Agriculture

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Introduction

The agricultural industry uses the natural resources of the earth to produce crops and livestock as a source of both food and raw materials. The industry in Europe has been transformed in recent decades in response to changing consumer demands, the globalisation of markets and a steady stream of technological innovations. In the 1950s, around one-third of the labour force in the countries making up the European Union was engaged in agriculture and it contributed around 20 per cent to Europe's GDP. By 1999, these proportions had fallen to 5 per cent and 2 per cent respectively, although generally agriculture remains more important in the Mediterranean region than in northern Europe (Table 1). Another feature of the data in Table 1 is that the shares of employment in agriculture are generally higher than the shares of agricultural GVA in percentage terms. The gap is particularly large in Finland (where agriculture accounts for 6 per cent of jobs and 1 per cent of GDP), Austria (6 per cent of jobs and 1 per cent of GDP) and Germany (3 per cent of jobs and 1 per cent of GDP). The figures are a first indication that labour productivity and thus incomes in agriculture may tend to lag behind other sectors (a point we return to later in this chapter).

Table 1. Agriculture's share in economic activity

	Employment			Gross domestic product		
	1950	1973	1999	1950	1973	1999
EU-15	:	:	4.5	:	:	1.8
Belgium	12	3.9	2.4	8.8	4.2	1.2
Denmark	22	9.4	3.3	20.0	9.0	2.0
Germany	23	7.3	2.9	12.3	3.5	0.9
Greece	54	:	17.0	33.5	:	7.1
Spain	49	:	7.4	35.0	:	4.1
France	32	11.9	4.3	:	6.5	2.4
Ireland	40	25.1	8.6	31.3	19.0	2.9
Italy	39	16.3	5.4	29.5	9.9	2.6
Netherlands	19	6.6	3.2	12.9	5.8	2.4
Austria	32	:	6.2	16.4	:	1.2
Portugal	47	:	12.7	26.8	:	3.3
Finland	:	:	6.4	:	:	0.9
Sweden	18	:	3.0	7.0	n.a.	0.7
UK	5	2.9	1.2	6.0	3.0	0.9

Source: Ackrill, 2000; Commission, 2001. Employment is calculated as the percentage of employed civilian population. The GDP share is calculated as the percentage of agricultural gross value added (GVA) to Gross Domestic Product at factor cost.

The agricultural area in the EU-15 is 135 million ha, of which 43 per cent is accounted for by France and Spain. In terms of its contribution to agricultural output, France is the single most important agricultural producer, accounting for 23 per cent of the EU-15's output in 1999, with Italy, Germany and Spain the next-ranking in importance (Table 2). Comparing shares in the value of agricultural output with shares in the agricultural land area highlights differences in the intensity of agricultural land use in each country. The Netherlands, for example, produces 4.7 times more than its land area share and Belgium 2.5 times its share. At the other end of the scale, Spain, Ireland, the UK and Sweden with large areas of marginal land and significant amounts of extensive production produce only 0.6 to 0.7 times their land area share. EU agricultural production is dominated by livestock products (including dairy), grains, vegetables, wine, fruits and sugar. Again, there are significant regional differences, with livestock output dominating in northern Europe and crop production in southern Europe.

Table 2. Value and composition of output, 1999

	Utilised agricultural area ('000 ha)	Per cent of EU-15 area total	Gross value of agricultural output	Per cent of EU-15 output total	Share of crop products in total output	Share of livestock products in total output
	€m	%	€m	%	%	%
EU-15	135,825	100.0	268,961	100.0	56.4	40.5
Belgium	1,394	1.0	6,872	2.6	45.6	54.0
Denmark	2,684	2.0	7,714	2.9	41.6	54.7
Germany	17,152	12.6	41,515	15.4	52.7	44.4
Greece	5,109	3.8	10,798	4.0	75.8	24.2
Spain	28,882	21.3	32,486	12.1	65.1	34.5
France	29,937	22.0	62,041	23.1	59.4	36.5
Ireland	4,418	3.3	5,469	2.0	20.2	74.8
Italy	15,401	11.3	41,365	15.4	66.3	31.4
Netherlands	1,962	1.4	18,376	6.8	50.9	41.5
Austria	3,410	2.5	4,841	1.8	50.9	45.2
Portugal	3,908	2.9	6,309	2.3	64.3	35.6
Finland	2,201	1.6	3,424	1.3	43.0	54.1
Sweden	3,071	2.3	4,235	1.6	46.5	51.1
UK	16,169	11.9	23,270	8.7	40.3	55.3

Source: Commission, 2001. Agricultural output is valued at basic prices.

This chapter highlights four themes in its discussion of European agriculture. The first is the dramatic changes that are occurring in the *structure* of the industry and which are often characterised as the industrialisation of agriculture. This refers to the increasing consolidation of agricultural production units, and to vertical coordination (contracting and integration) between farmers and other stages of the food chain. Traditionally, agriculture is seen as a highly dispersed industry in which many millions of individual farms, predominantly family-run, produce a range of relatively homogeneous commodities. This picture is changing rapidly. Farm production is increasingly concentrated on fewer and larger farms, even though the number of holdings shows greater stability as occupiers turn to off-farm employment to survive. The impending enlargement of the EU to include Central and Eastern European countries will greatly increase the heterogeneity of European agriculture.

A second important theme is that the agricultural industry is facing a major *loss of consumer confidence* in its products and in its production methods. The recent food scandals in Europe around issues such as BSE (bovine spongiform encephalopathy) or the dioxin contamination of animal feed have called into question the very safety of food. Consumers are increasingly uneasy about what they eat and worry about genetically modified foods, the use of growth promoters, pesticide residues in food, salmonella, E-Coli, and anti-microbial resistance to name just some of the concerns which have emerged. Many consumes have started to question whether the intensive production methods which have underpinned agriculture's productivity miracle are sustainable, and this unease has encouraged a consumer backlash against new technologies proposed for use in agriculture. This is clearly seen in attitudes towards the use and sale of genetically-modified organisms (GMOs), where the EU placed a moratorium on approvals of new GMO varieties for use by farmers for most of the 1990s and requires strict identification of foods containing GMOs in response to consumer consumers about the ethical, food safety and environmental impacts of this technology.

A third issue which is shaping the industry is concern over its environmental impact. The significance of agriculture for the environment in the European Union is highlighted by the fact that of its total territory 50.5 per cent is agricultural land and 27.9 per cent is wooded land. Farming has a unique relationship with land and its management. For much of the history of agriculture this was a relatively benign relationship. But along with the intensification of farming in recent decades has come increasing pressure on the environment. Agriculture, however, is also a producer of environmental goods. Many of

the valued landscapes in Europe are not natural but semi-natural, the product of farming activity. Agriculture has created habitats, landscapes and biodiversity as well as put them in danger. Furthermore, agriculture remains an important element of rural communities, particularly in more remote and peripheral areas. These characteristics of farming have led to an emphasis on the multifunctionality of agriculture, and on the need to support a particularly European model of agriculture. Will farmers in the future be more landscape gardeners than food producers?

A fourth important theme is the extent to which agricultural markets are regulated and managed by governments through the EU's Common Agricultural Policy (CAP). Some of the economic reasons for this are discussed later in the chapter. At this point, it is sufficient to highlight its significance. One indicator developed by the OECD to measure public support for agriculture is called the Producer Support Equivalent (PSE). This measures the proportion of the total receipts of farming which are accounted for by transfers from taxpayers (through direct budget supports) and from consumers (as a result of border protection which requires consumers to pay higher prices for food than would otherwise be the case). The EU's PSE has fluctuated around 45 per cent in recent years, indicating that almost half of the revenue accruing to agriculture (and a higher proportion of the income) is the result of public policy (OECD, 2000). What this highlights is the vulnerability of the industry in Europe to any move towards deregulation and the liberalisation of markets. Two factors which we discuss later in the chapter which are pushing in this direction are the eastward enlargement of the EU (which, in the absence of agricultural policy reform, could add significantly to its budgetary cost) and the development of WTO rules disciplining the nature and amount of support that can be provided to farmers in the future.

Production structure

The structure of farming

Agriculture is carried out on some 7.0 million holdings across the European Union; more than 2.3 million of these are in Italy alone (Table 3). These farms differ greatly in size, type and value of commodities produced, technology used, resource endowment, financial status and many other attributes. Farmers themselves differ in the extent of their time commitment to agriculture, management abilities, business goals and financial resources. The result is a sector which cannot be accurately summarised by any single measure or characteristic. The size structure of holdings, however, is one indicator which can be used to throw light on structural change. Farm size is usually measured by the area of land farmed, although this

can be a misleading indicator of the size of the farm business which also depends on the value of the products produced and the intensity with which the land is used. Some intensive animal units may have little land attached to them, although they can be substantial businesses. Average farm size in the EU-15 in 1997 was 18.4 ha, but the variation across Member States was enormous, ranging from almost 70 ha in the UK to just 4 ha on average in Greece. In fact, 68 per cent of EU farms are less than 10 ha in size and 55 per cent are less than 5 ha in size. There are also regional differences in the way farm structures are changing over time. In many European countries, a quarter or more of all holdings disappeared in the 1987-1997 period, but in Greece, Italy and Portugal (but not Spain) the number of holdings increased and average farm size declined.

Table 3. Structure of European agriculture

	Number of holdings	Percentage change in number of holdings	Average farm size	Average farm size	Per cent of farms > 50 ha	Per cent of farms < 10 ha,
	1997 '000	1987-97 %	1987 ha	1997 ha	1997 %	1997 %
EU-15	6,989.1	-4.8*	:	18.4	8.6	68.6
Belgium	67.2	-14.7	17.3	20.6	10.0	44.2
Denmark	63.2	-26.5	32.5	42.6	27.8	19.5
Germany	534.4	-20.3	17.6	32.1	14.1	45.6
Greece	821.4	16.8	5.3	4.3	0.4	90.0
Spain	1,208.3	-21.5	16.0	21.2	8.2	69.0
France	679.8	-25.4	30.7	41.7	29.7	35.3
Ireland	147.8	-31.9	22.7	29.4	14.1	19.8
Italy	2,315.2	17.3	7.7	6.4	1.8	87.4
Netherlands	107.9	-8.0	17.2	18.6	7.1	46.4
Austria	210.1	:	:	16.3	4.0	46.4
Portugal	416.7	8.5	8.3	9.2	2.3	87.5
Finland	91.4	:	:	23.7	8.8	24.2
Sweden	89.6	:	:	34.7	20.2	29.8
UK	233.2	-4.0	68.9	69.3	33.7	26.8

Note: * Refers to the EU-12

Source: Commission (2001) and earlier editions

The concentration of resources into fewer and larger farms has continued apace. Looking just a changes in the size structure of farms underestimates the rate of structural change in farming. Generally, we observe a growing dualism in farm structure, where production is increasingly concentrated on the larger farms, while smaller farms are worked less intensively. This is seen most clearly in the changes in herd size structure in the livestock sector (Table 4). In the case of cattle farms, for example, not only

has the proportion of the total cattle herd in herds over 100 in size grown from 36 per cent in 1987 to 55 per cent in 1997; the total number of herds over 100 in size has grown by 39 per cent but the total number of cattle in these herds has grown by 50 per cent. The reasons behind the growth in this dualistic structure include economies of size on larger farms (even though economies of size are probably exhausted when activity levels are such as to provide employment for at least two labour units) and the growing trends towards off-farm employment on smaller holdings (see below).

Table 4. Structural change in EU-12 livestock farming

	Cattle		Dairy			Pigs	
	1987	1997	1987	1997		1987	1997
No holdings ('000)	2,536	1,586	1,600	1,013		1,873	1,404
No. animals ('000)	80,248	78,866	25,116	20,312		105,017	114,479
Average herd size	32	50	16	20		56	82
Herd size class	Per cent of total animals				Herd size class	Per cent of total animals	
1-2	0.7	0.4	2.2	0.9	1-9	3.1	1.4
3-9	4.9	2.3	10.2	4.1	10-49	5.9	2.2
10-19	7.5	4.0	17.4	9.6	50-99	5.4	2.5
20-29	7.4	4.4	17.2	13.6	100-199	9.0	5.0
30-49	14.4	9.6	23.8	26.1	200-399	14.9	9.5
50-99	29.2	24.8	20.3	28.1	400-999	29.8	25.1
>100	35.8	54.6	9.0	17.5	>1000	31.9	54.2

Source: Commission, 2001 and earlier editions

Labour use in agriculture

Another perspective on the changing structure of agriculture focuses on the labour force. Several statistical sources measure employment in agriculture, including labour force surveys and agricultural statistics. Labour force survey data assign people to the economic sector in which they mainly work, and are normally used to compare employment in agriculture with employment in other sectors (such as in Table 1). However, they do not cover all persons who are employed in agriculture. A feature of farming is that many farmers and farm workers work only part-time and often have other jobs, while many farm spouses who may be classified as working on home duties in labour force surveys also make an important contribution to the farm. A full measure of the volume of employment in agriculture is provided by surveys on the structure of agricultural holdings. Because the persons covered include both full-time and part-time workers, it is common to convert the numbers of persons employed to a measure of full-time equivalent workers called 'annual work units'.

Using this measure, there are about 7 million annual work units employed in agriculture in the EU-15, involving more than twice that number of actual persons. The countries of southern Europe account for almost 60 per cent of the agricultural labour force, with France (13.6 per cent) and Germany (9.4 per cent) also accounting for important shares (Table 5). There has been a substantial decline in the volume of labour input between 1987 and 1997, averaging around 30 per cent for the EU-12. This contrasts with the fall in the number of holdings over the same period of just 5 per cent. The reduction was particularly noticeable in Portugal (-47 per cent) and Germany (-36 per cent), while the decline was more moderate in the Netherlands (-11 per cent), Denmark (-12 per cent) and Italy (-16 per cent). Family workers account for almost 80 per cent of the EU-15 agricultural labour force, with the figure exceeding 90 per cent in Austria, Ireland and Finland. Denmark and the United Kingdom have the highest proportions of non-family workers, at almost 40 per cent of the total. A consequence of a declining labour force is that the average age of those employed is high. In 1997, workers aged 55 or over accounted for 40 per cent of the permanent labour force in the EU-15, with particularly high shares in Greece and Portugal. There are very few countries where the majority of new entrants into agriculture are less than 35 years old.

Table 5. Agricultural labour force in the EU, 1987-1997 ('000 Annual Work Units)

	Total labour force 1997	Country shares in total labour force 1997	Change in total labour force 1987-97	Family labour force (per cent of total) %	Workers aged 55 or over in permanent labour force %
EU-15	7,023	100.0	-29*	79.2	38.3***
Belgium	79	1.1	-22	87.4	28.3
Denmark	98	1.4	-12	60.4	27.7
Germany	657	9.4	-36**	72.0	29.4
Greece	597	8.5	-30	87.6	46.5
Spain	1,099	15.6	-32	70.8	39.1
France	958	13.6	-34	77.0	25.4
Ireland	202	2.9	-20	93.0	36.4
Italy	1,798	25.6	-16	85.7	46.8
Netherlands	209	3.0	-11	73.7	24.5***
Austria	178	2.5	:	90.9	21.3
Portugal	520	7.4	-47	82.7	51.9
Finland	126	1.8	:	95.0	23.5
Sweden	82	1.2	:	76.8	34.1***
United Kingdom	416	5.9	-21	62.3	31.4***

Notes: * Variations 1987-1997 refer to EU-12 (excluding the former East Germany)

** Excluding the former East Germany

*** 1995 data

Source: Commission, 2001

Associated with the decline in the labour force is a growth in part-time farming. Two different concepts can be distinguished here, part-time farms and part-time farmers. Part-time farms are those where the activity level does not require the full-time labour of one person. In the EU-15, the great majority of farms are part-time farms in this sense; 58 per cent of farms in 1997 failed to provide sufficient activity even to correspond to half a labour unit (Table 6). This figure closely corresponds to the 55 per cent of farms in 1997 less than 5 ha in size, although it would be wrong to draw the conclusion that these are the same farms. Some horticultural farms in the south of Europe can be very labour-intensive, while some larger drystock farms in northern Europe can be operated very extensively.

Part-time farming is where the farm occupier has off-farm employment. In the EU-15 as a whole, around 23 per cent of farmers in 1997 had an off-farm job which was their principal occupation, while for a further 6 per cent of farmers, the off-farm job was a secondary source of income. There are significant structural differences across countries. In the Netherlands, nearly 70 per cent of farms are full-time, in Greece only 10 per cent. Part-time farming is most prevalent in Germany and Sweden and least prevalent in the Netherlands and Belgium. Importantly, on around 60 per cent of the part-time farms the farmer had no outside gainful employment. Farmers on these holdings are underemployed and will have low average earnings. While many such farmers will be elderly and in receipt of social welfare payments, they are also an important source of the low-income problem in farming.

Table 6. Importance of part-time farming and farmers, 1997, per cent

	Work provided as per cent of a full-time worker			Other employment		
	100%	50-99%	<50%	No other gainful employment	With other main gainful employment	With other secondary gainful employment
EU-15	26.8	15.2	58.0	71	23	6
Belgium	60.6	7.6	31.8	83	14	2
Denmark	49.2	15.9	34.9	64	28	6
Germany	38.2	7.7	54.3	55	40	5
Greece	10.8	20.5	68.8	74	23	4
Spain	24.5	13.5	62.1	72	24	4
France	50.2	14.1	35.9	75	14	11
Ireland	67.1	16.8	16.1	67	17	16
Italy	16.0	12.6	71.4	76	22	2
Netherlands	67.3	15.4	18.3	79	14	7
Austria	29.7	26.0	44.8	61	25	13
Portugal	18.3	30.5	51.3	67	30	3

Finland	54.0	14.9	28.7	51	25	25
Sweden	26.8	17.1	56.1	42	39	19
United Kingdom	50.8	14.6	34.7	70	20	10

Source: Commission, 2001

The impact of enlargement on farm structures

The structure of EU agriculture will dramatically alter when the candidate countries of Central and Eastern Europe (CEECs) become members. Four figures tell the story: membership will increase the EU's GDP by 5 per cent, agricultural output by 8 per cent, the agricultural land area by 42 per cent and the agricultural labour force by more than double. Two things are immediately clear from these figures: agriculture is relatively more important in the candidate countries than it is in the EU-15 (on average, it accounted for 7 per cent of GDP compared to 2 per cent in the EU in the late 1990s), and agricultural productivity is still considerably below the levels achieved in the EU. Currently, the CEECs are net importers of agri-food products and only Hungary and Bulgaria are net exporters among them. However, the potential for expanded output as the diffusion of modern technology helps to raise yields to EU-15 levels is one of the factors worrying EU-15 farmers as they contemplate the impact of expansion.

There are important differences between the applicant countries. The most important agricultural countries, in terms of agricultural area and in terms of the farm population, are Poland and Romania. Combined they have almost as many farmers (7.3 million) as the EU-15 and more than three times as many as the other CEECs combined (Table 7). The Mediterranean countries Cyprus and Malta are also applicant countries but their agricultural sectors are so small that their inclusion does not alter the overall picture. Turkey is also included in this table for illustrative purposes as it is a candidate country though accession negotiations have not yet begun. Another important feature of these economies which is highlighted in the table is the relatively high proportion of household expenditure which is spent on food, equal to or exceeding 50 per cent in Bulgaria and Romania. The implication is that changes in the level of food prices have important distributional implications in these economies.

Table Role of agriculture in the applicant countries

	Agricultural area	Gross value added of agriculture		Agricultural employment		Food expenditure
	UUA ('000 ha)	Mio €	Share of agric in GDP	Employment ('000)	As per cent of total employment	per cent of total expenditure
		1999			1998	

Bulgaria	5,696	2,054	21.1	795	26.2	49.6
Cyprus	134	349	4.2	28	9.7	17.0
Czech Rep.	4,285	1,700	3.7	265	5.5	23.3
Estonia	1,043	247	5.7	61	9.5	34.2
Hungary	6,186	2,043	5.5	277	7.5	38.0
Latvia	2,488	204	4.0	189	18.8	32.1
Lithuania	3,496	789	8.8	336	21.0	41.4
Malta	12	75	2.6	2.6	1.8	:
Poland	18,222	4,889	3.9	2,933	19.1	33.7
Romania	14,784	4,441	15.5	4,338	40.0	55.3
Slovakia	2,444	752	4.5	180	8.2	28.4
Slovenia	491	594	3.6	104	11.4	22.0
Turkey	41,488	24,265	14.3	9,149	41.8	29.7

Source: Commission, 2000

The image of European farming as dominated by family farms will need to be adjusted when the countries of Central and Eastern Europe become members of the EU. None of these countries experienced the wholesale nationalisation of land as in Russia, although some land belonging, for example, to groups such as ethnic German-speakers and the Church was nationalised in the immediate post-war period. Instead, farmers were required to pool their land in agricultural co-operatives and they effectively became employees of these large farm units. In Hungary, for example, 80 per cent of the land area was in collective farms with an average size of 4,000 hectares. In the Czech Republic, 60 per cent of the land was in collective farms and a further 38 per cent in state farms, with an average size respectively of 2,500 and 9,500 hectares. However, in the case of Poland, which was an exception to the general picture, about 23 per cent of the land was in collective or state farms and 77 per cent was in privately-owned household plots with an average size of under 7 hectares.

At the beginning of the transition process, these countries had to decide what to do with this land. In most cases, they restituted it to those families who owned the land at the time of collectivisation. As a result, a very fragmented structure of land ownership has arisen, and many land owners now live in towns and have nothing to do with farming. The impact on farm structures has been more complex. There were two views at the outset of transition. One was that the old state and collective farms would collapse because of their inherent inefficiency once the framework of state support was removed. The other was that the farm labour force had become 'proletarianised' and had lost the management skills and the will to run their own farming businesses. In the event, although a complete shift to individual farming has occurred in a few countries, the most common pattern is a very dualistic structure with a few very large-scale corporate farms and many (very) small-scale individual farms. While the share farmed by the large corporate farms has been falling gradually in most candidate countries, it appears that they will be a stable part of the farm structure for some time to come.

Market behaviour

Demand trends

While changing demographic structures and consumer behaviour in Europe provide opportunities for European food companies to increase the value added content of food products (see Food Industry chapter), the farm-level demand for food is much less buoyant. Food consumers are saturated in terms of volume and a common characteristic of agricultural markets in most European countries is a stagnating food demand in volume terms. Changes in the structure of food demand continue, although the trend towards a lower per capita consumption of carbohydrates and fats and towards a higher consumption of animal proteins which marked European food consumption patterns in the first three post-war decades seems to have reached maturity stage.

Health considerations, environmental aspects and animal welfare arguments play an increasing role in influencing food demand. For example, the decrease in butter consumption since the mid-1960s, of egg consumption since the 1970s and the decrease of meat consumption since the beginning of the 1990s are partly due to the health concerns of consumers. A particular feature of the market for food is the influence of 'food scares'. Over the past fifteen years, major food scares have shaken public confidence in purchasing many food items, including milk, cheese, eggs, olive oil and beef. Of course, the link between BSE and human health first announced in 1996 is the major example.

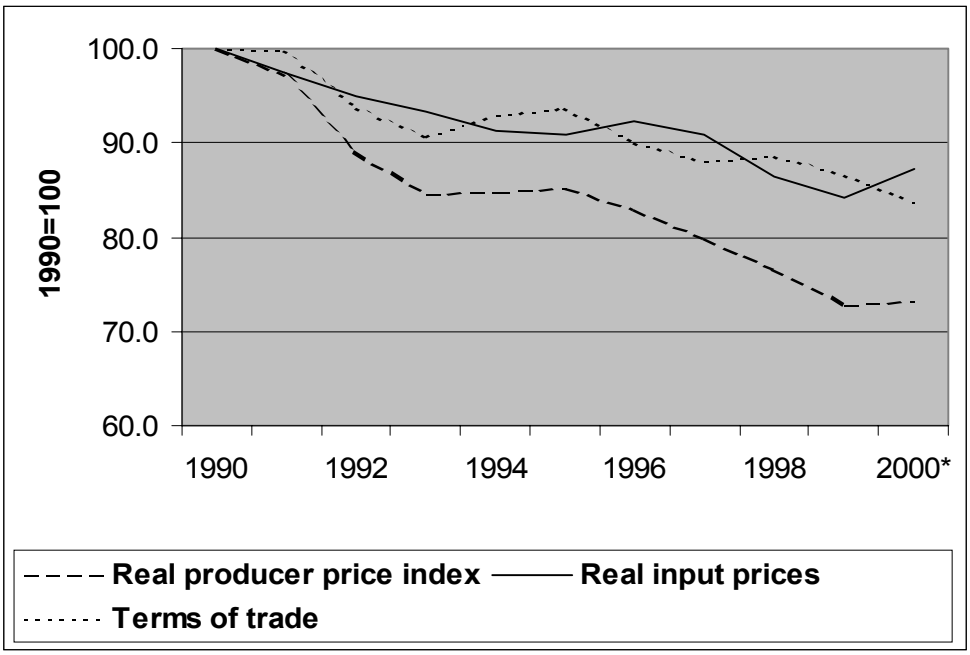
In response to these trends, the number of organic farms has increased significantly in all European countries. However, organic farming still accounts for less than 1 per cent of overall agricultural land area, though the figure rises to 4 per cent in Italy, 9 per cent in Sweden and 10 per cent in Austria. Organic farming places maximum reliance on self-regulating agro-ecosystems and aims to minimise dependence on external inputs as far as possible. As a result, organic farms are, in general, more labour intensive than conventional farms and require a price premium to cover their additional costs. The EU has set up a harmonised framework for the labelling, production and control of organic products and also provides financial aid for the promotion of organic farming. Another trend has been increased emphasis on the promotion of quality foods and foods associated with particular geographical regions within Europe.

Price trends

Farmers buy their supplies such as fertilisers, chemicals and medicines in input markets and sell their output in commodity markets. The relationship between farm output and input prices is defined as the agricultural terms of trade and is an important factor determining farm incomes. The trend in farm output prices (in real terms) depends on the relative movements in the demand for and supply of farm products. The early classical economists predicted that the demand for food (stimulated by the growing population and incomes at the time of the industrial revolution) would outstrip the ability of the agricultural sector (which was limited by the supply of land) to meet this demand, and thus that the real price of food would rise over time. In fact, in the period since the Second World War, the opposite has been the case. The classical economists underestimated the importance of technological change in food production. In the early post-war decades, the supply curve of farm produce moved rapidly to the right, by up to 2 per cent per annum, largely as a result of technical progress. As noted in the previous section, however, the demand curve for farm produce has been much less buoyant because population growth in the EU has slowed and because, at the high average per capita incomes in the EU, people spend very little of their additional income on food products. The result has been a steady decline in real farm prices.

The trend in the 1990s is illustrated in Figure 1, which shows that real farm prices dropped by over 25 per cent during this decade even though policy constraints reduced output growth to around 1 per cent per annum (see below). This was an exceptional drop, due to a number of special factors. First, the implementation of the MacSharry CAP reform (which is discussed in more detail later) resulted in a deliberate reduction in output prices for cereals and beef which was phased in over the 1993-95 period. Second, the BSE crisis led to a further fall in beef prices after 1996. Some of the fall in output prices was reflected in a corresponding fall in input prices (one of the major farm inputs is compound feedingstuffs, the cost of which also fell as a direct result of the MacSharry reform). Nonetheless, the terms of trade index, which takes both trends into account, fell by around 15 per cent over the decade. This fall in the level of real farm prices over time has prompted farmers to lobby extensively for public intervention to offset the negative effects on farm incomes.

Figure 1. Price trends for EU agricultural products, 1990-2000



Market structure

European agriculture is characterised by production on small family farms, dispersed over a large land area, producing mainly homogeneous commodities for sale to first-stage handlers and processors. Farmers rarely sell direct to consumers, with some exceptions such as pick-your-own fruit, country markets and some roadside stalls. Agricultural markets are also characterised by significant public intervention, with price and purchase guarantees provided for most important agricultural products under the EU's Common Agricultural Policy.

Traditionally, agricultural inputs were purchased and many agricultural products were sold through open markets such as auctions, e.g. beef, grain, fruits and vegetables. For some commodities, characterised by a high market risk because of the inelasticity of supply and a high level of fixed costs in production, contract farming was a significant means of securing raw materials supply, e.g. sugarbeet, canning vegetables. Increasingly, however, consumer preferences for food products and services have become more specific than traditional price signals in open markets can convey. Buyers looking for particular qualities or attributes prefer to enter into contracts to ensure these requirements. Thus, seed and agrochemicals, primary agriculture and food processing are increasingly co-ordinated to provide food with specific functional requirements.

Market power

Another important consequence of a production structure dominated by many small farms is that farmers tend to be price takers. They have no opportunity individually to influence the price which they receive. On the other side of the market, they often face just a few buyers who may be able to exercise oligopsonistic power in order to depress the price paid to producers below what it might otherwise be. Farmers often point to their declining share of final consumers' expenditure as evidence of their weak bargaining position in the marketing chain. Such evidence is rarely persuasive because the growth in the marketing margin (the difference between what the consumer pays and what farmers receive) usually reflects both growth in the amount of additional services provided to food consumers (for example, prepared foods to help save cooking time) as well as a tendency for service costs (which are relatively labour-intensive) to grow relative to other prices in the economy. On the other hand, the possibility that input supply or marketing or processing firms may abuse their dominant position cannot be ruled out. The largest anti-trust fines to date were imposed by the US on two European pharmaceutical firms in 1999 for a price-fixing and market-sharing arrangement affecting, among other products, additives in animal feeds.

One route open to farmers to strengthen their market position is to come together in co-operatives to purchase agricultural inputs and to invest in upstream processing industries. Agricultural co-operatives play an important role in the European food chain, particularly in dairying, the meat industry and grain trading, as well as providing input supplies and finance to farmers. Another option open to farmers is the formation of producer groups which are designed to improve production structures by enforcing quality regulations and co-ordinating market supply by suppliers. Co-operation was seen as a means of exploiting economies of scale, building market power, and creating more value added. In a number of countries, governments have encouraged co-operative forms of organisation by offering favourable tax rates, subsidised interest rates or other supports. Co-operatives may also be favoured by competition policy that gives them the possibility to exert market power. However, the co-operative form of industrial organisation has its drawbacks and agricultural co-operatives are being forced to rationalise and restructure in many countries. The dominance of suppliers on co-operative boards puts pressure on companies to maximise the prices paid to producers at the expense of building up surpluses for reinvestment and expansion. Co-operative rules also mean that it can be difficult to raise external finance

for merger and expansion projects. In many countries, farmers' co-operatives are selling their assets to joint stock companies in which farmers are just one shareholder grouping amongst a number.

Market support systems

Another way in which farmers have tried to strengthen their market position has been to lobby for protection against low-cost imports and to support the level of market prices. Governments have responded with Europe's Common Agricultural Policy which consists of two main policy instruments: a price and markets policy, designed to influence and support farm prices and incomes; and a rural development policy, referred to as the second pillar of the CAP, which is designed to encourage the modernisation of farming. The price and markets policy is based on three principles: common prices across the EU, preference for EU producers in supplying the EU market, and solidarity in sharing the costs of the policy. The way it works can be briefly described as follows.

For each of the main commodities produced in the EU, the Council of Agricultural Ministers each year establishes a *target price* (or its equivalent). This is the price Ministers ideally would like producers to receive in the coming year. To maintain the market price around this target level the EU has at its disposal a number of policy instruments, including import controls, market intervention and export subsidies. The most important form of import barrier in the past was the *variable levy*. By setting this levy equal to the difference between the EU target price and the world price, the EU ensured that no produce could be imported into the Union below the target price and so undermine the market price received by EU producers. Following the conclusion of the WTO Agreement on Agriculture in 1995, variables levies were replaced by border tariffs, often set at very high levels. Price guarantees to producers are further strengthened in the event of excess EU supplies in that the Union stands ready to purchase farm produce at a price (called the *intervention price*) usually set some 10-30 per cent below the target price. If there is excess supply on the EU market, farmers have the option to sell to the intervention agency in each state which then takes the produce off the market and puts it in store. Intervention was intended to deal with temporary surpluses of supply, but during the 1980s it became a regular market output for Europe's beef, dairy, cereals and wine surpluses. The need to limit farmers' reliance on intervention as a market outlet was one of the driving factors behind CAP reform in the 1990s. As the EU became more than self-sufficient in many temperate-zone foods, greater reliance was placed on *export subsidies or refunds*. These export refunds bridge the gap between the high internal market prices and the

lower world prices in most years and make possible the export of higher-priced foodstuffs out of the EU. Border tariffs, intervention purchases and export refunds are the principal means of supporting prices to farmers under the CAP.

Industry performance

Output, productivity and incomes

Taking a long-term perspective, there has been a steady slowing-down in the annual growth rate of EU agricultural output (Table 8). This has been mainly policy driven rather than being a reflection of a slow-down in underlying productivity growth. Beginning in 1984, when the EU introduced quotas on milk production, there has been a series of measures designed to discourage output growth and to encourage extensification. These include the requirement on arable farmers to set-aside (idle) a portion of their land to retain eligibility for the arable aids introduced as part of the MacSharry reform of the CAP (see below), ceilings on the number of premia paid to livestock producers also introduced as part of that reform, as well as extensification payments designed to encourage livestock farmers to reduce their stocking rates. These measures have adversely affected average yield growth although labour productivity has continued to increase at an impressive rate.

Table 8. Growth in output, employment and productivity in EU agriculture, 1968-1997 (per cent per annum)

	EC-6 1968-73	EC-10 1973-83	EC-12 1983-1990	EC-12 1990-1997
Final production (at constant prices)	3.0	1.8		1.0
Employment (AWU)	-4.9	-2.8		-3.6
Utilised agricultural area (m ha)	-0.7	-0.2		-0.4
Labour productivity (final production per AWU)	7.6	4.7		4.6
Land productivity (final production per ha of UAA)	3.7	2.0		1.4

Source: Ingersent and Rayner, 1999; Commission (2001) and previous editions

A consequence of the dynamic output growth in the 1960s and 1970s was a dramatic growth in self-sufficiency. Although the EU is the world's largest importer of agricultural commodities, it also became the largest exporter of agricultural goods in 1998 when EU agricultural exports surpassed US agricultural exports for the first time ever, . Major export commodities include grains (wheat and barley), sugar, dairy products, beef, poultry, pork, fruit, vegetables, and wine. Most agricultural imports are

products not suited to the European climate and include soybeans and their products, cotton, tobacco, tropical products, off-season fruits and vegetables, coffee, cocoa, tea, and spices. The EU also imports large quantities of animal feed to supplement domestically produced supplies.

A number of different indicators can be used to evaluate the income performance of the sector. First, the growth in average income from farming over time is commonly measured by Eurostat as the net value added at factor cost in agriculture, per unit of labour used. Net value added at factor cost consists of output minus intermediate inputs and depreciation, adjusted for taxes, grants and subsidies. Although rents, interest and wages paid to employees are not deducted from this measure, so that it overstates the level of income accruing to family labour, this is not likely to influence the trend over time very much. Over the 1987-1997 period, this indicator grew by just 3.0 per cent per annum in nominal terms, suggesting little growth in real terms once inflation is taken into account. More detailed examination of the individual Member State figures highlights two striking features. First, there can be striking volatility in income from year to year. Farm incomes in the UK, for example, dropped by 22 per cent between 1996 and 1997, while incomes in the Netherlands rose by 18 per cent. The second feature is the very disparate trends across Member States, despite the fact that farmers are operating in a common market, highlighted by the comparison between the experience of British and Dutch farmers above. These differences partly reflect differences in the composition of output across countries, and partly differences in national economic environments, including inflation rates and currency movements.

A second interest is in the comparison of the average level of farm incomes with incomes in the non-farm sector. Such a comparison is complicated by two factors. First, the wide disparity in farm structures highlighted earlier implies that there is also a very great dispersion of farm incomes around the average. Data on individual farm incomes collected in the EU through the Farm Accountancy Data Network (FADN) throw light on these differences. The data can be grouped in various ways, including by size of farm and size of the farm business. Table 9 shows the differences in accountancy results by member state and by type of farming. Dairying is the type of farming which returns the highest income on average in the EU, although in many Member States it is arable farmers which earn the highest incomes. As each type of farming is also undertaken by farms of different size, actual income disparities are considerably greater than shown in this table.

Table 9. Net value added per agricultural work unit, by farm type (€'000), 1997/98

Farm type	All	Arable	Dairy	Drystock
EU-15	16.4	15.2	20.6	14.1
Belgium	30.7	39.6	29.4	25.9
Denmark	38.2	30.6	38.5	:
Germany	22.4	27.7	19.2	19.6
Greece	5.9	5.8	9.6	7.5
Spain	16.3	18.8	10.7	16.6
France	25.1	30.4	18.9	18
Ireland	15.1	25.5	20.9	10.8
Italy	13.2	10.4	22.9	14.8
Netherlands	37.4	48.1	40.1	16.1
Austria	16.1	21.8	13.2	13.6
Portugal	2.6	2.2	4.8	2.7
Finland	14.5	18.6	13.1	12.6
Sweden	14.5	18.2	14.6	6.3
UK	26.6	32.9	33.1	17.1

Source: Commission, 2001

The other factor which complicates inter-sectoral income comparisons is that income from farming is only one of the sources of income earned by farming households. We saw above that around 30 per cent of farm operators in the EU have off-farm employment, and other family members may also have off-farm jobs. When this non-farm income is included, farm households in most countries for which data are available earn, on average, a level of net disposable income greater than the average for all households (Eurostat, 1997). Again, however, it must be stressed that averages are of limited value in such a structurally diverse sector, and there continue to be significant numbers of low-income farm households in most European countries.

Environmental impact

Agriculture's environmental performance is increasingly monitored. As noted earlier, its relationship with the environment is a complex one. It can contribute to the pollution of the environment through the build up of nitrate and other mineral residues, pesticide residues, salination, ammonia and methane emissions. It can lead to the depletion of natural resources through inappropriate use of water or soil or the destruction of natural or semi-natural landscapes and habitats. But it also preserves and enhances the environment through the creation and preservation of landscapes, habitats, genetic diversity and the production of renewable energy resources. The abandonment of agriculture particularly in more marginal farming areas would lead to a degradation of landscape quality and the loss of landscape diversity.

The main cause of agriculture's negative environmental impacts has been intensification caused by higher livestock stocking densities and greater use of chemical inputs to increase yields. High support

prices under the CAP have encouraged this trend, although agricultural intensification has also occurred elsewhere even without price support. High land prices relative to the prices of other inputs have stimulated technical innovations in the use of mineral fertilisers, herbicides and pesticides which increased their attractiveness. Similarly, the growth in the use of farm machinery to substitute for labour, partly in response to the rising relative cost of labour, has been a factor in the growth of larger field sizes and the removal of hedgerows, stone walls, etc.

Recent evidence from the OECD suggests that there has been some success in tackling these adverse impacts (Table 10). Take nitrates, for example, which can lead to eutrophication of fresh and coastal water and contamination of groundwater, threatening the quality of drinking water. Agriculture is not the only sector responsible for water pollution, but in the case of nitrogen it is a major contributor in most EU countries. However, the trend with regard to surpluses in national nitrogen soil surface balances over the last decade is downward or constant for most EU countries. This suggests that the potential environmental impact from agricultural nitrogen emissions is decreasing or stable. Similarly, the trend in pesticide use over the last decade has remained constant or declined in most EU countries, although for a few countries use has increased.

Global warming and climate change is another major environmental issue. New commitments to reduce emissions of so-called greenhouse gases (gases which in the atmosphere cause heat to be retained rather than radiated out and thus are believed to contribute to global warming) beyond the year 2000 were agreed in Kyoto in December 1997. Agriculture in the EU is responsible for about 10 per cent of the EU's total greenhouse gas emissions (though in some countries, for example, Ireland, this proportion increases to as high as 34 per cent). Livestock farming is responsible for emissions of ammonia and methane, while fertiliser contributes to nitrous oxide emissions. The EU has committed to cut emissions by 8 per cent by 2008-2021 compared to 1990 and farming will be expected to play its part in meeting this target. Transferring agricultural land to forestry (which absorbs carbon and thus reduces greenhouse gas emissions) is one possible strategy which may have relevance in a number of countries.

Table 10. Agri-environment indicators

Country	Nitrogen balance		Pesticide use		Percentage share of agriculture in total GHG emissions
	Kg/ha of total agricultural land		Tonnes of active ingredients		per cent
	1985-87	1995-97	1985-87	1995-97	1995-97

EU-15	60	58	333804	253684	10.7
Belgium	180	181	8806	9710	10.0
Denmark	154	118	6144	4051	21.7
Germany	88	61	:	:	6.2
Greece	58	38	6928	9143	13.3
Spain	40	41	41592	31704	13.5
France	50	53	96897	97229	17.3
Ireland	62	79	1812	2107	34.0
Italy	44	31	99100	48270	9.6
Netherlands	314	262	20241	10553	12.2
Austria	35	27	5670	3552	7.0
Portugal	62	66	:	:	10.5
Finland	78	64	1962	1001	8.2
Sweden	47	34	3885	1454	13.7
United Kingdom	107	86	40768	34910	8.1

Source: OECD, 2000.

Public policy towards agriculture

Agricultural policy objectives

Policy objectives for the agricultural sector were set out in Article 39 of the Treaty of Rome (now Article 33 of the consolidated version of the Treaties which followed the Treaty of Amsterdam). They included: 'to increase agricultural productivity, … to ensure a fair standard of living for the agricultural community, … to stabilise markets, … to guarantee security of supply, … and to ensure that supplies reach consumers at reasonable prices'. These objectives reflected the concerns surrounding agriculture when the Rome Treaty was drafted, but they have not been changed in the successive revisions of the Treaties. However, the Council of Ministers did update the objectives in the Agenda 2000 negotiations setting out the goals for EU farm policy in the period 2000-2006.

The new policy objectives emphasise that, to help European agriculture take advantage of expected positive world market developments, further reform of the CAP must *improve the competitiveness* of Union agriculture on both domestic and external markets. This implies lower guaranteed prices to help facilitate the progressive integration of new Member States, to reinforce the position of the Union as a major food exporter and to prepare for the outcome of the WTO trade negotiations. *Food safety and food quality* should be pursued not only as an aspect of competitiveness but also as a fundamental obligation to consumers both inside and outside the Union. Ensuring a fair standard of living for the agricultural community and contributing to the stability of *farm incomes* remains a key objective. The *integration of environmental goals* into the CAP must play an increasingly

important role. The creation of complementary or alternative *income and employment opportunities* for farmers and their families becomes a major aim for the future, as employment possibilities in agriculture fall away. Finally, rural policies should contribute to *economic cohesion* within the Union.

These objectives underlie the vision of a European model of agriculture strongly promoted by the European Commission based on competitive, multifunctional and sustainable farming throughout the EU. The Commission argues that, unlike agriculture in many other countries, EU agriculture is highly diversified, and farming in Europe also performs a range of additional tasks. These include the production of renewable raw materials, providing environmental services, protecting the countryside and maintaining the vitality of rural regions. The Commission argues that these are services which in future will have to be rewarded under the second pillar of the common agricultural policy, i.e. rural development policy, to ensure that they continue to be available in future.

Reform of the Common Agricultural Policy

The operation of the CAP price policy discussed above ensured a greater degree of internal price stability than in other countries and meant higher per capita incomes for a greater number of farmers than would otherwise have been the case. However, these achievements were bought at a price. As the EU moved from being a net importer to a net exporter of food products, the budget cost of purchasing surplus production for intervention storage and to finance export refunds escalated. Agricultural spending (including spending on structural measures) threatened to bankrupt the EU budget on a number of occasions during the 1980s. It amounted to 64 per cent of total EU spending in 1991 and still accounted for 51 per cent of the EU budget in 2001. CAP price support has also had adverse distributional effects. Because the support provided is proportional to a farmer's volume of production, most of it goes to the largest farmers who need it least. Given the enormous disparities in farm structures documented above, it follows that the benefits of price support are very unequally distributed. The European Commission has calculated that 80 per cent of the support provided by the CAP went to the largest 20 per cent of farmers (Commission, 1991). Furthermore, the costs of the policy are borne disproportionately by low-income consumers who spend relatively larger amounts of their household income on food. Price support also encouraged the intensification of agriculture which has been damaging to the environment as we have seen. It led to increasing tension with the EU's trading partners who objected to the loss of their markets to EU subsidised exports. The policy was also ineffective as much of the transfers from taxpayers and

consumers failed to be reflected in improved farm incomes and instead was capitalised into increasing land values.

A number of half-hearted attempts had been made to limit the budgetary cost of the CAP during the 1980s, including the freezing of support prices in nominal terms and the introduction of milk quotas in 1984 and market stabilisers in 1988.. However, the 1993 reforms introduced by Agriculture Commissioner MacSharry, albeit still incomplete, went much further in that they initiated a significant reduction in support prices, focusing on cereals and beef. Compensation for these price reductions was provided by means of direct arable and livestock payments. Supply control measures were extended (particularly through the introduction of 'set-aside' for cereals and oilseeds and limits on the numbers of livestock premia) and the role of intervention support, particularly in the beef sector, was greatly reduced. These market regime reforms were accompanied by new agri-environment, forestry and early retirement schemes for farmers.

A further round of CAP reform was agreed in March 1999 as part of the negotiations on the Agenda 2000 agreement to prepare the EU for the next enlargement. This pursued the same model of reductions in support prices while compensating farmers by increased direct payments. For the first time, the dairy sector was included in the reform although implementation was postponed until 2005, with a review of the situation in 2003. These two reforms have greatly increased the importance of direct payments in overall farm incomes, particularly in the arable, beef, sheepmeat and olive oil sectors. However, for other sectors, such as dairying and sugar, price protection remains very high.

Future policy challenges

The MacSharry CAP reform was, in part, designed to enable the EU to sign up to the Agreement on Agriculture negotiated in the Uruguay Round of world trade negotiations. This Agreement is part of the Agreement establishing the World Trade Organisation (WTO) which came into force in 1995. The Agreement establishes rules on the manner and amount of government support to agriculture. All border restrictions, including the EU's variable levies, had to be converted into fixed tariffs which were bound at a maximum rate. Furthermore, these bound tariffs were reduced by 36 per cent compared to their average in 1986-90 over a six-year period beginning in 1995. There is also an obligation to ensure that a minimum of 5 per cent of the domestic market is open to foreign competition from 2000 on. For countries which use export subsidies, these subsidies must be reduced by 36 per cent in value and 21 per

cent in volume relative to the average for the period 1986-90; no new export subsidies can be introduced. With regard to domestic support to agriculture, the Agreement distinguishes between permitted and non-permitted forms of support. Support which does not influence farmers' incentives to produce is permitted and there are no disciplines applied (support of this kind is considered decoupled from production and deemed not to cause distortions to trade). Distortionary support, such as market price support, is capped and must be reduced by 20 per cent over the base period 1986-88.

The actual impact of the Uruguay Round disciplines on EU agriculture to date has been minimal, for a number of reasons. The reference period for the tariff cuts was based on a period of low world prices and thus high EU variable levies. Hence the tariff cuts were made from very high levels, giving maximum protection in the short run. The compensation payments payable under the MacSharry and Agenda 2000 reforms were exempted from reduction commitments as a result of a last-minute deal with the US during the negotiations. Even the obligation to reduce the amount of subsidised exports has been relatively easily met by the EU. However, with continued increases in yields in the EU and limited growth in internal demand, surpluses will again begin to grow and with them the need for exports, so that maintaining the commitments on export subsidies will become increasingly difficult. More important, a new round of negotiations to liberalise agricultural trade began in March 2000. In these negotiations, the EU's trading partners are targeting the continued high levels of tariff protection for EU agriculture, the EU's continued use of export subsidies and the arrangements to protect the EU's compensation payments from reduction. The EU, on the other hand, wants increased flexibility to protect the European model of agriculture and to introduce restrictions on imports of novel foods where there are consumer fears about the long-term health and environmental effects. While it is not possible to say at this point when or even if these negotiations will be successfully concluded, it is likely that further changes to the CAP will be required arising from new WTO commitments during the second half of this decade.

EU agricultural policy will also come under pressure from the next EU enlargement. Much will depend on the production response in the candidate countries after accession and on political decisions regarding the future of direct payments. Farm producer prices in most of the applicant countries are below those in the EU. Membership will thus imply higher prices and an incentive to higher production. The extent to which agricultural output responds to CAP price incentives and whether these countries will emerge as significant agricultural exporters in the medium term will be important factors in determining the size of any necessary adjustment to EU agricultural policy. Considerable price convergence has

already taken place in recent years as the applicant countries adopt agricultural policies more akin to the CAP, so the impetus to increase production when membership occurs now looks smaller than previously forecast. Also, relative price levels are only one factor which determine agricultural output. Production levels in the CEECs may be held back for years to come because of structural weaknesses in management, technology, marketing, input services and food processing. In the longer run, however, as we observed above, these countries have considerable unexploited yield potential and will be in a position to increase their production significantly.

In the short-run, from a budget perspective, the important issue is whether direct payments to farmers, which are now such an important component of farm incomes in the present EU, will be extended to farmers in the applicant countries. The EU's financial perspective for the 2000-2006 period agreed in the Agenda 2000 negotiations assumes that this will not happen, on the grounds that farmers in the applicant countries have not experienced a reduction in support prices and thus earned the right to compensation payments. Substantial income transfers through direct payments would risk creating income disparities and social distortions in the rural areas of these countries. But it will be difficult to sustain this argument given the idea that the CAP is a common policy. Extending direct payments to farmers in the new members would imply much higher expenditure that has been budgeted for to date, and higher than the existing member states may be willing to pay.

Another challenge facing farming is the greater priority given to environmental policy in the Treaty on European Union which requires that "*environmental protection requirements must be integrated into the definition and implementation of the other Community policies*" (article 130r), and which has given greater impetus to the integration of agricultural and environmental policies. The main objectives are to minimise the adverse effects of agriculture on the environment while promoting the production of public goods associated with farming activity. A major step towards the integration of environmental concerns into the common market regimes under the Agenda 2000 CAP reform is that Member States are now obliged to specify minimum environmental measures for farmers in receipt of direct support measures and rural development payments. In addition, funding for the EU's agri-environment measure under which Member States can introduce schemes to pay farmers for the lost opportunities and additional costs involved in meeting stricter environmental targets than required by good farming practice has been increased.

At the same time, there is a growing body of environmental legislation which has implications for farming. Agricultural water pollution issues are directly addressed in the Drinking Water Directive (which sets limits on the allowed contaminants in drinking water such as nitrates and pesticides) and in the Nitrates Directive on pollution caused by nitrates from agricultural sources, which was adopted in 1991. The latter Directive requires Member States to designate as "vulnerable zones" areas of land that are likely to contribute to nitrate levels exceeding a specified level and to require farmers in these areas to follow nutrient management practices to limit nitrate run-off. Nature conservation is promoted under the Habitats Directive which requires member states to designate Special Protection Areas (for birds) and Special Conservation Areas (sites hosting the natural habitats and species designated under the Habitats Directive). Management plans in these areas may also impose restrictions on agricultural activities.

Finally, food safety is the other area where public policy is evolving rapidly, with important consequences for farmers. It was made a top priority by the incoming European Commission in October 1999 in response to consumer concerns, and an EU White Paper on Food Safety was produced in January 2000. The strategic priorities of the White Paper are to create a European Food Safety Authority, to modernise EU food law by implementing a farm to table approach in food legislation, and to improve control and enforcement procedures. The new Authority will provide a source of independent, objective scientific advice on food-related risks. It will also have responsibility for the EU Rapid Alert System for food which links EU countries in cases of food-borne threats. A key instrument in ensuring food safety is traceability, that is, the ability to source back individual purchases in the supermarket to the particular farm where the food was produced and to be able to monitor production methods on these farms. EU legislation will make it mandatory for businesses to have in place systems to trace at least from whom they have purchased foods and to whom they have supplied them. These demands will require farmers to undertake additional investments and will accelerate the process of structural change in the industry. However, they also open up additional marketing opportunities; beef can be produced not just as a commodity product but for particular niche markets where consumers can be guaranteed that their particular requirements have been met.

Prospects

European agriculture on the threshold of the twenty-first century is facing unfamiliar challenges. Farming in the past was driven by a productivist philosophy of maximising food production. Much of the market

risk was removed by government guarantees to underpin price levels in the market place through intervention buying and export subsidies. Support prices which were set at levels designed to keep smaller farms in production gave significant incentives to larger, more cost efficient units to expand production, often through intensification with accompanying adverse environmental impacts. Structural adjustment continued apace as production became concentrated on fewer and larger farms.

Farming in the future will be much more exposed to consumer demands as price support is gradually wound down and as individual producers become more tightly integrated into the food marketing chain. Furthermore, although a segment of consumers will always be price conscious and will continue to demand cheap food, many more consumers will want greater assurances that their food is safe and that production methods are sustainable in environmental terms and ethical in terms of animal welfare. This more differentiated market demand will provide increased scope for farmers to develop alternative production strategies, but it will also require enhanced levels of management skills among those who will survive in the new environment.

References

Ackrill, R., 2000, *The Common Agricultural Policy,* Sheffield: Sheffield University Press.

Commission of the European Communities, 1991, *The Development and Future of the CAP*. Communication of the Commission to the Council, COM(91)100 final, Brussels.

Commission of the European Union, 2000, *EU and enlargement*, Fact Sheet, Brussels: Directorate-General for Agriculture.

Commission of the European Union, 2001, *The Agricultural Situation in the European Union 2000*, Brussels: Office for Official Publications of the European Union.

Eurostat, 1997, *Total Income of Agricultural Households 1996*, Luxembourg: Office for Official Publications of the European Communities.

OECD, 2000, *Agricultural Policies in OECD* Countries, Paris: OECD.

OECD, 2000, *Environmental Indicators for Agriculture: Methods and Results*, Paris: OECD.

Further reading

Fennell, R., 1997, *The Common Agricultural Policy: continuity and change*, Oxford: Oxford University Press.

OECD, 1998, *The Future of Food: Long-term Prospects for the Agro-food Sector*, Paris: OECD.

OECD (annual). *Agricultural Policies in Emerging and Transition Economies*, Paris, OECD.

Ritson, C. and Harvey, D.(eds), 1997, *The Common Agricultural Policy*, 2nd edition, Wallingford: CAB International.