Prospects for the agricultural sector in the Netherlands

Economic and technological explorations

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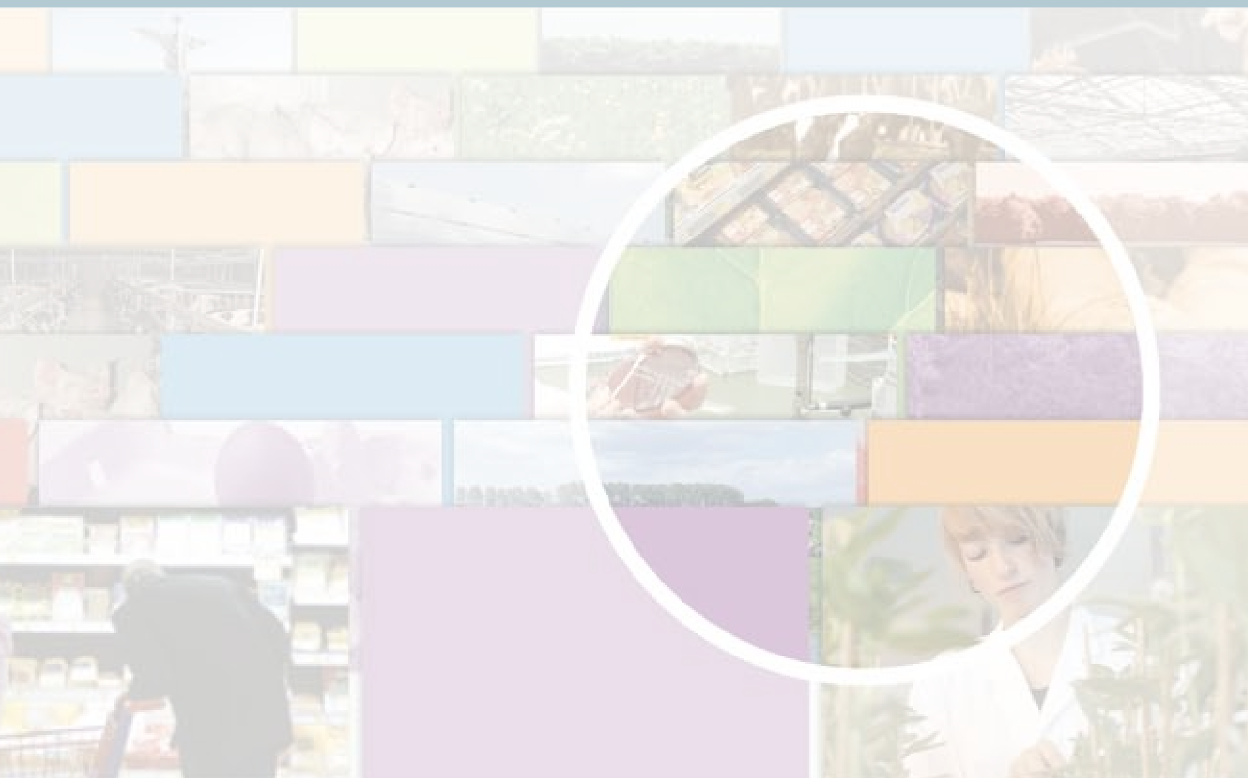

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Prospects for the agricultural sector in the Netherlands
Economic and technological explorations
H.J. Silvis and F. Leenstra (eds.)

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The first part of this report addresses the prospects of the agricultural sector in the Netherlands until 2020. Which developments and uncertainties should be taken into account? After presenting a reference scenario to describe the results, the report adds some sensitivity analyses. These refer to variants related to agricultural and trade policy, the oil price and the derogation of the Nitrate Directive. The second part of this report gives an overview of technological developments that provide opportunities for the agricultural sector and/or can take away impediments.

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Preface

This document provides an English summary of two future-oriented reports commissioned by the Netherlands Ministry of Agriculture, Nature and Food Quality (framework BO-03-003):

- De agrarische sector in Nederland naar 2020; Perspectieven en onzekerheden[1]
- Technologische verkenningen voor de agrosector[2]

The first report addresses the prospects of the agricultural sector in the Netherlands until 2020: which developments and uncertainties should be taken into account and how do they affect policy? The report studies the agricultural sector in a broad sense, i.e. including suppliers, trade, processing, etcetera. The developments are charted on the basis of a reference scenario and sensitivity analyses, whereby economic models were used in combination with expert knowledge. With respect to the data used relating to product prices and cost factors, including energy, analyses and projections of international organisations like the FAO and the OECD were used wherever possible.

Based on a survey, the second report discusses the effects of technological developments on trends in agricultural production in the next 10-15 years. This study was prepared by scientists of the Animal Science Group of Wageningen UR.

For detailed references of the two studies, the reader is referred to the original publications, which can also be downloaded from the web.

Prof. dr. ir. R.B.M. Huirne
Director General LEI Wageningen UR

1 Silvis et al., 2009

2 Leenstra et al., 2009

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Economic prospects and uncertainties

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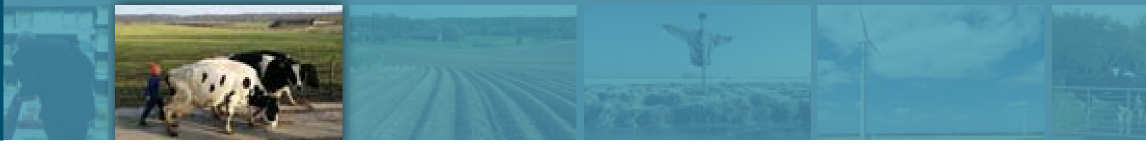


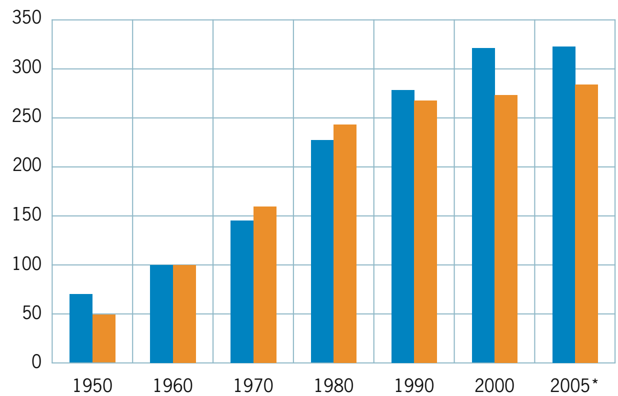
1.1 Current position of the agricultural sector in the Netherlands

The Dutch agricultural sector is greatly influenced by the global economy; the sector is very much focused on international trade. Every year, the agricultural sector generates an extensive positive export balance of over €20 billion (€23 billion in 2007).
The proportion of agricultural products and food in total Dutch exports of goods and services is also fairly high (17%). A large proportion (around 70%) of the activities of the agro-complex is related to foreign sales, so there is heavy dependence on international trade. Around 80% of Dutch agricultural exports go to other EU countries while more than 60% of the imports come from there. This underlines the importance of internal EU market integration with the single currency (euro) and similar policy conditions.

Primary agriculture and horticulture still account for about two thirds of the land use in the Netherlands. In the last decades production increased strongly, but since the nineties the growth of production has slowed down (Figure 1.1). This is partly explained by developments in environmental policies and by reforms of the Common Agricultural Policy (CAP).

Figure 1.1

Volume (index, 1960=100) of agricultural output and input in the Netherlands, 1950-2005

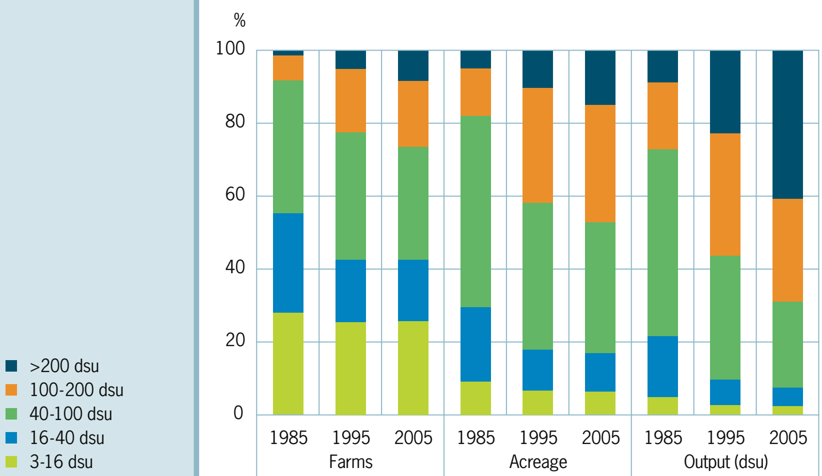


Source: Eurostat/Statistics Netherlands, processing LEI.

The number of farms is declining quite rapidly, so increases in scale are an important trend. At the same time, there are still many smaller farms, including part-timers, and farms which are broadening their scope. There is therefore a dual development with the most production and income generation among the big farms (Figure 1.2). Sustainability is a topical issue, but after rapid improvements until around 2000, further improvements in environmental performance have been slow.

Figure 1.2

Composition (percentages) of farms in terms of economic size, land use and output, 1985-2005



Source: Netherlands Statistics, processing LEI.

The Dutch agricultural sector has several strengths, such as competitiveness, knowledge, natural and geographical conditions, but it is also vulnerable to the demands of society (environment, animal welfare, etc.) with respect to production methods and the resulting products. Furthermore, the sector operates in a prosperous and densely-populated country, which implies that wage levels and cost of land are fairly high.

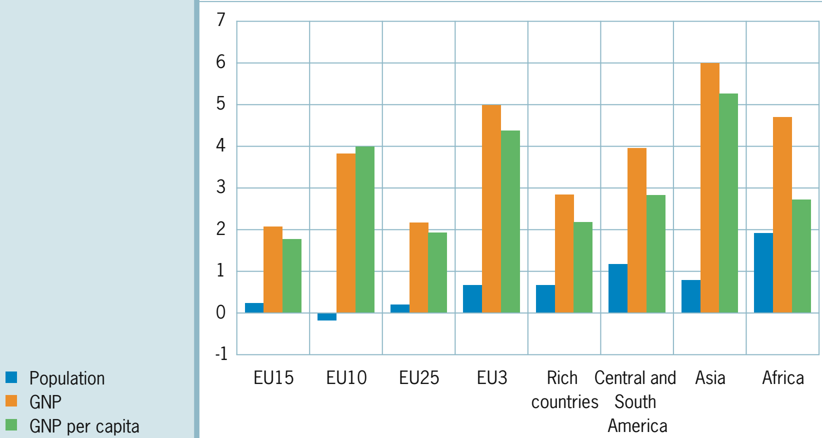
1.2 Driving forces

The driving forces which largely determine the prospects of the agricultural sector are mainly international and European developments related to the demand for and supply of products. In this context, government policy can greatly influence the development of the sector on a number of points.

Demand is partly determined by the continued growth of the world population until 2020 by 1% a year. This growth, which is lower than in the previous decade, mainly manifests itself outside the EU, particularly in Asia. Also important for demand is the growth of welfare. Up until 2020, the reference scenario is based on a fairly favourable development. Here too, growth outside Europe is stronger than within (Figure 1.3).

Figure 1.3

Growth (% per year) of population, GNP and GNP per capita, 2005-2020



Bron: OECD.

The combination of economic growth, population growth and urbanisation tends to increase demand in developing countries for animal products, fruit and vegetables and processed products. In the western world, there are also shifts in demand due to ageing and the changing ethnicity of the population. There is more emphasis on health and convenience. Whether agricultural products will play an important role in energy provision (biofuels) depends on oil prices compared with the price of alternatives, including agricultural products, energy policy like blend requirements and innovations in the application of first and second generation biofuels.

With respect to the supply of products, besides the available labour, capital and land, technological innovation is an important factor. The number of people working in the agricultural sector will continue to decline due to technological innovations, which will increase productivity, and due to employment opportunities in other sectors of the economy, particularly the service sector. Many older workers in the agricultural sector will not be replaced by younger people; many older farmers have no successor and the agricultural sector has limited attraction for employees. This may cause problems in labour intensive sub-sectors like horticulture. New technological breakthroughs, such as robotisation, may provide a solution.

The gradual decline in the available agricultural land, by around 0.3% a year, combined with relatively high land and lease prices, encourages efficient land use. The decline in the amount of land will not negatively affect the supply of products in itself. Besides increasing productivity, technological innovations may also solve environmental, energy and quality problems. However, some innovations are met with social opposition, for example the establishment of larger farms. Obstructing these innovations may negatively affect the competitive strength of the agricultural sector in the Netherlands and the EU.

The WTO and the EU are very influential with respect to policy for the agricultural sector, and particularly for the highly internationally-oriented Dutch agricultural sector. Agreements in a WTO context about further liberalisation of trade, including expansion of market access and reduction of export support, directly affect the markets and partly determine the future Common Agricultural Policy (CAP). This stipulates for the coming years the end of milk quotas, changes in farm supplements (simplification and conditions; discounts) and rural policy (supplementary resources).

In addition, the scope of the EU has become broader, so that the EU is also very influential in determining many of the production conditions of the agricultural sector, related among other things to the environment, energy, nature, animal welfare and health, food quality, etcetera. National policy thus tends to be an elaboration of EU policy. This applies for example, through Natura 2000, to nature policy and management. Land development policy is also financed by EU resources for rural policy. Compared with the past, spatial planning policy with agricultural development areas and Greenports increasingly determines where intensive livestock farming and greenhouse horticultural holdings may be established.

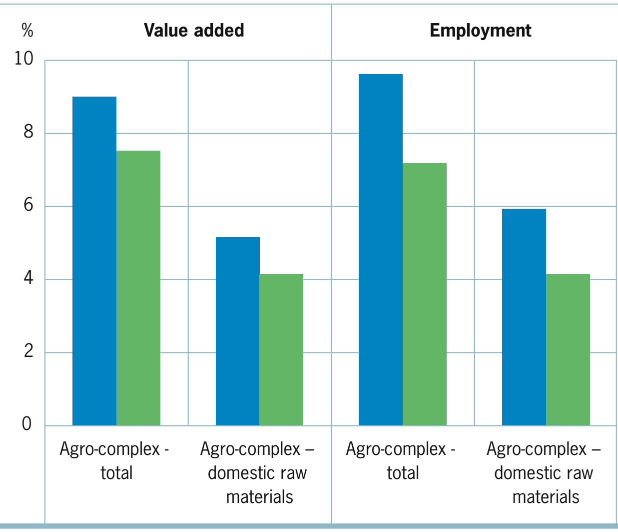
1.3 The agricultural sector in the reference scenario

The process of structural change is expected to continue in the next decade. Continued technological development linked to a limited growth in demand will lead to lower real prices. The share of agriculture in the economy and the employment in agriculture will thus decline further. Those who stay in the sector will enlarge their farms, start working part time or broaden their services.

In the reference scenario for the agricultural sector in 2020, the contribution of the agro-complex to the Dutch economy and employment will further decline. The added value of the agro-complex will increase in volume, but by less than the rest of the economy. Employment will decline in this period by over 20% (Figure 1.4).

Figure 1.4

Share (percentage) of agro-complex (total and based on domestic raw materials) in the national value added and employment, 2006 and 2020



Source: Input-outputmodel, LEI.

In the reference scenario the composition of the agricultural sector shows further changes. The greenhouse horticulture and open-field horticulture will become more prominent in the agro-complex, but glassland-based livestock farming remains the biggest sub-complex (Table 1.1).

Table 1.1

Share (%) of agro-complexes [a] in value added and employment, 2006 and 2020

	Value added		Employment	
	2006	**2020**	**2006**	**2020**
Arable farming complex	18.6	17.0	17.4	17.3
Openfield-horticulture complex	8.7	10.0	11.4	13.6
Glasshouse horticulture complex	21.7	25.5	16.3	19.3
Grasslandbased livestock complex	29.8	29.0	35.0	31.1
Intensive livestock complex	21.2	18.5	19.9	18.7
Agro-complex, domestic raw materials	100	100	100	100

a domestic raw materials.

Source: Input-outputmodel, LEI.

Mainly due to the abolition of milk quotas and the strong international competitive position, milk production in the Netherlands increases by 16% in the reference scenario. Thanks to the rise in milk production per cow, the cattle population rises slightly by 2%.

As far as the structure of the primary sector is concerned, the number of agricultural farms and horticultural holdings will be less than 50,000 in 2020, as against more than 80,000 in 2005 (Table 1.2).

Table 1.2 **Structural developments in Netherlands agriculture, 1995-2020**

	1995	2005	2020p
Number of farms (x 1,000)	113.3	81.8	47.7
o.w. dairy farms	33.3	21.3	9.8
arable farms	14.7	12.4	9.4
greenhouse-horticulture farms	10.0	6.4	2.9
open field-horticulture farms	12.0	8.6	5.0
intensive-livestock farms	11.6	7.2	3.0
Employment (x 1,000 ALU)	202.0	159.7	110.2
Acreage (x 1,000 ha)	1,965.3	1,920.8	1,855.7
ALU per farm	1.78	1.95	2.31
Ha per farm	17.3	23.5	38.9
Output per farm ('2005' = 100)	68	100	186
Output per ALU (idem)	75	100	157
Output per ha	93	100	112

Source: Netherlands Statistics and Eurostat, processing LEI.

1.4 Sensitivity analyses

Agricultural and trade policy

The reference scenario is based on further liberalisation of global trade and ongoing reform of the CAP. In the regionalisation variant no new WTO agreements will be made and the prices of grain, sugar, milk, meat and eggs will be higher in 2020 than in the reference scenario. Retaining the milk quotas will affect the prices of milk and beef most strongly; because of the milk quotas, Dutch milk production lags behind the reference scenario and the total European supply of milk and beef is lower. Because the milk quotas are retained, in 2020 there will be fewer dairy cows and the national manure surplus will be smaller than in the reference scenario. The consequences for employment in the agro-complex are limited (a 1% fall), mainly due to the decline in production in pasture-based livestock farming. However, the increase in income on some pasture-based farms, particularly the less rapid growers, may mean that the structural change is delayed.

Oil prices

The reference scenario assumes an oil price of around 100 dollars a barrel. But what happens when oil prices reach 150 dollars? In the assumption that the prices of other energy carriers, including gas, will become equally expensive, production in greenhouse horticulture will decline compared with the growth in the reference scenario. Cucumbers are the most susceptible here, but the production of other vegetables (tomatoes and peppers) and cut flowers will also decline. In the case of higher oil and gas prices, the prices of greenhouse horticulture products will rise. This will compensate the higher costs to some extent. The high energy prices not only produce cost disadvantages, but also revenue advantages for agriculture and horticulture as energy supplier. High oil prices are mainly disadvantageous for the income of greenhouse horticulture and to a lesser extent for livestock farming. This accelerates the closure of farms and increases in scale. But higher oil prices also encourage the introduction of 1st and 2nd generation biofuels and other alternative energy sources which can be supplied by the agricultural sector. Furthermore, high energy prices promote developments towards energy savings in the agricultural and logistics sectors.

Derogation

The reference scenario assumes the continuation of the derogation (exemption) granted by the European Commission to the Netherlands with regard to the Nitrate Directive. As a result, the Netherlands can apply 250 kg of animal manure per hectare of grassland instead of 170 kg. The question is: what might happen if the Netherlands is not granted derogation? In the reference scenario, the total excretion of minerals from manure (nitrogen and phosphate) declines by several per cent. Because the reference scenario stipulates a tightening of the manure application norms, more manure will therefore be processed and disposed of outside agriculture and possibly outside the Netherlands. If the derogation is no longer granted, this will increase further. As a result, manure disposal costs will rise, meaning that the cattle population will decline. This will particularly affect the number of dairy cows (around -5%), fattening pigs (-5%) and breeding sows (-2%). The ending of derogation will also mean a reduction in the added value of the total agro-complex, by almost 2%. In livestock farming sub-complexes, the relative reduction is higher, around 4%. With this reduction, there will be a decline in employment in the agricultural sector.

1.5 Implications

Knowledge and innovation

The future position of the agricultural sector in Dutch society initially seems to be guaranteed by its economic importance. Competitive strength based on growing productivity continues to be a basic condition for this. Among all the uncertainties about the future, knowledge, innovation and enterprise are vital attributes for a more sustainable agricultural sector. The Dutch knowledge infrastructure relating to the broad, multidisciplinary agricultural field will retain an important task in this. For the successful functioning of the knowledge network involving research, education and knowledge distribution, coordination with the various parts (chains, farms and organisations) of the agro-complex is an essential condition.

Role of farmers and organisations

Further farm enlargement is one of the main outcomes of this study. Calculated according to the expected number of farms in 2020 (nearly 50,000), the structure for most sub-sectors will not change fundamentally. In order to strengthen entrepreneurship, attention should be focused on specific competences. In this process, related parties (farmers, organisations, government, knowledge institutions) can play a role. Attention points in this regard are craftsmanship and management, skills in networking and promoting chain development and the ability to respond to consumer concerns. Organisations in the agricultural sector can also promote innovation by addressing social issues internally and actively working on solutions.

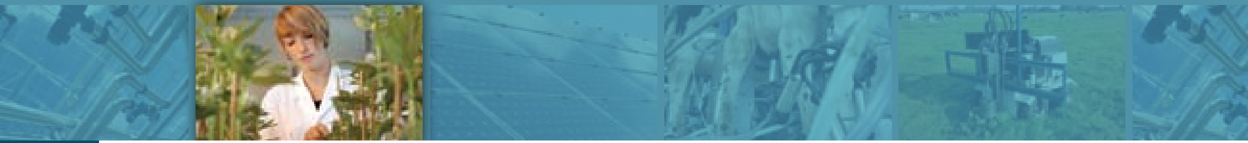
Role of governments

In order to strengthen the competitive position of the Dutch agricultural sector, besides promoting knowledge and innovation, other policy elements are also important. In view of the great dependence of the Dutch agricultural sector on export, harmonisation, improvement and simplification of legislation and regulations require constant attention. For businesses in the food and beverages industry, fiscal and social levies play a major role in international competition. Finally, for the future of the agricultural sector it is essential that governments deploy spatial and investment policy to facilitate increases in scale in a responsible and sustainable way. This is particularly important for non-pasture-based sectors (intensive livestock farming, greenhouse horticulture). A stringent 'structure freezing' attitude can mean that such sectors, including the other firms in the relevant sub-complexes, miss opportunities in the market.

Economic crisis

In this study, the global credit crisis and the expected economic recession in the coming years was not included as a determining factor for the developments until 2020. The influence of the credit crisis on the world economy may be modest in the long term, but we must wait and see. The economic recession may delay the developments considered here, such as the process of scale increase. Incidentally, the economic conjuncture will clearly have a less negative impact on the demand for agricultural products than on the demand for other products and services. More luxury products, including ornamental plants, will be affected and are therefore vulnerable. An important condition for the recovery of economic growth after 2010 is that internationally and within the EU no protectionist trade measures are taken.

Technological developments



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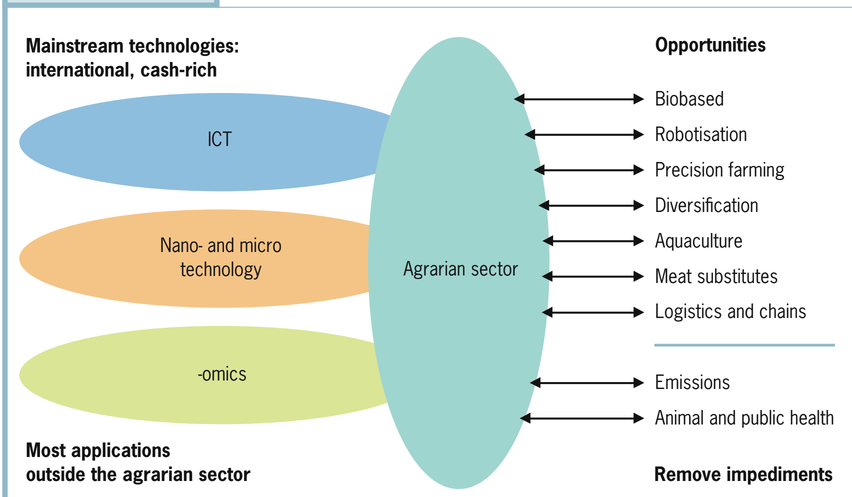
2.1 Technological explorations for the agri-sector

Technology offers opportunities for new developments in the agricultural sector and at the same time can contribute to preventing or decreasing negative or harmful effects of production. For policies (stimulating, regulating) it is important to recognise in time developments that may cause a trend breach. In this chapter the current technological developments and expectations as to their effect on the agri-sector are described. Worldwide there are three mainstreams in technology that are progressing out of curiosity and by dedicated research. These are genomics, the nano- and micro-technology and ICT. For all three sectors there are large national and international research programmes with applications in many fields. The developments for the agri-sector make up a small part. Each of these technologies, and all the more because of their combined actions, is essential for developments in the agricultural sector (Figure 2.1). The technological mainstreams are described as well as a number of specific application directions in the agricultural sector.

Figure 2.1 Technologies and the agricultural sector



2.2 Technological mainstreams

Genomics, or rather the entirety of '-omics', has developed enormously. Different parties still misunderstand genomics by stating that genomics is 'fiddling' with plants and animals. However, it is more to do with the technological knowledge about gene activity: when do genes become active with which expression and how can it be directed. This knowledge can be applied to management and nutrition in plants and animals, but traditional selection of improved generations can also be more efficient by using genomics.

Using genomics offers the possibility for tailor-made applications: dependent on market demand. This leads to a perspective that responds to social questions such as the quality of the products, removing negative side effects of production or food production under specific conditions such as drought and salinisation. Concrete examples are the demand for unsaturated fatty acids in animal products, type of starch in potatoes, resistance to particular diseases and plagues in plants or animals or defining the ripening stage of fruit. Genetic modification, that is to say hereditarily introducing new genes or eliminating endogenous genes, has already been applied often in micro-organisms and plants. Practical applications in fish can (internationally) be expected in the short term. Social acceptance (ethics and safety) is an important factor for applying genetic modification, particularly in animals.

Micro-system and nanotechnology is actually working with material sized between 0.1 and 100 nanometres, often at the level of individual atoms. From early 2000 research has aimed at biological applications, besides physical applications. At the start of the nanotechnology, there was a 'promises hype': 'nanobots' would be able to do 'anything'. Meanwhile, nanotechnology has developed to an established research field. From 2002-2005 over 50 organisations worked together within the programme NanoNed at a budget of €235 million in the Netherlands only. The research has certainly also been applied in agriculture and food production. Various national governments and large food concerns invest heavily in applications of nanotechnology. Practical applications vary from new processing and production systems to 'delivering systems' that effectively have additives take the right positions in the body (in cells), or in the field of packaging and logistics (preservative, signalling packaging, self-repairing foils) and intelligent sensors for many substances.

The large variation in applications may involve image risks, even more than with genomics, social debates about safety and ethical aspects of the applications may occur.

ICT itself is a technological development, which is necessary to give other technological developments more prospects. The agricultural sector can indirectly profit too from Dutch and international research and the developmental initiatives. Applying ICT developments is a precondition for utilising genomics (computing and data storage capacity), robotisation and precision farming (sensors, communication and decision models) and logistic possibilities (in the chain as well as from producer to consumer).

2.3 Technology that can directly be applied

On the one hand the *bio-based economy* aims at using green raw materials for non-food application such as plastics, adhesives, paint, medicines. On the other hand, innovations aim at producing bio-fuels; currently research aims at the third generation of bio-fuels already. A potential new 'production crop' is algae, fresh as well as salt water, in open basins and bioreactors (landless) with applications in food supplements, fish and animal feed, production of bio specialities, possibly energy and as a means for cleaning wastewater and/or utilisation of manure.

The developments can have a great effect on the Dutch petrochemical industry, the industry that processes agricultural products (starch, sugar) and trade and logistics in biomass (shift from petroleum to biomass). Yet no large effects due to technological developments in biomass production can be expected for land use in the Netherlands. The algae will not take the place of other crops; the bio-based economy can, however, result in a change among crops. The efficiency of biomass from manure, wood, 'nature' et cetera can strongly be increased (or sales costs can be decreased) by using the material for obtaining energy.

The technology to decrease the use of and the dependence on fossil energy is in all sectors applied. Examples are: the greenhouse as an energy source, barn roofs with photovoltaic cells, storage of heat and cold and their utilisation. A national research agenda on sustainable energy and the Advice of the Commission Research on Sustainable Energy (January 2008) represent the possibilities.

It is expected that *robotisation* leads to a trend breach worldwide. The trend in development of robots in combination with interconnectivity (information exchange between people, sensors, computers, automatic machines et cetera) will progress rapidly. This offers opportunities in a broad social field, which extends to agriculture.

The application of robotics to solve the labour problem seems to aim at the long term, as can be seen in greenhouse farming. Labour scarcity, which is apparent now in the agricultural sector, can speed up robotisation in the short term. The extent to which robotisation is applied in animal sectors will depend on the social acceptance and the extent to which the sectors are able to guarantee the intrinsic value of the animal.

Precision farming offers new opportunities for working on applications specifically rather than generically. Here it concerns the triplet sensors, intelligent networks and robots. Recognisable examples at the moment are in the area of crop protection where products are only used at specific time and location when necessary or applications in tillage or fertilisation. In this way precision farming is becoming made-to-measure production of specific applications for specific products for specific buyers.

The perspective of *diversification and made-to-measure production* is a combination of technological developments such as genomics, sensor and identification technology and ICT. Coordination is necessary for being successful. This particularly requires attention for existing institutions with their concomitant interests that slow down innovations or even impede them.

Safe surroundings within which pioneering entrepreneurs can realise this type of production is a solution to aim at. Furthermore, it is necessary to have a policy that pays attention to safety for the consumer and guarantees for the product specifications.

Aquaculture offers opportunities for fulfilling the increasing worldwide demand for fish and the approach to the problem of overfishing. The Netherlands has a prominent position as tothe knowledge about aquaculture in closed systems (recirculation). Such closed systems offer opportunities for the environment, health and welfare. The capacity to utilise technology for actual sustainable production is guiding for the future of the aquaculture. For any sizable perspective this requires further development aimed at welfare, environment and food safety. The production of fish feed is an important factor in this. After all, feeding farmed fish with fish meal from wild catch and/or protein crops that compete with human food is not sustainable. Integral systems of algae and worms and/or producing vegetarian fish can play a role in this. The Netherlands is leading in the world as to the size of fish feed production. For policy, attention should be paid to guaranteeing socially accepted husbandry systems (health and welfare, sustainable use of energy and raw materials for feed) and to establishing a certain image for the consumer.

Research into technological possibilities of *textured vegetable proteins and meat substitutions* continues, but it is not expected that this leads to a trend breach within a term of 15-20 years. Bottlenecks that are dealt with are the costs of the food medium, keeping germfree the entire process and growth of cells in a fixed matrix to acquire the specific meat structure. Although in other cultures the consumption of insects is substantial, the production and consumption of worms and insects as meat substitutions in western countries and the Netherlands only take place in the alternative circuit. Although the average meat consumption per capita increases worldwide, the western world sees a trend downwards. The share of meat substitutions in the total of protein consumption will increase.

Logistics and chain efficiency is increasingly important in technological developments from genomics, biotechnology, sensor and identification technology and ICT in order to successfully realise the resulting perspectives of diversification and made-to-measure production. By new technology, purchases and deliverance can and will occur worldwide. This will lead to a strong movement of international networks for fresh products. Moreover, new package and transport technology become available for agrifood products with for example replacing air transport by sea transport and replacing stocks and transhipment by ‘exactly in time and on place’ deliverances. Existing institutions that have filled the infrastructure in the food chain with a ‘bulk’ mindset are obstructing in trying to realise breakthroughs. After all, product diversification requires a new infrastructure that offers room to often less sizable chains instead of some large chains. For policy the overlap is in files such as decreasing CO_2 production, Greenports, sustainability/fair trade.

2.4 Technologies which can take away impediments

2

Dutch agriculture is a source of *(undesired) emissions* to soil, water and air through eutrophication, pesticides, dust, greenhouse gases and ammonia.

Eutrophication and emission of pesticides can be prevented to a large extent by applying the principles of precision farming. It is more difficult with greenhouse gases and ammonia in particularly the livestock industry and with dust in the poultry industry. Precision farming offers the technology to reduce emissions. Moreover, in the livestock industry end-of-pipeline solutions will be required to prevent/reduce emissions of dust, odour and ammonia. The technologies develop rapidly, but are as yet accompanied by increased energy consumption. By using ideas from the energy-producing greenhouse it should be possible, however, to further reduce energy consumption in the livestock industry.

Concerning *animal health* (and related to that *human health*) the challenges remain formidable, despite, and in some cases thanks to, approximately 200 years of veterinary research. On the one hand, the problems that are difficult to solve remain, on the other hand new problems arise, partly due to earlier innovations in the animal disease control. If problems concerning animal health – and human health related to that – are not, or cannot be, adequately dealt with, this will have consequences for the position of the livestock industry in the Netherlands.

A whole range of technologies (-omics, nanotechnology, sensors and ICT) offer opportunities to structurally improve diagnostics and animal disease control and developing more robust animals. The great challenge is combining and integrating zootechnical and veterinary knowledge in a sustainable livestock industry. Sustainable animal disease control has hardly been explored and defined, but is necessary for a society where people can be in contact with the countryside in general and with food production in particular.

2.5 Discussion

There are many technological developments in many areas that can have significant consequences. The chance that technologies cause a trend breach is the highest when policy and technology reinforce each other. In most cases a positive policy is necessary to have a technology make a breakthrough. An ‘internet of things’, the possibility of applying global sourcing individually, seems to develop itself independently of policy.

This and all intermediate forms between the current food market, dominated by retail, and completely individual sourcing have their effect on transparency, tracking and tracing and guarantees for quality and safety of food.

Apart from that it seems that technological developments and social demands are in a delicate balance: the greater the perception of a problem or chance, the more a solution may cost, the greater the chance that development and implementation will take place, if necessary via adaptations in legislation. Application of technology in the agricultural sector is not always a rational consideration, but is certainly dependent on emotional feelings and social perception. Take for example the change in acceptation of genetic modification in plants under the influence of the food crisis in the spring and summer of 2008.

Although technology is developing rapidly, those developments can be transparent if the developer pays sufficient attention to it. This also holds for policy: with sufficient attention and reflexivity, there is time to respond to the developments. So, policy plays a part in the awareness of the advantages and disadvantages of technological developments in the society.

Enforcing a new technology mostly takes at least 10 years. Genetically modified plants were already available 20 years ago; only after 2000 did the production of such crops increase considerably. The cubicle house for dairy cattle also took 15 years to be implemented on a large scale; the same holds for the milk robot. That is why no radical trend breaches as to agricultural production are to be expected in the Netherlands the coming years; however, gradual changes will be seen. Different bodies see opportunities for the Netherlands to be an experimenter and developer country rather than a production country, also because of the amply-present supplying industry. Whether and how this can be accomplished is an important policy issue for that matter.

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