

Agricultural Economic Report 2015

Summary



LEI

WAGENINGEN UR

Agricultural Economic Report 2015

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ABSTRACT

AGRICULTURAL ECONOMIC REPORT 2015 OF THE NETHERLANDS: SUMMARY

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This report offers an English summary of the *Landbouw-Economisch Bericht 2015* (www.landbouweconomischbericht.nl). It presents a survey of the economic state of Dutch agribusiness. First, attention is paid to general economic and political developments and to the development of the agricultural complex. Next, the report deals with the rural area and with environmental issues. Following a description of the production structure and production factors in agriculture, profitability and income formation in the various sub sectors are analysed.

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Preface

This summary of the *Landbouw-Economisch Bericht 2015* offers a global survey of the economic and financial state of Dutch agriculture and horticulture. In it, the changing economic and political circumstances affecting the sector are explicitly taken into account. The outline of the publication is similar to previous years.

Until 2013 the full version of the *Landbouw-Economisch Bericht* was printed. Starting in 2013, the full version is only available online. The final draft of the 2015 Dutch edition of the website was completed in May 2015.

The Hague, August 2015

Director LEI Wageningen UR a.i.,



Prof. dr. R.J. Bino

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Agriculture and horticulture from a general economic perspective

1



1.1 General economic developments

In 2015, the recovery of the global economy is receiving a substantial impetus from the lower oil prices. This growth will take place in both the highly developed and emerging economies, with the USA as the greatest driving force in the group of highly developed countries. Lagging investments are slowing growth in both the highly developed and emerging economies.

The lower oil prices are resulting in a higher rate of growth in the economy of the developed oil-importing countries than had been forecast. Conversely, the economic growth of oil-exporting countries such as Saudi Arabia, Russia and the USA will be retarded during the coming years.

According to the winter forecasts of the European Commission, in 2015 the economies of all EU Member States will return to growth for the first time since 2007. Economic activity in the EU and the euro area is expected to pick up moderately during the course of 2015, before accelerating in 2016. The divergence in economic performance across the EU is expected to continue. The European Commission is of the opinion that this is in part due to the variation in the debt reduction progress in the public sector, private sector and banking sector between the Member States. The positive effect of low oil prices on growth will also vary according to each country's energy mix. The degree to which exports will benefit from the lower exchange rate of the euro will depend on national trade orientation and patterns of specialisation.

The Dutch economy is expected to grow by 1.7% in 2015, and 1.8% in the next year. Exports, consumption and investments all contribute to the mitigation of the financial crisis. As in previous years exports – which exhibit an annual increase of more than 5% – will be the most important driving force. In 2015, the greatly reduced price competition will provide the greatest incentive to the increase in exports.

Prospects are uncertain

The general uncertainty about the existing economic prospects has increased. There are downward risks to the economy which are related to the geopolitical tension in Ukraine and the Middle East and the volatility on the financial markets, whilst the major economies diverge in their monetary policy and the extent to which they have implemented structural financial economic reforms. A lengthy period of very low or

negative inflation would also be detrimental to the prospects for growth. Conversely, the low energy prices could impart a more powerful impetus to global and EU growth than had originally been expected.

1.2 Organisations in the Dutch agricultural sector

The *Wet opheffing bedrijfslichamen* (Industrial bodies (abolition) Act) entered into force on 1 January 2015. On 1 January 2014, the Dutch Ministry of Economic Affairs' Netherlands Enterprise Agency (RVO) had already taken over the joint administration duties from the industrial bodies, whilst the majority of the activities of the commodity and industrial boards were either terminated or transferred to private parties. The agricultural business community has made use of the options for alternative forms of organisation that are possible within the context of the Common Agricultural Policy. These relate to producer organisations and sectoral organisations.

The *Producenten Organisatie Varkenshouderij* ('producer organisation of the pig-farming sector', POV) was recognised on 1 January 2015. Four sectoral organisations in the dairy, egg, poultry and veal sectors were also recognised on 1 January 2015. The organisations strive to achieve objectives set by the European regulations and which are intended to enhance the position of the primary producers. The recognition is valid until the end of 31 December 2020.

1.3 Trade in agricultural products

During the past decade, Asia has become the most important region in the international agricultural product and food markets, in terms of both imports and exports. Whilst Asia has the largest import balance, Latin America is the most important net exporter. The shares of the EU (excluding internal agricultural trade) and NAFTA – the North American Free Trade Agreement – in global agricultural trade have both fallen, although when expressed in terms of import and export values both blocs are now closer together than ten years ago.

The large majority of the EU's agricultural trade is internal trade. About one quarter of the trade is with countries outside the EU. During the period from 2009 to 2013, trade in agricultural products accounted for around 7.5% of the total trade with countries outside the EU, a percentage which is applicable to both imports and exports.

Dutch agricultural trade

The EU accounts for about 80% of Dutch agricultural exports and almost 60% of Dutch agricultural imports. In 2014, total Dutch exports of goods, including agricultural products, and imports of goods amounted to 432 billion euros and 385 billion euros respectively. Agricultural exports increased slightly to 80.7 billion euros (19% of total exports), while agricultural imports decreased slightly to 52.4 billion euros (14% of total imports). The agricultural trade surplus is due to trade with EU Member States. The Netherlands has an agricultural trade deficit with non-EU countries. Imports and exports both encompass a wide range of products. Important import products include oilseeds, fats and oils and animal feeds. Major export products include ornamental plant products and meat (Figure 1).

The majority of Dutch agricultural trade is with the country's neighbours, i.e. Germany, Belgium, France and the United Kingdom. Germany is the most important trading partner for both imports and exports. In 2014, almost 26% of Dutch agricultural exports were destined for Germany, while about 19% of agricultural imports to the Netherlands originated from Germany. Exports to Germany primarily consist of fruit and vegetables, ornamental plants, dairy products, eggs and meat. Most of the imports from Germany consist of dairy products, meat, cereals and cereal preparations. The dairy imports primarily consist of unprocessed milk, whey and skimmed milk powder that serve as ingredients for the food and beverages industry.

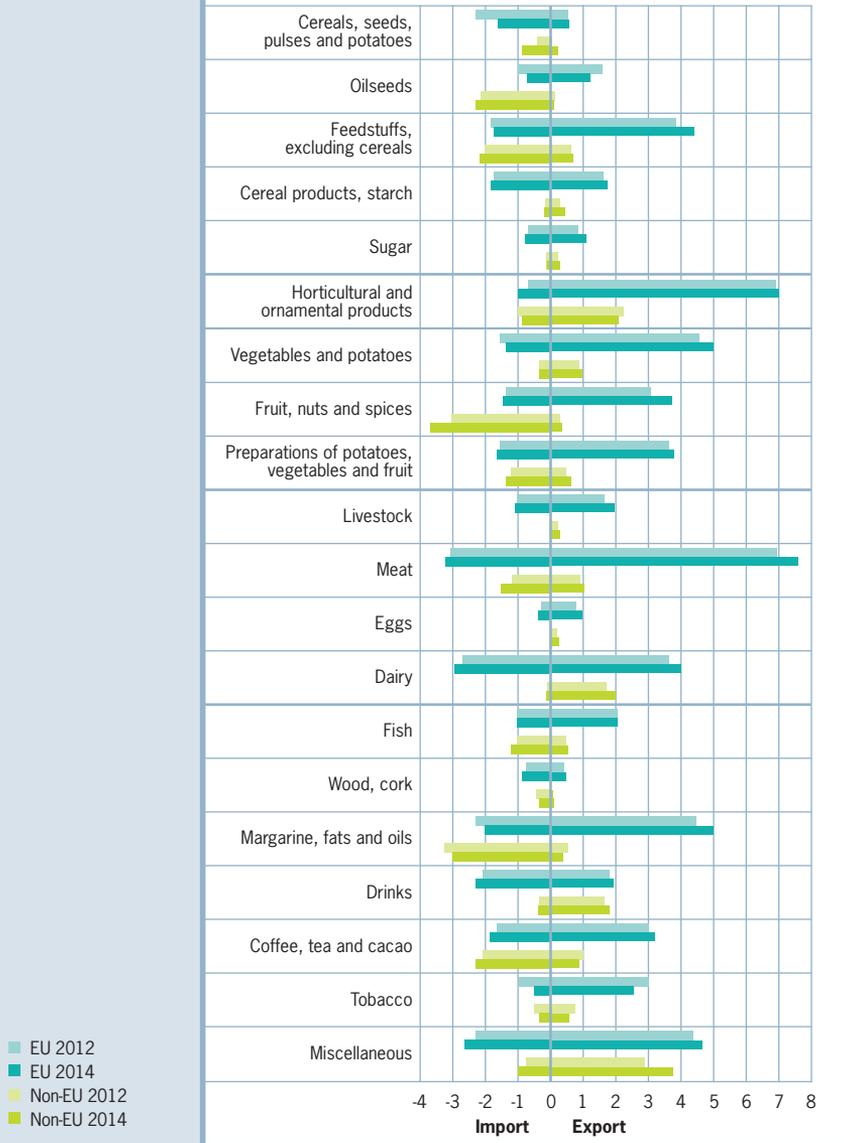
Transshipments and re-exports as elements of Dutch agricultural trade

Transshipments make a modest contribution to the total exports of Dutch agricultural products. In 2013, no more than 3% of the exports were of products that arrived in the Netherlands from countries of origin such as Brazil on their way to their country of destination, such as Germany. However, the contribution made by a few categories was substantial, namely fish (15%), fruit (11%) and meat products (13%).

Re-exports, conversely, do make a major contribution to total Dutch exports: 24% of all exports are imported products which are processed to some extent and then sold in the export market. The contribution made by the major export products – products representing an export value of more than 2 billion euros – is, once again, greatest for the fruit (68%) and oilseed (61%) product categories.

Figure 1

Dutch agricultural imports and exports by product with the EU and with third countries, 2012 and 2014 (billion euros)



Source: Statistics Netherlands, calculations by LEI.

The Dutch agricultural sector



2

2.1 The agricultural complex

In 2013, the added value generated by the total agricultural complex amounted to 48 billion euros (Table 1), more than 8% of the total national added value. The added value includes the input required for the supply industries – such as seed and seedlings, fertiliser and animal feed as well as, for example, the machines required by the food industry – and for the processing to semi-finished and finished products and their distribution to the supermarkets. As a result, the table expresses the economic activity generated by the processing, supply and distribution of agricultural raw materials produced both by the Dutch primary sector and imported into the Netherlands. Approximately two thirds of the added value is generated by agricultural raw materials produced in the Netherlands and about one third by imported agricultural raw materials.

During the period from 2010 to 2013, the economic importance of distribution and processing has increased more than of the primary production and supply parts of the chain. The segment of the agricultural complex that uses imports of agricultural raw materials also generates more value added per labour unit than the segment that uses agricultural raw materials produced in the Netherlands, a difference largely due to the lagging remuneration of labour, land and capital in the primary production sector as compared to the rest of the chain.

A distinction can be made between a number of sub-complexes within the total agricultural complex. The pasture based livestock farming complex is the largest sub-complex in terms of added value and employment. This sub-complex, in view of the forecast growth in milk production following the abolition of milk quotas, can be expected to retain its position as the largest in the coming years.

A large part of the operations in the agricultural production column is related to exports. The income from exports accounted for approximately 70% to more than 73% of the added value. Exports also make a contribution to employment of a comparable percentage: some 70% of the employment in the agricultural complex is generated by exports. The importance of exports has fallen slightly since the beginning of the century.

Table 1 Gross value added and employment of the Dutch agricultural complex, 2010 and 2013 ^a				
	Gross value added ^a (EUR billion)	Gross value added ^a (EUR billion)	Employment (1,000 labour units)	Employment (1,000 labour units)
	2010	2013 ^p	2010	2013 ^p
Agricultural complex ^b	43.7	48.0	569.4	600.1
<i>Share in national total</i>	7.7%	8.3%	8.0%	8.5%
Foreign agricultural raw materials	15.0	16.1	165.9	169.5
<i>Share in national total</i>	2.6%	2.8%	2.3%	2.4%
Agriculture and horticulture	28.6	31.9	403.6	430.6
<i>Share in national total</i>	5.0%	5.5%	5.7%	6.1%
Primary production	9.6	10.5	164.7	163.4
Processing industry	3.8	4.5	50.1	58.5
Input manufacturing	12.0	12.8	148.9	158.2
Distribution	3.2	4.1	39.8	50.5
p: preliminary.				
a In current prices;				
b based on domestic and foreign agricultural raw materials (including gardening, agricultural services, forestry, cocoa, alcohol and tobacco).				
Due to a revision of the data, the figures cannot be compared with previous years.				
Source: LEI.				

2.2 Food and beverages industry

In 2012, the food and beverages industry had 155,400 employees. Almost one out of every six of the employees in the industry sector work for one of the more than 5,900 companies active in the food and beverages industry. In 2012, the food and beverages industry generated turnover of more than 67 billion euros, equivalent to more than 21% of the total turnover generated by the industry sector. Abattoirs and the meat-processing industry make the greatest contribution to the food and beverages industry's turnover, amounting to 9.8 billion euros, followed by the dairy industry, which contributes 9.2 billion euros.

The food and beverages industry is a sector which is in a state of flux, a sector in which mergers and/or takeovers of companies or divisions of companies take place at regular intervals.

Margins in food chains

Discussions about 'fair' prices for farmers and growers and the market power and abuse of market power, either proven or alleged, by players such as the

supermarkets have been taking place for many years. These discussions are certainly not limited to the Netherlands, but also rage in many other countries. In 2009, LEI carried out a study of price formation and transmission in food chains. This study was repeated in 2014. One of the themes of this study was the distribution of gross margins in the chain.

The study revealed great differences between products. More than half of every euro that consumers spend on products with a higher degree of processing, such as poultry meat and bread, goes to the processors. The arable farmers and poultry farmers then receive 14% and 22% respectively: the costs and margins of the supermarkets account for 26% and 16% of every euro consumers spend. With non-processed products, the primary producers receive a share of every euro consumers spend, ranging between 16% (onions) and 43% (eggs). The supermarkets' share ranges from 39% (potatoes) to 68% (onions).

The gross margins do not give any indication of the costs incurred per product, for example, for labour, packaging, transport, energy for cooling or spoilage, etc. Virtually no information is available at company level about these costs for individual products. For this reason, it is not possible to calculate the net profit per unit of product for any link in the chain.

However, the total economic profit of companies in the various links of the chain has been studied. The average net profit margin on turnover is lower than 3% in all links in the chain. No parties were identified that generate a great deal of profit at the cost of the primary producers. However, this does not exclude the possibility that parties make almost no profit on some products but a great deal of profit on other products in their range.

The selling prices of products in the chain, in conclusion, often exhibit a strong relationship and increases in prices are rarely passed on in the chain more rapidly than decreases in prices. However, a factor which plays a large role for many products is the ratio of supply and demand, which has a great effect on price levels: prices are high when supply is low and demand is high. In other words, the profitability of the agricultural products examined in the study is to a large extent dependent on the ratio of supply and demand and is not demonstrably influenced by the abuse of market power in the chain.

2.3 Retail chain and consumption of food

In 2014, store turnover from food and beverages increased by 1.5% from the previous year, largely due to a 1.3% increase in volume: higher prices accounted for just 0.2% of the increase. In previous years, the increase in turnover had been largely due to higher prices. Supermarket turnover increased by 1.7% in 2014, a rate of growth which was virtually unchanged from that in 2013. Once again, the growth in volume made the greatest contribution to this increase, 1.6%, whilst higher prices contributed just 0.1%.

In 2013, households spent 42.2 billion euros on food and beverages, almost 2% more than in 2012. The majority of this amount, 31.9 billion euros, was spent on foods including dairy products, meat, potatoes, fruit and vegetables. The remainder, 10.3 billion euros, was spent on beverages and tobacco products. The total expenditure on food and beverages accounted for 14.6% of total household expenditure.

In 2013, consumers spent more than 984 million euros on organic products, 5.4% more than in 2012. Organic products' share of the total expenditure on food and beverages is increasing slowly but surely, with a share of 2.4% in 2013 as compared to 2.3% in 2012.

Emergence of online: buying food in shops is becoming discretionary

The Netherlands has a high supermarket density, certainly in comparison with other European countries. Dutch consumers do not need to walk, cycle or drive far to a supermarket and can often choose from several formulae.

However, this is not the only alternative: consumers no longer need to step out the door. They can now order all their shopping relatively simply, with just a couple of mouse clicks. The Netherlands has a good online infrastructure and an Internet penetration rate that is one of the highest in Europe. The percentage of Dutch residents who make use of the Internet almost every day is high and is increasing, whilst the percentage who have never used the Internet is decreasing.

The food segment is one of the segments with the greatest rate of growth in the online sales channel. What consequences will this have for retailers in the food sector? Will the supermarkets follow travel agencies and CD stores and become extinct? Or will the supermarkets adjust their revenue model in response to the new webshops without physical stores – what are referred to as pure players – or will the existing physical retailers also dominate the online sales channel?

It is still not clear which scenario will materialise in the Netherlands, although it is clear that the emerging e-commerce is capturing sales volume from physical stores. As a result, buying food in the shops is becoming discretionary – with an impact on the traditional physical retailers in the food sector and their function that cannot be underestimated.

Rural areas



3.1 Spatial shifts in land use

In 2010, 56% of the Dutch land surface area, including water, was used by agriculture, 17% was covered by water, 15% was built-up land or accommodated the infrastructure and 12% was allocated to nature. The area of agricultural land decreased by more than 100,000 hectares between 1996 and 2010, equivalent to a decline of 4% in the total area of agricultural land. More than three-quarters of this reduction in the area was transformed into built-up land. During this same period the area of built-up land, including the infrastructure and semi built-up land such as recreational area, increased by 14%. The area of water also increased slightly, by 1%, in part due to the policy for the creation of water storage areas. The area allocated to woods and nature, in conclusion, increased by almost 2% between 1996 and 2010. Although this would appear to be a small result from all the efforts made to acquire land pursuant to the nature policy, this is due to the difference between the actual and designated use of much of the land acquired for nature purposes: this land is still in agricultural use, but is designated for nature.

3

3.2 Spatial shifts in the use of agricultural land, 1988-2013

The use of land by the various agricultural production sectors is, in analogy with the division of land between the various functions, anything but fixed. Moreover, the various agricultural production sectors are not distributed evenly throughout the Netherlands. The spatial distribution of the production sectors can change over the course of time in response to economic developments or as a result of policy.

The dairy farming sector is the largest production sector within the Dutch agricultural complex in terms of the number of holdings and the use of land. The sector is also distributed relatively evenly throughout the country. An analysis of the spatial pattern of the dairy farming sector between 1988 and 2013 reveals that the distribution has remained virtually unchanged. The same is applicable to the spatial distribution of the intensive livestock farming sector. It is striking to note that the spatial distribution of the greenhouse horticulture sector has also remained virtually unchanged in the past 25 years, notwithstanding the policy designed both to counter what was referred to as 'dispersed glass' and to reduce the spatial pressure on the Westland region by providing incentives for relocations to some ten new development regions.

The other production sectors did exhibit shifts in concentration between 1988 and 2013. This relates to production sectors including the other grazing livestock farming (beef cattle, sheep, goats and horses) and arable farming sectors: the importance of arable farming in the traditional arable farming areas declined between 1998 and 2013.

The open field horticultural sector exhibits the greatest spatial shifts in the Dutch agricultural complex. The West-Friesland region's dominant position in open field horticulture is much less pronounced, whilst the role of both the IJsselmeer polders and Eastern Noord-Brabant has increased. Northern and Middle Limburg were already of importance to this sector and have retained their position.

3.3 Nature and landscape policy

3

The Netherlands has decentralised its nature policy in recent years, and the provinces now bear the full responsibility for the policy. The central government lays down the framework and continues to bear the overall responsibility for compliance with international obligations, in particular the obligations arising from the Habitats and Birds Directives and the Water Framework Directive. The ambitions of the central government and the provinces for the nature policy relate to the development of the Natuurnetwerk Nederland ('Netherlands nature network'), the achievement of the international targets and the enhancement of society's involvement in nature.

The central government and the provinces have agreed that the twelve provinces will bear the financial responsibility for the nature policy as from 2014. The financial cover for the policy consists of central government financing, EU co-financing and contributions from provinces and third parties. During the period between 2014 and 2021, the nominal funding by the central government will amount to almost 2.5 billion euros, with an additional 500 million euros from the provinces and 320 million euros from the EU in the form of co-financing from the third Rural Development Programme. Consequently, the total nominal funding will amount to more than 3.3 billion euros, exclusive of additional contributions from third parties and the provinces.

One sixth of the budget for nature is allocated to agricultural nature management

The provinces allocate almost one third of their annual expenditure of 415 million euros – structurally from 2018 onwards – to nature management and a further one quarter to nature development. The remainder, more than 40%, is allocated to agricultural nature management, goose management, restoration management and hydrological and other measures. In addition to the annual expenditure of these financial resources, funds for the development of nature are also made available from what is referred to as the 'land for land principle'. This principle is based on the assumption that the investments in the development of nature are covered by the revenue generated by the exchange and sale of land. This land includes the land of the Land Management Service (BBL) and the non-laid-out land of land management organisations.

The Government's vision for nature policy

The Government published its vision for nature policy in April 2014. This vision is based on the principle that nature has a place in the centre of society. This principle is in turn based on the understanding that society needs nature and that nature is afforded the best protection when it is an integral element of society. This latter can be achieved by integrating nature in other sectors such as the agricultural, fishery, housing, industry, recreation and energy sectors. The responsibility for the nature policy will primarily be borne at a regional level. The central government will take a step back when society demonstrates that it is able to achieve nature objects and will focus more on creating the necessary conditions and providing incentives.

The Government's 2014 nature vision adopts a broad definition of nature by encompassing everything that is to some extent green. Many other definitions remain vague, which gives the strong impression that the nature vision is no more than a cost cutting operation. However, the central government does retain what is referred to as a system responsibility for specific issues. This relates primarily to national and international legislation and regulations and to the associated supervision as well as, as referred to above, the creation of the conditions the other parties need to assume their responsibilities.

Agreement reached on programmed approach to nitrogen deposits

Many Natura 2000 areas have had a nitrogen surplus for many years. This is harmful to specific species in nature and, moreover, impedes the issue of permits for economic activities that emit nitrogen. An initiative was taken several years ago to break through this impasse by introducing the Programmatische Aanpak Stikstof ('programmed approach to nitrogen deposits', PAS). This approach has been adopted to create room for economic development around the Natura 2000 areas in a manner that is not detrimental to nature. The PAS will enter into force within the near future. In December 2014, the central government, members of the provincial executives of the rural areas and a delegation from the Association of Water Boards reached agreement on the implementation of the PAS. The PAS will enter into force on 1 July 2015.

3.4 **Agricultural nature management**

During the period from 1 January 2013 to 2014, the area under agricultural nature management within the National Ecological Network declined by more than one-quarter from some 16,000 hectares to 11,400 hectares. This decline is primarily due to the non-renewal of expiring contracts pending the introduction of the new system for agricultural nature management.

The degree to which the area of agricultural nature management outside the National Ecological Network has changed was not known at the time of the publication of this



report (in mid May). The Agricultural Economic Report 2014 stated that about 58,000 hectares of land were under agricultural nature management on 1 January 2013, of which some 16,000 hectares were inside the National Ecological Network and almost 43,000 hectares were outside the Network.

Collective agricultural nature management begins to acquire shape

As from 2016, the Ministry of Economic Affairs intends to organise the agricultural nature management that is jointly financed by the second pillar of the Common Agricultural Policy solely with the assistance of farmers' collectives. The provinces will acquire a directive role in which they draw up a nature management plan that specifies which targets are to be achieved in which regions: the collectives will then be invited to submit management plans to the provinces which specify the manner in which they intend to achieve the targets on their land.

Some 40 regional farmers' collectives were formed in 2014, usually on the merger of a number of *Agrarische Natuurverenigingen* ('agricultural nature associations,' ANVs). In addition to drawing up management plans, the collectives also need to conclude contracts with their members, make arrangements for inspections and the enforcement of compliance with the contracts and make arrangements for payments. The collectives are responsible for the organisation of their accounting systems.

The collectives must submit their draft management plans to the provinces by no later than 1 June 2015. An issue of relevance to the draft management plans of the collective is the approach to the expenditure of the management funds – i.e. a 'broad' or 'narrow' approach – which will be an important point for discussions: will the funds be allocated throughout the entire management area of the collective or, conversely, will they be allocated to a limited number of key areas?

There is still a great deal of uncertainty about the monitoring and evaluation of the collectives' agricultural nature management: although, for example, the collectives' management plans will need to be subjected to an ecological review, it is not clear how this review should be conducted or by whom. Pursuant to the division of responsibilities the provinces are responsible for monitoring policy and the collectives are responsible for monitoring the results, but the necessary baseline measurement has not yet been carried out by all collectives.

3.5 **Agricultural and water policy**

The *National Water Plan 2009-2015* and the *Draft National Water Plan 2016-2021* have been drawn up with the objective of implementing sustainable water management. These plans also include the targets of the EU Water Framework Directive for the quality of surface water and groundwater. The Government is seeking cooperation with the business community for the achievement of these national water objectives. Within this



context, the Dutch Federation of Agriculture and Horticulture (LTO) has taken the initiative for a Deltaplan Agrarisch Waterbeheer ('water management for agriculture delta plan,' DAW). The DAW intends to make a contribution both to the achievement of the water objectives in agricultural regions, such as the reduction of the leaching and washing away of nutrients and crop protection agents, and to the development of an economically strong and sustainable agricultural sector that will in turn reduce the probability of the future implementation of more stringent statutory regulations.

The DAW specifies three ambitious targets: (i) 80% of the current problems with the water quality caused by the leaching and washing away of nutrients and crop protection agents used by the agricultural sector must be resolved by 2021 and 100% by 2027; (ii) in 2021, the supplies of agricultural water will be secured throughout the country by means of the economic use of water at business level, the optimum conservation of water at area level and the improved buffering of fresh water at national level and (iii) the improvement of the agricultural production potential at regional level by an average of 2% per annum by means of regional processes, new spatial instruments and innovative technologies.

The implementation of the DAW will require intensive cooperation between the agricultural business community and water boards to resolve the bottlenecks in the pollution of water with manure or crop protection agents, salinisation, floods and droughts. Within the agricultural sector the DAW will focus on farmers growing open field crops (potatoes, cereals, forage, field vegetables, flower bulbs, trees and fruit) and on the pasture based livestock farming sector.

Farmers participate in the non-statutory DAW measures on a voluntary basis

The DAW relates to the implementation of non-statutory measures in which farmers participate on a voluntary basis. They will participate only when they expect to acquire a business gain from the measure or a quid pro quo such as financial compensation, a grant, savings on costs or room for the development of their farm. This quid pro quo can also consist of non-financial compensatory measures by the water boards or land administrators, such as regional water storage and supplies of fresh water.

The DAW initiatives will create support among farmers and water authorities for the resolution of problems with the water quality. In the longer term, this will retard increases in water board charges as a result of the obviation of the need to implement costly water management measures or make drastic policy adjustments.

Agriculture and the environment

4.1 Crop protection

Sales of crop protection agents have fluctuated around 10 million kg of active ingredient per annum for many years. In 2013, the sales amounted to 9.9 million kg of active ingredient, 12.5% lower than in 2012 (Table 2). This was largely due to the cold and, consequently, slow beginning of the cultivation season that also retarded the development of diseases and infestations. Nearly 40% of the products are fungicides. In years with damp summers fungal outbreaks are more severe than in dry years, as was the case in 2013.

About 98% of the total Dutch sales of protection agents is destined for the agricultural and horticultural sector. The remainder is used by private individuals and managers of public parks. These are often weed killers.

In addition to use, the environmental impact of crop protection agents is also an important factor. Surface water is much more susceptible to the environmental impact of crop protection agents as compared to groundwater and soil. The total environmental impact of crop protection agents (expressed in environmental impact points) fell during the period from 2007 to 2010, increased in 2011 and then declined in 2012, but has not yet fallen below the level of 2010. Alongside the use expressed in kg active ingredient, the environmental impact per kg of active ingredient is also of importance: the environmental impact per kg of active ingredient has declined for many years due to the continual elimination of ingredients with a relatively high impact.

Policy

The Ministry of Economic Affairs presented the *Second Memorandum on Sustainable Crop Protection* in May 2013. The Memorandum expresses the ambition for 2023 to achieve a 90% reduction of the number of transgressions of the environmental quality standards of surface water from the level in 2013. Although an ex ante evaluation has revealed that this general ambition is 'feasible and affordable', it has also revealed that specific supplementary measures will be required, in particular for farm emissions and problem substances. The affordability could, however, be a problem for individual sectors or businesses.

	2000	2005	2010	2011	2012	2013
Use of crop protection agents (in million kg of active substance)	11.38	10.71	9.6	10.95	11.36	9.94
Greenhouse gas emissions (in billion kg CO ₂ equivalents)	26.5	24.4	27.2	25.6	25.0	24.2
Surplus of nitrogen (N, kg per hectare)	183	154	113	108	109	101
Surplus of phosphates (P ₂ O ₅ , kg per hectare)	57	45	31	18	10	12
Ammonia emissions (in million kg)	182	160	144	138	135	134

Sources: Plant Protection Service; RIVM/CBS (Statistics Netherlands), Milieucompendium, various years.

4.2 Energy and climate - greenhouse horticulture

The Dutch greenhouse horticultural sector is working on the energy transition required to achieve the climate and energy targets. The greenhouse horticultural sector and the government have agreed on targets, ambitions and emission allocations for the sector's CO₂ emissions, energy efficiency and share of sustainable energy.

The greenhouse horticultural sector's CO₂ emissions relate both to emissions resulting from cultivation and to the CO₂ emissions from combined heat and power plants resulting from the generation of power for sale on the market. Sales of combined heat and power plant power increased sharply in the years from 2005 to 2010, which also resulted in an increase in the total CO₂ emissions.

In 2013, total CO₂ emissions fell to 6.8 Mtonnes, 0.6 above the CO₂ emission allocation for 2020 (Table 3). CO₂ emissions resulting from cultivation decreased to 4.9 Mtonnes, 1.9 Mtonnes (28%) below the level in 1990 and 0.9 Mtonnes below the target for 2020.

Stabilisation of energy efficiency, increase in share of sustainable energy

In 2013, the primary fuel consumption per unit of product deteriorated by 1 percentage point, although still 56% lower than in 1990 (Table 3). This, in other words, indicates that the greenhouse horticulture sector consumed 56% less energy per unit of product in 2013 as compared to 1990. As a result, the energy efficiency is now just 1 percentage point from the 2020 target of 57%.

In 2013, the share of sustainable energy increased to 2.9% (Table 3). As this is still more than 17 percentage points from the 2020 target (20%), the achievement of this target would not appear to be feasible.



Table 3 **CO₂ emission resulting from cultivation and total, energy efficiency and share of sustainable energy glass horticulture, 1990-2013**

	1990	2000	2005	2010	2011	2012	2013 (v)	Target 2020
CO ₂ emission resulting from cultivation (mio ton) ^a	6.8	6.6	6.1	5.8	5.2	5.0	4.9	6.2
CO ₂ emission total (mio ton) ^{a b}	6.8	6.7	6.5	8.1	7.4	6.9	6.8	5.8
Energy efficiency (index)	100	84	67	43	43	43	43	44
Share of sustainable energy (%)	-	0.1	0.5	1.9	2.1	2.4	2.9	20

a CO₂ emission resulting from cultivation is total CO₂ emission minus CO₂-emission of the sale of electricity;
b use of energy per unit of product in 2013 as compared to 1990.

Source: Van der Velden en Smit.

4.3 Energy consumption of other agricultural sectors

The energy policy for the agricultural sectors other than the greenhouse horticultural sector is laid down in the *Clean and Economical Agro Sectors Covenant*. This Agro Sectors Covenant - drawn up by the Dutch government in cooperation with the relevant agricultural sectors - specifies targets for energy consumption and savings, energy from sustainable sources, wind energy and greenhouse gas emissions, with the associated action plans.

Supplementary targets for the dairy farming sector, for 2020, have been laid down in the *Sustainable Dairy Chain initiative*. These relate to four themes, namely climate and energy, animal health and animal welfare, pasture grazing and biodiversity and the environment. The Sustainable Dairy Chain initiative was taken by the dairy industry (Dutch Dairy Association) and dairy farmers (Dutch Federation of Agriculture and Horticulture).

Energy saving measures

The energy efficiency target for all sectors for the 1990-2020 period is an efficiency improvement of at least 2% per annum. The sectors other than the greenhouse horticultural sectors (arable farming, open field horticulture and livestock farming) also have a supplementary target which stipulates a 60% reduction of the direct energy consumption in the period between 1990 and 2020. The sectors have now achieved a 15% reduction and will need to make substantial efforts if they are to achieve the 60% reduction target in 2020. The dairy farming sector was the sector that consumed the most fossil energy in 2012 (more than 35%) of the arable farming, open field horticulture and livestock farming sectors, followed by the open field holdings (arable farming and open field horticulture) and intensive livestock farming holdings (both about 24%).

Sustainable energy: consumption and production

The Agro Sectors Covenant specifies 2020 targets for the production of energy from sustainable sources by sector. The targets for the arable farming, open field horticulture



and livestock farming sectors relate to the supply of biomass expressed in terms of the supply of biogas from fermentation (48 PJ), the production of wind energy (12 PJ), the incineration of poultry manure (2 PJ) and the in house production and use of electricity (solar energy) (1 PJ).

In 2012, the primary arable farming, open field horticulture and livestock farming sectors produced 5 PJ of biogas, 10% of the 2020 target. The production of wind energy at primary agricultural holdings owned by the business or leased from the owners amounted to more than 11 PJ, of which 4 PJ from wind turbines owned by an individual agricultural holding. Consequently, although it would appear that progress is being made in the production of wind energy, the absence of information about the title to the wind turbines complicates the assessment of the feasibility of achieving the target of 12 PJ from wind energy.

4.4 Greenhouse gas emissions by the arable farming, horticulture and livestock farming sectors

Pursuant to the Kyoto Protocol, the Netherlands is governed by a greenhouse gas emission reduction target of an average of 6% in the years from 1990 to 2010. In 2007, the European Commission formulated a 2020 reduction target of at least 20%, and preferably 30%, from the levels in 1990. The Dutch Coalition Agreement of 2010 includes this target as one of the Coalition Government's ambitions.

The Agro Sectors Covenant implements the Kyoto Protocol by specifying emission reduction targets by sector and type of greenhouse gas. The 2020 target for the arable farming, horticulture and livestock farming sectors stipulates a reduction of the emissions of methane and nitrous oxide of between 25 and 30% (4-6 Mtonnes) from the levels in 1990. This target reduction was achieved in 2013 (Table 2), albeit entirely due to the reduction of emissions of nitrous oxide. The 2013 increase in methane emissions was due to the increase in the number of dairy cattle. The reduction in nitrous oxide emissions was largely due to the decline in direct emissions that was in turn due to the reduced application of artificial nitrogen fertiliser. Methane emissions will probably increase in the coming years following the abolition of the milk quota system.

The carbon dioxide reduction target for all agricultural and horticultural sectors stipulates a reduction of 3.5 Mtonnes. To date, carbon dioxide emissions have actually increased since 1990, due to the increased consumption of energy.

The emissions of the various types of greenhouse gases cannot simply be totalled: they first need to be converted into CO₂ equivalents using the conversion factor for each type of gas. The IPCC adjusts these conversion factors at periodic intervals (1997, 2007 and 2013). However, the reduction targets as specified in the Agro Sectors Covenant are defined relative to the levels in 1990. For this reason, the emissions listed in Table 2 are presented on the basis of the IPCC 1997 conversion factors to provide for comparisons of the actual reductions.

4.5 Manure and minerals

In 2011, the Government stated that it intended to give the manure policy shape by adopting a triple track approach, namely (i) a sustainable balance between manure production and manure disposal by means of obligatory manure processing and the guaranteed disposal of the remaining surplus, (ii) measures to reduce unnecessarily high quantities of phosphorous and nitrogen in feed and (iii) the recognition of high-quality products made from animal manure as artificial fertiliser replacement.

Manure and mineral production

The nitrogen produced by the Dutch livestock fell by 30% to 417 million kg in the years between 1990 and 2005, and thereafter fluctuated at around 420 million kg. In 2013, the calculated nitrogen surplus per hectare (the difference between supply and removal) was almost 40% lower than the surplus in 1970. The nitrogen surplus fell by more than 60% from the level in the record year of 1986.

The phosphate production from animal manure fell by 25% to 170 million kg in the years between 1990 and 2005. After 2005, phosphate production rose due to an increase in the number of animals to 179 million kg in 2010, 6 million kg above the production ceiling the Netherlands has agreed with the EU. For this reason, the government, the Dutch Organisation for Agriculture and Horticulture and the Dutch Feed Industry Association concluded a covenant for the reduction of the quantity of nutrients in manure by 20 million kg, a reduction to be achieved by the implementation of feed measures in what is referred to as the 'feed track'. The measures implemented pursuant to the agreements resulted in the decline of phosphate production to 166 million kg in 2013. In recent years, the phosphate surplus per hectare was more than 80% below the level in 1970 - and 90% below the level in the record year of 1986.

Obligatory manure processing

The obligatory manure processing system entered into force on 1 January 2014. Entrepreneurs who produce more phosphate on their holding than they apply within the usage standards are under the obligation to process or arrange for the processing of part of the phosphate surplus. The amount of the obligatory part of the manure processing is laid down once a year. The exact amount of the obligatory part depends on the full or partial achievement of the 'feed track'. In 2012, the dairy farming sector achieved half of the 'feed track' target and the pig farming sector two thirds. The obligatory manure processing percentages for 2015 are - depending on the degree to which the 'feed track' is achieved - set 20 to 35% too low for the achievement of an acceptable balance in the manure market. The Ministry of Economic Affairs has granted the parties a few more years to achieve a balance between supply and demand according to manure processing capacity. In 2016 and 2017, the percentages will, in

consultation with the sector, be increased gradually to achieve a balance in the manure market in 2017. In 2014, the actual manure processing was estimated to amount to 35 million kg of phosphate, about 5 million kg of phosphate higher than the obligatory amount for 2015.

4.6 **Ammonia**

Dutch ammonia emissions continue to fall. New insights and the addition of sources have resulted in more accurate calculations of ammonia emissions from the 2012 calculation year. This has resulted in the upwards adjustment of the ammonia emissions by 15 kilotonnes for each year in the period from 1990 to 2013. As a result, the emissions in 2013 were 6 kilotonnes higher than the maximum of 128 kilotonnes specified by the European Union since 2010. The resultant consequences for the agricultural sector are not clear at present.

4.7 **Global risks of animal diseases**

The Dutch livestock farming sector must be continually alert to prevent the introduction of animal diseases. African swine fever (ASF), for example, is a serious disease that can cause great harm to the sector. The greatest risks of the introduction of ASF arise from inadequately-cleaned cattle transport trucks and imports of meat products from high-risk regions in Eastern Europe. Other infectious animal diseases that gave cause to great alertness in the past year were Porcine Epidemic Diarrhoea (PED) and Avian Influenza (AI).

Outbreaks of PED have caused a great deal of harm to US cattle farmers since April 2013. A mild variant of PED has been seen in the Netherlands and a number of other European countries since November 2014. PED is a highly infectious disease that can be spread by anything and anyone bearing even a tiny speck of manure. Analyses of the US PED epidemic have revealed that collection points and abattoirs pose a risk and that birds can infect feed stored outdoors. Consequently, measures focused solely on clean cattle transport trucks and 'clean' visitors are inadequate. The Animal Health Service recommends stringent hygiene measures including thorough pest and fly control measures and the use of appropriate covers to protect feed stored in open trench silos from birds and pests.

Avian Influenza (AI) is a serious animal disease than can, like African Swine Fever, cause serious loss. The virus can be introduced into the Netherlands by migrating birds and by legal or illegal imports of ornamental birds. The virus can be dispersed by means including contact with infected material, pests or dust blown from infected sheds.

Structure of the agricultural and horticultural sector

5.1 Number of holdings

In 2014, the number of agricultural and horticultural holdings fell by almost 2,000 to 65,500 (Table 4). This 2.9% decline is virtually in line with the average annual decline since 2000. Once again, the decline in the number of holdings in the various sectors varied greatly, ranging from a limited decline in the dairy farming sector (1.1%) to a substantial decline in the greenhouse horticulture sector (7.5%). This development is in line with a longer-term trend based on the dependency on land: the decline in the number of holdings is inversely influenced by their dependency on land. The number of holdings in the sectors that are relatively or fully independent of land - horticulture, greenhouse horticulture and intensive livestock farming - has declined by 53% since the turn of the century, in contrast to the decline of no more than 21% in the number of holdings in the land based sectors - arable farming and grazing livestock farming (including dairy farming) - during the same period. Since 2000, the trend towards specialisation has resulted in a decline in the number of combined (mixed) holdings of no less than 60%.

The sharp decline in the number of holdings in the less land based sectors in the years since 2000 is in part due to environmental and animal welfare policy (buy-up schemes and mandatory investments) and market developments (potential sales markets and prices). The land based sectors have, in general, benefited from better market conditions, which has resulted in incomes that are, on average, reasonable: moreover, the prospects for holdings in these sectors are favourable, in part due to the abolition of the milk quotas.

The decline in the number of agricultural and horticultural holdings is largely due to their more or less voluntary termination on passing to the next generation. The compulsory winding up of insolvent businesses is still rare.

In 2014, the number of certified organic agricultural and horticultural holdings increased net by more than 60 to just over 1,500. In 2014, the area of land in used by certified organic agricultural and horticultural holdings increased by 1,200 hectares to 57,300 hectares. This is equivalent to 3.1% of the total area of land under cultivation (2000: 1.7%). The large majority of the organic cultivation land is allocated to the cultivation of grass and fodder crops (73%), as well as to the cultivation of potatoes, fruit and vegetables (12%) and cereals (9%).

Table 4 Development of number of holdings, number of workers and area of farmland from 2000 onwards

	2000	2005	2010	2013	2014
Number of agricultural and horticultural farms (x 1,000)	97,389	81,750	72,324	67,481	65,507
Number of workers (x 1,000)	280.9	235.7	212.0	193.0	190.0
Area of farmland (x 1,000 ha)	1,975.5	1,937.7	1,872.3	1,847.6	1,839.0

Source: CBS (Statistics Netherland) agricultural census, processed by LEI.

Number of animals

In 2014, the cattle herd increased to more than 4 million animals, an increase due to the developments in dairy farming. In the period from the introduction of the milk quota system in 1984 to 2007, the dairy cow herd declined from 2.5 million to 1.4 million, and following the expansion of the milk quota increased again to 1.6 million on 1 December 2014 (several months prior to the abolition of quotas). This is equivalent to a 14% increase: during the same period, the number of young stock for milk production increased by 20%.

During the past year the total number of other grazing animals declined by about 4%, largely due to the decline in the number of sheep. In the years after the introduction of the milk quota system, the number of sheep grew rapidly from 0.8 million to almost 2 million in 1992. However, following the manure legislation and the reduction of the support provided for ewes (subsequently incorporated in the farm payments system) the number of sheep has since declined again to less than one million. The number of goats, which has increased virtually every year, increased by approximately 10,000 to 430,000 in 2014. The last interruption in this growth was in 2009 and 2010, on the outbreak of Q fever and the subsequent goat culls.

5.2 Labour

The total number of persons who are regularly at work in the primary agricultural and horticultural sector declined by 1.7% to 190,000 in 2014 (Table 4), a decline which is slightly lower than the average annual decline of 2.7% since 2000. This figure includes workers who are or are not members of the family on the holding. In 2014, the number of family workers amounted to almost 58,000, one third of whom were women. These figures do not include the group of temporary workers - workers from temporary employment agencies or with temporary contracts of employment - who account for an increasingly greater share of horticultural labour: estimates indicate that their share increased from 37% in 2000 to 66% in 2011. However, the permanent employees usually have year-round jobs whilst temporary workers, in particular in the open field sectors, are called in solely during peak periods. As a result, it is difficult to determine the total number of temporary workers.

Another measure of the amount of employment provided by the agricultural and horticultural sector is the labour volume, which expresses the number of jobs in terms of full-time jobs. The agricultural and horticultural sector uses the annual labour unit (ALU) for this purpose, where 1 ALU is equal to one full time year round job. During the past year the labour volume declined by 2.2% to almost 158,000 ALU, although this key figure does include some temporary labour.

5.3 Land

During the past year the total area of agricultural cultivated land in use by the registered agricultural and horticultural holdings declined by 14,000 hectares (0.5%) to 1.84 million hectares (Table 4). The area allocated to cereals and, to a lesser extent, to silage maize, has fallen sharply whilst the area in temporary use as grassland has increased sharply. These shifts are the result of the more stringent grassland requirement governing derogation holdings (80% grassland rather than 70%), the abolition of the milk quotas and the more stringent manure legislation.

Arable farming has exhibited the greatest shift in the use of land since the turn of the century, with an 18% decline in the area from 117,000 hectares to 517,000 hectares in 2014. The poor economic conditions for the greenhouse horticulture sector in recent years have resulted in a decline in the area used by this sector of about 750 hectares (more than 7%) in the past three years. Of the total area of cultivated land, 54% is in use as grassland (permanent, temporary and natural), 13% for green fodder crops, 28% as other arable land, 5% is for open field horticulture and 0.5% for greenhouse horticulture.

Slight increase in agricultural land prices

The average price of Dutch agricultural land increased to about 55,000 euros per hectare in the fourth quarter of 2014. Land prices have increased slightly since the third quarter of 2013, after a number of quarters in which the price fluctuated at around 50,000 euros per hectare.

5.4 Capital

The average value of Dutch agricultural and horticultural holdings increased from 2.1 million euros in 2009 to 2.7 million euros in 2014, primarily due to the increase in the average size of the holdings and the increase in land prices. In 2014, the average value of land based holdings was higher than that of non land based holdings. Arable farms have the highest balance sheet total, on average 3.6 million euros per holding.

Solvency of the pig farming and greenhouse horticulture sectors has declined

Both the balance sheet totals and the manner in which the assets are financed varies greatly between holding and types of holdings. On average, about two thirds of the balance sheet total is financed with equity capital. On average, land based holdings employ more equity capital than non land based holdings. The annual formation of equity capital of agricultural and horticultural holdings takes place on the basis of the revaluation of the holding's assets and other movements resulting from savings, legacies received and other movements in assets.

The increase in the equity capital of arable farms and dairy farms has been greater than the increase in external capital during the past five years, which has resulted in their solvency increasing by 80% and 70% respectively. The solvency of holdings in the greenhouse horticulture and pig farming sectors declined by 33% and 51% respectively in 2014. It is important, from a risk management perspective, for holdings to possess an adequate financial buffer to absorb fluctuations in income. Holdings with a low solvency are very susceptible to fluctuations of this nature. Although the equity capital of pig farming holdings has increased in the past five years, their expansion and modernisation investments have been financed more with external capital than equity capital. The decline of the solvency of holdings in the greenhouse horticulture sector is due to the mediocre economic results during the past years that compelled the holdings to draw on their reserves and to the decline in the price of horticultural land. It should be noted that the balance sheet total of holdings in the greenhouse horticulture sector has been declining since as early as 2010. A substantial portion of the liabilities of this sector are current liabilities (almost 20%), often relating to invoices for the procurement of plant material that is delivered in the autumn and which are settled in the spring when the holding receives its first income from crops in the next year.

Results and investments in the agricultural and horticultural sector

6.1 The sector's income

In 2014, the Dutch primary agricultural and horticultural sector's gross production value was estimated to amount to more than 27 billion euros, almost 3% lower than in 2013. This decline was largely due to lower prices. The volume of the total production increased slightly, largely due to increased production in the arable farming (sugar beet +13% and potatoes +4%) and in the intensive livestock farming (poultry meat +6% and eggs +3%) sectors. The prices of virtually all arable farming products - cereals, potatoes and sugar beet - declined sharply by almost 20%.

The value of the procured goods and services purchased decreased more than the increase in production value. This decrease was virtually entirely due to lower prices, in particular of feed (-9%) and energy (-7%). In 2013, energy prices had still been more than 6% higher than in 2012. In 2014, the terms of trade deteriorated as output prices fell more sharply than the prices of procured products and services. Productivity, conversely, increased on the rise in output volume at virtually unchanged input volumes.

On balance, these developments resulted in an growth in the gross added value of slightly more than 2% as compared to 2013. As both depreciation changes and the balance of levies and grants increased in 2014, the net added value decreased by more than 4% to 6.9 billion euros. Although the number of workers in the agricultural and horticultural sector declined in 2014, the cost of labour per worker rose in the same year. However, the total of the factor costs (wages, interest charges and leases) fell due to the very low interest rates and, as a result, the lower interest payments. The aforementioned developments resulted in an 8.5% decline in remaining income.

Income generation

The estimates indicate that after two very good years (2012 and 2013) the operating income of the average holding in the agricultural and horticultural sector will decline in 2014 (Table 5). This decline is largely due to the deterioration of the results in the arable farming, pig farming and fruit farming sectors caused by the lower output prices. The estimates indicate a substantial improvement of the income of holdings in the somewhat smaller sectors - in terms of the number of holdings - such as the poultry farming and milk-goat farming sectors. A slightly higher income is forecast for holdings in the largest sector, the dairy farming sector, on the basis of increases in milk output and lower feed prices.

The declines in output have been accompanied by, on average, lower costs, in particular of feed and energy. The estimated nominal income for 2014 is, notwithstanding the decline, still significantly higher than the average since 2001. However, this operating income is now generated by much larger holdings following the disappearance of many smaller holdings.

In 2014, the output returns of 528,500 euros yielded an operating income of about 52,000 euros, almost 10%. The percentages included in the figures for the five year averages were more than 13% in the 2001-2005 period and just under 12% in the 2006-2010 period. Consequently, although income has increased in absolute terms, a larger proportion of the output revenue has been allocated to costs - or, in other words, the margin has narrowed. Prices then play a role to some extent: for example, although the prices of feed and energy were lower in 2014 than in 2013, they were still above the prices at the turn of the century.

Revenue other than output revenue also plays a role in operating income. Most of this revenue is in the form of grants (largely farm payments) and other income including the income from diversification activities such as care farming, agricultural childcare, recreation, agricultural nature management, farm education and farm retail sales. These items jointly account for between 8 and 10% of the total revenue, although the percentage varies greatly between holdings. The most recent multifunctional agriculture turnover measurements reveal that diversification activities generated turnover of about 500 million euros in 2013, slightly more than in 2011. The importance of non-agricultural revenue is relatively higher in years with lower operating results, such as 2011, than in years with better operating results.

Table 5		Results (x 1,000 euros per holding) on the average agricultural and horticultural holding, 2001-2014					
		2001-2005	2006-2010	2011	2012	2013	2014(p)
Gross returns	(+)	275.0	388.1	493.8	529.0	543.0	528.5
<i>of which agricultural production (%)</i>		95.0	90.9	90.5	91.5	91.6	91.7
<i>subsidies (%)</i>		3.0	4.7	4.4	4.1	3.8	3.9
<i>secondary activities (%)</i>		2.0	4.4	5.1	4.4	4.6	4.4
Paid costs and depreciations	(-)	239.1	345.3	452.8	465.6	482.5	477.0
Special benefits and charges	(+)	1.0	-0.5	0.0	0.0	0.0	0.3
Operating income	(=)	36.9	42.3	41.0	63.4	60.5	51.8
Idem per unpaid labour force unit		25.8	29.5	28.3	43.9	42.6	36.5
Income from outside the farm	(+)	11.8	19.1	19.7	21.2	18.5	18.2
<i>of which labour</i>		5.7	9.0	10.1	8.8	8.2	8.0
<i>other income</i>		6.1	10.1	9.6	12.4	10.3	10.1
Total income	(=)	48.7	61.4	60.6	84.6	79.0	70.0

Source: Farm Accountancy Data Network.

In addition to operating income from the holding, most holdings also have income from outside the farm, i.e. external income. In 2013, this external income amounted to an average of 18,000 euros per holding (Table 5). External income can, roughly-speaking, be subdivided to three components: labour, investments and social benefits. Although labour, amounting to about 8,000 euros per holding, is important, the contribution labour makes to external income exhibits a declining trend. As for other income sources, there are great differences in labour income between holdings.

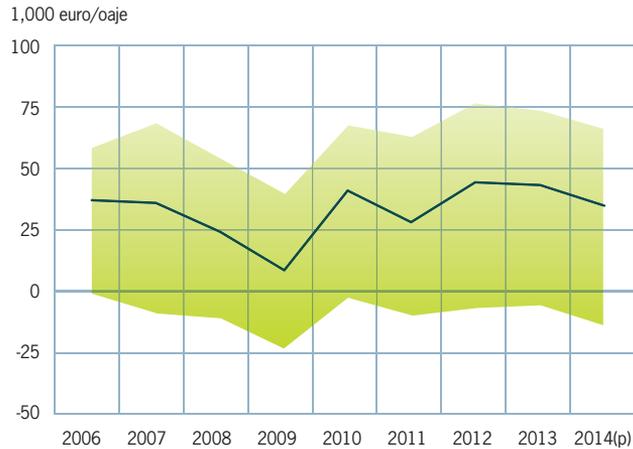
Income distribution

The operating income varies greatly between holdings, in part due to differences in the size and organisation of holdings, as well as in their labour efficiency and entrepreneurship. The sector in which the holding is active also plays a role when making comparisons in a given year. 2013 was, for example, a very poor year for tomato growers: these holdings then belonged to the group with low incomes, in contrast to the situation 2014, when the high tomato prices brought them into the group with the highest incomes. Comparisons of the operating results of holdings of different sizes are simplified by expressing the income in euros per unpaid annual labour unit (ALU). The reimbursement - the income - is then linked to the input of labour for which the remuneration is received. On average, holdings have 1.4 unpaid ALU, a number that has remained fairly constant over the years. These unpaid ALUs are the entrepreneurs, their partners and other unpaid members of their families. On smaller holdings the labour input can be smaller than 1 ALU.

Figure 2 shows the variation in income per unpaid ALU between holdings. The figure shows both the average (the curve) and the distribution (the area). In any given year, 60% of the holdings record an income which lies within the coloured area. Twenty percent of the holdings record an income below the lower value of that area (2014 (p): lower than about -9,000 euros) and an equally large group record an income above the higher value of the area (2014 (p): higher than about 68,000 euros). In 2014, the group of the 20% of the holdings with the lowest income included a relatively high proportion of pig farmers and fruit and cucumber growers, whilst the group of the 20% of the holdings with the highest income included pot plant growers and goat and broiler farms. Within a given type of holding, many holders maintain a relatively fixed position relative to other holdings: good entrepreneurship then often ensures that the best stay the best.

Figure 2

Development and variation in operating income ^a per unpaid annual labour unit, 2006-2014



a The curve shows the average, the area the distribution of the operating income.

Source: Farm Accountancy Data Network.

6.2 Sustainable investments - innovation

The Ministry of Economic Affairs makes grants available and offers fiscal schemes to provide incentives for sustainable investments. Annual calculations are made of the share of sustainable investments - investments that make use of the schemes and grants that promote and provide incentives for sustainability - in the total investments in sheds, greenhouses, machines and installations.

In 2013, 36% of the investments were sustainable investments. One year earlier this had been just 27%. As the target is 30% in 2015, the target was achieved by an ample margin in 2013. This was largely due to the 18% decline in total investments to 2.7 billion euros, and to the increase in sustainable investments. Investments fell in most categories, in particular in buildings. Conversely, investments in machines, machinery and installations increased. In 2013, total sustainable investments increased by 10% to almost 1 billion euros. Only a very small part of these sustainable investments related to the fisheries (about 25 million euros).

Innovation remains largely unchanged

In 2013, 1.7% of the holdings in the agricultural and horticultural sector could be regarded as innovative holdings. After a period in which the number of innovators and early adopters fell, the higher level of 2102 has now been maintained. In 2013, 14.2% of holdings in the agricultural and horticultural sector were either innovators or early adopters. This percentage fell just short of the Ministry of Economic Affairs' target of 15% for 2013. However, the arable farming, greenhouse horticulture and pig farming sectors did achieve the 15% target.

Innovations can be classified into a number of categories such as product and process innovations. In 2013, the largest number of product innovations that were implemented related to the development of new cultivars in the ornamental plant sector. Examples of process innovations implemented during this same year include innovations relating to sustainable energy, the introduction of milking and planting robots and the use of GPS-controlled equipment for precision agricultural farming.