairies and slaughterhouses. Partly as a result of this and partly as result of early social security measures, rural poverty was essentially defeated at a very early stage - before the 1930's (Just, 2002).

It is moreover remarkable that agriculture has had and still has the highest productivity increase compared to all other trades in the country. From the end of 1800 up to World War II, the agricultural sector has been the best organized sector in the country (see Figure 1).

## **2.2. The agricultural sector in Denmark, the farmers and their role in society**

### **2.2.1. Overall situation of Danish agriculture today**

Danish agriculture is among the most efficient and knowledge based of agricultural sectors in the world. Table 1 provides a few key figures for Danish agriculture.

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**Table 1. Key figures for Danish agriculture 2010<sup>1</sup>**

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- 61% of Denmark's total area is cultivated – 2.6 million ha
  - 40 000 farms (vs. 140 000 in 1970)
  - 1 300 horticulture producers
  - Average farm size 65 ha (vs. 21 ha in 1970)
  - Labour force, agriculture primary production 2.5%
  - The industry accounts for 3% of GDP
  - 20 million slaughter pigs produced per year
  - 7 million live piglets exported per year
  - 574 000 dairy cows (9 000 kg milk per cow)
  - Producing food for 15 million people
  - Exports EUR 14 billion, including agro industrial products (20% of total export)
- 

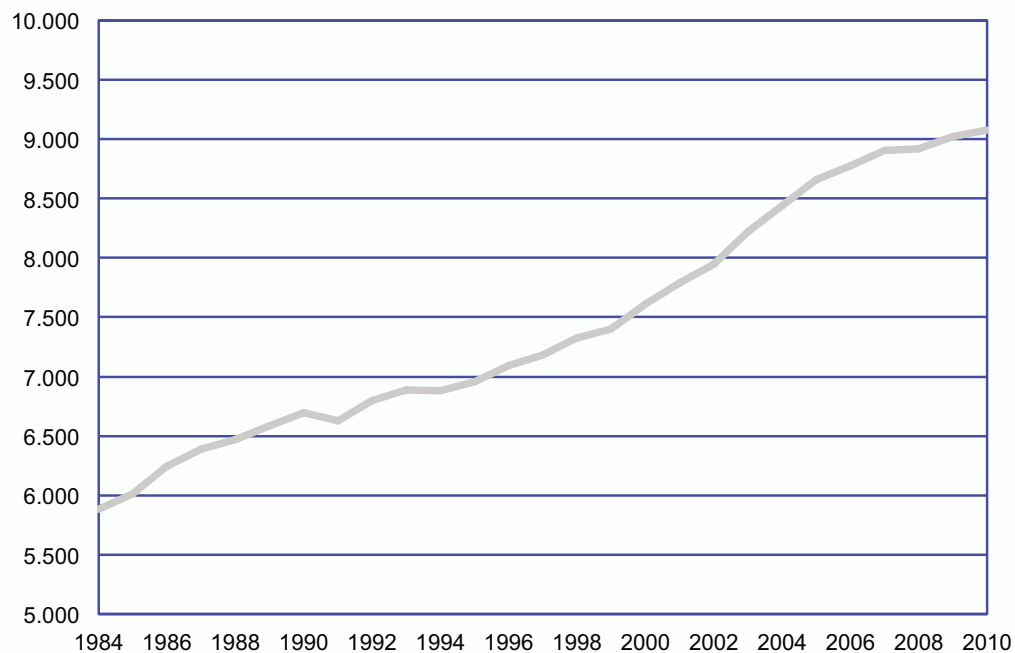
As Table 1 indicates, the main produce from Danish agriculture is livestock: pigs and dairy, but it should be noted that fur animals (mink) have increased in importance over the last decades. Productivity is constantly increasing. Figures 2 and 3 illustrates the situation for pigs and milk production.

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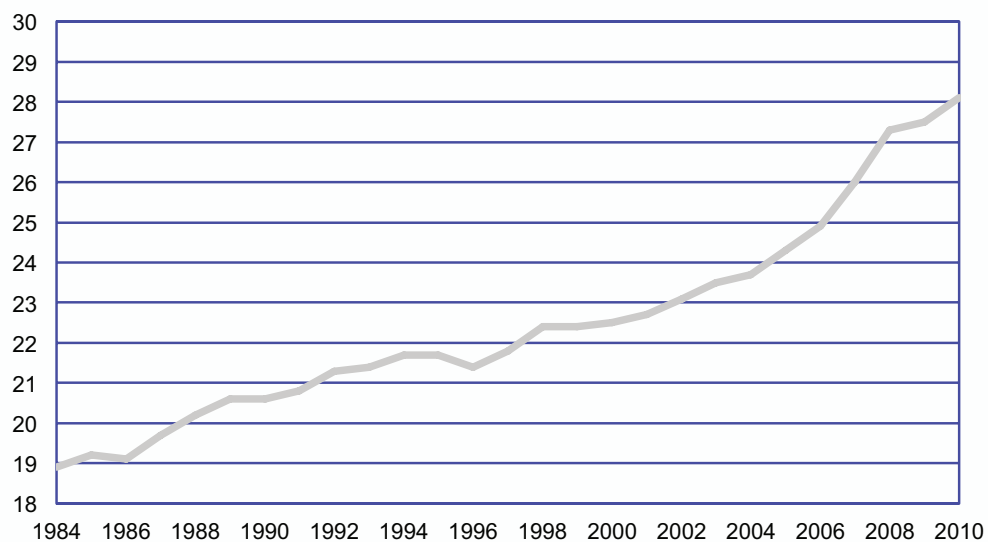
<sup>1</sup> Facts and Figures on Danish Agriculture 2010.



**Figure 2. Efficiency in livestock production. Annual milk yield per dairy cow, kg<sup>2</sup>**



**Figure 3. Efficiency in livestock production. Produced pigs per sow<sup>3</sup>**



<sup>2</sup>Facts and Figures on Danish Agriculture 2010.

<sup>3</sup>Facts and Figures on Danish Agriculture 2010.

It is characteristic for the farming sector in Denmark that the farmers are well educated. The Agriculture Act has since 1978 ensured this by requiring that only farmers who graduate from an agricultural college and therefore obtain a green certificate can run a farm.

The farmers have strong organizations both at the local and at national level. At national level, the farmer organizations are organized jointly with the Food Industry, which are mainly farmer-owned cooperatives. The name of the joint organization is Danish Food and Agricultural Council. The Danish Food and Agricultural Council is working both politically through policy lobbying, and practically with market-related activities and campaigns as a common good for all the members.

The division between private and public responsibilities in developing the agricultural sector is clear. The farmers and their organizations are responsible for issues of private interests, such as private-sector research and technology development, advisory services and marketing, while the government is responsible for public-interest research, such as environment- and health-related research and development. The public authorities administer control and inspection tasks related to this, and process EU subsidies. There is, however, a strong tradition in Denmark for public-private collaboration in knowledge dissemination and data collection related to public interest.

One of the well known features of the Danish farming sector is the strong cooperative sector. The cooperatives have developed since the 1870s and the sector is well established. The cooperative sector has undergone major structural changes over time: While in the early 1900s there were 1 100 cooperative dairies and slaughterhouses, there were only 13 in 2009. Despite the structural changes, the cooperative sector is still very strong in Denmark. One estimate is that 95% of all the output and input markets in Denmark are through farmer-owned cooperatives.

The successful development of agriculture in Denmark is to a high degree based on knowledge generation and dissemination, along with capacity development. The agricultural advisory services have played a major role in this, and the following sections will focus on analysing how this developed as a public-private partnership with a strong focus on the farmers' needs and priorities. The characteristics of the agricultural development were that it was partly subsidized by the Government, but almost fully implemented by the farmer organizations, and that funds from production levies and farming taxes have been instrumental in financing both research, development and capacity building of the advisory services. The subsidies for advisory services were gradually phased out, ending in 2004. The users now pay the full cost of advisory services.

### *2.2.2. Characteristics of the Danish farmers*

Apart from the fact that the farmers in Denmark are well educated and participate regularly in educational activities, it is also characteristic that nearly all Danish farmers own and operate their own farms. The large majority of farmers are members of their farmer organization and they sell and buy most produce through farmer-owned cooperatives. The Danish farms employ only few technical staff. Instead, they use the advisory services extensively for various technical and management purposes.

### ***2.2.3. The current challenges for the farming sector***

Apart from the impact that the financial crisis has had on Danish agriculture since 2008, the main challenges today are the demand for continuously increasing productivity and cost control, while at the same time reducing the carbon emission and other environmental impacts. There are, moreover, strong challenges connected with increasing demands concerning product quality and the associated documentation. At the same time, Danish agriculture is struggling with challenges related to its reputation in Danish society in terms of ethics, environment and animal welfare, which have important bearings on the political climate and policy environment for the state of the sector. In the past, while farming was a main occupation in Denmark, and most Danish people therefore had good connections to the farming community, there was a tremendous amount of goodwill in society towards the farming sector. Today, the sector has become much more distant for most Danes. As production methods have changed towards industrialization, it is now a challenge to bridge the gap of mutual understanding.

## ***2.3. The historical and political context – knowledge-based development and cooperation for profit for farmers***

In order to understand the success of the Danish model for agricultural development in a way that can be helpful as inspiration for developing countries today, it is necessary to look at the historical and political context in which the model developed.

Several historical studies and publications have discussed the context and the reasons for the unique Danish experiences, from different perspectives (see the list of references). Despite all the different perspectives and ideologies behind these, there is general consensus that the model developed as the result of a combination of factors, including:

- Early agricultural reforms.
- Use of new technologies.
- Education of farmers.
- Successful market-led transition from grain to the more intensive livestock production.
- Proximity to favourable markets for livestock products.
- Strong farmer organizations.
- The strong political position of Danish farmers.
- National will to prioritize agricultural development.

### ***2.3.1. Early reforms and new technologies***

Agricultural reforms started already in the late 1700s. Before this time, the society was a feudal system, where small-scale producers were subject to hereditary tenancy contracts with estate

owners, and the land was cultivated communally using inefficient technology and farming systems. The agricultural reform process consisted of a comprehensive set of changes in laws that provided individual freedom and private ownership for small-scale producers. The reforms of laws was combined with the use of new technologies, such as the swing plough drawn by two horses, and introduction of grass and clover in crop rotation systems. This all contributed to development of more effective farms. From the 1830s, the combination of legislative reforms and new technology started manifesting itself in more efficient and sustainable farming systems.

### *2.3.2. Successful transition from grain to livestock production*

However, the big blow to Danish agriculture came in the 1870s and 1880s, when the steam-ships carrying cereals from the “New World” to Europe destroyed the relatively favourable grain markets that the Danish farmers had enjoyed for ages. One could say that Danish agriculture at that time appeared to be defeated by globalization.

However, in this situation the Danish farmers focussed on the opportunities that the lower grain prices provided for developing the dairy industry. The crisis therefore ultimately had the effect that the farmers started using new technology – primarily the centrifuge, to separate milk and cream – to enter the British market for butter. Pork production started as a by-product of this, because the pigs could utilize the skimmed milk from the butter and cheese production.

The fact that the processing and marketing were developed through the farmer-owned cooperatives was important, for the profit to remain with the farmers. This also had the effect that the farmer leaders, through their leadership positions in the cooperatives, became closely connected with the market and developed a thorough understanding of the market and its demands.

In 1864, Denmark lost a huge and important territory to Germany. This created a national trauma, but at the same time a will among all players to act and intensify the utilization of the remaining opportunities and resources. A Danish politician (Enrico Dalgas), is often cited for the statement: “What is lost outwards must be won inwards”. This materialized as huge investments in cultivation of marginal lands, along with all initiatives of cultivation of new markets.

Due to the successful transition of agriculture from grain to livestock production, the importance of agriculture in society was extremely high, not only for food, but also for employment and export earning of foreign currency, which also assisted in development of the industrial sector. During the 1800s, 90 percent of Danish export was agricultural, and agriculture remained the main export earner all the way to the 1960s. There was therefore an obvious national interest for the government to support development of the agricultural sector, and the transition to livestock production in particular, through enabling policies and through direct economic development support.

### *2.3.3. Good political position of farmers*

It should, however, also be noted that the political environment was unique in terms of the position that the farming community developed over the years from the beginning of the reforms. A few important mile-stones were:

- **Education for all** The world's first educational act in 1814 provided everybody with the right to education from seven to fourteen years of age. This led to fast progress in the farming community in terms of being able to read and write.
- **Farmer organizations** started establishing from first half of the 1800s. In the beginning, they were mainly focusing on politics, but later, from the 1840s, they concentrated more on professional aspects (Porsmose and Bjoern, 1997). The farmers organized discussion meetings and sharing of experiences, and livestock shows and new crops were introduced.
- The fall of the absolute monarchy in 1848 and the **democratic constitution** of 1849, which gave the right to vote and eligibility to all men over 30 years of age.
- The start of the **Folk High Schools** in the 1850s through the inspiration of the Danish priest N.F.S. Grundtvig<sup>4</sup> brought about a kind of spiritual revival. Many farmer leaders came from the Folk High Schools, where they had participated in free discussions of history and politics, alongside spiritual matters.

All this led to empowerment and independence of the Danish farmers, and an independent self-conscious farmer community with organizational experiences. It facilitated a fast rise of the Liberal Party, which provided the farming community with important political influence. Later (1910 to 1914), the small-scale farmers created their own organizations, which were followed by the creation of the Social Liberal Party that defended the particular land concerns of the small-scale farmers, as well as the social equity concerns of the poorer segments of the rural population.

As mentioned above, the high political priority assigned to agricultural development continued up to 1960–1970. After the Second World War, there was a particular focus on increasing agricultural productivity and a number of policy measures supported this goal. In this work, the Marshall Plan and its aid programmes became instrumental and had significant influence on the development of the organizational and institutional structure of agricultural advisory services. This is further discussed in Chapters 4 and 5.

An important element of the political context is that the high priority to agriculture throughout the various periods has led to a strong tradition of mutual trust between the government authorities and the agricultural sector. This has resulted in a governance structure in the innovation system, in which there was and still is representation of farmer organizations and the advisory service in the relevant Boards and Committees for universities, research programmes and financing foundations. This is illustrated in Section 3.2.3.

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<sup>4</sup>Grundtvig was a pastor, a theologian, a teacher, a writer and even a politician for a while. Grundtvig lived in the 1800s in Copenhagen. Although relatively unknown internationally, he is one of the most influential people in Danish history. He has influenced Danish society in many ways and his ideas have had a lasting impact in many areas of Danish culture, like education, politics and the church.





## 3. The Danish agricultural innovation and knowledge system

The present chapter gives an overview of the current structure and functioning of the agricultural innovation and knowledge system in Denmark. The current model is a result of a long term and gradual development, framed by the economic, social and political situation of the different periods in Danish history. Chapter 4 then elaborates more on how this system developed over time.

### 3.1. Multi-stakeholder structure and functioning

While the take-up of technology innovations in Denmark may not always have been the fastest in the world, it is, however, still characteristic that the transfer of innovation to practical use is happening at a relatively fast and efficient speed.

#### 3.1.1. The collaborative model

It is characteristic that the innovation and knowledge system involves collaboration between many stakeholders and institutions:

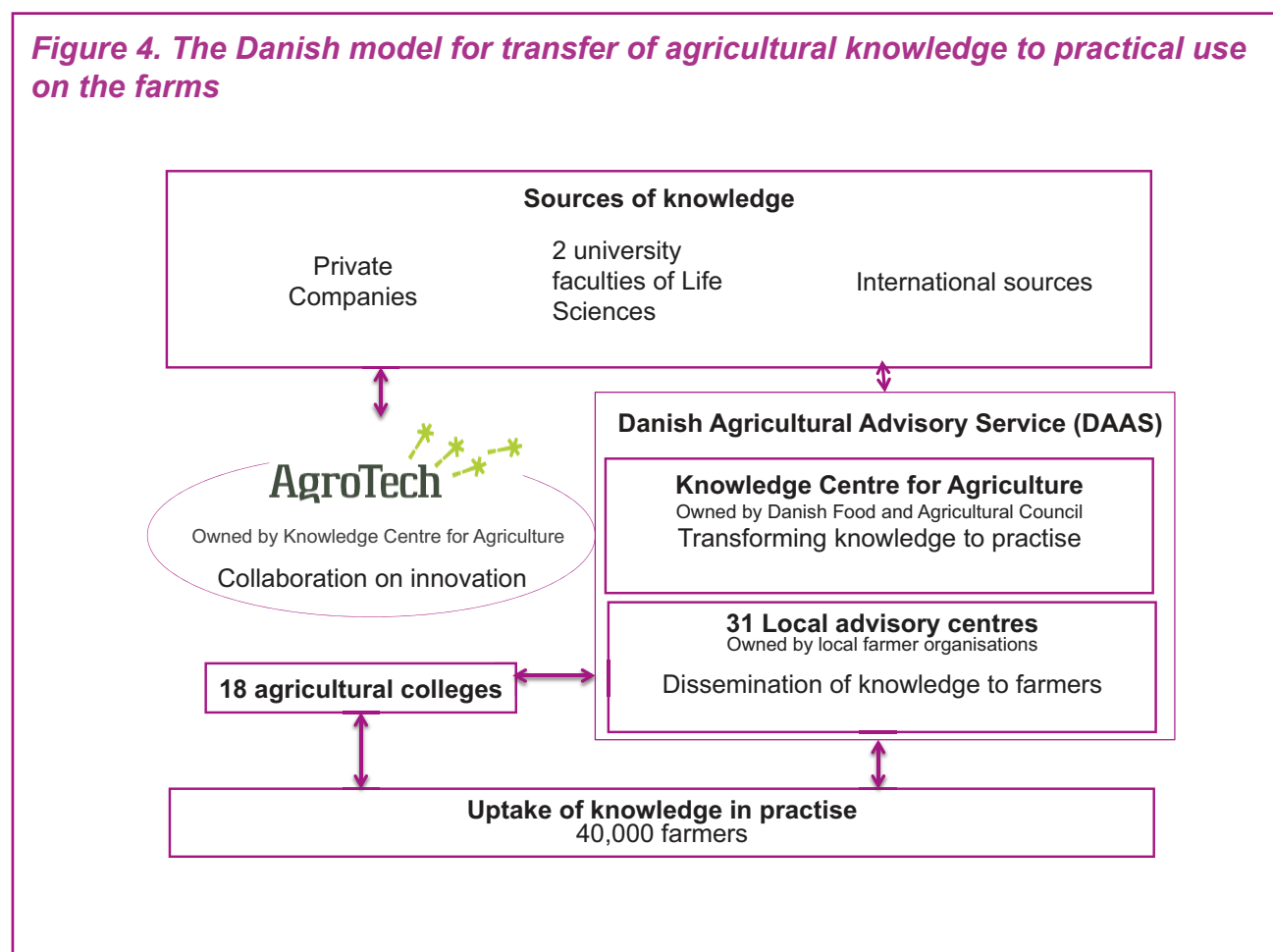
- Research institutes – which are primarily connected to two faculties, in the Universities of Aarhus and of Copenhagen.
- Input supply companies such as seed companies, chemical factories developing fertilizers and pesticides, feed mills, livestock breeding associations, manufacturers of farm machinery and equipment, etc. These are all private enterprises.
- Food industries.
- Agrotech – an advanced technology institute that establishes collaboration between companies, research institutions and advisory services on different technology innovations.
- Danish Agricultural Advisory Service (DAAS).
- Agricultural schools.
- Farmers and their organizations.

Figure 4 illustrates how the Danish system generates and collects new knowledge and technologies. It also shows how the system transfers this into practice. There are a multitude of sources of new knowledge: two university faculties of life sciences, at Aarhus and Copenhagen Universities; and the private companies and the food industry, as mentioned above, have their own active research and development activities for development of new technologies and products. Moreover, the system is also active in searching for and collecting new knowledge and technology from outside Denmark. The Videncentret for Landbrug [Knowledge Centre for Agriculture] (VFL)<sup>5</sup>

<sup>5</sup> Knowledge Centre for Agriculture recently changed its name to SEGES.

is the national centre for Danish Agricultural Advisory Service (DAAS). VFL collaborates closely with the universities and private companies and participates in international research programmes. The universities are primarily active in basic and strategic research, while VFL focuses more on applied research, development and focused advisory services, but is also active in new development and often collaborates with the research institutions on research programmes. VFL furthermore has an important role in identifying relevant research needs in the agricultural sector, and passing these over to the research institutes and the funding authorities.

**Figure 4. The Danish model for transfer of agricultural knowledge to practical use on the farms**



In DAAS, knowledge is passed from the source to the farmer in a two-stage system. VFL transforms new knowledge and technology into practical solutions for farmers and recommendations for the advisers. It functions as the national innovation and development centre for these, and provides the local advisers with practice-related knowledge and tools for their work. The local advisory centres provide the direct advice to farmers.

AgroTech is a government authorized technology service institute, working with fostering innovation in the fields of food and agro-technology. It collaborates closely with private companies, public research institutes and DAAS.



### 3.1.2. Danish Agricultural Advisory Service

DAAS is a partnership consisting of 31 local advisory centres and VFL. The collaboration between the partners aims at securing the most effective dissemination of knowledge to the farmers and development of tools and competences for use in the sector (see Figure 5).

**Figure 5. The DAAS partnership 2011**



The role of the Danish Agricultural Advisory Service (DAAS) is to provide farmers with the best knowledge available through linking research with practical farming. The focus is on providing practical solutions to farmers' needs. Apart from that, it also:

- Records and processes technical and economics data.
- Records and processes farm accounts for taxation and farm management purposes.
- Carries out on-farm trials, analyses and tests.
- Designs and organizes training tailored to farmers' needs.

DAAS provides advice on almost all areas of agriculture, such as:

- Production, including organic production.
- Energy crops.
- Environment.
- Finance.
- Management and organization.
- Tax.
- Buildings and surroundings.
- Human Resources.
- Legal matters.
- Technical advice to producer organizations and public authorities.

New areas for advisory services are gradually being developed alongside new challenges and opportunities arising in the farming sector, such as bio-energy production, and architecture.

DAAS is a non-profit organization and employs approximately 3 300 highly specialized advisers, of which approximately 500 are at VFL. In all, DAAS serves 48 000 clients and has an annual turnover of US\$ 380 million<sup>6</sup>.

### ***3.1.3. Knowledge Centre for Agriculture (VFL)***

The primary task of VFL is to ensure that research and development in the agricultural sector are relevant and have the desired effect. This is through applied research and development activities and trials. VFL has an important role in coordinating the testing of new technologies through the Danish Trial System, which recently developed into a Nordic Trial System. The local centres implement the trials on farmers' fields, and VFL processes the data and publishes the results in annual publications for use by both local advisers and farmers. In effect, this means that the independent trial system tests all new technology before Danish farmers adopt it. VFL also has its own development activities, and collaborates closely with public authorities, private companies and other knowledge institutions in addressing current challenges for the sector. For example, quality assurance and issues of food safety and traceability are addressed in close collaboration with the food industry. An example is the development of a full quality concept for milk production "Arla-Gaarden" in collaboration with Arla.

Agrotech – Institute for Agriculture and Food Innovation is a relatively new institution. It complements the key activities of VFL. VFL is the owner of Agrotech, but the governance system is set up in such a way that it operates independently from the mother-organization. Agrotech is an officially recognized advanced technology innovation centre working for promoting development and utilization of the most recent technological and biological knowledge in the agriculture and food sector. The institute establishes collaboration between private companies and the relevant research institutions on commercial projects defined by the private sector. Moreover, VFL owns the company HortiAdvice Scandinavia A/S jointly with the Dutch advisory company DLV<sup>7</sup>, and is the co-owner together with Aarhus University of the Cattle Research Centre in Foulum.

VFL has important tasks in carrying out a number of common tasks both for the sector and on contract with the authorities, such as identification and registration of livestock, herd health advice, collection and qualification of valid farm management data, setting of nitrogen standards and prognoses, development of ICT tools, etc. All this assists both farmers in complying with legislation, and authorities in controlling the same.

## ***3.2. Governance – ownership, funding and decision-making***

Probably the most peculiar aspect of the Danish advisory system is the governance system, as discussed below, in terms of ownership and funding, as well as the set-up for decision-making. The main principles for governance of the Danish advisory services are that they are:

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<sup>6</sup> VFL, 2011.

<sup>7</sup> DLV is the former public extension service in Holland, that is now become a commercial advisory company.

- Owned and organized by the farmers' organizations.
- User paid (over the years the user payment has been subsidized by support from the government, as described below).
- Officially and universally recognized as impartial.
- Has no inspection tasks on behalf of the government.

Danish farmers have always found it crucial that they receive unbiased advice. This has to a large extent determined the way the advisory service is organized. The advisory service moreover supports the producer organizations with professional advice that they use in their political work for influencing policies. At the same time, it functions as the farmers' link to authorities in order to help them adapt to government rules and regulations.

It is obviously a knife-edge balancing to be able to serve both the farmer organizations and the government and remain recognized as unbiased. This requires that the advisory service keep neutral in their professional advice. This is possible due to the institutional set-up that separates the operation of VFL from the political owner organization – Danish Food and Agriculture Council.

The other important factor in terms of governance is that the agricultural sector (farmers and the agro industry) has substantial funds available to finance research and development. This is crucial for being able to fund tasks of specific importance to the sector such, as for example the field trial system.

### 3.2.1. *Ownership*

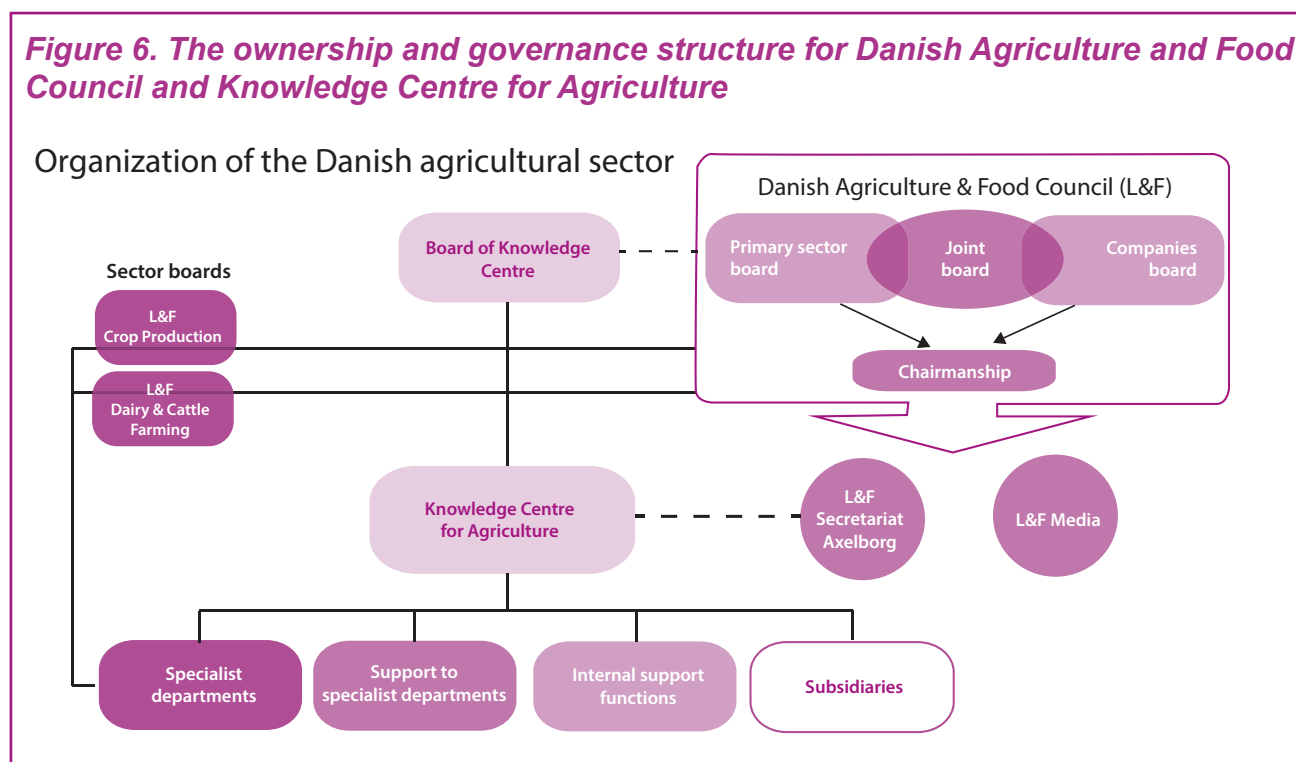
As Figure 4 shows, knowledge generation takes place in basically three sectors: public research institutions; private and cooperative companies; and in VFL. Agrotech facilitates linking these sectors. This means that knowledge generation takes place in a complex relationship, with ownerships divided among the government, private sector and farmer organizations.

Figure 6 describes the organizational structure surrounding Danish Food and Agriculture Council. At the same time, it depicts the ownership and governance of the same organizations. The local advisory centres are all autonomous organizations and owned by the local farmer organizations, some of which have merged into joint ownership of the modern large regional centres that are the cornerstones of the advisory services to farmers. VFL is owned by the Danish Food and Agriculture Council – the national federation of the farmer organizations and the food industry. VFL and the local centres collaborate in a partnership agreement almost equal to a franchising system, where the Knowledge Centre delivers services to the local centres on demand and for payment.

For the Danish farmers, it is and always has been, extremely important that they own the advisory service in such a way that the advice they receive is independent of any other interest – commercial as well as governmental. The advisory services therefore never mix their services – neither with private commercial interests nor inspection or control tasks on behalf of the government. Farmers do of course receive advice also from private companies, but that happens on their own initiative outside the context of DAAS.

At the same time, as mentioned above, VFL provides data and professional technical analyses to the government that aid public policy decision and direction, as well as facilitating enforcement of legislation. It is therefore crucial that the government regards VFL as being independent from the political interest of the Food and Agriculture Council.

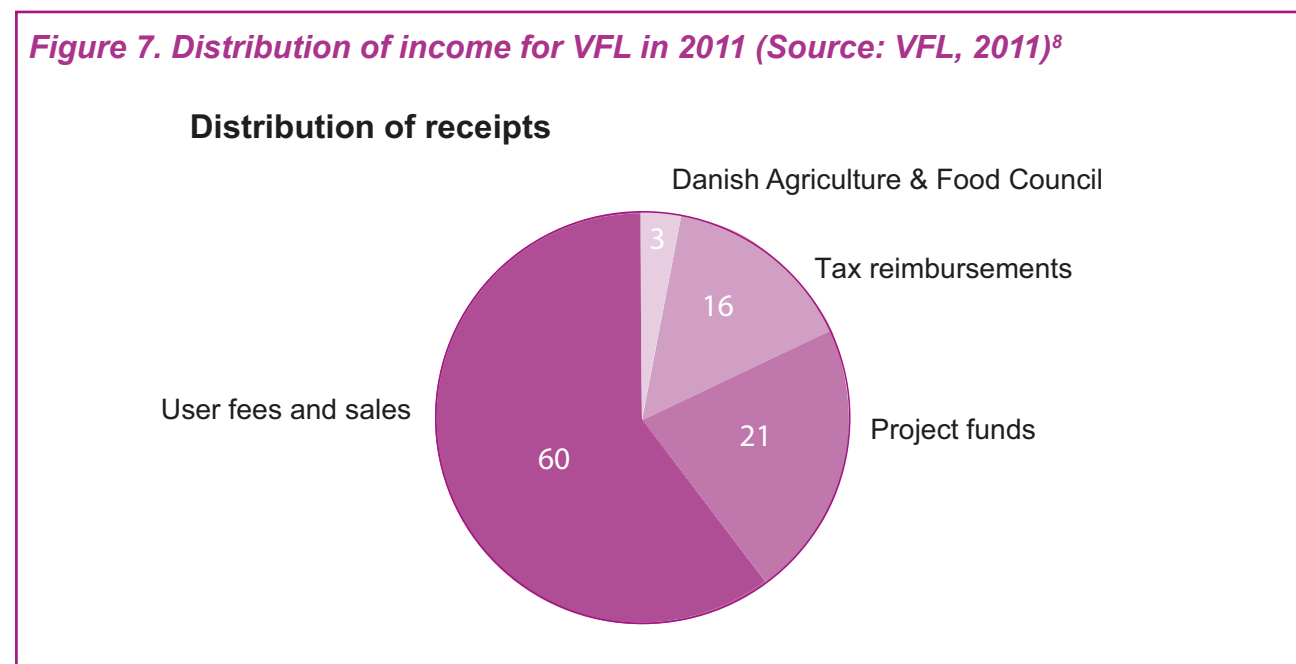
**Figure 6. The ownership and governance structure for Danish Agriculture and Food Council and Knowledge Centre for Agriculture**



### 3.2.2. Funding

VFL's services and advice are primarily user financed. The income from sale and user payment for concrete services amounts to 60% of the total turnover – see Figure 7. Total turnover was approximately US\$ 75 million in 2011.

**Figure 7. Distribution of income for VFL in 2011 (Source: VFL, 2011)<sup>8</sup>**



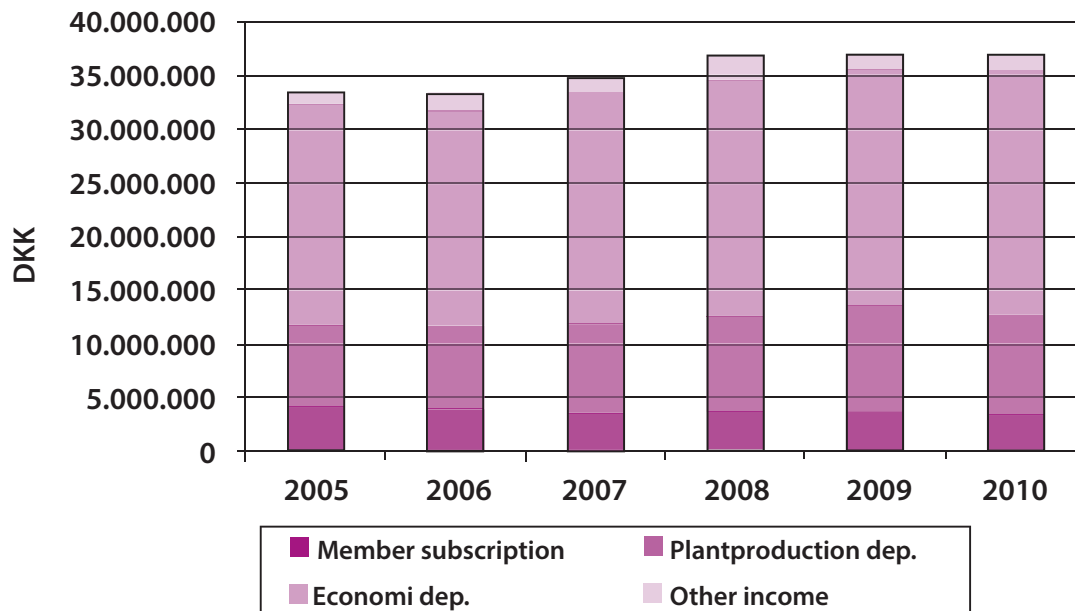
<sup>8</sup> Adapted from Års Rapport fra Videncentret for Landbrug 2011.

In relation to specific projects that aim at creating new knowledge, research as well as more applied development, VFL applies for funds from different foundations, national and EU related funds. Of these, the agricultural sector's own funds are extremely important. They consist of production levies that the sector collects and administrates as well as taxes on chemicals (pesticides and fertilizers) that the government collects and of which a part is "ploughed back" into the funds for agricultural development purposes<sup>9</sup>. This means that the agricultural sector has substantive amount of funds in research and development programmes administered by the sector itself. Often public funds and the sector's own funds finance research and development programmes in collaboration.

Public funds for research are primarily used for basic and strategic research programmes related to issues of public interest, for example environmental protection, organic farming systems and green energy.

The advisory services in the local centres provide services for approximately 48,000 customers – these are farmers and rural based SMEs in other trades. The users pay for the services at normal market conditions. Figure 8 shows the distribution of income at an average size agricultural advisory centre. Please note the relative high importance of the economic department. The income here is from a combination of accounting services and actual economic advice.

**Figure 8. Annual Income for a medium size Advisory Centre 2005 – 2010 (Danish Kroner)**



The exact financial tools, as they have developed over time, are elaborated in detail in Chapter 5.

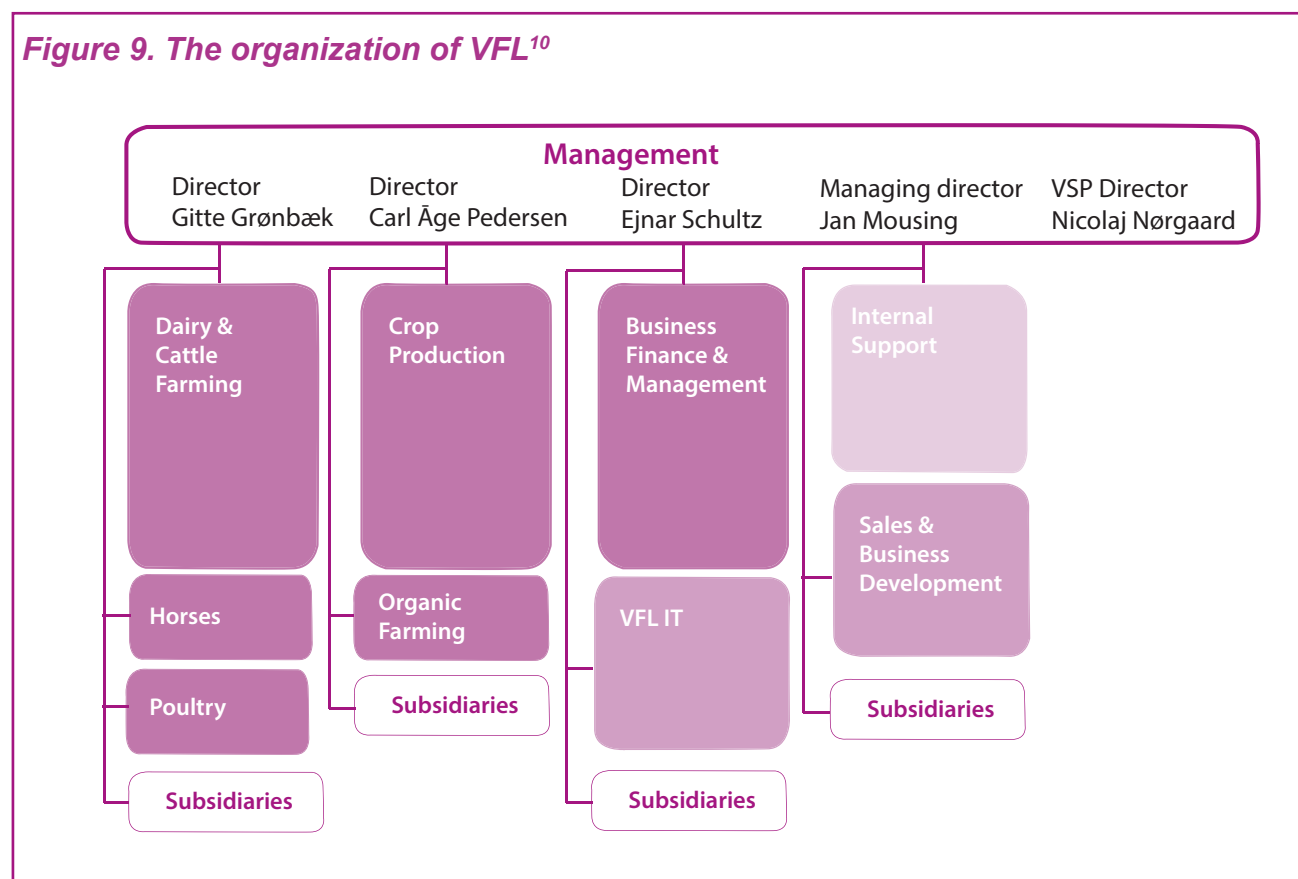
<sup>9</sup>The distribution of the agricultural funds is visualised below in section 5.2, figure 7.

### 3.2.3. Decision-making

#### *Organization and decision-making at VFL*

Figure 9 illustrates the organization of VFL with four blocks, three for the actual technical knowledge development and one for supporting the rest in terms of administration and project and business development.

**Figure 9. The organization of VFL<sup>10</sup>**



The centre is led by four directors, with a Managing Director who is responsible to a Board of Directors consisting of:

- 9 farmers from the Danish Agriculture and Food Council.
- 2 Directors from the local advisory centres.
- The Managing Director of Danish Agriculture.
- 2 representatives of employees.

It is worth noting that VFL is strongly user driven and controlled. The Board of Directors consists mainly of representatives of the users – the farmers and directors of the local centres that VFL are serving.

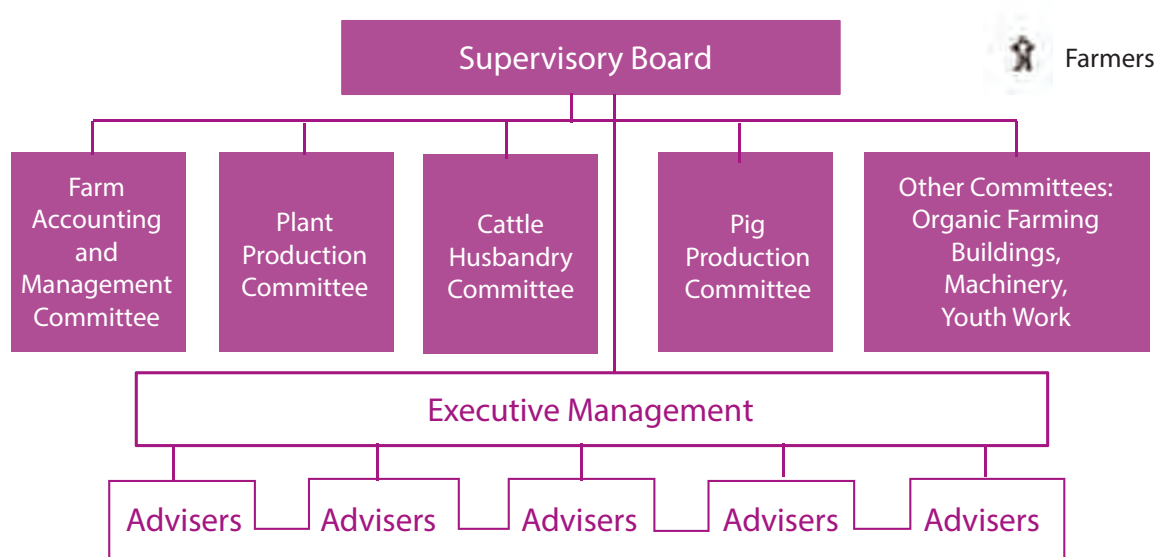
<sup>10</sup> The detailed organization frequently changes. This organizational structure is from 2012.

### *Organization and decision-making in the local centres*

Every local advisory centre operates as an independent enterprise, where farmer members can purchase advice and other services, as they require. Figure 10 shows the governance system of the local advisory centres.

The local advisory centres are normally organized in departments for each production sector with each a Head of Department. For each department there is a committee of three to four elected farmers to whom the Head of Department is responsible. The department committees define the framework within which the advisers work and are responsible for the departmental budget. The overall Executive Management of the Centre is responsible to the Supervisory Board of farmers elected by the local farmers' organizations.

**Figure 10. The governance of local advisory centres**



### *Farmers' influence on research*

Farmers influence priorities and the actual running of the agricultural research through the governance structures. There are representatives from both the farmer organizations and the advisory services in the research councils and in the steering committees for most research programmes and projects both public and private funded. This ensures the relevance of most research programmes from both the perspective of the agricultural sector and the rest of society. Moreover, the fact that the agricultural sector has control over their own funds for more strategic and practical related research and development projects is another important aspect of the agricultural innovation system and contributing to effectiveness of agricultural knowledge creation and adaptation of new technologies in Denmark.







## 4. The historical gradual development

### 4.1. Development of the agricultural advisory services

In global terms of agricultural knowledge and innovation systems, the Danish institutional set-up and functioning is unique. The current institutional set-up, and the role of the advisory services in this, is, as indicated in Chapter 2, a result of a long history of gradual development. In order to explain how this unique development was possible, the gradual development of the Danish Agricultural Advisory Service is described, relating this to the changing social, economic and political contexts during the last 150 years of Danish history.

#### 4.1.1. Early development – the start of modern livestock production

The historian Mackintosh (1993a, b) provides an overview starting with the transition from grain production to modern livestock production. As farmers realized the opportunities for developing livestock production for the markets in UK and in Germany they tried to pursue these through the creation of cooperative dairies. This created a strong need in the farming community for rapid dissemination of new knowledge and technology, and also for better professional education of farmers. The first knowledge gaps were found in topics such as breeding of better performing animals, improved feeding in terms of both amount and quality of fodder, economics and the interrelation between the need for feed of a certain quality and production in the fields.

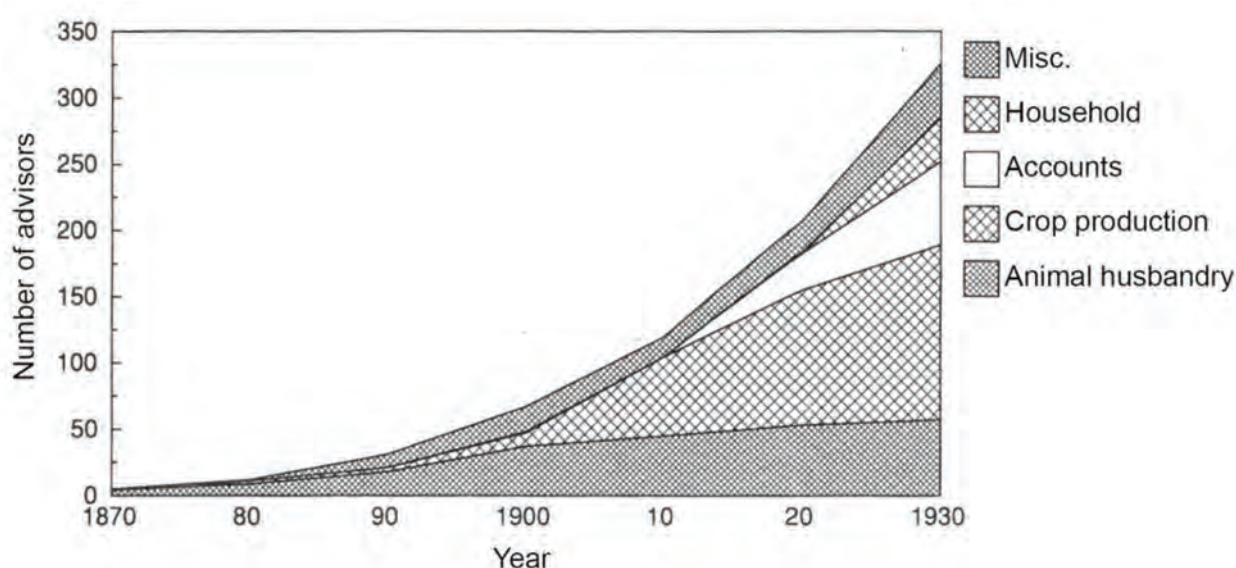
In order to fill the knowledge gaps, the association – the farmer-owned Royal Agricultural Society – was established, and gradually local farmer organizations emerged. In the beginning, the farmer organizations focused primarily on political issues, but later they developed a more professional perspective, serving members' needs for improved skills and knowledge. The organizations tried different means to develop the knowledge and skills needed. They started arranging discussion meetings and lectures for farmers on relevant topics. The establishment of agricultural schools made it possible to draw on their teachers to give lectures in the local organizations. Some of the organizations tried to collaborate with the Agricultural University, established in 1856, on setting up a system of on-farm field trials for testing of new technologies. They also tried to use an idea from Germany of mobile teachers spreading the messages. This was however not successful, primarily because of lack of means for financing.

There were some early attempts in the 1840s to employ advisers. The Royal Agricultural Society employed the first adviser, supported by a few assistants that were progressive farmers in the local organizations.

In 1887 came the first Livestock Law, which generated a rapid response. The Livestock Law provided for government support to livestock shows and awards, breeding associations and to the establishment of herd books. The law also gave government the basis to support employment of livestock advisers by farmer organizations. After three years, there were fourteen advisers in Denmark.

Figure 11 shows the development in number and distribution of advisers. As the figure illustrates, it starts with the livestock advisers, but from 1906 there is support also for crop advisers, and later come the advisers in accounting and book-keeping, home economics and others.

**Figure 11. Development in number and distribution of agricultural advisers in the early period, from 1870 to 1930**



The numbers of advisers increased significantly from 1912 to 1916, which increased costs. There was therefore need for a different mode of organization, and this led to a strong dispute about the management of the advisers. In the beginning, the government employed the advisers and the Royal Agricultural Society was responsible for education and professional supervision. Later the government wanted to take over all the responsibility. However, the farmer organizations protested strongly and argued that if that happened, the advisers would become civil servants of the Ministry and would cease being accountable to the farming community. Finally, it was decided that management remain with the Royal Agricultural Society.

#### 4.1.2. Market orientation – feed-back loop from the export markets

An exception to this was that the government along with financing agricultural advisers also employed the so-called State Consultants. The State Consultants were stationed in the countries with the most important markets for Danish livestock produce, such as UK and Germany, to monitor the export markets and pass on information and feed back to farmer leaders, the cooperatives

and researchers in Denmark. They made it possible for the farmer leaders to acquire a good understanding of the demands of export markets. In addition, a mass of scientists at the newly established agricultural university researched in close collaboration with the practical farming community, and the advisers adapted the results of new knowledge in their advice to farmers. The overall impact of this was that agricultural development was to a large extent guided by the demands of markets. For example, the very first issue the livestock advisers had to deal with was improving the quality of butter for export, as requested by the export markets. They were therefore addressing issues of hygiene as well as advice to improve the quality of the fodder, which was crucial in order to get the right quality of butter.

#### 4.1.3. *The advisers were part of the farming community*

The local farmer organizations directly employed the advisers and the local farmer organizations received up to half of the advisers' salaries as a government subsidy administered by the Royal Agricultural Society. The rest of the cost was paid through the membership fees of the farmer organizations. It was characteristic that most of the advisers came from the farming communities that they were serving. In the beginning, the advisers were progressive farmers. However, when education of agronomists started at the University of Agriculture and the government subsidy to employment of advisers took off, more of the advisers were now educated with a degree in agricultural sciences. It remained characteristic that most advisers were coming from the farming communities, as most of them were farmers' sons.

**Table 2. Education or title for the government-supported advisers in local farmer organizations (number)**

Designation	1900	1910
Agronomist	10	56
Farmer	12	14
Veterinarian	7	3
Teacher	1	3
Without title	0	16

SOURCE: Data extracted from the 1900 and 1910 Reports of the [Danish] Ministry of Agriculture.

The first advisers worked from their homes and travelled to the farms by bicycle. The agricultural advisers were never very highly paid. This was probably a result of the facts that most of the advisers were born of the farming community and that the local farmer organizations had to pay at least half of the costs of the advisers from their own funds. In 1920, the Agricultural Advisers' Association was established. This was with the purpose of improving the economic conditions for the advisers, including pensions.

#### 4.1.4. Demand-led adjustment during the unstable period, 1914 to 1950

Naturally, the development of the agricultural sector and the advisory services in a market-oriented context is highly dependent on the political climate and market conditions. The development during the period 1914 to 1950 was a period with two world wars, and was socio-economically very unstable with frequent changes in legislation, conditions for production, and market demands. It required a high level of adaptability on the part of the advisers to assist farmers in a meaningful way through all the changes and difficult times.

After the First World War, there was a great increase in the need for advisory services, and the number of advisers increased by 50% from 1915 to 1920. The increase in production in the 1920s also resulted in an increase in advisers of 57%, while the crisis in the 1930s meant that the number almost stagnated (the increase was only 9%). After the Second World War, the employment of advisers increased again rapidly to compensate for the losses of productivity during the war. From 1940 to 1950, the increase in numbers was 69%.

For some of the specialized advisory services, there were special arrangements for financing. The farmer organizations, for example, employed milk hygiene advisers. These were, however, paid for by government in combination with funds from the dairies. Another example was the poultry production advisers. Here the support from government supplemented funds from an egg production levy.

#### 4.1.5. The law on agricultural advisers

Despite the fact that the advisory services had received Government recognition and financial support through all these years, the arrangement was not established in law until 1971, when

##### **Box 1. Summary of the Law on Agricultural Advisers**

The law on agricultural advisers established government support to cover part of expenses for agricultural advisory services provided by farmer organizations

Government support is provided to the farmer organizations for the following services:

- Salaries of advisers and their assistants (agronomists and agricultural technicians)
- Travel expenses for the advisers and assistants
- Pension contributions
- Publication of certain professional journals
- In-service training of advisers and assistants

Government support is provided to the farmer organizations for advisory services in the following areas:

- Crop production (agriculture and horticulture)
- Livestock production
- Youth work
- Agricultural machinery
- Home economics
- Farm management and economy
- Farm buildings

General

- Advisers must not promote any particular company's product in their advice.

SOURCE: Lov om tilskud til den landøkonomiske konsulentvirksomhed. Nr. 182 af 28 April 1971.

the Law on Agricultural Advisers was passed. The law created a good framework for continued development.

The Government suspended this law in 2004, after which the advisory services have been fully user paid. Section 5.1 elaborates on the financing mechanisms, the distribution of funds and the gradual reduction of support.

#### *4.1.6. The American way or the Danish model?<sup>11</sup>*

After the Second World War, the Organisation for European Economic Co-operation (OEEC) was formed in 1948 by the European countries to administer the Marshall Plan, which aimed at reconstructing the European economies after the war. The productivity of agriculture was a strong concern. In most of the European countries, the productivity of agriculture had not benefited from the technological advances that had been continuing in USA during the time of war. In order to support the European agriculture to catch up with development elsewhere, the Technical Assistance Programme of the Marshall funds instituted the Agricultural Productivity Foundation. This became important for development, including in Denmark, during the post-war years. Several sources have described experiences during these years (Mackintosh, 1993a, b). The following is a summary of the development of the advisory services in Denmark resulting from the programme.

A part of the programme was composed of study tours for Danish agricultural experts to USA, and while a big part of the aim of this was related to transfer of technologies and sale of machinery, the programme also aimed at influencing systems for dissemination of research and development of extension services. A group of Danish agricultural experts was therefore sent to USA to study the extension system, with a particular emphasis on information and knowledge sharing. The Danish experts were inspired by the North American more centralized knowledge system implemented by the agricultural universities. However, when the experts shared these thoughts back in Denmark they met with serious resistance in the Danish farming communities. The farmers never seriously discussed adopting the USA model for extension. The Danish knowledge system that had developed from bottom up and was at that time only organized locally, had the strong advantage of being closely connected to practice, but it was, however, realized that the decentralized system had difficulties in solving bigger common tasks, such as knowledge and capacity development. The expert group therefore suggested the establishment of a central institution for information, dissemination of knowledge and capacity building to the local advisory services.

It was discussed how the dissemination of research to practice should be strengthened. There were different views, but the final decision was to strengthen the dissemination of research to practice by making it the task of several National Advisory Offices along sub-sectoral lines (crops, cattle, pigs, economics, etc.). The national offices joined and established a common National Centre, in Viby in 1973. Here the national offices were located, each with their own governing committee and management. However, awareness gradually developed that there was need for increasing the collaboration between the disciplines, so when the centre moved to Skejby to become The National Agricultural Advisory Centre (now VFL), the centre was finally organized with a common committee as the Board for the centre (Skovbæk, 2010).

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<sup>11</sup> Based on Bjerrum, 2011.



## ***4.2. Dissemination of information and advisers' education***

The Agricultural Productivity Foundation was established in 1953 through funds from the Benton Moody Foundation (part of the Marshall Plan). From this, the Agriculture Information Office (LIK – Landbrugets Informationskontor) evolved. LIK had a strong principle of providing information only as per demand from the users. The activities were:

- Production and distribution of films.
- Publications (technical booklets and handbooks).
- Dias shows and exhibition materials.
- Training programmes.
- Summaries of foreign agricultural articles.
- Professional media service (Newspapers, radio and TV programmes).

Later, the Danish Government contributed budgetary funds.

In 1968, LIK was re-directed to a main emphasis on education – in-service training of agricultural advisers and teachers. The training took place at Tune Agricultural College, owned by the farmer organizations, the agricultural council and the Cooperative Committee. Kellogg Foundation funded the first three-year plan. The new law for agricultural advisers in 1971 included financial support to in-service training of advisers, and therefore took over the funding. In the coming years there were 1300 to 1400 advisers participating in the training each year. This was almost all the agricultural teachers and 2/3 of the agricultural advisers.

It was agreed with the University of Agriculture that they would refrain from teaching advisory techniques as a subject, while Tune Agricultural College established the Basic Course in advisory services and teaching offered to students during their last year at the University of Agriculture. The educational tasks of agricultural advisers are now in the DAAS Educational Academy, located at VFL. The professional departments of VFL now provide the remaining tasks of the former LIK.

The period 1979–88 was a time of crisis for farming in Denmark. Many farmers faced serious economic problems and several went bankrupt. The response from the advisory service was to further strengthen the efforts of in-service training of advisers, and focus on crisis advice and the development of new, more effective advisory methods, where inter-professional advisory teams dealing with the whole farming system and management collaborated on the individual farms. Moreover, the new training concept “A Week at Agricultural School”, mainly focusing on farm management and economy, was introduced for farmers. A new law supported the training of farmers. The farmers only paid a small part of the cost and could apply for support to hiring a substitute to do the farm work, while they were attending the course.

## ***4.3. Small-scale farmers created their own organizations and advisory services***

Development of the Danish small-scale producer movement had its background in socio-economic politics, but also in issues of equality and relevance of the advisory services for small-scale farmers. The following will describe the development of this and try to describe the impact in terms of economic and political empowerment.

A negative side effect of the early land reform process was that it created a mass of landless agricultural workers and small-scale producers, who struggled with very poor and insecure living conditions. This became particularly evident during the 1880s. At the same time, the bigger farmers and estate owners feared to lose the agricultural work force to the upcoming industry. The Danish Government therefore made an effort to combat rural poverty and intensify agricultural production in Denmark. In 1899, and again in 1919, the Danish Government thus passed laws for land allocations for governmental small-scale producer settlement schemes. These laws expropriated and parcelled out estate land to state-owned smallholdings for families to rent. In the first half of the 1890s, the land laws facilitated a redistribution of land that was very favourable to the small-scale producers. The impacts of this were:

- Increased productivity The smallholdings were most effective as they were more intensive than the larger farms and relied on family labour.
- Self-awareness and self-confidence of large groups of poor farmers.
- Economic independence.

The smallholdings were characterized by being family oriented, extremely intensive, highly productive, but also very labour demanding and vulnerable to market trends. Thus many small-scale farmers had part-time employment to supplement income, such as collecting milk for the dairy (Nielsen, n.d.).

The small-scale producers separated from the existing Farmer Organizations and created the Smallholder Associations during 1900 to 1914, that soon became very widespread. This was primarily because of differences in interests regarding the land laws. In 1910, the National Federation of Danish Smallholders was established, and in 1932 they entered the Agricultural Council as a policy lobby together with the farmer organizations. The focuses of the Smallholder Associations were:

- Land laws.
- Equality of small and larger farms.
- Farm family at the centre.

The Smallholder Associations were politically associated primarily with the Social Liberal Party, which more or less started as a small-scale farmers' party, defending the interests of small-scale producers. The Social Liberal Party soon became an important political actor.

In 1901, a Government led commission recommended the establishment of agricultural schools for small-scale producers and Governmental support was established for small-scale producers' exposure visits to other parts of the country, short courses, awards and award loans for well-run small-scale farms, and also for support to advisory services attached to the small-scale producer associations. In the beginning this was all administered by the Farmer Organizations, but from 1909–1910 the Smallholder Association administered their own allocations.

Skrubbeltrang (1952) lists the arguments for establishing the separate associations and advisory services. The small-scale producers received too little attention in terms of advisory services. In Funen County, the farmers' organizations had only spent 13% of the government funds on small-scale producers, in Zealand County 23%, and in Jutland County 32%. The differences between the different parts of the country illustrate that the polarization between the small-scale producers and

other farmers was bigger on the Islands, where there were relatively more estates and bigger farms, whereas the difference was less in Jutland where the farms were generally smaller. There were many more cases of the organizations collaborating on the advisory services in Jutland (particularly in the north) than on the Islands. However, there was need for equal attention to the small-scale producers in terms of technical issues and skills development. The relation of confidence was very important—the farmers and peasants needed to see the advisers as their own advisers.

The advisory services were administrated by the provincial federations and financed through government support, membership fees and revenue from the agricultural lottery. Despite the fact that the salaries of advisers were generally lower than the advisers' in the farmer organizations, this was not sufficient and the small-scale producers started early to suggest the establishment of export or production levies, and established the Agricultural Production and Marketing Board in 1948.

It was characteristic for the small-scale producer associations that they took on agricultural as well as social and cultural tasks, and that they had a family focus, with the engagement of both men and women. The values of the movement were aligned around the following:

- Economic independence.
- Non-economic – working for your own farm and family.
- Professional upgrading of skills.
- Independence and self confidence.
- Combining economic, social and cultural life.

Some of these values are reflected in the fine description of the small-scale producer leader Christian Pedersen narrated in Box 2.

### **Box 2. A description of a small-scale-producer leader, and of the small-scale-producer movement and its importance<sup>12</sup> in a story from the Fiskbaek area**

“Christian Pedersen realized the value of obtaining theoretical knowledge and using it in practical farming. He arranged the so-called small-scale producer study tours, where small-scale producers collected new knowledge and inspiration by visiting well run small-scale producer farms, and he arranged professional meetings with lectures by agricultural advisers. The professional meetings and study tours were an enormous encouragement for the hardworking small-scale producers, and mentally, it was decisive that it took place in a small-scale producer movement that tried to embrace all aspects of a small-scale producer family's social and cultural life. The fact that they had their own organizations and agricultural schools gave them identity. And it gave them self-esteem that they almost had their own political party. It gave them a strong sense of community when small-scale producers, men and women met locally for coffee, lectures and readings and ended the day by singing songs composed for the small-scale producer movement. Their effort resulted in small, well run farms all over Denmark. As the writer Knud Soerensen beautifully expresses it: Nameless they changed Denmark, toiled for land and self-consciousness, dreamed of safety for the grandchildren, created wealth and died. In the 1960s, the time had passed for the small farms; sadly the land was sold and the small-scale producers became employed in industry.”

SOURCE: <http://www.viborghistorie.dk/historier/historie-1291719488-487602-9088.tkl>

<sup>12</sup> <http://www.viborghistorie.dk/historier/historie-1291719488-487602-9088.tkl>



#### ***4.4. Marginalization of the roles of women in farming***

During the modernization of Danish agriculture described in the sections above, the traditional tasks of women such as milking and processing milk were mechanized and transferred from the farms to cooperative dairies. This gradually marginalized the roles of women, and women have now more or less left Danish agriculture (Zenius, 1982).

Zenius (1982) makes reference to discussions about women's participation in farm work already in 1887–1888. This illustrates that gender relations already by then were moving away from the previous equality in work distribution on the farms, and women were left with what was often the most manual, monotonous and hardest, work such as weeding and harvesting of sugar beet and potatoes.

The increased access to education and knowledge in agriculture described above was primarily for men. Women did not participate in professional meetings in the farmer organizations and this left a gap of inequality between the genders in terms of professional agricultural knowledge. In the beginning, this was also the case for attending the folk high schools, but, from 1863, women started attending the folk high schools for the summer courses (the so-called Summer-girls) (Berg et al., 1984). For the young rural women who attended these courses, a new world opened. They received new knowledge and developed opinions and views. However, apart from that, the period was characterized by the male farmers receiving education, knowledge and new skills, which women did not become part of, and therefore their professional roles in the farming diminished.

The changes in women's work tasks on the farms marked a transition to where the roles of men and women developed a clear division. Men's responsibilities were on the farm – in the field and stables; while women's responsibilities were inside the homes, being responsible for the household, housekeeping and taking care of the children. On the bigger farms, where there were often a number of employees living on the farms, the women had a major role in overseeing and managing the large household and the home gardens. However, women were often involved in the farm work during peak seasons for tasks such as weeding and harvesting. They were often responsible for some of the more sensitive parts of the livestock keeping such as caring for small calves or piglets, and for the poultry production.

The first Home Economics Associations were established in 1908 and the farmer organizations established committees on home economics. Over the years, these became the basis for farmwomen's participation in the farmer organizations. The organizations employed special advisers in home economics and women started receiving education and training in housekeeping and accounting. There were also special courses for women, e.g. in gardening and poultry.

The gender roles on the small-scale producer farms differed from the bigger farms as these relied much more on the full participation of the whole family in farming activities. The way that men and women participated in the Smallholder Movement reflected this. When the Smallholder Associations started, they had a focus on the household, and according to their constitutions, both husband and wife on a farm were voting members. From the beginning, it became a tradition for husbands and wives to go together for the meetings and specialized courses were organized for women – particularly in livestock production topics.



According to Oldrup (1978), “masculinization” of Danish agriculture happened in three phases:

1. Female wage earners left agriculture.
2. Near relatives left the work in agriculture.
3. Farmers’ spouses found employment outside agriculture.

Since then Danish agriculture has consolidated as a male occupation. There are very few women in leadership in the farmer organizations, and agricultural research and advisory services have a focus on the farmers as males. It gives only very limited attention to questions of relevance to women. In the 1980s women still carried out a lot of the farm-work, particularly with livestock, but only 12% had ever participated in advisory activities such as meetings, courses or advisory visits, and only 4% of women in their fifties had ever received assistance from an adviser. However, one-third of the wives on the farms handled the accounts and administration.

Today, women’s involvement in agriculture has changed a lot. Farmers’ wives often have daily work outside the farm, and often they do not originate from the farming community. They have their expectations for family life and gender relations from a more urban, modern setting, while the husbands remain integrated in a traditional farming culture with a traditional understanding of gender roles. This has resulted in conflicts between women’s expectations regarding gender roles and the real life situation, and the divorce rates are very high in agriculture. One of the ways that the advisory services have tried to address this is by taking an initiative to establish experience-sharing

groups for rural women working outside the farms. Surveys have showed that this has assisted the women a lot: They have realized that they are not alone in their situation. In the groups, they have the space to formulate their own opinions, attitudes and values. They get a deeper understanding of their own situation and therefore become better at addressing the conflicts in their daily life. In this way, there is a possibility that the gender relations will gradually change and be modernized so that women will not disappear from agriculture but rather contribute to developing the sector.

An interesting detail is that while women have more or less disappeared from practical farming, they have re-entered the scene as agricultural advisers and researchers. More than 50% of the Danish agricultural advisers today are female.





## 5. Financial and regulatory tools

The financing of DAAS has gone through several changes over time, and there is a complex set of sources and mechanisms involved. Box 3 provides an overview of the sources and the subsequent text will elaborate on the mechanisms for funding. Since 2004, there has only been public funding of the State Consultants.

The following elaborates on the mechanisms for direct public financing of agricultural advisory services. It also describes the mechanisms for funding through the production levies and chemical taxes that are used for development of the agricultural sector.

### Box 3. Sources of financing of DAAS between 1971 and 2004

- Public financing
  - Support to agricultural advisers
  - Support to education of farmers and advisers
  - State-consultants to oversee export markets and pass information and feedback to farmer leaders in the coops and to researchers
- The agricultural sector's own funds
  - Membership fees
  - Subscription fees
  - Direct user payment
- Production levies and chemical taxes

### 5.1. Public support to advisory services

The Danish Government had provided support for agricultural advisory services since 1887. Until 1971, this happened based on annual national budgeting. In order to give an impression of the conditions, in 1942, the ministerial committee for agricultural advisory services pointed out that the salary conditions for the advisers were generally too poor and should be improved. It was therefore made conditional for support that the advisers should have a relevant education (agricultural, horticultural, or household economics or equivalent), that the salary should be a minimum of 3 000 DKK per year, at least half their time should be spent on advisory activities and the adviser should be insured for pension. At the same time, it was a strong condition that the adviser should be independent, meaning have no personal economic engagement in purchase or sale of produce, input, livestock, tools, equipment or chemicals.

In 1947, the Government support was:

- For livestock, crop, youth and housekeeping advisers: 50% of salary and travel expenses – max 7 000 DKK per year.
- For economy and soil improvement advisers: 25% of salary and travel – max 7 000 DKK.
- Telephone costs: 25%.
- Publication of herd books: 25%.
- Publication of economy reports: 25%.

In 1955, the maximum cost for advisers increased to 9 600 DKK and to 50% support to economy and accounts.

From 1971, the support for advisory services had its own law, which up to 2004 provided the framework for public support to the agricultural advisory services. Box 1 (Chapter 4) provides a summary of the law. For expenses such as salaries, transport, pension and in-service training of the advisers, the law provides for up to 70% support to the expenses, and for publication of technical reports up to 50%. In special cases of difficulties, the law, however, has the possibility to support up to 85% of costs. The percentages gradually reduced over the years.

From 1988, the Government, decided a gradual reduction in the support, and in the following years, support developed as described in Table 3.

**Table 3. Government allocation to advisory services from 1988 to 1992**

Year	Million DKK (Approx. million USD)
1988	260 (44)
1989	230 (39)
1990	200 (34)
1991	135 (23)
1992	135 (23)

SOURCE: Data extracted from De danske landboforeningers beretning 1992.

The mechanism for providing the support was that the national organizations received a frame amount that would be subject to adjustment according to the actual expenses, and distributed this to the local organizations. Table 4 shows the distribution of the 1992 allocation among the national organizations.

Figure 12 shows the rather simple funding mechanism. The Ministry of Agriculture provided a frame amount of funds to the National Organizations. The support was in monthly instalments as payment on account. At the end of the year, the organizations had to document that they used the amounts that would justify the support funds. The administration of the arrangement was through a computer-based system developed in collaboration between the Ministry of Agriculture and the national farmer organizations.



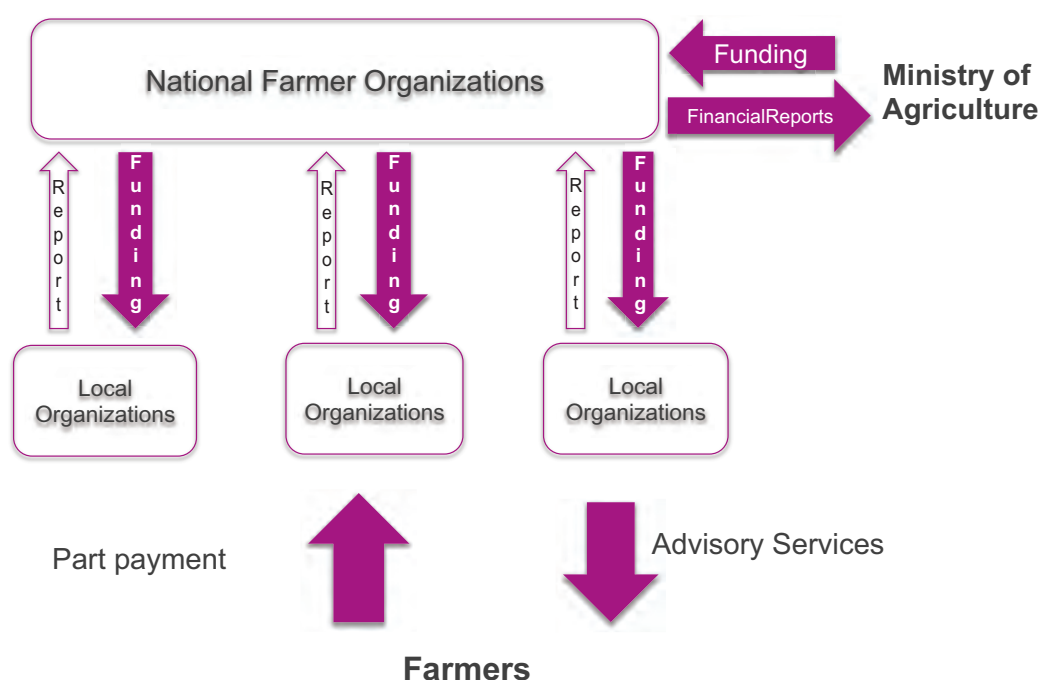
The Ministry of Agriculture had established a committee for the advisory support that was advisory to the ministry and responsible for the practical administration of the arrangement. It consisted of three people from the Ministry and one representative from the farmer organizations.

**Table 4. Distribution of Government allocation for agricultural advisory services in 1992**

National Organizations	Million DKK (Approx. million USD)
The Danish Farmer Organizations	83,2 (14)
Danish Smallholder Associations	19,2 (3,2)
The National Advisory Centre	13,5 (2,3)
Danish Horticultural Association	7,5 (1,3)
Danish Fruit-producers	1,2 (0,2)
The National Committee for Poultry Production	1,8 (0,3)
Danish Fur Producers Association	2,5 (0,4)
Danish Forest Association	0,7 (0,2)
Others	1,1 (0,2)
Total	130,7 (22)

SOURCE: De danske landboforeningers beretning (1992).

**Figure 12: The funding mechanism for advisory services under the Law for Agricultural Advisers**



## 5.2. Production levies and tax reimbursements for development tasks

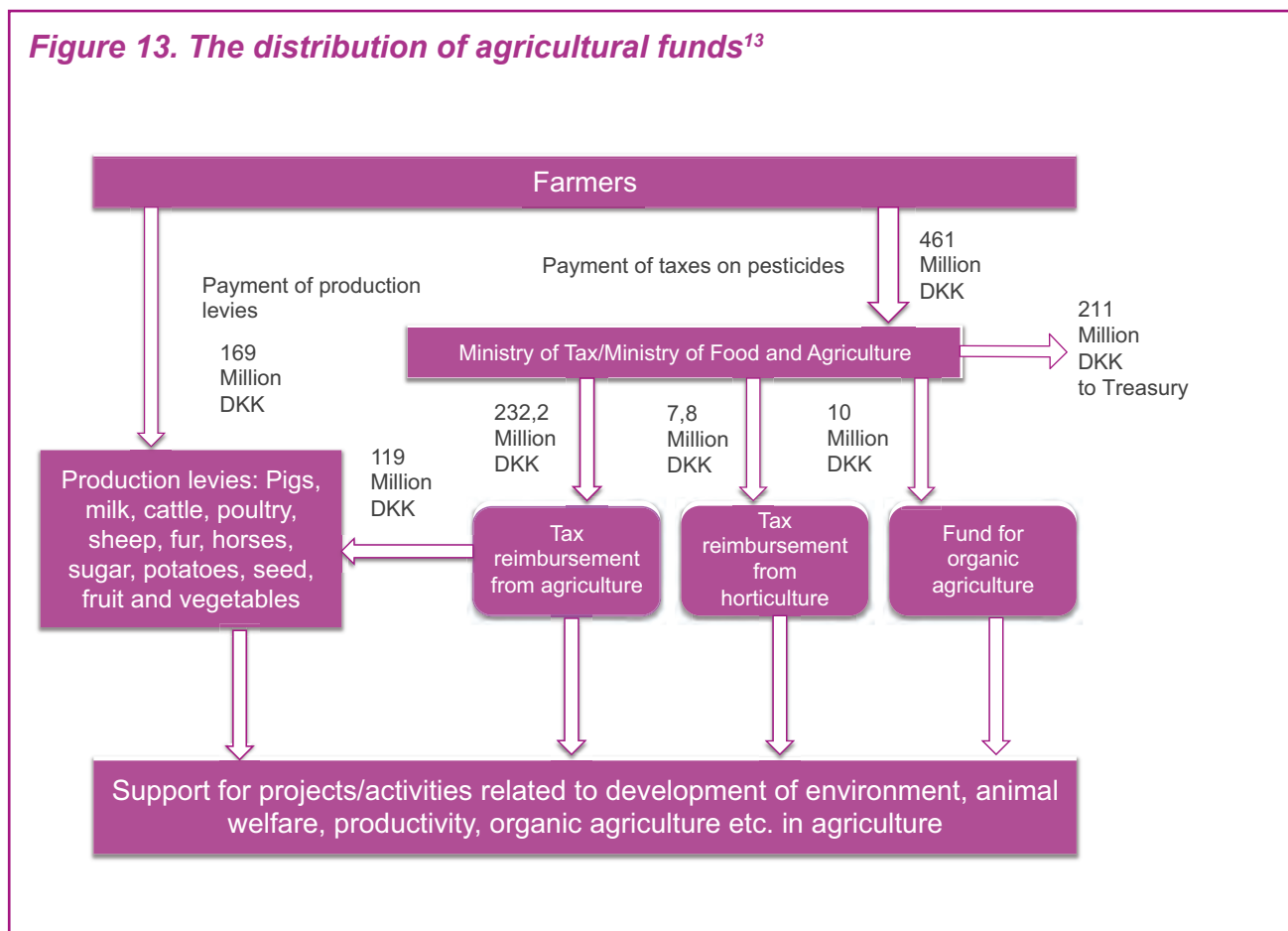
The funds from production levies and tax reimbursement are in a grey area between private and public funds.

The Danish agricultural sector has a long history of collecting production levies on its own. These are for funding important common tasks for the sector, which the individual producer or company cannot solve on their own. When Denmark entered the European Economic Community (EEC) in 1972, it became necessary to institute the levies by law and the agricultural sector therefore requested the government to do this and the funds have now a legal framework in the Law of Agricultural Support. Thereby, the funds became public funds in a way, but the agreement was that the sector's own organizations continued to fix the size of the levy and also to administer its use.

The tax reimbursement fund was instituted in 1977. At that time, it consisted of land taxes going back to the agricultural sector. Since 1995, the funds have been complemented by taxes on pesticides.

As described in Figure 13, there are today eleven production levy funds. The payment of levies is instituted by law, but the rate of the production levies is decided by the agricultural sector itself.

**Figure 13. The distribution of agricultural funds<sup>13</sup>**



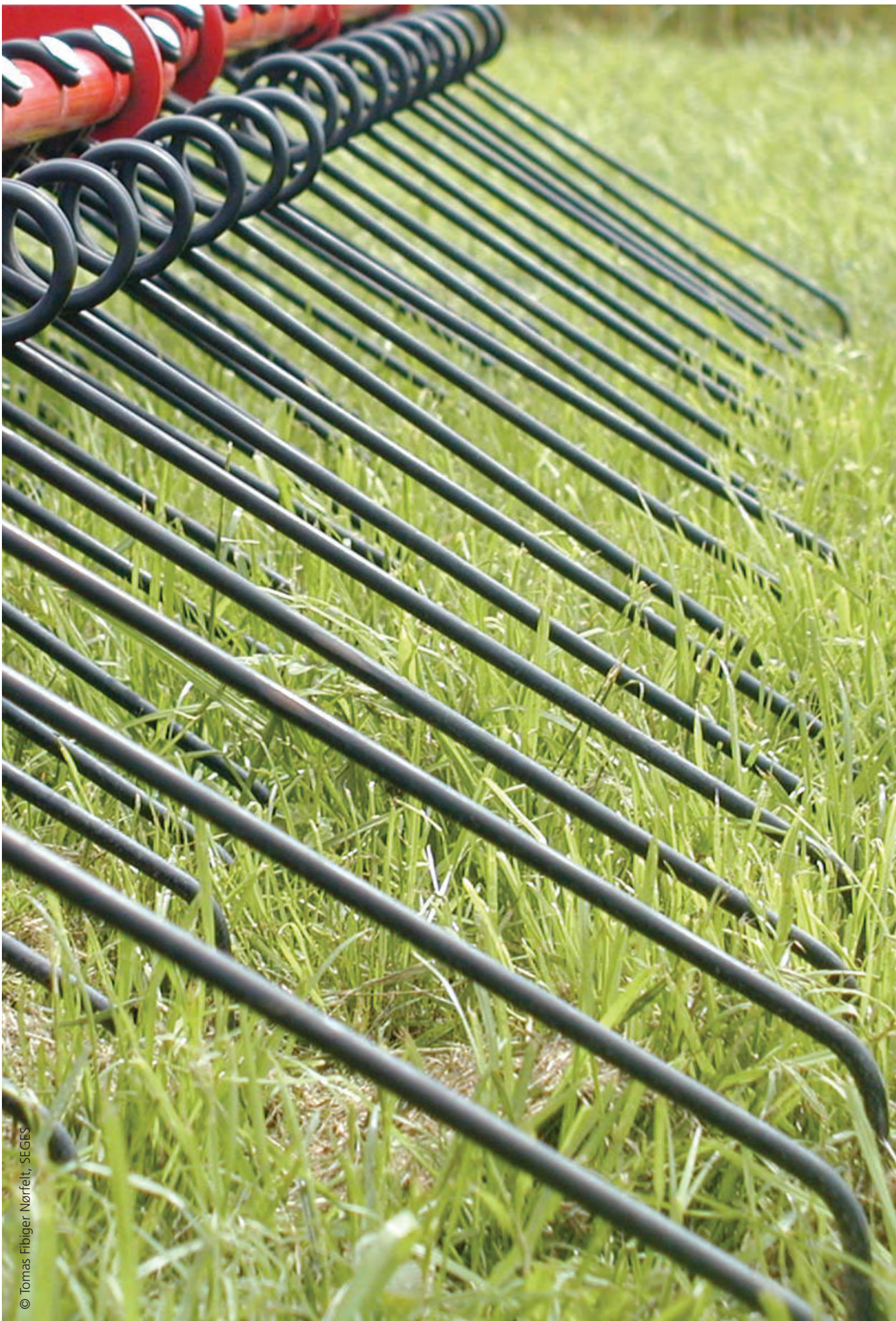
<sup>13</sup> Promille- og produktionsafgiftsfondenes virksomhed 2010; Ministeriet for Fødevarer, Landbrug og Fiskeri, NaturErhvervstyrelsen.

Moreover, there are the three tax reimbursement funds – for agriculture, horticulture and organic agriculture. The rate of payment of taxes on pesticides is decided by government and only part of it is distributed to the tax reimbursement funds. The rest goes to Treasury. Each fund is managed by a Board appointed by the Minister for Food and Agriculture. This is by nomination from the sector organizations. There are six representatives of the farmer organizations and five representing different public interest: workers' unions, business, consumers and two research councils. That the agricultural sector has the majority in the Boards is of symbolic importance as it means that the farmers regard their contribution to them not as actual taxes but as their contribution to development of their sector. The administration of the funds is provided by the Danish Food and Agriculture Council.

The tax reimbursement fund for agriculture supports development projects within the following nine main purposes:

- Market development – 15%.
- Research, trials and product development – 45%.
- Advisory services and education – 15%.
- Disease prevention, combating of disease and animal welfare – 15%.
- Co-financing of EU projects – 10%.







## 6. The impact of the financing mechanisms

As the preceding chapters illustrate, the development of the Danish system for agricultural advisory services has a long history, framed by the complex and changing political, social and economic situation through the years. A number of factors contributed to the success of Danish agriculture. The advisory services had a strong part in this, but did not work in isolation. The advisory services were part of a complex and widespread institutionalization of almost all aspects of the farming business, such as a strong cooperative movement, strong market orientation, farmer management of breeding centres and testing stations, close collaboration with research, a high educational level, etc. It is therefore not possible to isolate the results of the financing mechanisms for the advisory services. The present section describes the way that stakeholders understand how it worked and what contribution it made to agricultural development in Denmark.

### 6.1. Importance of the financing mechanism for the direct advisory services

It is clear that the public support for developing the advisory services has been of decisive importance. Without this, it would not have been likely that widespread and effective services would have developed. The question is whether the fact that the financing from government went to the farmer organizations to organize the services themselves had any particular impact in terms of demand orientation, speed of transfer of knowledge to practice, facilitation of access to markets, capacity of the farmer organizations, and the roles of the advisers.

#### 6.1.1. *The advisory services were and are farmer driven*

Several of the sources of information regarding the history of the advisory services, and the choices that were made at different points of time, suggest that the farmers to a high degree through all the periods have seen the advisory services as belonging to the farming community. At different times, when this choice has been under discussion, they have expressed strongly that this would not have been the case, had the advisers been civil servants employed by the government, or had the system been led by central governmental coordination. The governance system in the local farmer organizations, as well as at VFL, ensures a close relationship among them, and full accountability to farmers.

The accountability is ensured in two ways. First of all, by the governance system, where the advisers are under direct farmer leadership by the professional boards in the local centres and the Board of Directors in VFL. Secondly, through the farmers' own financial contribution to the services. The farmers have throughout the time of development, paid a considerable part of the services from their own pocket and farmers have therefore been able to hold the advisers accountable in terms of the quality of the services.

As described in Chapter 4, the initial development had a tendency to focus on the larger-scale farmers, who were often better educated and more influential in the organizations. However, by the separation of the small-scale producers into their own organizations, these took charge over their own advisory service and thereby the line of accountability to the small-scale producers was established as well.

The organizational experiences that the farmers and small-scale producers received from the organization of advisory services reflected in the way they chose to organize in many other aspects of their sector alongside the advisory services. In most aspects, the farmers gained control: education, processing, marketing, livestock breeding, field trials, etc. A good example is the story behind the cattle breeding associations. The experts at the University of Agriculture were strongly against the idea of farmers organizing the cattle breeding through their own associations. However, the farmers insisted and developed the breeding and milk recording associations for milk recording, herd books, livestock shows, bull tests and selection, artificial insemination, etc. A good relationship developed, whereby the breeding experts provided the theoretical knowledge and developed index systems for testing and selection of animal, and the farmer leaders in the breeding associations made the more political choices of breeding goals and favoured genetic traits in the selection.

### *6.1.2. Rapid transfer of knowledge and technology to practice*

An important factor for the increases in productivity is the speed of transfer of new knowledge and technology to practice. There is a general consensus among the actors that the farmers' strong attention to productivity, and therefore to the transfer, as well as the institutional set-up of the innovation system, with its close collaboration between the advisory services and private and public research actors, has contributed tremendously to the high productivity of Danish agriculture.

Increasing productivity has always been a major DAAS focus and this is reflected in the actual results (see Figures 2 and 3). The increases in productivity are of course not only attributable to the advisory services. They are results of many different factors, but it is clear that the effective dissemination of knowledge and technologies, and the results-oriented advice to individual farmers, have been extremely instrumental. Other factors, such as the cooperative processing and marketing of produce, have furthermore ensured that the productivity increases have resulted in benefits for the farmers.

### *6.1.3. Facilitating access to markets*

The set-up of the advisory services has been well suited to transform market trends and research findings into guidelines and recommendation to farmers. This has mainly been due to the close collaboration with the cooperative movement. It is, however, clear that also the state financed consultants based at the exports markets have contributed to this. Through them, farmer leaders have always been updated on the relevant issues and trends in the export markets, and again the advisers have been effective in translating this into recommendations that would assist the farmers in improving their practices to fit the required consumer demands and quality standards.

#### *6.1.4. Capacity building of farmer organizations*

Farmer organizations in Denmark have had a strong influence on public policies related to the agricultural sector. Some historians claim that at time the Ministry of Agriculture has been de facto handling offices for the wishes of the agricultural sector (Just, 2002). The agricultural advisers were of importance not only to the Danish farmers but also to development of their organizations – the advisers often acted as secretaries for the organizations and played strong facilitative roles for organizational development. The advisers were almost all farmers' sons, who were educated and had interest in serving the farming community with their knowledge.

After the Second World War, the organizations developed more into political lobby organizations, and the advisory services were established in advisory centres with their own management structure. However, the fact that the farmer organizations in this way “owned” the organization of technical knowledge had great influence on the political lobby and advocacy, in the sense that it was based on solid technical knowledge. It made the organizations strong that they had this knowledge. The Ministry of Agriculture never had any facility for technical knowledge of its own and therefore depended, and partly still depends, on the VFL for technical data and knowledge. The relation thus depended and still depends on mutual trust.

Today, the influence of the farmer organizations has decreased in parallel with the increasing importance of other sectors in the Danish economy. The close collaboration between state and sector through the knowledge developed in DAAS is, however, still of vital importance for the continued adaptation of policies and regulations to practical needs, and for farmers' successful adaptation to regulations. A good example of this is the relative success that Danish agriculture has had in adapting environmental regulations. VFL in collaboration with local advisory centres delivers professionally qualified advice to the Danish Food and Agriculture Council to use for the negotiations with the government on planning and implementation of the regulations. VFL on the other side develops recommendations and tools for the farmers to adapt to the regulations in the most profitable way.

#### *6.1.5. Total privatization changed the role of the advisers*

The fact that the public support to advisory services disappeared from 2004 changed the roles of the advisers. The impact is, however, difficult to isolate from the general rapid changes in the agricultural sector, its structure, and new market conditions that make the operation much more complex than before.

The challenges for the advisers are to keep focusing on new and developing trends, the need for increasing acceleration of knowledge to work in practice, to deal with the structural changes, keep a focus on new market development and constantly operate with the producers' growth strategies.

The advisers now more than before need to be sharp on specialized advice that creates immediate value for the client. They are moreover increasingly active in seeking out and applying for project-funded assignments that can create value for their farmers, both from public funds and from the agricultural funds. Box 4 provides an example of the new roles from an interview with a horticultural adviser.

#### Box 4. The roles of advisers have changed

Anne Krog Larsen is a highly specialized adviser in the production of pot plants. She has worked twenty years in this sun sector. She says:

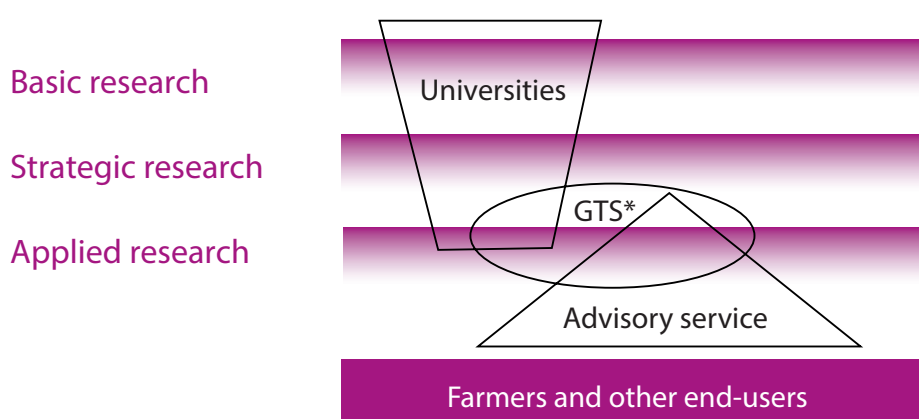
“Twenty years ago, when we had public support for the advice to the producers, we had a lot of telephone consultations. We had fixed times for this. We met with colleagues in the mornings and then went out for emergency visits. Apart from that, there were planned visits to producers. Now the telephone consultations have almost disappeared. The producers are much more qualified and more specialized and they do not have as much need to seek advice on daily management. We are now used primarily as sparring-partners at pre-planned visits, that can be planned six to twenty-five times per year depending on the need, and for emergency tasks when there are acute problems arising in the cultures. In the role as sparring-partner, it is not adequate to discuss biology. It is essential that you as an adviser know the whole enterprise and can contribute to optimize the production, minimize losses and in general provide inspiration towards the development of the enterprise.”

SOURCE: Adapted from interview with Horticultural Adviser Anne Krogh Larsen in 2012, by Anette Eckholdt.

## 6.2. Impact of the agricultural funds for development

The impacts of the agricultural funds for development have been substantial. As the funds are utilized on the part of research and development that is closest to practice, it has facilitated collaboration between the universities and VFL. The universities address the needs for basic and strategic research in the area of agriculture and food, while VFL contributes with practice-related trials development and advice (see Figure 14). This division of roles enables development at a very high level of professionalism and is probably a strong contributing factor to the success of the Danish agricultural sector in terms of production as well as environmental sustainability.

**Figure 14. Agricultural research and sharing of knowledge in Denmark**



\* Advanced Technology Group (9)



The particular set-up of the agricultural funds, with majority representation of the farmer organizations, ensures ownership by the sector and thereby a strong engagement in order to ensure the maximum added value from the allocated funds. In this way the funds have enabled independent testing of new technologies, as well as development of knowledge closely related to the concrete challenges of the farmers. The independent trials and testing have had crucial outcomes for the farmers' ability to adapt to new policy frameworks: Examples are the very low use of pesticides and nitrogen in Denmark compared with other comparable countries. See Table 5 as an example.

**Table 5. Use of pesticides(1) in wheat in four EU countries – measures as treatment index<sup>14</sup>**

	UK	France	Germany	Denmark
Total	6.74	4.1	5.8	2.62

NOTES: (1) Herbicides, fungicides, insecticides and growth regulators. (2) Data from Promille afgiftsfonden, 2010.

From the data from the four EU countries, it is seen that the Danish farmers have been able to keep the use of pesticides on less than half of the use in UK and in Germany. In this way Danish farmers have reduced the environmental impact of the production and at the same time saved on the costs of pesticides.

<sup>14</sup>Promille afgiftsfonden 2010 [www.promilleafgiftsfonden.dk].







## 7. Conclusions and recommendations

### 7.1. Conclusions

What is particularly remarkable about Danish agricultural development is the rapid speed of transfer of new knowledge and technology to practice, which has led to the Danish agricultural sector being in the forefront globally in terms of productivity. The Danish model for financing of agricultural advisory service as a joint venture of public support and farmers' own contributions has formed a part of an extensive and complex institutionalization of Danish agriculture. This has been instrumental in the development of a highly efficient agricultural sector that has been a main contributor to economic and social development of the Danish nation.

The particular context surrounding the development – a ready market for Danish produce, and the increasing educational level and consciousness of the farmers – resulted in the beginning organization, leading to the creation of the liberal party, which gained good political ground. All this paved the way for the recognition of public interest in agricultural development, which led to an enabling policy environment through more than 100 years of development.

The choices were made at an early stage, where the government chose to let development rely on self-organization by farmers, and at the same time invested massively in education, information and spreading of knowledge. These choices were of course based on the fact that the farmers had already by then proved their organizational strength as they participated in the early land-reform process and the start of the cooperative movement.

It is clear that it has been decisive that the government invested public funds in the development of advisory services, and the related activities of knowledge development. The facts that it was through the farmers' own organizations, and that farmers had to contribute their own funds, meant that the development was grassroots based, and founded on farmers' private commercial interests. The fact that farmers employed their own advisers ensured their identity as farmers' advisers and their independence from other commercial interests. This was a major factor in building trust between farmer and adviser.

The agricultural advisers lived in the local communities that they were serving, and they assisted in facilitating the organizational development in many ways. Moreover, the resulting organizational learning contributed to the creation of capacity for lobbying and advocacy. Later, the capacity built in the national centre VFL for delivering reliable technical data and recommendations for the organizations' political work enforced this.

General education and knowledge played a crucial role in the development. At the same time, the creation and dissemination of knowledge were the tools that paved the way for increased productivity.

## **7.2. Recommendations**

The context of agriculture today – the conditions of markets, global economy and policy – is in many ways incomparable with the context of the Danish farmers and small-scale producers in the late 1800s and early 1900s. However, important principles can be drawn from the Danish experiences, which can be considered when discussing new models for financing advisory services in developing countries.

### ***7.2.1. The government to play a facilitating and regulating role***

It is crucial that government recognizes the importance of, and the public interest in, developing the agricultural sector and small-scale farmers in particular. The government's priority can pave the way for development through investing in advisory services, along with providing policies that enable production and market development. For the last, mechanisms to raise funds for practice-related test and trials, for education and for continuing development of the system – such as the production levies fund in the Danish case – are of major importance for securing sustainability of the knowledge system.

### ***7.2.2. Supporting self-organization by farmers***

Supporting advisory services through the farmers' own organization can secure effectiveness and accountability of the services to the farmers. Moreover, the self-organization can have important side-effect of building capacity, creating self-confidence and empowering the farming community, which has potential for contributing to eliminating the root causes of poverty.

When the advisers are employed by the farmers' organizations, there is a good possibility that the farming community will have confidence and trust in their advisers so that these can develop into being not only disseminators of information, but rather key partners for the farmers in development and decision-making on their farms. This also secures their confidence in times of adapting to changing policies, such as seen with the implementation of the environmental regulations in the Danish case.

### ***7.2.3. Small-scale producer participation is important***

In the Danish case, the role of small-scale producer development was extremely important for the building of the nation and its agricultural sector. Despite the fact that the small-scale producer sector was later squeezed out by the larger farmers, the small-scale producers were during the period from 1900 to around 1960 an extremely element in an intensive farming sector and for rural employment in general. The favourable policy environment secured land availability and the possibilities for separate advisory services facilitated the effectiveness of the small-scale farms. In the Danish case, it was necessary to separate the organization of small-scale producer farmers from the medium- and larger-scale farmers. This may not always be necessary. However, it is important that the set-up, as well as the content and attitude of the services, respects the concerns of the small-scale producers. If this includes attention to social needs along with professional, then this must be addressed.



#### *7.2.4. Women need to be included*

In many developing countries, women play major roles in agricultural production and the trend is for an increasing feminization of agriculture, which is opposite to the masculinization that happened in Denmark. However, it is important to learn from the Danish experiences here. If the women, as happened in the Danish case, are left out of the development today and the gender inequality increases even more in agriculture, it will have disastrous effect on food production and for women's possibilities for economic development in general in the developing countries. The Danish case shows that it is crucial that women are included in the professional and organizational capacity building, as they were in the small-scale producer organizations, and that this must influence the function and focus of the organizations.



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- <http://www.viborghistorie.dk/historier/historie-1291719488-487602-9088.tkl??>

### Stakeholders interviewed

- Flemming Just, historian and specialist in the history of Danish agricultural development, former Professor at South Danish University and currently Director of Sydvestjyske Museer.
- Georg Nielsen, former Principal of LIK.
- Henrik Nygaaard, former Director of Cattle Advice, VFL and Danish Cattle Association.
- Jens Ole Thøgersen, formerly educational responsible for educational of agricultural advisers in VFL educational Academy.
- Joergen Skovgaard, former Secretary of the Danish Agricultural Farmers Federation.
- Johannes Krogh, former Principal of Tune and Koldkaergaard Agricultural Colleges. Responsible for in-service education for agricultural advisers.
- Jytte Lauridsen, head of Company Secretariat, VFL.
- Torben Huus-Bruun, former Director of International department.







The reform of extension systems towards pluralism and more demand drive over the past decades and the shift towards Agricultural Innovation Systems went along with changes in financing mechanisms. This book is part of a series of four case studies and a synthesis of these cases undertaken by the FAO Research and Extension Unit. The series documents innovative types of financing mechanisms for demand-led agricultural advisory systems and services in Denmark, Chile, Colombia and Senegal.

A synthesis of the four experiences highlights the changes that have occurred due to the different financing models and describes to what extent this has resulted in farmer empowerment and in more relevant, effective and sustainable services.

The Danish case provides a unique example of a long-term, farmer-led development of agricultural advisory services, where public funds have been used to assist farmer organizations in developing their own services, as these funds have complemented user payment of the services. The case also provides an example of gradual development towards full user payment and the results of such, by tracing the historical and political factors that made this development possible. It describes how the advisory services influenced capacity development in and empowerment of the farmer organizations, content and quality of their services, and the accountability of agricultural advisory services towards the farmers. It draws out lessons learned that can relate to other countries engaged in reforming their advisory services.

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