

AGRICULTURAL DEVELOPMENT IN THE NETHERLANDS
An analysis of the history of Dutch agricultural development and its
importance for China

July 1998

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ABBREVIATIONS

LEI-DLO	Agricultural Economics Research Institute in the Netherlands
DLO	Agricultural Research Department
LNV	Ministry of Agriculture, Nature Management and Fisheries in the Netherlands
EU	European Union
EC	European Community
VNO-NCW	Confederation of Dutch Employers
TFP	Total Factor Productivity
AWU	Annual Work Units
ECU	European Currency Unit
CPB	Central Planning Bureau in the Netherlands
CBS	Statistics Netherlands
SDU	
NSU	Netherlands Size Units
NLG (f)	Dutch guilder
NCR	National Cooperative Council for Agriculture in the Netherlands
VOC	
OECD	Organization of Economic Cooperation and Development
NATO	North Atlantic Treaty Organization
ALGF	Agricultural Loan Guarantee Fund in the Netherlands
VECO	Union of the Netherlands Seed, Seed Potato and Trade Potato Marketing
STOPA	Surplus Buying Agency in the Netherlands
LTO	Dutch Federation of Agricultural and Horticultural Organizations
WTO	World Trade Organization
AUW	Agricultural University in Wageningen in the Netherlands
DLV	Agricultural Extension Service in the Netherlands
SEV	Social-economic Advisory Service in the Netherlands
ADRF	Agricultural Development and Reorganization Fund in the Netherlands
CAP	Common Agricultural Policy of EU

PREFACE

In November 1995 the Chinese Minister of Agriculture, Mr. Liu Jiang, and his Dutch counterpart Mr. J.J. van Aartsen agreed on a Letter of Intent of Agricultural Cooperation between both ministries. Part of it was an Agreement between the Chinese Academy of Agricultural Sciences (CAAS) and the Netherlands Agricultural Research Department (DLO-NL) on cooperative research in agricultural economics. On the basis of this Agreement the Institute of Agricultural Economics (IAE-CAAS) and the Agricultural Economics Research Institute (LEI-DLO) have formulated three joint research projects. One is 'On the experience of Holland Agricultural Development and its importance to agriculture in the People's Republic of China'.

The two major objectives of these projects are:

- a) to reveal the causes of the large difference between agricultural productivity in China and the Netherlands and to find ways to improve the efficiency of Chinese agriculture;
- b) to analyse the developments in Chinese agriculture with special reference to market opportunities for Dutch agribusiness.

The project will start with some basic reviews on the development of agriculture in the Yangtze Delta since 1978 and in the Netherlands in the last century.

Prof. Dr. Feng Haifa, assistant director of IAE-CAAS, and visiting scholar at LEI-DLO from November 1996 to May 1997, has written a report called 'On Dutch Agricultural Development'. This review has proven to be an excellent step in the project. Even for Dutch readers it will be interesting to learn from the developments in the past. Prof. Feng referred to one of three famous Chinese expressions to illustrate this: 'Taking history as mirror, the ups and downs can be understood correctly.' It is evident and of great relevance to learn from past developments.

Looking for the effect of different economic, social and institutional factors in different stages of agricultural development opens the opportunity to learn from successes and failures. It is clear, also from this study, that there is never just one single factor involved. From the Dutch experience it is also clear that the agricultural development is a never ending story and therefore its adjustment is a constant issue. Nevertheless, it is challenging for agricultural economists to provide relevant information to policymakers, farmers and agribusinesses to prepare for their decisions and actions. We expect that the results of the project will provide an important contribution to the benefits of both nations. The questions to be answered in this project challenge Chinese as well as Dutch scientists.

It has been a real honour and pleasure for LEI-DLO to have had prof. Feng Haifa as visiting scholar. Thanks to his intensive effort, in only six months he has offered a substantial contribution to the project. In my opinion he has touched the right aspects in Dutch agricultural development. His work consisted of reading reports and consultations with many Dutch experts. I would like to thank all these informants for their efforts.

As said before, this study should be regarded as an important step in the project. Many steps have to follow. Future cooperation with Prof. Feng Haifa and his colleagues will be an interesting and pleasant challenge to all of us.

The director,



L.C. Zachariasse

The Hague, July 1998

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In China, my specialist research area is agricultural development and policy. Besides the research work, I am also a part-time teacher in the Postgraduate School at the Chinese Academy of Agricultural Sciences (CAAS). I teach Development Economics to postgraduates who are majoring in agricultural economics and farm management.

During my research and teaching career, I have read some material on Dutch agricultural development and I already knew that Dutch flowers are very famous in the world. Not for nothing is Dutch net agricultural trade volume second only in the world only to the United States. I have always asked myself why the Netherlands is able to make such great achievements in agriculture and what the underlying factors and the driving force are behind the prosperity of Dutch agriculture. My postgraduate students sometimes asked me to explain these issues, but unfortunately there is little information in print in China about Dutch agricultural development. I can not fully answer these questions, either to the satisfaction of the postgraduates or myself.

Before I set foot on Dutch soil, I only knew that the Netherlands had a very healthy agricultural industry, but what I did not know was why and how Dutch agriculture had become so healthy. The reasons for the successes of Dutch agricultural development are a maze for me, as well as for almost all of the Chinese agricultural economics researchers and agricultural policy-makers. Because China is a large country with the largest developing agriculture in the world, it goes without saying that China will have to speed up agricultural development as much as possible in the near future. And to transform its traditional agriculture into a modern one, China will need to take heed of all the agricultural lessons learned in other countries.

The experience of Dutch agricultural development will without doubt be very useful for China in its journey toward agricultural modernization. So exploring and explaining the miracle of Dutch agricultural success has become one of my most important research goals. I had been longing to visit Netherlands and to analyse the course of Dutch agricultural development, and to translate the Dutch model to the situation in China.

I have now achieved this goal. According to a bilateral cooperation plan between the Dutch Ministry of Agriculture, Nature Management and Fisheries and the Chinese Ministry of Agriculture, I lived in the Netherlands for six months from late November 1996 till late May 1997 as a visiting scholar. Even though six months is not a very long period compared with one's lifetime, and is not enough time for one to reveal the full picture of the experiences of Dutch agricultural development, it did provide me with a good opportunity to drop in on this 'low country' and to investigate its agricultural development. No matter how you count it, whether in months, days or hours, the time I had to complete my work is rather limited. Time is a precious treasure and, as the saying goes, time and tide wait for no man and procrastination is the thief of time. For me, the first important issue is to seize the opportunity and make the best use of the limited time. So I threw myself into the ocean of information and concentrated on the topic which was already at the top of my research agenda as soon as I had stepped onto this beautiful 'low land'. This report is the main result of my visiting research work, and although it is in my opinion by no means perfect, I dare say that it is the fruit of my painstaking labours during my times in the Netherlands.

Although I study the issue of Dutch agricultural development in the Netherlands, I consider it a pity that I do not understand Dutch. Fortunately, even though the Netherlands is not an English-speaking country, almost all Dutch people can understand English and most of them can speak it fluently. What impressed me most is that Dutch farmers can understand and speak English, as this is unthinkable in China. There is abundant literature written in English in the Netherlands, and so I could always find what I wanted. I did not feel any inconvenience during everyday work and life. From this point of view, the Neth-

erlands is an ideal country in which to work and live, not only for its own people but also for any world citizen. The Netherlands is not an English-speaking country, but the English language is so popular in Dutch society that I think this may explain why Dutch agricultural development has succeeded.

It would be absolutely impossible for me to read all the material available on Dutch agricultural development in my limited time. I had to confine myself to the field of how Dutch agriculture has developed and especially the underlying reasons which have made Dutch agriculture a success. I selected as far as possible related materials to read and digest, and I then expressed the processed research result as soon as I could in accordance with my own ideas and beliefs. So my report is based only on selected materials. With regard to the structure of the report, I have given priority to the needs of the Chinese reader so as to be consistent with the main mission of my research visit. However, the report is not intended only for Chinese consumption. The analysis in my report should be helpful to those who are working far away from Western Europe and interested in Dutch agricultural development and may have little immediate prospect of visiting the Netherlands, particularly those in developing countries. And even Dutch readers may learn something from a Chinese view of their agriculture, because in China there is a famous saying: the onlooker sees the game best.

During the course of my research visit, I have been fortunate to receive a lot of support and help, in one way or another, from various people and organizations. Financial support from the IAC (International Agricultural Centre in the Netherlands) is gratefully acknowledged; without this support it would have been impossible for me to visit and stay in the Netherlands. Financial support from LEI-DLO for publishing my work is also gratefully acknowledged, as without it my life in the Netherlands would have been more difficult and my research report would not have been published in English. I would also like to express my thanks for a fellowship granted by LEI-DLO. As the central organization in the Netherlands for socio-economic research into agriculture, horticulture, fisheries, forestry and rural areas, LEI-DLO has first-class facilities and an excellent scholastic climate for research. What I have gained from LEI-DLO is not only information about Dutch agricultural development, but I have also learned how to manage a modern institute, which will help me in my management activities after my return to China.

I am most indebted to Prof. Dr. V. Zachariasse, the Director of LEI-DLO, who not only gave me a lot of help on indoor work and field trips, but also in everyday life. It was Prof. Dr. V. Zachariasse who arranged the comfortable apartment for me despite his very busy schedule. Discussions with him on Dutch agricultural development, institute management and other issues profited me a good deal, his erudition on agricultural economics and farm management gave me a favourable impression, and his probing comments on the draft of my report have contributed greatly to the successful completion of the final version. I shall not forget the marvellous times I enjoyed with him and his wife, viewing the beautiful Dutch landscape during the last weekend before I left the Netherlands.

I am also most indebted to Jaap Post, head of the General Economics and Statistics Department of LEI-DLO, the department where I worked. His careful arrangement allowed my research work to progress smoothly. He also took me to visit farmers and typical Dutch sights by bike at the weekends in spite of his venerable age. We also discussed Dutch agricultural development and other issues and his careful reading and comments on my report draft benefited me a great deal. His kindness, modesty and hospitality impressed me deeply, and I shall not forget the enjoyable times of Christmas Day last year, my first Christmas Day outside China, which I enjoyed in his home.

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Needless to say, I remain responsible for all the views expressed in this report and for any errors and omissions which may remain. I would be glad to hear any comments or criticisms. I shall continue my study of some of the aspects which have perhaps not been explored in detail in this report.

1. INTRODUCTION

1.1 Statement of concern

Agriculture is the cornerstone of a national economy and this is an objective economic law of universal applicability. Mankind could not exist and non-agricultural sectors could not be developed without agriculture. It is quite clear that a modern economy and society cannot be based on a backward agriculture. In today's world there is no lack of examples that show that the national economy of one country is crippled owing to the backwardness of agriculture or to not having paid sufficient attention to agricultural development for its development strategy and plan; but we cannot see any example of an advanced agriculture being accompanied by backward non-agricultural sectors or by a crippled national economy. If agriculture is less developed in one country, it is impossible for an advanced economy and society to be developed, even if in some cases a relatively advanced industry industrial subsector can be developed. However, if there is an advanced agriculture in one country, it follows there must be an advanced national economy and society. The importance of agriculture has determined that more attention has to be placed on agriculture in the course of economic development; agriculture cannot be neglected at any rate in a country's development strategy and plan.

There are differences in agricultural development level among countries. Of course differences in natural endowments, such as climate, location, and soil type, etcetera, play an important role in these agricultural differences. But the experience of world agricultural development has shown that it is the socio-economic institutional resources, such as land ownership and tenure, finance, marketing, education, research and extension systems, and government policy, namely the manmade resources, which have determined the differences in agricultural development level among countries, especially the differences between developed countries and developing countries. The natural endowment is unmoveable, even though the social resources can be transferred from one country to another and from one sector to another. This means that developing countries can overcome their agricultural differences by learning from developed countries. This so-called learning effect in Development Economics has already come into bloom in some developing countries.

China is the largest developing country in the world now, and its agriculture is still very backward compared with developed countries. The most important issue is feeding China's vast population - more than 1.2 billion people¹, nearly a quarter of the total world population. There is no doubt about the importance of agriculture and the need to develop it in China. Nowadays there is increased worldwide concern whether China will be able to feed its people in the next century. According to the projection made by Mr. Lester R. Brown, the Director of World Watch Institute in the United States, in 2030, China's grain production will be 263 million tons, dropping 20% against 1990, whereas China's grain consumption will rise to 641 million tons and there will be a 378 million ton deficit between grain production and grain consumption in China, which amounts to about 60% of the total grain consumption. Nevertheless, world grain exports will be only about 200 million tons, which is far less than the amount needed by China. If China will

¹According to an authoritative projection, China's population will increase steadily in the next three decades. The population will be 1.3 billion in 2000, 1.4 billion in 2010, 1.6 billion in 2030; this is projected as China's peak population. Consequently, it is clear that Chinese agriculture will be confronted with the burden of a growing population.

not feed its people and the world will not feed China either, who will feed China ¹? I believe Mr. Brown's conclusion is a pessimistic one, but it is a good warning for China. It means that if proper attention is not paid to agricultural development, China will face serious problems in its food economy. China has made a magnificent plan for developing its national economy in the next fifteen years. Nevertheless, whether this plan can be executed depends on the level of agricultural development. Only if agriculture has improved, can China reach its established goal well. An improved agriculture will lay a solid foundation for Chinese economic and social development in the next decades, but agricultural deterioration will result in a failed economic development. Nor is this all, since the significance of developing Chinese agriculture soon has already extended beyond China. It is clear that if a big country like China wants to maintain its balance in supply and demand of food by approaching the international market, it will definitely cause a strong fluctuation in international grain market and prices. It might not be a good thing, neither for domestic producers and the finance of grain exporting countries, nor for the food deficit nations.

However, it is no simple task to improve China's agriculture. Undoubtedly, the development of Chinese agriculture must rely on China's own efforts. Using the successful experience of other countries, especially developed countries, however, is indispensable for China: what China generally lacks is not natural resources, but institutional aspects. Generally speaking, China has not established effective institutional systems, such as systems for land use, finance, marketing, cooperation, education-research-extension, structural system and government policy, required for developing agriculture until now. As mentioned before, institutional systems can be transferred from one country to another country, which, of course, is not the case for natural resources. The transferability of institutional systems provides China with an opportunity to use the experience of other countries as a point of reference for agricultural improvement. It also provides a possibility for developed countries to translate their experiences to developing countries.

The Netherlands is a developed country and its agriculture is renowned throughout the world. When foreigners mention the Netherlands, they are bound to mention flowers first, one agricultural sector ². To some extent, the flower is the symbol of the Netherlands because agriculture is a major part of the Dutch economic miracle. The Netherlands has set up successful institutional systems enabling its agriculture to flourish. It is important and necessary to summarize the experience of Dutch agricultural development and apply this experience to China and other developing countries. It is also very significant to derive a new theoretical concept and model from the Dutch experience for Development Economics.

The Netherlands is a very densely populated country. Agricultural development has demonstrated that the more dense a country is, the more successful the economic development, especially in agriculture. Though less dense than the Netherlands, China is also a densely populated country. From this viewpoint, Dutch agricultural development is suitable for China.

Even though Dutch agricultural development is based on a free market economy, it is possible to apply the experience to China because China has given up their centralized planning economy and is striving for a market economy with Chinese characteristics. China has had the soil to grow Dutch experience. There will not be any institutional barriers to introduce the Dutch experience to China.

¹Lester R. Brown, WHO WILL FEED CHINA, World Watch, September/October 1994.

²It is said that there are three treasures in the Netherlands: tulip, windmill, and clogs. These three treasures are all associated with agriculture. Tulip, or the flower industry, is one of the sub-sectors of agriculture; windmills were used to mill grain (agricultural product processing) and to pump water out of farmland; these were important power factors in agricultural production; clogs, being waterproof, are useful for farmers and fishermen alike.

1.2 Objectives of the report

The main objective of this report is to summarize the history of agricultural development in the Netherlands and to apply the Dutch experience to China so as to transform

Chinese agriculture. Another key objective is to derive a new concept from Dutch agricultural development for Development Economics. The objectives of the report are fivefold:

- first, to dissect the Dutch agriculture from a bird's eye view so as to present the major features and symbols of Dutch agriculture;
- second, to analyse the process of Dutch agricultural development from a historical view point;
- third, to summarize Dutch agricultural development based on the features and processes of Dutch agricultural development so as to bring the factors leading Dutch agricultural development to success to light;
- four, to try to derive a new concept about Dutch agricultural development for Development Economics, thereby showing the significance of Dutch agricultural development in Economics;
- five, to apply Dutch expertise in agricultural development to Chinese agriculture, so as to transform it.

The report concerns Dutch agricultural development and its importance to China. The main emphasis is on exploring the development. Ultimately, this report intends to use Dutch experience as a point of reference for optimally transforming Chinese agriculture.

1.3 Approach

An approach is a tool of research. If the approach used is not appropriate, it is difficult to reach the goal. The approach, however, is not omnipotent. The best approach in any research is one which is consistent with the research purpose, not just the most advanced approach. Even though an approach is the most advanced from the point of its own function, it could not be a good one if it does not hold consistent with the purpose of research. My philosophy in selecting a method is that the simpler one is better than the intricate one if they both have the same result. Simple methods functioned better than intricate methods in many research programmes which have already been carried out. In socio-economic research, we should not fall into the trap of using a method for the method's sake.

This report is mainly based on desk research. Abstracting scientific concepts and the essence in things from their outward appearance, is the fundamental approach I have used. Comparison as a research method is continually used in this report.

No modelling work was elaborated in the framework of my research. But my study was mainly based on many research consequences, some of which were based upon modelling work that had been done on Dutch agricultural development. Modelling work is the indirect basis of my study.

What must be mentioned concerning the methodology is that in the Netherlands fisheries is not included in agriculture according to the Dutch Standard Industrial Classification, unlike in most countries. This required adjusting the database by including fisheries to enable comparisons. Except for the cases where no data is available, all agricultural counts in this report include data on fisheries. Fortunately, there is little deviation when Dutch agriculture is compared directly with other countries because fisheries only makes up a small part of agriculture in the Netherlands.

To present agricultural policymakers in China with a general framework of Dutch agricultural development and to help them obtain a comprehensive understanding of all major aspects so as to establish a proper institutional system for Chinese agricultural development, I have attempted to include as many aspects as possible. So, both broader and more general issues make up this report.

1.4 Structure

The report consists of six chapters. Chapter 1 is about the statement of research concern and objectives. Chapter 2 focuses on Objective 1. The general appearance of Dutch

agriculture, including the natural background, the current situation, the contribution to the whole economy, and the position in a worldwide context, is discussed in this chapter.

Chapter 3 deals with the analysis of long-term agricultural development. The fundamental subject is how Dutch agriculture gradually improved. The issues covered include the distinguishing features of each developmental stage and the accompanying changes in institutional systems. Generally speaking, this chapter corresponds to Objective 2.

Chapter 4 is concerned with summarizing Dutch agricultural development. The institutional systems through which Dutch agricultural development met with success, including systems of land ownership and tenure, finance, marketing, cooperation, farmers' organization, education, research and extension, and government policy are described extensively. This chapter is the most important part of the report.

Chapter 5 handles Objective 5. An attempt is made to abstract a new concept, i.e. the Dutch Model, for Development Economics from Dutch agricultural development.

Chapter 6 translates the Dutch experience to Chinese circumstances. The focus is placed on what China can learn from Dutch agricultural development. The lag in development of Chinese agriculture compared with the Netherlands and the main obstacles facing Chinese development are also discussed briefly in this Chapter.

2. GENERAL APPEARANCE OF DUTCH AGRICULTURE

By understanding the general appearance of Dutch agriculture, Dutch agricultural development can be explored well. A general picture of Dutch agriculture will be drawn by looking at the natural background, the current situation, the contribution to the national economy, and the position on the world's scoreboard.

2.1 Natural background

Agriculture, unlike other industries, relies much on natural resources. In agriculture, land not only fulfills the role of a location factor as it does for manufacturing industry and other non-agricultural industries, but it is primarily an indispensable production factor. This is especially true for arable farming, horticultural field crops and stock farming. Only in the case of modern operations involved in intensive animal husbandry and greenhouse horticulture, which are similar to industrial operations, does land mainly fulfill the function of location factor. Other so-called Ricardian factors¹, including climate, soil fertility, supply channels (such as harbours) or distribution areas, also play an important role in agricultural production. A favourable natural background is an asset for a country's agricultural development.

In general, the Netherlands has a more favourable natural background for agricultural development, but there are also some unfavourable factors.

2.1.1 Favourable points

The following is a list of favourable factors for agricultural development in the Netherlands.

Flat land

As a part of the coastal plain of Western Europe, situated around the estuaries of the rivers Meuse, Rhine and Scheldt, the Netherlands, on the whole, is a predominantly flat country. There are no mountains, not even anything remotely like a mountain. Only in the eastern part and in the extreme south near Maastricht, where the Maastricht Treaty was signed which led to the formation of the EU from the EC, can a few hills be found. The highest point, only 323 m above sea level, is near Vaals. Along the coast sand-dunes and flood barriers protect the country against flooding. Dikes have also been built along rivers to prevent inundations.

Many tourists always complain there is no mountainous landscape in the Netherlands. But from the agricultural point of view, the Netherlands is a rare place. The flat land is well suited for farming, because it is highly accessible; also, because it is convenient

¹D. Ricardo, British classical economist, created the concept of Comparative Advantages in Economics. He stressed that the trade flows result from comparative advantages, i.e. the relative, rather than from absolute profitability. In this view, these advantages are linked to a favourable geographic position and the availability of natural resources. These immovable production factors are called Ricardian factors.

for mechanization, there is little soil erosion and consequently no loss of considerable amounts of minerals for crops ¹.

Moderate climate

Although it is situated in latitude 54°--51° North, due to the proximity of the sea and the warm North Atlantic Gulf Stream which passes close to the coast, the Netherlands has a moderate sea climate, characterized by cool summers and mild winters. The temperature does not fluctuate greatly in the course of a day or a year; the average January temperature is 2° Centigrade and the average July temperature is 17°C in July. The average year temperature is 10° C, the lowest temperatures occurring in January (- 1°C) and the highest in July (+22°C).

Precipitation, averaging about 800 mm, is fairly evenly distributed throughout the year. Ground frost does not occur frequently. Variations in climate between regions are small. The distance of more than 300 km from north to south has some influence on temperature, and the influence of the sea decreases towards the east.

The mild, damp climate is beneficial for pastures needed for stock breeding and for horticulture in the coastal regions. Fisheries suffers very little from ice during the mild winter.

Convenient communication

The Netherlands has countless links with the European hinterland. Three large rivers flowing into the world's busiest sea have made the Netherlands one of the world's largest and most important centres of transport and distribution. All seaports, from Delfzijl in the northeast through Amsterdam and Rotterdam to Vlissingen and Terneuzen in the southwest, are interconnected by a complex system of inland waterways which give access to and from Germany, Belgium, France and beyond. For decades Rotterdam has been the largest seaport in the world: every year some 32,000 ocean-going ships moor at this port, transporting almost 300 million tons of cargo. Present plans foresee an increase to about 400 million tons by the year 2010 (VNO-NCW, December 1995). More than a quarter of all sea cargo destined for Europe is transhipped in Rotterdam. A fleet of 6,000 inland waterway craft, the largest of its kind in the world, carries two-thirds of EU waterborne cargo. The canals which are part of the main drainage system are also of great importance for inland shipping.

The extensive rail network links up with foreign railways at a great number of points. In the near future, the railway link between Rotterdam and Germany will be upgraded and the high speed railway from Paris and Brussels will be extended to Amsterdam; trains travelling at up to 300 km per hour will connect Amsterdam and Rotterdam with Brussels, Paris and London. The relatively dense Dutch road network is part of a network of European motorways. Dutch airports provide access to every corner of the world. The largest airport in the country, Schiphol, is regularly voted best European airport in opinion polls. All this has earned the Netherlands the name 'Gateway to and from Europe'.

The convenient communication provides Dutch agricultural products accessibility to the world market. Fresh flowers can reach consumers outside the Netherlands in a single day. Convenient transportation also helps adjust production structures by importing cheaper feedstuffs to develop extensive export-oriented stock breeding. Undoubtedly, the favourable transport conditions are the solid foundation for the outward oriented Dutch

¹For example, in China mountain areas account for about 70% of total land area. Owing to the soil erosion in unflat land, many minerals such as N, P and K are lost every year. These N, P and K minerals lost every year are the equivalent of thousands of tons of chemical fertilizer. Soil erosion not only makes farmland infertile, but also raises the cost of agricultural products. Even more, soil erosion raises riverbeds, resulting in easier destruction of farmland through flooding.

agriculture.

Strategic location

Geographically, the Netherlands has an extremely favourable strategic location. As figure 2.1 shows, the Netherlands is not only a gateway to and from Europe, but also in the European economic core region. This strategic location makes the Netherlands cater well for the needs of a large part of Europe, a market with millions of consumers.

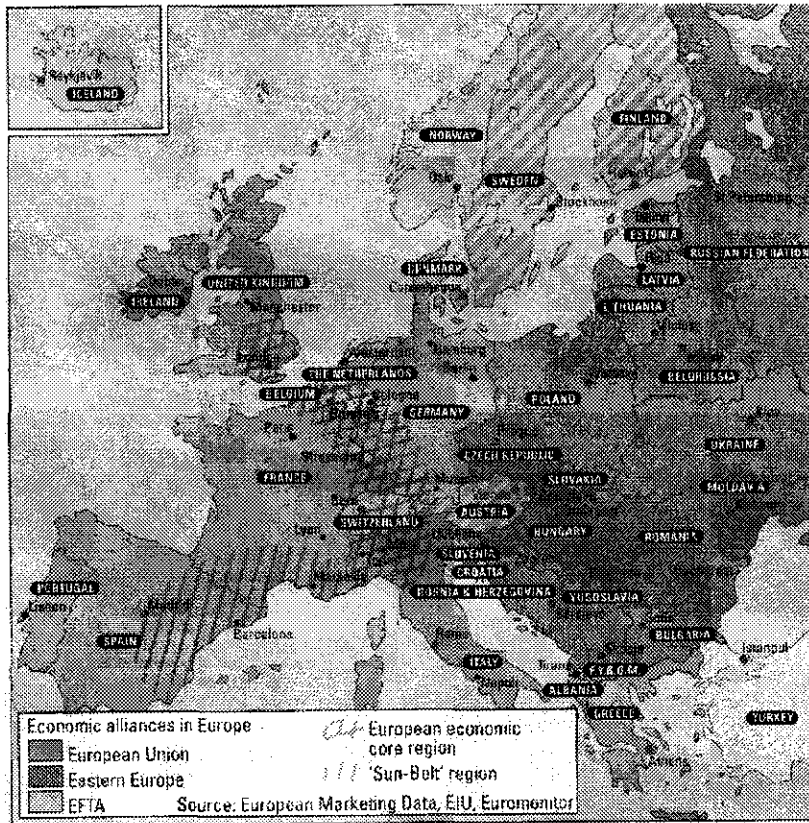


Figure 2.1 The location of the Netherlands in Europe

Dutch agriculture already benefitted substantially from this location in the past. From 1900 onwards the neighbouring countries United Kingdom, Germany, Belgium, and France, experienced an increased development of manufacturing industries. They attained an ever higher level of prosperity, and their demand for high-priced agricultural produce, including not only butter, cheese, eggs, bacon and vegetables, but also other products such as bulbs, flowers, ornamental shrubs and forced early crops, increased considerably. Agricultural development in these countries, however, lagged behind other industries. There was even a tendency to revert to less-intensive farming as many people left the rural areas to seek for better-paid jobs in the towns. This provided the Netherlands with a good opportunity to export agricultural produce to these countries.

Looking to the future, Dutch agriculture will probably benefit more from this location. Political changes in Eastern Europe in 1989 have created a combined market of about 800 million consumers. The political barriers blocking Dutch agricultural produce from entering Eastern European countries have not already existed. Undoubtedly, this will give Dutch agriculture more chances to send its products into these areas. In fact, the Netherlands has already recognized this point and is seizing this opportunity to promote its agriculture to develop further.

We have listed the favourable points of Dutch agriculture in natural background as above. But it needs to say that although the Netherlands has more favourable natural

background, the favourable natural background could not become realistic economic achievement automatically if one country cannot make the best use of them. The valuable point is that the Netherlands has seized those opportunities well and made the best use of them.

2.1.2 Unfavourable points

There are always two sides to everything. Dutch agriculture also faces some unfavourable points in natural background.

Threat from the sea

The sea can be friendly, but is also the greatest enemy in the Netherlands. There is a love-hate relationship between the Dutch and water.

The Netherlands is a low country. The lowest point in the country is some 6.7 m below sea level. Although more than 25% of the total area of the country is below sea level, about 60% of the total population live in these low-lying areas. About 40% of the country would be covered with water at regular intervals if the dunes and dikes did not exist. The threat from the water, especially from the sea, is tremendous. The flood disaster of the stormtide of the night of January 31, 1953, is a clear indication. A permanent vigilant attitude towards the sea is necessary.

Threat from the sea to agriculture is manifold. High springtides were often the cause of dike breaks, extensive inundations, temporary and sometimes permanent loss of land. Seawater can also flood the farmland via estuaries and inlets. For example, about 150,000 ha of farmland were lost in the flood disaster in 1953.

Thanks to the sea, there is a fair cloud cover in the Netherlands. The average number of hours of sunshine is only 1,570. In the summer there is too little sunshine for the production of certain types of crop. To a certain extent the shortage of sunshine places some restrictions on Dutch agricultural development.

Pressure from the density

Although the Netherlands is a small country which covers only 41,526 square kilometres, it has a population of more than 15.5 million. Less land and more people make the Netherlands one of the most densely populated countries in the world. With more than 450 people per square kilometre, which is about ten times the world average, the population density is second highest in the world. Population densities are even considerably higher in the 'Randstad' conurbation¹ in the western Netherlands.

The high density exerts more pressure on the limited (agricultural). Consequently, agricultural development is more intensive, as history has shown. However, more intensive agriculture is bound to have negative effects on the environment. This results in Dutch agriculture being faced with a new kind of challenge.

2.2 Current situation

Dutch agriculture is one of the few leading agricultural systems in the world with its own distinguishing features.

2.2.1 Productive level

Normally the indicators of partial productivities, such as labour productivity, land

¹'Randstad' conurbation is made up of the cities of Amsterdam, The Hague, Rotterdam, and Utrecht, and a number of smaller cities between the former ones. It is the economic heart of the Netherlands.

productivity and capital productivity, and total factor productivity (TFP) are used to dem-

onstrate the productive level of agriculture. Due to the limited data, only labour productivity and land productivity are used here to reflect Dutch agricultural productive level.

In general, Dutch agriculture has a higher level of labour productivity and land productivity. Calculated from Eurostat data, agricultural labour productivity, i.e. gross value added at 1990 price and exchange rates per AWU¹ per year, was 41,223 ECU² in the Netherlands in 1994. As shown below (see section 2.4), this level sets the tone in Europe. Setting 10 European member states³ at 100, the agricultural labour productivity index in the Netherlands was 215 in 1975, 199 in 1980, and 234 in 1985 (Terluin, 1990). These levels were also the leading ones in Europe. According to FAO, calculated in 'International U.S. Dollar' (IUSD), the agricultural labour productivity in the Netherlands in 1991 was 44,339 IUSD, ranking among the highest in the world. In 1995 in the Netherlands, on average, cereal production per man-year in agriculture is 5,741 kg, meat production is 11,260 kg, and milk production is 52,465 kg.

Dutch agricultural land productivity is among the highest in the world. In 1991, production value per hectare was 2,468 IUSD, which is much higher than United States and France. For 1995, arable production per hectare was as follows: winter wheat 8,800 kg, sugar beet 56,000 kg, potatoes for consumption 41,000 kg, spring barley 5,700 kg, fodder corn 11,500 kg⁴. All of these rank among the world's highest production levels. In the horticulture sector, especially glasshouse horticulture, land productivity is so high that it is even measured per square metre. Tomato production per square metre is about 45 kg and cucumber production per square metre is about 66 kg in 1995; per hectare, tomato production reaches 450,000 kg whereas cucumber production reaches 660,000⁵. The Netherlands has a highly developed glasshouse horticulture with a considerable land productivity. Consequently, the Netherlands is also known as 'Glass Country', and parts of it belong to 'Glass City'. In animal husbandry, milk yield per cow is 6,596 kg and the number of eggs per layer is 306 in 1995.

2.2.2 Production structure

From a structural point of view, Dutch agriculture is still dominated by livestock production, as shown in figures 2.2 and 2.3 and table 2.1. This is a major feature of Dutch agriculture which differs from China.

From figure 2.2, we can clearly see that the agricultural land index in the Netherlands is near 60%. It is higher than most in most countries. There is hardly any desert land or other land which cannot be used for agriculture. This reflects from another angle that Dutch agriculture has a good natural background as we have presented above. Figure 2.3 shows that of total Dutch agricultural land use, grassland, which is used for animal husbandry, amounts to more than half, arable land amounts to about two-fifths, and horticultural land covers less than 6%. Even of arable land there is a considerable part which is used for foodstuff production. Land use for livestock breeding, then, dominates Dutch agricultural land use.

Looking at the gross value of agricultural production, we see that Dutch agriculture is also dominated by livestock production. Table 2.1 tells us that more than 55% of the gross value of agricultural production comes from livestock production. The share of horticulture in agricultural production is 35% and for arable production the share is only about 10%.

¹AWU, i.e. annual work units, is a standard agricultural labour input measurement unit used in EU member states. 2,200 hours of work each year is one AWU. In 1995, the volume of total labour input in agriculture in the Netherlands is 221,400 AWU.

²ECU, European Currency Unit, is a virtual currency used in EU member states. One ECU is 2.15827 Nlf in 1994.

³Germany, France, Italy, the Netherlands, Belgium, United Kingdom, Ireland, Denmark, Greece, and Spain.

⁴In dry weight.

⁵On LEI-DLO's sample information system database.

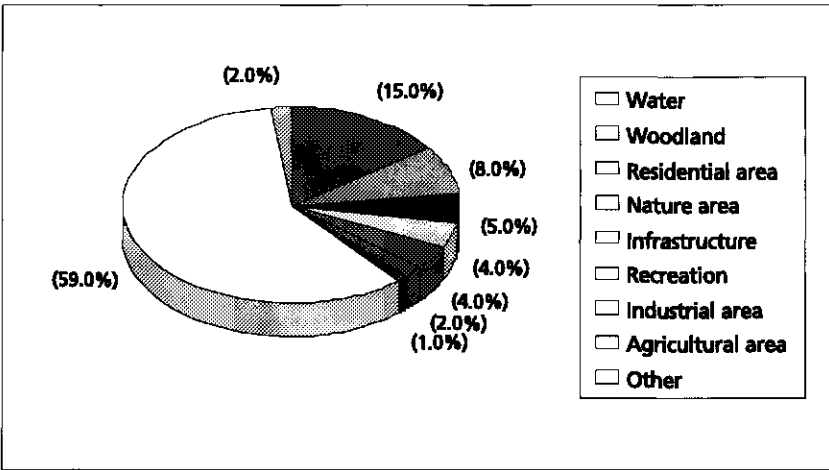


Figure 2.2 Land use structure in the Netherlands
Source: CBS.

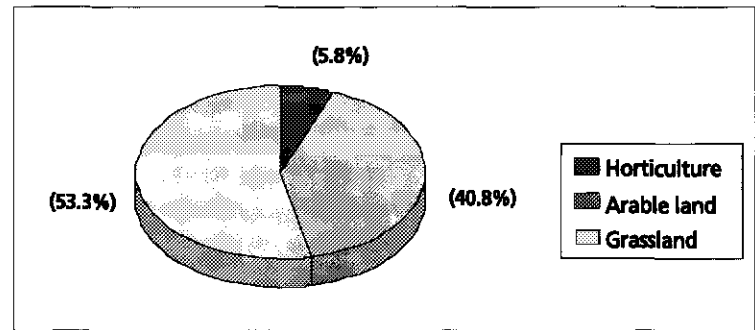


Figure 2.3 Agricultural land use structure in the Netherlands
Source: CBS.

However, it should be borne in mind that if we compare the shares of agricultural land use and agricultural production value, the livestock production, which dominates Dutch agriculture, is not the sector with the highest comparative land productivity¹. On the contrary, horticulture, which despite covering only 3.5% of total agricultural land accounts for 35% of total agricultural production, has the highest comparative land productivity. The comparative land productivity of arable production is only 0.25, which is much less than 1; the comparative land productivity of livestock production is 1.03; for horticulture this figure is 6, which is 24 times the level of arable production and 6 times that of livestock production. These comparative land productivity figures show that the land productivity of arable production is far lower than the average land productivity, and that comparative land productivity of horticulture is much higher than average land productivity. From this viewpoint, arable production is not of economy in land utilization. It is useful to recognize this aspect for the adjustment of Dutch agricultural structure.

Regarding the production structure of each sub-sector, we can see from table 2.1 that arable production is dominated by potatoes, with a share of about 56% of total arable production. Horticulture is dominated by flower production (almost 55% of total horticulture production), and livestock production is dominated by dairy cows and cattle

¹Comparative land productivity is defined as the production value share of one sector in total production value divided by its land use share in total land use.

breeding (58% of total livestock production). These three dominating production categories, i.e. potatoes, flowers, and dairy cows and cattle breeding, contribute more than 55% to the gross value of agricultural production.

Table 2.1 The structure of agricultural production in the Netherlands in 1994

	Gross value	Share in gross value
	Million NLf	%
Total arable production	3,862	10.23
Of which: Cereals	371	0.98
Potatoes	2,163	5.73
Sugar beet	640	1.70
Onions	200	1.82
Total horticulture	13,115	34.74
Of which: Vegetables	4,002	10.60
Fruit	570	1.51
Flowers and plants	6,022	15.95
Flower bulbs	1,064	2.82
Hardy nursery stock	812	3.86
Total livestock production	20,780	55.03
Of which: Cattle (excluding calves)	4,463	11.83
Milk	7,566	20.04
Pigs	6,099	16.15
Poultry	1,336	3.54
Eggs	875	3.47

Source: CBS/LEI-DLO.

2.2.3 Regional concentration

Dutch agriculture has been mainly concentrated in specific geographic locations. Each region has its own specialized production items which are consistent with the region's relative advantages. This geographical concentration, i.e. regional division of agriculture, is beneficial not only to effective farmland utilization and land productivity, but also to labour productivity. High specialization in regions consists of one of the major distinguishing features of Dutch agriculture.

Generally speaking, as shown in figure 2.4, there are three main belts of geographical concentration:

- the west, along the coast, comprises the horticulture belt, especially flower production;
- the central area, the dairy production belt. Dairy cows, also cattle and calf, are specialized in this area;
- the east and more southern area: intensive livestock production, together with dairy farming, namely pig and chicken production.

Arable production is scattered in the southwestern, northeastern, and central polder areas, which is also where arable farming is specialized.

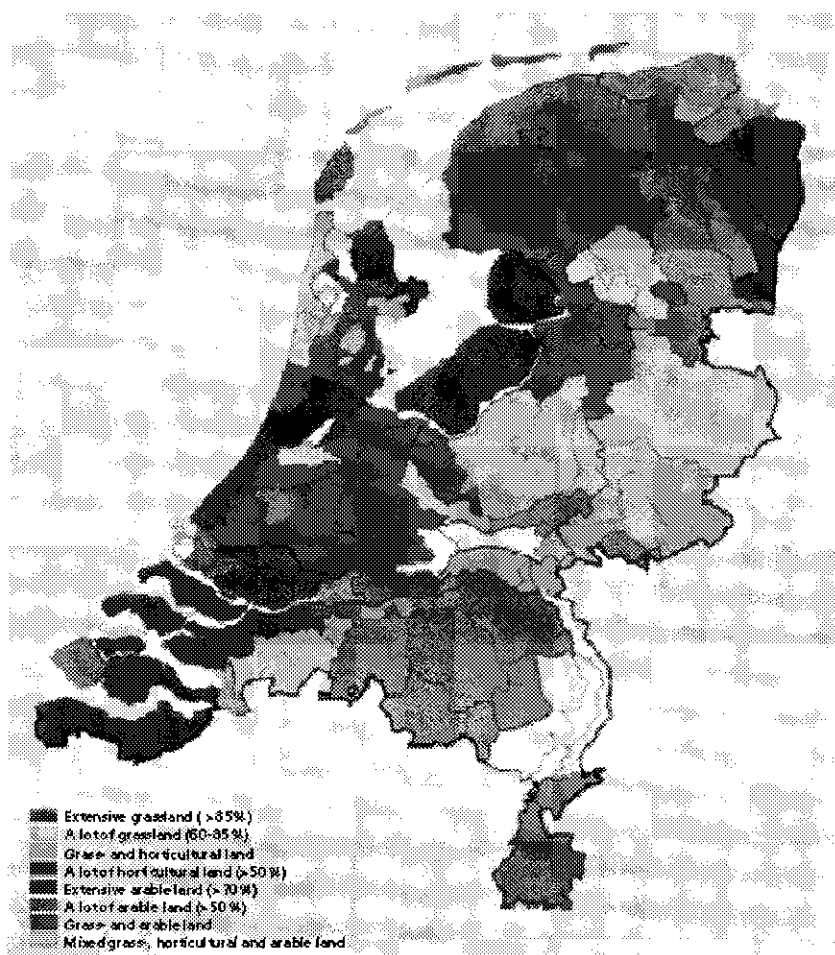


Figure 2.4 The concentration of agriculture in the Netherlands
Source: SDU.

2.2.4 Farm structure

Individual private family farms are the basic foundation of Dutch agriculture. Farm structure is defined as the ratio of each kind of farms in total farms. It will be described here from farm type view and farm size view.

Farm type structure

Dutch farm type structure is shown in table 2.2. It is clear that Dutch farms are dominated by livestock farms, including grazing livestock farms, pig and poultry farms¹, mixed livestock farms and mixed crop-livestock farms. There are nearly 70,000 specialized livestock farms excluding mixed crop-livestock farms in 1995. The share of specialized livestock farms in total farms is 62%, more than 48 percentage points higher than horticulture farms and almost 50 percentage points higher than arable farms. The farm type with predominantly livestock production is consistent with the agricultural land use and the gross value of agricultural production.

Table 2.2 also shows us that the share of part-time farms in the Netherlands is low, on average less than 18% of which permanent crops farms have the highest degree of part-time farms, its ratio more than 25%, it means that more than one quarter of the per-

¹Pig and poultry farms are also called intensive livestock farms or factory farms in the Netherlands.

manent crops farms is not full-time farms; yet, the horticulture farms have the lowest degree of part-time farms, its ratio less than 8%.

Table 2.2 Number and type of farms in the Netherlands in 1995

Farm type	Farm number	of which fulltime farms	Share of each kind farms in total farms	Ratio of fulltime farms
	1	1	%	%
Arable	14,663	11,947	13.0	81.5
Horticulture	15,884	14,651	14.0	92.2
Permanent crops	5,750	4,247	5.1	73.9
Grazing livestock	54,613	44,008	48.2	80.6
Pigs and poultry	10,414	8,584	9.2	82.4
Mixed cropping	2,484	2,066	2.2	83.2
Mixed livestock	4,561	3,752	4.0	82.3
Mixed crops-livestock	4,828	3,621	4.3	75.0
Total	113,202	92,876	100.0	82.0

Source: CBS/LEI-DLO.

It seems that the low number of part-time farms in the Netherlands could change the traditional theory about part-time farming. Some economists have concluded from the situation in eastern and southeastern Asian countries that a large number of part-time farms is an inevitable trend of agricultural development in densely-populated countries. For the Netherlands, though, this is clearly not the case.

Farm size structure

Dutch farm sizes are expressed in area sizes and economic sizes respectively. In animal husbandry, the number of dairy cows per farm and the number of pigs or pork pigs per farm are also used to reflect farm size.

Table 2.3 Percentual distribution of farms (including part-time farms) in relation to farm area size in the Netherlands in 1995

Farm type	Farm size in hectare							
	<5	5-10	10-15	15-20	20-30	30-50	50-100	100 or more
	%							
Arable	10.4	16.0	9.8	7.4	13.1	21.2	18.4	3.7
Horticulture	81.7	9.1	3.9	1.8	2.0	1.0	0.5	... *)
Permanent crops	61.5	17.4	10.2	5.4	3.5	1.4	0.6	... *)
Grazing livestock	18.6	15.8	10.9	10.9	19.9	18.5	5.1	0.3
Pigs and poultry	67.2	18.4	8.7	3.2	2.0	0.5	... *)	0.0
Mixed cropping	26.2	17.0	12.0	9.2	14.1	13.4	6.7	1.4
Mixed livestock	21.3	25.0	20.5	13.4	12.2	6.1	1.3	0.2
Mixed crops-livestock	18.5	23.7	14.2	9.9	12.7	12.7	6.7	1.6
Total	33.3	15.9	10.1	8.2	13.3	13.0	5.4	0.8

*) Less than 0.1.

Source: CBS/LEI-DLO.

Table 2.4 Percentual distribution of farms (including part-time farms) in relation to farm economic size in the Netherlands in 1995

Farm type	Farm size in NSU						
	3- <12	12- <20	20- <32	32- <50	50- <70	70- <100	100 or more
	%						
Arable	25.8	10.5	10.4	12.2	12.8	13.6	14.7
Horticulture	7.2	5.7	7.6	10.2	10.1	12.7	46.5
Permanent crops	15.2	10.2	11.9	15.9	12.6	14.2	20.0
Grazing livestock	24.4	9.1	7.7	9.5	12.4	18.0	18.9
Pigs and poultry	10.4	7.6	10.2	14.5	17.6	19.4	20.3
Mixed cropping	13.0	10.8	14.4	15.4	11.9	13.8	20.7
Mixed livestock	14.5	11.9	12.3	12.9	13.5	15.7	19.2
Mixed crops-livestock	33.2	14.5	11.5	9.5	8.3	9.8	13.2
Total	20.2	9.1	8.9	11.0	12.5	16.1	22.2

Source: CBS/LEI-DLO.

Table 2.3 and table 2.4 show farm sizes in the Netherlands in 1995. On average, the farm size is 17.4 ha. More than one-third of farms have an area of less than 5 ha; the number of farms larger than 20 ha is almost one-third, whereas farms with 100 or more hectares is less than 1%. But if we observe each of the sub-sectors, the situation is very different. The general trend, as shown in table 2.5, is that the arable farms, grazing livestock farms, mixed cropping farms and mixed crop-livestock farms are larger, but that the horticultural farms, pig and poultry farms, and permanent crop farms are smaller. In arable production, the average farm is about 34 ha, the number of farms with an area of more than 20 ha is 56.4%, whereas 4% of farms are larger than 100 ha. In horticultural production, the average farm size is only 3.8 ha. More than three-fifths of farms are smaller than 5 ha. Of all horticultural farms, the share of farms with an area between 0.01 and 1 ha is 30.3%; the share of farms smaller than 0.01 ha is 2.3%. This means that in horticultural production about one-third of farms are smaller than one hectare.

Table 2.5 Average farm size (including part-time farms) in the Netherlands in 1995

Farm type	Farm size in hectare	Farm size in NSU
Arable	33.9	53.5
Horticulture	3.8	133.0
Permanent crops	6.3	68.0
Grazing livestock	20.4	58.1
Pigs and poultry	4.6	71.8
Mixed cropping	20.2	68.8
Mixed livestock	13.6	62.3
Mixed crops-livestock	20.6	46.2
Total	17.4	69.7

Source: CBS/LEI-DLO.

The average economic size is 70 NSU¹; the share of farms larger than 50 NSU is more than 50% and the share of farms smaller than 50 NSU is less than 50%. However, there is considerable difference in economic size among the sub-sectors. For all types of farms, horticultural farms with the smallest area size have the largest economic size; arable farms (including mixed crop-livestock farms) which according to area size are among the five largest categories, have the smallest economic size.

In absolute terms, as can be seen in table 2.5, arable farms have the largest area, whereas horticultural farms have the smallest sizes. The area size of arable farms is nine times that of horticultural farms. The economic size of horticultural farms is 2.5 times that of arable farms. It is clear that horticulture produces more net output with less land and that the accompanying land use is highly efficient.

Table 2.6 presents the absolute size measured in numbers of livestock in animal husbandry. In 1995, the average number of dairy cows per farm with dairy cows is 46; 35% of farms with dairy cows have between 50 to 100 dairy cows; the average number of pigs per pig farm is 620, 40% of pig farms have more than 500 pigs. More than 20% of farms have more than 1,000 pigs. Over 7,000 farms have more than 75 sows; about 4,000 have more than 150 sows. 8,000 farms have more than 300 pork pigs, 1,300 of which more than 1,000. Each year almost 20 million pigs are slaughtered in 32 slaughterhouses.

Table 2.6 Percentual distribution of farms in relation to farm size measured in number of live-stocks per farm in the Netherlands in 1995

Farms with dairy cows		Farms with pigs		Farms with pork pigs	
number of dairy cows per farm	share of farms	number of pigs per farm	share of farms	number of pork pigs per farm	share of farms
1- 10	9.0	1- 100	17.9	1-100	31.9
10- 20	9.0	100- 300	27.6	100-300	30.6
20- 30	12.3	300- 500	14.7	300-500	14.6
30- 50	30.1	500-1,000	18.9	>750	22.9
50-100	35.1	>1,000	20.9		
>100	4.5				

Source: CBS/LEI-DLO.

2.2.5 Farm income

Farm income is a basic indicator of agricultural development. Dutch farm income is shown in table 2.7. On average, entrepreneurs in horticulture under glass have a higher income per entrepreneur. Potted plant farms have the highest income per entrepreneur, which is also the highest among all farm types. There is little difference in average income per entrepreneur among farm types, though this does not mean there are no differences among farms at all. In fact, there is considerable variance annually. This variance motivates farmers with higher incomes to do even better, and also causes farmers with lower incomes to carry through improvements in their business. So, the adjustment of farms in

¹NSU, Netherlands size units, is an economic size unit based on the balance per livestock species and per hectare of crops, for which standard gross margins (sgm) are calculated by subtracting specific costs from the yield. The sgm = financial results minus direct non-factor costs. Direct non-factor costs include sowing seed, fertilizers and pesticides, energy for heating and lighting, and other direct costs. The sgm is expressed in ECU and revised regularly. The NSU in 1995 equals an sgm of 1,320 ECU. An example for the base period 1995: 1 ha. Winter wheat = 0.89 NSU, 1 dairy cow = 1.33 NSU.

income and financial result is towards more efficiency.

Table 2.7 Farm income in the Netherlands in 1995 *)

Farm type	Output per f 100 costs	Family farm income (in f 1,000 per entrepreneur)
Accounting year May/April **)		
Dairy farms	79	49
Intensive livestock farms	89	48
Arable farms	88	53
Accounting year Jan./Dec.		
Horticulture under glass	91	53
of which: vegetables	88	37
cutflowers	92	63
potplants	94	72
Mushroom holdings	88	44

*) Average for last three years, not including the smallest farms; **) Output per f 100 costs on tenancy basis.

Source: LEI-DLO.

As far as cost productivity is concerned, the highest output per f 100 costs in horticulture under glass is 91 guilders; 88 guilders for arable farms and 79 guilders for dairy farms. The variance among farm types, and also among farmers, is obvious. There is a close interrelationship between farm income and farm return to cost. The farms with higher returns to cost have higher income levels, the farms with lower returns have lower income levels.

2.2.6 Trade capacity

Trade ¹ is the most brilliant page in the book of Dutch agriculture. The international orientation is the most important feature of the Dutch agricultural sector. Dutch agricultural development cannot be really understood without an understanding of Dutch agricultural trade.

Dutch agricultural trade features more imports and much more exports, as the tables below show. In 1995, the proportion of agricultural imports to total agricultural production reaches 1.05, and the proportion of agricultural exports to total agricultural production comes to 1.80; the value of agricultural exports is 1.7 times the value of agricultural imports. Agricultural trade accounts for almost 80,000 man-years each year. The model of more imports and much more exports means that Dutch people have given full play to their favourable communication advantages, and obtained more value added by importing products, especially raw products, which have less comparative advantages in the Netherlands and by processing them so as to make them high value products. These products are then exported. This is the essence of Dutch agricultural trade.

Import flow

The structures of agricultural imports (including coffee beans, cocoa beans, tobacco) by products and by countries is listed table 2.8 and table 2.9, respectively. In the same table, we find the structure of exports. More than one-third of the imports is arable produce, about one-fifth is livestock, horticultural imports ranking third. Most of the arable imports concerns products which are not grown in the Netherlands. Animal foodstuffs amount to 21% of total arable imports. More than 95% of agricultural imports is destined

¹Trade means foreign trade in most of time in my report.

for the processing industry. In turn, most of the processed goods are destined for export and final consumption; only 3% goes to agriculture.

The European Union is vital to Dutch agriculture as a source of agricultural trade, as can be seen in table 2.9. More than two-thirds of Dutch agricultural imports comes from these countries, of which the imports from Germany amount to nearly one-third. Germany is the largest source of Dutch agricultural imports. Outside EU, the United States is the biggest source of Dutch agricultural imports, its share is near 9%. Of the EU countries it is in the Netherlands that imports a lot of agricultural products from outside the EU.

Table 2.8 Structures of agricultural imports and exports by products in the Netherlands in 1995
*)

Product	Import		Export	
	value in mln. NLf	share in %	value in mln. NLf	share in %
Arable products	14,359.3	36.5	21,970.1	32.6
grown in the Netherlands	2,732.7	6.9	1,615.3	2.4
exotic products, drinks	6,584.1	16.7	10,560.8	15.7
animal feed	3,077.3	7.8	3,830.1	5.7
preparations	1,965.2	5.0	5,964.0	8.8
Horticultural products	7,387.9	18.8	17,525.6	26.0
grown in the Netherlands	3,304.7	8.4	13,605.7	20.2
other horticulture products	3,056.9	7.8	2,170.9	3.2
preparations	1,026.3	2.6	1,749.0	2.6
Livestock products	7,961.7	20.2	18,583.6	27.6
livestock and meat	2,117.3	5.4	8,127.7	12.1
poultry and eggs	908.1	2.3	2,866.1	4.3
milk and dairy	4,936.3	12.5	7,589.7	11.3
Fishery products	1,520.7	3.9	2,363.1	3.5
Margarine, fats and oil	4,810.2	12.2	3,215.2	4.8
Other products	3,337.4	8.5	3,740.0	5.5
Total agricultural products	39,377.1	100.0	67,397.6	100.0
destined for agriculture	1,299.2	3.3	...	...
destined for industry and consumption	38,077.9	96.7	...	...
virtually unprocessed	...	...	19,410.5	28.8
processed	...	...	30,396.3	45.1
non-Dutch	...	...	17,590.8	26.1

*) Registered trade only, actual trade is estimated to be 10-15% higher.
Source: CBS/LEI-DLO.

Export flow

In 1995, Dutch agricultural export totals 67,400 million Guilders. This makes the Netherlands the third largest agricultural exporter in the world, after the United States and France. The value of agricultural exports exceeds the gross value of domestic agricultural production by far. It is a miracle, a world miracle. More than half of total agricultural

output from within the Netherlands is exported. Agricultural exports have become a principal pillar of the Dutch economy.

Arable produce forms the main part of Dutch agricultural export, its share being about 33%. Livestock products rank second, followed by horticultural exports and then livestock product. Exotic products, so not the products grown in the Netherlands, dominate arable product exports. Among horticultural exports, on the other hand, products grown in the Netherlands are most important. More than 45% of exports is processed, whereas less than 30% is virtually unprocessed. Non-Dutch products amount to about one-fourth.

Germany is by far the largest consumer of Dutch agricultural produce, receiving about one-third of exports. All EU countries together account for nearly 80% of Dutch agricultural exports. Outside the EU, North and South America are mayor clients for Dutch agricultural products; Eastern Europe is becoming increasingly important for Dutch agricultural exports. Nowadays the Netherlands focuses on developing the Eastern European markets.

Table 2.9 Structures of agricultural exports and imports by countries in the Netherlands in 1995
*)

Country	Imports		Exports	
	value in mln. NLf	share in %	value in mln. NLf	share in %
World	39,377.1	100.0	67,397.6	100.0
EU-15	23,663.5	60.1	52,824.6	78.4
France	4,173.1	10.6	8,047.7	11.9
Belgium and Luxembourg	5,249.0	13.3	6,787.3	10.1
Germany	7,236.0	18.4	20,646.8	30.6
Italy	937.9	2.4	4,869.1	7.2
United Kingdom	2,174.6	5.5	5,540.8	8.2
Ireland	1,135.4	2.9	467.8	0.7
Denmark	547.1	1.4	1,002.8	1.5
Greece	161.7	0.4	1,385.9	2.1
Portugal	136.4	0.3	421.9	0.6
Spain	1,085.1	2.8	1,674.5	2.5
Sweden	443.7	1.1	865.5	1.3
Finland	289.3	0.7	317.6	0.5
Austria	94.3	0.2	796.9	1.2
Third countries	15,713.6	39.9	14,573.0	21.6
USA	3,312.5	8.4	1,825.3	2.7
Rest of OECD	1,107.5	2.8	2,443.2	3.6
Arabian countries in Middle				
East and Iran	71.8	0.2	1,465.1	2.2
Eastern Europe	754.4	1.9	2,971.7	4.4
Other countries	10,467.4	26.6	5,867.7	8.7

*) Registered trade only, actual trade is estimated to be 10-15% higher.

Source: CBS/LEI-DLO.

Trade balance

The Netherlands is a major net exporter of agricultural products: exports far exceed imports. Agricultural trade surplus was nearly 17,000 million U.S. Dollars in 1995, ranking second largest in the world, just behind the United States. Dutch total agricultural exports

are smaller than France's, but its net agricultural exports are higher. For a small country such as the Netherlands, this is remarkable.

Almost all products, except arable products grown in the Netherlands, other horticultural products, margarine, fats and oil, have trade surplus. The products with the highest trade surplus (137%) are horticultural products. Livestock products have the second highest surplus, 133%. Exports exceed imports by 53% in arable products.

Germany is the most important source of Dutch agricultural trade surplus. Nearly half of Dutch agricultural trade surplus came from Germany in 1995. In the EU, every country, except Ireland, contributes to the Dutch agricultural trade surplus. As a whole, EU countries account for all the Dutch agricultural trade surplus because the surplus from EU countries exceeds the total surplus. This means that Dutch agricultural trade balance is in deficit outside EU countries as a whole. The United States is the biggest source of Dutch agricultural trade deficit. Exports to the United States is only 55% of imports from the United States in the Netherlands in 1995.

On average, Dutch net agricultural exports per hectare of cultivated land amounted to about 16,000 U.S. Dollar; per agricultural labour force attained around 67,000 U.S. Dollars in 1995. These are world records. It is clear that Dutch agriculture has the highest trade capacity in today's world. Of course food industry, transport, and trade, among others, play a very important role in the export of agricultural products.

2.3 Contribution to the national economy

As a modern developed economy, the Netherlands has the same feature as other developed nations, i.e. a relatively small share of agriculture, agricultural labour and agricultural value added in the whole economy. Figure 2.5 and figure 2.6 show that nowadays in the Netherlands the share of the agricultural working population in the total working population is less than 5% and the share of agricultural value added in GDP is about 4%.

Although in the Netherlands, compared to the whole economy, agriculture is a small sector, it is an important contributor to the national economy. Agriculture provides work for more than 250,000 and an annual national income of almost 8,800 million guilders.

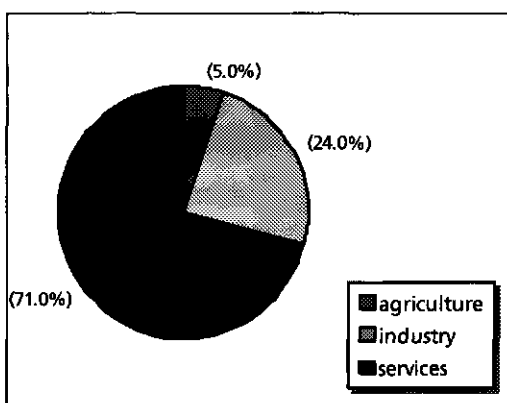


Figure 2.5 Structure of the working population in the Netherlands in 1994
Source: CBS.

More important is that the net agricultural exports amount to about 90% of total net exports (excluding services exports). So even though agriculture is not the major source of national income, undoubtedly it is the major source of trade surplus and foreign exchange in the Netherlands. It is unthinkable for the Netherlands to maintain the balance of international payments without agriculture.

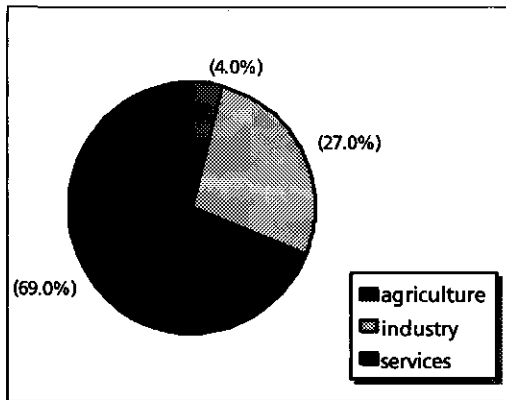


Figure 2.6 Structure of gross domestic product in the Netherlands in 1994
Source: CBS.

To get an insight into the economic significance of agriculture for the national economy, however, it is necessary to pay attention not only to the share of just the agricultural sector in the national income, but also to the income share of those sectors connected with agricultural production. In this context we should mention the subcontracting industry, which supplies the raw materials and services, and the industry, which processes and distributes agricultural products. The income of these industrial sectors nowadays exceeds that of the agricultural sector considerably. The income share of all these sectors together, including agriculture, is estimated to be around 10% of the Dutch national economy since 1970, as shown in table 2.10. That means that approximately one-tenth of Dutch national income has been earned in connection with the production and sale of nationally produced agricultural commodities.

Table 2.10 Contribution of sectors *) directly or indirectly related to agriculture to national income in the Netherlands

Income earned in	% of national income					
	1970	1975	1980	1985	1990	1995
Agriculture	5.8	4.6	3.2	3.8	3.7	3.2
Food industry	2.0	1.7	1.3	1.4	1.4	1.1
Supply industry	2.4	2.4	2.3	2.3	2.4	2.3
Distribution stage **)	2.4	1.8	1.3	1.3	1.2	1.2
Capital goods industry	1.0	0.9	0.7	0.8	0.8	0.8
Total	13.6	11.4	8.8	9.6	9.5	8.6

*) Excluding the processing of foreign raw materials; **) Trade, transport etc. between food industry and the consumer.

Source: CBS/LEI-DLO.

2.4 Position on the world's scoreboard

Dutch agriculture takes a leading position in the world. As mentioned before, total Dutch agricultural exports rank third and net agricultural exports ranks second in the world. However, as far as land area is concerned, the Netherlands is positioned somewhere after the first hundred or so. For a small country this is most remarkable and shows the significance of the Netherlands' contribution.

Within the EU, the Dutch agricultural sector tills about 1.6% of all land under cultivation, while comprising 1.7% of the total number of holdings and producing about 8% of the overall gross production value of the Union's agricultural sector. Dutch agriculture produces more output with less land and labour, which shows how efficient Dutch agriculture is.

In section 2.2.1, we presented an overview of Dutch agricultural productivity. As a comparison, table 2.11 mirrors more clearly the position of Dutch agricultural efficiency in western Europe, which is one of the world's leading agricultural areas. Dutch agricultural production, labour output and land productivity, has been the highest of 10 European countries. Dutch agricultural labour productivity and land productivity was 115% and 181% higher respectively than the average level in 1975, 100% and 250% higher in 1980, and 134% and 266% higher in 1985. Total grain ¹ (not including rice because there is no rice grown in the Netherlands) production per hectare in the Netherlands was 9,650 kg, the highest of the EU, which was nearly one time higher than the average level of EU 15 countries in 1993.

High productivity as the foundation of Dutch agriculture, that is the basis of the general picture of Dutch agriculture.

Table 2.11 Comparison of Dutch agricultural productivity with European countries

Country	1975		1980		1985	
	labour produc- tivity	land produc- tivity	labour produc- tivity	land produc- tivity	labour produc- tivity	land produc- tivity
The average of ten countries = 100						
Germany	118	126	107	119	105	109
France	122	87	114	93	126	94
Italy	76	140	98	171	93	171
Netherlands	215	281	199	305	234	366
Belgium	174	177	168	189	175	183
United Kingdom	108	44	130	57	128	56
Ireland	58	40	53	42	62	46
Denmark	142	91	135	102	223	130
Greece	57	151	60	180	56	172
Spain	...	...	75	59	67	55

Source: Terluin (1990).

¹Grain only includes cereals in the Netherlands, unlike in China.

3. LONG-TERM TREND

Dutch agriculture has a brilliant present, as demonstrated in the last Chapter. But what about its past? How did Dutch agriculture come to present from its past step by step? What is the long term trend of Dutch agricultural development? Looking back these historical aspects are helpful to understand the mystery of Dutch agricultural development and to hold the future of Dutch agricultural development. 'Taking the history as mirror, the ups and downs can be understood correctly'¹.

When the long-term trend is analysed, an important (and difficult) issue is the classification of developmental stages. Because different classifications of the same research object often lead to different conclusions, classification is often argued. In this report, on the basis of development features, the course of Dutch agricultural development is classified into four stages:

- pre-modern times, before 1880;
- first modernization phase, 1880-1950;
- second modernization phase, 1950-1980;
- sustainable growth, after 1980.

3.1 Pre-modern times: before 1880

The Netherlands derives its name from 'the Republic of the United Netherlands', which was established in the 16th Century. In that time, William of Orange led the United Provinces in a revolt against their Spanish rulers. After the so-called '80 Year War', the country gained formal independence in 1648. After independence, the Netherlands started its economic construction and social development immediately. In the 17th Century the Netherlands was the leading maritime nation in the world. This period was known as the 'Golden Century' or 'Golden Age' in Dutch history.

Agriculture, being a fundamental sector of Dutch economy, began its development as the Dutch economy flourished. But in general Dutch agriculture was in the traditional state it was in before 1880, even though many achievements were gained during this period.

Geographically, agriculture developed from coastal areas and concerned dairy farming. This is because large parts of the Netherlands, as described in last Chapter, lie below sea level. Much farmland, particularly in the sea districts, was marshy and usually too wet for arable farming. By draining the land with the help of windmills, it could be used as pasture and hayfields, though it was unsuitable for arable farming. Therefore a relative specialization in dairy farming took place first in these coastal areas. Dairy produce was sold to consumers in the Netherlands and beyond.

Higher daily wages per male labourer, higher rents per hectare of farmland, and higher yields per cow are the eloquent proof that Dutch agricultural development started from dairy farming in the coastal areas. This can be seen in table 3.1. Not only were the figures higher than those in inland provinces, they were also higher than the national average level. Wages and rents, as the price of productive factor, are determined by the supply and demand of factors. This means that the higher prices of labourer and farmland were deduced by the higher demand of agricultural production to these factors in the sea

¹This is one of the three famous expressions in ancient China. Those three expressions are: taking copper (in ancient China, the mirror was made by copper) as mirror, one can be dressed suitably; taking other people as mirror, rights and wrongs can be known; taking history as mirror, highs and lows can be understood correctly.

districts. Higher yields per cow are a clear indication of the higher level of agricultural development in the coastal areas than elsewhere.

Table 3.1 Agricultural wages and rents and yield per cow in the Netherlands at about 1810

	Coastal provinces					Inland provinces			Netherlands
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Daily wages per male agricultural labourer (NLf)	0.76	0.82	0.80	0.88	0.86	0.60	0.54	0.48	0.65
Rents per hectare (NLf)	25	22	31	30	31	9	14	19	23
Milk yield per cow (hl)	-	2.2	2.4	2.2	2.4	1.0	1.0	-	1.9

(1) Groningen, (2) Friesland, (3) North Holland, (4) South Holland, (5) Zeeland, (6) Drente, (7) Overijssel, (8) Gelderland

Source: van Zanden (1994).

The specialization in dairy farming in the coastal areas had both internal and external consequences. It forced the farmers in the coastal areas to buy foodstuffs like bread, instead of growing their own cereals. The farmers also began to buy their tools from the emerging farm implements industry, instead of making their own. This in turn stimulated the gradual commercialization of agriculture. So, this commercialization was the first external effect of the specialization of dairy farming in the coastal areas. This helped form and develop the domestic market and accompanying trade.

Because the coastal areas stopped growing cereals, an insufficient supply from the inland areas obliged farmers in coastal areas to import them from other countries and pay for them with export revenues, butter and cheese being among the most important export produce.

Another remarkable development during this period was the emergence of market gardening and its concentration near the cities. Beginning in the 17th century, all sectors started to flourish, especially trade. Related industries such as shipbuilding also developed. The population also grew rapidly, mostly in the large towns. The trade centre Amsterdam, for instance, already had about 100,000 inhabitants around 1600, and this figure soon increased to 200,000. The urbanization led to an increased demand for vegetables and fruit, resulting in the emergence of horticulture, including flowers and bulbs, near the cities. At the end of the 17th century, horticultural produce was already part of famous Dutch exports.

However, some problems were encountered during this period. Foremost was the heavy tax burden, imposed by the federal government in the coastal areas, which had to finance one war after another in the struggle with England and France to be able to maintain Dutch trade activities. But the government did not do anything in return and as a result, farmers had to choose: either specialize in intensive production for the market to pay taxes or retreat from agriculture altogether. The first choice resulted in a more intensive form of agriculture, whereas the second option reduced agricultural investments.

The second important problem appeared in the inland areas. In these provinces agricultural development was far behind. Before the 18th century, self-sufficient family farms were the main structure behind agricultural development in these areas. Cereal production prevailed and cattle was kept only for manure and power, with hardly any exportable surplus. Unfavourable natural conditions such as poor soil quality and an underdeveloped infrastructure - few roads and canals - were important reasons for the lagging development in inland areas. The most important reason, however, was institutional: the feudal system and the common grounds system. Undoubtedly the feudal system is harmful to agricultural development. The common grounds system, a system in which most pastures

were shared by all the inhabitants of a village, proved to be a hindrance for individuals who wanted to innovate, because everybody had to agree on any change. Although from 1800 onwards some efforts were made to abolish this system, solving this problem by legislation took three-quarters of the 19th century. A barter economy was also a restricting factor in the inland districts (Huizinga, 1986).

Generally speaking, Dutch agriculture developed with a gentle upward tendency before 1880, as shown in table 3.2. Gross production, labour input, agricultural land, productivity, all increased at different rates. For example, agricultural gross production increased 67.3% in 1880 against 1810, labour productivity grew 7%, land productivity rose near 50%, milk yield per cow increased 32%.

Table 3.2 Long term development of Dutch agriculture, 1810-1880 (in constant prices)

	1810	1850	1880
Gross production (mill.guilders)	205	257	343
Labour input (1,000 man years)	308	420	482
Agricultural land (1,000 ha)	1,796	1,906	2,015
Production per			
man year in guilder	665	611	711
hectare in guilder	114	135	170
Yield per hectare (hl)			
wheat	13	19.3	22.7
rye	15	18.0	17.2
barley	27	32.8	39.1
oats	25	32.4	35.3
potatoes	170	120	125
Yield per cow (milk in hl)	1.9	2.3	2.5

Source: van Zanden, 1994.

Table 3.3 The number of mouths fed by 100 people working in agriculture in four countries

Country	1500/20	1600	1700	1800
England/Wales	132	143	182	248
Belgium	173	160	192	233
Netherlands	177	219 *)	...	277
France	138	145	158	170

*) 1670.

Source: van Zanden, 1994.

Compared with surrounding countries, Dutch agriculture had reached a higher stage of development in this period. As table 3.3 shows, Dutch agricultural labour productivity, was between 12 to 63% higher than three of the surrounding countries in 1800.

3.2 First modernization phase: 1880-1950

Roughly speaking, Dutch industrial revolution started in the first half of the 19th century. This industrial revolution pumped the Netherlands into the so-called 'modern

economic growth'¹. At the beginning of the second half of the 19th Century, Dutch industrial development accelerated. Industrial development created not only a new demand for agricultural products which provided new opportunities for agriculture, but also improved the infrastructure such as canals, railway network, ports and tradeways which are needed for agricultural development. In the period 1851-1860 the length of new canals opened in the Netherlands reached 232 km, a 139 km increase in ten years; 144 km of new canals were opened in between 1871 and 1880, which was an increase of 66 km since a decade earlier. The length of the surfaced road network was 8,542 km by 1864; nine years later this figure was at 12,024 km. The length of the railway network was 335 km in 1860, and 4.5 times longer in 1880 (Griffiths, 1982).

The increasing demand and improved infrastructure provided favourable conditions for agricultural development. Against this background, Dutch agricultural development started its course of modernization after 1880.

The main features of Dutch agricultural development during this period are the introduction to agriculture of modern factors. On the production side, among others, we have artificial fertilizer and new crop varieties. New institution systems are also introduced, related to cooperations, finance, farmers' organizations, and education, research and extension, related to the production relation, into agriculture². These factors were not only the basic forces to drive Dutch agriculture towards modernization but they have also become the basis for the present agricultural system in the Netherlands.

The Dutch government played a key role from the start of this modernization phase. Facing the agricultural crisis which arose from the imports of cheap grain from North America from about 1880 to about 1900 due to considerable improvements in transportation, the Dutch government did not close the border to protect Dutch agriculture as the German government did, but took a series of measures, including the introduction of institutional factors and the introduction of modern input factors mentioned above, to improve agriculture and agricultural competitiveness.

3.2.1 Introduction of modern input factors

In the modernization process of Dutch agriculture, the gradual replacement of traditional input factors played an important role.

Diffusion of the use of artificial fertilizers

Artificial (chemical) fertilizer was the first modern productive factor introduced into Dutch agriculture. Due to the advent of artificial fertilizers, far-reaching changes took place in the fertilization of agricultural land after 1880. Because of this link, many changes occurred in agriculture as a whole. The introduction of artificial fertilizer broke the impediment from the shortage of manure already existing in several areas and had a considerable impact on agricultural production. It created a new frontier for not only agricultural growth but also the chemical fertilizer industry.

Because artificial fertilizer represented the new production force, there was a rapid diffusion of the use of chemical fertilizers in Dutch agriculture. Within a short period, the Netherlands became the largest consumer of artificial fertilizer per hectare of arable land. From the artificial fertilizer imports³, the rapid increase in this usage can be seen. Within 25 years only, the imports of Dutch artificial fertilizers increased to more than 105 times

¹The term 'modern economic growth' was introduced by the American economist Simon Kuznets to describe the combination of economic growth and structural change in the Western world in the 19th and 20th centuries. His work has made the term a household term in economic literature.

²According to Karl Marx, the productive force and production relation are two basic factors to move economic and social development forward.

³Prior to 1914, there were few artificial fertilizer firms. Nearly all artificial fertilizers were imported. So the imports of artificial fertilizers provide a good indication of their increased usage.

the level of 1885/1889, nearly doubling every five years and with an average growth rate of about 20% per year. Table 3.4 shows the percentage of land users who used artificial fertilizer around 1888. In some areas, this percentage reached 66 among large farms. It is also clear that everywhere the larger farms pioneered the use of artificial fertilizer. Though large farms generally tend to lead the way in agricultural innovation, in that time even crofters and labourers began to use artificial fertilizers.

According to the investigation of the State Commission, the first centres to use artificial fertilizers were, first of all, eastern Zeeuws-Vlaanderen and the peat colonies in Drenthe and Groningen. Both regions were important centres for diffusion of the use of artificial fertilizers. In Drenthe and Overijssel, the farmers in the peat colonies were instrumental in diffusing the use of artificial fertilizers. Their example induced the farmers on the sandy soil to start using them as well. The new polders in North Holland were the third area. The sea clay region in the southwestern Netherlands also consumed large quantities of artificial fertilizers.

Table 3.4 Number of land users who used artificial fertilizers as a percentage of the total number of land users by farm size, circa 1888, in the Netherlands

	(1)	(2)	(3)
Labourers	0.3	4.5	16.7
Small farmers	2.6	18.6	42.9
Large farmers	6.4	48.8	65.9
Total	2.0	17.9	38.4

(1) In 16 municipalities where between 0 and 10% of the land users used artificial fertilizers.

(2) In 10 municipalities where between 10 and 25% of the land users used artificial fertilizers.

(3) In 6 municipalities where more than 25% of the land users used artificial fertilizers.

Source: van Zanden, 1994.

By 1936/38, the use of artificial fertilizers had reached a high level. The use of fertilizers per acre was as follows: N 15 kg, P_2O_5 17 kg, and K_2O 19 kg (Foreign Agricultural Service, MLNV, 1959).

Two main factors caused the rapid diffusion of the use of artificial fertilizer after 1880. First, the supply of manure for intensive agriculture, as it had developed before 1880, was a serious bottleneck in many agricultural areas. Second, the growing output and trade of artificial fertilizers made the relative price of artificial fertilizers decline rapidly after 1880. The rise of the cooperative movement and the expansion of agricultural education after 1900 also played an important role in the diffusion of the use of chemical fertilizers.

Factory processing of dairy products

The factory processing of dairy products was another innovation in Dutch agriculture after 1880. The economies of scale inherent in the production process and in marketing the products were an important aspect of dairy production. But prior to 1880, factory processing of dairy products was rare; the problems involved with the production of butter and cheese, especially the poorer quality on the small farms, was not an urgent one.

The sharp rise of the margarine industry in the 1870s, with its concentration on exports to England, hit Dutch butter exports, which consequently declined. Farmers in Friesland, who were highly dependent on the marketing of butter, were the first to suffer from this blow. To maintain their position in the butter market, they established the first cooperative butter factory in 1886; this was less risky for a dairy farmer than producing butter in a privately-owned factory. Friesland became the centre of factory-made dairy

products after the late 1880s. Following the example of Friesland, this innovation spread rather quickly to other provinces.

The innovation in butter production played a key role in agricultural development. The increase in production and exports of butter and cheese, both quantitatively and qualitatively, was accompanied by a dramatic decrease in production costs. Consequently, all butter-producing farmers could benefit, especially the small farmers with less working capital. It also created economies of scale in dairy processing and this was another step towards further agricultural specialization.

New crop varieties

In the centuries before 1880, technical development in Dutch agriculture - such as new crop varieties, new system of rotation, and equipment - was the result of trial and error. It was more or less accidental, uncoordinated experiments carried out by individual farmers. The innovations spread from field to field when the farmers in the immediate vicinity saw the innovator's success and consequently appropriated the innovation. The diffusion of innovations was therefore generally relatively slow.

After 1880, with help from the government, a new system of innovation arose. The construction of experimental agricultural fields started after 1890; so-called 'wandellera-
ren' - literally 'walking teachers', agricultural consultants who walked through the fields - experimented with new techniques and new crops, enabling farmers to see the advantages of the innovations. After 1900, the number of experimental fields increased rapidly. This new system created many new techniques such as new crop and livestock varieties, and new planting systems, from which many farmers benefited.

3.2.2 Institutional factors

Modernizing agriculture not only requires new input factors - the hardware - but also software: knowledge and information. Without software, like any computer system, modern hardware in itself is insufficient. Institutional systems introduced into Dutch agriculture provided the foundation for agricultural modernization. This is still the case.

The first factor introduced into agriculture was the farmers' and farm worker organization. Although the Dutch agricultural organizations began in the first half of the 19th century¹, it took until 1884 before the first national umbrella organization was formed, the Netherlands Agricultural Committee. Once again it appeared to be very difficult to come to some form of centralization. Later, in 1896, a Roman Catholic union was formed out of the Netherlands Agricultural Committee, the Nederlandse Boerenbond (Dutch Farmers Union). In 1918 a protestant farmers union was founded. The organization of agricultural workers was set up in 1900. Then, the first agricultural employees' organization was formed, Nederlandse naam (Netherlands Agricultural Labourers' Union). Now farmers and farm workers had their own national association to present their interests to the national government.

The second institutional factor was the introduction of the cooperative from 1880 onward. In the second half of the 1880s the first agricultural cooperative was established in the Netherlands². The first dairy cooperative was found in 1886, which was the first cooperative for agricultural products; the first cooperative vegetable auction was established in 1887. After that numerous cooperatives were established everywhere. Up to 1949 there were already 3,150 cooperatives; the market shares of agricultural cooperatives were, respectively, 50% in credit, 61% in buying in fertilizer, 86% in cheese production,

¹In 1805 the government established the Advisory Committees for Agriculture. Later so-called free organizations were founded in the provinces, first in Groningen and Zeeland in 1837. In 1850 all provinces had their regional organizations. This was a reason for the government to disband the Advisory Committees for Agriculture the following year.

²Although the first agricultural purchasing cooperative was established in 1877, the cooperatives for agricultural products were not formed till 1886.

85% in butter production, 84% in milk deliveries, 83% in industrial potatoes processed, 98% in sales of marketed vegetables and fruit, 75% in sale of intake of wool, and 60% in sale of marketed flowers (NCR, 1993). Cooperatives can be seen as instruments of 'self-help'. Through the cooperatives, the farm and the market came into contact for the purchase of artificial fertilizer, feed, seeds, and agricultural machinery, for the sale and manufacture of products, and for providing credit. The advantages of cooperatives are clear. First of all, the cooperatives allowed farmers to profit from the economies of scale in the large-scale purchase of inputs as well as in the sale and manufacture of products; the cooperatives also allowed farmers to buy and use machinery which could not be used profitably by a single farmer. Secondly, the cooperatives were helpful in regaining and expanding the farmers' position in the markets, for example by increasing the prices they obtained for their products as well as checking buyers' and suppliers' monopolistic profits. Cooperatives improve the competitive power of farmers and strengthen their position on the markets.

The third institutional factor is the cooperative agricultural financial system. Because of the rapid improvement in transportation possibilities by sea and land in the second half of the 19th century, Europe became accessible to products from far-flung agricultural areas. The massive flow of agricultural products to Europe caused an enormous drop in prices in the Netherlands. Between 1870 and 1895 grain prices fell to less than half their previous level. Because many arable farms had converted into livestock farms, dairy prices and beef prices also dropped after 1885. The agricultural crisis brought about a great scarcity of money among the farmers, which led to social abuses such as paying in instalments, loans at usurious rates of interest and financial dependence of the individual farmers on itinerant traders and on shopkeepers. To protect farmers against extortionate rates and to promote agricultural development, in 1888 a government-appointed study committee, which of course had a broader function than simply supplying credit, emphasized the need for a sound agricultural credit system. However, this would have to be set up by the interested farmers themselves. It recommended the establishment of credit cooperatives on the model of the *Raffeißenbanks* in Germany, which took place in 1896. Two years later, two central farmers' credit banks were founded, the Cooperative Central *Raiffeissen* Bank in Utrecht (non-catholic, the members of which were mainly the local banks from all over the country apart from the south), and the Cooperative Central Farmers' Credit Bank in Eindhoven (catholic, the members of which were mainly the local banks in the south, the east and the west of the country). Right from the foundation of the farmers' credit bank, the cooperative agricultural financial system has played a very important role in agricultural development in the Netherlands. As mentioned earlier, up to 1949, the share of farmers' banks in agricultural credit reached 50%.

The fourth institutional factor is agricultural education, research and the extension system. During the agricultural crisis that arose as a result of foreign competition, the Dutch government chose not to close the borders but to strengthen its agriculture by setting up a system of education, research and advice. In this way the farmers were provided with the instruments to find solutions to their economic themselves. Known as the 'three pillars' of agriculture, education, research and extension have remained the basis of Dutch agriculture.

3.3 Second modernization phase: 1950 - 1980

After World War II, the economy as a whole in the Netherlands recovered quickly and agriculture experienced a boost. Agricultural development involved a strong growth of production and exports, also productivity, as illustrated in tables 3.5 - 3.8.

The average annual growth rate of gross agricultural production between 1950 and 1980 was above 4%, the highest growth rate occurring in horticulture, more than 5%. The rate for livestock farming was higher than 4.5%. The average annual growth rate of agricultural exports was more than 6%.

The most remarkable growth appeared in agricultural productivity. From table 3.8 we can see that the growth rate of agricultural productivity per year was above 3%, in the

period 1960-1970 it was as high as 3.7% annually; the contributive share of TFP in agricul-

Table 3.5 Agricultural growth in the Netherlands in 1950-80

Period	Gross production	Intermediate input	Net production in agriculture	Net national income
	average annual growth in %			
1950-60	4.6	6.8	3.3	4.0
1960-70	3.8	4.8	2.7	5.3
1970-80	4.6	4.7	4.2	2.8

Source: CBS/LEI-DLO.

Table 3.6 Growth of gross production per subsector of agriculture in the Netherlands in 1950-80

Period	Arable farming	Livestock farming	Horticulture
	average annual growth in %		
1950-60	4.4	4.9	3.9
1960-70	1.5	3.8	5.3
1970-80	2.3	4.6	5.8

Source: CBS/LEI-DLO.

Table 3.7 Growth of agricultural exports in the Netherlands in 1950-80

Period	Exports growth per year in %
1950-60	7.1
1960-70	5.8
1970-80	5.1

Source: CBS/LEI-DLO.

Table 3.8 Growth of agricultural productivity in the Netherlands in 1950-80

Period	TFP growth per year in %	Contributive share of TFP in agricultural growth in %
1950-60	2.16	59.8
1960-70	3.70	97.6
1970-80	3.28	74.7

Source: Rutten, 1992.

tural growth ¹, also called the relative contribution of TFP in agricultural growth, was above 60%, in 1960-70 it was so high with 98%. That means that on average more than 60% of Dutch agricultural growth during the period 1950-1980 came from an increased productivity, or improved agricultural efficiency. The high efficiency is the major source of Dutch agricultural growth.

¹The contributive share of TFP in agricultural growth is defined as the ratio of TFP growth rate to total agricultural production growth rate (Feng, 1989, 1992). It is calculated by dividing the TFP growth rate by the growth rate of total agricultural production.

Structural changes, as expressed by mechanization, scale enlargement, specialization and intensiveness, are the core of Dutch agricultural development during the period of 1950-80 is the structural changes, which were showed in.

3.3.1 Mechanization

Agricultural mechanization is one of the most remarkable changes that took place in the Netherlands between 1950 and 1980.

In Dutch practice, during this period, optimization of output or added value per person in agriculture was required to achieve the same level of purchasing power as outside agriculture. Mechanization served to increase output per person. The price relationship between labour and capital also led to mechanization.

After the war, especially since 1950, the rebuilding activities and the growing industrialization provided good job opportunities for the agricultural workers who wanted to leave the sector. At the same time the discrepancy between income per person in agriculture and in industry drew many people away from agriculture. So, the absolute decrease of agricultural workforce in the Netherlands started immediately after the WW II and developed in a very rapid way (table 3.9). The average annual decrease rate of agricultural labour was about 3% during the period 1950-1980. In the first two decades after 1950, more hired labour left than farm family labour.

Table 3.9 Change trend of agricultural workforce in the Netherlands in 1950-80

Period	Farm family labour	Hired labour	Total
annual change in %			
1950-60	-2.2	-2.8	-2.3
1960-70	-3.2	-5.5	-3.6
1970-80	-2.0	-1.2	-1.9

Source: CBS/LEI-DLO.

The shortage of agricultural workforce resulted in the use of more machinery. As a result, in the 1950s and 1960s mechanization in agriculture developed very fast in the Netherlands, as can be seen in table 3.10.

Table 3.10 Increase of agricultural machinery in the Netherlands in 1950-80

Period	Tractors	Milk machines	Combine harvesters	Potato harvesters	Sowing and planting machines
annual change in %					
1950-60	12.9	26.0	9.7	16.3	3.7
1960-70	6.7	8.3	9.5	0.6	-
1970-79	2.0	-3.4	-2.4	-1.6	0.6 *)
1950-79	7.3	10.1	5.7	5.0	1.7

*) 1960-79.

Source: CBS/LEI-DLO.

3.3.2 Scale enlargement

Scale enlargement, especially the scale enlargement per agricultural labour, is the most important structural change in Dutch agricultural development after 1950. There is a close relation between scale enlargement and mechanization: without mechanization, scale enlargement on the farm is impossible.

Mechanization alone is not sufficient, though. The enlargement of one farm will usually be at the expense of other farms. If other farms do not abandon their holdings and make their land available, enlargement of the independent farms is only possible to a limited extent due to the land-bound production. This means that related institutional system is necessary for scale enlargement in agriculture.

The locus of scale enlargement of Dutch farms in the period 1950-1980 is shown in tables 3.11-13. The share of holdings larger than 30 ha was more than 16% in 1980, 11 percentage points higher than in 1950; the share of holdings smaller than 10 ha declined 32 percentage points in 1980 against 1950. As for cultivated land area, the share of farms with less than 30 ha was 39% in 1980, 17 percentage points more than in 1950; the share of farms with less than 10 ha was 9%, much less than in 1950. On average, the size of main holdings was nearly 19 ha in 1980, 7.6 ha higher than in 1950. If horticultural holdings are included ¹, the average size of holdings was 13.9 ha in 1980, 8.2 ha more than in 1950, which is 1.5 times more.

Concerning the size of livestock farming, the increase is also substantial. The share of farms with more than 30 milk cows was 69% in 1980, 3.6 times higher than in 1950; the share of milk cows on farms with more than 30 milk cows in total milk cows was more

*Table 3.11 Scale enlargement according to area in the Netherlands in 1950-80 *)*

Size	1950		1960		1970		1980	
	holdings	area	holdings	area	holdings	area	holdings	area
<10 ha	61.7	28.9	52.4	25.8	36.5	14.4	29.8	9.1
10-20 ha	24.8	31.2	31.9	34.9	39.8	36.2	34.9	27.1
20-30 ha	8.0	17.3	9.4	17.7	14.4	22.1	19.1	24.7
30-50 ha	4.5	14.9	5.2	15.2	7.4	17.8	12.3	24.5
>50 ha	1.0	7.7	1.1	6.4	1.9	9.5	3.9	14.6
Average number of hectares per	11.1		12.7		15.6		18.7	

*) Not including horticulture holdings.

Source: CBS/LEI-DLO.

*Table 3.12 Average size of farms according to area in the Netherlands in 1950-80 *)*

	Farm size in hectare
1950	5.7
1960	7.5
1970	11.6
1980	13.9

*) All holdings, including part-time farms.

¹Generally speaking, horticultural holdings are smaller, as shown in table 2.5, because they are intensive. Horticulture has developed considerably since 1950. So, if horticultural holdings are included, average farm sizes will be smaller.

Source: CBS/LEI-DLO.

Table 3.13 Development of the number of animals per farm and per kind in the Netherlands in 1960-80

	1960	1970	1980
Milk cows			
number of farms with >30 milk cows			
as % of the total number of farms with milk cows	15	32	69
% of milk cows on farms >30 milk cows in total milk cows	31	51	80
Breeding sows			
number of farms with >50 breeding sows			
as % of the total farms with breeding sows	0	6	34
% of breeding sows on farms >50 breeding sows in total breeding sows	0	25	77
Fattening pigs >20 kg			
number of farms with >200 fattening pigs			
as % of the total farms with >200 fattening pigs	1	12	29
% of fattening pigs >20 kg on farms >200 fattening pigs in total fattening pigs >20 kg	5	50	75
Layers			
number of farms with >5000 layers			
as % of the total farms with >5000 layers	0	2	24
% of layers on farms >5000 layers in total layers	0	41	89

Source: CBS/LEI-DLO.

than 80% in 1980, 50 percentage points higher than in 1950. In fattening pig farms, the share of farms with more than 200 fattening pigs more than 20 kg in the total number of fattening pigs heavier than 20 kg increased 28 percentage points in 1980 against 1950; in 1980 this figure reached 75%, 15 times of that in 1950. This means that three-fourths of all fattening pigs heavier than 20 kg were already concentrated in the farms with 200 fattening pigs heavier than 20 kg in 1980. 76% of breeding sows and 89% of hens were centralized respectively on the breeding sow farms with more than 50 breeding sows and on the hen farms with more than 5,000 layers in 1980.

3.3.3 Specialization

Another structural change of Dutch agriculture after 1950 is specialization. In theory, specialization benefits scale of production and deepening of knowledge and information in agriculture. Dutch agricultural specialization took place in geography and farms, i.e. regional specialization and farm specialization.

As discussed in section 3.1, the dairy farming began to concentrate in the coastal areas before 1880. Although the trend of agricultural specialization on regions has continued since the beginning of this century, this trend accelerated during the period 1950-1980. Up to 1980, the three main belts of agricultural production, as shown in paragraph 2.2.3, were already shaped completely.

The specialization has also taken place in farms. Farm specialization is the basis of regional specialization. Taking the ratio of mixed farms in total farms as an indicator to reflect the farm specialization, the picture of farm specialization during 1950-1980 is that the ratio of mixed farms in total farms was less 5% in 1980, nearly a half decreased against 1965. That means that more than 95% of total farms consisted of specialized farms at the end of the 1970s.

3.3.4 Intensiveness

Intensiveness is another main trend of Dutch agricultural development during the period 1950-1980. Making full use of limited land resources, the meaning of agricultural intensiveness is to produce as many products as possible in a shorter period with more inputs of capital, technology, variable inputs and modern management on a specific land area. In a nutshell, intensive agriculture is one of high output with high input.

The sharp increase of the use of capital in the agricultural production process is a better indication of agricultural intensiveness. Total value of capital used in agriculture increased from 16 billion guilders in 1957 to 90 billion guilders in 1983 (Strijker, 1986), an annual growth rate of 7%. According to FAO, the amount of fixed capital per hectare in 1980 was 1,953 U.S. dollars in the Netherlands, the highest in the world and 12.3 times that of the U.S.

Maybe the best illustration of intensiveness is the enormous increase in agricultural productivity. When the level of 1950 is set at 100, labour productivity is 318 in 1970 and 559 in 1980. Labour productivity increased more than 4.5 times in 1980 against 1950, an annual growth rate of 6%. Land productivity in 1980 amounted to 1,785 U.S. dollars ¹, 46% higher than Japan, 132% higher than Germany ², and nearly 15 times higher than the U.S.

3.4 Sustainable growth: after 1980

Dutch agricultural development entered a new stage after 1980, i.e. the sustainable growth stage, which is aimed at improving the relationship between agriculture and the environment.

Before 1980, in general, Dutch agricultural development aimed at the highest production and export possible. Little attention was placed on environmental issues. After 1980, environmental issues became more important.

The use of chemicals and fuel, and the disposal of manure from agricultural production, contributes to the pollution of rivers and canals, the air, soil, and groundwater. However, agricultural production also functions as a manager of most of the green areas. In a densely populated country, this is increasingly important for recreational purposes, and for maintaining green zones between the urban agglomerations. So, agriculture is very important for a balanced environment.

The main environmental problems as a result of agricultural development in the Netherlands came from manure. Strong specialization and intensification of production systems, especially intensive livestock production, which predominantly focussed on an increase in productivity, had a negative effect on the natural environment. The rapid increase of livestock production also increased the manure production tremendously, thus serious environmental problems have resulted.

A great deal of superfluous manure resulted in at least four categories of environmental problems: eutrophication of surface water due to nitrogen and especially phosphate emissions, nitrate pollution of groundwater, acidification due to the volatilization of ammonia originating from manure, and, finally, accumulation of heavy metals in soils and food. Since 1980 only 30 to 35% of the phosphate that farmers currently apply is taken up by the crops. The remainder is largely absorbed by the soil. Already 30% of Dutch soils is saturated with phosphate. Approximately 75% of the total amount of nitrogen which is presently applied in the agricultural sector is accounted for as surplus, as these minerals are not incorporated in the products supplied by livestock and arable crops. Nitrate concentrations in groundwater continue to rise, resulting in some cases, in the closing down of wells. More closing downs are expected. Ammonia from manure contributes for more than 30% to the total acid deposition. Manure also contains heavy metals, such as cadmium, copper, mercury, lead and zinc. The application of manure to land

¹In 1975 US dollar.

²West Germany.

substantially contributes to the accumulation of heavy metals in soils and food.

Increasing environmental problems in agriculture urged the policymakers to develop instruments to reduce and control the pollution caused by the intensive farming practices. The Dutch government has taken several measures aimed at the protection of the natural environment and the sustainable growth of agriculture since 1980. These measures have driven Dutch agricultural development into the sustainable-growth phase in which agriculture provides not only better food but also a better environment.

4. MAIN FEATURE OF DUTCH AGRICULTURAL DEVELOPMENT

The success of Dutch agricultural development has been shown in previous chapters, but an explanation for this success still needs to be given. What factors made Dutch agricultural development so successful? Although Dutch agriculture benefited a good deal from its favourable natural background (see Chapter 2), it appears the factors behind the successful Dutch agricultural development are not the natural but the institutional ones. Behind the prosperity of Dutch agriculture is a set of institutional systems, including land ownership and tenure system, free trade system, financial system, marketing system, cooperative system, organizational system, education and research and extension system, and government policy system. These eight systems compose the principal experiences of Dutch agricultural development.

4.1 Land ownership and tenure system

Land ownership and tenure system refers to the way people own land and how they rent it to others to use if they choose not to cultivate it themselves. In agriculture land ownership and tenure system is much more important because of the close relationship between agriculture and land. Land is not only the location of agriculture but also a basic and important production factor of agriculture. Because land is the basis of agriculture, land ownership and tenure system is the basis of institutional systems which are needed for agricultural development.

Land ownership and tenure system has many impacts on agricultural development. Of them the most important one is the impact on agricultural productivity. An individual proprietor who owns his land knows that increased effort or skill that leads to a rise in output of land will also improve his income. This result does not necessarily follow if the land is owned by someone else. If a tenant's rent contract is only for a year or two, a rise in output may result in the landlord threatening to evict the tenant so that all or much of the increase in production can be captured through a rise in the rent. In this case, the tenant does not have the incentive to improve productive conditions and increase output, there must not be the increase of agricultural productivity which is the lifeblood of agricultural prosperity. It is obvious that from an incentive and management point of view the ideal land ownership and tenure system for agricultural development is that the land is owned by farmers or the tenant can rent land for a specific duration from the landlord.

4.1.1 Types of land ownership and tenure system

The family farm is the cornerstone of agricultural production. The agricultural sector is dominated by private enterprises, i.e. the family farm. This is the main characteristic of all institutional systems in Dutch agriculture.

In general, there is an efficient system of land ownership and tenure in the Netherlands. The family-owned farm features this system. About 70% of land used for agriculture at present is owned by farmers themselves, viz. the owner-occupied land; another 30% of farmland is rented from the landlord and partly from the State, namely the rented land.

Tables 4.1-4.5 show the type of land ownership and tenure system and its change in the Netherlands at various stages. These figures show that:

- (a) the owned land type dominates the agricultural land ownership and tenure system, but the position of owner-occupied land went down before 1950 and went up after 1950, the share of owned land increased 25 percentage points in 1995 against 1950. This means that the changing trend of farmland ownership and tenure system has

been marched towards the owned land type since 1950. The government policy aimed at controlling farmland price so as to stimulate farmers to buy land resulted in this trend;

- (b) the share of fully owned holdings is diminishing as the size of holdings increases. The percentage of farms with 5 and less than 5 ha of land, where the farmers are full owners, is 25% of all farms; but the percentage of farms with more than 50 ha of land, where the land is fully owned by farmers, is only 1.5% in total farms;
- (c) the share of fully owned land area rose first and then declined as the farm size increased;
- (d) more than half of rented land comes from the private owners. But the position of the government as a leaser is increasing, from 21.7% in 1977 to 24.8% in 1987. On the other hand, the position of farmers who lease land is decreasing, from 22.7% in 1977 to 13.6% in 1987, which is almost ten percentage points in ten years;
- (e) about one-tenth of total rented land, with a downward trend, comes from farmers' parents at present. This shows us the farmers' parents are not the major source of rented farmland.

Table 4.1 The position of owner-occupied and rented land in the Netherlands

Year	Agricultural land area in ha			% in total agricultural land area	
	owned	rented	total	owned	rented
1921	1,035,223	966,019	2,001,242	51.7	48.3
1930	1,095,928	835,706	1,931,634	51.0	49.0
1940	1,080,954	1,243,238	2,324,192	46.6	53.4
1950	1,029,152	1,305,967	2,335,119	44.1	55.9
1955	1,084,191	1,223,813	2,308,004	47.0	53.0
1970	1,112,124	1,030,473	2,142,597	51.9	48.1
1979	1,205,513	827,971	2,033,484	59.3	40.7
1985	1,275,630	743,394	2,019,023	63.2	36.8
1990	1,342,409	663,199	2,005,608	66.9	33.1
1995	1,361,653	603,094	1,964,747	69.3	30.7

Source: CBS/LEI-DLO.

Table 4.2 The type of land tenure system according to holdings in the Netherlands

	Full owned holdings	Part owned holdings					Full rented holdings
		80-99%	50-79%	20-49%	<20%	total	
				in %			
1970	38.1	8.8	14.1	10.4	6.0	39.3	22.6
1975	42.5	8.8	14.3	10.3	5.7	39.1	18.4
1985	47.1	10.6	15.1	9.9	5.2	40.8	12.1
1995	52.8	11.5	13.7	8.9	4.2	38.3	8.9
Specification 1995							
Hectare per holding							
0.01 to 5	25.2	0.6	1.8	1.3	0.4	4.1	2.8
5 to 15	14.1	2.5	3.9	2.6	1.1	10.1	2.3
15 to 30	8.0	4.1	4.1	2.4	1.3	11.9	2.0
30 to 50	3.9	2.9	2.6	1.6	1.0	8.1	1.3
> 50	1.5	1.5	1.4	1.0	0.5	4.4	0.5

Source: CBS/LEI-DLO.

Table 4.3 The type of land tenure system according to land area in the Netherlands

	Full owned land area	Part owned land area				total	Full rented land area
		80-99%	50-79%	20-49%	<20%		
				in %			
1970	27.9	10.5	14.9	11.6	8.2	45.2	26.9
1975	29.9	11.3	16.2	12.1	8.3	47.9	22.2
1985	31.9	15.5	18.5	12.9	7.7	54.6	13.5
1995	34.3	19.5	18.9	12.2	6.3	56.9	8.8
Specification 1995							
Hectare per holding							
0.01 to 5	2.9	0.1	0.3	0.2	0.1	0.7	0.4
5 to 15	7.0	1.4	2.1	1.4	0.6	5.5	1.2
15 to 30	9.7	5.2	8.7	2.9	1.6	18.4	2.5
30 to 50	8.3	6.1	5.6	3.5	2.1	17.3	2.8
> 50	6.4	6.7	5.9	4.1	2.0	20.7	2.0

Source: CBS/LEI-DLO.

Table 4.4 The type of rented land system in the Netherlands

Rented from the owners living in Netherlands						Rented from the owners living abroad
private persons		public organization		total		
farmers	others	government	others			
in %						
1977	22.7	38.7	21.7	13.3	96.4	3.6
1983	18.2	40.4	23.9	14.1	96.6	3.4
1987	13.6	42.8	24.8	15.4	96.6	3.4

Source: CBS/LEI-DLO.

Table 4.5 The type of rented land system in the Netherlands

	Rented from parents	Rented from others
	in %	
1970	18.0	82.0
1977	15.3	84.7
1983	13.0	87.0
1987	13.0	87.0
1993	11.3	88.7

Source: CBS/LEI-DLO.

4.1.2 Strong points

That most of the farmland is owned by farmers themselves, is an important aspect of the land ownership and tenure system. As mentioned earlier, there are no problems with the owner-occupied land system because the farmers who use their own land for agriculture know how to do so efficiently.

With reference to the rented land system, there are strict policy and law instruments to protect the interests of tenant farmers and landlords. The Netherlands is one of the six EU countries which dispose of administrative procedures destined to control the conclusion and modifications of the lease agreement¹. There is legislation which provides strict interventions in the relation between landlord and tenant in the Netherlands. This legislation ensures an efficient land use and maintains a reasonable relation between tenant and landlord.

The key points of Dutch rented farmland system are as the follows:

- the Land Board is in charge of lease agreements. All tenancy agreements are subject to the approval of the authority. The authority assesses the merits of contracts on the basis of rent levels, land distribution and quality, and location in regard to farmhouse and farm buildings;
- a special division of the law courts, Tenure Chambers, settles all legal disputes;
- the term of tenancy in each contract must be at least 12 years for farms and at least 6 years in the case of single plots of land;
- the term of tenancy will automatically be extended by six-year periods unless either party gives notice to quit within a specified period before the termination of the tenancy term;
- the tenant may within a period of one month after receipt of such notice apply to the appropriate Tenure Chamber for an extension of the term of tenancy;
- the Minister of Agriculture, Nature Management and Fisheries can set maximum rents for various classes and qualities of land and of farmhouses and buildings to control and maintain reasonable rent levels. When approving tenancy contracts, the Land Boards use the fixed maximum levels as a guide in defining the proper maximum permissible rent in a particular case;
- in cases where a tenant is compelled to quit land for non-agricultural purposes he may claim compensation for losses sustained. Compensation may be claimed not only in cases of dispossession of land but also if a tenancy contract on account of the non-agricultural purpose of the land is refused extension or is annulled. When assessing the compensation due consideration is given to the possibility of tenancy extension as embodied in the original contract;
- provisions have been made by which a tenant in case of illness, disablement or age (65 years) may transfer his tenancy to his wife, one of his children or step-children or adopted child or co-tenant. In such cases, however, the Tenure Chamber may refuse a request for transfer if the proposed succeeding tenant is considered unable to provide sufficient guarantee for reasonable management of the leased property;
- the death of the tenant does not cancel the contract automatically; certain heirs have the right to continue the lease. The Land Chamber can cancel contract, or it can order the continuation of the lease with all or several heirs;
- the landlord cannot sue for the rent, and neither party can cancel the agreement, as long as the lease agreement has not been notified to the authority;
- in case of neglect of leased property the Tenure Chamber will at the request of the landlord assess his neglect and fix a term within which any directions as defined by the Tenure Chamber must be carried out. Failure to carry out any such given direction may result in annulment of the agreement;
- rents may be reviewed after every three-year period. An application for a review of the rent must be submitted to the Land Board before the end of a three-year tenancy term. It is of course possible for the parties concerned to revise the rent by mutual agreement, but in that case also the approval of the Land Board is required;
- the tenant has the right of preemption when the leased land is sold. If the landlord does not respect the right of preemption, he is obliged by the Land Tenure Law to pay damages to the tenant.

¹The other five countries are Denmark, Germany, France, Ireland, and Spain.

4.2 Free trade system

The advantages of free trade between countries have been recorded by classical economic theory. Every country, by engaging in production according to its comparative advantage and then exchanging products with other countries freely, can make best and full use of its resources and obtain the highest welfare. In other words, every country may benefit from free trade.

Though for many reasons there is still no full free trade in the world, the Netherlands is one of the principal actors upholding and striving for free trade in the world.

Agricultural trade is a very important pillar of Dutch national economy, as demonstrated in paragraph 2.2.6. Dutch economy benefits from agriculture, agricultural development benefits from trade, agricultural trade benefits from the free trade system. Free trade is a cornerstone of Dutch agriculture.

The Dutch Government has devoted itself to free trade and has taken trade as the basic national policy in the course of agricultural development. Early in the 17th century, i.e. the Dutch 'Golden Age', thanks largely to the extensive trading network set up by the Dutch East India Company (V.O.C.), the Republic acquired great prosperity¹. The V.O.C., which was established in 1602 to coordinate trade with South-East Asia, was for a long time the largest commercial enterprise in the world. It was active in shipping and trade on every coast of the Indian Ocean. In the course of the 20th century, especially after World War II, the Netherlands became increasingly active in creating international organizations to promote free trade. It is a Founding Member of the EC, OECD, UN, NATO and various other international organizations. In 1958 it established, together with Belgium and Luxemburg, the first custom union in the world: the Benelux, with completely free movement of labour, capital and services. The Maastricht Treaty on closer economic and political integration, transforming the EC into the European Union (EU), was drafted by the Dutch government in December 1991, when the Dutch held the rotating Presidency of the EC.

The main points of Dutch free trade system are as follows:

- completely free trade of agricultural products inside the Netherlands (no trade barriers among the provinces). The station of collecting fees, which is aimed to restrict the free movement of products among regions in some countries, cannot be found in the Netherlands. There is a single market. It is obvious that the domestic free trade is the basis of the free trade with other countries;
- completely free movement of production factors inside the Netherlands;
- free goods trade with the surrounding countries, thanks to the EC, and later, the EU;
- all trade activities conform with the requirements for a good trade order. Regulations are made not just by the government and parliament. Mostly, they are made by individuals involved in the production, trade and consumption of agricultural products. There is a constant interaction between producers, traders, and consumers to comply with the rules;
- in a free trade system, also in a market economy system, the role of government is to provide a good framework for the producers, traders and consumers.

4.3 Cooperative system

Without any doubt the agricultural cooperative has played a key role in Dutch agricultural development. In theory, the structure of the markets determines the necessity. The relation among farmers is defined as 'full competition'. There are many farmers, in general with small farms, with an open production process and free access to agriculture. This means that the influence of the individual farmer on the total supply or demand is negligible. On the opposite side of the market, the situation generally is more or less monopolistic. Full competition on one side of the market and more or less monopolistic com-

¹Before 1795, the Netherlands was called the Republic of the United Netherlands.

petition on the other side, creates a need for agricultural cooperatives. The more the market diverts from 'full' competition, the greater the impulse to build up a countervailing power.

Dutch cooperatives exist throughout the agricultural sector and trade field. They have increased in operational scale, merged gradually to achieve attractive economies of scale, and have crossed national boundaries since their introduction into agriculture. The Dutch cooperative system is summarized in the following paragraph.

4.3.1 Agricultural cooperatives

In the Netherlands, the 'cooperative' is reserved for a very specific form of economic collaboration, based on private enterprise and voluntary organization. The definition of an agricultural cooperative is (NCR, 1993):

'An economic organization in which farmers collaborate permanently and put together parts of their economic activity (in general the market function), at joint risk and on joint account, in order to make the economic activity concerned as profitable as possible, while maintaining the self-supporting nature of the other functions of the agricultural enterprise'.

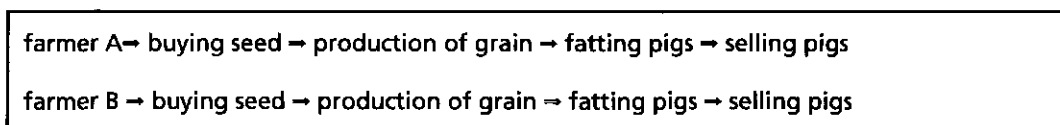


Figure 4.1 Individual farmer proces

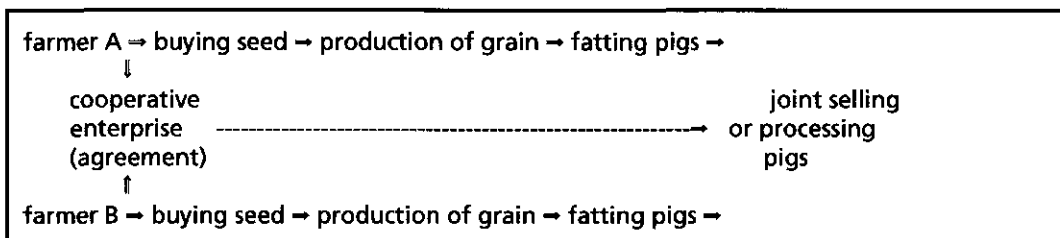


Figure 4.2 Cooperative activity

Figures 4.1 and 4.2 shows the processes involved in selling pigs, for example, or other final products such as sugarbeet, milk, flowers or vegetables, individually or in collaboration with others, respectively.

Both figures show four activities or functions within the farmer. The farmer as such does not carry out any market activity and the processes flow into each other until the farmer has to sell his final product on the market. For an individual farmer, all activities are carried out by himself. In cooperative case, two separate farmers A and B have agreed to collaborate for the purpose of commercialization on the basis of agreement made already by themselves, including the possibility of processing for a better valorization of the final product.

The principles of agricultural cooperatives may be summarized from the above figures and definition as follows:

- they are the collaboration of private enterprises;
- they are the collaboration of independent entrepreneurship. Each farmer remains himself responsible for all production decisions and the production process on his own farm. This means that the agricultural cooperatives are the collaboration between independent farms. In other words, the agricultural cooperative system is a form of 'external' economic organization;

- they are strictly based on the agreement made by farmers;
- they are founded on a voluntary basis. They are managed and controlled in a democratic way by members;
- they are fully independent of the government; there is no government intervention;
- the cooperatives incur costs and make profits which are for joint account of the members. By using an internal key of distribution, these costs and proceeds must be distributed among the members. The standard to be used in this respect shall be derived from the market structure and its straight or complete competition. This means an objective key of distribution based on the quantity and the quality of the economic activity each member undertakes with his cooperative;
- collecting the economic activities of farmers means 'pooling'. In the pooling system every farmer does not necessarily receive the same price. The price differs depending on the delivered products. From their inception many agricultural cooperatives have fixed the price paid by the quality of the produce. This is seen and accepted by the farmers as an objective system;
- internal rights and duties must be shared among the members of the cooperative organization. This concerns the financing, the sharing of risks, the liability of the voting system;
- concerning the voting system, daily practice has shown that, within a maximum limit, the majority vote is increasingly gaining ground in the Netherlands. The growing differences between the various farmers stimulate this development. This means that the 'one-man-one-vote' principle adopted from the Rochdale-pioneers must not be looked on as an 'axiom' for an economic organization like a cooperative;
- economically speaking agricultural cooperatives depend directly on the production process of their member farmers. This production process directs the cooperatives' primary objective and function. In other words, the cooperative is the 'prolongation' of its members;
- close membership. It means that if a farmer is a member of cooperative, he must sell all his products through the cooperative. It is not allowed that part of his products is sold to retailers by himself directly for a member farmer;
- multimembership. It means that one farmer may be the members of more than one cooperative organization.

4.3.2 Methods of agricultural cooperatives

The method used by agricultural cooperatives is one of horizontal and vertical integration or differentiation. The cooperative that farmers bring together and jointly sell their products is a kind of horizontal integration, a kind of a producers' society.

If additional activities can be taken over in relation with the further market functions, like for example the processing, wholesale and export activities, in other words, if cooperatives collect the products (horizontal integration) and take over the downstream commercial functions following the actual production process at member farmer level, the cooperative is a kind of vertical integration.

The 'radiation effect' of the cooperative is very important because the cooperative has impact on the price levels of all farm products. No enterprise can take the liberty to disregard the achieved price levels (i.e. achieved *inter alia* by the action of the cooperative) because otherwise it risks being pushed out of the market.

4.3.3 Defence of the cooperative interests

Local and regional cooperatives are either organized in so-called 'commercial' central cooperatives or in 'non-commercial' central organizations, societies or federations. The cooperative interests are mainly defended by their central representative organization.

Almost all the Dutch agricultural cooperatives are organized in the National Cooperative Council for agriculture and horticulture (NCR), as figure 4.3 explained. NCR, as a national umbrella organization, was established in 1934 as the result of a joint action of the agricultural cooperatives to defend the cooperatives at the national level against the at

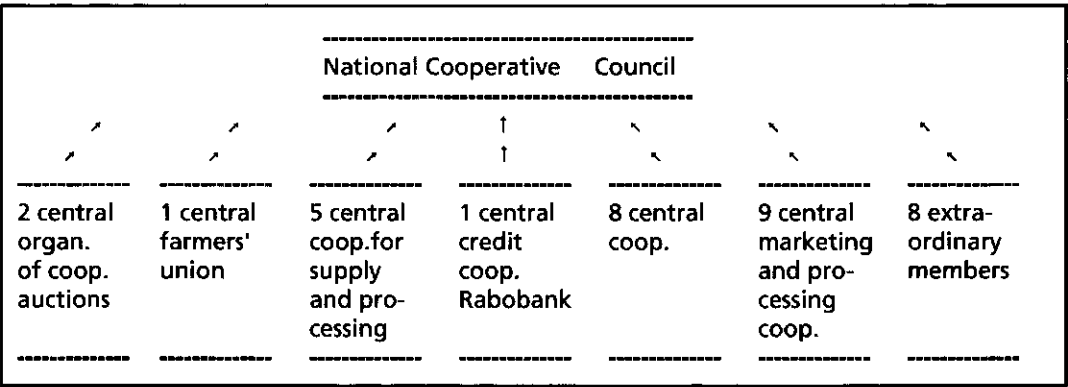


Figure 4.3 NCR as an umbrella organization

tacks of the non-cooperative enterprises, which denied the right to set up cooperatives and boycotted them.

- The main aims of the NCR can be described as follows:
- to further the cooperative enterprise and other corresponding economic forms of collaboration between farmers;
 - to represent the interests of the members, especially as a representative coordinating body of the agricultural cooperatives, at national and international level.

- The NCR endeavours to fulfil these aims by:
- studying problems of economic, legal, fiscal or organizational nature, especially where these problems effect the principles of cooperation, either directly or indirectly;
 - supplying information on principles of cooperation, both within the agricultural sector and to others such as the Dutch Government, the Parliament and the press, schools and foreigners;
 - publishing a quarterly magazine, called 'Cooperative Magazine', brochures and other printed matter about the cooperatives;
 - giving lectures about the history, theory and practice of the cooperatives;
 - consulting the Dutch and European Governments with respect to cooperative problems and legislation.

In practice, the Secretariat of NCR deals with a large scope of activities. It is a small office with a strong input of experts from the member organizations on the various subjects to be dealt with. They work in committees or working parties. On one hand, the committees advise and guide the Board of the NCR in its positions. On the other hand, some committees act as a contract place for cooperative employees in a specific area.

4.4 Financing system

The capital is the bloodhood of agriculture, especially modern agriculture. It is absolutely impossible to transfer agriculture from a traditional one to modern one without sufficient capital. How and where to get capital remains an important issues in agricultural development. It is obvious that farmers cannot be financed fully by their own means. There must be some channels outside farms to finance agriculture. An effective financing system is crucial for agricultural development.

Total invested capital for Dutch agriculture as a whole has grown sharply over the past few decades. At NLG 182 billion, the 1994 value of assets was almost 3.5 times the

1974 figure, NLG 52.5 billion (Rabobank, 1995) ¹. Total capital has grown by an average of 3.7% annually since 1984. Generally speaking, the picture of agricultural capital structure nowadays is as follows: of total invested capital, 59% comes from farmers' own capital, 23% from borrowed capital, and 18% from landlords' capital. This means that nearly a quarter of total invested capital is contributed by financial institutions. From table 4.6 it can be seen that the share of borrowed capital in total invested capital (not including landlords' capital) has been growing. This trend reflects the dependency of Dutch agriculture on borrowed capital. In other words, the financial resources beyond farmers is becoming increasingly important.

The effective financing system of agriculture will be described in the next paragraph.

*Table 4.6 Capital structure of agriculture in the Netherlands *)*

	1974	1980	1988	1992	1994
	in %				
Own funds	79	77	75	73	72
Borrowed capital	21	23	25	27	28

*) Not including landlords' capital; as at 1 January.

Source: CBS/LEI-DLO.

4.4.1 Financing sources

In general, there are four major sources of finance of Dutch agriculture.

Family as a source of finance

Family loans occur rather frequently, especially when farms are passed on from father to son. If the successor cannot get this kind of loan from his father, credit institutions need to be approached. However, for most young farmers it will be impossible to generate enough income (after consumption and taxes) for paying the interest and redeeming the loans if the farms are passed on against market prices, because of substantial increases in capital requirements to finance the farm assets. In 1991 for example, one needed 1.65 million guilders on average to finance a farm against market prices. A take-over against this market price is impossible. In terms of continuity of family farms, the parties involved (successor, parents and other children) have to look for other options for valuing the take-over.

In general, the take-over price of a farm is much lower than the market value. For most assets taken over, an appraisal will take place which comes down to the market value of those assets at that moment. For land and quotas ², there are special fiscal arrangements. In the case of a take-over within the family the successor only has to pay a price equivalent to the value of leased land, viz. about 60% of the value of free land. This means that the take-over price is only about 60% of the market price. The successor (being a family member) can take over the quota for free. Only when the successor pays less than the above-mentioned prices (after all parties gave their blessing to the proposal) does he have to pay taxes over the gift which is counted as the fiscally accepted prices minus paid prices for the assets taken over).

¹The increase is not just the result of investment, as it is prompted by price rises for various assets. Land price rises have been particularly high.

²Quotas are used to limit the production in the EU. Farmers have to pay for getting the quota.

There are two take-over types in the Netherlands: the direct take-over and the gradual take-over, which mostly takes place in the form of a partnership. With reference to the first way, the years before the take-over the son or daughter usually works on the farm of his parents as a paid labourer. (When the farm is economically too small for two full-time workers, the son can work outside the farm.) For liquidity reasons, a large part of his wages remains within the farm (as a credit note on the balance sheet) and for which the successor receives interest. In this way he builds up his own capital. In many ways parents and successor work toward the final take-over and they invest to guarantee future continuity. In reference to the second way, before the take-over the parents and the successor enter into a partnership with profits partially accumulated on the successor's account. Besides sharing the profits, the successor can also participate in the capital gains. A partnership will also give the prospective successor more juridical certainty concerning the take-over. The share of the successor in the capital gains depends on: the way the parents bring in the assets in the partnership (against market value or against fiscal value, each with its different fiscal consequences) and the arrangement made in the partnership contract; the development in prices of the assets and the contents of the contract the successor has the possibility to accumulate more capital of his own. Consequently, he will have to finance a smaller part of the take-over with borrowed capital.

Financial institutions

In this group, there are a large number of more or less specialized institutions for different agricultural capital requirements. These institutions, which are commercial lenders, lend money to farmers on business terms. The farmers have to pay interest on the loan, while security is usually required to cover the amount lent.

Commercial lenders can be divided into three groups:

1. agricultural credit institutions and merchant banks. Within this category Rabobank occupies by far the most important position in the agricultural sector. About 90% of total loans of agricultural sector is provided by Rabobank;
2. finance companies. These mainly give loans for the financing of movable property such as laying batteries, specialized machines, pig equipment and so on. They do so mainly in the form of leasing or hire purchase. Frequently, however, the purchase of movable assets can be financed through an ordinary bank. Compared with bank financing, the rate of interest for leasing and hire purchase is considerably higher. Financing through a finance company would be considered if the purchase has a limited economic life. Purchase of this nature would generate sufficient turnover and profit to guarantee that interest and capital can be repaid over the relatively short time usually allowed for the completion of such transactions;
3. mortgage banks, saving banks, insurance companies, private persons. Sources in this category only grant mortgage loans on real estate. These institutions do not normally allow overdrafts on current accounts. The financing possibilities are very often limited to a first mortgage.

Landlords

Landlords' capital is a typical characteristic of Dutch agriculture. It represents the value of land and buildings held on lease, and consequently does not stand for borrowed capital required by farmers to finance their operations. Owing to the increase of land price, the landlords' capital share in total capital provision has been pushed up. But the continuous decrease of leasehold land had an adverse effect on the landlords' capital.

The tenant farmer has the considerable advantage that the rent he pays is generally much lower than the interest and repayment capital when borrowing to finance the purchase of the land. So, the landlords' capital also play an important role in Dutch agricultural financing.

Government

The Dutch government has an important role in this field providing finance for the agricultural sector in a variety of ways. Only the role of landlord is reviewed here; others will be mentioned in paragraph 4.8.

Central and local government often acts as landlord, sometimes granting long leases in the Netherlands. It does so by means of the Public Lands Service and the SBL¹. In addition, it is possible to deploy the services of the Land Bank to arrange a transfer of ownership, purchase of a previously rented farm or expansion of a business. When the Land Bank provides assistance the land is let on a long lease. The annual ground rent is 2.5% of the purchase price of the land, and the amount of the rent may be revised every six years. Applications to the Land Bank must satisfy a number of criteria.

4.4.2 Financing methods

The financing methods mentioned here are just the methods used in commercial financial institutions. Such a method is a combination of security, the amount involved and the term of the loan. The various forms of finance are shown in table 4.7. In practice, which method of financing is used depends to a great degree on the specific business circumstances.

Mortgage Finance

Mortgage finance is the method most used in Dutch agriculture because it is the most favourable for the farmland. As to the amount borrowed and the minimum redemption:

- normal mortgage financing is not likely to exceed a maximum of 70% of the valuation;
- however, a 'topping up' mortgage is possible, but together with the normal mortgage financing must not exceed 90% of the valuation. The grant of a 'topping up' mortgage is partly dependent on the profitability and solvency of the business;
- depending on the nature of the securities, the minimum redemption payments required may not come into effect for five years and after that period will be from 1.5% per annum for mortgages on land to 5% per year for wooden buildings. In the case of 'topping-up' mortgages the redemption percentage is at least 5% and frequently higher.

When mortgages are granted on leasehold property or the right of building, the amount of the loan depends to a very large extent on the provisions of the contract. Loans granted vary from 25% of the valuation where a right of demolition is included in the contract to 50-70% when the contract contains a firm right to compensation.

Seasonal Crop Credits

Seasonal crop credits are intended to meet a temporary need for operating capital. This form of financing is mainly intended for arable farms in which expenditure and income fluctuate markedly with the seasons and when there is often a large credit requirement until harvest time. Temporary credit can be granted on the basis of the proceeds expected from the cropping programme. The loan must be repaid after the sale of the produce.

The securities usually required for a harvest loan are the transfer of ownership of the crop and an assignment of debts. Also on the mixed arable-pig farm crop credits can be a useful finance source.

¹Stichting Beheer Landbouwgronden (Foundation for the Administration of Agricultural Land).

Table 4.7 Principal types of finance in agriculture in the Netherlands

Security	Object	Level of lending	Maximum life
1. mortgage	land, buildings, glasshouses	up to 70% of the valuation	agriculture: 30-55 years horticulture under glass: 15-20 years 15-20 years
2. mortgage	buildings, on right of building/ long-term lease	up to 50-70% of the valuation	15 years
3. maximum-sum mortgage	land, buildings, glasshouses	up to 20% of the valuation (on top of the normal mortgage)	
4. transfer of demolition right	buildings and glasshouses on leasehold land	up to 25% of the valuation	
5. transfer of right to compensation	buildings and glasshouses on leasehold land	up to 50% of the valuation	agriculture: 15 years horticulture under glass: 10 years
6. personal security	guarantor's fin. status	limited	agriculture: 15 years horticulture under glass: 10 years
7. guarantee by the ALGF	viable business	not applicable	20 years
8. transfer of ownership machinery	dairy herd, tools and implements, under glass: 5 years	up to 50% of the valuation	20 years
9. transfer of ownership of harvested crops etc. and assignment of debts (crop credits for arable farming	arable farming crops	up to 25% of prospective proceeds	15-20 years; agriculture: 5-8 years; horticulture 9 months
10. transfer of auction money	auction money	up to 25% of auction money	9 months
11. transfer of ownership of bulbs etc. and assignment of debts	reproductive flower bulb stock	up to 40% of the valuation of the bulbs and prospective proceeds	6 months
12. assignment of accounts receivable	accounts receivable	up to 60-70% of the accounts receivable	to be established from year to year
13. transfer of ownership, assignment of debts, if necessary, supplemented by suretyship	stock of pigs and poultry (livestock financing)	dependent on the type of livestock; varies from arrangement to arrangement	continuous
14. transfer of ownership + suretyship or repurchase undertaking	heavy equipment and machinery	75-100%	4-5 years

Interest Accumulation Arrangement for Young Farmers

The aim of this kind of arrangement is to lighten the financing charges on young farmers in particular, by taking over existing firms or businesses.

In land-tied businesses, no redemption or interest payments are made on the mortgage loan for the first five years. During the first five years 5, 4, 3, 2 and 1% interest, respectively is added to the principal of the loan. After the first five years liabilities are as follows: (a) the previously agreed redemption payments on the principal; (b) the interest on the principal plus accrued interest; (c) the accrued interest to be redeemed in 10 years.

In enterprises not tied to land, that part of the loan for which the Agricultural Loan Guarantee Fund (ALGF) has provided a guarantee can be paid back in accordance with a graduated redemption system. Before this arrangement is adopted investigation shows whether this method of redemption is suitable for the particular enterprise, which must be capable of meeting the much higher charges after the fifth year.

Livestock Financing

There are a number of credit arrangements designed specifically for the financing of livestock. They can be divided into what is known as free arrangements and tied arrangements.

Under a free arrangement the proprietor is completely free in the choice of both customer and supplier, while a tied arrangement is based on a partial surety from the supplier and/or customer. The latter imposes on the proprietor the obligation to buy his stock from a particular supplier and to sell to a specified customer. This obligation is independent of any other concerning price guarantees, etcetera. When a proprietor wishes to change his supplier and/or customer, the situation can be reviewed to determine how the financing can be adapted, possibly to a free arrangement. Loans granted under free arrangements are generally somewhat lower than those given under tied contracts.

4.4.3 Major agricultural financial institute: Rabobank

As mentioned above, about 90% of bank lending to the agricultural sector comes from the Rabobank Group, with the remainder, about 10%, being provided by the commercial banks. To make the agricultural financial system understood well the Rabobank must be introduced independently.

Generally speaking, Rabobank is one of the largest banks in the Netherlands at present. Measured by total assets, it is the second largest bank. Measured by market share, it is the largest on the domestic market. Internationally, it is one of the 40 largest banks in the world. The strength of Rabobank's position is reflected in the following market shares. Rabobank awards approximately 90% of all bank credit granted to the agricultural sector. Some 40% of small and medium-sized companies bank with Rabobank, against approximately 15% of the large companies. Rabobank handles 35% of the private savings market and 25% of the residential mortgage market. A third of all payment transactions is performed by Rabobank.

The nature and objective of the Rabobank

As discussed in Chapter 3, Rabobank was established on the basis of farmers' credit cooperation. The main objective is granting credit to members/entrepreneurs at the most favourable rate and conditions possible. This means that Rabobank provides loans to the members and supplies other bank services, both at the most favourable conditions possible, and also in economically difficult times.

The goal of any cooperative is to provide optimal service to its members. For a credit cooperative like Rabobank, this means offering optimal financial service. The Rabobank members are all business clients that receive business loans. Members do not have to pay a contribution fee but become a member automatically when they receive loans for con-

ducting their business. Private clients do not become members automatically, but may request membership.

The structure of the Rabobank

There are two types of Rabobanks:

- a. the local Rabobanks. Each local Rabobank is an independent, autonomous unit with its own responsibilities carried by its own Boards. Each has its own geographical area within the confines of which it performs its operations on behalf of its clients in the area. The local Rabobanks are all members of the central Rabobank and through the central bank they are connected with each other;
- b. Rabobank Nederland, i.e. Central Rabobank¹. It is a separate cooperative institution which has its object to promote the interests of the local Rabobanks. All local Rabobanks are members of Rabobank Nederland.

The Rabobanks are also associates in various other (affiliated) institutions, of which the most important is Rabohypotheekbank N.V. (Rabo Mortgage Bank).

The local Rabobanks

The local Rabobanks are organized in a cooperative way based upon the principles of Raiffeissen. These principles are:

- a. member liability. In the past the members assumed unlimited liability for any deficits that would remain when the cooperative would have to be liquidated. The unlimited liability worked as a guarantee to clients that their deposits and savings would at any time be paid back. With this guarantee local clients are prepared to stall their money at the credit cooperative. Presently (since 1980) liability at the Rabobank organization is limited to NLG 5,000 per member, as the increased reserves are nowadays sufficient as a safeguard for the debts. This liability takes the place of a capital contribution by the members. Together with the reserves which the banks have built up over the years from retained profits, members' liability enhances the solidity of their own credit institution. Members' liability serves as an extra stimulus to the Rabobanks to pursue a cautious banking policy. As a result, the cooperative banks have, since their inception, never experienced the need to have recourse to their members' liability;
- b. cross-guarantee system. This makes the local Rabobanks and the central bank liable for each other's commitments. In line with this cross-guarantee system, all participants of the Rabobank organization are entitled to financial support where funds are inadequate to meet all liabilities. Premiums are not levied, but any amount paid eventually would be apportioned among the participants. Through the cross guarantee system it is possible, also for the smaller local Rabobanks or those which are not as solvent as the others, to profit from the perfect financial stance of the Rabobank Group in the financial markets;
- c. restricted area. Each local Rabobank is active in a restricted area, serving the local community, maintaining good personal contacts and being active in local associations (such as sports, music, etcetera);
- d. prudential management. Credits will only be granted to creditworthy members;
- e. reservation of profits. Profits are not distributed among members but have to be added to reserves. The profits are dedicated to improving the financial base to enlarge the borrowing capacity (and as such the lending capacity) and to reduce the

¹In 1972, two central cooperative umbrella banks, viz. Cooperative Central Raiffeissen Bank and Cooperative Central Farmers' Credit Bank, merged into one central bank, i.e. Cooperative Central Raiffeissen-Farmers' Credit Bank (Raiffeissen-Boerenleenbank, shortly Rabobank). Following the example of their central banks, local Raiffeissen and farmers' credit banks merged and increasingly started to call themselves Rabobanks.

liability and risks of the members. This provision aims at enabling the cooperative banks to constitute their own capital, needed both to shoulder any losses and to expand their service capabilities for the benefit of the local community.

Each local Rabobank is an association of persons on a cooperative basis, with the objective to serve the financial benefits of its members. The local Rabobanks grant loans to business and private clients, mainly for business investments and housing finance (mortgage). To finance these loans, they attract savings and deposits from clients in the local community.

Up to certain financial limits the local Rabobanks are completely free in conducting their business. For larger amounts they need approval of the central bank, because of the possible risks involved. Each local bank has to look after its own financial position, such as the solvency, liquidity and profitability.

The advantage for members of the local bank is not only that they get cheap financing, but also that they have considerable influence on the bank's policy.

The central Rabobank

All local Rabobanks are members of and have shares in the central Rabobank. The balance sheet total of each respective local bank determines the number of shares.

The central Rabobank, Rabobank Nederland, is thus a daughter company of all the local Rabobanks. Vividly, it is not the mother of the 510 local member banks¹, but the daughter of 510 mothers.

The central Rabobank has two different kinds of tasks: those that result from the relationship with the local member banks, and more conventional banking tasks. The central Rabobank is involved in policy making for the whole organization (strategy, marketing, sponsoring, public relations), advising and assisting local banks in cost-reduction plans, economic and financial developments, product development, etcetera another important task is the liquidity management. The central Rabobank helps the local Rabobanks with surplus funds channel these surplus funds to local Rabobanks with deficits. Furthermore, the central Rabobank supervises the local Rabobank's solvency and liquidity. The Dutch central bank has formally delegated this task of supervision of the member banks to the central Rabobank.

As a banking institution, the central Rabobank serves the larger companies which are often too big and need too specialist advice to be met by a local member bank. Other banking activities carried out by Rabobank Nederland are the foreign banking activities and money- and capital market transactions. The difference between central Rabobank and local Rabobanks is that the central bank issues stocks, whereas the local banks do not.

The management of the Rabobank

The scientific management is one of the important features of Rabobank. It is based upon the down-up model, not up-down model.

The management model of local Rabobanks consists of four parts, as shown in figure 4.4. The General Meeting has the highest formal authority within the local Rabobanks. Normally the members come together once a year in the General Meeting. The members of the Board of Directors and the Supervisory Board are elected by the General meeting. It is the General Meeting that has to approve of the overall policy, the annual accounts and the allocation of profits to activities of local or general interest.

The Board of Directors generally comprises three to five members. The number is so small to improve the decisiveness of policy making and to ensure discretion around the treatment of credit applications.

The Board of Directors defines general overall policy on liquidity, solvency, profitability; ensures the compliance to the Articles of Association and is accountable to the General Meeting and the Supervisory Board.

¹Now there are 510 local Rabobanks. The central Rabobank consists of 510 local banks.

The Management conducts the daily banking activities, such as granting loans and attracting deposits. It implements the policy decisions of the Board of Directors, looks after the liquidity, solvency and profitability of the bank.

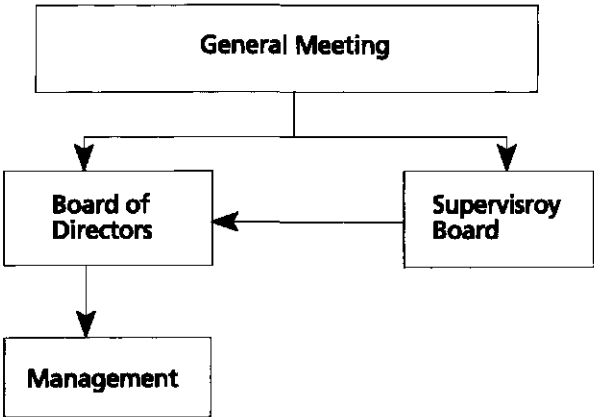


Figure 4.4 The management of local Rabobank

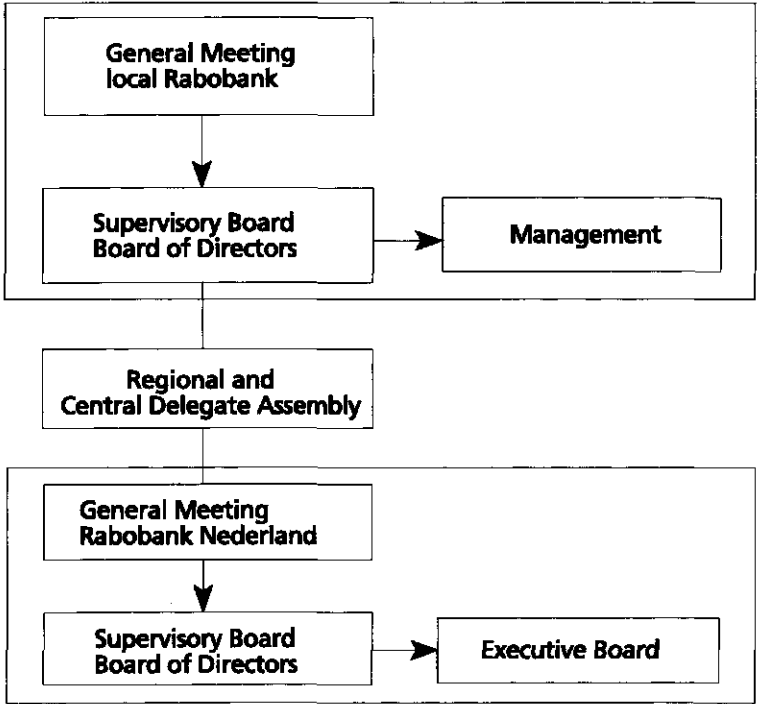


Figure 4.5 The management of central Rabobank

The Supervisory Board comprises at least three members. It not only supervises but also advises the Board of Directors and the Management. It has to approve some important decisions, such as on the budget, appointment of managers, closing/opening of branches.

The management of the central Rabobank, as shown in figure 4.5, looks very much like the management of local Rabobanks. There are an Executive Board which is in charge of daily financial and economic management; a Board of Directors in charge of general

policy, cooperative nature, relationship between central bank and local banks and among local banks; a Supervisory Board, consisting of members of affiliated banks and participations, in charge of supervision, advice and approval of some important decisions; a General Meeting with about 3,000 delegates of local member banks.

There is an extra, which is the Regional and Central Delegate Assembly, in the management structure of central bank. The reason for its existence is that it is virtually impossible to discuss major issues with the member banks at the General Meeting, since there are about 3,000 delegates at that meeting as mentioned above. Therefore the total number of member banks is divided into about 22 'circles', each comprising 10-30 local member banks. These 22 'circles' of local member banks each meet twice a year in a regional delegate assembly. Major issues are discussed there, the results of which are passed on to the central bank. Each regional assembly will send three delegates to a central delegate assembly, which meets four times a year. In central delegate assembly also delegates of the central bank participate. The objective of the regional and central delegate assemblies is to improve the communication between central bank and local banks, which at a general meeting of three thousand persons would not be possible. In the meetings of assembly the issues are discussed and the minds are made ready for changes. Consultation processes take place, which usually leads to unanimity or at least large majority acceptance. Through this organizational structure of decision-making there is a good communication possible between the many independent and autonomous parts of the Rabobank organization.

4.5 Marketing system

Marketing plays an important role in agricultural development. It not only deals with the issues how to sell the agricultural products effectively in the domestic and abroad markets, but also bridges consumers and producers. Through this bridge the changes of consumers' preference, which are the guide of the adjustment of food production, can be transmitted to producers. Marketing is an interactive process between producers and consumers.

4.5.1 The major points of marketing system

There is already a good agricultural marketing system in the Netherlands. Its major strong points can be summarized as follows.

Consumer orientation

Strong market-consumer orientation is the basic feature of the Dutch agricultural marketing system. The so called market-consumer orientation means that agricultural and food production is only the tool to meet consumer's need for food; the need of market-consumer is the ultimate aim of agricultural and food production; it is the market that determines the structure of agricultural and food production; product development, packing, branding and offering services in agricultural and food production have always to see consumers as 'king'.

In order to keep the strong market-consumer orientation, some market-consumer orientated institutions were established in the Netherlands. Of them the Commodity Boards and Industrial Boards must be mentioned.

The Netherlands is the only country in the world that has Commodity Boards (Produktschappen) and Industrial Boards (Bedrijfsschappen). Those institutions provide an institutional network for a vertical and horizontal marketing integration and in that way represent the interests of all participants (producers, processors and traders) in the product chain. The cooperation and communication within different industries as well as successful penetration of foreign markets can be explained by the existence of the Boards.

The Commodity Boards were set up in 1950s, when agricultural production structure typically existed of a great many small farms and processing companies. They are com-

posed of representatives of the producers, processing industry, and traders concerned with the commodities coming within the orbits of these Boards. Each Commodity Board consists of two or more groups of enterprises performing different economic functions in respect of a particular product or group of allied products. So, Commodity Boards are vertical organizations that were created on behalf of specific sectors. They include the entire production chain for each product: production, processing, wholesale and retail trade. They function in the control of the markets and may issue regulations under government supervision which are binding for all groups of people dealing with the products concerned. Thirteen Commodity Boards have been already established in the Netherlands, they are respectively for 'Livestock and meat', 'Poultry and eggs', 'Potatoes', 'Seeds of field crops and seed potatoes', 'Vegetables and fruit', 'Fishery produce', 'Cereals, oil seeds and pulses', 'Ornamental horticultural produce', 'Horticultural seeds', 'Dairy produce', 'Margarine, fats and oils', 'Feeding stuffs', 'Beer and distilled spirits'. Commodity Boards are independent in the formulation of the sector policy, such as the structure of the sector, quality of product, marketing and promotion, technical and market research, animal welfare, education and training, environment, innovation, public relations and information, working conditions, and advice for the government. By these means organized industry is able to deal with many affairs itself, and this has resulted in the reduction of government intervention in the economic sphere. Commodity Boards do not engage in buying and selling but are engaged in market research, promotion and technical research for the generic product. The total promotional budget of Commodity Boards surpasses 150 million guilders.

The Industry Boards are composed of enterprises performing equal or related economic functions. They are horizontal organizations, representing the interests of one sector, wholesale and retail dealers of agricultural products for example. In Industrial Boards, the Industrial Board for Agriculture (Landbouwschap)¹, nearly all agricultural producers being organized in it, has been empowered, under the supervision of the government, to prescribe rules and regulations applicable to everyone engaged in the agricultural industry, not only on technical and economic matters, but also in the social field.

There are many other private institutions involved in marketing promotion especially export promotion. At present various agribusiness firms, including cooperatives, have become national or even international companies in the Netherlands. They run their own individual marketing programs.

In general, the Dutch Government is not involved directly in agricultural marketing. It does promote agricultural products in international exhibition etcetera. It devotes itself to creating a good policy environment for agricultural marketing. There is one department in MLNV that is active in agricultural export promotion. Its main activities are: organization of trade meetings, arrangement of joint participation to exhibitions and trade fairs, supervision of missions and assistance by agricultural attaches.

Conducting through the product chain

Conducting through the product chain is another feature of Dutch agricultural marketing system. In general, each farm product has its own chain, which is from the pre-production (supply and service), to the production (agricultural production process), and then to the post-production (treatment and processing, trade and distribution). Marketing activities are conducted around the product chain.

A product chain can be described as 'a more or less independent cluster of vertically integrated economic activities related to the production, processing and trading of an agricultural product or a group of agricultural products including separate activities involved in the delivery of the necessary goods and services whereby all firms and institutions maintain a significant relation to each others' (Post, 1989). The main goal of the product chain is twofold. On one side, to coordinate and optimize the flow of products in the three stages in the chain (production, processing, trade). On the other side, to offer prod-

¹Landbouwschap will be finished at the end of 1997. Its functions will be transferred to other organizations.

ucts to consumers of the required quality and in the right place.

There are three main types of product chain: (a) undifferentiated. Producers and firms or enterprises in every stage of the product chain have roughly the same economic power in the market. (b) processing-production oriented. A dominant role is played by the processing firms. They have a monopoly position in that stage of the product chain. In this case, the entrance of new firms is rather difficult. Firms in other stages of the product chain have only a limited economic power compared with the processing industry. (c) demand dominated. The market power is concentrated on the demand side. In this case, the product chain is dominated by traders and consumers.

Table 4.8 shows the marketing activities conducted through the product chain in seed potato industry. Horizontal and vertical integrations around the potato can be seen clearly.

Auction as an important tool

Being introduced in 1887, auctions have gradually become the dominating marketing institution in Dutch agricultural sector, especially in horticulture. Growers sell most of their flowers, vegetables and fruits by auctions. The rapid development of the auction system is due to the fact that the growers realizes the importance of a strong marketing organization.

The auctions have expanded activities from price discovery and product assembly into other marketing activities, such as minimum pricing schemes, promotion, logistics, and product policy. the auctions cooperate in master organizations which coordinate activities, like national minimum price schemes and promotional activities. Some retail chains are critical of the auction system, since daily purchasing through auctions does not fit to retail sales planning. The auctions have developed additional selling operations, such as brokerage operations in pot plants and auctioneering for delivery at a future time period.

Table 4.8 A model of the integrative functions of marketing in seed potato industry in the Netherlands

		Type of Integration		
		Horizontal	Vertical	
Channel participants	P	1. Powerful specialist Bedrijfschap (the Landbouwschap) for seed producers	1. Strong institutionalized vertical integration through the Produktschap (the Pootaardappel Contract Commissie)	
	R			
	D			
	U			
	C			
	E	2. Non-fragmented and powerful farmers union representation	2. Marketing cooperatives, epitomizing the ideals of vertical integration, control 60% of all seed potato exports	
	R			
	C			
	E			
	R			
	S	3. Strong commercial integration of producers in producer cooperatives		

	M	1. Powerful self-regulatory Bedrijfschap for traders	3. Companies operating on the cooperative principles of vertical integration, control a further 35% of all seed potato exports	
	E			
	R	2. Enhanced cooperation between traders (and also strong policital representation) though VECO and NCR		4. Non-cooperative, private seed potato traders are increasingly utilizing vertical integration by entering into a proper contractual economy with producers
	C			
	H			
	A			
	N		3. Traders' Bedrijfschap shares control of the Produktschap with the Landbouwschap. This provides traders with another horizontal forum in managing surplus buying through STOPA, and generic promotions and market development through NIVAP	
T				
S				

Based on the cooperatives

Cooperatives are very important in Dutch agricultural development as mentioned in section 4.3. they play a vital role in agricultural marketing. Most of the marketing activities are carried out by cooperatives in the Netherlands. Three cooperative companies account for more than 80% of milk supply, two cooperative auctions dominate the flower market, cooperative auctions also dominate the vegetable market, one cooperative dominates the potato processing for industrial purposes. Maybe nowhere in the Dutch agro-economy is the cooperative role more strongly expressed than in the potato marketing. Cooperatives currently control 40% of all ware potato transactions and 100% of the starch potato industry, as well as the vast majority of seed exports. Totally, 95% of all seed potatoes are marketed by cooperatives or 'cooperative-type' organizations. So, based strongly upon the cooperatives is the important feature of Dutch agricultural marketing system.

4.5.2 Auction in the marketing system

As discussed above auctions play an important role in agricultural marketing, especially in flower and vegetables marketing. About 95% of the glasshouse vegetables are sold through the auctions. Auction, featuring the Dutch agricultural marketing, is the important part of Dutch agricultural marketing system.

The first auction, vegetable and fruit auction, was established during the last decade of the 19th century in the Netherlands. From that time onward the auction system has shown a very vigorous development. The auction is a strong marketing tool. It is unthinkable for flower and vegetables marketing without auctions at present.

The auction is a typical free market. the products are either graded and packed by the farmers or at grading and packing stations. Each auction market society has its own stock of containers, which are available to producers and buyers on payment of a deposit, plus rent for use. As soon as produce arrives at the auction market, it is examined on quality according to fixed standards. Subsequently it is auctioned by means of an electric auction clock. After the auction the products come into the distribution hall and are delivered by the distribution staff to the right buyers.

The most important tool in the auction is the auction clock. It is the heart of the auction. This is how it works. Opposite this clock are the seats of the buyers. Between the clock installation and the seats some room is left for exhibiting the produce, or samples, which enables buyers to examine it. When the produce is brought in front of the clock, the auctioneer announces the name of the producer and any remarks (quantity and quality) made by the auction inspector, and then the auction proceeds. The pointer on the clock is put into motion indicating figures on the dial. It moves from the highest figure on the clock downwards. As soon as it indicates the price a buyer is prepared to pay, he presses an electric button in front of him at his desk, and at the same time also indicates the quantity he wants to buy, the pointer stops at once. Instantaneously a number corresponding with that of the seat of the buyer, is illuminated in the centre of the dial or on a separate number-board, all other buttons being automatically disconnected. The following round gives another chance to buyers who were too late. All sales are automatically registered by the computer.

4.6 Organizational system

One of the main features of agriculture is that the agricultural production is conducted, in most of cases, by individual family farms. This is very different from the other industries. For example, the industry can not be modernized on the basis of individual family enterprises, but the agriculture can.

One problem resulted from this feature is how to look after the interests, economic interest and social interest, of individual farmers. Because in economic point of view individual farmers are in the state of perfect competition in the market, this means that any one of the individual farmers does not have the ability to influence the market. But there

is a different picture outside the individual farmers, monopoly exists to some extent on the opposite side of the market. In social point of view, individual farmers are separated each other, it is not easy to make their voice be heard. How to reflect their social position is a problem.

Although the interests of individual farmers can be represented by the government this is not far enough. Because the government represents not only farmers but also other social classes. Dutch experience has proved that the farmers' organization is the best way to look after the interests of individual farmers.

4.6.1 The structure of farmers' organizations

Farmers' organizations in the Netherlands include in this report farmers' unions, farm workers' unions, technical agricultural organizations, and umbrella organizations.

Farmers' Union

There are a great number of regional farmers' unions, which are the basis of the central farmers' union in the Netherlands. As we discussed in section 3.3, farmers' organization in the Netherlands started at the regional level. These regional organizations are an important economic and political factor. The regional organizations were united nationally into three central farmers unions based on the ideological currents. They were: The Netherlands Catholic Farmers' and Growers' Union (KNBTB), with about 55,000 members; The Royal Netherlands Agricultural Committee (KNLC), with about 47,000 members; The Netherlands Protestant Farmers' and Growers' Union (NCBTB), with about 21,000 members. The farmers' unions, regional level and central level, work very closely together.

In 1995 those three central farmers' unions united again into one single central farmers' union: The Dutch Federation of Agricultural and Horticultural Organizations (LTO-Nederland). LTO now does not only represent those three farmers' organizations. It represents at national and international level the collective interests of seven regional organizations and professional organizations. Together it looks after the interests of more than 100,000 entrepreneurs in agriculture who are member of these regional and professional organizations.

LTO also has several committees/working parties for the different types of farming, for example dairy farming, arable farming, pig farming, vegetables producers in glass-house etcetera. Besides these committees for specific types of production there are committees for different subjects/questions like 'land use' (planification), 'international affairs' (EU, WTO), 'social affairs' (salaries, labour conditions). The position of women in the farm sector is discussed in a special working party.

Logically, farmers are not the direct member of LTO. They are member of one of the regional organizations. Regional organizations are direct member of LTO. So the regional organizations receive financial contributions of the farmers. The level of contribution depends upon the farm size.

Mainly, the aims of the farmers' unions are:

- represent and promote the economic and social interests of entrepreneurs and their families in agricultural sector, at regional, national and international level;
- play an active part in the improvement of the regional, national and international market position of agriculture;
- promote the integration of all areas in market-aimed production chains and are dedicated to creating a fully valuable position in these for entrepreneurs in the primary sector;
- work towards innovation with a view to durable and competitive agriculture and improvement in the quality of country live;
- aim at interaction and cooperation with social organizations outside agriculture on a level of its own answerability towards its own members;
- promote the position of agriculture among the society as integrated and valuable.

Farm Employees' Unions

Farm workers have their own jointed forces. At national level there are also three farm employees' unions: General Netherlands Agricultural Workers' Union, The Netherlands Catholic Agricultural Workers' Union, The Netherlands Protestant Agricultural Workers' Union. Since 1970 the two latter unions have been absorbed into larger employees' organizations. Farm employees' unions are the organizations to represent the interests of those who are employed by farmers.

Technical agricultural organizations

The entrepreneurial spirit of Dutch farmers, stimulated by government subsidies, has provided a large number of supplementary organizations, especially in the area of information facilities. Many these establishments are set up by the farmers' unions. The varied collection of service establishments can be brought together under the name 'technical agricultural organizations'. The technical agricultural organizations are often directed, to a large extent, by the farmers. These organizations frequently work together with education, research and extension establishments.

The willingness of groups of farmers to work together on production improvement, cost reduction and production increase has also led to a great blossoming of the so-called study clubs. In a study club, a group of farmers try to find possibilities of improving business management and planning by sharing experiences and comparing business results. In the horticulture, growers have set up a society, The Dutch Association of Study Clubs for Horticulture (NTS), which coordinates the many study clubs. NTS looks after the interests of growers with respect to research and is, as their representative, the permanent consultation partner with research establishments and horticultural auctions.

Umbrella organizations

As discussed above, there were three central farmers' organizations and three farm workers' organizations before 1995. How to coordinate these organizations, particularly farmers' organizations and farm workers' organizations becomes a problem, because the employers' and the employees organizations do not confront each other like two non-communicating blocs, but on the contrary have achieved a large measure of cooperation. Under this circumstance, the formation under public law of the Industrial Board for Agriculture bears witness to this coordination and cooperation.

Since its established in 1954, the Landbouwschap has evolved into the official body for cooperation between agricultural employers and employees in which expertise is pooled. Committees have been formed for all aspects of agriculture. It also possesses regional councils which are concerned particularly with the promotion of agricultural interests in relation to land use and physical planning. It also plays an important role in international relations. Finally it acts as a permanent consultative body for MLNV.

The mergence of three central farmers unions and the sharp decrease of farm employees make the specific occordinative umbrella organization not so necessary. So Landbouwschap will be closed at the end of this year. But this does not mean that its functions disappear too. Its functions will be moved to other related organizations.

4.6.2 The main points of farmers' organization system

The main strong points of Dutch farmers organization system may be expressed as follows:

- farmers' organizations are indispensable in agricultural development. Without them the interests of farmers can not be looked after well, and farmers can not be organized well;
- farmers organizations are not only the economic organizations but also the political player in political and social affairs. This political force is necessary to balance the different social interest groups and maintain the social stability;

- farmers organizations are fully independent. They are farmers own organizations. They may contact with other organizations, also government bodies. But they do not belong to the government;
- farmers organizations are fully autonomous. They are organized, run and managed only by farmers themselves. Their internal affairs are not disturbed by external powers;
- farmers organizations are fully free to enter. Farmers have the full right to choose whether they are organized into the farmers organizations or not. Farmers are not obliged to become the member of farmers' organizations;
- farmers organizations have the full right to express their wishes. All legal measures, including demonstration, can be used to show their requirements and opinions;
- farmers organizations are managed on the basis of democracy. The chairman and the members of the Board of LTO are elected by its members, the chairmen of regional organizations are elected by their own members; the chairmen of committees are elected by farmers with that specific type of farming. This means that the farmers are in a position to influence the course of events at the farmers' organizations;
- farmers organizations (Landbouwschap) have the power to make regulations, in the technical, social, economic, environmental and administrative spheres, under the supervision of government. The regulations have to be observed in the sector (or a segment of it). This is an element of the autonomy granted by the Government—a measure of independent. Compliance with those regulations is reforced by the Government. The existing regulations relate to veterinary health, research at experimental farms and gardens, and quality improvement in a wide range of products. In addition, information, training and education of farm employees is laid down in a regulation;
- farmers' organizations are closely involved in the consultations on collective labour agreements. Ten different agreement are already concerned: for arable and grassland farming, (glasshouse) horticulture, bulbi culture, arboriculture, poultry production, agricultural crafts (contractors), farm management services, land development services, willow and reed cultivation and finally peat cutting;
- farmers organizations act as a consultative bodies for the Government and Parliament. The problems and wishes of agricultural world are discussed at the monthly meetings between the Minister of MLNV and a delegation from the farmers' organizations (Landbouwschap). The flow of information from farmers' organizations is directed at Government and Parliament, at the officials involving agricultural policy, at the farmers, and furthermore at all persons who play a role in the decision-making process concerning agricultural affairs;
- representation of interests by all means of measures and exercise of influence on Government policy at international, national, regional and local level which relate to agriculture and rural development for the benefit of agricultural holdings form the heart of the farmers' organizations work;
- the Government does not intervene in the affairs of farmers' organizations. But there are all kinds of communication and regular contacts and close cooperations between Government and farmers' organizations, and between Parliament and farmers' organizations.

4.7 Education, research and extension system

The Netherlands has a strong agricultural education, research and extension system. We have mentioned many times that this system is the key pillar supporting Dutch agricultural development.

4.7.1 Education system

Dutch farmers can speak English. Dutch farmers are competitive. All those are benefits from the education.

Some strong points exist in Dutch agricultural education system:

Various levels

Dutch agricultural education is vocational education. It consists of four levels.

(A) Lower education

Every child in the Netherlands receives a primary education. Because education is compulsory to 16 years, almost everyone follows secondary education after primary school. Lower agricultural education is a form of secondary education. It is a general education orientated towards a profession. Pupils have to follow 4 years of study at the lower agricultural school, beginning after finishing the 6th year in a general primary school. The first two years are obligatory.

Lower agricultural education is meant for every young farmer. It provides an agricultural basis. But the lower agricultural school is not an end station of the pupils, but rather a preparation for an intermediate or higher agricultural vocational training. Pupils can move on to further training schemes within and outside agricultural education after finishing it.

(B) Intermediate education

Intermediate agricultural education takes two, three or four years. Students choose a specialization in intermediate agricultural school. The intermediate agricultural education trains students for a variety of jobs in sectors which are connected with agriculture. Many of the students are preparing themselves to be an independent farmer.

(C) Higher education

There are five colleges of higher agricultural education in the Netherlands where training is given for higher executive functions in business, institutes and in agricultural organizations. The subjects cover all aspects of agriculture. Higher agricultural education takes 4.5 years to gain the qualification 'ingenieur' (ing.) which is equivalent to a Bachelor degree in other countries. It requires a prior education to senior secondary level (with physics and chemistry) or an intermediate agricultural education. Most of the agricultural advisors in the Netherlands have studied at one of the higher agricultural colleges.

After the higher agricultural education, there are a number of possibilities for further education, such as one-year agricultural teachers' training course, higher management training, one-year commercial economic course, entrance to Agricultural University and to the Faculty of Veterinary Medicine of Utrecht State University.

(D) University education

This is a degree-granting education. Agricultural training at university level is given at the Agricultural University of Wageningen (AUW). A university course leading to the qualification 'ingenieur' (Ir), on average, takes 5.5 years and is equivalent to a Master degree in other countries.

For the students who wish to specialise further within a certain discipline, there is the possibility of extending the training by the so-called second phase. Second-phase students work and study for 4 years as Assistants-in-Training towards the qualification of Doctor of Agricultural and Environmental Sciences.

Flexible forms

Besides the regular agricultural education mentioned above, there are many other flexible forms which provide agricultural knowledge to farmers and others who are involved in the affairs connected with agriculture. For example, agricultural evening class is one of these flexible forms. Evening classes are for the greater part specialized courses in several agricultural subjects.

Practical training schools also give specialist training and refresher courses. In agricultural practical schools, teachers, advisors, farmers, industry businessmen and researchers meet to exchange information.

Agricultural courses especially refresher courses are also given by agricultural experimental stations and agricultural extension organizations.

Looked after by MLNV

Agricultural education is part of MLNV in the Netherlands. This is an exceptional situation in the Netherlands. Almost all other (vocational) education is entirely the responsibility of the Ministry of Education and Sciences.

Undoubtedly, agricultural education looked after by the government body of agriculture is helpful to maintain the close relationship between education information and advice, research and the business community in the agricultural sector.

Supported by the Government

Agricultural education receives a great deal of support, especially financial support, from the Government. Lower and intermediate agricultural education undertaken by Agricultural Education Centers, agricultural colleges and university, are all financed by the Government. Lower and intermediate agricultural education undertaken by private schools are also heavily subsidized by the Government. Even though the evening classes, which are private, are nearly fully subsidized by the Government.

Involved by farmers' unions

Farmers' unions involve in the agricultural education. They take care of the financial aspects of private agricultural schools, though these schools are heavily subsidized by the Government.

More attention paid to practice

Agricultural education in the Netherlands pays more attention to practice so as to train the students' ability to solve problems independently. In lower agricultural education, the work in each school is closely related to agricultural conditions in the neighbourhood. Nearly all students in intermediate agricultural education and also students at agricultural colleges of higher education and the Agricultural University receive, as part of their course, practical training at a practical training school. At the practical training schools, students are taught to deal with real issues.

4.7.2 Research system

Agricultural research in the Netherlands takes place at many organizations. But as shown in table 4.9, the institutes of Agricultural Research Department (DLO) are the main part in agricultural research. Their research budget account for nearly 50% of the total budget for agricultural research. This means that nearly a half of agricultural research are carried out by the DLO institutes in the Netherlands.

In general, Dutch agricultural research system is composed by four parts:

Experimental stations and Regional Research Centers

Experimental stations and Regional Research Centers (ROCs) carry out the practical research. So-called practical research is the research that is closest to farmers. This features the Dutch agricultural research system. ROCs are (clusters of) experimental farmers. They are independent foundations with their own personnel. The experimental stations are foundations, the personnel of which are employed by the Government. Both groups are half financed by the Government and half by the farmers. In general, the experimental

stations and the ROCs are directed towards a specific branch of the industry. They concentrate on synthesising the available knowledge within and around agricultural research. This knowledge is collected and translated for use at farm level. There is coordinated research programming for each branch of the industry which is achieved in consultation with the business community, the extension service and the Government. Farmers, as users of the results and co-financiers, are intensely involved with this.

*Table 4.9 Agricultural research organizations and their share in the total budget for agricultural research in the Netherlands *)*

	Budget in mil. NLG	Share in %
DLO institutes	315 **)	45
Experimental stations and ROCs	70	10
Universities	175	25
Other research organizations	140	20
Total	700	100

*) The beginning of 1990s; **) About 70% from the Government.
Source: MLNV.

Agricultural research institutes

Agricultural research institutes include DLO institutes and non-DLO institutes. Strategic and applied research and part of the basic research are carried out at these institutes. DLO, as a special agency in agricultural research, is part of MLNV. The DLO institutes engage in the applied research which produces background knowledge which, by means of practical research, can be converted into techniques which farmers can use directly. They also pass on basic knowledge to the larger firms in the agricultural sector which undertake their own research. The DLO institutes are divided according to area of discipline, not to industrial branches. DLO is partly financed by the Government. Business community gives contract research projects. In the future, DLO will have a more independent position and will have to earn a larger proportion of its own budget by means of contract research. Nowadays the Government aid has changed from a basic subsidy to financial contributions to definite research programs.

Non-DLO institutes include the institutes, such as the institutes for Applied Scientific Research (TNO), The National Institute of Public Health and Environmental Hygiene financed by the Ministry of Housing, Town and Country Planning and Environmental Management, the institute affiliated by cattle feedstuffs industry, and a few private research establishments including the Sugar Beet Research Institute, the Netherlands Fertilizer Institute, and the Netherlands Institute for Dairy Research, which do not belong to DLO but also undertake applied and basic research for the agricultural sector. In addition, many private and cooperative firms carry out their own research in some areas.

Universities

Universities are an important part of agricultural research. From table 4.7 we can see the research budget of universities is the second most only after DLO. About one fourth of agricultural research are carried out at universities. The most important establishment in this category is the Agricultural University in Wageningen. AUW mainly undertakes basic research, also some applied research. About 70% of the research of AUW is financed by MLNV.

The National Council for Agricultural Research

The National Council for Agricultural Research (NRLO) used to be a coordinative agency. In NRLO, research establishments, social organizations and the Government consider requests for future research. NRLO develops reconnaissance studies in the field of science and technology and makes an inventory of research needs. For this, NRLO had programming committees for each branch of the agricultural industry. Every four years, NRLO presented its long-term outlook for agricultural research. This long-term outlook was, for MLNV, an important starting point for its research policy. At present, NRLO is an advisory council for MLNV. It does foresight studies on developments of Dutch agricultural and food sector, and tries to develop different strategies for science and technology policy.

4.7.3 Extension system

The extension is very active in Dutch agricultural development. A wide range of advisors and experts in government services, farmers' organizations, independent extension bureaus, cooperatives and other supply and processing businesses are engaged in agricultural extension field in the Netherlands.

Extension service from the government services

The Agricultural Extension Service (DLV) is the largest agricultural extension organization in the Netherlands. It has evolved from its former function as the government service into an more independent organization of agricultural extension service. At the national level, DLV is directed by an Agricultural Advisory Committee made up by representatives of government and farmers' organizations. At the regional level, each DLV team is supported by a guidance committee which is made up by members of technical agricultural organizations, representatives of farmers' organizations and a representative of the trade union for the food industry and functions as a sounding board for the team.

DLV gives advice on the production, technology and economy of the agricultural business. Its service has more than 60 regional teams spread over 26 offices throughout the country. The teams are divided over 15 agricultural sectors. Each team consists of a team leader and agricultural experts. The agricultural experts visit farmers on their holdings, write articles for the trade press, put folders and brochures together, organise group gatherings, guide farmers' study clubs, address meetings, organise demonstrations and make a contribution to agricultural courses. Advice is given not only on the daily running of a holding but also on long-term business developments. But the agricultural experts do not make decisions for farmers.

Extension service from the farmers' organizations

Farmers' organizations are strongly involved in agricultural extension service. The Social-economic Advisory Service (SEV) is an extension service agency in the social-economic field with more than 200 advisors who are employed by the regional farmers' unions and the trade unions in the agricultural sector and in the feedstuffs industry.

The services from SEV support farm families and employees in decisions concerning business and family. The SEV advisors give counselling about questions related to business succession, adaptations and closure, family finances, insurances, town and country planning, environment, land and lease matters and legal affairs. The SEV advisors give extension services by means of individual advice, organising written advice, material and group extension work, addressing meetings and giving education on economic and social topics. Where there are social-economic problems, the SEV advisors will always take the personal circumstances of the entrepreneur and his family into account. In the case of a take-over, the position of the family successor as well as of the parents will be discussed, not only in financial but also in social terms.

Besides giving advice in the social-economic field, the farmers' organizations also provide technical-economic extension services in horticulture via the Foundations for Cultivation Guidance. Those foundations give intensive guidance on cultivation to growers. In addition, farmers' organizations often employ legal and other specialists whom farmers and advisors can approach for help.

Extension service from the supply and processing business

Supply and processing businesses are also involved in agricultural extension service in the Netherlands. They usually employ their own advisors. Their extension services are often coupled with the sale of means of production. Their advisors operate independently and the advice they give is treated as a separate activity from selling. In dairy farming, farmers receive specifications via the dairy cooperatives or special inspection services on the composition of milk from each cow and advice on checking for diseases.

Extension service from the private extension bureaus

In nature, the advisors of supply and processing businesses are private extension service. Besides them, the commercial extension bureaus are important private extension service. During the last 15 years, the private extension service has increased a great deal in the Netherlands. The commercial extension bureaus, particularly in the horticultural industry, have taken over a significant part of the traditional advisory market.

4.8 Government policy system

Government plays an important role in the agricultural development although the Netherlands is a typical free market economy system. The functions of the Government are almost everywhere in the agricultural sector. The policy is the tool of Government promoting agricultural development. Policy system composes an important part of Dutch experiences of agricultural development.

4.8.1 The aspects of the Government function

The functions of the Government are involved in almost all aspects of Dutch agricultural development.

Agricultural education, research and extension is the field that the Government plays even more functions. As demonstrated in section 4.7, it is the Government that set up the establishments of agricultural education, research and extension, financed the activities of agricultural education, research and extension, promoted the developments of agricultural education, research and extension. All these have made the education, research and extension as the pillar of agricultural development. Dutch agricultural development is unthinkable without the education, research and extension. It is unthinkable for agricultural education, research and extension without the Government support.

In financing field, the Government also plays an important role. It is the Government that promoted the establishment of Rabobank, which is the major financier of agricultural sector as discussed in section 4.4. The Government not only exerts influence on agricultural financing by means of monetary policy, supervision of banks' business activities, and structure policy, but also provides important financial service for agricultural sector by means of Agricultural Loan Guarantee Fund (ALGF), Agricultural Development and Reorganization Fund (ADRF), and Land Planning (LP).

The ALGF was initiated in 1951 with the objective to promote the development of agricultural sector, and in particular the expansion of productivity in agricultural firms. It acts as an institutional guarantor, therefore, and does not lend money itself. It guarantees interest payments and repayments on the money loans granted by banks to farmers. Any entrepreneur operating an agricultural enterprise in the Netherlands and failing to obtain sufficient security may apply for guarantee for: (a) take-over of a holding or founding a

new enterprise, (b) modernization or expansion, and (c) refinancing but only where adequate proof is presented of the company's prospects of improving its profitability. Applications for guarantee will be evaluated based on criteria including: (a) entrepreneurship and professional expertise, (b) past financial policy, company size and production circumstances, (c) company profitability, and (d) own funds. The crucial condition is that the budget must demonstrate that sufficient savings will result and that liquidity trends are such that fluctuations in income will not endanger the company's continuity. The standard normally applied for guarantee obligations is that the Fund assume obligations equal to five times its total guarantee capital. The total guarantee fund reached 189 million NLG at the end of 1994, 7.6 times of that in 1952.

The ADRF was established in 1963 with the objective of promoting the development and reorganization of agriculture. This meant that on the one hand supporting enterprise widening-up and making provisions for persons leaving agriculture and, on the other hand, stimulating improvement of the operational structures of the remaining enterprises by means of subsidies. Over the years, many reorganization and development schemes have been introduced. Most of them have now fitted into EU structural policy or are an elaboration of that policy.

Land Planning Act which came into force on 1985 states that land planning is intended to improve the use of the countryside in accordance with its functions as laid down in the context of physical planning. It can encompass measures and facilities for agriculture and forestry, nature and the landscape, the infrastructure, open air recreation, cultural history. There are four types of land use measures in the Land Planning Act: reorganization, reallocation, use adaptation, and reallocation by agreement. The cost of land planning measures are borne by the Government and the owners involved. The average share of the total costs of 'reorganization' and 'reallocation' borne by the State is 60%. The remaining 40% is paid by the owners and by the third parties such as municipalities and district water boards.

In marketing field, although the Government does not involve in the concrete affairs of agricultural marketing it promotes agricultural trade with other countries via various measures as mentioned in section 4.5.

In cooperative field, the Government laid down cooperative regulations and law so as to provide institutional framework for cooperatives and the parties involving in the cooperatives.

In the price policy field, the Government assists the agricultural industry not only by providing research, advisory and educational facilities and measures for structural improvements in farming, but also by an active agricultural price policy. This price policy is designed on the one hand to stimulate more production, higher quality and healthier environment and, on the other hand, to safeguard agricultural producers to some extent against risks resulting from wide price fluctuations. In the early 1930s after the great crisis, the Government operated the price support policy, i.e. the fixed annually minimum guaranteed prices for a number of important products which guarantees were related to the cost prices of the individual products covered. The cost price calculations were based on the costs of production on farms which were justifiable from a social and economic aspect. The term 'socially and economically justifiable farms' means that the size and pattern of production and efficiency of the farm management of the sample farmers from which the data for cost pricing are collected are subject to special requirements. In addition to all paid expenses, the cost of family labour, the interest on invested capital and a remuneration for farm management are included in the calculated cost price. This remuneration is related to the salary scales of farm managers in the state farms in the polders of the Lake Yssel district. The cost prices calculated by LEI formed the basis for discussions about the level of the price guarantees between the Minister of MLNV and the Industrial Board for Agriculture. Not only the calculated cost prices but also other factors were taken into consideration when deciding on the agricultural price policy. Of importance was the development of marketing possibilities. From 1968, when the Common Agricultural Policy (CAP) was introduced, onward Dutch Government has implemented the CAP and played an important role in promoting the improvement and rationalization of the CAP.

In the environmental field, the Government is active in the environmental construction so as to maintain the sustainable development.

4.8.2 Some strong points of the Government policy system

The strong points of Dutch Government policy system can be summed up as the following aspects.

- the basic purpose of agricultural policy is to maintain the production to meet the certain demand, to improve the productivity, to raise the competitive capacity of agricultural sector in the world market, to keep the balance between agricultural production and environment, to promote the cooperation among all parties who are involved in agricultural sector;
- the principal means used by the Government are economic method and juristic method. This means that the Government does not directly intervene the affairs of agricultural sector. The Government functions through the economic levers. All activities of the Government are based upon the laws;
- the basic principle of the Government to manage agricultural development is that the Government absolutely does not engage in the business. The Government is the coach not the player;
- the Government always maintains good communications with farmers' organizations, cooperatives, and other parties that are playing more or less in the agricultural sector;
- the Government has to adjust the policies according to the changes taken place in the agricultural sector and the domestic and international markets so as to make the policies comply as much as possible with the consumer demand at home and abroad.

4.8.3 The policy priorities for the coming years

For the coming years the Dutch agricultural policy will focus on providing the agricultural sector with a new perspective for the future and protecting the interests of nature and landscape.

To realize these aims the Government has opted for a policy which (a) offers more incentives to promote innovation in the sector, (b) sticks to the objectives for nature and landscape but stresses people's own responsibility in the management of the natural heritage, and (c) promotes cooperation between research, education and extension bodies and encourages efforts in the areas of R&D and innovation.

5. SIGNIFICANCE OF DUTCH AGRICULTURAL DEVELOPMENT EXPERIENCE FOR DEVELOPMENT ECONOMICS

Development Economics deals with the issues how developing countries develop from less developed economy to developed economy. Agricultural development is one of the main issues in Development Economics. Backward agriculture is the basic feature of developing countries. Transforming backward agriculture to advanced one is the fundamental base on which developing countries modernize their economy. As analysed in above Chapters, the Netherlands has had a successful agricultural development, it has created valuable experience in its course of agricultural development. Undoubtedly, it is very necessary for developing countries to absorb Dutch experience of agricultural development. To make Dutch experience benefit others as more as possible, it is of necessity to introduce a new concept about Dutch experience of agricultural development into Development Economics.

5.1 Concept about Dutch already in Development Economics

There is already one concept about Dutch in Development Economics: Dutch Disease. But this concept more or less has a negative meaning.

For virtually all of the period of post World War II until the middle of 1970s the Netherlands enjoyed remarkable prosperity in almost all respects. Inflation rarely exceeded 3% per year, GDP growth rarely dropped below 5% per year, and unemployment fluctuated around 1% of the total labour force. Much of this prosperity, as we have described in above Chapters, was due to the fact that the traditional export sector, i.e. agricultural sector, was highly competitive with the rest of the world. Agricultural sector earned a large part of the revenue by means of export. However, in the early 1960s substantial reserves of natural gas were found in the Netherlands. Gas export became an important export goods during the following years. By 1975 gas exports had increased to about one tenth of total exports, and the Netherlands enjoyed a trade surplus of about 4% of GNP. Gas exports had made a double effect. On the one hand, it sharply increased the trade surplus and the Government revenue. The Government used the taxes on gas to fund its drastically increased spending, particularly welfare spending. On the other hand, the inflow of foreign exchange from gas exports buoyed up the exchange rate, as the Dutch guilder appreciated by about 30% relative to its major trading partners from 1973 through 1978. The appreciated guilder made a notable impact on traditional export sector, viz. agricultural sector. Traditional exporters were faced with a double blow: on one side, domestic costs increased; on the other side, guilder earnings from each dollar's worth of exports decreased. The competitiveness of agricultural exports in the world market was brought down. As a result unemployment rose sharply as the relatively labour-intensive export sector stagnated, GDP growth also dropped from the annual rate of 5% in 1960s to 1-2% by the end of 1970s. It is obvious that the gas 'bonanza' gave mixed blessings to the Netherlands.

The above experience of the Netherlands was already summarized as a concept in Development Economics, i.e. Dutch Disease. This concept means the impact on traditional export sector and the affliction of national economy from the enormous exports of natural resources (natural gas, oil) (Gillis, 1983).

After the Netherlands some developing countries such as Nigeria, Mexico, and Indonesia have suffered the Dutch Disease.

5.2 Can another concept about Dutch be summarized in Development Economics from Dutch agricultural development experience

Can we summarize another concept about Dutch in Development Economics from the Dutch experience of agricultural development shown in the above Chapters? The answer is 'yes'. Because the experience of Dutch agricultural development is of universal significance. I name this new concept as Dutch Model in agricultural development.

5.3 The content of Dutch Model

I am trying to define the content of Dutch Model in agricultural development as the following points.

- small family farms in primary production, with large scale, internationally oriented and competitive operations in other part of the agricultural column. Very often these large scale operations are cooperatives or have a cooperative function.
- a good institutional framework, including land tenure system, trade system, cooperative system, financing system, marketing system, farmers' organization system, education- research-extension system, and policy system. These systems form a solid ground on which all parties involved in agricultural sector can play freely and actively;
- outward-looking development. Agricultural resources are allocated according to the market demand at domestic and abroad. Agricultural production is engaged in according to the comparative advantages.
- efficiency priority. Agricultural production takes the efficiency as key. High competitive capacity is placed upon the basis of high productivity. High productivity is placed upon the basis of technical progress.
- knowledge and information generation and diffusion in agricultural sector.
- central guidance by government.

6. ENLIGHTENMENT OF DUTCH EXPERIENCE OF AGRICULTURAL DEVELOPMENT TO CHINA

China is the largest developing country in the world now. Its agriculture, in general, is still in traditional state. How to modernize China is a big question facing every Chinese, also interesting the rest of the world. Undoubtedly, the modernization of China can not be built upon a traditional agriculture. The modernization of China can not do without agricultural modernization. So, it seems to be very clear that more attention must be paid to the agricultural development in the course of Chinese modernization. There is no modernization of Chinese whole economy without agricultural modernization. Developing agriculture is an indispensable part of modernizing China. Needless to say, the experience of Dutch agricultural development is very useful to China.

6.1 Sino agriculture compared with Dutch

China has made many achievements in agricultural development. Especially since 1980 many changes have taken place in agricultural sector and rural area. In nowadays Chinese agriculture is well-known with its only 7% of the world's farmland feeding successfully 22% of the world's population. This is a big contribution of Chinese agriculture to the world.

But if compared with Dutch agriculture, Chinese agriculture is still very backward. In land area point of view, China is more than 230 times of the Netherlands; in population point of view, China is about 80 times of the Netherlands; in agricultural working population point of view, China is more than 1,300 times of the Netherlands. However, in gross value of agricultural production point of view, China is only 5 times of the Netherlands; in agricultural exports point of view, China is even less than the Netherlands. From the above numbers the backwardness of Chinese agriculture and the gap between Sino agriculture and Dutch agriculture can be seen clearly.

Obviously, the gap between Sino agriculture and Dutch agriculture is due to the gap of efficiency between two countries. The agricultural productivity of China is much and much lower than that of the Netherlands. China uses more than 1,300 times of the Netherlands agricultural labour forces to produce only 5 times of the Netherlands agricultural products. From 1950 through 1988, the contribution of productivity growth to agricultural growth in the Netherlands was 83%. But from 1952 through 1990 the contribution of productivity growth to agricultural growth in China was only 15% (Feng, 1995). This shows that the agricultural growth in the Netherlands comes mainly from the productivity increase, productivity increase accounts for about six sevenths of Dutch agricultural growth; on the contrary, productivity growth accounts for only one seventh of Sino agricultural growth. So, the improvement of efficiency is the key of Chinese agricultural development. There is no development of Chinese agriculture without the productivity improvement.

6.2 Main obstacles of Sino agricultural development

Many Chinese people hold the opinion that the main obstacle of Sino agricultural development is the more population with less land. However, if compared with Dutch, this opinion is not right. Because the population density of the Netherlands is about 3 times of that of China, and yet the Netherlands has a very strong agricultural sector. The experience of Dutch agricultural development has proved that the natural factors are not the main obstacle to hamper agricultural development.

In my opinion, the main obstacles to hamper Sino agricultural development do not come from the natural part, but the institutional part. It is the lack of effective institutional systems that hampers the development of Chinese agriculture. If a set of effective institutional systems will not be built up in the near future, Chinese agriculture will not run out of the backwardness.

6.3 What China can learn from the Dutch experience

Up to here the question has already become very clear. What China can learn and need to learn from the experience of Dutch agricultural development is not how to build windmill, how to grow tulip, and how to make woodenshoe, but how to construct a set of effective institutional systems. It is the a set of effective institutional systems that is needed for China to learn from the experience of Dutch agricultural development. China must build up the effective land ownership and tenure system, free trade system, cooperative system, financing system, marketing system, farmers' organization system, education-research-extension system, and government policy system to bear its agricultural development.

Owing to the limitation of time and space, the question how to build up concretely the institutional systems in China will not be discussed in this report which has answered all the questions related to its title. In fact, the answer to how to establish institutional systems in China has been already included in the fourth Chapter.

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