

Extensive & Intensive Rural Land Uses

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I INTRODUCTION

I.1 Study Context

This study forms is one of a series background research papers being undertaken as part of the preparation of the National Spatial Strategy (NSS). The preparation of the NSS is a 4 Stage process.

The research papers constitute Stage 2, of the four stage approach and form an assemblage of key sets of data and information necessary to allow an analysis of current trends and spatial distribution of development patterns in Ireland. In particular, the research papers will provide baseline data and basic material to evolve the preparation of Policy Papers in Stage 3.

I.2 Study Objectives

A central feature of the NSS is recognition that to achieve more balanced regional development it is necessary to reduce the disparities between and within regions and to optimise the potential of all regions to contribute to the continuing prosperity of the country.

The Objectives of this study are firstly to examine a range of Extensive & Intensive Rural Land Uses and the contribution development of those land uses can make to spatial strategy; secondly to highlight existing problems that occur as a result of the current level of development of those extensive and intensive land uses and thirdly identify appropriate management responses to those difficulties.

The study is designed to:

- Establish the distribution of Extensive & Intensive Rural Land Uses
- Establish trends, in the development of those Land Use resources
- Establish the effects of current trends on those Land Use resources

I.3 Approach & Methodology

No specific methodology was used other than the establishment of early and high level consultation with holders of key data and information close working with them for data assembly and identification of existing reports, papers and research material that were readily available. Only data and information from existing and reliably acknowledged sources were used.

Information was gathered in textual, tabular and graphic/map form that enabled the study to:

Identify a range of Extensive & Intensive Rural Land Uses that are likely to have an impact on spatial strategy,

Map/Quantify the range of Extensive & Intensive Rural Land Uses identified and establishing their spatial distribution,

Identify/Quantify existing problems and the implications of the continuation of trends of Extensive & Intensive Rural Land Use,

Identify the potential for those Land Use resources to contribute to the improved development of an area,

Identify any necessary management or policy requirements to ensure that Extensive & Intensive Rural Land Uses can continue to contribute to the improved development of an area.

as set out in the study brief.

In view of the time constraint within which the National Spatial Strategy has to be prepared it has not been possible to carry out an examination of the full range of rural resources. A number of key elements were selected as a representative sample of the issues that, in the opinion of the Spatial Planning Unit, are facing and impacting on rural resources in a national context.

2 EXTENSIVE & INTENSIVE LAND USE ISSUES

2.1 Background

Rural areas in Ireland are the location of many resources and land uses that contribute to the economic well-being of the nation. The various land uses, which can be both extensive and intensive in terms of their development, can be over-exploited (by reference to their environmental capacity) and result in environmental degradation which in turn can have adverse impact on the economic viability of those resources. The maintenance of a high quality can contribute to the quality of life of the individual and to the attraction of an area for inward investment. Furthermore the rural environment forms the essential ingredient for tourism.

2.2 Issues arising

It is increasingly obvious that with economic growth there are serious negative effects on the environment on which much of the rural economy depends, such effects are urban expansion, particularly urban generated housing, increasing leisure and recreation pressures, water and soil pollution etc. Although there are environmental problems there are also opportunities to be gained by identifying optimum levels of development rather than maximisation.

3 EXTENSIVE & INTENSIVE RURAL LAND USES EXAMINED

3.1 Extensive Uses

3.1.1 Afforestation

Introduction

The Strategic Development Plan for Forestry 1996 “Growing for the Future” aims to increase the national forest estate from its current level of 615,000 Ha in to 1.2 million Ha by 2030 (ie. to increase the land area of the State under afforestation from 8% to some 17%).

Map 1 - Afforestation in the 1990's



80% of the national forest estate of 600,000 Ha. is planted in conifer, 10% of which is in mixed species stands. Broadleaf forest accounts for 100,000 Ha.

The forestry production target in 1999 is for 2.7M m³. It is estimated that 10M m³ pa is required for economically viable forest industry, “the critical mass”. The current strategic plan for forestry will be reviewed in 2001.

The forest estate is being increased by 12-20,000 Ha per annum.

	TOTAL	PRIVATE	STATE	AREA	PLANTED
COUNTY					
CARLOW	6386.04	1968.64	4417.40	89635	7.124494
CAVAN	9127.67	3723.93	5403.74	189060	4.827922
CLARE	40234.35	16909.91	23324.44	318784	12.6212
CORK	70447	20741.52	49705.48	745988	9.44345
DONEGAL	51478.95	16660.40	34818.55	483058	10.65689
DUBLIN	5530.18	3347.18	2183.00	92156	6.00089
GALWAY	54937.27	14748.93	40188.34	593966	9.249228
KERRY	40402.8	21123.05	19279.75	470142	8.593743
KILDARE	9225.601	4078.60	5147.00	169425	5.445242
KILKENNY	17493.06	7438.66	10054.40	206167	8.484898
LAOIS	23532.46	6817.56	16714.90	171954	13.68532
LEITRIM	20741.31	7953.52	12787.79	152476	13.603
LIMERICK	18817.32	6910.09	11907.23	268580	7.006226
LONGFORD	5459.1	2546.33	2912.77	104387	5.229674
LOUTH	3228.585	1821.59	1407.00	82334	3.921327
MAYO	48134.61	15118.35	33016.26	539846	8.91636
MEATH	4908.333	4216.13	692.20	233587	2.101287
MONAGHAN	5398.24	1603.69	3794.55	129093	4.181667
OFFALY	14333.91	8253.91	6080.00	199774	7.175063
ROSCOMMON	17559.74	8253.25	9306.49	246276	7.130106
SLIGO	17808.63	8068.59	9740.04	179608	9.915277
TIPPERARY	44592.37	12768.06	31824.31	425458	10.48103
WATERFORD	28796.15	8441.72	20354.43	183786	15.6683
WESTMEATH	12974.22	7497.77	5476.45	176290	7.359592
WEXFORD	15406.4	6138.80	9267.60	235143	6.551928
WICKLOW	39518.74	8835.14	30683.60	202483	19.51706
TOTAL	626473	225985.3	400487.7	6889456	9.093215

Current Trends

Current forestry policy now places greater emphasis on the planting of broadleaf including native oak and ash. The current target for the planting of broadleaf species is 20% annually however increased demand for the uptake of broadleaf planting has meant an upward revision to 30% in next 7 years. The strategic shift to more productive soils only been possible because more land made available than expected.

The initial target set out in “Growing for the Future” to 2000 was for 4000Ha broadleaf planting, to-date target 5000Ha has been planted. The major reason for the increase in broadleaf planting was the improved planting grants for farmers although most of the planting is taking place on the poorest of mineral soils. Most forest planting is now east of the river Shannon and in Co. Cork. A second reason for the uptake of planting by farmers is that Coillte now works in close partnership with farmers and is not planting its own lands.

Current trends will reinforce the switch away from planting on upland blanket bogs in the west to wet mineral soils of the east (estimated at 1 million Ha) that are more productive for forestry.

Sustainable Forest Management (SFM)

The principles of Sustainable Forest Management were set out in 1992 by the Food and Agriculture Organisation. EU committed itself to these principles in Helsinki in 1993 and in Lisbon in 1998.

The criteria for SFM are :-

- Maintenance & enhancement of the forest resource and their contribution to global carbon cycles
- Maintenance of the forest ecosystem health and vitality
- Maintenance and development of the productive functions of forests
- Maintenance, enhancement and conservation of biological diversity of forest ecosystems
- Maintenance and enhancement of the protective functions in forest management (soil & water in particular)
- Maintenance of other socio-economic and cultural functions

The Irish National Forest Standard, setting out the implementation of SFM launched in September 2000 comprising of a Code of Best Practice and separate Environmental Guidelines.

Forestry is now included in the Rural Environmental Protection Scheme (REPS) and it is expected that this measure that will encourage more farm planting.

Greater priority is being given to existing native woodlands comprising some and in particular to restoration scheme for older broadleaf forests.

The multi-use of forested land as part of SFM is recognised through the Urban Forestry Scheme which is aimed recreational forest parks for urban areas. Public access through forest lands for walking routes is now formally acknowledged.

There are investigations into the suitability of Coillte lands for Landfill sites municipal sewage sludge spreading.

Investigations in to the use of the extensive Midland Cut-away bogs (BOGFOR) which at present cover 50,000Ha were undertaken in 1997/98 UCD / Coillte / Bord na Mona / Forest service. It is still not clear whether sustainable forestry is possible on Midland Bogs. Earlier studies show problems of :-

- i) high incidence of frost
- ii) Low potassium levels due to distance from sea
- iii) Poor management system of bogs
- iv) Trials for appropriate species

The 97/98 investigations are being assessed.

Conclusion

Greater emphasis will be placed on broadleaf planting the 4000Ha broadleaf target has been met with circa 5000Ha being planted. The main reason for this is improved grant aid to farmers for broadleaf planting. One feature however is that planting is taking place on the poorest mineral soils. Most planting is taking place East of the Shannon & Co. Cork

There is a need to review agriculture incentives encourage more farmers into forestry. Farmers need to get higher returns from forestry to make it compete with agriculture.

National databases (FIPS, Soil Classification etc) will help afforestation to locate in most appropriate areas.

There will be more environmental planting eg for catchment protection especially cross-county boundary.

As farming declines more land may become derelict which provides an opportunity for planting.

The EU Commission is pressing for an increase in the level of planting of native broadleaf species especially oak. The economic viability of extensive native broadleaf planting is a complex question. Native oak has a 150-200y rotation period which means economic return from the timber will be long term.

However, there are other economic and social benefits to be considered, broadleaf planting requires a high degree of management which would provide new employment opportunities, this could be allied to re-deployment of farmers who traditionally are not trained to manage broadleaf forestry.

Future Trends

The Irish National Forest Standard will reinforce the strategic shift to more productive soils in the east of the country.

The commitment to the Kyoto Agreement requires Ireland to manage its emission of greenhouse gasses to 1990 levels +13% over the period 2008-2012. Afforestation can be used a mechanism carbon sequestration. Some 20% CO² sequestration will be by forestry. A serious issue to be addressed is that while greenhouse gasses are increasing it may be seen as cheaper to plant forestry than other remedial action.

International Prices for timber may affect the economic viability of Irish forests. Low cost timber is now available from other markets, USSR & East Europe, Chile South Africa, New Zealand are now a major suppliers of softwood.

The area of Ireland under forest will double by 2030 at which time the country should be self sufficient to support a timber industry.

Greater emphasis will be placed on the planting of native broadleaf woodland. An additional 15,000 Ha of Native Woodland will to be planted and the existing native woodland reserve will be improved by the Woodland Conservation Scheme (WCS) which aimed at semi-natural woodland.

There is a need to review incentives to encourage farmers to diversify into forestry. Framers need higher returns from forestry to make it compete with agriculture. As farming is reformed by the CAP more land will become marginal for agriculture and provide an opportunity for planting.

There will be more environmental planting eg for water catchment protection.

National databases and Forest Inventory Planning System (FIPS) will help afforestation to locate in most appropriate areas. FIPS will encourage a greater variety of species due to more accurate site assessment (soils, climate, slope etc), it will allow better shape and configuration of the forest in the landscape and give better recognition to landscape character.

3.1.2 Wind Energy

Introduction

Wind energy development is relatively new in Ireland, compared to other EU countries such as Denmark and Germany. The first commercial wind farm of 6.45 Mw was commissioned and supplying electricity in 1992. This project was supported by the VALOREN programme. It remained the only wind farm supplying the electricity network until 1997 when a further 6 were commissioned with a combined generating capacity of 44 Mw, of these, 4 were built under the AER I (Alternative Energy Requirement) programme and 2 were built under the THERMIE programme. Since 1997 a further 5 wind farms have been built including the first AER III wind farm and the first wind farm whose electricity is being sold directly to final customers, under third party access.

Year	Site	Location	Installed Mw	Market mechanism
1992	Bellacorrick	Co. Mayo	6.45	VALOREN
1997	Barnesmore	Co. Donegal	15	AER I
1997	Altagowlan	Co. Leitrim	1.2	AER I+THERMIE
1997	Cark+Tullytresna	Co. Donegal	15	AER I
1997	Tullymurray	Co. Donegal	4.8	AER I
1997	Kilronan	Co. Roscommon	5	THERMIE
1997	Cronalaght	Co. Donegal	3	THERMIE
1998	Drumlough Hill	Co. Donegal	4.8	AER I
1998	Crockahenny	Co. Donegal	5	AER I
1999	Inverin	Co. Galway	2.64	THERMIE
1999	Curabwee	Co. Cork	4.62	AER III
2000	Cronalaght II	Co. Donegal	1.98	TPA
2000			69.49	

Wind Farms Developed in Ireland (June 2000)

There are 12 wind farm currently operational in Ireland. The combined installed capacity is 69.49 Mw. In terms of actual electricity production, the contribution of wind energy currently represents 1 % of the total electricity production in the State.

Map 2 - Location of Wind Farms



Ireland's geographical location, on the downwind side of the Atlantic Ocean, in the region of prevailing south-westerly winds, exposes the Irish coastline to one of the most vigorous wind regimes in the world. The *feasible* wind energy resource, in areas at or above the 7m/second 'cost effective' wind speed is estimated at 179 Gw, (40 times Ireland's current installed capacity). When areas which are more sensitive to the environmental impact of wind energy are excluded, what remains is the *accessible* wind energy resource estimated to be 2190 Mw under certain assumptions, and with a cost limit of 3p/Kwh. Based on assumptions regarding the ability of the network to accommodate wind generated electricity, the *practicable* wind energy resource, is estimated to be 812 MW.

Current Trends

In 1996 a target was set of an additional 90Mw to be installed by 2000. Under AER III Power Purchase Agreements were offered to 17 wind power projects with a capacity of 137MW.

Of these 17 projects, 9 (combined installed capacity 69 Mw) have secured planning (one of which is commissioned). The remaining 8 are at various stages of the planning process. There are 8 wind farms (combined installed capacity 50 MW) currently under construction which are expected to be commissioned before the end of 2000.

Current targets for renewable energy are set out in the Green Paper on Sustainable Energy. 530 Mw of additional electricity generating capacity from renewable energy sources are required in the period 2000- 2005, in order to meet our commitment to limit the growth of greenhouse gas emissions. The previous target for renewable energy over the same period was 155 Mw. If these targets are met, wind energy will account for 10.7% of Ireland's projected total installed electricity generating capacity, 7.1 % of electricity generated and 1.1% of total primary energy supply by 2005.

EU Draft Directive that requires Ireland to have 13.2% of its total electricity demand produced by renewables 8 or 9% of which will be wind generated by 2010. This is estimated to be 1000Mw *in addition* to projected 500 Mw in Green Paper.

Market Mechanisms

The *Alternative Energy Requirement* (AER) is a public service obligation through which producers submit competing tenders. The successful tenders are guaranteed sale for their output to ESB Power. The competitive nature of these schemes ensures that the cost ultimately borne by consumers in respect of the higher direct costs of electricity generated from sources is minimised.

Over the period of the four AER competitions the bid prices have decreased significantly. In 1995, the AER I bid price per unit (kWh) for all technologies was 4p. In 1998, the weighted average bid price for AER III was 2.748 pence per unit, a drop of 31%.

EU Energy Demonstration Schemes under the THERMIE programme between 1990 and 1998, 10 wind farms were awarded funding to demonstrate innovative wind energy applications, of these 4 have been built, 2 failed and the remaining 4 are at various stages of the development process. The wind farms received 15 year index linked power purchase agreements (PPA), the price being determined by the most recent AER competition prices.

The ENERGIE programme, which supersedes THERMIE, will pay producers the average of the price bid in the relevant category of the preceding AER competition.

A third market mechanism, which came into force in February 2000 is the Direct Sale of Electricity from windfarms to customers. Approximately 30% of the market is open now, 40% in 2002 and full liberalisation in five years time. This will allow independent electricity generators and/or suppliers to contract directly with designated customers for the supply of electricity. To date one wind farm has been built in Donegal under this mechanism. The responses by the wind energy industry to this new opportunity are mixed. The provision of direct sale is clearly seen as positive. The process is still evolving and issues should become clearer as time progresses. The half hourly trading system, which forms part of regulatory requirements, provides a significant challenge to wind energy given the intermittent nature of wind energy. Furthermore, the availability of finance to fund wind farms in the absence of a 15 year PPA is uncertain.

All EU States utilise instruments for the development wind energy.

COUNTRY	Installed in 1998 MW	Total installed MW	Average price (p/kWh)
Germany	794	2,875	0.086
Denmark	300	1,448	0.078
Spain	195	707	0.072
UK	14	325	0.070
Ireland	10	63	0.051

Increases in wind energy penetration and average cost

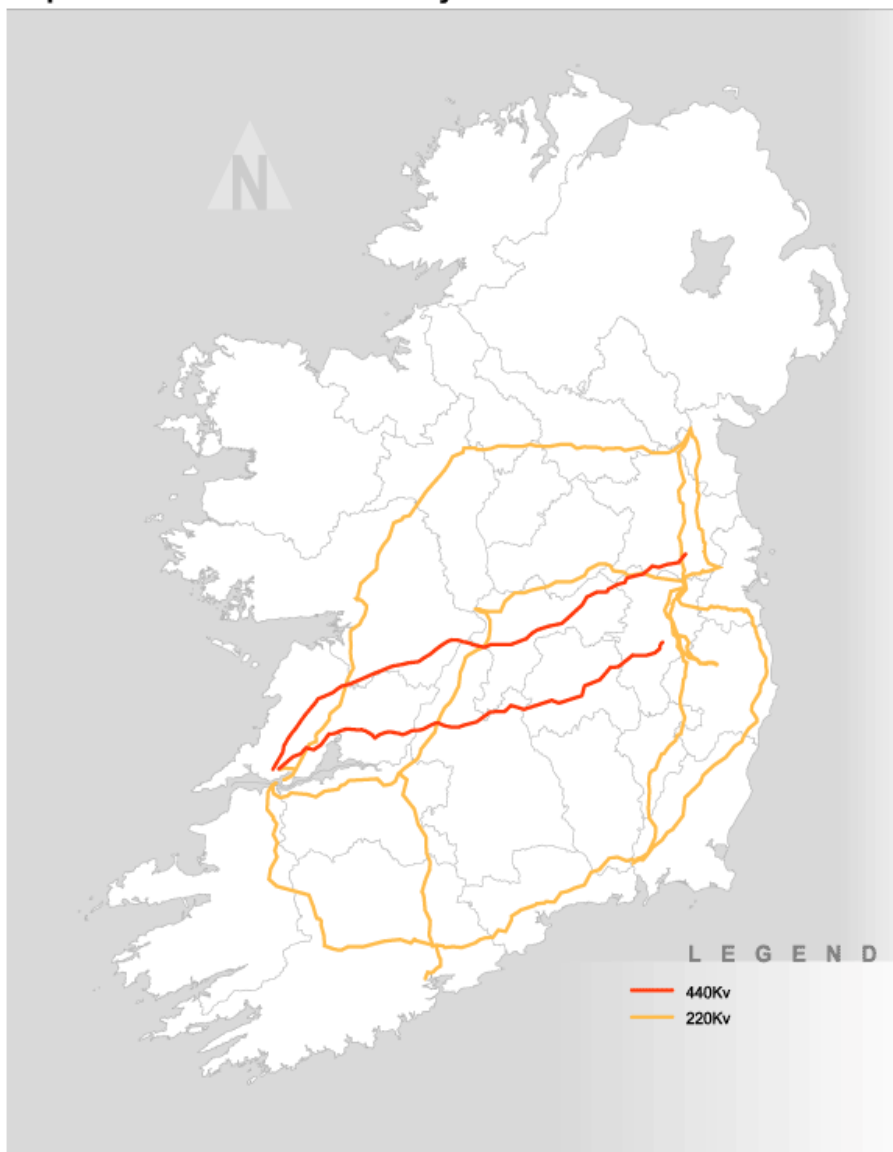
Denmark, Germany and Spain, for example, have achieved considerable growth through fixed price schemes. Ireland & the UK focus on improving the price-performance ratio through a competitive process. Wind farm produced electricity from fixed price schemes is of the order of twice that in Ireland. Equally the penetration level achieved in 1998 may reflect the stop/go nature of the competitive offers or other factors.

In Ireland wind generated electricity produced at between 2.6 to 3p per unit can compete with traditional sources of electricity production. However, most 660 Kw wind turbines produce electricity at 7p per unit and so cannot compete, the new generation of turbines (1 Mw to 1.65 Mw) may give some economies of scale.

Access to the electricity network

ESB have a number of concerns in relation to the increased penetration of renewable energy feeding into the Irish electricity network.

Map 3 - 220Kv & 440Kv Electricity Grid



Firstly because many sources of renewable energy, such as wind, are intermittent ie subject to variations in the amount of electricity they produce, back-up capacity to ensure continuity of supply is essential. Against that, where the point of generation is closer to the load and generation profile matches the load profile, then electricity loss in transmission and distribution is reduced.

Secondly the strength of the network and its ability to accommodate renewable energy varies across the country. The best wind energy resource is, understandably, along the west coast of Ireland however this is where the electricity network is generally at its weakest due to the dispersed nature of electricity loads. This mismatch of resource and grid, raises the issue of upgrading the electricity network strategically to accommodate renewable energy sources.

The cost of grid connection is high, as much as 20% of the capital cost of a wind energy project, developers want the ESB to bear this cost. However the ESB has a fixed payment to farmers for poles crossing their land, therefore farmers object to wind farm developments.

The powerlines connecting the wind farm to the electricity network will also have an impact in the landscape.

Planning Issues

The preferred location for wind farms by the wind energy industry is along the western seaboard and exposed upland and mountain areas which are more often than not within areas of high quality landscape. The preference for this type of location occurs largely as a result of the competitive tendering process for wind energy and often leads to land use conflict between the development of wind farms and other land use priorities for the area, in particular tourism and amenity

Regional Dispersion

The Strategy for Intensifying Wind Energy Deployment discusses the issue of regional dispersion of wind farms.

There are two advantages which would accrue from more dispersed siting of wind farms:

- The combined fluctuations due to the intermittency of wind power would become considerably smoother. This is very important from a system operational perspective,
- The capacity credit attributable to WTG capacity in total would increase.

Dispersed siting means at some wind farms should be located near the south and south eastern coasts, where wind yields can be quite satisfactory. The difficulty in the new liberalised market situation is to devise correct price signals to gain the desired effects for the ultimate benefit of the electricity consumer.

Locational price signals are in place in England and Wales through the transmission use system charges. These are designed to encourage generation and penalise demand in the south and vice versa in the north. The result is an encouragement for generation to locate close to demand and minimise both transmission and network expenditure and losses.

In the Irish market, locational signals are contained to some extent in the pricing structure for using the network. All generators are required to pay a *Network location-based Capacity Charge*.

A recent study examined the impact of geographical dispersion of wind farms in the Irish context. The study was based on an assumed installed wind energy capacity of 1500 Mw evenly spread around the country, half of which is installed offshore. The relative frequency with which the combined power output changes within one hour was examined. The case of total power output from dispersed wind farms is compared 5 other cases, each representing the total wind power output being placed at a single site.

The figure below shows that where the wind farms are dispersed around the country, the combined power output varies considerably less than when the wind farms are concentrated in one location. In addition, the study found that the variation in combined power output from the dispersed wind farms never exceeds 60% (increase or decrease) thin a one hour time period.

The national guidelines on wind farm development from the DoELG offer a policy outline although they may not be sufficiently specific to give adequate guidance to planners or individual project developers.

Many countries have regional plans for wind energy. In the case of Denmark regional plan sets the regional targets for capacity, identifies key sites for large installations prescribes key regulations (eg. regarding tower height and noise). These form a framework within which the municipalities prepare their plans. In Germany Regional Authorities can assess their target capacity, identify search areas for 'spatially significant development and can set out regional regulations.

National planning is particularly important in Denmark and Germany where national policy promotes wind energy. It is evident that strong support and clear direction from above greatly helps the application of planning policies at local level.

One plan led approach is suggested by the Renewable Energy Strategy Group in its report “Strategy for Intensifying Wind Energy Development”. 4 distinct categories of areas will be identified:

- Strategic areas -these key areas are deemed to be eminently suitable for wind farm development and should be reserved for such purposes.

- Preferred areas -these areas are suitable for wind farm development and should normally be granted planning permission unless specific local planning circumstances would support a decision to refuse permission in the context of the development plan.
- Areas Open for consideration -applications for planning permission will be treated on their merits with the developer having a clear responsibility to demonstrate as to why the development should be granted permission.
- No-go areas -these areas are identified as particularly unsuitable for wind farm development.

The above areas may be identified by Local Authorities or on a regional or national basis and should all be incorporated into Local Authority development plans. In this way, the plan led approach should identify where wind energy should be developed. From this appropriate market mechanisms may be determined and appropriate locations for investment in the grid infrastructure.

The approach needs to be informed by the existing grid infrastructure, cost effective upgrade options and wind speeds for the areas identified.

Small scale farmer led wind farms or small groups of turbines may lead to less objections.

Conclusion

Ireland is facing a major challenge to meet its commitment to limit the growth of greenhouse gas emissions. Emissions are projected to grow in excess of 35% between 1990 and 2010, compared to the 13% limit that Ireland is committed to. Most of this growth is attributable to the energy sector.

Renewable energy generally and wind power in particular is expected to meet substantial increases in electricity production over the 2000-2005 period.

The rapid expansion required will be hindered by 3 types of constraint :

electricity market mechanisms

electricity network

spatial planning.

These are distinct but closely interrelated issues which cannot be considered in isolation from each other.

Future Trends

The targets set in 1996 have been revised upwards and there is potentially the resource to meet them. Consideration must be given to a National Strategy that will:

- address the location and distribution of wind farms;
- market mechanisms which are appropriate to Ireland;
- planning permission for the turbines and, where necessary, for the connection to the network;
- securing wayleaves;
- availability of finance to fund the wind farm development;
- use of the electricity network to deliver the electricity to the point of consumption.

Regional dispersion from a network perspective was shown to offer a number of positive characteristics. Dispersed siting from a spatial planning perspective, needs to address many questions :-

Is it better from a planning perspective to have a large number of wind farms, each with a limited number of turbines?

Should the focus be on a small number of wind farms each with a large number of turbines?

Should wind farms be intervisible from each other?

Smaller turbines may be more easily accommodated spatially, depending on the landscape but to achieve the maximum from the wind energy resource larger machines will necessary.

The associated impact of infrastructure relating to connection of the wind farms to the electricity network. Smaller wind farms eg 3 Mw require less infrastructure where grid connection to the local distribution network is possible. Larger wind farms eg 20 Mw, need to connect to the transmission network.

Should avoidance of a proliferation of grid connections be a specific policy?

The development of an integrated strategy and its associated research requirements is essential. An integrated approach would have to address matters fundamental to energy production eg. Should there be a trade off between reduced pollution vs subsidised wind/alternative energy production.

If wind farms were viewed in the context of rural development could the Department of Agriculture subsidise farmers who are demanding 7-9p Kw/hour prices?

One solution to farmers objections may be to allow the developer build the grid connection and allow him to compensate the farmer at a price agreed between them.

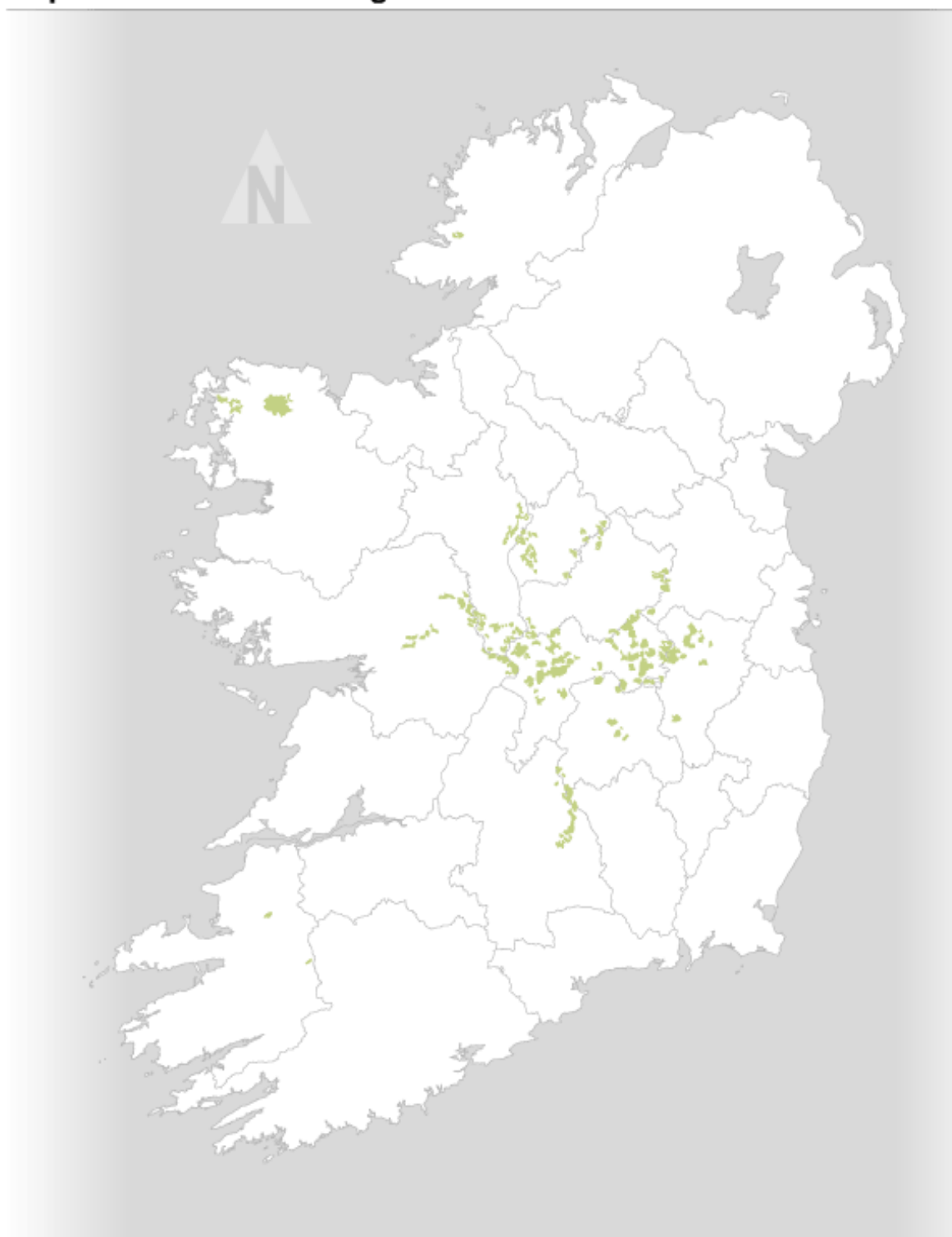
Offshore windfarms may offer a partial solution to the rapid development of wind generated electricity. The Department of the Marine & Natural Resources has issued a consultation document “ Offshore Electricity Generating Stations – Note for Intending Developers”. The development of offshore windfarms will require a study of the resource which may take 3-5 years to complete.

3.1.3 Peat Extraction

Introduction

Peat is an indigenous fuel that continues to provide a secure source of energy or electricity generation. Bord na Mona also produces peat fuel in the form of briquettes and sod turf, horticultural peat in addition to the milled peat for power stations.

Map 4 - Bord Na Mona Bogs



Bord na Móna owns some 7% of the total peatlands in Ireland, some 80,000 Ha. approximately half of which will be cutaway in the next 20 years with the remaining 40,000 Ha having a life expectancy of about 30 years. Bord na Móna estimate that their reserves provide sufficient peat resources in already developed bogs to guarantee availability of this fuel for at least the next thirty years without the need to open up new bogs.

Current Trends

Electricity Production

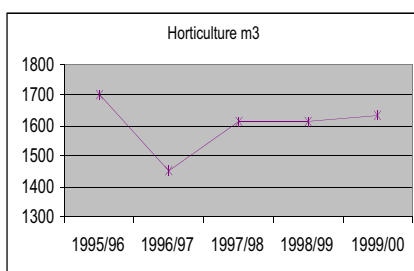
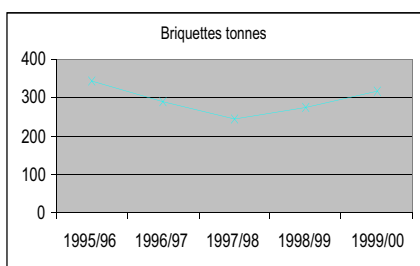
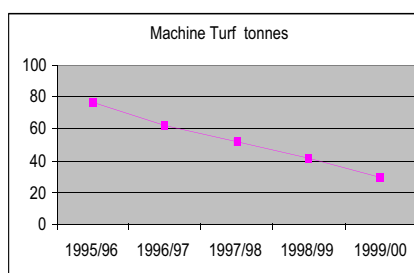
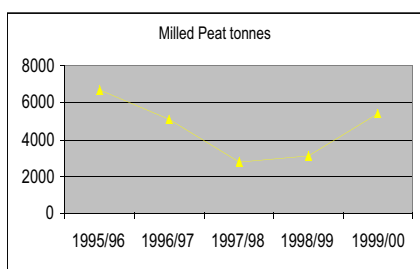
Up to recently, the contribution of peat to electricity production has been comparable to that of imported oil. Peat-fired electricity generating stations provide just under 10% of the country's electricity in line with Government policy on the use of economical indigenous energy and on diversification of the fuels used in energy supply.

Primary Energy Used for Electricity Production, 1986-1997 (000 TOE)							
Year	Peat	Coal	Oil	Natural Gas	Hydro	Other Renewables	TOTAL
1986	416	411	1232	606	77	N/A	2742
1987	578	1100	643	503	56	N/A	2880
1988	665	1167	248	729	73	N/A	2883
1989	561	1348	181	899	60	N/A	3050
1990	592	1315	347	843	59	1	3156
1991	611	1286	568	790	63	1	3320
1992	627	1458	584	756	68	1	3495
1993	558	1429	574	1009	63	2	3636
1994	587	1480	660	1007	78	2	3814
1995	576	1537	631	1122	63	1	3930
1996	569	1570	636	1389	61	1	4226
1997	555	1509	814	1398	58	26	4360

At the end of 1997, the ESB had an installed capacity of 4121 Mw, and other small scale generation plants accounted for 176 MW, giving a total of 4,297 Mw of capacity. To the year ending March 1999 Bord na Móna supplied 2.87 million tonnes of milled peat to 5 peat-fired power stations with a total generating capacity of 420 Mw.

Currently there is a programme for the orderly closure of all existing peat-fired power stations owned by the ESB and for their replacement by two new stations using the latest technology for converting peat to electricity. The two new stations will be located at Shannonbridge and Lanesborough. These are in addition to the peat-fired power station currently under construction near Clonbulloge, Co. Offaly.

Trends in Peat Production					
	1995/96	1996/97	1997/98	1998/99	1999/00
Machine Turf tonnes	77	62	52	41	29
Milled Peat tonnes	6658	5049	2744	3104	5378
Briquettes tonnes	344	291	244	276	317
Horticulture m3	1702	1452	1616	1615	1631



Briquette Production

Consumption of solid fuels has declined over the past decade typified by the ceasing of briquette production at Croghan and demand for briquettes has reached a level that can be supplied by only 2 factories.

Horticultural Production

Bord na Mona produces and markets peat-based growing media and other horticultural products. It serves two distinct markets - the gardening or retail market and the professional growing market. 90% of the company's sales are exported. Sales in the two largest markets - Britain and the Netherlands - were down but sales in other markets rose. The underlying trend in production and demand is upward.

Wind Energy

Bord na Mona Energy Limited holds an 88.5% shareholding in Renewable Energy Ireland Limited which operates a wind farm at Bellacorick in Co Mayo) the windfarm has 22 turbines and produces 6.25 Mw of electricity.

Natural Environment & Heritage

It is the policy of Bord na Mona not to produce peat on any peatland considered to be of conservation interest. There is a commitment to planning for the environmentally sustainable after-use of cutaway bogs; mitigation of the effect of its operations on the environment; a commitment to preserving representative examples of different bog types and areas of special natural beauty and significance.

Bord na Mona has transferred some 6,650 hectares of land that were in its ownership, to Duchas for nature conservation. It also removed from its land acquisition programme 1,000 Ha of peatlands that were identified as being of scientific importance and worthy of conservation. In 1999/2000 Bord na Mona transferred a further 1,100 hectares to Duchas.

Conclusion

Bord na Mona has extensive landholdings, 80,000 Ha concentrated in the Midlands.

Nationally electricity production has been increasing and peat power currently provides about 8% of the national demand. The source of power generation are changing, with peat playing a lesser role. The 5 existing peat power stations are being replaced with 3 modern more efficient plants that use less peat.

In line with national trends solid fuel production in the form of briquette and sod turf has fallen and will continue to do so. Briquette production plants have been rationalised to two accordingly.

Horticultural peat production is increasing and is almost totally exported.

Future Trends

Electricity Production

The two new peat fired electricity stations, together with the new Edenderry Power Station, will have an annual requirement for 3.5m tonnes of milled peat. With a life expectancy of each of these stations of 20 years then this consumption of peat will last for the 20 years. 3.5m tonnes x 20 years ie. 70m tonnes.

Over the past ten years demand for electricity has grown at a rate comparable to the growth in Gross National Product (GNP). Demand for electricity grew from 11.7 million units in 1990 to 16.9 million units in 1997. This demand for electricity is forecast to continue to grow into the future.

Forecast Demand, Capacity and Peak Load 2000-2015						
Year	Demand	Annual Average% Change	Capacity	Annual Average% Change	PeakLoad	Annual Average% Change
	TW		MW		MW	
1995	14.7		4159		3039	
2000	18.4	4.6	4666	2.3	3542	3.1
2005	22.4	4.0	5494	3.3	4230	3.6
2010	26.7	3.6	6248	2.6	5006	3.4
2015	31.1	3.1	7133	2.7	5837	3.1

A feature of future supply forecasts is the reduction in the use of indigenous energy sources. The Kinsale gas field is approaching the end of its natural life and by 2004 will be virtually exhausted. Initial predictions of indicate that up to one third of Ireland's gas requirements could be supplied from the Corrib gas field, even so, considerable gas volumes will continue to be imported from the UK. By 2015 over 60% of Ireland's electricity will be generated from gas, so that even with a supply of gas from the Corrib field, any potential interruptions in the supply of gas imported via the UK pipeline, would leave the country in a difficult position.

Forecast Energy Sources (%) of Units Generated 2000-2015						
Year	Peat	Gas	Coal	Oil	Hydro	Wind &
Other						
1995	11	29	41	15	4	0
2000	9	37	28	18	4	4
2005	9	50	26	7	3	6
2010	6	55	21	9	3	7
2015	4	61	18	7	2	7

Peat power stations offer some degree of self-sufficiency in power generation. Developments in peat combustion technology and harvesting methods have ensured that peat will continue to meet the need for a secure source of energy that is competitively priced. Advances in peat combustion technology have delivered thermal efficiencies in peat-fired generating plant of 38%, equivalent to efficiencies achieved in the existing coal and oil fired generating plants. Against this peat is the least efficient fossil fuel used in Ireland and is expected to incur significant cost disadvantage with the introduction of carbon energy taxation.

Briquette Production

Consumption of solid fuels has declined over the past decade and it is predicted to continue. Briquette production is likely therefore to decline to 50% of present production. 0.5m tonnes dropping to 0.25m tonnes over 20 years ie. 7.5m tonnes.

Horticultural Production

It is expected that demand will grow by an estimated 3% per annum over the next 20 years. from 0.4m pa annum to 0.75m pa annum over 20 years ie. 11.5m tonnes.

Total Production and Consumption of Peat over the next 20 Years is estimated at 88m tonnes.

The volume of peat required over the next 20 years can be extracted from existing bogland already developed for peat production.

The significance of this is that the predicted demand for peat can be met without developing new, pristine bogs. A continuation of peat production, as predicted above, will not lead to the destruction of new peatlands.

90% of fuel peat is transported via the Board's own internal rail infrastructure continued production will have little impact on road transport. The reduction in briquette production and the increase in horticultural production should balance out with regard to road transport.

Over the next 20 years approximately 50% of the land area owned by the Bord na Mona (40,000 hectares) will be fully exploited for peat production and as the areas become available they will be developed into their designated alternative uses.

Private Peat Production

The production of peat by private producers is estimated at 1m tonnes/pa. Approximately 75% of this is in the form of sod turf for domestic use with a further 25% produced as horticultural peat. Precise figures on private peat production are not available and the above figure is estimated from participation in the private bog schemes that were administered by Bord na Mona in the eighties.

In keeping with the drop in solid fuel use it is expected that the use of sod turf will decline over the next 20 years but probably not at the same rate in rural areas as in urban. In line with horticultural market predictions horticultural output by the private sector will likely double to 0.5m tonnes.

Carbon Sequestration

Bord na Mona is examining the ability of peatlands to act as stores of carbon. As peatlands grow and develop they sequester carbon in the form of partially-decomposed plant residues. When the peatlands are drained and developed for energy purposes, the stored carbon is released back into the atmosphere. When the cutaway peatlands are developed for forestry, or for the re-creation of natural wetland ecosystems, carbon is once again captured from the atmosphere and retained in the vegetation. The first part of the research work, which aims to model the carbon capture and release processes in Irish raised bogs, commenced in March 1997.

A second element of research will investigate the effect of different management strategies on greenhouse gas balances in industrial cutaway peatlands. The results will allow a comparison of the effects of different re-use strategies for industrial peatlands on fluxes of the principal greenhouse gases -carbon dioxide, methane and nitrous oxide.

3.1.4 Cut away bogs

Introduction

In the longer term therefore, after it has completed peat extraction, Bord na Móna will have over 80,000 hectares of peatland will have been cut away and available for re-use.

The after-use of cutaway bogs is dependant on many factors, the principal one being drainage capacity. Other factors are residual peat type and depth, the nature of the underlying soils, the cost of infrastructure development such as the provision of access roads etc.

Three principal after-uses of the cutaways have been identified:

- grassland on gravity-drained cutaways with shallow peat depth;
- forestry on gravity-drained cutaways;
- wetland wilderness in the areas with drainage difficulties.

Bord na Mona is committed to the long-term integrated planning of the emerging cutaways to maximise their economic and environmental potential.

Current Trends

The amount of peatland that will become available as cutaway over the next few years is relatively small. Although significant areas have been and will continue to be withdrawn from production they remain unusable until substantial adjoining areas become available with independent access. In the meantime areas not in production are maintained in a way which keeps them suitable for their planned long-term after-use.

A project to develop wetlands and to research the related ecological processes has been in place for some years. It is funded equally by Bord na Mona and the EU. Under this programme some 900 hectares of alkaline wetlands have been developed on cutaway bogs. Within this area, 26 hectares of quality angling lakes have been created. These are now stocked with coarse fish and angling facilities have been provided.

Up to 50,000 hectares of industrial cutaway could have the potential to be developed as forestry. This would make a significant contribution to the national policy of substantially increasing the proportion of the country's land devoted to forestry. The BOGFOR research programme was established began in 1997/98 to seek ways to improve existing afforestation and to maximise the productivity of future crops. The programme is co-ordinated by the Department of Environmental Resource Management of University College Dublin and includes as partners Bord na Mona, Coillte and the Forest Service.

It is still not clear whether sustainable forestry is possible on Midland Bogs. Earlier studies show problems of :-

- i) high incidence of frost
- ii) Low potassium levels due to distance from sea
- iii) Poor management system of bogs
- iv) Trials for appropriate species

The 1997/98 investigations are currently being assessed.

Conclusion

While the immediate release of cutaway bog may be limited there is no doubt that in the medium to longer term the 80,000 Ha of land that will result from peat extraction represents an asset of significant potential.

Already investigations have begun into the various after-uses, grassland, forestry and wilderness. Bord na Mona also recognise that the Midland cutaway bog has potential for the development of wind energy, this option is limited however by the current failings of wind energy strategy which forces developers to the west coast and upland areas.

Future Trends

It is expected that of the 40,000 Ha that will become available over the next 20 years some 20,000 Ha will be developed for afforestation both hardwood and coniferous. Some 4,000 Ha will be capable of development into grassland and assuming that no change in market demand for agricultural land occurs this development will proceed speedily. The remaining 16,000 Ha has drainage difficulties and will be developed as wetlands/wilderness. The principal benefit of the latter use is the creation of quality wildlife habitat which will help in some

way to redress the destruction of wildlife habitats which has occurred due to peatland and agricultural drainage over the past decades.

Wind Energy

Bord na Mona is already involved in windfarming. The current policy on competition for wind energy favours tax-driven developers and installations on elevated sites with high wind regimes. A change in this policy could make it commercially viable to install wind farms on the extensive Bord na Mona cutaway bogs with lower wind regimes.

Given the issues raised in section 3.1.2 regarding size and location of windfarms and the pricing regime, the location of windfarms on the cutaway bog would appear to offer a significant opportunity to resolve some of the windfarm conflicts.

Tourism Potential

Bord Failte has identified that the tourism base in the Midlands is poorly developed compared to the established tourism areas. Much of the Bord na Mona bogs in the Midlands are located in “Developing Tourism Areas” or “Special Interest Activity Areas”.

The 16,000 Ha with drainage difficulties to be developed as wetlands/ wilderness clearly has the potential to advance the tourism base in the Midlands than exists at present.

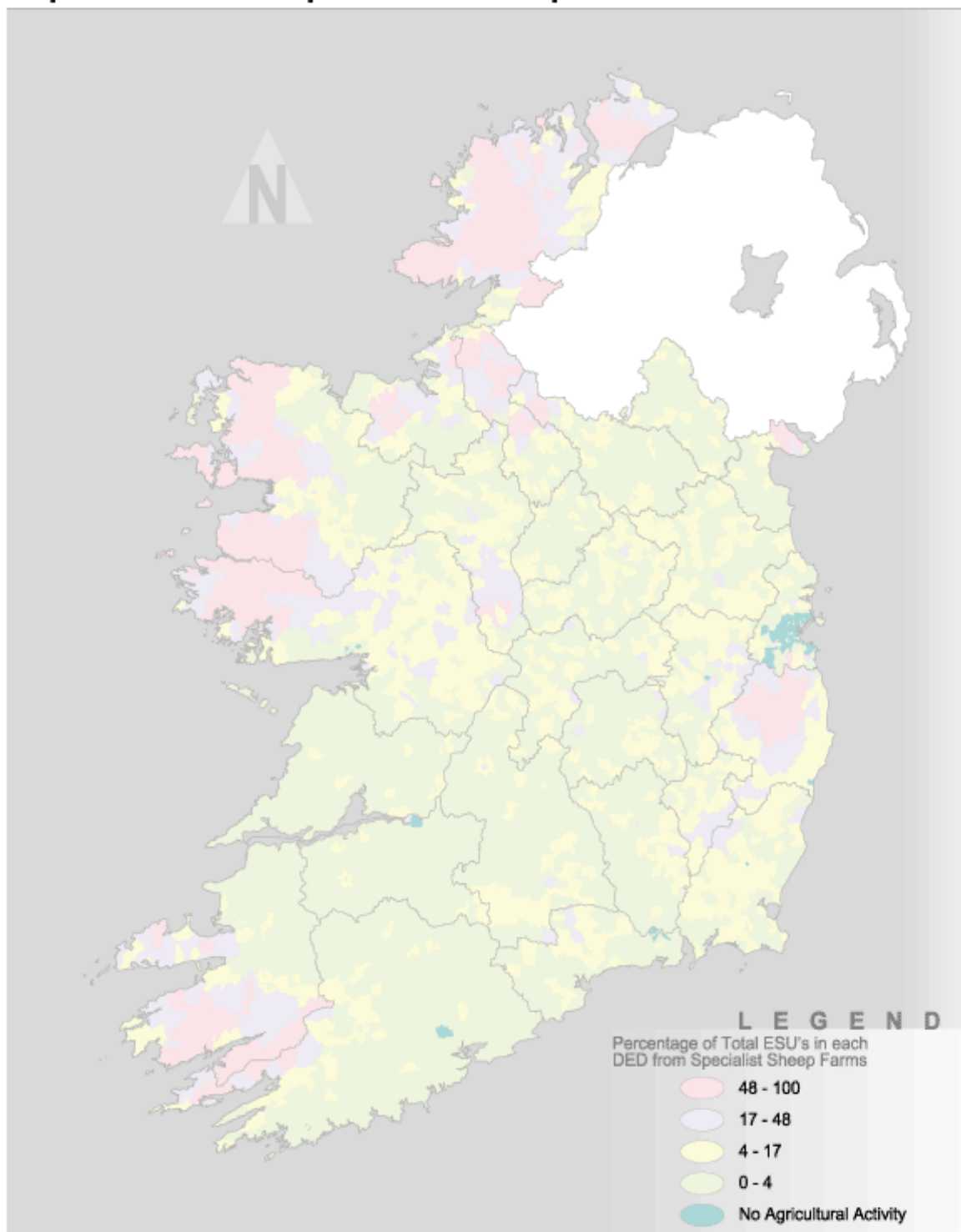
3.2 Intensive Land Uses

3.2.1 Overgrazing

Introduction

Overgrazing by sheep in the upland parts of Counties Mayo, Galway, Donegal and Kerry in the west of Ireland is a serious problem. Overgrazing affects water quality by silting and biological contamination, in addition to adverse impacts on natural habitats, flora and fauna. The overstocking of sheep arose as a consequence of EU Headage payments to farmers based on the number of sheep carried on their land. As a result farmers increased their sheep numbers considerably and frequently well in excess of sustainable stocking densities.

Map 5 - Economic Importance of Sheep 1991



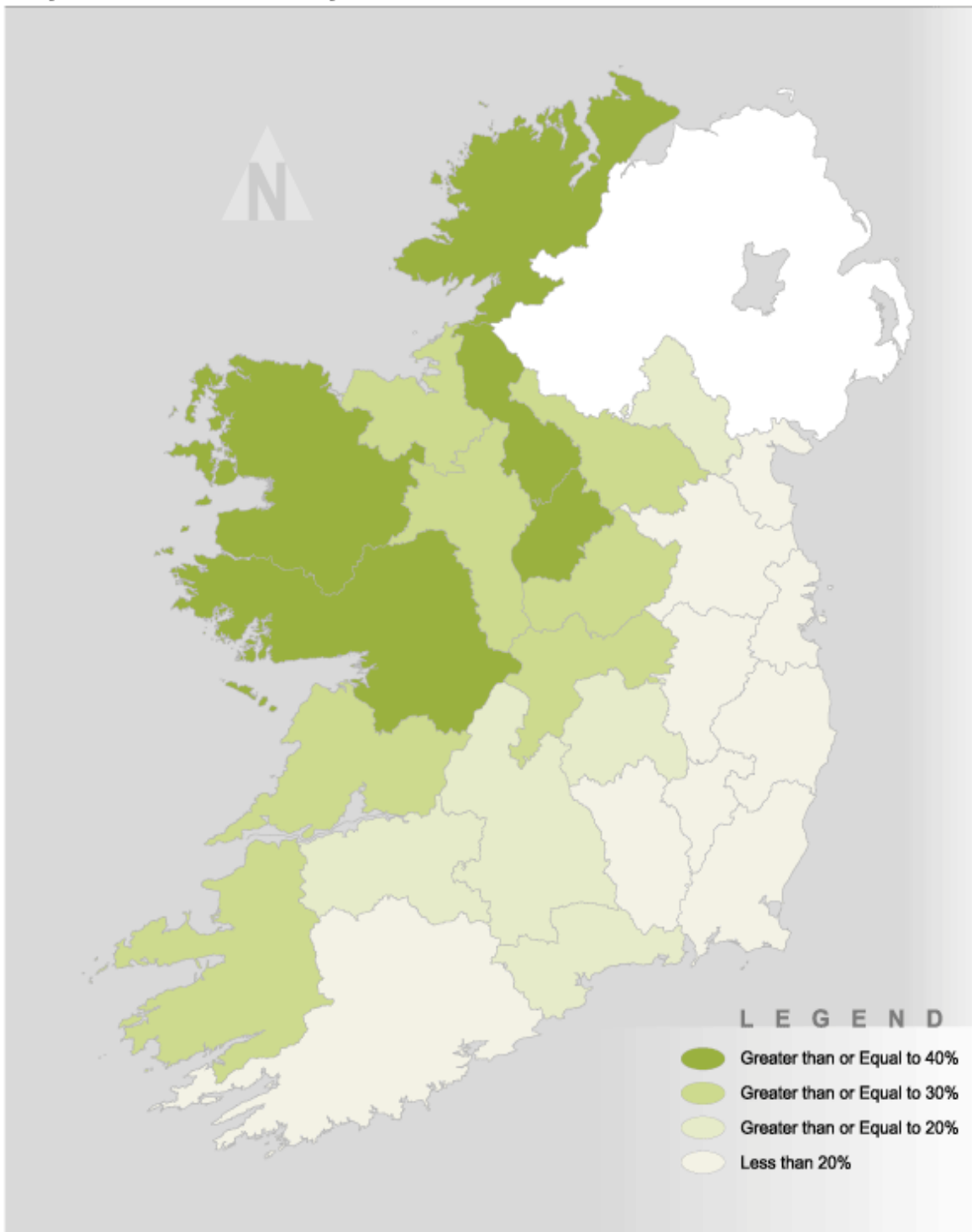
The number of sheep in the country increased by more than 5 million animals between 1980 and 1992 from 3.3 million to 8.9 million. Since 1992, sheep numbers have decreased somewhat to 7.7 million animals in 1996. Teagasc estimate that around 20% of the upland area (0.3 million Ha) may be affected by soil erosion to varying degrees with overgrazing by sheep one of principal contributing factors.

Current Trends

The introduction of the initial Rural Environment Protection Scheme (REPS) was expected to assist in reducing the overgrazing problem. This did not prove to be the case and REPS has since been modified to make it more effective in reducing sheep numbers. It is anticipated that these modifications, combined with the introduction of the SAC programme initiated in March 1997 and the introduction of further cross-compliance controls in 1998 should greatly assist in alleviating the serious overgrazing problem.

REPS was initiated in 1994. The scheme has a five year budget of £230 million, which is financed by the EU (75%) and the National Exchequer. In March 1997, 23,279 farmers were participating, at a cost of over £82 million and covering 773,232 hectares. It would appear that the target set in the National Sustainable Development Strategy, namely to have 30% of all farmers participating in the REPS by the year 2,000, will be achieved.

Map 6 - Area Under Repts as % of Area Farmed 1991



Participation in REPS is voluntary and farmers from any part of the country can apply. The same uniform scheme applies across the country. The objectives of REPS are to *establish farming practices and controlled production methods which reflect the increasing concern with conservation, landscape protection and wider environmental problems; protect wildlife habitats and endangered species of fauna and flora; produce quality food in an extensive and environmentally friendly manner.*

There are supplementary measures to deal with NHAs/SACs; and the rejuvenation of degraded areas; these are mandatory in proposed NHAs/SACs and Degraded Areas. Participants in REPS who have land within an NHA or SAC must comply with conservation prescriptions set out by National Parks and Wildlife for the NHA or SAC, as well as complying with the basic REPS requirements on the rest of the holding. Farmers receive additional payments for NHAs and SACs above those applying for the basic scheme.

Measures to assess the damage to overgrazed areas and to establish optimum stocking densities are under way with the Commonage Assessment Survey. This Commonage Assessment Survey will survey all commonages, commencing in the West of Ireland and agri-environmental plans will be produced for each commonage. These plans will be used by REPS planners to produce individual farm plans.

Conclusion

Should an ideal stocking rate be adopted and observed, grazing could be maintained in those areas that bogs have as yet suffered only minor damage. Limited field research conducted by Duchas has shown that recovery of vegetation cover in experimental enclosures can be dramatic, indicating that for some areas at least, removal of sheep for indefinite period could be effective in assisting natural regeneration, especially if the root mat is still intact. However, some blanket bog areas are so severely damaged that withdrawal of sheep is unlikely to lead to a restoration of bog vegetation in either the short or medium term.

The commonage framework plans should provide valuable ecological data for evaluating the success of REPS in future years in restoring and managing these fragile systems. Concerns have been expressed about the ecological expertise of REPS planners and the competitive pressures under which they operate the scheme. It is important that there is a clear and transparent mechanism for monitoring and evaluating the scheme. As REPS is one of the principal mechanisms to meet conservation objectives in national and European sites, appropriate ecological management these areas under REPS is essential.

Future Trends

The requirement since 1998 for cross-compliance between REPS and the Headage and Ewe Premium Schemes in areas degraded by overgrazing and subsequent extension of this requirement to all commonages), the development of Commonage Framework Plans and the introduction of the SAC programme, are positive developments and should help address the overgrazing brought about by these sheep payment schemes.

However, it appears incongruous that one scheme, REPS, makes payments to farmers degraded areas, to counteract the negative effects of other schemes –the Ewe Premium and Headage Payment Schemes. It would be far more desirable that environmental objectives would be an integral part of all relevant agricultural grant schemes. It is anticipated that the modifications to REPS combined with other cross-compliance controls introduced in 1998 should assist in alleviating the serious overgrazing problem.

A recent Government evaluation of REPS indicated that while it was having positive environmental and socio-economic impacts a need for better evaluation procedures and indicators is required. While Teagasc and other organisations have undertaken studies on aspects of the Scheme, the lack of adequate baseline information in REPS plans and the absence of a formal country-wide environmental monitoring programme of representative farms make it very difficult to assess the environmental benefit of REPS nationally. Thus it is important that a system for baseline data collection and monitoring be established.

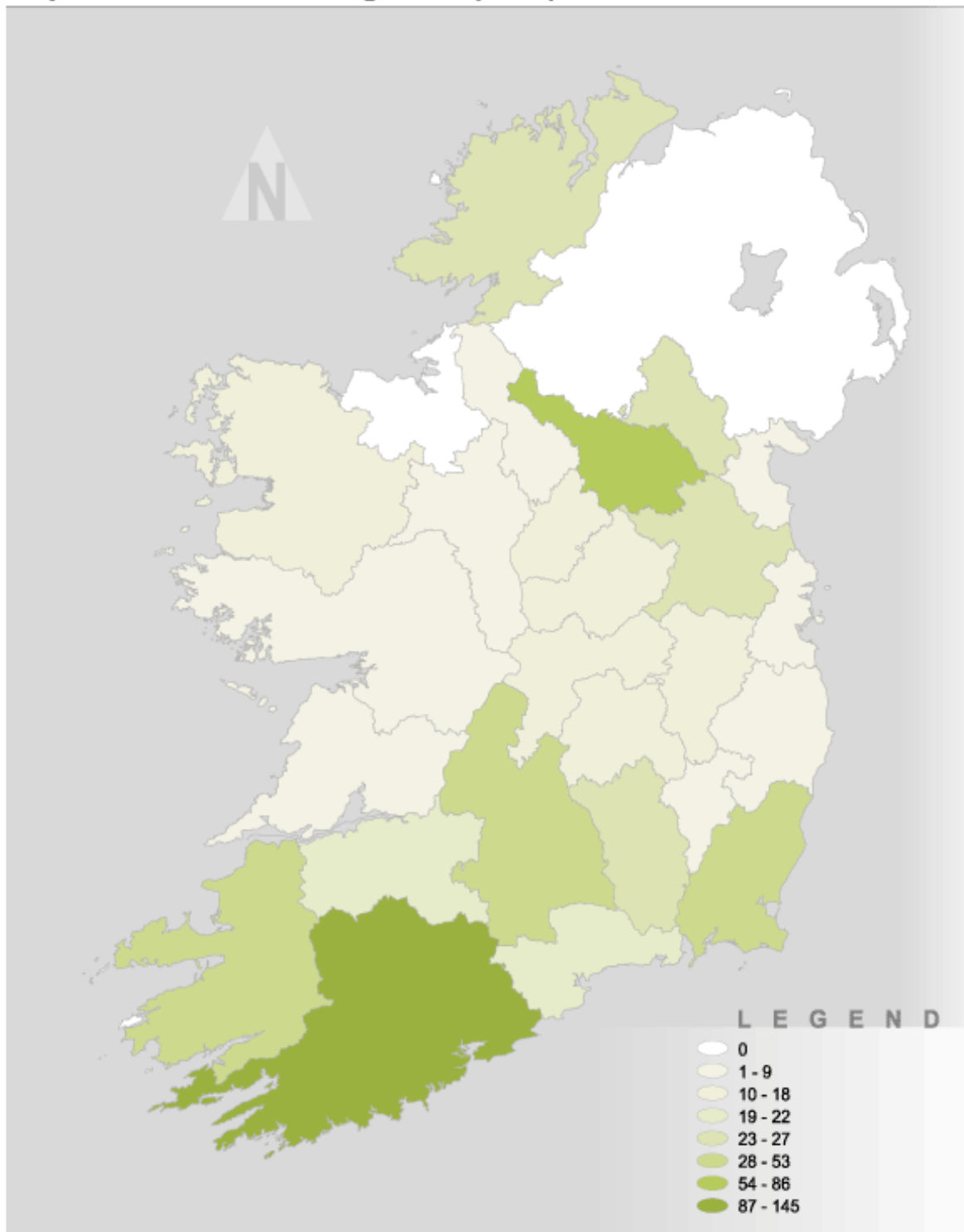
3.2.2 Intensive agriculture

Current Trend

Pig Production

In 1997 pigs contributed 7.7 per cent of the value of gross agricultural output. Traditionally, pig rearing took place on a very small scale on a large number of farms. In many cases a farm household may have had only one or two sows. This pattern has changed dramatically and profitable pig production now requires a large number of animals and has come to be a highly specialised activity dominated by a small number of very large producers. In 1973 the average size of herd was 29 animals, by 1983 this had increased to 114 and by 1997 it was 846, indicating the extent of the 'industrialisation' associated with pig production.

Map 7 - Distribution of Pig Units (1999)



Pig rearing is now confined to approximately 2,000 farms, of which one-fifth account for 91% of the total number of animals. The largest numbers of pigs are found in the South-East region which has over 21 per cent of the total herd while the South-West and the Border (east) regions follow with 20 per cent each. On a county basis the highest numbers are located in counties Cork and Cavan each of which has 16 per cent of the total. Generally the total number of pigs has increased in all regions since 1980 although decline has been recorded in some individual counties.

Recently Irish pig production has been subject to the worst depression in modern agriculture in terms of economic viability. The fall in pig prices started in 1997 and has continued. In previous recessions in pig prices there were quick reductions in sow numbers, which brought about reduced pig output and increased prices. Given the current structure of the Irish sow herd it is difficult for rapid contraction in numbers to take place ie there are fewer units and those that are producing are very much larger in scale.

A. INTEGRATED BREEDING & FINISHING UNITS		
Unit Size (Sows)	No. Units	Total sows
20-49	24	930
50-99	48	3,450
100-299	207	38,335
300-499	56	21,345
500-999	61	38,720
1,000 +	26	42,585
Totals	422	145,365

B. SPECIALISED BREEDING UNITS		
Unit Size (Sows)	No. Units	Total sows
20-49	31	1,080
50-99	30	2,135
100-299	40	7,180
300-499	14	5,345
500-999	11	6,825
1,000+	5	6,960
Totals	131	29,525

C. SPECIALISED FINISHING UNITS		
Unit Size.	No. Units	Total places
150-499	25	7,450
500-999	27	18,950
1,000-2,999	33	55,700
3,000-4,999	11	41,400
5,000+	7	45,500
Totals	103	169,000
Grand Totals:	553 Sow Units	174,890 sows
	525 Finishing Units	858,000 places
	657 Commercial Pig Farms	

Between 1997 and early 1999 Sow numbers increased by 6,775 (+4%) to about 175,000 sows. The decline in the number of commercial pig units has resumed with a fall of 10% to 657 farms. The number of sow units under 100 sows has fallen by 26% and now account for approx. 4% of all sows. The average herd size has increased from 274 sows to 316 sows. Integrated units now have an average size of 344 sows, while specialised breeding units average 225 sows.

The percentage of sows in integrated breeding and finishing units has increased from 76% to 83%. A significant number of producers operate breeding and finishing units on separate sites and these are classified as specialised breeding or finishing units. There was a 37% reduction in the number of specialised breeding units over the last two years.

The main features of the current pig herd structure are a total sow herd of 174,890. The current sow numbers are capable of producing 3.85 million pigs per year. Approximately 191 pig units (i.e. >300 sows or >3,000 finishing places) may be liable for an IPC licence from the EPA. There are now 31 units with more than 1,000 sows each, carrying 49,545 sows (28% of total sows). There are now 103 units with more than 500 sows each, carrying about 95,000 sows (54.4% of total sows). The increase in the number of sow units has taken place in integrated units > 100 sows.

County	Breeding Units		finishing pigs		Total No.
	No. Units	No. Sows	No. Units	No. Pig Places	Pig Units
Longford	13	7,385	13	33,900	15
Westmeath	10	7,365	12	37,800	15
Wexford	28	6,875	25	30,000	33
Kilkenny	21	6,315	21	31,400	24
Limerick	17	6,225	17	24,000	21
Offaly	14	6,000	12	18,400	17
Laois	17	5,570	10	20,600	18
Kerry	30	5,405	18	29,900	35
Monaghan	23	4,040	23	22,000	26
Meath	19	4,785	21	23,600	24
Kildare	12	4,560	15	15,700	16
Donegal	25	3,815	22	20,300	27
Leitrim	9	3,665	8	13,900	9
Mayo	14	3,095	15	18,900	17
Carlow	9	2,375	8	11,000	9
Roscommon	7	2,135	7	10,000	7
Louth	5	1,965	7	8,500	8
Wicklow	5	1,580	7	14,800	7
Clare	5	1,385	5	6,500	7
Galway	7	865	8	4,500	8
Sligo	2}				
Dublin	1}	950	7	10,500	8
Totals	553	174,890	525	858,000	657

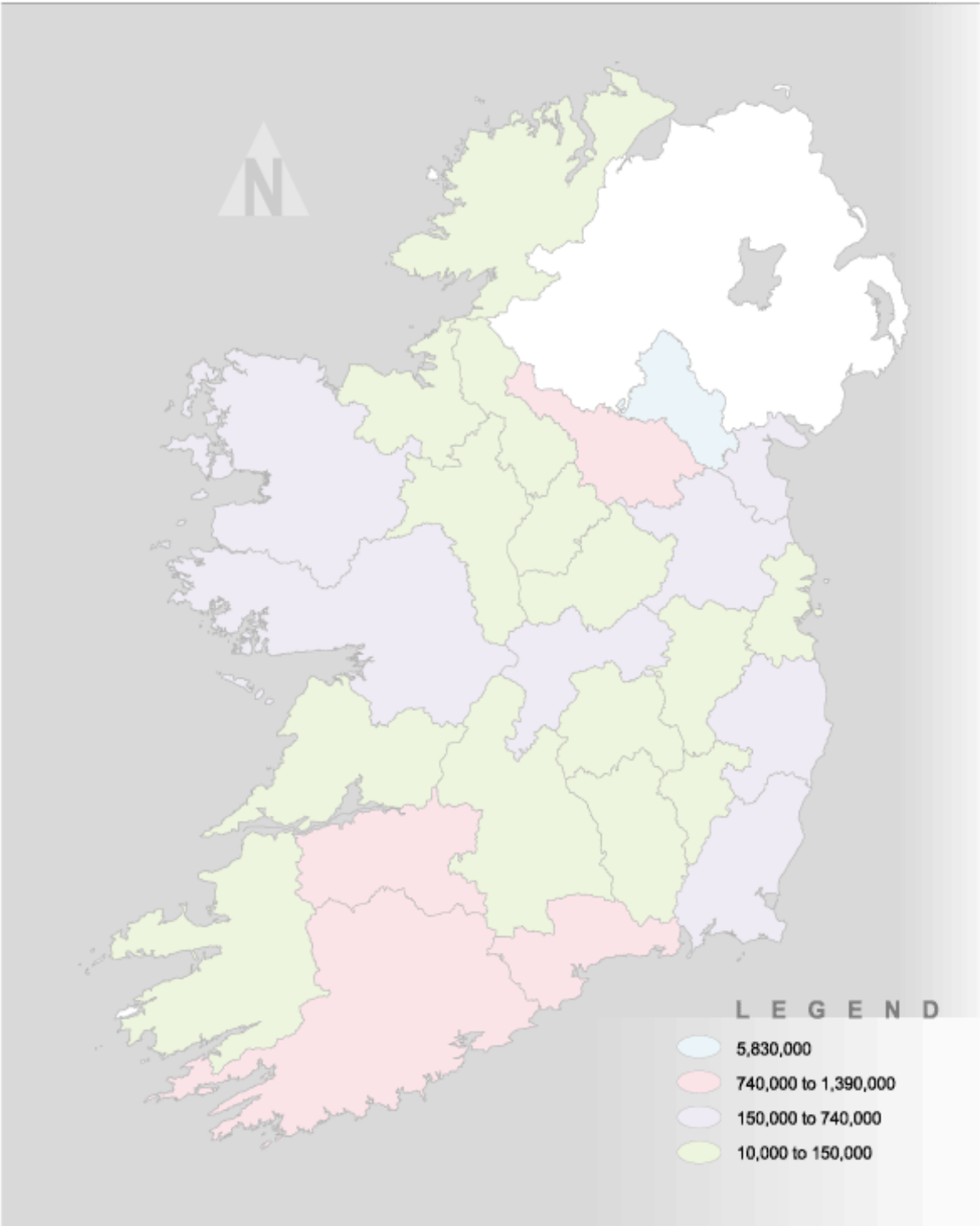
Over half of all sows and finishers are found in just four counties (i.e. Cork, Cavan, Tipperary and Waterford). More than three quarters of all pigs are found in 11 counties. The concentration of sows in Co. Cavan is 1 sow per 4ha farmed, compared to 1 sow per 15ha in Cork and 1 sow per 21 ha farmed in Tipperary. The national average is about one sow per 25 Ha of farmed area.

The majority of counties showed an increase in sow numbers during the last two years, with the largest increases in Counties Cork, Westmeath and Longford. The number of sows in Cavan and Monaghan has fallen in the last two years.

Poultry Production

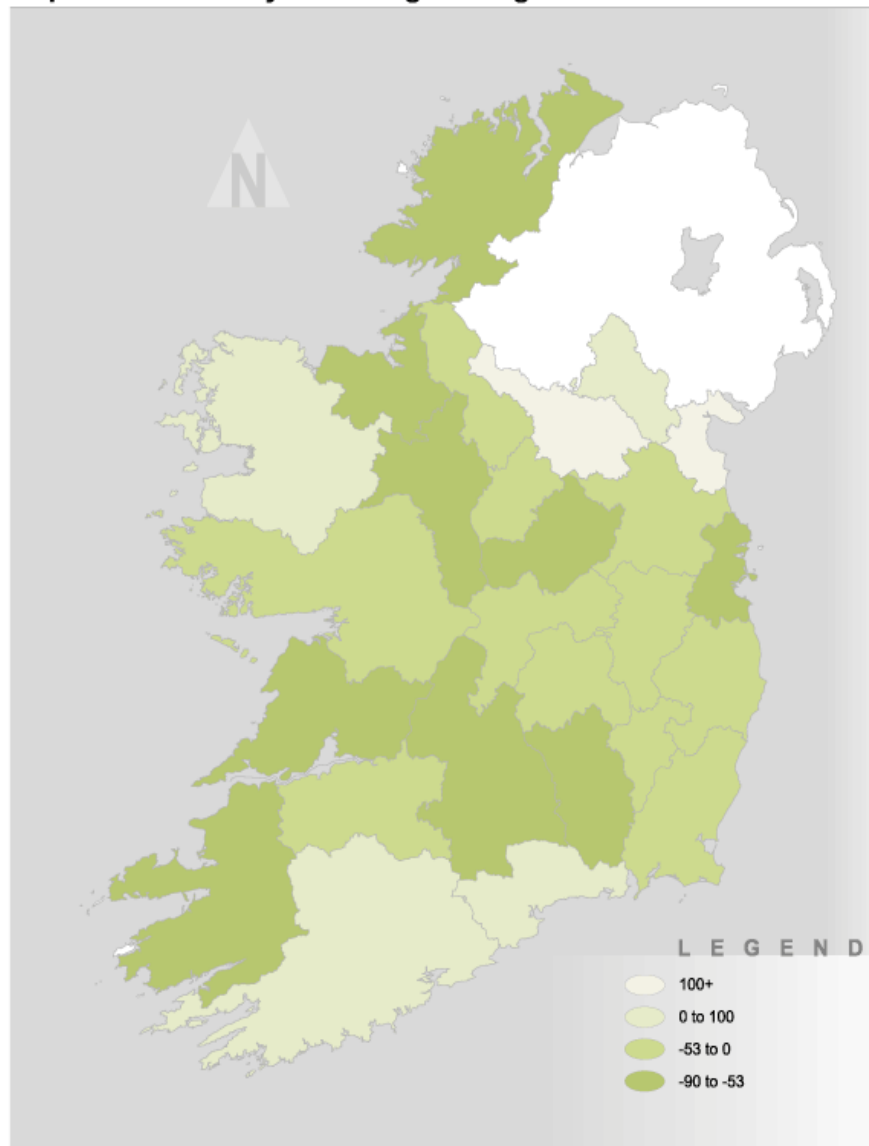
Traditionally, poultry were kept on a free-range basis on many farms throughout the State. They had a particular association with small farms on which they provided a much needed additional source of income. Changes in the organisational structure of poultry production have resulted in this enterprise becoming highly specialised and concentrated. In 1991 poultry were kept on just over 26,600 farms with an average flock size of 453 birds. However, approximately 720 large units, with an average flock size of over 11,200 birds, accounted for two-thirds of the total. About 30 per cent of the flocks are on specialist dairy farms, and another 20 per cent are on mixed grazing livestock farms. shows that over 56 per cent of the total flock is located in the Border (east) region. At county level, almost half of the total is in Monaghan.

Map 8 - Total Poultry 1991



The increasing concentration is seen in the Border Region where Poultry numbers increased by over 87% between 1980 and 1991. Conversely decreases were recorded in almost every other region. The trend since 1991 indicates significant decline in the West and Midland regions while concentration continues in the Border region and also in the Mid-West after some decline there in the 1980s.

Map 9 - Total Poultry Percentage Change 1980 - 1991



Conclusion

Intensive agriculture, in the form of pig and poultry production have been under going major structural change. The main thrust of reform in both these sectors has been the concentration of production into a smaller number of larger units, as well as an overall increase in actual pig and poultry numbers.

The area of pig production would appear to be expanding out of the traditionally strong production counties of Cavan and Monaghan in which pig numbers which have declined, into the adjoining counties of Westmeath and Longford. This expansion could be as a result of capacity constraints in effluent disposal in Cavan and Monaghan.

Future Trends

It is likely that, for the foreseeable future, pig and poultry production will continue to rationalise into a smaller number of units which will be substantially larger in scale of operation than previously existed. Smaller producers will be forced out and the surviving producers will be very large. The estimated number of pig producers is likely to be about 500 compared to the 2873 farms who kept pigs in 1991. The concentration of production will be geographically limited to existing production areas and expansion about their margins.

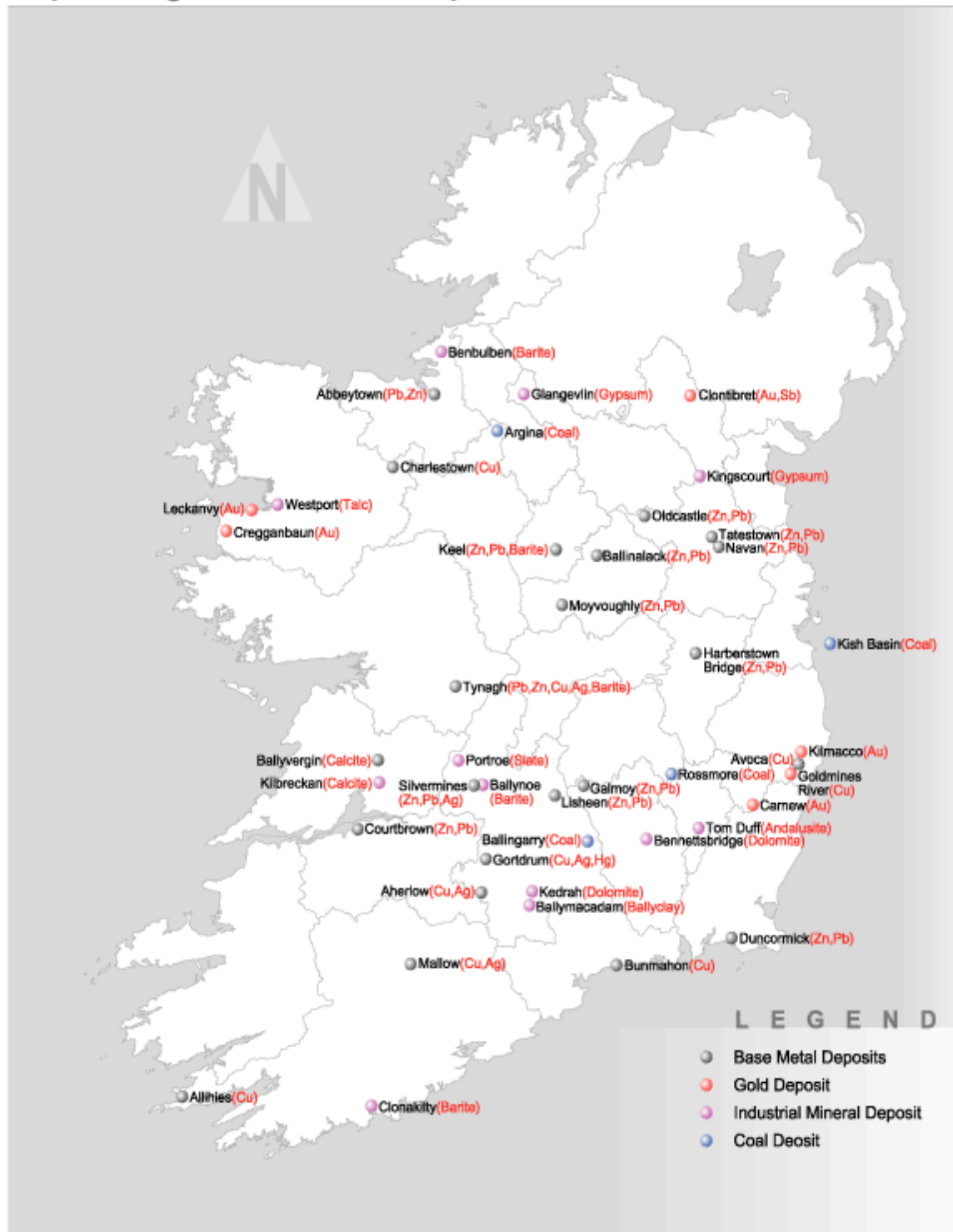
3.2.3 Extractive Industries

Introduction

Mining and aggregate extraction can have significant impacts on the environment and economy.

Modern practice in mining and quarrying ensures all care is taken in the siting and development of mines and quarries so that they do not adversely affect the tourism and recreation economy. Possible problems of concern would include Visual disturbance from excavations, spoil heaps, storage mounds as well as noise, traffic dust and discharges to waters.

Map 10 - Significant Mineral Deposits



As these operations are essential for development, the nature and effect of the undoubtedly increased levels of mineral and aggregate extraction must be balanced with the environmental, social and economic consequences of such development.

Current trends

Exploration & Mining

Recent exploration mining industry activity in Ireland does not reflect the global downturn in the industry. Mine production ensured that Ireland maintained its position as the 7th largest producer of zinc and the 12th largest producer of lead internationally.

Intensive exploration for minerals in Ireland has continued largely focused on zinc but with significant expenditure also on the search for gold. There is also some exploration interest for gemstones.

Exploration Activity			
	1996	1997	1998
Exploration in Ireland (in IR£M)	7.14	8.05	9.34
Proportion of global exploration	0.213%	0.218%	0.26
Proportion of European expenditure	4.01%	5.59%	9.3
Number of current prospecting licences (at year end)	428	401	397

Although no new economic mineral deposits have been discovered recently, optimism remains high, several new exploration companies have been attracted to the country. Ireland has continued to increase its share of the global exploration budget, and has attracted over 10% of the total expenditure for Europe.

Exploration globally has taken a severe downturn since 1997, with global spending in 1999 reduced to US\$2.7 billion, slumping by some 31% compared to 1997. South America remained the top region for exploration funding (some US\$630 million), while Europe attracted less than US\$100 million. Gold exploration again attracted the most expenditure (50% of the total global figure) while base metals exploration increased proportionately from 27.1% in 1997 to 32% in 1999. Of the 1999 base metal budget some 32% was allocated to zinc-related exploration.

The largest mines in the country are Lead-zinc mines at Navan, Co. Meath, Galmoy, Co. Kilkenny and Lisheen, Co. Tipperary. Large scale production of gypsum continued at Knocknacran, Co. Monaghan, with lesser output from other smaller mining operations for various industrial minerals.

An indication of the interest in mining can be gained from the fact that in 1999 125 applications for 106 prospecting licence areas were made to the Department of Marine and Natural resources. 119 Prospecting Licences were granted 63, expired or were surrendered, 147 existing licence areas were assessed and continuation recommended under the Prospecting Licences Review Process. 22 Renewal Applications were assessed and recommended.

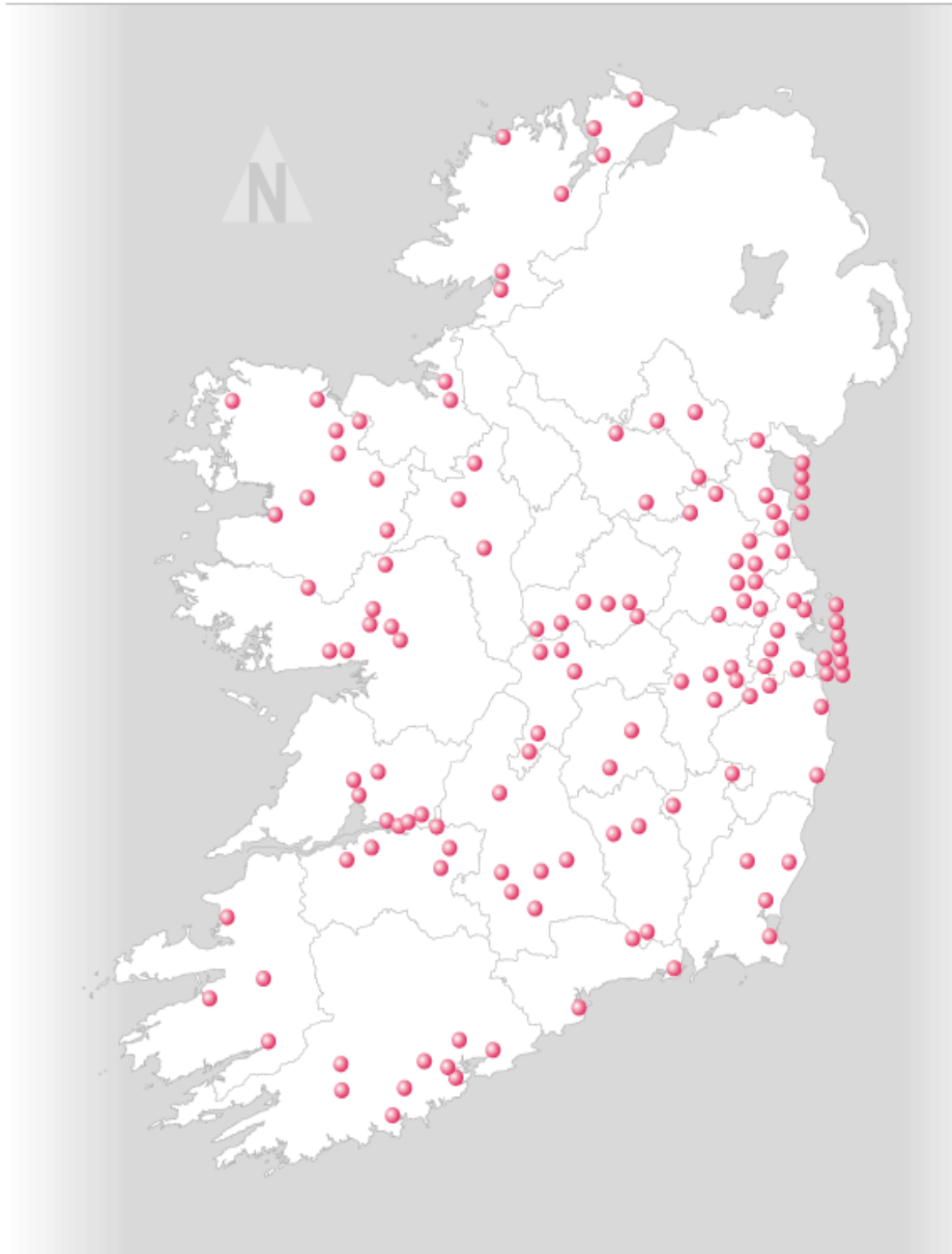
Quarrying and Aggregate Removal

Overall consumption of aggregates in Ireland is now estimated to be approaching 50 million tonnes per annum or approximately 14 tonnes per capita per annum. One indication of demand is that approximately 300 to 400 tonnes of aggregates are needed to build a typical house with housing provision at 50,000 pa to 2005, somewhere between 15 and 20 million tonnes of aggregates will be required for housing alone.

Approximately 35 million tonnes of aggregates are obtained from hard rock quarries and about 15 million tonnes of sand and gravel are extracted by direct digging from pits. In some instances an apparent scarcity of suitable inland sources in certain areas, there has led to an increased interest in offshore extraction of sand and gravel.

The industry is made up largely of small scale operations of the 357 pits and quarries producing primary raw materials and aggregates. 73 are operated by public companies and 284 by private/ family firms. Of the 201 readymix concrete plants, 65 operated by public companies and 136 are operated by private family firms. There are 101 Concrete Block Plants with 36 operated by Public Companies and 65 operated by private/ family firms.

Map 11 - Aggregates & Roadmaking Materials



In 1999 the concrete products sector utilised on average only 83% of its nominal capacity. The seasonal trends in the construction industry, and regional variations in demand resulted in some firms operating at full capacity for substantial periods during 1999. The industry is highly flexible, and can increase capacity without substantial difficulty, and demand was catered for during 1999.

Conclusion

Mining and minerals exploration are significant contributors to the national economy but by their limited distribution and fixed location they are not amenable to influence by spatial policy. Mines do create spatial policy issues themselves such as transport links, location of processing plants, environmental considerations etc.

Aggregate and Sand/Gravel extraction are more subject to spatial policy given their wider distribution. Generally quarries & sand/gravel pits service a 30 mile radius from the sources material (based on economics of transport). There is significant clustering of quarries & sand/gravel pits around the major cities, where development is concentrated. The demand for construction materials will accelerate as a result of the implementation of the NDP. In this context the ICF anticipates that the industry has sufficient capacity to meet future demand.

Given the enlarged demand for building materials the environmental considerations associated with aggregate and Sand/Gravel extraction will be increased.

Future Trends

The National Development Plan

The NDP provides for investment of IR£40.6bn to the year 2006, of which IR£17.6bn (43%) will be directed towards public infrastructure. In addition the two regional Operational Programmes have significant projections for infrastructure investment. The high investment on "hard" infrastructure reflects a shift in policy focus from efforts to address unemployment, industrial capacity and training, to the removal of infrastructure bottlenecks, congestion and housing deficits that now emerge as the more significant national economic challenges.

NDP and Construction Activity

The National Development Plan will impact on construction activity and therefore aggregate demand by:

- direct funding of public built infrastructure;
- Co-financing building investments in private agriculture, industry or service-sector activities
- Facilitation of private sector housing, retail, commercial and other commercial development

The ICF* Report “A Strategy for the Concrete Industry in Ireland” estimates that:

Demand for private housing will be for an annual average of 48,000 new dwellings per year over the period to 2005.

An annual average of 5,000 new public housing units will be required over the period of the plan. The volume of construction activity in public housing provision is forecast to increase sharply in 2000 and 2001 (84% greater than 1999). Thereafter growth will be more modest year-on-year.

New office construction is expected to increase on average by 4.3% per annum up to 2006.

Growth in industrial construction is likely to be low given the limited labour availability for new industrial employment.

The development of the National road network over the NDP period is forecast to increase by over 100% by 2002, and to grow thereafter at more steady rates up to 2006.

Tourism-related new construction, energy sector and education sector activity will in all likelihood have modest growth.

New construction of water and sanitary facilities is forecast to increase by 22% in 2000 and by 18% in 2003, with periods of stability following both peaks.

The volume of construction of new retail and wholesale building is expected to increase by an average of 3.9% annually over the 2000-2006 period.

Taking recent trends in agricultural construction into account it is anticipated that there will be a decline of about 5% per annum to 2006.

Aggregate Construction Forecasts

Given the scenario outlined above the overall volume of construction activity is expected to grow substantially over the 2000-2006 period.

Rate of Construction Volume Growth 2000-2006						
	2001	2002	2003	2004	2005	2006
Annual construction volume growth (%)	6.9	4.2	2.9	2.3	1.5	0.1
Cumulative increase on 1999 base	12.6	17.4	20.8	23.5	25.4	25.5

The general conclusion is that the construction industry and construction output will continue to grow at high levels over the period 2000-2006, although not at the very high rates of recent years.

*. ICF Irish Concrete Federation

Future Industry Capacity

The ICF Report shows that capacity increases planned and/or committed to by the industry, for the year 2000 will increase nominal capacity by 13%. This in turn infers a nominal processing capacity of £1.54 billion by end of 2000.

If no further investment were to take place, and if overall demand were to increase as predicted, demand in 2003 will be £1.37 billion at constant prices.

This future demand is lower than the nominal 2000 capacity.

If investment in plant, equipment, technical capability and increased capacity continues as in recent years, the ICF is of the view that there is sufficient processing and extraction plant capacity to cater for expected future needs.

The key constraints on capacity in the opinion of the ICF are likely to be regulatory restrictions such as on vehicle movements and the level of quarrying activities permitted.

Quarrying and sand/gravel extraction invariably involve the creation of unsightly areas in the landscape. Given the expected demand for the raw material of construction the impact on visual amenity and other potential environmental impacts will also increase.

Re-cycling of Building Material

The recycling of construction, renovation and demolition waste can mitigate the potential environmental damage from aggregate extraction. The composition of the waste is variable and depends on the type of activity from which it arises

2.7 million tonnes of construction and demolition waste were sent to landfill sites in 1998. 1.7 million (43%) tonnes was recovered and used within the landfill sites themselves. The amount of construction and demolition waste will be significantly higher over the short and medium term, given the predicted level of construction activity. The recycling of construction and demolition waste does represent an opportunity to examine, in an integrated way, the whole question of the extractive industries. As long as stocks of natural aggregate remain high, the incentive to move towards recycled material will depend on the price differential. The increased use of recycled building materials will have the twin benefit of reducing both the environmental impact of quarrying and the material going to and landfill.

3.2.4 Tourism “Hot-spots”

Introduction

In the period 1994-1999 tourism both in absolute numbers and revenue generated has increased dramatically in Ireland. Overseas tourist trips had an average annual growth rate of 10% however due to reduced length of stay the average annual bed-night grew by only 6% from 34.8 million overseas tourist nights in 1994 to 45.6 million in 1999.

Current Trends

Ireland's tourism sector has outperformed European averages, growing at 7% on average over the past 5 years, compared with the European average of 3%. In 2000, it is expected that 6.3 million visitors will have visited Ireland and that this figure could increase to over 8 million by 2006. Under the NDP, foreign revenue earnings from the Irish tourism sector are projected to grow by 5% on average.

The trends in tourism over the past few years has been to reinforce the dominance of certain areas, e.g., Dublin and the SW, as reference to Overseas Visitor bed-nights indicate.

Dublin's increase in Tourism can be accounted for by its popularity as a short-break urban destination. There is also an element of “catch-up” in relation to Dublin because, historically, Dublin's share of the market had been less than might have been expected for a capital city.

It should, however, be noted that even regions which lost relative shares did have some growth in volume.

It is clear that within the regions there are variations, with some destinations at or near their peak season capacity given the current approaches to management of tourism traffic and infrastructure provision in those areas. It is, therefore, essential to focus on those areas which have the capacity to generate and absorb new growth in a sustainable manner.

Over the past few years there have been many instances of peak-season congestion at popular sights, attractive urban tourist centres, and major touring routes. Peaceful environments and natural habitats can have their unique ambience destroyed by much lower visitor numbers. It must be accepted that such locations can have a finite carrying capacity and when this is exceeded, the destination is diminished and so is the pleasure of the visitor and of the resident community.

Firm action now needs to follow from the Pilot Initiative on Tourism and the Environment to establish such carrying capacities and to introduce effective visitor management programmes that will secure the integrity of our famous tourism sites. It is clear from the experience with the Pilot Project that local authorities have a key role to play in co-ordinating the implementation of the lessons learned.

Future Trends

Both nationally and internationally, holiday patterns are changing. The average duration of holidays appears to be decreasing. The number of short-term breaks is on the rise. This has implications for spatial spread of tourism given that large urban areas with international access, like Dublin, tend to be the primary beneficiaries of the international short-break business in particular.

Different nationalities have different preferences as between urban and rural locations. That means that increases/decreases in visitor numbers from different countries may have significantly different spatial implications.

Activity holidays are on the increase and this can be of benefit to non-urban areas provided international standard facilities and integrated marketing plans are in place to avail of growing opportunities.

Labour shortages may also have an effect on the spatial spread of the industry. With large student/migrant populations, the industry in Dublin may be better placed to acquire temporary/part-time staff than the industry in other areas, especially in the BMW Region.

At present, the B&B sector is experiencing difficulties in more remote areas. The B&B sector has come under pressure from better facilities and lower prices at 3-star hotels in particular. It may also be affected by a large increase in self-catering and, in some areas at least, by an over-supply in the B&B market.

Threats

Although Ireland is performing well in attracting visitors from North America and Britain, it is losing market share in the major Continental markets of France and Germany. It is worth noting that a major competitor like Scotland, has been experiencing decreasing visitor numbers in recent years.

Inflationary pressures are a concern because of potential impacts on price competitiveness.

Labour shortages are a significant issue both in relation to quality of welcome and service and pose particular challenges to the industry in terms of management, training and productivity.

One of the reasons for the softness in performance in some of the major Continental markets may be a perception in these markets that the core values of Irish tourism are in decline.

The core values, which attract visitors to Ireland, according to ITIC/BFE analysis, are Landscape and People. There appears to be a growing concern in some markets about possible declines in these values.

There is a concern that Ireland is a less welcoming place, that the Céad Míle Fáilte is no longer so evident. In certain markets, the Celtic Tiger image can have a downside in relation to tourism as it conflicts with the traditional images which have attracted people to Ireland in the past.

There are also worries about environmental degradation, e.g., declines in domestic water quality in certain areas, pollution in rivers and lakes which erode the angling base, inappropriate development in scenic landscapes, etc. and the amount of development or use certain locations can absorb without undergoing long-term damage.

Policy Responses

The tourism industry is seeking to address some of these challenges posed by perceived declines in the core tourism values through its People and Place Programme.

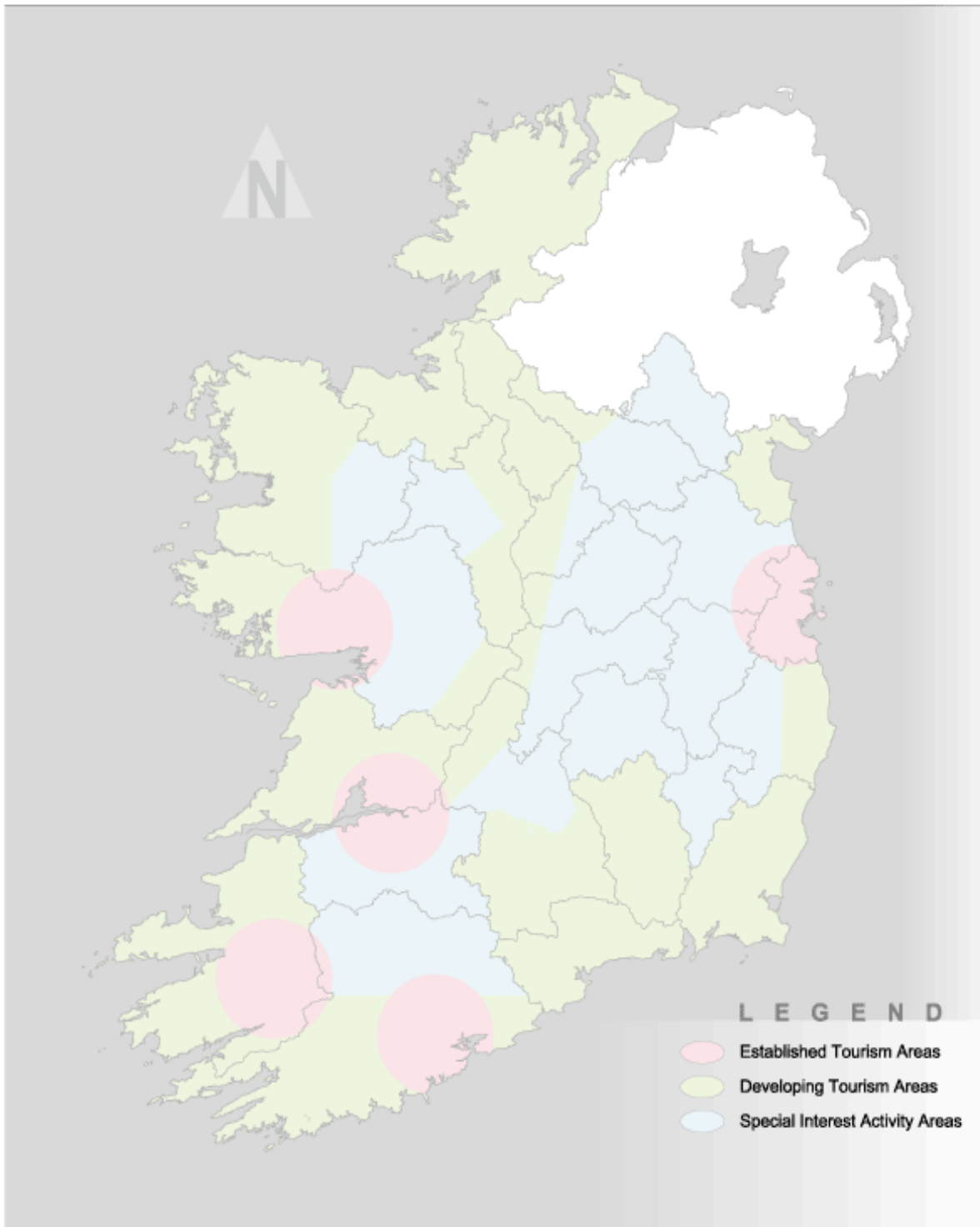
Bord Fáilte

Bord Failte is moving towards addressing Regional imbalance it has £1 million to market regions to the exclusion of congested areas.

A more spatially driven approach to tourism has been developed by Bord Failte in the “Tourism Strategy 2000-2006”, the strategy has developed the concept of Tourism Zones.

- (i) Established Tourism Zones focussed on the main urban tourism centres of Dublin, Killarney, Galway, Cork, Limerick/Ennis
- (ii) Developing Tourism Areas
- (iii) Special Interest Activity Areas

Map 12 - Tourism Planning Zones



Established Tourism Areas will not attract funding in the future from the NDP

In order for the tourism strategy to function properly it is important to establish carrying capacities in order to avoid peak-season congestion. This process must embrace, not just the physical capacity of a destination but also the levels of use at which the ecology is protected, the visitor experience is undiminished and the resident community is not overwhelmed.

The Strategy highlights the need for:

- The application of high standards of visitor management in the established tourism centres
- The active development of a number of growth centres, away from the existing highly developed locations, which have the capacity to evolve into well managed, established centres in their own right.
- The fostering of the highest practical standards in every aspect of the environment on which tourism depends
- Active discouragement of product development and marketing activities which are driving forces for exceeding the carrying capacity of specific locations or sites and which do not meet internationally acceptable product standards for customer service and quality management.
- The rigorous preservation and conservation of our environment and heritage.
- Investment incentives concentrated on the Developing Tourism Areas to help them realise their potential to absorb a higher share of growth. But there will be need for great care in how these incentives are applied. The various zones are diverse and include thriving centres of international tourism, popular home holiday resorts and zones where business/ commercial traffic is the main user of accommodation. Parts of some zones are already quite congested in peak season and sections of other zones are particularly fragile environmentally.

The tourism zones/areas offer an opportunity to resolve conflicts and agree visitor management strategies in the context of a partnership of community, tourism industry and Local Authorities interests. The critical challenge will be to agree growth targets which respect peak season carrying capacities and then to put in place product development action plans which are in harmony with these targets.

Department of Tourism Sport and Recreation

The Tourism Measures in the new Regional Operational Programmes Recreation in co-operation with the Regional Assemblies, incorporate a proactive strategy to improve the spatial spread of tourism. The Tourism Measures aim to promote an improved spatial strategy by concentrating investment in:

- up to 11 (6 in SAE and 5 in BMW), new major day-visitor attractions, capable of attracting over 100,000 visitors a year, in areas where none currently exist and which are capable, environmentally and economically, of supporting such attractions (The Measures clearly list the tourism catchment areas which are regarded as priorities for this type of investment.);
- the upgrading and improved packaging of identified, geographically coherent and financially sustainable, clusters of existing attractions including, where necessary, support for investment in some new projects identified as essential for the completion of such clusters.
- the development of special interest pursuits including cycling, walking, horse-riding, great gardens, outdoor activities, water-based and health tourism, etc.
- the promotion of the better management of the relationship between tourism and the environment, with a particular focus on the implementation of Integrated Tourism Management Plans in established tourism areas.

On the environment side, the assessment of project proposals under the new Tourism Measures will take cognisance of environmental issues but it needs to be recognised that the tourism policy-makers and the tourism industry are not the key players in relation to decisions and practices affecting the environment.

It is the view of the Department of Tourism Sport and Recreation and Bord Fáilte that tourism product funding cannot be effective in isolation. There are clear lessons to be learned from areas which have experienced rapid, concentrated investment.

Where infrastructural networks are deficient, overload can be experienced, on the one hand, with consequent problems for both local and visiting populations. On the other hand, infrastructural deficits can inhibit the realisation of the tourism potential of less developed areas.

Successful realisation of the strategy set out in the Tourism Measures is dependent on, and directly linked to, the delivery by relevant local and other authorities of the necessary infrastructure, facilities and controls.

For National Development Plan purposes, the Department of Tourism Sport and Recreation drew up a detailed list of tourism-related infrastructure priorities - non-national roads, water and sanitation schemes. This list was compiled from input by the Regional Tourism Managers who, in turn, consulted with relevant local authorities.

In the NSS context, therefore, it is important to bear in mind that infrastructure plans also need to serve tourism priorities and that those priorities will not always relate to areas which are a priority for general industrial/commercial/residential development.

Conclusion

The industry, Bord Fáilte, CERT and other relevant players will have to tackle the challenges posed by perceived declines in core tourism values and by labour supply pressures.

The Established Tourism Areas will require integrated strategies in order to manage the challenges of success.

A better spatial spread of tourism will require the successful implementation of the new Measures and Development Strategies prepared by the Department of Tourism Sport and Recreation and the Regional Assemblies and by Bord Fáilte.

There will have to be a clear acceptance of the fact that successful realisation of the strategy set out in the Tourism Measures is dependent on, and directly linked to, the delivery by relevant local and other authorities of the necessary infrastructure, facilities and controls. This means that infrastructure decisions will need to reflect tourism priorities.

Protecting the quality of the physical environment will have to have increased priority nationally, regionally and locally, and, in this context, cognisance needs to be taken of the amount of development or use particular sites can bear.

4 SUMMARY AND POLICY IMPLICATIONS.

EXTENSIVE USES

Afforestation

Greater emphasis will be placed on broadleaf planting the 4000Ha broadleaf target has been met 5000Ha achieved. The farmers grant is the major reason but planting is taking place on the poorest mineral soils. Most planting is taking place East of the Shannon & Co. Cork

There is a need to review incentives to get farmers into forestry. Framers need to get higher returns from forestry to make it compete with agriculture.

National databases (FIPS, Soil Classification etc) will help afforestation to locate in most appropriate areas.

There will be more planting for environmental reasons eg for catchment protection especially where catchments are cross-county boundary.

As farming declines more land may become derelict which provides an opportunity for planting

Renewable Energy

Renewable energy generally and wind power in particular is expected to meet substantial increases in electricity production over the 2000-2005 period.

The rapid expansion required will be hindered by 3 types of constraint :

electricity market mechanisms

electricity network

spatial planning.

These are distinct but closely interrelated issues which cannot be considered in isolation from each other.

Peat Extraction

Bord na Mona has extensive landholdings, 80,000 Ha concentrated in the Midlands.

Nationally electricity production has been increasing and peat power currently provides about 10% of the national demand. The sources of power generation are changing, with peat playing a lesser role. The 5 existing peat power stations are being replaced with 3 modern more efficient plants that use less peat.

In line with national trends solid fuel production in the form of briquette and sod turf has fallen and will continue to do so.

Horticultural peat production is increasing and is almost all exported.

Cut away bogs

While the immediate release of cutaway bog may be limited there is no doubt that in the medium to longer term the 80,000 Ha of land that will result from peat extraction represents an asset of significant potential.

Already investigations have begun into the various after-uses, grassland, forestry and wilderness. Bord na Mona also recognise that the Midland cutaway bog has potential for the development of wind energy, this option is limited however by the current failings of wind energy strategy which forces developers to the west coast and upland areas.

Overgrazing

Should an ideal stocking rate be adopted and observed, grazing could be maintained in those areas that bogs have as yet suffered only minor damage. Limited field research conducted by Duchas has shown that recovery of vegetation cover in experimental enclosures can be dramatic, indicating that for some areas at least, removal of sheep for indefinite period could be effective in assisting natural regeneration, especially if the root mat is still intact. However, some blanket bog areas are so severely damaged that withdrawal of sheep is unlikely to lead to a restoration of bog vegetation in either the short or medium term.

Commonage framework plans, in the process of being drawn up by Duchas and the Department of Agriculture, Food and Rural Development, should provide valuable ecological data for evaluating the success of REPS in future years in restoring and managing these fragile systems. Concerns have been expressed about the ecological expertise of REPS planners and the competitive pressures under which they operate the scheme. It is important that there is a clear and transparent mechanism for monitoring and evaluating the scheme. As REPS is one of the principal mechanisms to meet conservation objectives in national (NHA and European (SACs and SPAs) sites, appropriate ecological management these areas under REPS is essential.

INTENSIVE USES

Intensive agriculture

Intensive agriculture, in the form of pig and poultry production has been undergoing major structural change. The main thrust of reform in both these sectors has been the concentration of production into a smaller number of larger units, as well as an overall increase in actual pig and poultry numbers.

The areas of pig production have expanded into the counties of Westmeath and Longford, adjoining the traditionally strong production counties of Cavan and Monaghan which have declined.

Extractive Industries

Mining and minerals exploration are significant contributors to the national economy but by their limited distribution and fixed location they are not amenable to influence by spatial policy. Mines do create spatial policy issues themselves such transport links, location of process plant, environmental considerations etc.

Aggregate and Sand/Gravel extraction are more subject to spatial policy given their wider distribution. Generally quarries & sand/gravel pits service a 30 mile radius from the source (based on economics of transport). There is significant clustering of quarries & sand/gravel pits around the major cities, where development is concentrated. The demand for construction materials will accelerate as a result of the implementation of the NDP. In this context the ICF anticipates that the industry has sufficient capacity to meet future demand.

Given the increasing demand for building materials the environmental considerations associated with aggregate and Sand/Gravel extraction will be multiplied.

Tourism “Hot Spots”

Tourism will grow target 9% currently 6% Internationally 3-3.5% especially as leisure & wealth continue to increase.

The current trend is for greater concentration in a few areas leading to tourism congestion in some locations and limited growth in other areas. The attraction of Ireland for visitors is the beautiful scenic landscape, the distinctive cultural heritage, the unspoilt natural environment and the opportunities for relaxation and peace and quiet. The base on which our tourism is founded is being eroded and Ireland will lose its competitiveness.

POLICY IMPLICATIONS.

Afforestation

- The period to 2010 will see the rapid expansion of forestry especially of broadleaf species. There will be significant broadleaf development on wet mineral soils that are currently in agricultural production but are marginal.
- The expanded forest estate, especially the broadleaf, will contribute to greenhouse gas abatement (carbon sequestration) but will the forest expansion be used as an excuse not to address sustainable transport?

- The anticipated urban growth will lead to greater generation of municipal sewage sludge. Normally spread on tillage land, afforested lands may offer an alternative location for sludge disposal, given the limited tillage land and its location close to urban areas.

Renewable Energy

- Policy change to the pricing regime to encourage location away from coastal and upland sites would help resolve conflict of turbine in scenic/ high amenity landscapes. Particularly as the future will be larger turbines and larger numbers of turbines in any one location.

Peat Extraction

- Peat will play a lesser role in electricity generation, how is this resolved with increasing dependency of imported natural gas and security of supply? The likelihood of carbon taxation and peat burning efficiency?

Cut away bogs

- Cutaway bogs offer a major resource for forestry, grassland, wetland/ wilderness and with policy change, wind farms.

Overgrazing

- On going CAP reform will see sheep production continue its retreat to upland areas in particularly in the West where it could conflict with SAC/ SPA designated areas, if not the actual areas, then their margins. Will the overgrazed areas expand?

Intensive agriculture

- It is probable that there will be intensive pig/poultry where dairying is currently only marginally profitable. Secondly as existing areas of intensive pig/poultry production reach capacity, in terms of slurry disposal, they are expanding into adjoining counties. How will this be reconciled with deteriorating water quality, both surface & ground?

Extractive Industries

- Demand for aggregates will multiply significantly with NDP infrastructure, construction programmes. There will be increased impact on the environment and landscape. There is no national policy or guidance on mining or quarrying.

Tourism “hot spots”

- There is tourism overcapacity in some areas so there is a need to re-distribute tourism to other areas especially away from Dublin/East coast urban based tourism. A new area based approach to tourism is proposed. The tourism “product” ie the environment, scenic amenity, natural landscapes etc is being undermined by uncontrolled development without regard to the integrated relationships of the tourism economy.

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