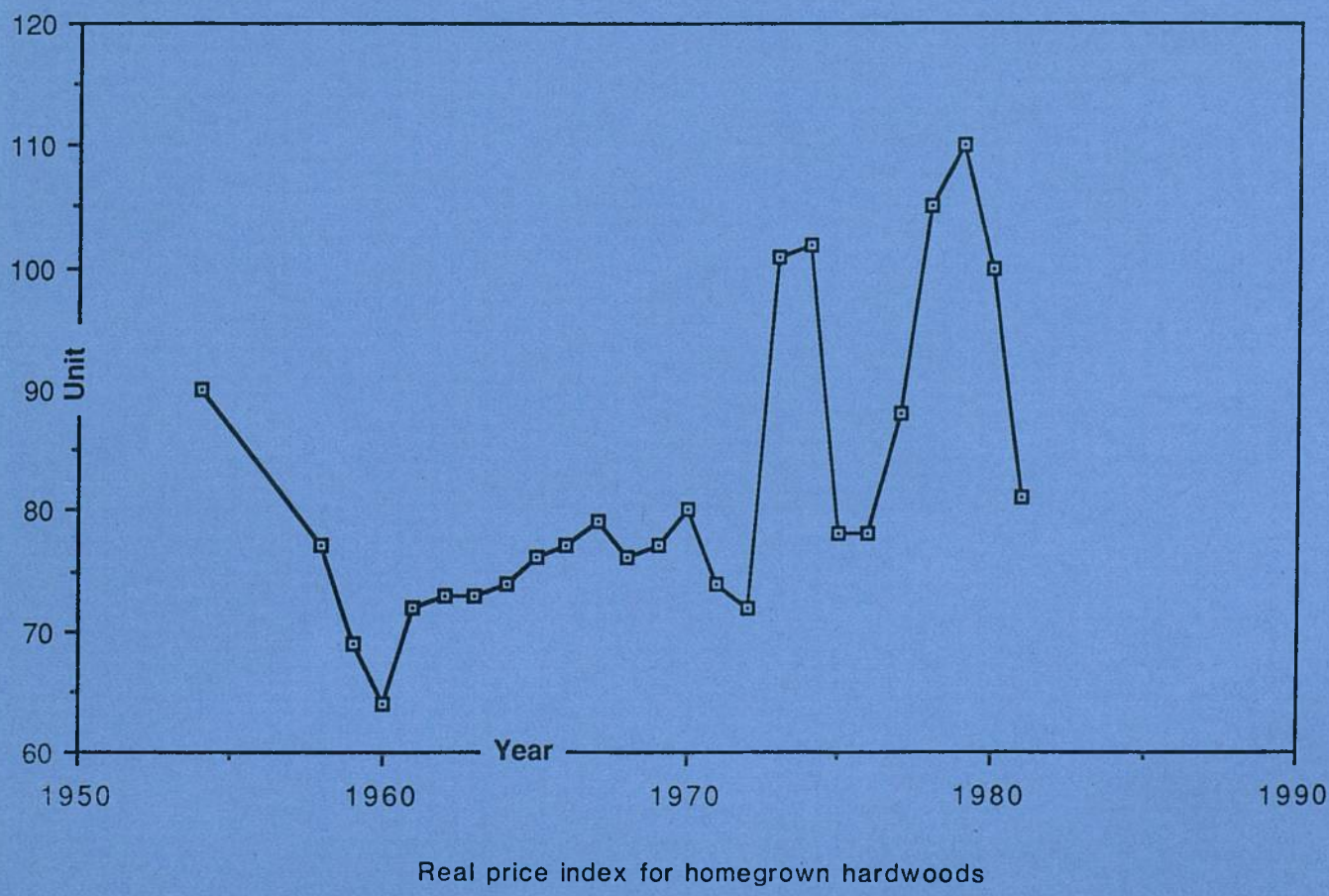




# The Impact of Government Intervention on Private Forest Management in England and Wales

J.A. Johnson  
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## **Preface**

The original work for this report began in September 1985 and was completed 2 years later, before the Chancellor of the Exchequer's Budget Statement of March 1988. In the light of the reforms which have taken place since, the study has been completely rewritten and updated as far as possible. It is probably true to say that a report of this nature is dated as soon as it gets into print but even essentially historical analyses have their use.

## **Acknowledgements**

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## Abstract

This report presents the results of an enquiry into the influence of taxation and subsidies in forestry on the management of private woodlands in England and Wales. The aim of the study has been to clarify the critical elements in the management decisions of private woodland owners. The main feature distinguishing this study from others of its nature is that it is based on a direct comparison of the circumstances of woodland owners in 1964 with those in 1986. To widen the remit of the 1986 survey data were acquired by additional interviews undertaken on farms in the following regions: the north London fringe, the Welsh borders and South Wales. These data were analysed using the same multivariate statistical analysis applied in 1964 — Principal Component Analysis.

Comparing the circumstances of woodland owners in 1964 with those in 1986, and assessing the information obtained from interviews with farmers, the following significant points emerge:

1. Government intervention has done little to improve the economic performance of forestry. Cash flow problems, common to many landowners, have continued to obstruct forestry activities. The low rates of return from woodlands have been the biggest single impediment to encouraging investment. For low-income earners grants have been more valuable in raising private rates of return; for high income earners tax relief has generally been more valuable.
2. For estate owners, before March 1988, the fiscal system had a greater impact on income than on the capital value of the woodland investment. Consequently owners have been driven towards developing income-producing rather than capital-producing activities. On the ground this has been translated into a separation of objectives, so that some parts of an estate's woodlands are now viewed purely in terms of making a small annual profit, while other parts are set aside to cater for other functions such as amenity, recreation and conservation.
3. For farmers, before March 1988, the fiscal incentives were generally ineffective in encouraging the development of farm woodlands. This is largely because the most important of the incentives, tax relief, could not adequately be exploited by many farmers and the size of grants was insufficient to defray the additional expenditure and risk incurred with moving into a relatively unknown and long-term form of land management.
4. Land use change between 1964 and 1986 was insignificant for very much the same reasons as given in 3 above.
5. The private sector marketing scenario has improved little, if at all, since 1963. Many vendors in 1986 were receiving prices for their timber which, in real terms, were substantially less than the prices they received in 1963.
6. The growing of trees for objectives other than timber production has become increasingly significant. Landowners are prepared to undertake this, even if it means for them an economic loss, provided they have recourse to consociate funds or other income to cover the need for deficit-financing. The extent to which landowners will continue to do this is largely dependent on future changes in European policy for agriculture.

# Chapter 1

## Introduction

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The Government's ability to tax the community and to spend on its behalf gives it a major lever on the level of activity in all sectors of the economy. With forestry there is no exception. Intervention through taxation, grant aid and statutory control, has been a significant driving force for over 80 years.

Out of a national total of 2 094 000 ha of woodland approximately 1 195 000 ha are in private ownership and, of this, 725 000 ha are in England and Wales. It is clear that much of the large scale private afforestation in upland Britain would not have occurred in the absence of tax concessions. What is far less clear, however, is how these concessions and their counterpart, direct subsidies, have influenced the management of lowland woods.

By the end of the 1980s only a limited amount of research appeared to have been carried out to provide answers to such questions as: What have been the effects of the various fiscal measures on private forestry? How far have forest owners' decisions been influenced by the different incentives? Are landowners aware of the incentives? What other influences are significant determinants of forest management attitudes and practices?

Since the 1950s national policy for woodlands has ceased to be overwhelmingly dominated by a desire to increase the size of the forest estate for strategic reasons. Policy has recently focused on many aspects apart from efficient timber production (Forestry Commission, 1985; Stewart, 1987; House of Commons, 1990) and, in some ways, the sweeping reforms introduced in the Chancellor's Budget of 1988 corroborated a change in the perception of forestry which had been evident for years.

In itself the removal of income taxation for forestry does not mean that the vehicle for driving national policy has become less complex as a result. The competing demands which policy advisers face and the means with which they resolve resource conflicts should be viewed in their universal totality even though their focus is at the national level. A whole new ethic has been created by environmental concerns. It centres around consideration for human beings in other places and other times as well as ourselves, the preservation of other species, habitats and wild places for their own intrinsic value rather than their economic value. The complexity which this introduces into national policy should encourage a continuous process of questioning and reassessing government intervention in the form of fiscal measures and how best to marry these to the achievement of national goals.

### Background to study

This report presents the results of an enquiry into the influence of taxation and subsidies in forestry on the management of private woodlands in England and Wales. The aim of the study has been to clarify the critical elements in the management decisions of private woodland owners. The main feature distinguishing this study from others of its nature is that it is based on a direct comparison of the circumstances of woodland owners in 1963 with those in 1986.

In the early 1960s Nicholls undertook some research into the determinants of forest policies on private estates in England and Wales. The results of this research were published in Forestry Commission Bulletin 39 *Use of land for forestry within the proprietary land unit* (Nicholls, 1969).

The present enquiry was carried out between 1985 and 1987. The authors returned to the same estates which had been visited some 23 years earlier in order to examine the changes which had occurred and particularly to assess the impact on woodland management of changes in fiscal arrangements. In order to broaden the scope of the study and to assess how other types of landowners viewed the prevailing fiscal system in 1986 surveys of farms in three separate regions were also carried out.

### Form of report

The subsequent chapters of the report centre on the analysis of data and the findings of the study. The second chapter briefly describes the earlier 1964 survey and its results. Chapter 3 discusses the various forms of



government intervention on a historical basis and includes the most recent introductions into the fiscal apparatus. The methodology of the more recent survey undertaken between 1985 and 1987 is to be found in Chapter 4. This latter survey is referred to throughout as the 1986 survey. The results and their interpretation are assigned to Chapter 5; this covers both the results of the Principal Component Analyses and the interpretation of the wider range of information gathered during the course of the surveys. In the final part of the study (Chapter 6) government intervention at the European level is examined in relation to the single European market. Although this was not a part of the original study it forms the basis for evaluating the findings of this study and is a useful cornerstone on which to draw conclusions.

## Chapter 2

### The 1964 survey

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#### Objectives of the 1964 survey

The study undertaken by Nicholls (1969) between 1962 and 1964 was based on an original survey of 72 selected proprietary land units in England and Wales. The objectives of the study were threefold: first, to investigate the present pattern of forest land use; second, to determine the most important factors which influenced this pattern; and third, to assess the role of forestry within the composite proprietary land unit and the role of private forestry in national forestry policy.

#### Method used for the 1964 survey

The two surveys described took the form of a pilot survey of 20 estates followed by the main survey covering 72 estates, 10 of which had been included in the pilot survey. The distribution of the estates is shown in Table 1.

**Table 1** Regional distribution of estates in the 1964 survey

	<i>Region</i>	<i>Counties</i>	<i>Number of estates</i>
I.	Far West	Cornwall, Devon	7
II.	Mid West	Dorset, Somerset, Gloucestershire, Wiltshire, Oxfordshire (excluding Chilterns)	8
III.	South East	Hampshire, Berkshire, Middlesex, Surrey, Kent	8
IV.	West Midlands	Herefordshire, Worcestershire, Warwickshire, Shropshire, Staffordshire, Cheshire	6
V.	Chilterns	Parts of Oxfordshire and Buckinghamshire	8
VI.	East Midlands	Buckinghamshire (excluding Chilterns), Bedfordshire, Northamptonshire, Leicestershire, Nottinghamshire, Derbyshire, Lincolnshire, Rutland	7
VII.	East Anglia	Huntingdonshire, Cambridgeshire, Norfolk, Suffolk, Essex, Hertfordshire	6
VIII.	North	Lancashire, Yorkshire, Cumberland, Westmorland, Northumberland, Durham	10
IX.	South Wales	Monmouthshire, Glamorganshire, Carmarthenshire, Pembrokeshire, Cardiganshire, Radnorshire	4
X.	North Wales	Anglesey, Caernarvonshire, Flintshire, Denbighshire, Montgomeryshire, Merionethshire	8
Total			72

*Note:* Although the actual survey took place between 1962 and 1964, for convenience it is referred to throughout the text as the 1964 survey.

The area of agricultural and forest land included in the survey amounted to 233 754 ha. This was about 1.5% of the total land area of England and Wales: 1 547 110 ha. The total woodland area surveyed, 32 665 ha, represented 4.1% of the area of private woodlands (750 417 ha) in the two countries.

Data were collected under the survey headings shown in Table 2.

**Table 2** The main survey headings

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<i>General</i>	Land use
	Location and shape
	Ownership: personality, duration, consociate capital
	Management structure
<i>Agriculture</i>	Area let: number of holdings, rents, rental values
	Area in hand: number of holdings
	Predominant farming systems
	Future policy
<i>Forestry</i>	Area let: rents and reasons for letting
	Area in hand: geographical distribution
	Woodland sites: determinants of present locations
	History of management post-1920
	Main species and age structure
	Labour utilisation and marketing methods
	Economics and finance
	Tradition
	Factors influencing policy and practice
	Future policy

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### Analysis of information in 1964

The data were analysed by subjecting them to two multivariate statistical analyses: Principal Component Analysis (PCA) and Association Analysis. The former was used for the quantitative data (such as area of woodland) and the latter largely for the qualitative data (such as 'yes' or 'no' answers to questions like "are your woodlands profitable?"). The objective of using these techniques of multivariate analysis is to try to reduce the variation in the data. So for example, in PCA, the first Principal Component may be viewed as the single best summary of linear relationships in the data. This effectively means that other variables are of lesser importance in explaining the differences between the estates. Chapter 4 discusses the use of the technique of PCA in more detail.

## Results

The results of the two types of analysis are summarised below.

### *Quantitative analysis*

The results of the quantitative analysis are shown in Table 11. The main results of the 1964 survey are as follows:

1. The principal factor distinguishing the estates from one another (that is, contributing to maximum variance) was *estate size* and the second that of *total woodland area* contrasted with the agricultural and total areas. As a component accounts for increasingly less of the variation in the data it becomes more difficult to identify. The third component gave rise to a much wider range of coefficients but was identified as a factor of *woodland area let* as against *agricultural rental values*. It was only the fourth and subsequent components which were more obscure and left unidentified.
2. Estate area, agricultural area and woodland area were strongly positively correlated.
3. There were marked regional differences in the mean areas of estates and woodlands and in the area of agricultural land farmed in-hand.
4. Twenty of the woodlands on the 72 estates showed an annual loss. The main characteristics of these loss-making woodlands were threefold: they had not been consistently managed during the inter-war years 1919 to 1939; they had suffered excessively heavy felling during the Second World War; and they contained high proportions of plantations under 20 years of age.

### *Qualitative analysis*

The results of the qualitative analysis were to a large extent dependent on the method of coding used to qualify a range of responses to single questions. It was clear that two major factors stood out:

1. The profitability, or otherwise, of the woodlands was the factor chiefly responsible for the differences between the estates.
2. Income tax arrangements emerged as by far the most significant form of government assistance to forestry.

## Conclusions

The 1964 survey brought out many lines of evidence confirming the extremely close relationship between government intervention and woodland establishment and management. The main conclusions drawn by Nicholls (1969) were as follows:

1. The grants provided through the Forestry Act of 1947 had done much to assist the post-War rehabilitation of plantations. It was arguable that the grants should have been much greater because the exploitation of woodland during the war was not in the proprietors' interest even though it may have been in the national interest. It was suggested that by the end of this century, when forestry grants were scheduled to end, private forestry must become self-supporting and that this would only come about through increased efficiency in the use of labour and in the marketing of timber products.
2. Land use patterns within the proprietary units had remained fairly static since 1945, with most land owners being prepared to maintain the land uses which they had first adopted. Where the primary objective of management was to maximise profit the two main enterprises of forestry and agriculture were usually considered as separate enterprises. Tradition was thought to be the factor influencing the then current allocation of land use; this was further confirmed by the fact that many estate owners were prepared to manage some estate enterprises, such as sawmills, at a considerable annual loss. This does not deny the fact that to all types of woodland owner the economics of forestry were important. But very few found it necessary or meaningful to discount costs and returns in estimating the profitability of their woodlands. It was the whole return on the capital investment which occupied the proprietary mind and that return included all aspects of amenity, recreation, sport and conservation. If plantations were to reach a state of normality by the year 2000 then, with increasing demand for timber and timber products, it was implied that forestry could attain the attributes of a 'most profitable enterprise'.

3. The value of the tax concessions was such that Nicholls (1969) considered it paramount that clear, long-term assurances for the continuation of the system be given. Government aid, it was stated, was fully justified.

The relationships between the major analyses performed on the survey data were, as Nicholls (1969) wrote, “very much as could have been predicted”; but, as he further intimated “it (was) interesting and very important that these statistical analyses confirm personal impressions”.

## Chapter 3

### Government intervention in forestry

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The term 'Government intervention' as used here refers to intervention through direct subsidies (grants) and indirect subsidies (taxation) and other forms of control such as statutory restrictions. This chapter provides a brief overview of the history of taxation and grants in the United Kingdom up to the current day. The present structure of grants and taxation is detailed and compared with systems existing in other European countries.

#### GRANTS FOR PRIVATE FORESTRY IN GREAT BRITAIN

For a comprehensive guide to all kinds of grant assistance related to trees, see Lorrain-Smith (1989).

##### **Forestry Commission Grant Schemes**

The first grants administered by the Forestry Commission upon its establishment in 1919 related to scrub clearance and other ground preparation and planting. Larger grants were available for corporate bodies than for private individuals. Then, in 1927, planting grants were fixed at £2 per acre for conifers and £4 per acre for hardwoods, irrespective of ownership.

##### ***Basis I and Basis II Dedication Schemes***

The main focus for grant aid and the most enduring system was the Dedication Scheme (Basis I or Basis II) which ran from 1947 to 1981 and offered either a percentage of net costs or a planting grant with an annual management grant. When an owner agreed to dedicate woodlands it meant an entrance into an inherently restrictive deed of covenant. The agreement was that ".... no part of the dedicated woodland .... shall .... at any time hereafter be used otherwise than for the growing of timber thereon in accordance with the rules or practice of good forestry ...." (Forestry Commission, 1948). After any change of ownership the subsequent owner was restricted to using dedicated woodlands for forestry purposes, but this did not mean that they should be managed in an 'approved manner'. The Forestry Commission Census of Woodlands 1979-82 revealed that two-thirds of all woodlands in England and Wales were in private ownership and that, within the private sector, just under one-third was in the 'Dedicated and Approved Woodland' category though much of the remaining area was well managed.

##### ***Small Woods Planting Scheme***

In 1950 a Small Woods Planting Scheme was introduced and, at about the same time, further grants were made available to encourage thinning (1949-59), the planting of poplar (1950-59), specifically for the matchstick industry, and scrub clearance (1953-63).

##### ***Approved Woodlands Scheme***

The Approved Woodlands Scheme was introduced in 1953. This enabled owners to receive half of the planting grant given under the Dedication Scheme, without having to dedicate the land to forestry, although the woods had to be managed under an approved plan of operations.

##### ***Basis III Dedication***

The final dedication scheme known as Basis III was introduced in 1974. Under this scheme an outright payment was made for each hectare of land planted or replanted to an approved plan of operations and the owner had to accept a continuing obligation to manage his woodlands. A management grant was added to Basis III in 1977.

Table 3 gives the grant rates for Basis II and Basis III Dedication Schemes, effective from 1 October 1984.

**Table 3** Basis II and III Dedication Schemes

<i>1984 figures in £/hectare</i>	
Planting grant	110.00
Management grant per annum	
first 40 ha	4.80
second 40 ha	3.25
balance	2.00
Basis III Dedication	
Planting grant	
conifers	145.00
broadleaves	330.00
Management grant — per annum	4.20

*Source: House of Commons (1990), vol. 2, p. 231.*

Under all the dedication schemes, Basis I, II and III, timber production had to be the primary objective of planting. Under Basis I and II sport and amenity had to be 'reconciled' with silviculture. Basis III stood to 'secure sound forestry practice, effective integration with agriculture, environmental safeguards and such opportunities for public recreation as may be appropriate (Forestry Commission, 1977). Furthermore, under Basis III a woodland might be taken out of the scheme at the end of a rotation.

Initially, Basis III dedication was applicable to all plantings of one hectare or more. However, in 1977, a Small Woods Grant was introduced to cover woodland areas of between a quarter and 10 hectares while Basis III was restricted to woodland areas greater than 10 ha. This was a combined scheme which was closed in 1981 in order to reduce administrative costs.

Since the first introduction of forestry grants the various schemes have been changed many times and especially so since 1972. The changes are summarised in Table 4.

**Table 4** Forestry Commission grants up to 1990

<i>Grant</i>	<i>Inaugurated</i>	<i>Closed</i>	<i>Structure</i>
Dedication Basis I	1948	1972	Annual grant
Dedication Basis II	1948	1972	Planting and maintenance
Dedication Basis III	1974	1981	Planting grant (from 1977 also a management grant)
Small Woods Planting Grant	1950	1971	For smaller areas
Approved Woodlands Scheme	1953	1972	Planting Grant
Small Woods Grant	1977	1981	Woodland areas between 0.25 ha and 10 ha
Forestry Grant Scheme	1981	1982	Planting grant only
Broadleaved Woodland Grant Scheme	1985	1988	Planting grant only
Woodland Grant Scheme	1988	to date	Planting grant only

## ***Forestry Grant Scheme***

In 1981 the Forestry Commission introduced the Forestry Grant Scheme (FGS) applicable to both broadleaves and conifers. This was a planting grant only, with no subsequent management grant. The conditions attached to the grant were, firstly that timber production must be the primary objective and, secondly, that owners must be willing to discuss public access with the relevant local authority. Where mixtures of conifers and broadleaves were acceptable on landscape and conservation grounds, the grant was payable in proportion to the areas of conifers and broadleaves at the time of planting. The grants ranged from £630 per ha (0.15-0.9 ha area planted) to £240 per ha (10 ha and over) for conifers and from £890 per ha (0.15-0.9 ha) to £470 per ha (10 ha and above) for broadleaves.

## ***Broadleaved Woodland Grant Scheme***

The increasing interest in broadleaves led to the introduction of the Broadleaved Woodland Grant Scheme in 1985. This was applicable to pure broadleaved woods but, for the first time, timber production was not a primary objective of grant aid. Like the FGS the grant was for planting or natural regeneration only and no management grant was available. Furthermore the owner had to be willing to discuss access with the local authority. For the smallest areas planted (0.15-0.9 ha) the grant was increased to £1200 per ha and the largest areas (10 ha and over) attracted a rate of £600 per ha.

Immediately following the 1988 Budget statement the Forestry Commission announced the closure of the FGS and the BWGS to new applications as from 15 March 1988.

Private woodlands which were dedicated before 1981 may continue to be grant aided under the relevant dedication scheme, but for new applications the following schemes now operate.

## ***Woodland Grant Scheme***

The Woodland Grant Scheme (WGS), introduced in June 1988, is now the standard Forestry Commission scheme for grant aid for all new forestry planting and restocking of existing woodland. The scheme is aimed at encouraging the multi-purpose use of woodland and encompasses the following wide-ranging objectives:

- to encourage timber production;
- to provide jobs in and increase the economic potential of rural areas with declining agricultural employment and few alternative sources of economic activity;
- to enhance the landscape, to create new wildlife habitats and to provide for recreation and sporting uses in the longer term;
- to encourage the conservation and regeneration of existing forests and woodlands.

**Table 5** Woodland Grant Scheme; current (1990) rates of grant for establishment (£/hectare)

<i>Area planted</i>	<i>Conifers</i>	<i>Broadleaves</i>	<i>Instalments</i>
0.25-0.9 ha	1005	1575	70% at planting
1.0-2.9 ha	880	1375	20% after 5 years and 10%
3.0-9.9 ha	795	1175	after further 5 years (subject to
10 ha and over	615	975	satisfactory establishment)

The WGS, as illustrated in Table 5, offers substantially higher grants than its predecessors. It also has a number of other features. For example, a Better Land Supplement (BLS) is payable for planting on arable land or improved grassland which has been cultivated or reseeded within the 10 years before an application for grant



but with the qualification that any treatments had started before 31 December 1987. Cultivation must include the physical preparation of the soil to a maximum depth of 200 mm. Permanent pasture and grassland which has been 'improved' by liming, fertilising and other management methods but without cultivation is not eligible. The supplement is in addition to standard WGS grants available for planting on other types of agricultural land. The BLS is payable (formerly £200 per ha; from 1 October 1990, increased to £400 per ha for conifers and £600 per ha for broadleaves) with the first instalment of the WGS. All broadleaved planting, whether on its own or in mixture with conifers, will attract the same higher broadleaved rate of grant.

### **New measures for management of woodlands**

In July 1990 the Forestry Commission announced the following new measures:

#### ***Woodland management grants (see Table 6)***

Woodland management grants, as part of the existing Woodland Grant Scheme, will offer to landowners annual payments in return for 5-year management plans, to be agreed with and monitored by the Forestry Commission. Such plans will be expected to increase the environmental value of both broadleaved and conifer woodlands, as well as detailing more normal maintenance operations. The grants will be available from 10 years after the establishment of the woodland until 40 years of age for broadleaved woods, and 20 years for conifer woods.

#### ***Special management grants***

Higher special management grants will also be available for woodlands of particular environmental value. These will be woodlands which the Forestry Commission consider to be of special value for nature conservation, landscape or public recreation by virtue of their nature, location or use. In return for these grants the owner will be expected to take action to maintain and enhance the woodland's special character. They will be offered as an alternative to the standard grant for eligible woodland of any age over 10 years.

Proposals to create, develop or improve facilities for public access or recreation may attract the higher special rate of grant, where the Forestry Commission is satisfied that there is a demand for such provision.

#### ***Farm Woodland Scheme***

Similar management grants will be available to farmers under the Farm Woodland Scheme, *in addition to the annual payments under that Scheme*, (see page 13), which are compensation for agricultural income foregone and are not provided for the purpose of defraying maintenance expenditure.

#### ***Small woods supplement***

Supplementary grants will also be paid for woodlands of less than 10 ha because of the higher management costs involved.

**Table 6** Woodland management grants: effective from 1 April 1992

<i>Type of Grant</i>	<i>Period of eligibility (age of wood in years)</i>	<i>Rate of Grant (£/ha/annum)</i>
Standard Management Grant		
Conifer	11-20	10
Broadleaved	11-40	25
Special Management Grant	11 onwards	35
Supplement for small woods		
Standard: conifer	11-20	5
Standard: broadleaved	11-40	10
Special grant	11 onwards	10

*Note:* Mixed woodlands will be eligible for the broadleaved and conifer element of the grant in proportion to the area occupied by the two categories

## ***Management plans***

A one-off payment of £100, for woodland owners who draw up their management plans for the first time with the benefit of professional advice, is also proposed for applicants for management grants, though not for planting grants.

## ***Grants for coppice woodland***

The Forestry Commission will be introducing an extension to the Woodland Grant Scheme to allow planting grants to be made for the establishment of short rotation coppice. Recognising the high conservation value of traditional coppice rotations, these will be eligible for the new management grants.

## ***Other conditions***

### ***Open spaces***

The Forestry Commission has been asked by the Government to “continue to adopt a flexible approach when paying planting grants, in order to recognise the environmental benefits of open ground and associated edge habitats for reasons of landscape, nature conservation, recreation and game management” (Forestry Information 13/90 issued 23 July 1990). There is no question, however, of planting grants being paid for large areas left unplanted.

### ***Grey squirrel control***

Measures to preserve new broadleaved woodlands from grey squirrel attack will be a condition of payment of the new management grants. While recognising the limited success in encouraging the setting up of grey squirrel control groups, the Government has asked the Commission to persevere with these initiatives since they regard such co-operative effort as essential for the protection of new broadleaved woods.

## **Ministry of Agriculture, Fisheries and Food grant schemes**

### ***Farm and Conservation Grant Scheme***

The Farm and Conservation Grant Scheme replaced the Agriculture Improvement Scheme in 1989. The new scheme allows grant aid to be paid towards capital expenditure on work which has a conservation value and which forms part of a farm improvement plan. The scheme may cover grants for shelterbelts, hedgerows and the enclosure of grazed broadleaved woodland to exclude stock. The standard rate of grant is 40% (50% in Less Favoured Areas) but only 15% for shelterbelts where broadleaves form less than half the total stocking.

### ***Farm Woodland Scheme***

Annual income support payments are now made to farmers who establish woodland on their farms under the terms of the Farm Woodland Scheme (FWS).

The four aims of the Scheme are:

- to divert land away from agricultural production and thereby assist in the reduction of agricultural surpluses;
- to enhance the landscape, to create new wildlife habitats, to encourage recreational use, including sport and to expand tourist interest;
- to contribute to supporting farm income and rural employment;
- to encourage greater interest in timber production from farms and, in the longer term, to contribute to the UK's timber requirements.

Payments are made in addition to the Forestry Commission planting grants. Included within the scheme are arable land, improved grassland and unimproved land under the following conditions:

1. Land under arable or improved grassland (as defined for the WGS) within the 10 years prior to the date of application for grant is eligible. Grassland must not have been treated or land converted to arable since 31 December 1987.

2. Unimproved land may include permanent pasture or rough grazing in Less Favoured Areas. The land must have been in use for agricultural purposes and must have been converted to agricultural use before 31 December 1987.

The following are *specifically excluded* from the Farm Woodland Scheme:

- common land or National Nature Reserves;
- land which has received or is to receive grants from another source where the purpose of that grant is likely to be frustrated, e.g. drainage or reseeded paid within the last 2 years;
- existing woodland, including grazed woodland, although fields containing a few scattered trees may be eligible;
- Christmas trees;
- short rotation coppice;
- land returned from a tenant for planting.

The scheme is only open to occupiers of land who carry on, either personally or through a manager, an agricultural business on an agricultural unit which included that land. If the land ceases to be managed as part of an agricultural business then annual payments cease. Tenants must obtain the landlord's written consent to enter the scheme.

Over the 3 years of the scheme the minimum planting area per holding is 3 ha (in blocks of not less than 1 ha) and the maximum area per holding is 40 ha.

The scheme is experimental and is limited to 12000 ha per annum in the UK over the 3 years from 1 October 1988. Each year 1000 ha is to be allocated to unimproved farmland in the Less Favoured Areas.

#### *Rate of grant*

Planting grants (£/ha) are available as shown in Table 7. For broadleaves the rates are the same as in the WGS but for conifers they are lower (actually at the pre-1988 FGS rates).

Grant payable is 70% at completion of planting. Further instalments of 20% and 10% of the grant rate at time of payment are payable at 5 and 10 years respectively. These are subject to achieving satisfactory establishment and maintenance.

Grant for planting of broadleaved-conifer mixtures is payable on a pro-rata basis.

**Table 7** Current rates for grant for planting under the Farm Woodland Scheme

<i>Area</i>	<i>Conifer</i>	<i>Broadleaved</i>
1-2.9 ha	£505	£1375
3-9.9 ha	£420	£1175
10+ ha	£240	£ 975

In addition to planting grants, payments from the Agriculture Departments are payable as shown in Table 8.

**Table 8** Payments from the Agriculture Departments

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Arable/improved grassland:	
Outwith Less Favoured Areas	£190 per ha
Less Favoured Areas (Disadvantaged Areas)	£150 per ha
Less Favoured Areas (Severely Disadvantaged Areas)	£100 per ha
Unimproved land:	
Less Favoured Areas	£ 30 per ha

The period over which annual payments are payable is determined by category:

*Category 1: 40 years*

Native oak or beech woodland or mixed beech and oak woodland. Other broadleaves may occupy up to 10% of the planted area.

*Category 2: 30 years*

Mixed woods with greater than 50% by area or broadleaves or broadleaved woods other than oak or beech.

*Category 3: 20 years*

Conifer woods or mixed woods with 50% by area or less of broadleaves.

*Category 4: 10 years*

Traditional coppice, e.g. hazel, sweet chestnut, lime, oak.

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Annual payments will be reviewed in 1991 at the latest and at intervals of not more than five years subsequently. Adjustments will take into account trends in income from comparable agricultural land and other relevant factors. The level of payments may in the future be adjusted upwards or downwards.

***Taxation***

Under the new fiscal arrangements planting grants are not taxable but the annual payments under the FWS are taxable as they are paid in lieu of agricultural income.

***Set Aside Scheme***

Set Aside is a European Community Scheme administered by the Agricultural Departments. It is designed to help reduce surpluses of arable crops. Farmers first apply for acceptance into the Set Aside Scheme. They then have the choice of putting the land to one or more of the following: permanent fallow, rotation fallow, non-agricultural use (with some exceptions) or woodland.

If the woodland option is chosen the farmer may opt for planting grants under the WGS or the FWS, subject to the restrictions of each scheme. The farmer may choose to plant some areas under the WGS and some under FWS. Planting grants are the same for broadleaves under both schemes but conifers attract a lower rate of grant under the FWS than they do under the WGS. No Better Land Supplement is payable under the WGS within Set Aside.

Small areas of woodland not eligible for the WGS or the FWS may be planted without planting grant or under amenity planting grants available through local authorities or the Countryside Commissions. Land may also be planted to short-rotation coppice (for energy or biomass). No planting grant is available and this is classed as a non-agricultural use of the land.

Land planted under the FWS will attract annual payments for 10-40 years but that under the WGS, other grants or without grant for only 5 years.

Christmas trees are not permitted under the Scheme.

### *Eligibility*

Hectareage is based on the area of arable farmland used for growing 'relevant' crops in the year between the 1 July 1987 and 30 June 1988 (the 'base year') and must not have been converted to arable production after 31 December 1987. 'Relevant' crops are cereals, peas and beans harvested in dried form for human or animal consumption, sugar beet, hops, oilseed rape, fresh vegetables, flax, linseed and other oilseeds. Potatoes are not eligible.

The actual land to be planted must have been in the arable rotation in the base year. Both land under 'relevant' crops and other arable crops may be planted. Other crops include potatoes and crops grown for stock feed — forage roots and tubers, lupins, lucerne, sainfoin, clover, vetches, fodder kale and fodder rape. Land in the arable rotation under bare fallow is also allowable.

Participating farmers must, at the outset, enter the Scheme for 5 years but have the option to withdraw at 3 years. If woodlands were then destroyed or the land developed for other non-approved uses Forestry Commission planting grants would be repayable but Set Aside payments would not.

To qualify for the scheme a farmer must have been farming and in occupation of the land for at least 12 months preceding 1 October of the year in which the Set Aside undertaking commences. He or she has the right to farm the land for the duration of the Set Aside Scheme or to hold a tenancy from year to year under the provisions of the Agricultural Holdings Act 1986. Tenant applications must obtain the prior written consent of the landlord in order to participate. Part-time farmers are also eligible for the Scheme.

### *Size*

A farmer must set aside at least 20% of his land devoted to relevant arable crops in the base year, although not all of this area has to be given to woodlands. The minimum Set Aside area is 1 ha in one block though, again, not all of this has to be given over to woodland. The minimum size for land planted under WGS is therefore 0.25 ha and under FWS is 1 ha. Smaller areas may be planted under other grant aid. There is no maximum size for woodland set aside but under FWS terms the maximum plantable is 40 ha. Planting of an entire agricultural holding is permitted except where planting is undertaken under FWS terms.

The area set aside may be increased, but not decreased, by addition of part of the existing holding or on newly acquired arable land. All such additional land must of course meet the conditions of eligibility.

### *Rates of grant*

Farm Woodland Scheme — see Table 7. No Set Aside payments are made in addition to FWS annual payments.

Set Aside Scheme/WGS. Planting grants are available at the same rate as WGS. The Better Land Supplement is not payable.

In addition compensatory Set Aside payments are made annually in arrears for 5 years, as below:

Outwith Less Favoured Areas — £200 per ha

Less Favoured Areas — £180 per ha.

Other or no planting grants — compensatory Set Aside payments are made annually in arrears for 5 years, as indicated above.

Short Rotation Coppice — Compensatory Set Aside payments are made annually in arrears for 5 years, as below:

Outwith Less Favoured areas — £150 per ha

Less Favoured Areas — £130 per ha.

### **Nature Conservancy Council schemes**

Grant aid for projects is made under the Wildlife and Countryside Act (1981) under which the NCC may give grant to “any person .... doing anything which, in their opinion, is conducive to nature conservation or fostering the understanding of nature conservation”. The following points are applicable:

- priority given to sites of existing high nature conservation interest;
- no standard rate of grant but grants normally up to 50% of acceptable costs;
- all grants are discretionary.

### **Countryside Commission schemes**

Landscape conservation grants are offered towards the creation and management of features in the landscape:

- planting of trees and small woods of less than 0.25 ha;
- management of small woods or existing trees;
- conservation of hedgerows, ponds, stone walls and green lanes;
- work must benefit the landscape and contribute to the public’s enjoyment of the countryside;
- administered by local authorities (usually County Councils).

In eastern counties of England, the Countryside Commission offers a Countryside Premium, additional to Set Aside payments from MAFF, where the land set aside is managed for certain conservation objectives.

## **TAXATION OF PRIVATE WOODLANDS IN THE UNITED KINGDOM**

In his 1988 Budget Statement the Chancellor of the Exchequer announced that commercial woodlands would be wholly removed from the scope of income tax and corporation tax with effect from 15 March 1988. As a result the main taxes of significance to forestry today are the capital taxes — Inheritance Tax (IHT) and Capital Gains Tax (CGT).

### **General principles of taxation**

The intention of any forest tax system should be to take into account the nature of forest investment where the return on capital is comparatively low and the investment is a long-term commitment. In the United Kingdom the Inland Revenue had, up until 1988, regarded forestry as a business and the trees as a crop where woodlands were managed on a commercial basis. Today, woodlands are not assessed for income tax but may attract a liability for IHT (with available relief) and CGT (on land). Lynch (1989) provides the most comprehensive review of the relevant pre- and post-1988 fiscal system.

### **General provisions of taxation**

#### ***THE SITUATION FOR COMMERCIAL WOODS UP TO 1988***

Although commercial woodlands were removed from the income and corporation tax after the Budget of March 1988 a general description of the pre-1988 tax system is provided here for comparison and because that system operated at the time the survey was carried out.

## ***Income and Corporation Tax***

### ***Income Tax Schedule B***

Up to 1988 the normal basis of taxation of commercially occupied and managed woodlands was by assessment under Schedule B (ICTA 1970, S91). The occupier\* was deemed to receive income of one-third of the annual value of the land in its unimproved state (ICTA 1970, S92 (2)). The annual value did not take into account the value of the trees growing on the land and, pending any revaluation, the assessment was constant from year to year. The costs of assessment and collection often exceeded the tax payable and, for this reason, the assessment may not have been raised at all. Income from the sale of woodland produce and from grants was ignored for tax purposes under Schedule B. Similarly no taxes were deductible from the assessment nor were capital allowances available. The Schedule B taxation treatment was appropriate for a woodland investment generating substantial income in relation to modest expenditure, typically mature, well-managed woodlands.

### ***Income Tax Schedule D***

Where expenditure was substantial and income minimal or non-existent the occupier of commercially managed woodlands could elect to be assessed under Schedule D (ICTA 1970, S111 (11)). Under Schedule D profits and losses arising from woodland management activities were treated as if they arose from a trade, although the trees were not trading stock and their value did not have to be brought into the trading accounts. Once the Schedule D assessment had been made it was irrevocable so long as the taxpayer making the election continued to occupy the woodlands.

Election to Schedule D did not have to cover the whole area of the woodland estate. An election could be made for all or part of the young plantations under 10 years old to be treated as a separate woodland estate assessed under Schedule D, leaving the remainder of the woodland to be covered by the Schedule B assessment. This was sometimes known colloquially as 'the 10 year rule'. If the occupier wished to elect areas containing plantations over 10 years old to Schedule D the election had to extend to the whole woodland. Clear felled Schedule B areas could be replanted under Schedule D enabling the costs to be allowable for tax relief.

Change of occupation: When a change of occupation occurred, whether through inheritance, purchase or some internal arrangement such as the establishment of a family trust with family members obtaining shares in that trust, the commercial woodland automatically reverted to being taxed under Schedule B. The new owner then needed to make a new election for the Schedule D basis to apply. In practice the tax rules recognised that the life of commercial woodlands would normally span at least two generations and that the person who planted trees created an asset for his or her children and grandchildren.

Those items of expenditure which were not allowable in the Schedule D account were new roads, new drains, new permanent fences and new land preparation. These were all treated as capital expenditure. The costs of establishing and protecting plantations and the maintenance of their roads, fences, walls and drains were admissible in the annual account.

Schedule D had a bearing on IHT. The cost of replanting following the felling of timber could not be deducted from the proceeds of sale for IHT purposes (see below) if the expenditure had been or would be relieved for income tax under Schedule D.

Insurance: Receipts in respect of woodlands under Schedule D were chargeable to tax as income.

Capital allowances: Where the owner of woodland assessed under Schedule D incurred capital expenditure on forestry buildings, cottages, fences, walls, new roads and new drains, relief could be claimed in the form of annual writing down allowances of 4% (formerly 10%) until the expenditure was written off. Allowance on the provision of plant and machinery used in Schedule D woodlands was claimed on the same basis as a trade.

Sporting: Receipts from sporting activities were taxable under Schedule A but expenditure involved in managing the keep would have been deductible under Schedule D. Rents received under sporting leases are also subject to VAT at the standard rate.

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\*Although the Inland Revenue's technical reference to the woodland owner was that of 'occupier' it was not necessary for the 'occupier' physically to occupy his or her woodlands. Where the woodland was based and where the 'occupier' lived could be two different places.

Nurseries, Christmas trees and sawmills: Where forest nursery stock was to be used solely for use on the estate it was either not taxed (if used in Schedule B woodlands) or allowed as an expense (if used in Schedule D woodlands). Profits from sales outside the estate would have been taxed under Schedule D.

Profits from growing Christmas trees were taxable under Schedule D. The situation was different if the Christmas trees were grown within a mixture or if only some were to be used as such while the rest were allowed to grow on for timber. In these instances the income was tax free if the estate was taxed under Schedule B.

As for sawmills, if wood was converted from Schedule B woodlands, then any profits were tax free. However, if conversion was taken much beyond that of 'normal saw-milling' consequent profits were assessed under Schedule D.

### *THE SITUATION FOR COMMERCIAL WOODS AFTER 1988*

#### ***Income and Corporation Tax***

The effect of the new tax system, operating from March 1988, is that expenditure on the cost of planting and maintaining trees is no longer allowed as a tax deduction against other income and that the proceeds from the sale of trees are not charged to tax.

#### ***Capital Gains Tax***

Capital Gains Tax (CGT) is chargeable at 30% on the accrued gain on the disposal of the land on which the trees are growing. The timber and underwood is not chargeable. 'Disposal' may include any occasion on which the asset is transferred. The CGT liability on the land may be reduced by indexation and deferred under the holdover or roll-over provisions.

Woodlands which are not run on a commercial basis are subject to the normal CGT rules. Felled trees are treated as chattels for CGT purposes and a chargeable gain can arise only if an individual tree is sold for more than £3000.

#### ***Inheritance Tax***

In March 1976 estate duty, which had been the principal source of capital taxation on woodlands since it was first introduced by the 1984 Finance Act, was replaced by the more stringent Capital Transfer Tax (CTT). CTT was chargeable on lifetime gifts, on property left on death and on certain transfers relating to settled property. Because the tax became chargeable on lifetime gifts there were very few ways in which it could be avoided.

The introduction of Inheritance Tax (IHT), from 18 March 1986, in effect restored the characteristic of estate duty. It provided a means by which individuals, who make lifetime gifts more than 7 years before the donor's death, can secure a tax exemption on the transfer. The tax on trees (but not the land) can be deferred until the trees are sold when tax is charged on the net proceeds of sale. That contrasts with the pre-1975 rules for Estate Duty under which deferred duty was payable on the value of the timber at the date of death.

The transfer of woodland property is treated in the same way as any business property. Forestry land and growing timber qualifies for business property relief provided the property has been owned for at least 2 years. The value passing is reduced by 50% for an interest in an unincorporated business or a controlling interest in a company. Where woodlands are occupied by a partnership of which the woodland owner is a member, the transferor qualifies for 30% business property relief.

### ***HERITAGE AND AMENITY WOODS***

Certain amenity or heritage woodlands may gain conditional exemption from IHT. The conditions are as follows:

- that the land is actively maintained and its character preserved;



- that reasonable public access is secured;
- that the woodlands are not subsequently sold.

On non-exempt woodlands the following reliefs apply:

- IHT payment on land can be paid by interest-free instalments over 10 years;
- IHT payment on the trees can be deferred (as for commercial woodlands) but Business Property Relief cannot be claimed.

## **STATUTORY RESTRICTIONS**

Using land in order to grow trees is generally outside the scope of development control under Town and Country Planning legislations. Since 1974, the Forestry Commission has consulted as appropriate with MAFF, local planning authorities and other statutory authorities on applications for grant aid or felling licences and on draft plans of operations containing planting or felling proposals.

Where consultation is required it is the Forestry Commission which operates the procedures. The order of enquiry proceeds through the appropriate authorities and if there is no agreement with these authorities then a chain of enquiry may be set up through the Forestry Commission Regional Advisory Committee, to the Forestry Commissioners, to the Minister of Agriculture and finally to the Secretary of State for the Environment (or from the Forestry Commissioners to the Secretary of State in Wales and Scotland).

### **Felling licences**

A felling licence is normally required to fell growing trees. In any calendar quarter up to 5 m<sup>3</sup> may be felled by an occupier without a licence provided not more than 2 m<sup>3</sup> are sold. Certain types of felling are exempt and these include:

- felling which takes place within a plan of operations approved by one of the Forestry Commission grant schemes;
- garden, orchard trees or those in public open spaces;
- dead or diseased trees or those creating a nuisance in some specified way.

Trees must usually be inspected before a felling licence is granted and replanting proposals discussed. Replanting conditions may be imposed. In Conservation Areas or in an area covered by a Tree Preservation Order (TPO) or a Site of Specific Scientific Interest (SSSI) additional special permission is required.

A licence is valid for a set period of years which may vary from case to case. In circumstances where felling which is carried out requires a licence and a licence is not obtained then an offence is committed and a fine of £1000 (or twice the value of the trees) may be imposed.

### **Tree Preservation Orders**

A Tree Preservation Order (TPO) is made by the planning authority — the District Council. The objective is usually to preserve a tree or a number of trees (TPOs may cover whole woodlands) in the interests of amenity. Trees covered by a TPO can be felled but only with the consent of the planning authority and sometimes the Forestry Commission. Again, replanting or other conditions may be attached to the consent.

### **Planting in the English and Welsh uplands**

From March 1988 the Secretary of State for the Environment announced that environmental guidance was to be given to the Forestry Commission concerning the approval of grant applications for afforestation in England. The main feature of this guidance was that approval should not normally be given for new planting in the English uplands consisting predominantly of conifers. In the Welsh uplands the approach would continue to be based on the existing consultation arrangements for considering approvals for grant aid.

## **INTERVENTION BY THE EUROPEAN COMMUNITY**

### **Environmental Assessment**

The Environmental Assessment (Afforestation) Regulations 1988 are the means by which the requirements of European Community (EC) Directive No 85/337 are implemented in Great Britain. As from July 1988 anyone who submits an application to the Forestry Commission for grant-aid for new planting may be required to undertake a formal Environmental Assessment (EA) of the effects on the environment of the proposed planting. This is particularly relevant in environmentally sensitive areas such as National Nature Reserves, Sites of Special Scientific Interest, National Parks and so on. Where an area of more than 100 ha is proposed for planting within such designated areas an EA will invariably be required.

### **Environmental incentives**

At the Community level the principal basis for the provision of environmental incentives for farming and forestry are Articles 15 and 19 of Regulation 797/85 as amended by Regulation 1760/87. Since 1987 the Community has approved 29 national schemes under Article 19 of 797/85. These are located in the United Kingdom, in Germany, and in the Netherlands. Most of the national efforts in this area are at the stage of formulation rather than implementation (Countryside Commission, 1989). Currently the EC Commission is examining new schemes from the United Kingdom, Germany, France, Denmark, Italy, Spain and the Netherlands. It should be noted that by the end of the 1990s the Commission expects to present proposals to modify the provisions of Article 19 of Regulation 797/85. This modification is expected to broaden the scope of EC support in this field.

### **Forestry Action Plan**

The EC is expected to promulgate shortly details of its proposals for a forestry strategy and an associated Forestry Action Programme within the Community. It is anticipated that the Programme will make provision for Community support for forestry on two main fronts: new planting on farmland in association with moves to reduce agricultural surpluses and provide alternative farm enterprises; and aid for management of existing woodlands in certain limited areas in line with the Single European Act (1992) of promoting structural adjustment, particularly in less advanced regions of the Community.

## Chapter 4

### Survey methodology

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#### **The 1986 survey categories**

The investigation took the form of three surveys, undertaken during 1985 and 1986, which are described below:

#### **Survey 1 — estates**

The first survey covered 68 woodland estates in England and Wales. All but four of the original 72 estates surveyed in 1962-64, as described in Chapter 2, were included in the 1986 survey. The reasons for changes in the practices and patterns of estate forestry were investigated.

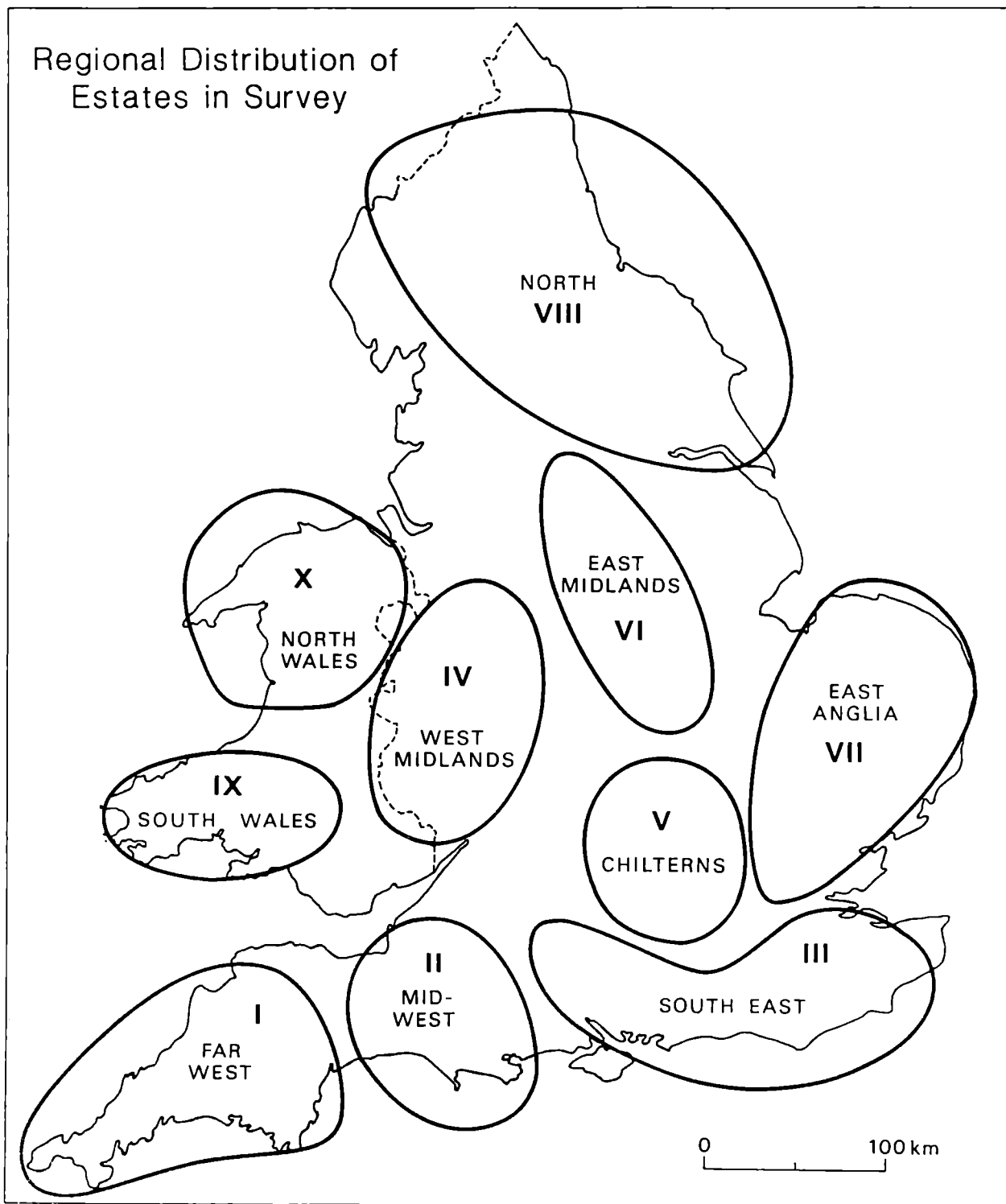
The definition of woodland estate adopted for the 1963 survey restricted coverage to those estates which included at least some let agricultural land and on which the woods were 'in hand' and were positively managed under a definite plan of operations — in most cases one which had Forestry Commission approval. The vast majority of these estates conformed to the popular notion of a 'traditional country estate'. A few of the 68 estates re-visited in 1986 did not satisfy the earlier definition because they had disposed of their let agricultural land. This did not affect the analysis. Nicholls' (1969) eventual choice of estates could not be considered as a random sample. Even so there was a wide distribution of ownership and size embracing ten geographical regions in England and Wales (Figure 1).

#### ***Survey 2 – the Western Counties survey***

The second survey covered owner-occupied farms with some woodland. The sample of farms was drawn from two contrasting geographical regions: the first region included the counties of Gwent and Dyfed; the second the neighbouring counties of Herefordshire and Worcestershire. These two regions provided very different sampling frames in terms of agricultural and forestry traditions and soil and climate characteristics, hence their appeal for a survey relating to woods on farms. The final sample totalled 25 farms in the Welsh counties and 25 farms in the English counties. For convenience this survey is referred to throughout the text as the 'Western Counties survey'.

#### ***Survey 3 – London Fringe survey***

The third and final survey was directed towards estates and farms in an area subject to considerable public pressure for access and recreation facilities. The London fringe was selected for this part of the study and a sample of 27 farms was drawn from south Essex and Hertfordshire. The aim of this survey was to clarify the impact of public demand for recreation facilities and conservation on woodland pattern and tradition. This survey is referred to as the 'London Fringe survey'.



**Figure 1** Map to show the approximate regional area covered in England and Wales.

## The sampling framework

The areas of agricultural and forest land covered in the surveys are given in Table 9.

**Table 9** Agricultural and woodland areas surveyed (hectares)

	<i>Estates</i>		<i>Farms</i>	
			<i>Western Counties</i>	<i>London Fringe</i>
Sampling year	1963*	1986	1986	1986
Sampling size	68	68	50	27
Total agricultural and wood land	229 226	179 335	9 976	7 886
Percentage of England and Wales	1.5	1.2	<0.1	<0.1
Total woodland	30 808	30 978	1 242	575
Percentage of private woodland, England and Wales	4.1†	3.8†	<1.0‡	<1.0‡
Mean woodland size	453	424	25	21

\* Less the four estates which were not included in the 1986 sample.

† Forestry Commission (1983) private woodland census.

‡ MAFF (1985) Farm Woodland estimate.

The small sample sizes for the farm surveys led to the information being analysed in a case-study fashion. While some of the evidence may allow generalisations to be drawn some of it is specific to a region and it would be unwise to read into the results a conclusive framework for the rest of the country.

## Location of farms in the Western Counties and London Fringe surveys

The majority of the 27 farms involved in the London Fringe survey were sited on good agricultural land (MAFF Grade II land accounting for 70% of the sample) and 80% of the farming systems encountered were arable. The Western Counties survey of 25 farms, on the other hand embraced a much wider range of topographical, soil and climatic characteristics. In South Wales two-thirds of all the farms were located partially or wholly within the Less Favoured Areas (LFAs) and endowed with attributes such as steep slopes and abundant rainfall, placing them firmly in the category of stock rearing. Table 10 indicates these regional differences.

**Table 10** Farming systems surveyed for surveys 2 and 3 only

<i>Farming system</i>	<i>Western Counties (% of farms)</i>			<i>London Fringe (% of farms)</i>
	<i>Wales</i>	<i>England</i>	<i>Total</i>	<i>Total</i>
Dairying	30	8	19	0
Stock rearing	48	44	46	9
Arable	2	20	11	82
Mixed	20	28	24	9

Within the Western Counties survey there were distinct geographical differences between those farms located in Wales and those in England. In South Wales the survey covered the Brecon Beacons, the Towy watershed and the drier coastlands of western Pembrokeshire. The Hereford-Worcester survey, although centred on farms in the River Severn Valley, also included the dramatic scenery of the Wye Valley. Maximum altitudes were 220 m for the English farms and 700 m for the Welsh.

### **Ownership type**

For the purpose of the survey, management was taken to be either residential or non-residential. The question posed was whether the estate, farm and woodland sectors were managed by the owner or by an internal or external agent. The aim was to find out who contributed to day-to-day decision making.

Four different types of owner were identified in a similar fashion to the 1964 survey:

1. The single owner, including the life tenant.
2. The trustee who possesses the power of a life tenancy but lacks its status. Trustees own land for the purpose of executing specific financial trusts in the land.
3. The company which is usually a private estate company formed expressly to own and administer the estate. Some may be public companies owning an estate as an incidental interest.
4. The charity including various types of corporations which may broadly be termed charitable institutions such as colleges. All were exempt from income tax and wholly immune from some forms of capital taxation.

### **Method of survey**

The method of survey in all cases was by personal interview with the same interview proforma being used across all estates and farms. The interview involved a discussion with the owner or his or her agent or forester (frequently all three persons) coupled with a tour of at least part of the estate or farm, looking especially at the woodlands.

A detailed questionnaire, to be adhered rigidly to in every case, was inappropriate. Table 2 gives the headings under which data were collected. There were three sections: the first dealt with the general description of the estate or farm, its composition, ownership and management; the second and third sections dealt in more detail with the agricultural and forestry components respectively.

### **Method of analysis**

The qualitative and quantitative information was coded and processed using the same multivariate analytical technique utilised in 1964. This technique, as described in Chapter 2, is called Principal Component Analysis (PCA). The purpose behind using the same technique was to demonstrate comparative changes in land use patterns and the adoption of fiscal incentives over the 23-year period. The raw data of the 1964 survey were re-coded and directly compared with those collected during the 1986 survey. The data collected by farm interview were subjected to the same method of analysis.

### ***Principal Component Analysis***

The object of PCA is to represent a  $k$ -dimensional variation by a number of orthogonal components, that is, ones which are statistically independent. This orthogonal set of linear functions is derived from a correlation matrix which shows the relationships between all the original variables. The first of these linear combinations (Principal Component One) has maximum variance, the second is uncorrelated with the first and has as large a variance as possible, and so on. The original data can then be described in terms of a number (in this case, four) of uncorrelated linear functions. The values of the principal components were calculated for each estate in the investigation and then examined to see whether there were any clear groupings and whether there were any strong correlations with other variables classifying the estates.

The qualitative data were analysed solely on a region-by-region basis, looking particularly at attribute frequencies. The Association Analysis undertaken in 1964 was not repeated in 1986. The reason for this was that the questions asked of respondents in 1986 aimed to elicit as much information as possible on attitudes to and perceptions of the prevailing fiscal measures. Consequently the decision was taken to analyse this information case-by-case rather than to code it numerically as this latter method would reduce the amount of information upon which conclusions could be drawn.

## Chapter 5

### Results and their interpretation

The raw data that Nicholls (1969) obtained in 1964 were re-coded and re-analysed together with the data collected during the 1986 survey. The same method of analysis was applied to the estate data as to the farm data and the results of the different analyses are presented on pages 25-36 and pages 37-43 respectively. The main part of this chapter (page 43 onwards) deals with the range of other information collected during the course of the survey, focusing particularly on the impact of government intervention.

#### THE RESULTS OF THE ANALYSIS OF ESTATE DATA

##### Principal Component Analysis

**Table 11** Principal Component Analysis of estate data

<i>1964 survey</i>			<i>1986 survey</i>		
<i>Component score</i>	<i>Percentage of total variability</i>	<i>Identity of component</i>	<i>Component score</i>	<i>Percentage of total variability</i>	<i>Identity of component</i>
I	53.3	Estate size	I	58.4	Estate size
II	18.4	In-hand woodland	II	15.3	Let woodland and let agricultural land
III	10.7	Let woodland and in-hand agricultural land	III	10.9	Average rental values
IV	8.6	Average rental values	IV	6.5	In-hand agricultural land and in-hand woodland

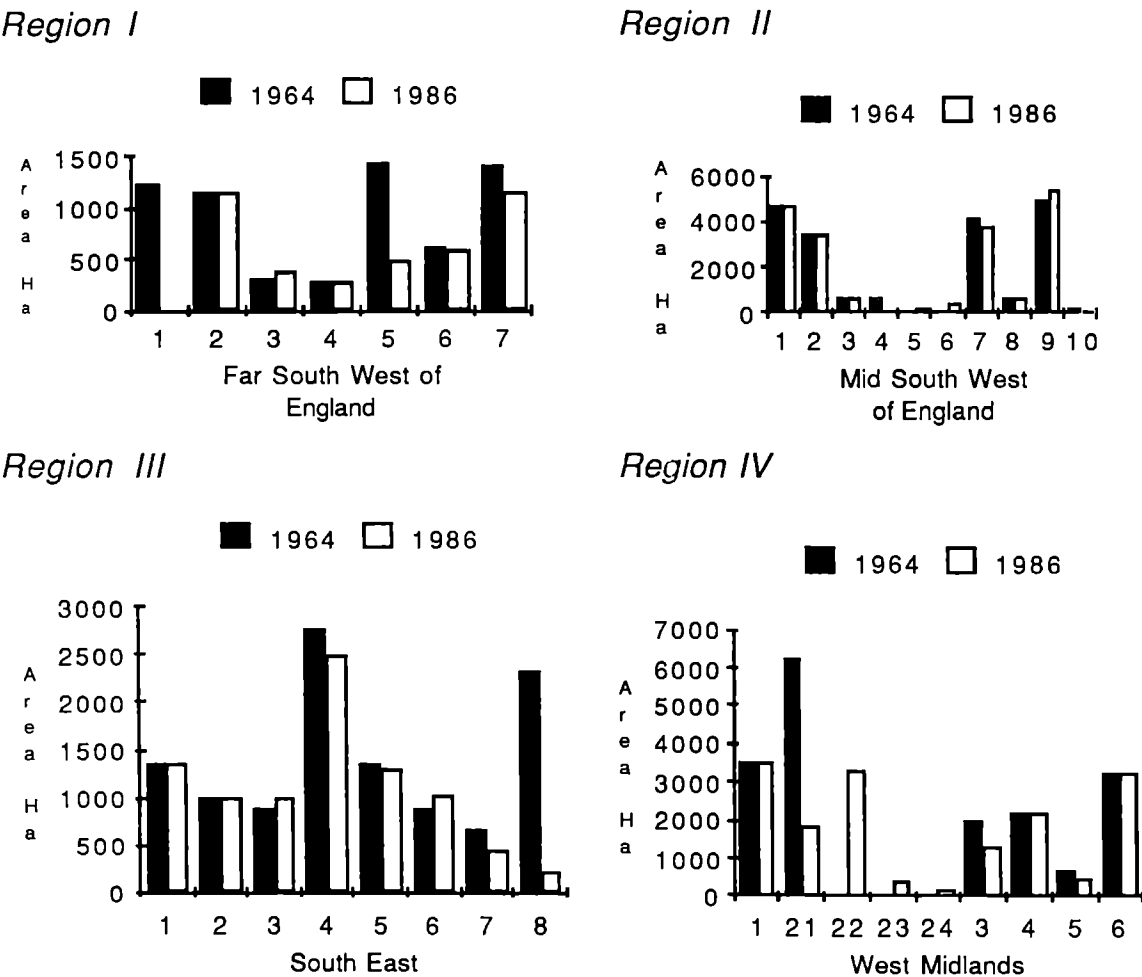
Table 11 illustrates the main differences between the analyses of the 1964 and 1986 data respectively. Almost identical results to those presented by Nicholls (1969) were obtained when the 1964 data were re-analysed. The main differences lay in shifts of identities between components. Given the time lapse between the two survey periods there is a remarkable degree of uniformity in the identification of the factor components for each of the years. As explained in Chapter 4 these components are composite scores accounting for the greatest amount of variability in the data. The component values probably provide a more accurate indication of the relative importance of each component identity (such as the estate size) than the variable itself (hectareage) since they take into account the relationship between that variable and all the other variables.

The main point in Table 11 is that those factors accounting for the greatest degree of variance in the data have changed little between 1964 and 1986. In 1964 82% of the total variance within the sample was due to three factors: estate size, woodland area and agricultural land in-hand. In 1986 about 85% of the variance within sample was due to almost identical factors, the difference being that agricultural rental values occupied a more significant place.

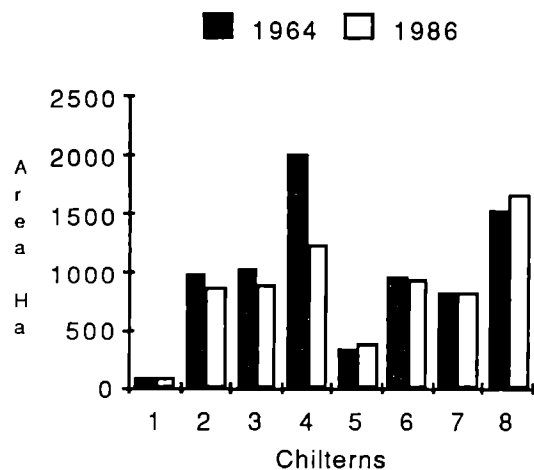


The attributes of the first four principal components are briefly described and the quantitative data to which they relate are itemised by region in Figures 2 to 6. If the estates are described in each year in terms of these three components — estate size, woodland let and average rental values — the major part of the variability is accounted for. Any subsequent analysis using solely these components will be more simple and sufficiently accurate for many purposes. The actual regional pattern of component values attained by individual estates are not discussed here because there was no new insight obtained by such an exercise that had not been revealed by Nicholls' (1969) analysis. This temporal uniformity, in itself, is an interesting factor which comes into the discussion at later points in the report.

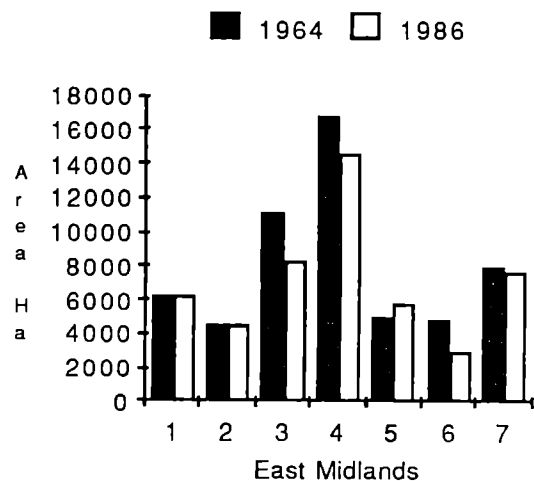
**Figure 2** Change in total estate area for each numbered estate in each region, 1964-86.



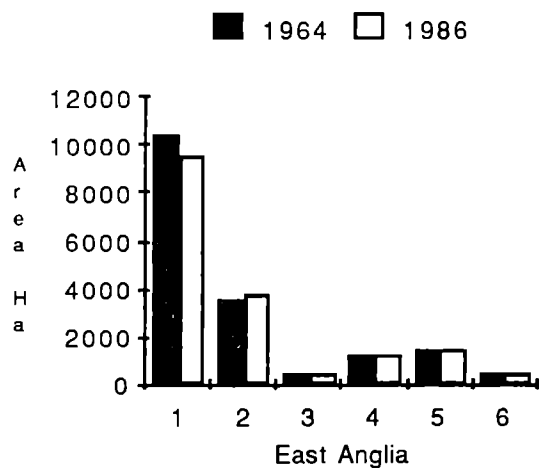
### Region V



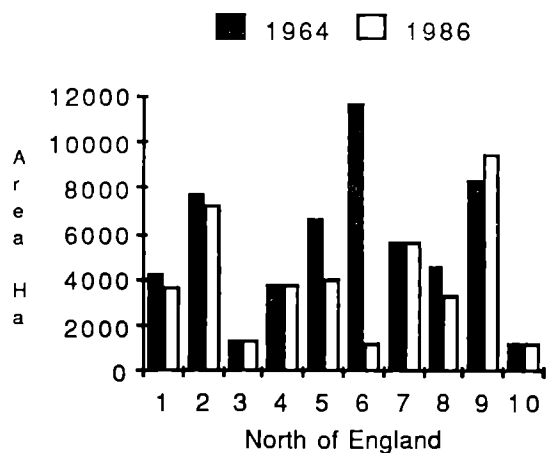
### Region VI



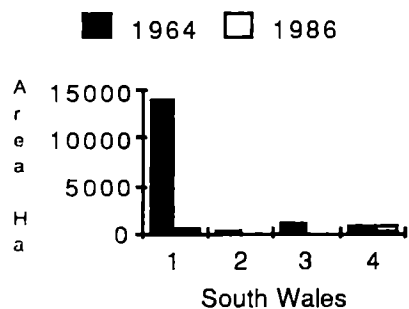
### Region VII



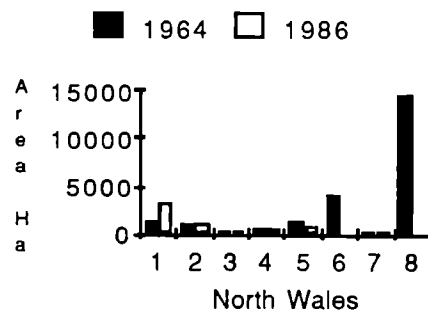
### Region VIII



### Region IX



### Region X



### ***Principal Component One: estate size***

Estate size varied widely in both survey periods. In 1963 it ranged from 100 ha to more than 17 000 ha and, in 1986, from 12 ha up to 14 170 ha. As the charts in Figure 2 show it is not easy to identify regional characteristics of change. The trend in all regions has been towards a reduction in estate size but this has not been particularly significant.

Regional characteristics tend to stand out more in terms of the mean estate size found in each region. This undoubtedly results partly from long-standing traditional patterns of land ownership but geographical and climatic factors also play a role. The largest land units, for example, were found in the East Midland and North regions with mean sizes of 6977 ha and 5041 ha respectively. By contrast the mean unit in the Far West region was 666 ha (980 ha in 1963) compared with an overall mean of 2457 ha. The pattern in the North is not unlike that in Scotland; it is one of large family estates which have remained intact for many generations. In the East Midland region too, many of the estates included hundreds of hectares of land of very poor agricultural quality suitable only for extensive stock grazing. Land quality in itself is not the sole determinant of the maintenance of larger land units; the explanation is also to be found in the long standing ownership traditions of the North and the East Midlands. Many estates in these regions had been in the same family control for well over one century and some considerably longer, dating as far back as AD 1000.

Surprisingly few estates had been 'broken up' during the 23-year period although nearly two-thirds of them changed hands largely through inheritance. Only four had been sufficiently fragmented into different ownerships that it was considered necessary to treat the ensuing fragments as separate units. These occur in Regions II, IV, IX and X in Figure 2. Most owners had tried to rationalise and consolidate where possible so there were cases of outlying parcels of land being sold or odd fragments bought for special purposes. Land sales had occurred on half of the estates and, on the whole, these sales were much larger in area than the equivalent number of land purchases. The overall tendency for land transfer, including sales of whole estates, was much higher in the south-east of England than elsewhere. This seems partly to be due to an increased demand for country residences and partly to the burgeoning requirements of the road, housing and building industries.

### ***Principal Component Two***

Principal Component Two consisted of two contrasting identities: let agricultural land on the one hand and let woodland on the other. These are discussed in turn below.

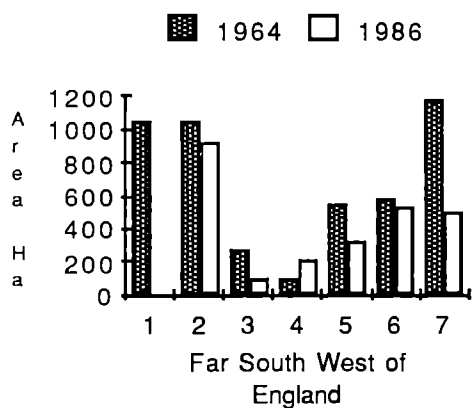
#### ***Let agricultural land***

Between 1963 and 1986 the agricultural component of most estates has, by and large, been the bulwark of the forestry component. On traditional estates there has usually been a division between agricultural land retained in hand — the home farm — and that let to tenant farmers. The change in land which is let and land in-hand is illustrated in Figures 3 and 4 respectively. Agricultural land prices for both vacant and tenanted land have fallen substantially since the early 1980s. On let farms the fall in value has probably been as high as 40-50% largely because of concern about the Common Agricultural Policy and EEC and American farm surpluses. This fall in the value of agricultural land has worrying implications for the management of all sectors of some estates, falling particularly hard on the forestry sector which has traditionally been so dependent on agricultural prosperity.

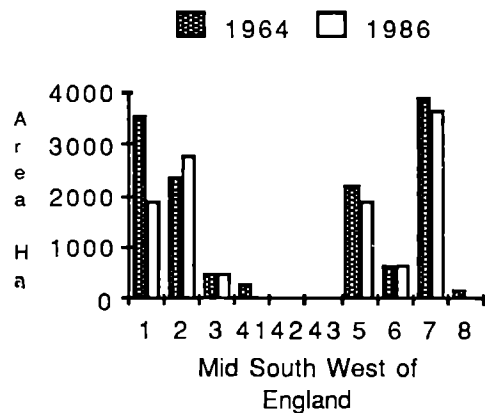
Since 1963 the mean area of let agricultural land in each region has been reduced by almost one half. This trend is illustrated in Figure 3. In some regions this reduction has been more marked: in the South East (III), the Chilterns (V) and East Anglia (VII) the proportion of let agricultural land has fallen by not less than 60%. The smallest changes have taken place in northern England (VIII) where pressure to amalgamate and rationalise has been less intense.

**Figure 3** Change in total estate let agricultural area for each numbered estate in each region, 1964-86.

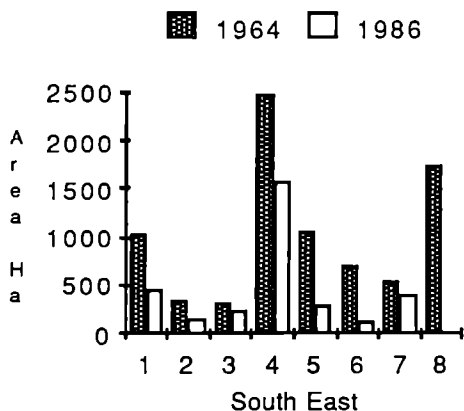
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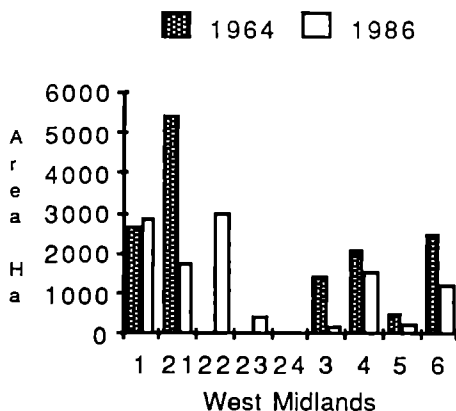
*Region II*



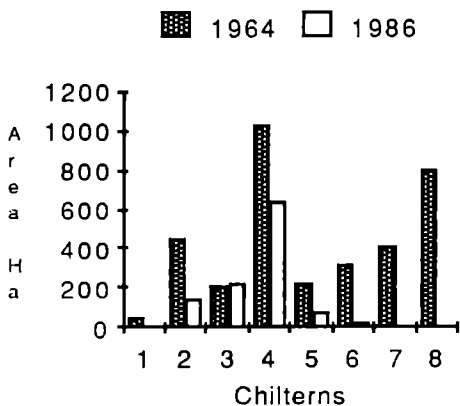
*Region III*



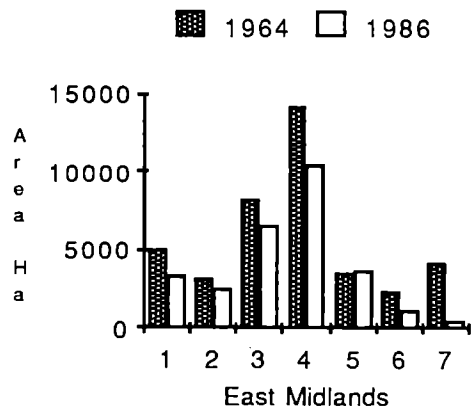
*Region IV*



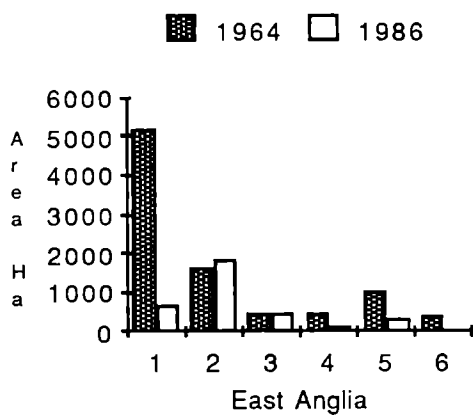
*Region V*



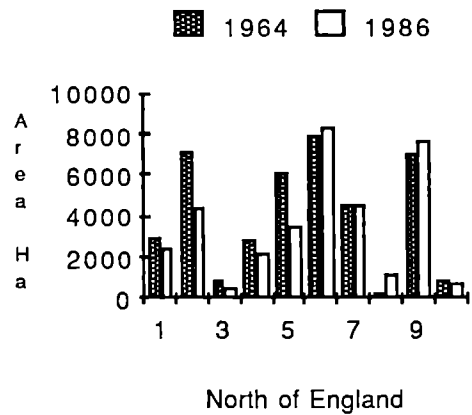
*Region VI*



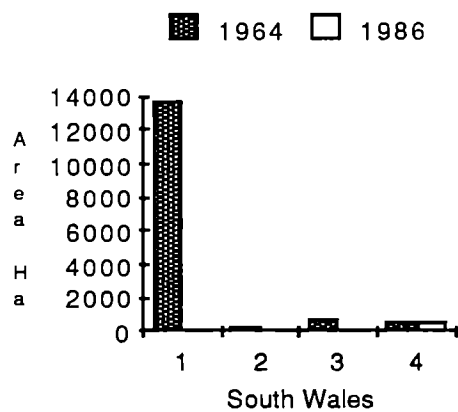
### Region VII



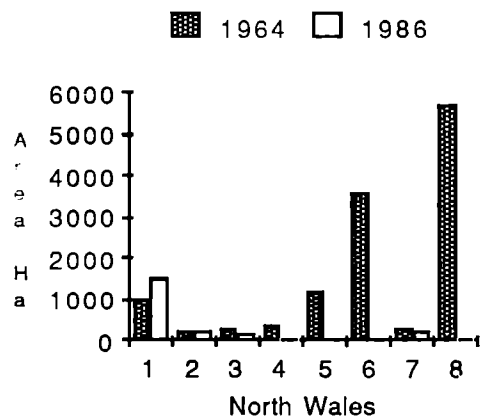
### Region VIII



### Region IX

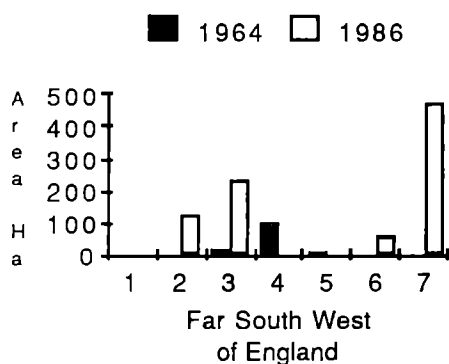


### Region X

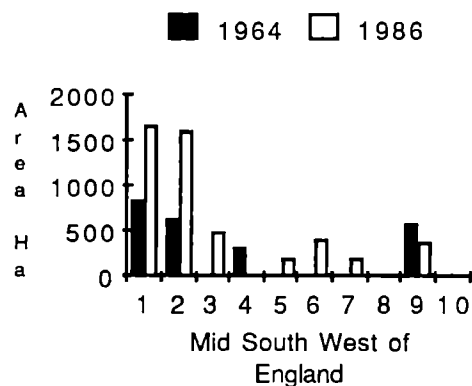


**Figure 4** Change in estate agricultural land in-hand for each numbered estate in each region, 1964-86.

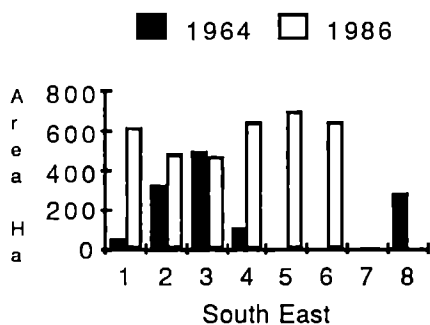
*Region I*



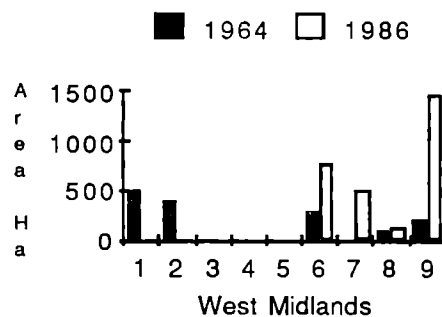
*Region II*



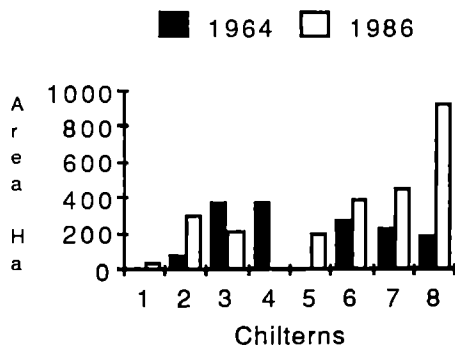
*Region III*



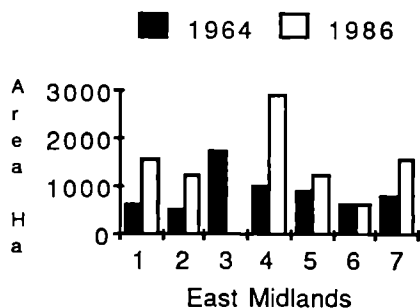
*Region IV*



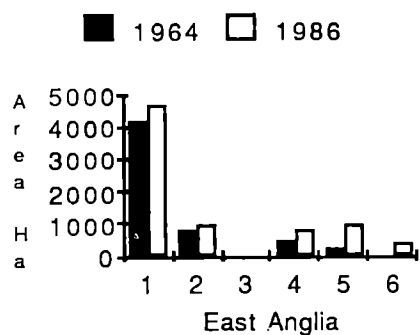
*Region V*



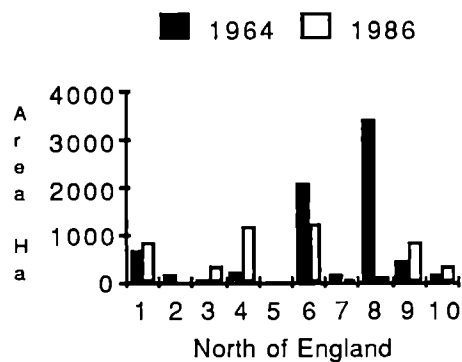
*Region VI*



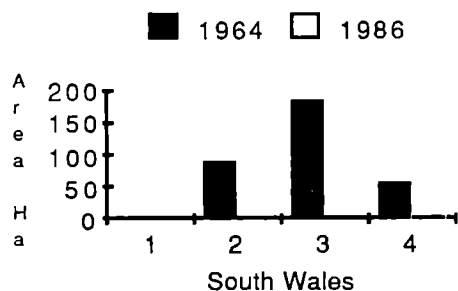
## Region VII



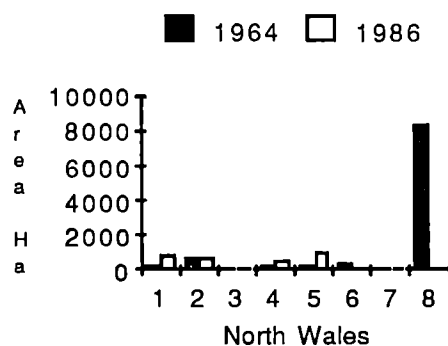
## Region VIII



## Region IX



## Region X



*Note: In regions IV, IX and X there is some information missing which is due either to the break-up of an estate or lack of participation in the 1986 survey.*

## Let woodland

Letting woodland is not a popular management option. Ten estates let woodland in 1986 and seven in 1964. The area of woodland let in 1986 ranged from 4 ha up to 1620 ha and, in two instances, more than half the woodland area was let on long leases to the Forestry Commission.

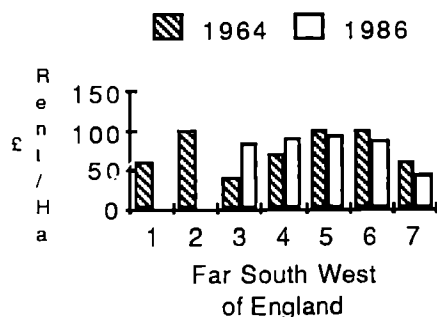
Woodlands are usually let when a substantial capital injection is required to rehabilitate or improve their productivity. The lessor, usually the Commission or a syndicate or contracting firm may be in a better position than the freeholder to invest large sums of money over the long term. It was interesting, therefore, to note that more than half the let woodlands were located in the East Midlands where deficit-financing of woodlands was also a very significant factor. Furthermore the leasing of woodlands was more likely to take place when the proprietor was assured of a successor in title. Thus, as expected, leasing was specially favoured under company ownership. Letting woodlands is a way of shifting management responsibilities for long periods of time at a lower cost and it can play an influential role in determining other courses of action.

### **Principal Component Three: average rental values**

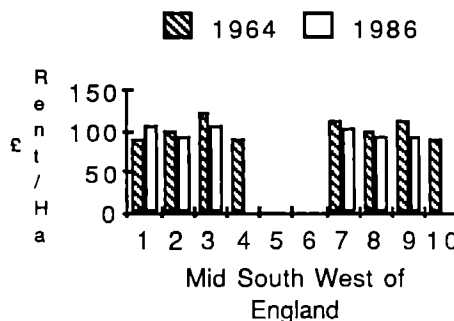
The average rental values of the farms on each estate give a rough indication of the value of the agricultural land. In Figure 5 the rental values shown for 1964 have been inflated in line with the retail price index (RPI) and are therefore real values. The mean rental value in 1986 stood at £72.20 per hectare which is a little higher than the mean value found in 1964 to stand at £61.50 per hectare (real value).

**Figure 5** Change in estate agricultural rents per hectare for each numbered estate in each region, 1964-86. (1964 rents are *real values* in line with changes in the retail price index.)

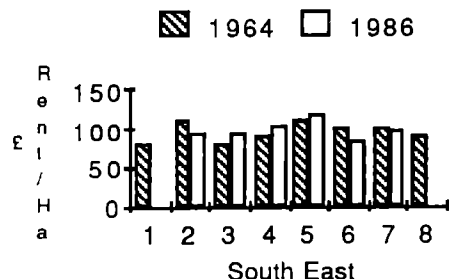
#### *Region I*



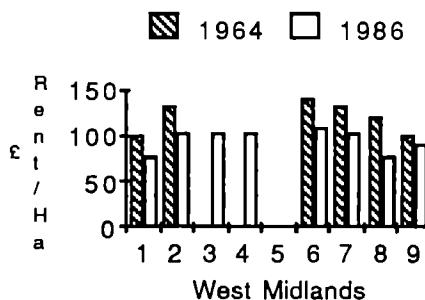
#### *Region II*



#### *Region III*

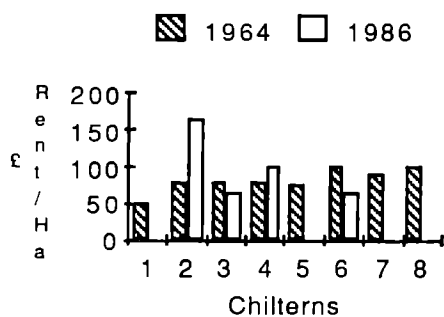


#### *Region IV*

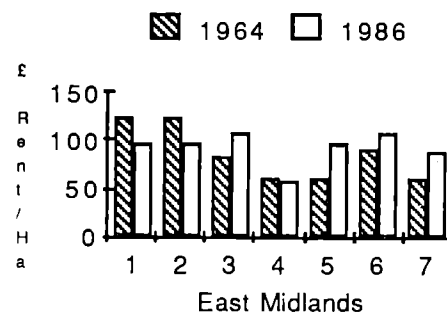




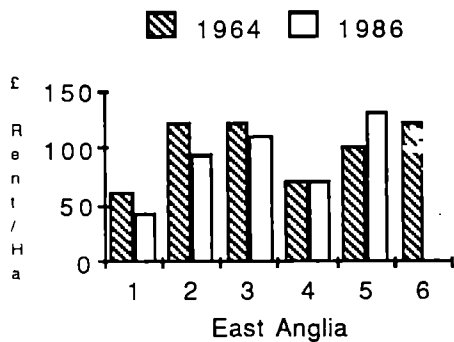
### Region V



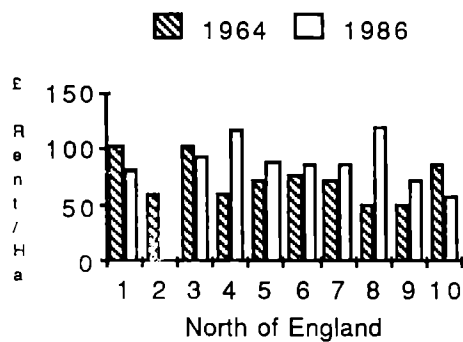
### Region VI



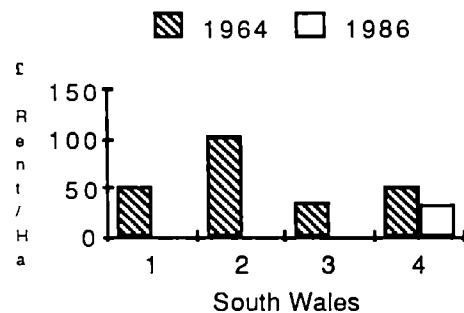
### Region VII



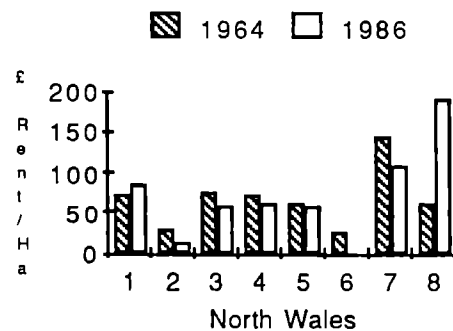
### Region VIII



### Region IX



### Region X



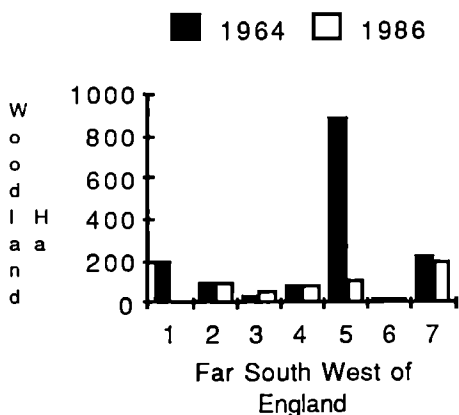
Net yields on fully rented investments are now 4.5-7%, depending on quality, better than the return in the FT share index and higher than during the land market collapse of 1975. Changes to capital transfer tax and the introduction of the more recent inheritance tax (March 1986) have allowed let land to re-emerge as a highly effective tax vehicle. Many landowners have found that the sharp fall in the value of land during the 1980s has provided an opportunity to gift land away by reducing the need to sell capital assets to pay a much reduced tax. Providing early planning has been implemented the rental income from let land may be sufficient to pay the tax over an interest-free period of, say, 10 years. The value of let land will obviously be higher where higher rents can be obtained. Generally speaking, with the exception of the East Midlands and the North of England regions, which have achieved rent increases above the country-wide average during the last two decades, estates in the South West of England and Wales continue to let land at the lowest rates. In theory rental value is related to the quality of the agricultural land but Grade III land in the North of Wales and the South West of England commands a noticeably lower rent than Grade III land in the English Midlands or South East. Access to agricultural markets and demand for housing is a more significant catalyst to rent increases.

#### ***Principal Component Four***

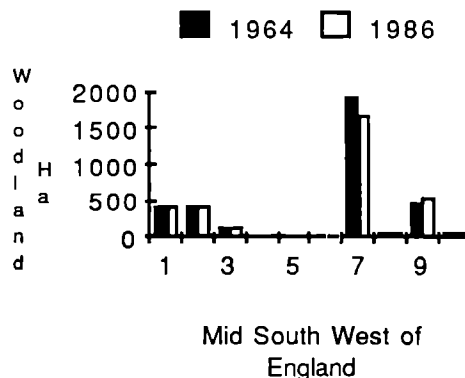
Principal Component Four had two strong but contrasting identities: the area of agricultural land in-hand against the area of woodland in-hand. Figures 4 and 6 illustrate the respective changes between 1964 and 1986 for agricultural land in-hand and woodland in-hand.

**Figure 6** Change in total estate woodland area (in hand) for each numbered estate in each region, 1964-86.

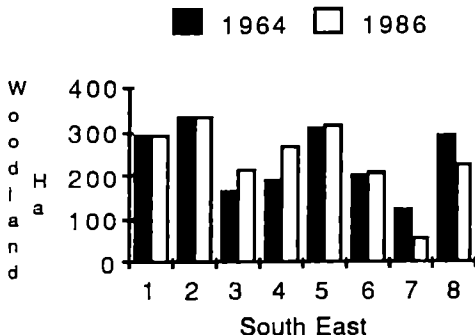
#### ***Region I***



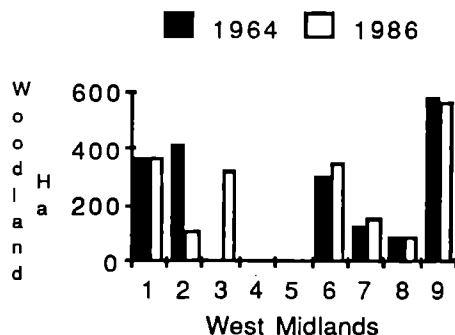
#### ***Region II***



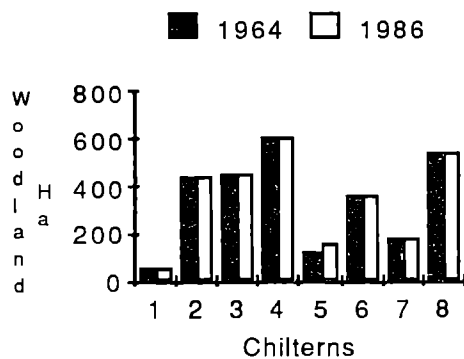
#### ***Region III***



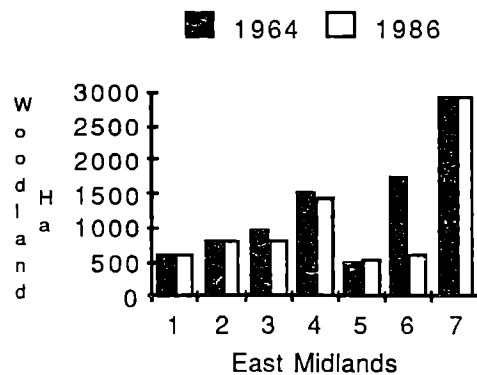
#### ***Region IV***



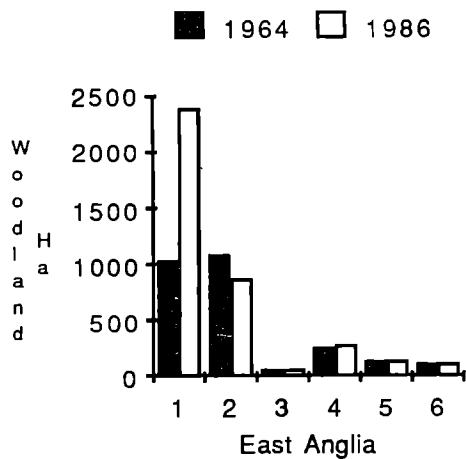
### Region V



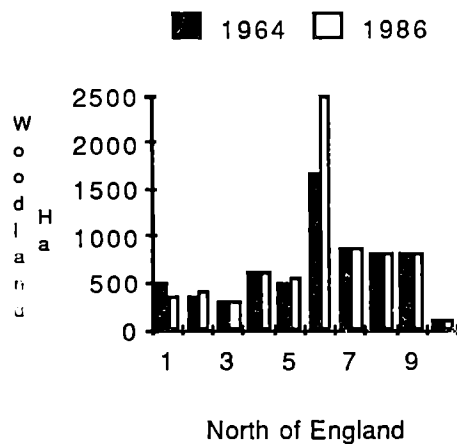
### Region VI



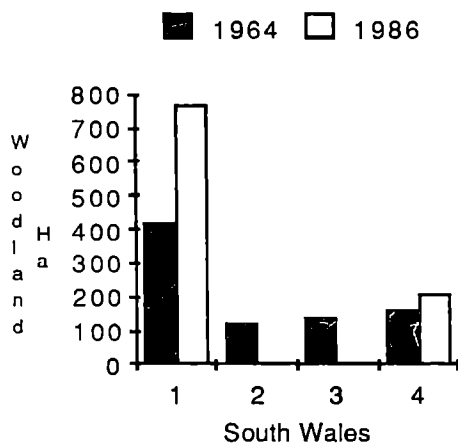
### Region VII



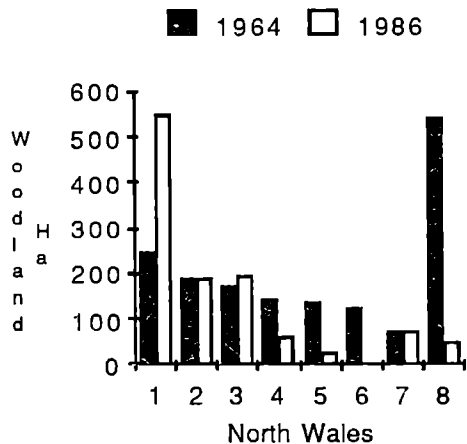
### Region VIII



### Region IX



### Region X



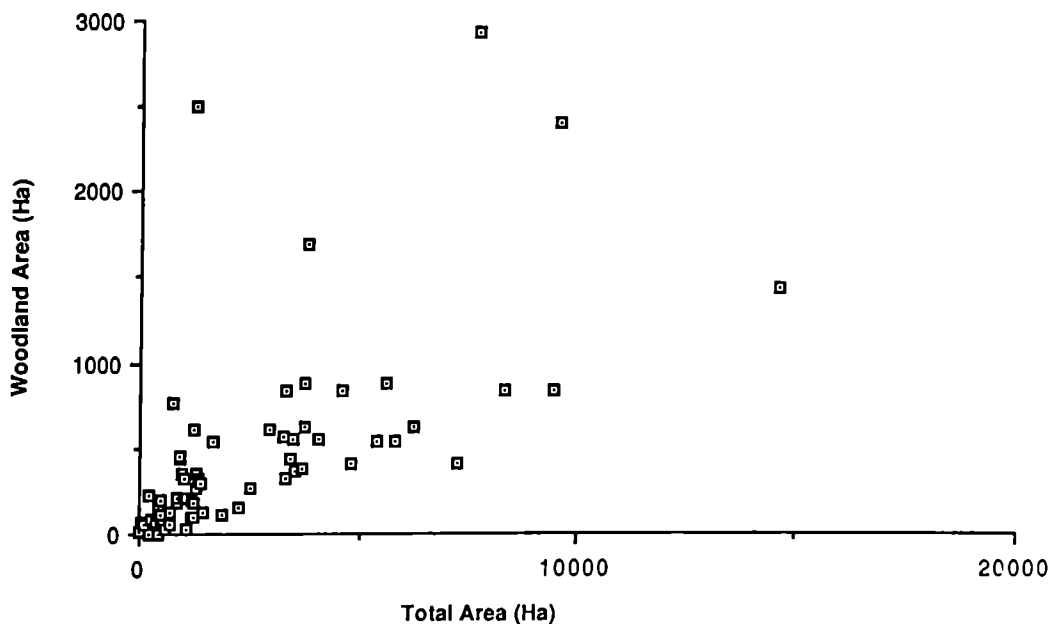
### *Agricultural land in-hand*

There has been a dramatic increase in the area of land farmed in-hand (Figure 4) in nearly all regions except the North of England (because of missing information it is not possible to draw conclusions about Region IX—South Wales). This, of course, is a reflection of the change in let land (Figure 3) which has been in the reverse direction.

An important aspect which affects the management of woodlands has been the marked trend towards specialisation of production on the home farm. In 1964 about half the estate farming systems were mixed. Those that specialised were engaged either in dairying, arable or stock-rearing, in that priority. In 1986 one-third of the estates was running a mixed farm economy and the most frequent change to a specialist function was to stock rather than to arable.

### *In-hand woodland*

There has been little marked change in the area of woodlands recorded in the two survey periods. A minor trend, though not an obvious one, has been an increase rather than a decrease in the woodland area. This is observed in Figure 6.



**Figure 7** Relationship between total and woodland areas of estates in 1986.

One of the interesting features of the land use pattern in both survey periods is a marked correlation between the total estate size and the percentage of the estate which is woodland. This correlation between estate size and woodland size, illustrated in Figure 7 suggests that owners recognise the desirability of retaining a certain area of woodlands to benefit from economies of scale. This feature is discussed further on page 57.

## THE RESULTS OF THE ANALYSIS OF FARM DATA

### Principal Component Analysis

The main object of this section is to describe the results of analysing the data obtained from the farm surveys and to explore any similarities or contrasting features which these results have with those from the estate survey. Attention is again placed on emphasising the relationships between farm characteristics and government incentives. All the data collected for the London Fringe survey and the Western Counties survey were analysed in identical fashion to the estate data.

**Table 12** Principal Components Analysis of farm data

<i>Western Counties survey</i>				<i>London Fringe survey</i>			
<i>Component</i>		<i>Percentage of total variability</i>	<i>Identity of component</i>	<i>Component</i>		<i>Percentage of total variability</i>	<i>Identity of component</i>
<i>No.</i>	<i>Value</i>			<i>No.</i>	<i>Value</i>		
I	5.11	73.0	Farm size	I	4.09	58.0	Farm size
II	1.16	16.6	Land rents	II	1.72	24.6	Land rents
III	0.69	10.0	Land in-hand	III	0.86	12.2	Woodland area

Principal Components, comprising combinations of the original variables, were derived; their composition and values are shown in Table 12. Both farm surveys yield similar results to the major sources of variation identified within the estate data. Only the first three components were identifiable and, for both surveys, accounted for more than 95% of the variability in the data. The mean size of woodlands surveyed in each region was quite similar: 25 ha per farm in the Western Counties and 21 ha per farm in the London Fringe. One of the important results, however, is that woodland is more significant in accounting for differences between farms on the London fringe than in the Western Counties region. As with the estate analysis (pages 25-36) it was not found to be a useful exercise when a search was made for clear groupings determined by the value of each principal component for each farm. The reason here however was because of the small number of farms included in the analysis and the difficulties in making generalisations — something which has already been alluded to in Chapter 4.

Each Principal Component is identified and briefly described below.

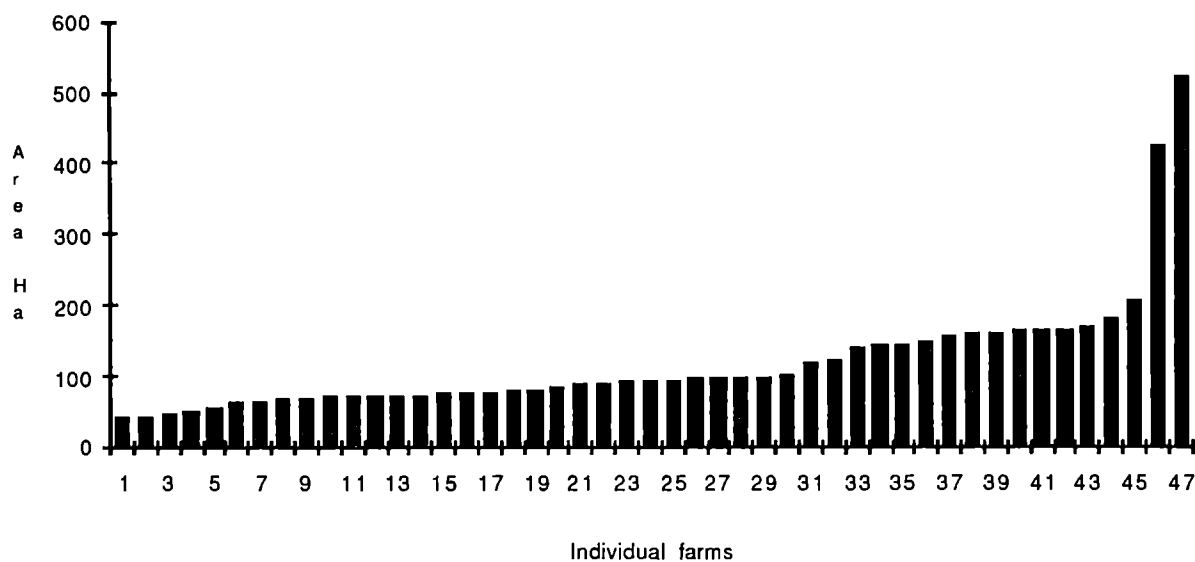
#### ***Principal Component One: farm size***

The range of farm size encountered in both farm surveys is shown in Figure 8. In the Western Counties survey, as Table 13 indicates, farms are polarised into the 50-59 and 100-199 ha classes. This reflects the fact that the vast majority of the farms are family farms which are manageable without the employment of any full-time external farm workers within that size range. Some of these family farms had been in the same family for more than a century. One of their strongest features was the use of family labour and a heavy reliance on all members of the family exerting more effort at peak times rather than bringing in paid labour. Approximately half of the farms employed additional labour on a casual, seasonal and, sometimes, full-time basis.

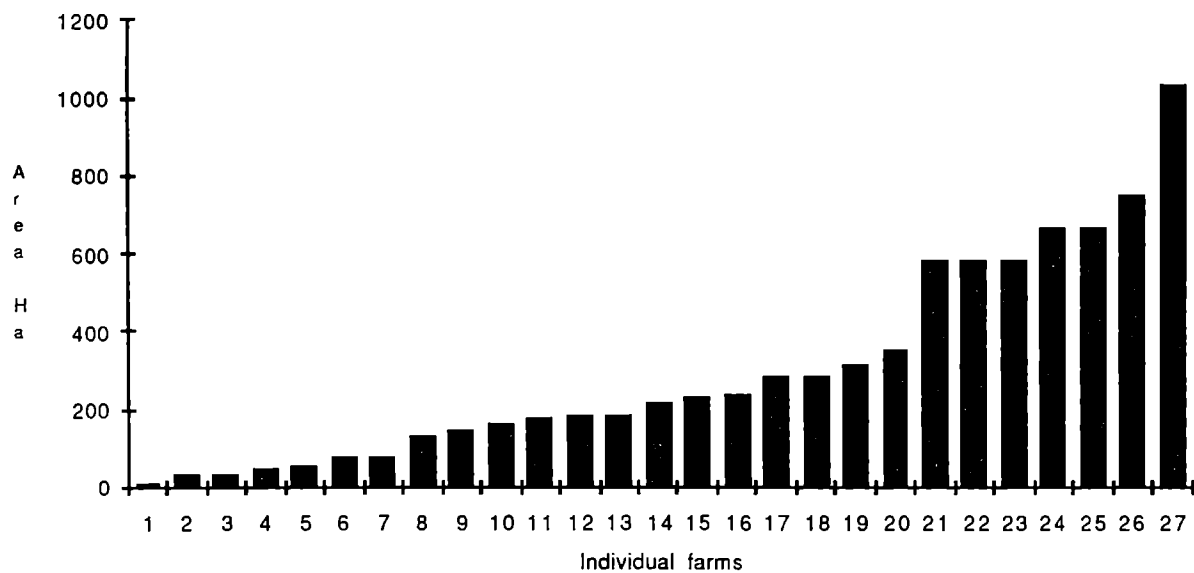
**Table 13** Farm size classes for farms in the farm surveys

<i>Class size (ha)</i>	<i>Numbers of farms</i>	
	<i>Western Counties</i>	<i>London Fringe</i>
0-19		1
20-49		2
50-99	30	4
100-199	17	6
200-299		5
300-399		2
400-499	1	
500-599	1	4
>600	1	3
Total number of farms	50	27

Range of total farm areas (Western Counties)



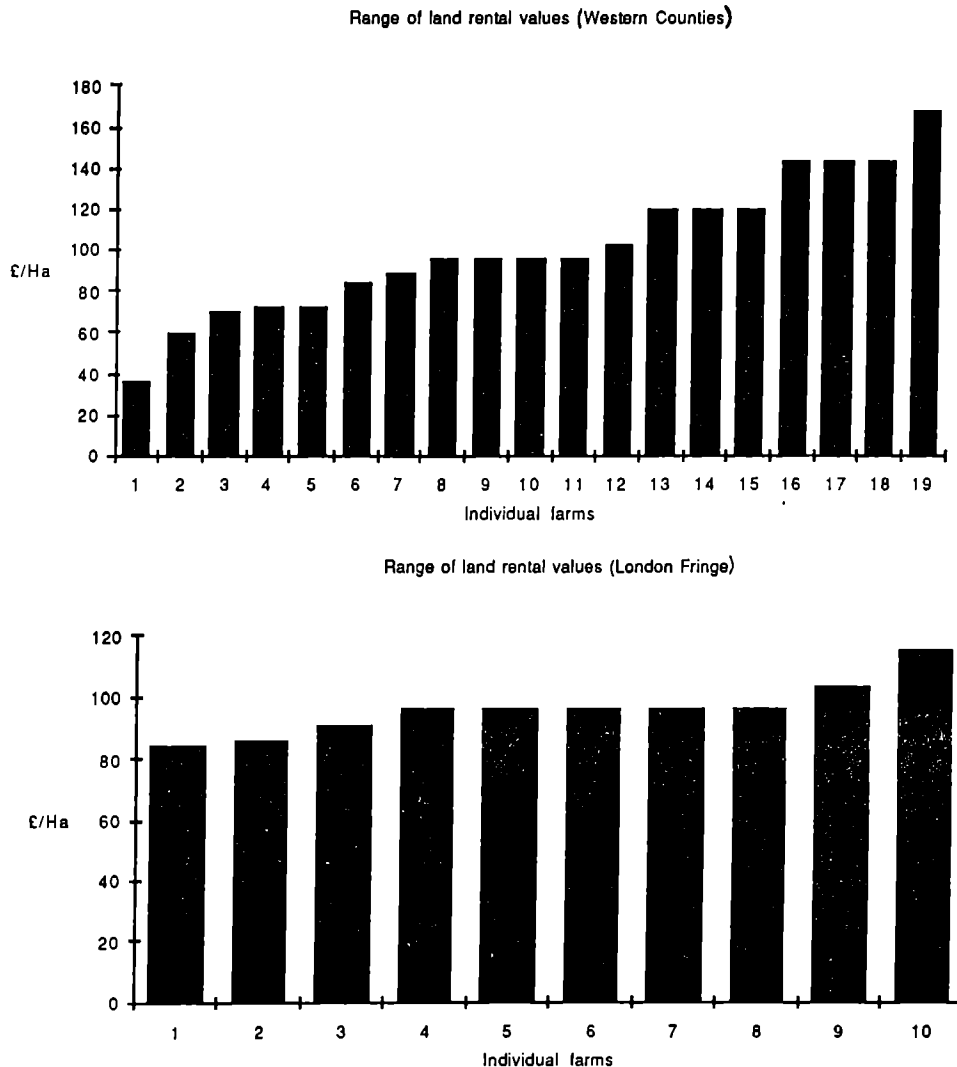
Range of total farms areas (London Fringe)



**Figure 8** Range of total farm areas.

### ***Principal Component Two: land rents***

The significance of this component is discussed under Principal Component Three on page 33-35 while the ranges of values observed in the Western Counties and London Fringe surveys, respectively, are given in Figure 9.



**Figure 9** Range of farmland rental values.

The first point of interest in Figure 9 is that although the range of rental values recorded in the Western County survey is wider than that in the London Fringe (and this may be solely an attribute of more units of observation) the highest values are also recorded there (up to £170 per ha per annum). This pattern accords with the findings of the estate survey (Figure 5) where the highest rental values are attributed to Region IV — the West Midlands. The sample size in South Wales is too small to draw any conclusions. If Region III (the South East) is compared with the London Fringe Survey (Figure 9) the range of rental values are found to be similar.

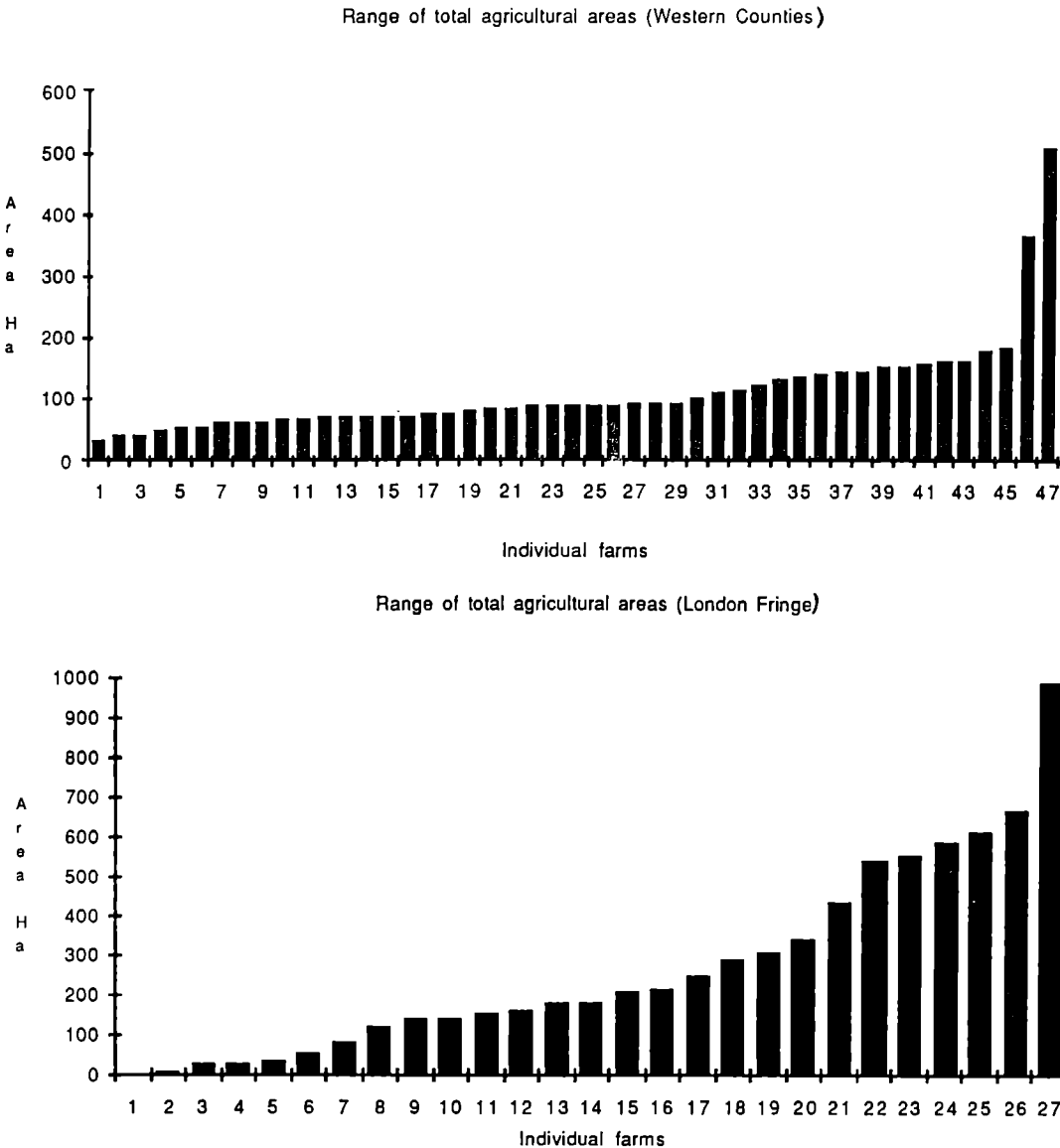


**Principal Component Three**

Two contrasting identities — land in-hand and woodland in-hand — were attributed to this component. Each is briefly described below.

*Land in-hand*

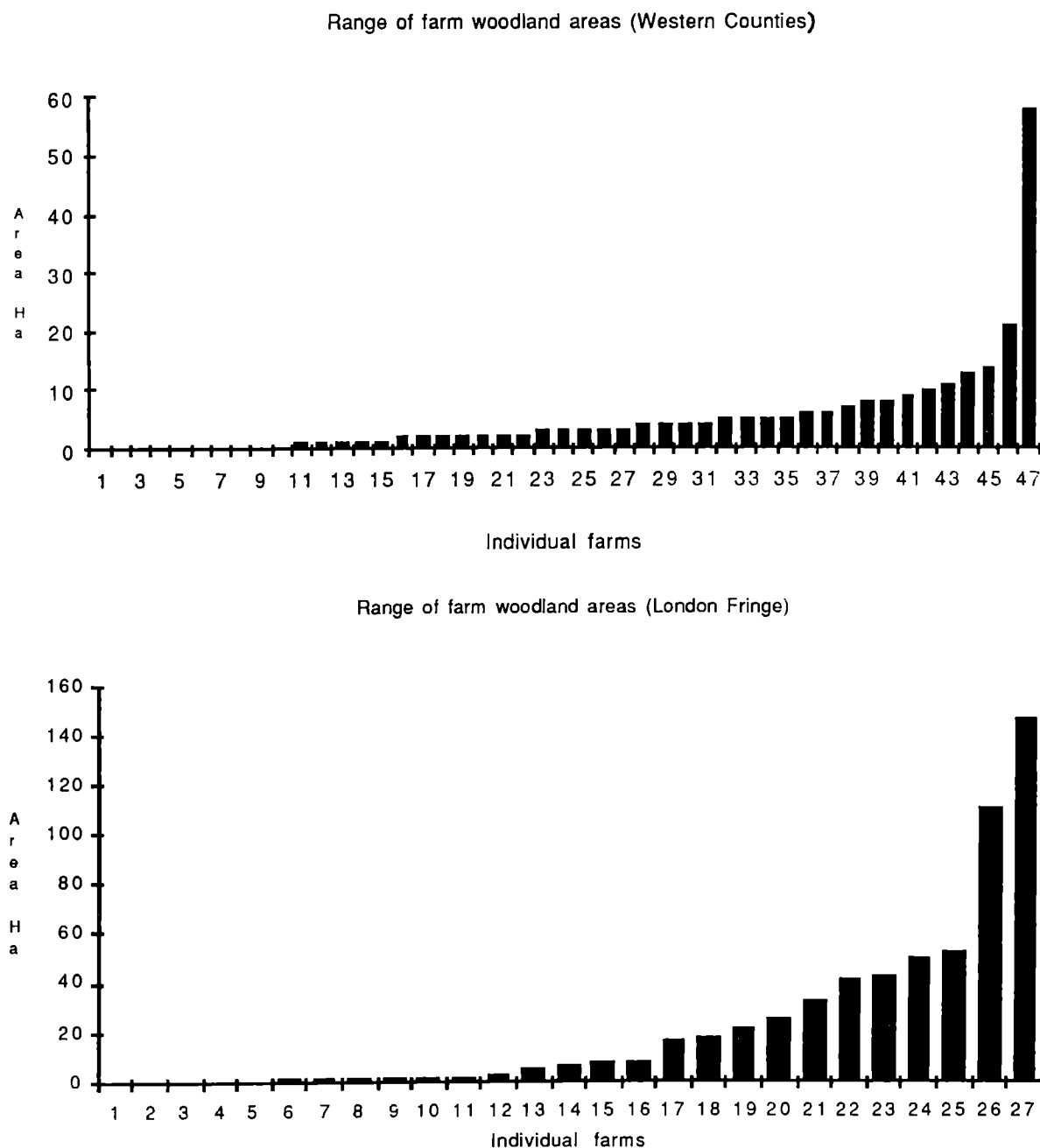
In all cases farmland was retained in hand rather than let although some farmers rented additional land in their district. This is a feature characteristic of the size (see Figure 10) and type of farms under consideration. Farmers viewed personal management of their land as a more lucrative proposition than the value of rents which could otherwise be obtained. In the Western Counties it was simply not the usual course to rent out land. In the London fringe the type of owner often encountered was no longer the farmer who farmed for a living but the businessman or woman who preferred the green hinterlands, approximating to the rural idyll of the metropolis, to the congested streets of the inner and outer city.



**Figure 10** Range of total agricultural areas.

### Woodland in-hand

The significance of the area of woodlands in accounting for some of the variability among the London Fringe sample is discussed at greater length in the section on pages 53-54. Figure 11 and Table 14 illustrate the differences in woodland sizes between farms and between the two survey regions.



**Figure 11** Range of farm woodland areas.

**Table 14** Farm woodland areas by size class

<i>Class size (ha)</i>	<i>Numbers of farms</i>	
	<i>Western Counties</i>	<i>London Fringe</i>
0-4	33	9
5-9	9	3
10-19	2	2
20-49	1	5
50-74	1	1
75-99		
100-124		1
125-149		1
>150		
Total number of farms	47	22

It is clear that the majority of farm woodlands in the Western Counties survey were small — mostly under 5 ha. The range was also skewed towards this size category in the London fringe. Many of the woodlands were overmature and heavily dominated by broadleaves. Their history was one of neglect and their value underrated. For many owners the woods were there because ‘they had always been there’ — as spinneys, copses, hedgerows and coverts, occupying small and less accessible areas of the farm but contributing enormously to landscape and conservation.

## RESULTS OF QUESTIONNAIRE SURVEY

In the previous part of this chapter the results of the Principal Component Analysis have been explained. These results, useful as they are, contribute more to an understanding of what has not changed since 1964 and rather less to an understanding of what has changed. In particular the aim of this next section is to try and pull together some of the more loquacious answers to questions at the interview which can provide an insight into the impact of fiscal and other forces on land-owner decision making.

Much of this information is tabulated below. It comes under the headings of the impact of intervention on the following: objectives of management, woodland profit, prices and marketing, employment, management controls, amenity and conservation, and ownership characteristics. The availability and uptake of grant aid is explored, and the impact of ownership on tax schedule election is described. The final section discusses the main determinants of a profitable woodland enterprise.

## The impact of intervention on objectives of management

It is evident that, on estates at least, timber production has remained a primary objective. There were no noticeable regional discrepancies. Despite the fact that timber production remains at the forefront of objectives it is clear that this appears to be unrelated to some of the other objectives, namely making a profit and increasing the capital value of the woodland. The next section looks at one of the primary reasons behind this change — product price. It is probably true to say that the impact of intervention on this change has come about through indirect means; the cost of managing and rehabilitating woodlands (and therefore maintaining their capital value) has increased at a faster rate than the increase in the value of receipts (the income). This cost-price squeeze has not been offset by a parallel increase in the rate of incentives which would have filled the deficit. The whole situation is, furthermore, exacerbated by inflation.

**Table 15** Objectives of management

<i>Objectives of management</i>	<i>Estates (%)</i>		<i>Western Counties (% of farms)</i>		<i>London Fringe (% of farms)</i>
	<i>1964</i>	<i>1986</i>	<i>Wales</i>	<i>England</i>	
Timber production	42	52	8	4	4
Profit and capital value	49	25	4	12	0
Conservation and amenity	3	20	24	80	73
Shelter	0	0	28	0	0
Game	3	1	0	0	0
Various objectives	3	1	20	0	0
None	0	1	16	4	9
Number of units surveyed	68	68	25	25	50

The other main point about the objectives of estate proprietors to observe from Table 15 is the increased expectation of the role of conservation and amenity. This is discussed further on pages 58-59. One of the main features observed was that forest functions have become increasingly compartmentalised so that some parts of an estate's woodlands are managed for service functions (recreation and amenity) and others for commercial functions (timber production).

For farmers, on the other hand, the objective of timber production from their woodlands is not something which tends to dominate their outlook. This, of course, is not surprising given that, for most farm woods, management activities are undertaken as little as possible. Where farmers do have specific objectives major differences were found to exist between those farmers in South Wales compared with the Herefordshire-Worcestershire border and the London fringe. In general terms this reflects the more stringent requirements for a practical use of trees such as shelter for stock in some parts of Wales and the ability to pay more attention to conservation and amenity where agricultural incomes are higher.

## The impact of intervention on woodland profits

One of the most difficult undertakings of this study was to determine whether or not the woodlands were profitable. Profit, as the term is used in economics, refers to pure profit (Lipsey, 1976), that is any excess of revenues over all opportunity costs. Negative profits, more commonly called losses, imply that revenues fall short of opportunity costs. This use of the words profit and loss gives specialised definitions to words that are in everyday use. They are, therefore, a potential source of confusion. It was quite clear that the notion of profit, as perceived by individual proprietors was as varied as the personalities of the proprietors themselves.

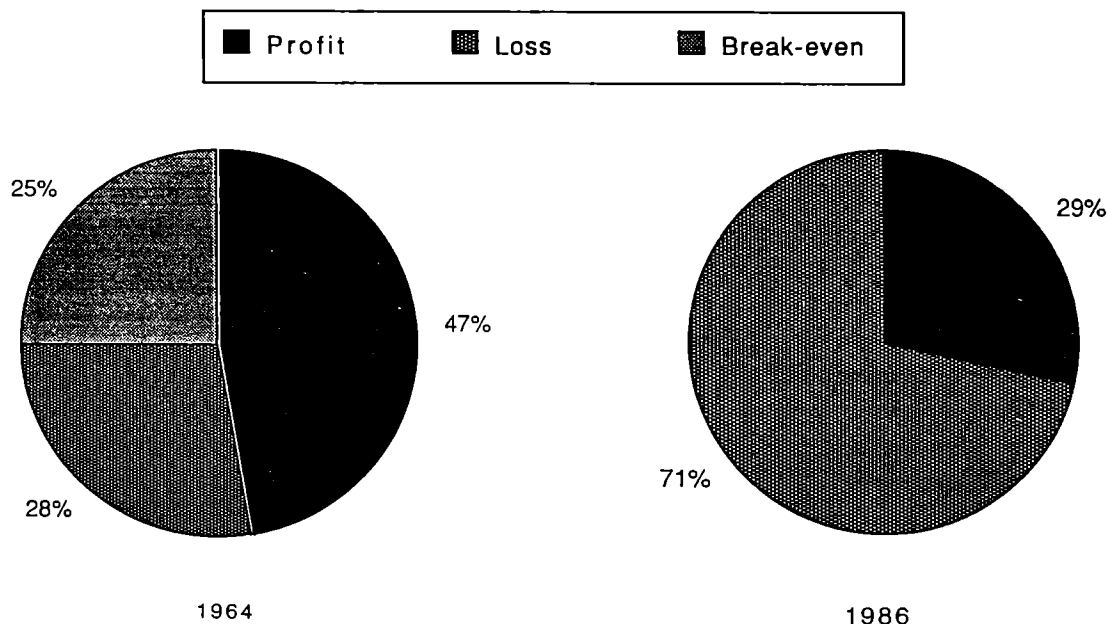
A second problem in determining pre-tax and post-tax profits lay in the assessment procedures under previous Schedule D taxation. Since profits were taxed under this Schedule it was of obvious benefit to the owner to reduce their magnitude. Indeed it used to be a cardinal principle that any woodlands assessed under the Schedule D account (see Chapter 3) showed a loss so that the owner should reap the benefits of tax concessions. Thus woodlands which appeared 'unprofitable' were not necessarily so.

A third factor influencing the notion of profit is that the long time span of forestry does not allow owners to view profits in the usual way. As a woodland ages it gains value over and above the growing worth of the timber itself, because the associated products of conservation, amenity, recreation and sport begin to be realised. Resources used in creating such a production system are deemed to be an investment but, for trees, the rewards of investment come after several years and sometimes after several generations. This investment may require the continuing input of resources even though the profit signals indicate those resources should be placed elsewhere. To move resources out prematurely (for instance by premature felling) because the woodland balance sheet is unprofitable would result in the initial resources being wasted at a much higher cost to the landowner.

Successful estate and farm management relies on constancy of practice and commitment to a set of rules which are passed on from generation to generation. Despite a changing assortment of government interventions in both forestry and agriculture between 1964 and 1986 the general method of estate management and use of land has not changed very much. Intuitively this may not turn out to be a surprising statement, but if owners are deemed to respond to financial influences and to take tactical measures in response to profit signals what is surprising is that the area of land under trees has changed little and, in some regions, increased over the intervening period. Why this should be so is something of a mystery because, despite the government's various forms of intervention, many proprietors would concede that woodland management is not a profitable enterprise.

The financial position of woodlands has steadily worsened between the mid-1960s and the mid-1980s. On more than one occasion it was reported that "today (1986) the woods do little but break even but in the 1960s they were an important part of the estate economy". Losses were evident in both periods under review but they were significantly more evident in 1986 and particularly so in some regions, for example the West and East Midlands. Figure 12 indicates the change towards loss-making woodlands which has taken place since 1964. It is not possible to determine from this figure whether the woodlands which are now insolvent formerly made a profit or broke even. What is clear is that there were fewer profitable woodlands in 1986 than there were in 1964. On only 20 estates (that is 29%) did the owners regard their woods as profitable and, in many of these cases, the profits quoted were so low that to all intents and purposes a break even situation prevailed.

If profit is taken to be the excess of revenues over costs then it is important to ask what are the underlying controls. This was touched on on page 45. The major factor underscoring revenues is *price* and that underscoring cost is *labour*. Indeed Nicholls (1969) had concluded that profitable woodland enterprises would need to be pre-empted by changes in both these factors. They are briefly dealt with in the next two sections.



**Figure 12** Status of woodland accounts in 1964 and 1986. (Percentage of estates in each category.)

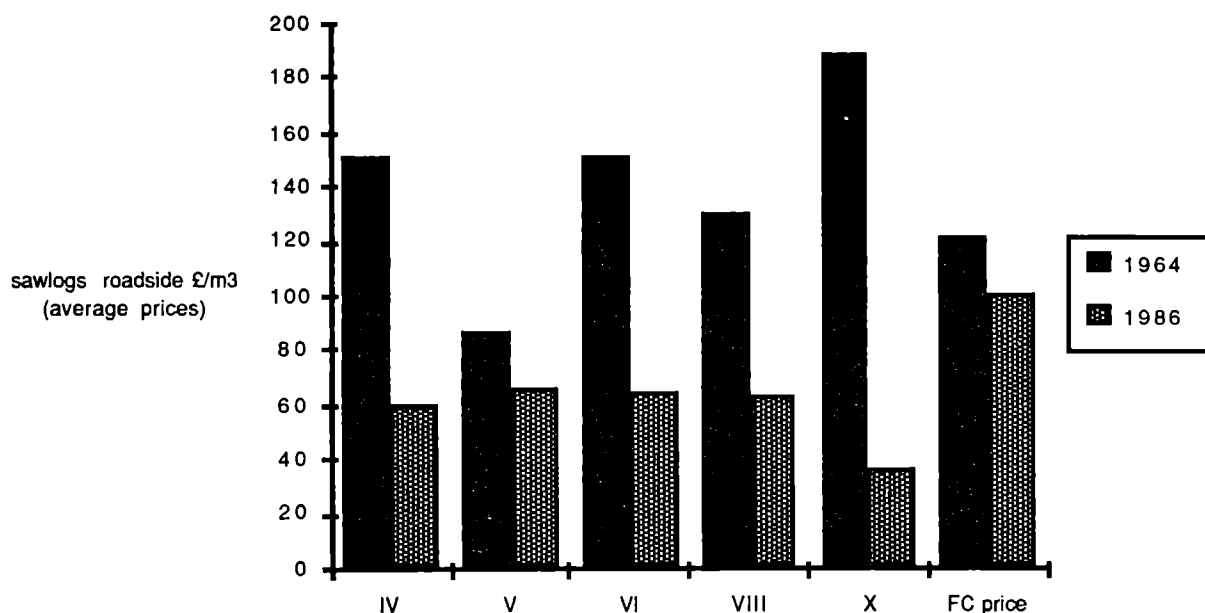
### The impact of intervention on price and marketing

The marketing of timber from estates was described by Nicholls (1969) to be unsatisfactory in 1964. The trend over the intervening period has been for the situation to worsen rather than to improve. A perennial problem of small woods is difficulties in marketing timber. Owners are inexperienced; parcels are too small to attract buyers; and co-operatives have proved hard to organise and even harder to sustain.

It is important to assess the 1986 situation against the backdrop of the circumstances of estates in 1964. One half of the estates were subject to extensive fellings during the Second World War and most marketable timber was removed. The result has been that most of the timber felled since 1945 has been of a poor or moderate quality or insufficiently mature to attain the best prices. Only now is the more valuable timber beginning to come on stream. A similar situation confronts owners whose woods were neglected during the first half of this century. The disposal of large quantities of poor-quality, over-mature timber has allowed the price to remain depressed. Circumstances have been further hampered in many regions by the need to clear timber subject to Dutch elm disease. Further proof of the difficulties of disposing of a flood of poor quality timber on the market has also been seen in the after-effects of the more recent storms of 1987 and 1990.

At the same time many estates have run down their domestic processing facilities and, therefore, have lost the opportunity to capitalise on the value-added product. In 1964 sawmills were found on 43 out of the 72 estates in the sample; by 1986 this number had decreased to 24 out of a total of 68 estates. Of those sawmills still operating some were considered to be the most profitable part of the estate enterprise.

Many proprietors regard the ultimate forest product — timber — to provide a lower return in 1986 than in former years. Figure 13 suggests that they are probably correct. Prices obtained from the estates are compared with Forestry Commission prices for 1964 and 1986.



**Figure 13** Average roadside prices for sawlogs\* by region compared with Forestry Commission prices, 1964† and 1986.

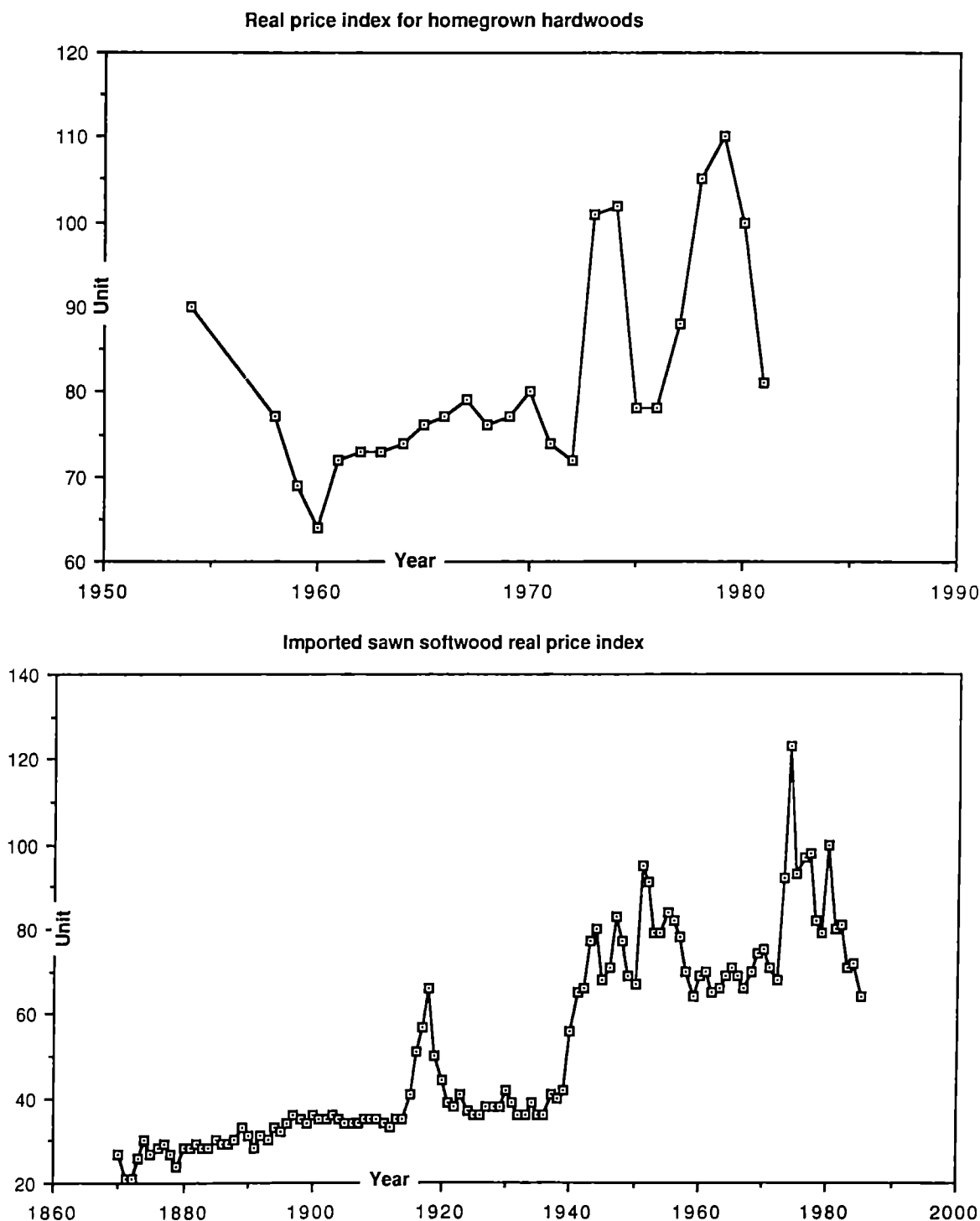
IV West Midlands, V Chilterns, VI East Midlands, VIII North of England, X North Wales

FC prices are obtained from the *FAO Yearbook of Forest Products*

\* For regions prices quoted are roadside prices for sawlogs whilst the Forestry Commission prices are for imported coniferous sawnwood

† All 1964 prices have been inflated using the GDP inflator from *Economic Trends*

Price comparison between years was made difficult because of a complete lack of standardisation. Prices were recorded per cubic foot, per board foot, per cubic metre, per tonne or per acre. Furthermore the price was dependent on whether the timber was sold at 'roadside', 'standing' or at 'point of delivery'. Large regional differences existed both in 1964 and 1986. For example, in 1964 elm was selling in the East Midlands for £12-30 per cubic metre (£152 at 1986 constant prices), while veneer sycamore went for £53 per cubic metre (£383 at 1986 constant prices) and hardwood pulp for £1 per tonne (£7.00 at 1986 constant prices). In 1986 the price of oak was recorded to vary from £80-100 per cubic metre in the Chilterns, to £34 per cubic metre in the West Midlands and, as veneer, oak sold for £230 per cubic metre in the North. Spruce for pulp was selling at £2.00 per tonne (standing) in North Wales which was considerably less than the price obtained in 1964.



**Figure 14** Trends in the real price index for imported sawn softwoods and homegrown hardwoods.

Sources: Sawn softwood imports — *Timber Trades Journal, Centenary Supplement*, 1973; *FAO Yearbook of forest products*, 1985. Homegrown hardwood logs — *wholesale price index of homegrown hardwood in the round and standing*, DTI, London.



Figure 14 illustrates the trends in the real prices of both sawn softwood and homegrown hardwoods. Changes in the value of timber have probably not been affected by changes in government intervention, a view which is supported by the Forestry Commission in their minutes of evidence to the Agriculture Committee on Forestry and Land Use (House of Commons, 1990). For the private owner, however, it is the future financial scenario for their enterprise which is all-important and, of the great range of variables which underlie this scenario, it is the price of timber which has varied most over the course of the last 25 years. Looking at Figure 14 it is difficult to discern a definite price trend for either commodity; there is a high degree of volatility in the price index and it does appear to be particularly susceptible to economic fluctuations controlled by, for example, the oil embargo of 1973-4 and the recession of the late 1970s-early 1980s. The point is that no private woodland owner is able to influence the price of the product which he or she produces, except through producing a higher value product. This in itself is not a bad thing as it tends to imply a more freely operating market. However, while the price of timber is not guaranteed, what is guaranteed is a high degree of uncertainty for any private operator. For many forest managers, or potential managers, this degree of uncertainty in the final price may be totally unacceptable. While the risk remains high and the value of the final product modest it is very hard for marginal producers to enter the market at all.

The marketing of timber on farms presented an even less optimistic scenario than that on estates. The nature of farm woodlands is such that, from the narrow viewpoint of finance alone, they combine one or more undesirable features such as small size, dispersed location, inaccessibility or difficult extracting conditions, together with small timber volumes. Many farmers showed distrust of aspects of the timber market. They did not know how much their timber was worth and this placed them at a disadvantage in negotiating a price with potential buyers. Farmers felt that they were at the mercy of timber merchants who were much better placed for estimating the rise and fall of markets for particular species.

Only 12% of the Welsh farmers, 25% of the Herefordshire-Worcestershire farmers and 50% of the London Fringe farmers sold any timber beyond the farm gate. Firewood accounted for the greatest proportion of timber sold, particularly close to London. The fuelwood market is one of the few sectors of the low-quality timber market which has expanded in recent years and indeed it is the only one for native broadleaves which shows potential for growth. In some regions the price for fuelwood was found to be higher than that for pulpwod or mining timber.

### **The impact of intervention on employment**

The impact of intervention on employment has, like that on marketing, been of an indirect nature. Total permanent woodland employment on estates fell from 427 individuals to 190 between 1964 and 1986. This amounted to a decrease in the man:land ratio from 1 man per 72 ha to 1 man per 163 ha. This effect was countered on some estates by other factors, for example, recreation and game departments had witnessed real increases in employment. It must be stressed, however, that the cost of labour has remained the biggest single item in the accounts since 1963. A vital factor in increasing the profitability of the forestry component is the extent to which the labour:output ratio can be reduced. A permanent labour force can only be retained if the size and structure of the woodland can justify its retention on a financial basis. Otherwise the substitution of estate staff by contractors may be the only satisfactory alternative.

### **The impact of intervention on management control**

The control of management practices, both on a day to day basis and over the long term, is a crucial factor affecting overall viability. Only five of the estates were owned by absentee landlords. In many instances the owner and agent worked together in planning and decision making over the long term. The major discernible trend over the 25 year period is that owners now play a larger part in the management of their property. One of the reasons for this has been the gradual decline in the number of farm managers employed. It is not clear whether this was a result of personal financial circumstances, since there has been a surprising increase in external management in the woodland component. In 1963 one half of the estates employed a residential forest manager; by 1986 this had risen to 60%.

The facts that, first, forestry has become less profitable and second, the area of forests has remained static, if not increased, represent something of a paradox. In the next sections relationships are sought to try and explain or clarify the reasons behind this willingness to maintain apparently uneconomic enterprises.

### **The availability and uptake of grant aid 1964 and 1986**

The breakdown of the total woodland hectareage under different forms of grant aid in both 1964 and 1986 is provided in Table 16.

**Table 16** Uptake of grants 1964 and 1986

<i>Grant Aid Scheme</i>	<i>1964</i>		<i>1986</i>	
	<i>Total woodland area (ha)</i>	<i>Percentage of estates</i>	<i>Total woodland area (ha)</i>	<i>Percentage of estates</i>
Dedicated	25 300	76	24 970	69
Approved	5 018	18	2 750	9
FGS*	n.a.	n.a.	8 202	46
BWGS†	n.a.	n.a.	4 442	12
Other grants‡	n.a.	n.a.	1 835	41
No grants	1 421	6	915	8

\* Forestry Grant Scheme 1981-1988

† Broadleaved Woodland Grant Scheme 1985-1988

‡ Other grants provided by MAFF, NCC and Local Authorities

n.a. not applicable

It is clear that for both periods under review the Dedication Scheme accounted for by far the largest areas of woodland under grant aid. The area Dedicated had changed little despite the decrease in the number of estates with Dedicated woodlands. This is partly because those woods withdrawn from the Scheme were the relatively smaller ones.

### ***Regional differences***

There was no strong regional bias towards any particular form of grant aid. Both the BWGS and the FGS had been taken up in all regions although the geographical characteristics of the estates themselves will obviously have determined eligibility for the BWGS.

### **Factors affecting grant uptake \***

#### ***Awareness of grants***

A large porportion of owners (some 80%) felt that they were aware of all the grants available for woodlands while 90% said that they knew to whom to apply for grants.

Knowledge of the existence of grant aid and actual uptake was not related. The fact that grant aid exists and that farmers know it exists, but do not make use of it, is a poor promise that the grant aid is acting as an incentive.

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\* For further confirmation of farmers' perceptions of forestry, the Gwent Small Woods Project (Forestry Commission, 1984) and Kelleher's (1986) study in Ireland provide useful reading.

## ***Attitudes to grant aid***

Proof of the relatively moderate impact of grants was provided by the fact that 80% of owners claimed that they would have planted and managed their woods in the absence of any form of direct assistance. The main vices of the grant system were perceived to be fourfold. First, it was felt that the grants were not sufficiently large to act as incentives — even the newer BWGS and FGS which have since been withdrawn (see Chapter 3). Second, the provision for 'protracted consultation procedures and large amounts of paper work' was 'off-putting'; unsuccessful grant applications approached a level (10%) which might give cause for concern to both donor and donee if the causes could not easily be identified and rectified. Third, it was felt that the conditions attached to the grant aid could turn it into a form of disincentive. For example, there was some uncertainty that if the planting scheme failed the awarding authority might recoup the grant with interest. Finally, and to a lesser degree, instability in the provision of grants, changes in their value and structure with successive changes in government policy may discourage some proprietors from taking them up altogether.

### ***Grant aid 'with strings attached'***

Conditions attached to grant aid impede its purpose as an incentive. One of the most important conditions from the proprietor's viewpoint is that of public access. Table 17 illustrates that the greater the incidence of trespass the less amenable are owners to public access.

**Table 17** Public access and trespass on farms and estates in 1986

	<i>Western Counties</i> (% farms)		<i>London Fringe</i> (% farms)	<i>Estates</i> (%)
	<i>England</i>	<i>Wales</i>		
Rights of way	96	76	77	82
Trespass occurring	28	20	50	40
Owner amenable to public access	68	72	55	62

The requirements of the Forestry Commission grant schemes, that owners must be willing to discuss access with the local authority, discouraged some proprietors from applying for grant aid simply because of a poor track record in public relations. On the other hand, it is perhaps fair to ask where is the evidence that public access to private woodlands has increased as a result of the condition now attached to grants or, indeed as a consequence of heritage exemption from inheritance tax.

### **The impact of intervention on amenity and conservation**

One of the most important ways in which woodlands contribute to the overall value of farms and estates is through their effect on landscape, conservation and amenity. This operates at two levels: directly through land values and indirectly through recreation and tourism. The main way in which this surge of interest in these additional functions of woodlands reflected itself in practice was through the objectives of individual owners, as Table 15 indicates. In 1964 only 3% of estate owners managed their woods first and foremost for the object of conservation and amenity; in 1986 this had risen to 20%.

On farms these non-financial objectives were even more proliferate, largely because the areas of woodland were often too small to allow commercial objectives to dominate. A few farmers had resorted to grubbing out 'scrub woodlands' or hedgerows during the early 1980s but considerably more had planted on 'bare land' often without grants. Table 18 suggests not only that farmers considered trees to be an important component of landscape value but that this consideration encouraged them to take up grants. New planting was found to be a particular feature of farms in the Herefordshire-Worcestershire area where 60% of all farmers had planted trees within the period 1980-1985.

**Table 18** Tree planting, landscape and grant uptake on farms

<i>Comment</i>	<i>London Fringe (% of farms)</i>	<i>Western Counties (% of farms)</i>	
		<i>Wales</i>	<i>England</i>
Replanting 1981-86	20	52	50
New planting 1981-86	24	60	32
Landscape considered of great importance	24	48	60
Uptake of grants	28	49	55

On neither farms nor estates did the provision of recreational activities related to the woods bear any direct relation to the availability of fiscal incentives.

### **The impact of intervention on ownership characteristics**

Both Nicholls' report (1969) and the present study found that ownership characteristics emerged as important determinants of the type of woodland managed. Table 19 describes the rate of uptake of different types of grant aid by different types of investors. In the following section the tax measures in force before 1988 are analysed in relation to the type of investor affected.

**Table 19** Type of estate ownership taking up different forms of grant aid

<i>Grant Aid scheme</i>	<i>Numbers of types of owner</i>				<i>Total</i>
	<i>Single person</i>	<i>Company</i>	<i>Charity</i>	<i>Trust</i>	
1964					
Dedicated	42	4	3	4	53
Approved	8	4	1	1	14
No grants	1	1	3	0	5
1986					
Dedicated	31	5	3	11	50
Approved	3	2	0	1	6
FGS*	17	9	2	6	34
BWGS†	3	5	1	0	9
No grants	8	1	0	1	10

\* Forestry Grant Scheme 1981-1988

† Broadleaved Woodland Grant Scheme 1985-1988

Other grants provided by MAFF, NCC and Local Authorities

There has been little change in the pattern of type of ownership taking up different forms of grants as illustrated in Table 19. Out of a total of 53 dedicated woodlands in 1964 it can be seen that the majority (42) were owned by single proprietors. This proportion had fallen by 1986 the shortfall being made up of an increase in trust ownership of Dedicated woodlands.

The other main point of interest in Table 19 is that it illustrates how companies are relatively quick to seize new opportunities of finance and this is reflected in the take up of both the then new FGS and newer BWGS. Almost half of the estates had taken up the Forestry Grant Scheme (FGS) but covering only a relatively small area of land. It was too early in the life of the Broadleaved Woodland Grant Scheme to pronounce on its popularity but a number of owners were considering its potential. The grant was terminated in 1988 and replaced with the all-encompassing Woodland Grant Scheme.

### **The impact of ownership on tax schedule election**

It was fiscal measures, rather than degree of land transfer, which had more influence on changes in type of ownership between 1964 and 1986. The burden of taxation had decreed its own method of control and some 25% of estates had changed their status from single proprietorship to charities or trusts.

Not only does the type of tax incentive available influence type of ownership; perhaps more importantly, the type of ownership significantly affects the uptake of different types of tax incentive. Figure 15 illustrates the changes which have taken place on a regional basis between 1964 and 1986. The majority of woods were taxed under both Schedules in both 1964 and 1986 and there was no substantial change over the years. In the West Midlands (Region IV) and North Wales (Region X) approximately half the woodlands were retained solely under Schedule B. In contrast in the South West (Region I) and East Anglia (Region VII) proportionately larger areas of woodland were taxed under Schedule D.

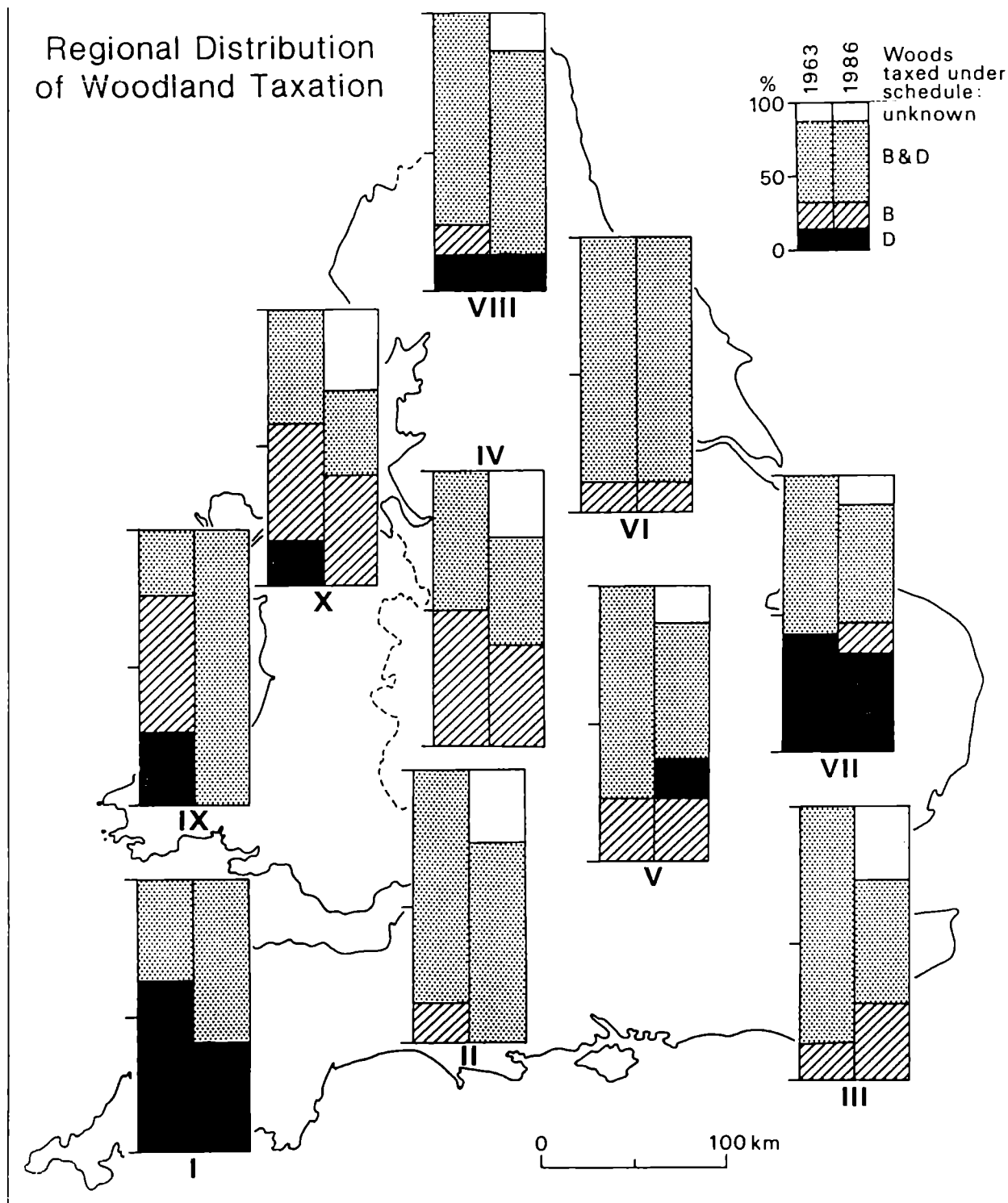
Viewed as investors the owners of woodland may be divided into three broad categories:

#### ***Category 1: proprietors with relatively small amounts of capital available for investment***

One-quarter of the estate proprietors, more than one-third of the London Fringe farmers and almost all of the Western Counties farmers came within this category. Any planting undertaken needed to be financed very largely out of revenue from existing woodlands or from surplus agricultural revenues. Between 1968 and 1978 farm incomes grew at roughly the same rate as other wages, broadly 3% per annum across the EC. Then production prices stabilised or decreased under the pressure of surpluses, so that in 1988 the real average income of farmers was less than it was in the middle of the 1970s (CEC, 1990). In addition there now exist substantial income gaps within the agricultural sector between different regions, types of production and sizes of holding. For many farmers the easiest course of action has been to allow the woodland to become derelict. Given the uncertainty about future interest and inflation rates that characterises the farmer's environment for decision making it is obvious that the cash-in-hand certainty of a grant is a stronger incentive than tax reliefs. Further as several woodland owners pointed out the Schedule D tax incentives were of more benefit to higher rate tax payers. In themselves these incentives would have had some value, even to standard rate tax payers, but the greatest value was obtained by individuals being taxed at the highest marginal rate.

#### ***Category 2: proprietors with appreciable amounts of capital available for investment***

The second main type of woodland owner is the proprietor who possesses appreciable amounts of consociate capital and who is willing and able to transfer some of this to woodland. Immediate returns are less important. Of the estate proprietors some 74% had substantial amounts of consociate capital and the benefits of amenity and conservation were regarded as adequate recompense for annual financial profit foregone through forestry investment. In the other 26% of cases, where the woodland was expected to justify its existence financially, there was little flow of consociate funds into the woodland, either for rehabilitation or new planting. Here the consequence of proprietorial decision-making was little different to that arising in Category 1.



**Figure 15** Regional distribution of estate woodland taxation, 1963 and 1986.

Financial institutions such as insurance companies, pension funds, unit trusts and merchant banks are also proprietors with appreciable amounts of consociate capital. For these the influence of changes in the application of taxation measures to forestry are likely to be less marked, partly because the time scale of the investment is probably of lesser importance than for individuals.

Most institutions regarded agriculture and forestry as just one item in their portfolios, coming at the long-term capital gain, relatively low yield end of the spectrum. Land forested with conifers may produce returns of between 4% and 6% in real terms which is, in fact well below the return expected of long term gilts.

For those companies paying corporation tax under the previous (pre-1988) fiscal regime, the management of faster-growing, even-aged species was favoured. This trend towards faster-growing species is illustrated in Table 19. Pension funds and charities which, of course, were not required to pay tax on their investment income were still found to have increased the proportion of land area given to conifers. This was despite the fact that, in theory, at least, institutions are better equipped than any other type of land owner to sustain the management of slower-growing, uneven-aged broadleaved woods.

### ***Category 3: proprietors with appreciable amounts of income available for investment***

During the late 1960s the Labour Government raised the marginal rate of income tax to 98%. Since then a trend which had been obvious for some time (Nicholls, 1969) began to assume a new importance. High income earners were drawn into woodland ownership as forestry was regarded as a sound means of reducing income tax and estate duty burdens. This form of tax avoidance improved the profitability of an investment more for the rich than for the poor. Tax avoidance is, of course, perfectly legitimate. As Chapter 3 describes there was no specific 'loophole' in the tax arrangements for forestry. The ability to offset losses against tax on the Schedule D account was available to other types of business venture. The concession lay in the allowance given for the woodland to be transferred to Schedule B on a change of occupiership thereby providing a virtually tax-free revenue. Even if it were possible that the same trees were planted and harvested by the same proprietor, the system did not allow the same individual to be subsidised both at the beginning and at the end of a rotation. Arranging the transfer of woodland to take maximum advantage of the properties of each tax schedule had long been practised by prudent landowners, but became increasingly difficult if the objective was a mixed, uneven-aged woodland.

### **Factors affecting change in tax schedule election**

#### ***Attitudes to taxation concessions – estates***

One of the questions raised during the 1986 survey related to the impact on proprietors' woodland operations of the removal of the income and corporation tax incentives. The estate respondents, the only survey respondents to whom this question was relevant, were exactly divided in their opinion. (Almost all farmers interviewed were not concerned with income tax concessions relevant to forestry.) Half of the interviewees replied that they would consider terminating all management activities immediately; the other half of the proprietors implied that the removal of incentives would have little or no effect on their management activities.

The main reasons given in support of the latter category were as follows:

- insufficient income generated to justify election under Schedule D;
- continuity of ownership very important and easier under Schedule B;
- capital taxation exerts more impact on management decisions;
- difficulties in arranging the transfer from one occupier to another (and so from one Schedule to another) to coincide with the management operations which also need to be undertaken.

#### ***Attitudes to taxation concessions – farms***

Income and capital taxation concessions for woodlands were irrelevant for the majority of farmers in both survey areas. The major reason given was that the woods were not run as commercial woodlands and therefore could not be taxed as such. Furthermore even had the woods been classified as commercial the fact that so little management was being carried out would negate the benefits to be obtained under Schedule D arrangements.

Knowledge of the tax system in relation to forestry was scant and rudimentary. Farmers knew that some concessions existed but were not sure about how they operated. The opportunities which existed to alleviate tax burdens via forestry were not seriously considered.

### **Determinants of a profitable woodland estate**

The owner's view of whether or not the woodlands are profitable is one consideration; what, in reality, makes the enterprise profitable is quite another.

The most profitable woodlands were found in the North of England (Region VIII) while the most unprofitable woodlands were recorded in North Wales, the South East of England and the East and West Midlands. There were several features which the profitable woodlands shared and these are discussed below.

### ***Consistent woodland management***

All estates with profitable woodlands had a track record of consistent woodland management. The motives for this were often mixed: timber production was important but the capital, amenity and conservation values were rated highly. Many of these woodlands had been in the same family for at least 100 years; some considerably longer. The passage of an estate through the generations of one family can clearly encourage continuous management: "I want to manage the woods as my father did" or "I would like my children to get as much pleasure from the estate woodlands as I do". These are all laudable although undistinguished routes to success. It is important to note that not only will consistent management lead to profitability but the reverse may also be true. On many estates the policy of investing profits from the woodlands back into the woodlands themselves was one pursued to good effect.

### ***Woodland structure***

The age structure of woodlands remains as in 1964, predominantly uneven-aged, as illustrated in Table 20. The size, structure and species content of the woodlands are all important. Perhaps running against the intuitive grain we found no clear relationship between woodland size and profitability; many of the larger woods were run at a heavy financial loss while there appeared to be an equal probability of smaller woods failing or succeeding financially.

**Table 20** Distribution of woodlands by age structure (figures in per cent)

	<i>Estates</i>		<i>Western Counties farms</i>	<i>London Fringe farms</i>
	<i>1964</i>	<i>1986</i>		
Even-aged mature*	4	5	48	54
Even-aged immature†	4	10	20	10
Uneven-aged	92	85	32	36

\* An even-aged mature woodland is one described as being at or beyond the economic rotation length.

† An even-aged immature woodland is one in which trees that have not yet reached their economic rotation length predominate.

The relevant point about woodland size lies in the advantage conferred by economies of scale. Profit only accrues, and even that cannot be guaranteed, when the trees are harvested and the timber sold. A financial surplus which appears on the balance accounts once every 20 years or so is not usually regarded as 'profit'. The key is to create a resource with an income flow at regular, frequent intervals; it is obvious that this is far easier to entertain when the woodland is larger with a wider distribution of age classes. Apart from the difficulty in marketing small volumes of timber, the unit costs of extraction, haulage and transport may well be prohibitive. Furthermore, on smaller woodlands, it may only be feasible to employ contract staff since there is insufficient work or income to justify the employment of a permanent estate staff. This may reduce the consistency of management.



The age structure of the woodlands is important because it influences the supply of available timber and the amount of investment required to keep the woodlands in the sort of order that will allow future crops of timber to be reaped or will maintain the woods' appearance.

It would therefore be expected that even-aged immature woodlands be financially unrewarding in that state and that even-aged mature woodlands require careful planning to stagger the rate at which the mature timber is harvested.

The surveys exhibited a range of different types of age structure with, as previously noted, little relationship with profitability. The predominant tendency on farms was to do nothing. On estates, some of the most profitable woodlands were those with a high component of conifers within a predominantly uneven-aged structure. Many proprietors had chosen to grow conifers long before the 1964 survey, their introduction coinciding with the onset of entry into the Dedication Scheme. A trend towards a larger non-broadleaved component was notable. This trend is shown in Table 21.

**Table 21** Composition of estate and farm woodlands 1964 and 1986

<i>Composition (broadleaved content)</i>	<i>Estates (%)</i>		<i>Western Counties (% of farms)</i>			<i>London Fringe (% of farms)</i>
	<i>1964</i>	<i>1986</i>	<i>Wales</i>	<i>England</i>	<i>Mean</i>	
<25%	25	35	8	12	10	5
>25%	3	10	8	0	4	0
50%	5	5	8	0	4	9
>50%	67	50	76	88	82	86

The shorter rotation length for conifers and a growing market for their disposal makes them a prime target for commercial activities. Owners have been aware of this for years and the usual practice has been to plant the softwoods as a nurse-crop together with the broadleaves. Not only does this ameliorate the trees' immediate environment but it provides a necessary intermediate return at a much earlier point than if the site were planted solely with broadleaves. Crawford (1988), in a market review of private woodland conifer production, stated that over the decade 1978-1988 softwood production from private woodlands had increased significantly and that 60% of this increased production was from thinnings.

### ***Landscape and conservation***

One of the most important ways in which woodlands contribute to the overall value of farms and estates is through their effect on landscape and amenity. Assisted by growing public concern about the environment these factors were increasingly being appreciated by owners.

It has been suggested by certain reports (HM Treasury, 1972; NAO, 1986; PIEDA, 1986) that, in appraising the national forest resource its landscape and conservation values are adequately accounted for and that they would contribute to only fine adjustments being made for an economic assessment. Despite the fact that these values are often considered to be unquantifiable, and therefore unplaced in economic appraisals, evidence on the perceptions of individual owners suggests that it is precisely these factors which contribute to the owners' desires to retain their woodlands in the face of loss-making activities.

A report prepared for the Countryside Commission (1989) by the Bureau Européen de Recherches SA concluded that widely differing attitudes existed to the issue of incentives for environmentally favourable farming and forestry activity (see Chapter 3). The reasons for this were not examined in depth but the report sought to give some indication of why this should be the case. It appeared that where there was a combination of strong environmental concern and adequate resources, such as in the Netherlands, Germany and Denmark, comprehensive and detailed programmes with broadly similar objectives were either being implemented or about to start. In France and Ireland, on the other hand, there appeared to be considerable disagreement with the principle of compensation to farmers for environmental objectives alone. In the case of Ireland this view was probably reinforced by the limited central government funding likely to be made available. As the report made clear most of the programmes were in the process of formulation rather than implementation. It was therefore too early to draw any conclusions about the effectiveness of the different national schemes.

### ***Public recreation***

For some proprietors the most lucrative estate enterprises were those which had grown in response to the public's demand for recreation. Estate owners, rather than farmers, are in the best position to respond and more than one-third had provided special facilities. These ranged from letting the grounds for special events, to leisure parks and ancillary activities, including tree nurseries, souvenir shops, tea rooms and glasshouses. On farms the most popular forms of alternative enterprise were letting sites for camping and caravanning, bed and breakfast and marketing farm produce through a farm shop.

### ***Sporting interest***

Management of woodland for game shooting has taken on increasing importance over the last two decades. Mixed woodlands are most valuable especially if managed to provide a variety of tree, shrub and ground vegetation species to give cover, shelter and food. Some 60% of estate proprietors considered the shoot to be important and at least two-thirds of these let the shoot at a rent varying from about £2.50 per ha to up to £12.00 per ha (1986 figures) depending on the quality of the shoot and the terms under which it was let. For farmers the shoot was considered to be important on 16% of the Welsh farms, 40% of those in the Herefordshire-Worcestershire region and 73% of the farms in the London fringe.

The value of the shoot was not specific to different regions although shooting receipts, particularly where an estate was accessible to the London market, were a valuable asset. Neglected woods or outgrown coppice, draughty and inhospitable woods do not contribute to a valuable shoot regardless of locality.

It was rare to find that timber production suffered where heavy emphasis was placed on the shoot. Although conflict between the two functions was recorded on 18% of the estates there was tacit recognition that the roles of each form of management should be complementary. Many of the guidelines for management for wildlife conservation apply to management for game (Forestry Commission, 1985). These include providing berried shrubs for food, woodland ponds and streams and rides and breaks to create suitable habitat. Most of these factors do not diminish the return from a commercial woodland but they may require additional foresight and planning.

## **Chapter 6**

### **The European framework**

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#### **GOVERNMENT INTERVENTION IN THE SINGLE EUROPEAN MARKET**

The Commission of the European Community (CEC) views overall forest strategy in terms of on three goals: protection, exploitation and development. It also recognises, however, that forests serve as an arena for competing vested interests and conflicting objectives. Achievement of any of the three goals depends crucially on the successful enactment of policy in the private sector. Within the 12 countries of the European Community (EC) there is no class of forest owner in the private sector which has hegemony over the economic control of forests (Florio, 1987). Across the EC about half of the forest area is privately owned; most of these (5-6 million) landowners are smallholders, frequently with less than 1 ha in their control. The management problems of these small forest holdings arise from similar sources in each country: the woods are too small to generate any relevant annual income and they are often too small to guarantee even a consistent but minor income. These are the woods which account for 60% by area of the EC forest resource. In addition there are a few thousand larger, private forest holdings, which are more or less well-managed, and are capable of generating some net income and increasing in capital value over time.

#### **The challenge of the control of the Community's forest resource**

Forest policies which are enacted up to and after the creation of the Single European Market depend crucially on the role of the 5-6 million small, private forest owners. The representation of the interests of these forest owners is weak and badly organised. There are historical reasons for this. The forest is productive capital with a long gestation cycle — one of the longest of all capital goods. It is generally recognised (Florio, 1987) that the small private forest owners pay little attention to discounting future profits, calculating net present values and comparing these with outflows from alternative investments. For most of these owners forests represent a source of economic loss, particularly when legislation imposes some kind of productive behaviour based on compulsory forest management plans and income generated is less than the cost of this management including harvesting costs. The consequence for the owner may be that woodland is cleared or abandoned; the consequence for the country is subsequent decline of the forest resource. For larger private forest holdings the traditional target is to maximise profits or at least to maintain minimal guaranteed profit. The private forest holding may be just a part of a capital portfolio, serving to secure loans for other activities. There is a tendency, on the part of both small and big property owners to rely on future increases in land value or, at least, stability in land values in real terms, in order to cover uncertainties in the management of their woodlands (Florio, 1987).

#### **The role of intervention and policy formulation**

There is general consensus in Europe that forests should be protected and managed as a renewable resource to supply products and services which contribute to the welfare of people now and in the future. Virtually all member countries subscribe to the principle of multipurpose management yet at the same time it is becoming apparent that management objectives are becoming increasingly specialised, just as was found in this study (page 45). This reflects deficiencies in the economic mechanism which gives insufficient signals that forests be considered as valuable social capital. It may also explain why Hummel (1989), in his review of forestry policies in Europe, draws the conclusion that it is in the interests of most national governments to separate, as far as possible, support for timber production from that given to the service functions of forests (conservation, recreation and so on).

The key problem of forestry policy in Europe (Hummel, 1989) is to translate a general appreciation of forests into a willingness by the public and governments to give forestry more active support. Clear and concise

statements of forest policy objectives are apparently held by few countries, although the Geneva Declaration (Hummel, 1989) revealed that there is a broad consensus on certain elements of forest policy. The Food and Agriculture Organization of the United Nations (Hummel, 1989) defines the main forest policy objectives for EC countries to be as follows:

- a sustainable increase in the economic availability of timber and other forest produce;
- the conservation and improvement of the environment;
- the provision of opportunities for recreation.

It was further stated that forest policy should:

- be dynamic whilst respecting the long-term nature of forestry;
- seek to create conditions in which efficiently managed forests are economically viable;
- take account of the distinctive characteristics and complementary roles of the different categories of forest owners as well as of the various users of forest products and services;
- be consistent with other national policies, especially those for agriculture, forest industries and rural development.

## **CONCLUDING COMMENTS**

Incentives, defined by Gregersen (1983) are public subsidies given in various forms to the private sector to encourage socially desirable action by private entities. It is generally accepted that incentives are needed to overcome three main types of problems.

1. Lack of financial ability on the part of private individuals to undertake certain activities. Cash flow problems are common to many landowners; grants may be of critical importance.
2. Lack of motivation to invest on the part of private individuals, generally due to perceived low rates of return. Subsidies can help raise private rates of return.
3. Lack of knowledge or understanding of what to do with private woodlands. Public support in the form of advisory services provides information about opportunities or about what to do, technically, with given opportunities.

If the success of the provision of incentives in the United Kingdom is measured in terms of having overcome these problems then it must be concluded that the main consequence of the fiscal system is that it has not been wholly successful. In this chapter some of the reasons behind this are examined. The conclusions presented here draw on the evidence presented earlier in the report.

### **The relationship between incentives and forestry scenarios in the United Kingdom**

During the first half of this century the central purpose of the fiscal apparatus was to encourage timber production for strategic purposes. While the taxation arrangements, which were eminently suitable for these purposes, continued, they encouraged timber production for the national market. Timber production remained an important objective on more than half of the estates (page 45) but timber production for profit or woodlands as capital assets are objectives that owners have adhered to less and less. Growing trees for timber with the aim in mind of potential profit has become less significant for proprietors as profits have remained out of reach (page 46). Even though some proprietors perceived amenity and conservation and other intangibles to be valid components of 'profit' it was sometimes hard to see the logical outcome. The owners of larger estates had tended to move towards the commercial production of even-aged softwoods, not primarily as a result of the tax arrangements but because that was the only type of forestry which was perceived to be financially profitable; the tax arrangements were available to oil the business machinery.

It is apparent that the pre-1988 fiscal system worked in certain circumstances but not in others. It was appropriate for traditional forestry policy, that is policy which centred on the supply of timber from land rather than the range of other functions which woodlands have to offer. Only half of the estate owners were convinced of the necessity of the various incentives which operated before 1988. Bearing in mind that estate proprietorship is a very special category of landownership comprising, by and large, individuals with substantial income or capital, there were, therefore, many private landowners — those with fewer financial means — for whom that fiscal regime was ineffective.

Economic incentives (largely through tax concessions) have led to the following main trends on lowland estates:

- increasing size of plantations and more regular outlines to capitalise on economies of scale and reduced boundary lengths, respectively;
- an increase in the proportion of conifers planted in response to market demand, the utilisation of poorer quality land and the need to reduce the time-scale of the whole operation;
- the adoption of new technology and reduced requirements for labour.

At the same time these incentives have been shown to be inadequate for two main reasons.

1. The value of the incentive depended on the proprietor's general tax position; if there was little income generated from other sources the value of the ability to offset expenditure on forestry operations against income from other sources was virtually worthless; if, on the other hand, the proprietor's marginal rate of income tax was 60%, it was worth a great deal.
2. The tax concessions could not easily be directed towards specific purposes — particular sites, species, operations — and therefore were not readily co-ordinated with changes in government policy which have been sought since the late 1950s.

It is still unclear as to the effect of declining agricultural prosperity on woodland prosperity, given the dependence of the one on the other. In a recently published report (ESCA, 1990) the CEC revealed that the amount of state aid paid to farmers is declining with the total of national (as against Community) subsidies averaging 9.272 billion ECU for 1986-88, down 5.6% on the previous 5 years. The single European market of 1992 will not reduce the need for either the British or any other European government to pay less attention to how it intervenes in forest management. It seems unlikely that there will be a call for a unified policy, however; the range of forest types, owners and management problems will prohibit any agreement on 'the way forward' except in the most general terms.

### **Profitable woodland management and the role of incentives**

The single most important point shown by this study is that the means of intervention available since the early 1960s have not overtly assisted in the improvement of the economic performance of forestry. Small-scale, self-sustaining, economically-efficient woodland management has been found to be a very difficult target to achieve. The United Kingdom is not alone in this and Hummel (1989) advises that support for timber production concentrates on 'pump priming' measures, that is, measures which will make timber production self-sustaining. It is clear, however, that he regards the incorporation of a timetable for phasing out support as impracticable as well as politically unwise. In this respect it seems unlikely that the goal stated in Nicholls' (1969) report, to end forestry grants before the year AD 2000 will transpire. Given the range of social benefits implicit in lowland woodland management there is no *prima facie* reason why government support should not continue provided that these social benefits are allowed room to grow. This does not mean that the interests of all concerned with forestry are best served by increasing the scope of government intervention or the amount of assistance. The changes in the Budget of 1988 have shown that assistance curtails independence and that has important implications for private growers.

The current measures introduced in response to environmental requirements and agricultural policies are not targeted at the improvement of economic performance and, in a real sense, should this occur, it will be a spill-over effect after other objectives have been achieved. The recent new initiatives on the part of the Forestry Commission to introduce management grants (pages 10-11 onwards) should assist towards this end.

In Chapter 5 it was observed that there were several features of profitable woodland estates which deserved attention. These were consistency of management, the species and age structure of the woodlands themselves and one or more flourishing 'ancillary activities' such as recreation or provision of game for sport. While these are not particularly startling observations they do lend support for a re-assessment of the way forward for the type of intervention necessary.

First, tradition continues to emerge, as it did in Nicholls' (1969) study, as the most important factor determining the present pattern of forestry within proprietary land units. Tradition has two clear effects. The first is that it may result in inflexibility in the use of land and may inhibit fresh approaches to management, including technological innovation in silviculture, with consequent implications for growth and development within the private sector. The second effect, however, is that it reduces uncertainty. It allows the development of a system of sustained woodland management which is based on clear principles which need not change over time. One of the main conclusions drawn from this study is that for lowland forestry, the imposition of a fiscal system based on *ad hoc* changes in keeping with prevailing economic and political circumstances would be highly unrewarding. There is no avoiding the long time-scale over which forest managers must operate and there is no point in providing any set of measures which do not first, and foremost, take this obstacle into account.

Second, incentives, whether in the form of tax relief, cash, cheap loans, the supply of materials and services or other forms of control, are only effective if the people they are intended to attract know these incentives exist and can be persuaded that they have value.

Third, it is quite clear from this study that outputs from woodlands, other than solely timber, are desired not only by the general public but by the proprietors themselves. What is also transparent is that the pre-1988 fiscal system had no cutting edge to this end. As Price (1989) points out, the extreme variability of many environmental benefits makes them a very inappropriate target for general indirect subsidy. Direct subsidies are better suited to achieving environmental benefits. Of all the grant schemes most likely to have assisted towards this end the Dedication schemes had the most profound effect through stabilising management and providing a reward for continuity of management procedures. In the final analysis this is what is most important for forest managers. The requirement is financial flexibility to allow the promotion of the so-called ancillary functions of woodlands and consistency of support.

## References and further reading

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- BULL, C. and WIBBERLEY, G.P. (1976). *Farm based recreation in south-east England*. University of London, Wye College, Countryside Planning Unit, Studies in Rural Land Use, Report 12.
- BURRELL, A.M., HILL, G.P. and WILLIAMS, N.T. (1983). Grants and tax reliefs as investment incentives. *Journal of Agricultural Economics* 34, 127-138.
- CARROLL, M.R. (1978). *Multiple use of woodlands*. University of Cambridge, Department of Land Economy, Occasional Paper No. 10.
- COMMISSION OF THE EUROPEAN COMMUNITIES (1979). Forestry policy in the European Community. *Bulletin of the European Communities Supplement* 3/79 CEC.
- COMMISSION OF THE EUROPEAN COMMUNITIES (1990). *The Community's agricultural policy on the threshold of the 1990s*. European File No. 1/90.
- COUNTRYSIDE COMMISSION (1983). *Small woods on farms*. CCP 143.
- COUNTRYSIDE COMMISSION (1989). *Environmental incentives for farmers in selected European countries*. Report prepared for the Countryside Commission by the Bureau Européen de Recherches SA. Countryside Commission Conservation Branch.
- CRAWFORD, D.B. (1988). *Record private woodland conifer production*. Note by the Chairman, TGUK Technical Committee, *Timber Grower*, Winter 1988.
- DART (1974). *Farm recreation and tourism in England and Wales*. Countryside Commission Publication No. 83.
- DART (1987). Various research projects undertaken by the Dartington Amenity Research Trust and the Dartington Institute, Devon.
- DASGUPTA, P. (1982). *The control of resources*. Basil Blackwell, Oxford.
- DENMAN, R. (1987). *Recreation and tourism on farms, crofts and estates*. A report to the Highlands and Islands Development Board and the Scottish Tourist Board.
- DENNE, T., BOWN, M.J.B. and ABEL, J.A. (1986). *Forestry: Britain's growing resource, a review of forest policies past and present and option for the future*. UK Centre for Economic and Environmental Development, London.
- ESCA (1989). *Weekly Economic Summary* 15(8). Agricultural Resource Management Department, East of Scotland College of Agriculture, 24 February 1989.
- FLORIO, M. (1990). *The forest resource in the European Community: scenario analysis, long-term challenges, strategic options*. Final Report of the FAST Forestry Network Activity, Internal Paper, CEC, Brussels.
- FORESTRY COMMISSION (1948). *The dedication of woodlands*. HMSO, London.
- FORESTRY COMMISSION (1977). *Advice for woodland owners*. Forestry Commission, Edinburgh.
- FORESTRY COMMISSION (1983). *Census of woodlands and trees 1979-82*. Forestry Commission, Edinburgh.

- FORESTRY COMMISSION (1984). *Broadleaves in Britain: a consultative paper*. Forestry Commission, Edinburgh.
- FORESTRY COMMISSION (1985). *The policy for broadleaved woodlands*. Policy Paper 5. Forestry Commission, Edinburgh.
- GAMBLE, B.T. (1986). *Forestry investment and taxation. The professional's guide*. Fountain Forestry Ltd, London.
- GREGERSEN, H.M. (1983). Incentives for afforestation: a comparative assessment. In, *Strategies and designs for afforestation, reforestation and tree planting*, ed. K.F. Wiersum, Proceedings of an International Symposium, Wageningen, 19-23 September, 1983.
- HART, C.E. (1986). *Taxation of woodlands up to and including the Finance Act 1986*. Hart, Chenies, Coleford, Glos.
- HELLIWELL, D.R. (1976). *The small woodland: social benefits, landscape, amenity and recreation*. The future of the small woodland, a day conference at the Peak District National Park Study Centre, March 1976.
- H.M. TREASURY (1972). *Forestry in Great Britain: an interdepartmental cost/benefit study*. HMSO, London.
- HOUSE OF COMMONS (1990). *Land use and forestry*. Minutes of Evidence to the Agriculture Committee. HMSO, London.
- HUMMEL, F.C. (1989). Forest policy in the EEC — an analysis. *FAO Forestry Paper 92*, Food and Agriculture Organization of the United Nations, Rome.
- JOHNSON, J.A. and NICHOLLS, D.C. (1986). *The value of fiscal measures to the private woodland owner in Britain*. European Association of Agricultural Economists' 11th Seminar on Multipurpose Agriculture and Forestry, Motta di Livenza e Cortina, Italy, April-May 1986.
- JOHNSON, J.A. and PRICE, C. (1987). Afforestation, employment and rural depopulation in the Snowdonia National Park. *Journal of Rural Studies* 3 (3), 195-205.
- KAY, J.A. and KING, M.A. (1983). *The British tax system*. 3rd edn, Oxford University Press, Oxford.
- KELLEHER, C. (1986). Farmers and forestry. In, *The changing CAP and its implications*. An Foras Taluntais, Economics and Rural Welfare Research Centre, 13th Annual Conference, December 1986.
- LEAN, G. (1986). Timber tax dodge is felled by whistleblower. *Observer*, 23 August 1986.
- LIPSEY, R.G. (1976). *Positive economics*. Weidenfeld and Nicolson, London.
- LORRAIN-SMITH, R. (1988). *The economic effects of the 'Guidelines for the management of broadleaved woodland'*. A study carried out for Timber Growers UK Ltd.
- LORRAIN-SMITH, R. (1989). *Grants and other financial assistance for trees*. Calderdale Metropolitan Borough Council, Leisure Services Department.
- LYNCH, T.D. (1989). *The taxation of woodlands in the United Kingdom*. Green and Son, Edinburgh.
- MAFF (1985). *Report of a working group set up to examine the scope for encouraging woodland as a farm crop*. Ministry of Agriculture, Fisheries and Food, London.



- MAFF (1987). *Farm woodland scheme*. A consultation document by the Agriculture Departments and the Forestry Commission, March 1987.
- McGREGOR, P.G. and McNICHOLL, I.H. (1989). *The impact of forestry on output and employment in the UK and its member countries*. Final Report by the Fraser of Allander Institute and the Department of Economics, University of Strathclyde. Forestry Industry Committee of Great Britain, London.
- MOORE, P.J. (1985). The real world of private forestry. *Ecos* 6(2), 2-7.
- NAO (1986). *Review of Forestry Commission objectives and achievements*. Report by the comptroller and Auditor General. HMSO, London.
- NCC (1984). *Nature conservation in Great Britain*. Nature Conservancy Council, Peterborough.
- NICHOLLS, D.C. (1969). *Use of land for forestry within the proprietary land unit*. Forestry Commission Bulletin 39. HMSO, London.
- PENISTAN, M.J. (1986). Oak in Wessex: an account of field studies 1982-4. *Forestry* 59(2), 243-257.
- PIDDINGTON, H.R. (1980). *Shooting and fishing in land use; a study of economic, conservation and recreational aspects*. Report to the Country Landowners' Association, University of Cambridge, Department of Land Economy.
- PIEDA (1986). *Forestry in Great Britain*. An economic assessment for the NAO by PIEDA. National Audit Office, London.
- PRICE, C. (1989). *The theory and application of forest economics*. Basil Blackwell, Oxford.
- STEWART, P.J. (1987). *Growing against the grain – United Kingdom Forestry Policy*. Council for the Protection of Rural England, London.
- WATKINS, C. (1984). The use of grant aid to encourage woodland planting in Great Britain. *Quarterly Journal of Forestry* 78(4), 213-223.
- WOODS, A. (ed.) (1985). *Broadleaved woodlands in Wales: the core report*. Coed Cymru/Countryside Commission.

