

RURAL IRELAND 2025

Foresight Perspectives

Joint Publication

NUI Maynooth
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Teagasc

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Copies of the report can be obtained from:

- The National Institute for Regional and Spatial Analysis, NUI Maynooth
- The Rural Economy Research Centre and the Environmental Research Centre, Teagasc
- The Department of Agribusiness, Extension and Rural Development, UCD, Dublin
- COFORD, Sandyford, Dublin

Copies of the report can also be downloaded from the websites of the above institutions.

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FOREWORD

Will the goals of State policy for rural Ireland be achieved?

Can they be achieved?

These are among the important questions addressed by this foresight study.

In response to emerging challenges and opportunities, an Inter-Institutional Working Group drawn from NUI Maynooth, UCD and Teagasc undertook this assessment of the prospects for rural Ireland to 2025. Funding was provided by the Department of Agriculture and Food, COFORD, the Environmental Protection Agency and the Marine Institute.

The report reflects the insights and analysis of the joint Working Group and was informed by a Consultative Forum (Appendix I and II). It thus provides a well-informed view of alternative outcomes for the Irish rural economy in the next 20 years. It details both the likely outcome of continuing current trends and of alternative perspectives. Initiatives to achieve these alternative outcomes are considered. The report concludes that the benefits of national development programmes could be greatly enhanced by three over-arching measures. The Executive Summary highlights these measures.

Part One comprises a Synthesis Report drawing on the Thematic Papers contained in Part Two. Each section of the Synthesis Report has been framed so as to deal comprehensively with the dimension of the Foresight process indicated in the title of the section. While this involves some unavoidable repetition, it allows each section of the Synthesis Report to be read as a discrete entity. The views expressed in the Synthesis Report and Thematic Papers are those of the Working Group, as individual members or collectively, unless otherwise indicated.

The contributions of all members of the Working Group and participants in the Consultative Forum are gratefully acknowledged, in particular Michael Dowling for chairing the Consultative Forum. We also wish to express our appreciation of the major input by Liam Downey in preparing the draft Synthesis Report. Finalisation of the Synthesis Report and Executive Summary was undertaken by Jim Kinsella, Patrick Commins and Brendan Riordan. Liam Downey and John Fennessy played a central role in finalising the report. Preparation of the report for publication was undertaken by Lauren MacLennan, COFORD.

The widespread commitment to the foresight project demonstrates the importance of what is at stake for the future of the Irish rural economy, and the imperative to act now.

Working Group Co-Chairs:

Professor James A. Walsh, NUI Maynooth

Professor P. Joseph Mannion, UCD, Dublin

EXECUTIVE SUMMARY

Government policy for rural areas aims to build a rural economy where enterprises will be commercially competitive without damaging the environment. It seeks to have vibrant sustainable communities, with a quality of life that will make them attractive places in which to work and live. It aspires for equity of opportunity between rural and urban areas, and for balanced development between the regions. These initiatives are underpinned by EU policy for rural areas, which subscribes to the attainment of ‘living countrysides’ within the context of balanced regional development across the Union.

Are these goals being achieved?

Can they be achieved?

If Current Trends Continue...

A scenario assuming no major changes in current trends, other than those already signalled, will result in serious failures to achieve the declared policy goals for rural Ireland. Although the aggregate headline indicators in the national economy are positive, they mask some underlying weaknesses that adversely affect prospects for the rural economy. On current trends the following outcomes are likely by 2025.

- There will not be an acceptable regional balance in Ireland’s economy; population, commercial agriculture and modern enterprises will be even more concentrated in the east and south than at present.
- Rural areas, especially in the northwest and north midlands, will lag behind in respect of communications and other infrastructure, particularly as EU funds will not be available for their further development.
- There will be dramatic reductions in farmer numbers, lower agricultural prices, and widespread decline in commercial farming. Lower volumes of farm output will threaten the viability of agri-food processing enterprises.
- Forested land area will almost double; however, the value of forestry and wood product output will not increase to the same extent.
- The marine sector will not have reached its inherent potential, especially in terms of value-

added in the seafood and renewable energy sectors.

- Provision of public goods from natural resources, including carbon sequestration by forests, will not be achieved in the absence of adequate attention to the valuation of these public goods and arrangements to pay their potential suppliers.
- The rural landscape with Ireland’s rich natural and cultural environment will be under continued threat.
- Developments in the broader rural economy will not offset losses and other weaknesses in the natural resource sectors. Growth in exports from the dominant indigenous enterprises will remain relatively low. Moreover, it is likely that a large part of manufacturing output from foreign owned enterprises will move to lower cost economies. In these circumstances, employment in building and construction will not continue at current high levels.
- New types of employment will not benefit the many rural communities outside of commuting catchment zones.

What Future Could Be Achieved?

Rural Ireland in 2025 could be closer to the situation envisaged in the goals for national policies. However, this requires taking action now on the following:

- The National Spatial Strategy, implemented in conjunction with successive regionally focused national plans, would result in a more balanced distribution of population and economic activity throughout the country.
- Rapid communications and supporting infrastructure would provide greater accessibility throughout all parts of the country.
- The rural economy could sustain more competitive enterprises through the development of additional entrepreneurial and management skills, as well as further innovation in products, business organisation and marketing.
- The agri-food industry could have more developed business, technological and innovative

- capacities, with a widely differentiated product portfolio selling in international markets.
- Forestry and the ocean economy could be sizeable suppliers to the energy sector and provide valued public goods.
- Maintenance of an attractive rural environment could be secured by compliance with EU Directives and payment for public goods, as well as better management systems nationally.
- A knowledge-based bio-economy could emerge built on the comparative advantage of Ireland's natural resources.
- 'Old economy' enterprises could be upgraded, and manufacturing small and medium sized enterprises (SMEs) could increase their contribution to the rural economy.
- Tourism could be a vibrant sector of the rural economy, providing knowledge-based environmental goods and services, focused on Ireland's unique landscapes and culture.
- Clusters of internationally oriented companies could exploit the full potential of natural resources in food, the marine, forestry and tourism.
- Repositioning of the Irish rural economy in the evolving global economy so that competitiveness, productivity growth, and transition to a services-based knowledge economy are reconciled with environmental sustainability and rural social viability.
- Acceptance of the fact that while economic competitiveness is a central requirement, much of rural development provides public goods and their value should be added to relevant receipts from commercial markets in reaching decisions.
- Recognition that rural development requires a strong focus on multisectoral development, tailored to the circumstances of different regions and sub-regions and goes beyond agriculture and agricultural policy.
- Emphasis on applying knowledge and research based information in decision-making and innovation at all levels.
- Stronger operational links between rural and coastal development strategies.

Realising Attainable National Policy Goals

Overall changes required to achieve the above perspective and the ultimate goals of rural policies are summarised below.

- Greater commitment to rural and regional development throughout government.
- Construct an effective institutional framework to ensure that policies respond to the defined needs of the rural economy and rural communities.
- Change in the prevailing mode of policy-making, public administration and policy delivery such as that
 - (i) the rhetoric of stated policy is followed through with clear operational programmes, especially in relation to the White Paper on Rural Development and the National Spatial Strategy;
 - (ii) public programmes are initiated proactively and are not dependent on Directives from Brussels;
 - (iii) consultation with stakeholders and the completion of value for money audits prior to commitment of major initiatives.

What Are The Most Essential Enabling Measures?

For the proper implementation of the range of strategic initiatives advocated in this Foresight report, three overarching measures are necessary:

- 1. Establishment of a Rural Policy Implementation Group to facilitate efficient resource use in developing a competitive and sustainable rural economy.**
- 2. Development of Regional Innovation and Research Systems to support the development of a knowledge based rural economy.**
- 3. Provision of Education and Training Programmes to raise the human resource capabilities of rural businesses, and of rural populations generally.**

Without these measures the rural economy will not attain the prospects outlined above, and furthermore the declared goals of rural policy will not be achieved.

INTRODUCTION

PROJECT AIM, APPROACH AND ORGANISATION

The aim of this foresight project is to provide perspectives of Irish rural and coastal areas to 2025. The focus is on ensuring the economic vitality of rural communities, protecting the quality of the physical environment, and on enhancing the use of the country's natural resources. Developments in the national economy and international drivers of change are also taken into account. The project identifies likely outcomes from alternative scenarios of the future for selected themes. One scenario posits a continuation of current trends. Another includes initiatives leading to outcomes that would achieve a greater degree of implementation of goals set forth in national policy documents.

The Rural Foresight project, initiated in late 2003, was undertaken by an Inter-Institutional Working Group from NUI Maynooth, University College Dublin and Teagasc (Appendix 1). Funding was provided by the Department of Agriculture and Food, COFORD, the Environmental Protection Agency and the Marine Institute.

To provide a wider input into the study, a Consultative Forum, comprising knowledgeable and influential stakeholders, was established (Appendix 2). Their discussions were facilitated by the presentation of Thematic Papers prepared by members of the joint Working Group, and by staff from COFORD and the Marine Institute. The Working Group also drew on additional material in relevant reports from other organisations.

REPORT STRUCTURE

This report is in two parts. Part One comprises a Synthesis Report. This is based on the Thematic Papers contained in Part Two. In general, these follow a common structure covering: (i) the drivers of change; (ii) current trends and issues; (iii) a baseline perspective to 2025, that assumes no major changes in the current trajectory; (iv) an alternative and attainable scenario to 2025; and (v) key initiatives required to achieve a better future by 2025.

RATIONALE AND CONTEXT

Foresight initiatives create greater awareness of longer-term trends and develop perspectives of possible futures, so that challenges and opportunities can be anticipated and emerging issues taken into consideration in current policy formation.

The basic rationale for the rural foresight study stems from the declared aims of State policy, as set out in the 1999 White Paper on Rural Development, as well as in other policy documents. Rural policy aims for the maintenance of the rural population, not just in aggregate numbers but also in a balanced spatial distribution. It aspires for equity in access and opportunity between rural and urban populations, and for balanced development between the regions. It seeks to have vibrant sustainable rural communities with a quality of life that will make them attractive places in which to work and live. It aims to build a rural economy where enterprises will be commercially competitive, without damaging the natural environment.

The foresight study considers these policy aims within an international and longer-term context. It identifies the various factors, which impact on efforts to achieve such aims. It also provides an assessment of the extent to which policy aims are being realised, while giving early warning of the need for crucial policy adjustments.

The other rationale for the project is the necessity to take stock of the mix of strong socio-economic and technological factors, as well as changing policy orientations, which are now impacting on rural areas. The driving forces of greater competition and business rationalisation continue to bring about restructuring in the natural resource based sectors. Increasingly, the rural resources of land, forestry and the marine will be expected to provide for the amenity and recreational needs of a more urbanised society. While some rural areas face the prospect of depopulation and economic decline, other areas, especially those within the catchments of urban centres, on inter-urban communication routes, or in high amenity zones, are experiencing growing pressures on rural space, accompanied by a declining consensus as to the manner in which this space is used.

Reforms of the Common Agricultural Policy (CAP) will reduce the scale of non-market subsidies. The scope of current EU rural policy measures is narrowly conceived and will not build a strong and diversified rural economy in areas where both farming and urban-generated development are economically weak. The next phases of EU Cohesion Policy will be dominated by the needs of the new Member States. Ireland and other long-standing EU States will have to frame their regional policies with much less support from EU sources.

In the global context, Ireland, as a small open economy with a comparatively high dependence on foreign direct investment (FDI), is particularly exposed to risks from trade liberalisation, deregulation of markets, and the global mobility of capital and business. There is an accentuated emphasis on market competitiveness, while at the same time there are growing concerns for the protection of the environment, food safety and animal welfare. Also, within an enlarged EU, economic, social and territorial cohesion are important policy issues.

PART ONE

Synthesis Report

1. Current Situation

- 1.1 The National Economy
- 1.2 The Rural Economy
- 1.3 Agri-Food Industry
- 1.4 Forestry
- 1.5 Marine
- 1.6 Rural Landscapes

2. Baseline Perspective to 2025: Sectoral Dimensions

- 2.1 Agri-Food Industry
- 2.2 Forestry
- 2.3 Marine
- 2.4 Rural Landscapes

3. Baseline Perspective to 2025: Spatial Dimensions

- 3.1 Population and Employment
- 3.2 Agri-Food Industry
- 3.3 Forestry
- 3.4 Marine

4. Strategic Challenges and Initiatives

- 4.1 Agri-Food Industry
- 4.2 Forestry
- 4.3 Marine
- 4.4 Rural Landscapes
- 4.5 Population, Employment and Spatial Dimensions

5. Competitive and Sustainable Rural Economy to 2025

- 5.1 Economic Prospects
- 5.2 Achievable Perspective

6. Knowledge Rural Economy

- 6.1 Institutional Framework
- 6.2 Rural Policy Implementation Group
- 6.3 Regional Innovation and Research Systems
- 6.4 Knowledge Transfer, Innovation and Human Resource Capacities

7. Conclusions

Appendix 1: Members of the Inter-Institutional Working Group

Appendix 2: Participants in the Foresight Consultative Forum

RURAL IRELAND 2025: SYNTHESIS REPORT

1. CURRENT SITUATION

1.1 The national economy (1¹)

The exceptional growth performance over the past decade has been driven largely by the internationally traded goods and services sectors, especially the unprecedented growth in Foreign Direct Investment (FDI), rather than by significant improvements in the underlying rate of productivity growth. Many of these FDI enterprises are strongly oriented to producing goods, often at a relatively low point in the value chain. These labour intensive industries are now open to the growing attractiveness of other countries, as evidenced by a net outflow from Ireland, between 2001 and 2004, of 15,000 jobs from internationally trading foreign-owned companies.

Expansion of employment in recent years reflects the strong growth in the financial and business services and a boom in building and construction. In contrast, manufacturing employment has declined to its lowest point since 1996. The tourism industry, as measured in terms of total visitor numbers, grew by some 5 percent per annum between 1990 and 2002. However, rural areas have not benefited commensurately from this growth. Also, visitor satisfaction rates are declining, especially in regard to value for money and infrastructural deficiencies. Despite the substantial investment in recent years, the physical infrastructure is still poorly developed and less effective than in most developed countries.

Funding of research and development (R&D) has increased significantly over the past decade. However, business expenditure on R&D is concentrated mainly in large and foreign owned companies, while the majority of small and medium enterprises (SMEs) are characterised by a low technological absorptive capacity. With some important exceptions, public funded research is increasingly concentrated in the universities where it is largely committed to fundamental/academic

research. Strategic research, leading to product and process innovations, and also new technological research on marketing and supply chain management, remain relatively neglected.

1.2 The rural economy (2 & 3)²

Some key features of the broader rural economy are outlined below, followed by synoptic perspectives of the agri-food industry, forestry, marine and the rural environment.

Population and employment trends, as well as the location of economic activity in general, show clear and growing differences between urban and rural areas, and between the economies of different regions. An outcome of this spatial differentiation is that the rural economy can be envisaged as comprising the following main categories: (i) peri-urban areas with a high level of commuting to urban-based jobs; (ii) economically diversified areas relying on building construction, manufacturing and other non-farming employment; (iii) commercially strong farming areas; and (iv) economically weak areas highly dependent upon poor but heavily subsidised farming.

During the 1990s, the combined numbers of people living in Dublin and the three neighbouring counties continued to grow at a faster rate (13.7%) than in the remainder of the country (9.5%). Rural areas with the highest population growth rates are those adjacent to urban centres, and also those with a high-amenity natural environment. Areas with low or negligible population growth are generally in the west or north-west, together with narrow branches extending into the south and midlands.

Spatial differences in farming and land use are increasing. The west and the border region show the faster rates of withdrawal from dairying, accompanied by higher rates of tree planting on farms and higher levels of participation in agri-environmental schemes.

¹ For further details see Thematic Paper No.1 entitled: *Economic Conditions in the 2025 Baseline Scenario*

² For further details, see Thematic Paper No.2 entitled: *The Broader Rural Economy* and No.3 entitled: *Some Spatial Dimensions: Population and Settlement Patterns*

Although not reflected in increases in total population numbers, employment growth in rural areas has been quite widespread during the years 1991 to 2002. Much of this growth was due to expansion in construction, and in commercial and retail services, both of which are dependent on the vitality of the macro economy. Associated with employment growth were considerable increases in commuting and the spread of single dwelling houses in the commuting and high amenity zones.

Visitor numbers to Ireland increased steadily between 1990 and 2002. However, as already indicated (Section 1.1), the distribution of the related revenue strongly favoured Dublin and the south-west, with lower revenue growth rates being recorded in the more rural regions of the north-west and west.

For the decade 1995 to 2004, there were pronounced regional variations in the employment growth rates in those enterprises supported by the state agencies. Dublin and the mid-east combined had the highest rates of expansion. The south-west and west fared relatively well, and the south-east, mid-west and midlands less so. The border region failed to show any expansion.

Some 60% of the population may be described as rural, in that they live outside the five major urban centres and predominantly in coastal counties. With all but an estimated 10% of the population residing within a 40 km radius of the 13 larger urban centres, the rural economy is not a geographically separate entity from the urban or general national economy. The functional interdependencies between rural and urban areas are increasing and the national economic growth of the past decade has benefited rural areas in a number of ways. In particular, employment expansion in rural areas has more than offset labour losses in farming. However, rural regions continue to have a high dependence on agriculture or other production-based employment, often part-time and low-paid. This reflects, among other issues, weakness in the linkages between rural economies and FDI enterprises. Allied to this is the continued failure to develop the regional innovation support services required to address the weak technological absorptive capacity of many indigenous small and medium scale companies, particularly those not located adjacent to the main cities.

Low levels of regional innovation are related to weak institutional capacities and reflect the lack of

effective operating networks between local businesses and third-level colleges, research organisations, enterprise support and training agencies (Sections 6.3 & 6.4). A key determinant of regional institutional capacity is the competencies of managers and others employed in the region, in both private and public sectors, and their adaptability, entrepreneurship and attitudes to change, risk and investment. Poorly developed and inefficient physical infrastructure also disadvantages rural business. As indicated by the fact that infrastructural expenditure in the BMW region is falling behind projections, this situation is not likely to improve markedly in the immediate years ahead.

Notwithstanding the economic benefits to rural areas of the national economic growth of the past decade, there is a noticeable failure in social development. This is evident from the declining voluntarism in local communities and weakness in the capacity for mutual benefit and community development associations, as well as continuing social exclusion, and failure to provide the level of local services and amenities needed to contribute to a better quality of life.

1.3 Agri-food industry (4³)

The past decade has been characterised by a major increase in the participation by farmers and farm families in the wider rural economy, with a progressive decline in the contribution of agriculture to the broader rural economy. These changes have been accompanied by some structural and other improvements in the agri-food sector. The average farm size rose by some 20% during the 1990s and there was also an overall increase in labour productivity. The food and drinks sector grew by 6% per annum on average between 1995 and 2001, and employment levels in the sector increased from 45,000 in 1995 to 51,600 in 2002. An issue of growing importance over the last decade and more is that the relationship between agriculture and the environment is increasingly seen to be out of balance in many countries.

In the immediate years ahead, world demand for agricultural products will continue to grow, although at a slower rate than in previous decades. Dairy and meat products, especially poultry, as well as seafood, will provide a growing share of the human diet. The

³ For further details see Thematic Paper No. 4, entitled: *Foresight Study of the Agri-Food Sector*

rapidly growing demand for convenience foods will continue, in conjunction with electronic home shopping. Major new markets will emerge for functional foods, including probiotic foods and nutraceuticals. Also, the requirement to become less dependent on non-renewable energy sources, can be expected to provide new market opportunities for the agricultural sector and for coastal communities. To capitalise on these opportunities and to develop a multi-functional agri-food sector, that is internationally competitive and environmentally sustainable, the industry needs to be re-positioned in the knowledge economy.

1.4 Forestry (5⁴)

Forestry is a multifunctional industry and land use which, in addition to the generation of marketable forest products, has important dimensions in relation to the rural economy/employment, agriculture, renewable energy generation, and the provision of environmental goods/services, notably biodiversity, carbon sequestration and recreational uses. The forestry contribution to GNP was just under €700 m in 2004.

In response to the 1996 national forest strategy (*Growing for the Future: A Strategic Plan for the Development of the Forestry Sector in Ireland*) approximately 15,000 hectares of forest have been planted per annum. While this is below the target of 20,000 ha, it nevertheless represents the single biggest land use change over the past decade. Continuation of this trend would result in some 1 million hectares, or 14-15% of the land area, being converted to forestry by 2025. This is still well below the EU average of 25%. The new Rural Development Regulation will reduce grant aid for afforestation from 100% to 70% of the cost of afforestation in advantaged areas and to 80% in disadvantaged areas. The payment period for annual premiums will also be reduced from 20 to 15 years. These changes will reduce planting levels substantially in the absence of any additional government funding

The forestry sector is exposed to increasing competition from the coming on-stream of wood supply from new EU Member States, which generally have lower costs and prices. This situation is likely to

change with increasing levels of prosperity in the new Member States. Ireland's natural growth rate advantage is also being challenged by increased costs across the sector. There is scope for improved cost competitiveness through reform of the timber sales area, (as identified in the COFORD OPTILOG Project⁵) and in the areas of harvesting and transport. A further challenge is the relatively small average size of private sector plantations (8 hectares on average). This figure is distorted by the large number of plantations in the 2-3 ha size category. Half of the grant aided plantations are 20 ha or more.

The future competitiveness of the forestry sector will require greater cost efficiencies throughout all segments of the wood supply chain, as well as significant investment in R&D in all aspects of the wood-chain, including process and product R&D. In regard to the farm forestry sector in particular, the development of cost-effective harvesting and transportation systems is essential. The ability of the private sector to achieve forest certification is also important. Many of the panel board mills and sawmills now require roundwood to be sourced from forests that have been independently certified as well managed.

In the future the forestry sector will play an increasing role in the provision of public goods and services. In regard to climate change, forestry has a significant role to play in storing atmospheric carbon dioxide in forests and wood products. Recreational use of forests will also grow in line with increasing affluence and population levels, as well as greater urbanisation. Forests also have a significant role to play in biodiversity conservation and enhancement, at the genetic, species and ecosystem levels. The advent of the Water Framework Directive will also impact on forestry, with increasing emphasis on the role of riparian woodland in achieving water quality standards.

1.5 Marine⁶

The country's marine resources encompass some 900,000 km² of seabed, which is ten times the terrestrial area. The sector accounts for more than 0.9% of national GDP and provides employment (directly and indirectly) for some 40,000 people. Of

⁴ For details see Thematic Paper No. 5 entitled: *Foresight Report of the Forestry Sector in Ireland*

⁵ OPTILOG is a collaborative project funded by COFORD and undertaken by the Irish Timber Council and Coillte, carrying out an efficiency analysis of the sale, purchase, harvesting and haulage of timber in the Irish forestry sector.

⁶ Comments on the marine in this report are based on a submission from the Marine Institute.

the turnover of €3.1 billion in 2002, 67% was generated by marine services (maritime transport, marine tourism), 29% by marine resource use (fishing, aquaculture, seafood processing, offshore oil and gas exploration), and 4% by marine manufacturing. The sector has strong linkages with other components of the economy. An efficient national transportation system demands seamless linkages between land, air and sea transport. An attractive tourism product depends on aspects of the marine and terrestrial environment. An efficient energy generation and supply system can draw on new opportunities in offshore wind, wave and tidal energy. Food, produced on farms or from the sea, depends on a generic suite of production techniques, quality control, value added processing and marketing.

The marine resource provides significant national benefits that are not readily captured by conventional economic accounting. These include biodiversity, amenity and environmental quality. There is a need to recognise the value of such natural assets and allocate values and prices to them.

Commonly used measures of output, income and employment, applied to the national economy, may underestimate the value of an economic activity in particular areas. Many of the regions where the marine sector is strongest are well below the average in economic performance. The development and enhancement of marine-related activities is thus a priority for the economic well-being of many coastal communities.

The key drivers of change and development in the marine sector are many, complex and varied. Economic factors include a constant need to maintain competitiveness in a global, open market. Europe is currently a major importer of food, including seafood. Markets will grow for value-added products, such as convenience foods, health foods, niche products and diversified agricultural products. Over 90% of Ireland's exports and imports are transported by sea. Maritime transport and related activities are expected to expand to facilitate increased exports and imports, with traffic moving from roads to short sea shipping routes.

Economic forces may, if unrestrained by national social and economic objectives, lead to undesirable exploitation practices, unbalanced spatial develop-

ment and environmental degradation. If economics were the sole driver, one could envisage an Ireland where maritime and shipping services, energy supplies and food (including seafood) were supplied from outside the State with little or no employment or added-value accruing to the Irish economy. Since this would be unacceptable in national policy, economic forces are tempered by other objectives, based on environmental, social, and regional development criteria.

Concerns about maintaining the quality of the environment will have implications for the marketing of Irish seafood and marine tourism products. With an increased population and greater utilisation of marine resources, coastal space will be in demand for habitation, industrial and tourism/leisure activities.

The predicted impacts of climate change⁷ represent both challenges and opportunities for many marine and coastal resources. A predictive capability and an adaptive strategy will facilitate an accommodation to change, which could otherwise have major social and economic implications.

Environmental legislation, will be a key driver in the use and management of marine resources. EU policies and Directives, such as the Common Fisheries Policy, the Habitats Directive, the Water Framework Directive, the EU Marine Strategy, as well as international conventions (OSPAR, CBD, etc.) will govern the management of future developments. An improved science-based knowledge will be required to negotiate flexibility in the way European legislation is implemented at the local and regional levels.

New and emerging technologies (ICT, nano-technology, biotechnology) are expected to result in innovative and improved ways of "doing better, what we already do" and to create new opportunities in how the marine resource is utilised, managed and monitored.

1.6 Rural landscapes (6⁸)

Ireland's rural landscapes are being reshaped by changes in agriculture, as well as road, building, new housing and other infrastructural developments. In agriculture there is continuing spatial differentiation (Section 3.2), involving the concentration of commercial farming in Munster and south Leinster

⁷ Climate Change: Implications for Ireland's Marine Environment and Resources (Marine Institute 2005).

⁸ For further details see Thematic Paper No. 6 entitled: *The Rural Environment*

and the greater extensification of production in regions with sub-viable farms. While there is a noticeable decline in economic activity and population in some rural regions, coastal and other high amenity areas are experiencing population growth. Interfacial areas between urban and rural settlements are being subjected to unprecedented pressures from competing spatial demands. These developments have major implications for the rural environment, both natural and built.

Water resources: Economic expansion, allied to sizable population growth in some regions, is placing increased pressure on water resources. The contributions of waste from urban water treatment plants and also agriculture, to the deterioration in water quality can be expected to decline in the coming decade. Conversely, the ongoing developments in housing, roads and other infrastructure will continue to contribute to losses in water quality. In particular, with the siting of greater numbers of one-off houses in rural areas, (Section 6) contamination of water resources by septic tanks is likely to increase. Also, the much larger volumes of sewage sludge produced and the limited options available for its disposal, including land spreading, are becoming serious concerns.

Air quality: The continued growth in road traffic together with overall energy consumption point to a progressive deterioration in air quality, especially in urban areas. To meet the commitments entered into under the Kyoto Agreement, together with the more stringent limits set in the EU Air Framework Directive, measures must be implemented in the short term to reduce greenhouse gaseous emissions. The projected reduction in the size of the national cattle and sheep herd and the associated lower usage of nitrogen fertilisers may lead to some reduction in the sizeable contribution of agriculture to the national emission levels. COFORD estimates that the much expanded forestry programme of the past decade will be beneficial in reducing carbon dioxide levels by some 8-12%. Eventually, however, compliance with the aforementioned international requirements and EU Directives will necessitate more stringent control measures being applied to agriculture, especially the more intensive production systems.

Biodiversity: Ireland has a rich heritage of natural habitats including wetland, coastal and upland

landscapes. These important natural resources have experienced serious impacts in recent decades. Moreover the number and scale of threats are increasing. The aforementioned concentration of commercial agriculture in Munster and south Leinster will impact on natural habitats, leading to a decline in population and species diversity, especially in the more intensive farming areas. The concomitant withdrawal of farming from regions with predominantly sub-viable farms, and consequential scrub encroachment, will affect the unique natural and built environment in upland and wetland areas. However, there may be positive outcomes from the decoupling of farm subsidies from production volumes. With the greater importance attached to the conservation of wildlife habitats on farms, under the reformed CAP, and the increased funding being provided for their protection, more rigor will in future be applied to ensuring that wildlife measures are appropriately designed, implemented and monitored.

Soils: Irish soils are generally considered to be of good quality. They are, however, experiencing increased pressures from land use changes, agricultural production systems, erosion, waste disposal, industrial development and urbanisation. Following the publication in 2002 of the European Commission's document entitled *Toward a Thematic Strategy for Soil Protection*, increased attention is being given to soil quality. The reformed CAP includes the requirement to maintain all farmland in good agricultural and environmental condition. Also, criteria in relation to soil erosion, organic matter and structure are included in regulated cross-compliance measures. Further to this, an EU Soils Protection Framework is expected in 2008, outlining what is known about European soils, their importance and sustainable use, leading to more detailed legislative requirements in the future.

Waste management: An estimated 75 M tonnes of waste was generated in Ireland in 2001, of which 75% was contributed by agriculture, with manufacturing, building and municipal wastes accounting for the remainder. With further economic growth, waste production can be expected to increase. The total quantity of agricultural waste is, however, likely to reduce with the projected decline in the size of the national cattle and sheep herd. However, in the more intensive farming regions there is an

immediate requirement to develop strategies to ensure that animal wastes are utilised in plant growth, rather than entering water supplies and the atmosphere. The problem is particularly acute in relation to large scale pig and poultry enterprises. The bulk of the 21 M tonnes of manufacturing, building and municipal wastes are disposed of through landfill. With the remaining national landfill capacity limited to less than eight years, much greater urgency needs to be given to waste reduction and recycling and the development of industrial scale landfill facilities, enclosed by adequate buffer zones. Incinerators proposed in some of the regional waste management plans are creating significant controversy in rural areas.

Environmental goods: While there is increasing concern about the negative impacts of agriculture (pollution, erosion, loss of habitats, destruction of archaeological sites, etc) there is also growing recognition of, and demand for its associated public goods. In this regard, access to rural landscapes, archaeological and other heritage resources are issues of growing importance and conflict. With the increasing demands on rural areas, the value of public goods associated with agriculture, forestry and the marine (such as archaeological features and amenity areas) and public access to those are becoming increasingly important concerns. There is a pressing need to quantify the relative value of these public goods and develop their potential to contribute to the local economies, especially in areas withdrawing from agriculture.

2. BASELINE PERSPECTIVE TO 2025: SECTORAL DIMENSIONS

Assuming no major shifts in policies and other developments, apart from those already well heralded, a *business as usual* perspective to 2025 of the major components and features of the rural economy are outlined below.

2.1 Agri-food industry

As stated in the Report of the Agri-vision 2015 Committee, established by the Department of Agriculture and Food in 2004, “*The number of Irish farms is expected to decline by 23%, from 136,000 in 2002 to 105,000 in 2015. By 2015, one third of the*

farm population will be classed as economically viable, another third of farms will be economically unviable with the operators working primarily off the farm, and the remaining third will be transitional farms characterised by adverse demographic features, such as having an elderly farm operator and/or lacking an identified heir.

Of the third of farms that will remain economically viable by 2015, 75% will be farmed on a part-time basis... Of those farms that are operated on a full time basis and which are economically viable, the vast majority are expected to be dairy enterprises”(see www.agri-vision2015.ie).

There is general agreement that the total number of farmers will decline substantially in the decade ahead (see Thematic Paper No. 4). Whether, however, the contraction will occur as rapidly as suggested by the aforementioned report, may be questioned by some commentators. Important determinants in this regard include the future availability of off-farm employment (Sections 1.1 and 1.2), in particular, job opportunities that will continue to attract young farm inheritors to pursue non-farming careers. Lifestyle issues will also influence the rate of change. The Single Farm Payment System and quality of life interests, allied to familial association with the home farm, may slow down the expected decline in the number of farmers. Conversely, the pressures associated with the day-to-day commercial operation of a farm, while at the same time holding down an off-farm job may prove increasingly unattractive, especially to the next generation of farmers.

A continuation of these trends of declining farm numbers and increasing part time operation of farming enterprises may be expected to 2025, stimulated by a buoyant non-agricultural economy, continued capitalisation of the sector and lower real agricultural prices. Land use for energy production, for forestry and for leisure uses will increase at the expense of farming, and less productive land will be abandoned. The spatial differentiation of production, which has been a feature of recent decades, will continue.

In summary, it is unlikely that by 2025 that Ireland will have appreciably more than

- 10,000 full-time commercial farmers, comprising predominantly dairy farmers, a thousand or so commercial dry stock farmers, with roughly a similar number of sheep producers and a few hundred pig enterprises.

- 30,000 part-time farmers deriving a significant portion (possibly half or more) of their income mainly from cattle/sheep production. Many of those will have farm forestry/biomass enterprises.

The competitiveness of the dairy and beef sectors in the freer trade environment arising from the on-going WTO negotiations will depend on the attainment of substantial scale and a shift from predominantly commodity production to the manufacture of milk and beef products for specific consumer markets on a consistent supply basis, and thereby securing producer prices. The pursuit of competitive scale would result in a very dramatic reduction in farmer numbers as already indicated, and also in employment in food processing.

In the coming decade(s) there may be no more than two dairy processing companies and a comparable number of large meat export groups. There could be a sizeable number of small and medium scale agri-companies, engaged in the delivery of farm services and products including food products. While the number of farmers is expected to drop by about one-quarter over the next decade, farm output is unlikely to decline. Indeed it may rise, especially when the milk quota system is abolished, possibly in the coming decade. The value of agricultural output would however have to double for the sector to retain its current share of national output.

In terms of milk output per cow or per hectare, Ireland's dairy production sector had, in 2004, one of the lowest productivity levels relative to seven other EU countries. However, because of lower costs, the sector has a high degree of competitiveness, in terms of cash costs as a percentage of output. In this respect, Ireland's dairy production sector is better positioned than those in most other EU countries to cope with the expected economic environment in the immediate years ahead.

However, a major threat to the continued international competitiveness of dairy production in Ireland, and also the beef and cereals sectors, is the high price of land. If, as previously considered, farmer numbers do not contract to levels approaching those outlined above, and given the increasing demands on rural space for housing, roads, and other infrastructure, land prices will remain high. In those circumstances, farmers will have difficulties in purchasing land and expanding their businesses to the scale and with the rapidity necessary to maintain international competitiveness, except perhaps

through leasing or partnership arrangements. If, on the other hand, the on-going reforms of the CAP, in particular the introduction of the Single Payment System, result in the rapid decline over the coming decade in farmer numbers envisaged above, this could lead to a situation where Ireland's national milk quota would no longer be a constraint on milk production. In those circumstances, the value of individual farm milk quotas would decline, and the quota system would no longer be a restriction on the output of saleable milk. Currently, the investment capacity of dairy farmers to expand and cope with declining milk prices, and also the opportunities for a new cohort of well-trained young farmers to build dairy businesses, are severely limited.

Flexibility in access to land for farming allied to the business, innovative and technological capacities of those engaged in farm production and food processing, will ultimately determine whether Ireland has more or less than the 10,000 full time commercial farmers in 2025.

2.2 Forestry

Assuming the continuation of current planting trends, up to one million hectares of land, amounting to some 15% of the total is likely to be converted to forests by 2025, as previously indicated. Approximately two thirds will be private forestry, mainly owned by farmers with the balance in public ownership (see Thematic Paper No 5).

The sector is expected to be harvesting 6 million cubic metres of roundwood, with roughly comparable amounts being produced by the private and public sectors. The bulk (some 75%) of the forestry output in 2025 will be sawlog. The remaining one-quarter will be pulpwood.

The real price of roundwood in 2025 may be lower than current prices. Furthermore, the forest contracting and other support infrastructural services will, at best be operating at marginal profitability. Other weaknesses that may characterise the private forestry sector in coming decades include small, scattered farm forestry holdings, (just 8 hectares on average) and little private investment in afforestation. While up to half of houses may be of timber frame construction, the share of the home market supplied by domestic sawnwood is likely to be limited.

By 2025 afforestation grants and the payment of annual premiums are likely to have been substantially reduced or even discontinued. The major uncertainty

currently facing the sector relates to the timing of and/or the extent to which these vital financial supports for afforestation may be reformed.

The major benefits of the national forest plan may relate mainly to the public goods aspects of forestry, in particular carbon sequestration and recreation. Two important considerations in this regard are *firstly*, afforestation and forest operations must continue to have due regard for the natural and cultural environment, in particular biodiversity and archaeological features. *Secondly*, forests already planted or being planted must be designed to cope with expected climate change. With the growing interest in green energy, many of the 30,000 part-time farmers that Ireland is expected to have in 2025 (Section 2.1) as well as a number of the projected 10,000 full-time commercial farmers, will be producing wood biomass as an important component of their farming enterprises.

2.3 Marine

In a business as usual scenario, based on current trends and policies, the dominant development path in the marine sector will be characterised by short-term planning with little consideration for realising longer-term sustainable economic opportunities.

Without strong leadership being provided by the State, development of the sector will be along narrow economic lines with technological advances focused on achieving greater economies and efficiencies. As is already evident:

- The private sector cannot provide for comprehensive development as most of the marine resources are held in public ownership.
- Failure to invest in marine infrastructures and in broad-based sustainable marine development will result in enterprises at the lower end of the value-chain moving to lower-cost countries.
- The shipping sector will continue to provide vital trade linkages, but it will be dominated by foreign-owned vessels and services.
- The full potential of the renewable ocean energy sector will remain untapped, although Ireland will have a small but successful oil and gas industry.
- The country's reputation as a high-quality environment for tourism and quality seafood will be compromised.

- In the fishing sector, the mismatch between catching capacity and available stocks will continue to undermine stability. However, reforms of the Common Fisheries Policy and the establishment of Regional Advisory Committees will alleviate this to some extent.
- Aquaculture production will be constrained by price competition, disease problems and environmental conflicts.
- Delays and failures in implementing EU environmental Directives will have negative outcomes for the marine food and tourism sectors.
- Failure to quantify in economic terms the public goods and services provided by the marine will result in adverse and irreversible longer term impacts.

2.4 Rural landscapes

Ireland's rural landscapes will be substantially changed by 2025 (see Thematic Paper No. 6). As is already evident in urban catchments and high amenity areas, there will be increasing demands on rural and coastal landscapes. To strike the necessary balance between economic dictates and the protection of rural landscapes, sustained financial and human resources need to be committed to conflict resolution processes, leading to the development of a more rational public consensus on the location of housing, roads, utilities, and access to rural landscapes.

Overall, pollution of waterways is likely to have abated by 2025, but with some important exceptions. Unless substantial resources are devoted to the regular inspection and maintenance of the septic tanks in the increasing number of one-off houses in the countryside, contamination of water supplies, including domestic springs, will become a major problem, especially in high amenity areas.

Agriculture's contribution to the deterioration of water quality is expected to be reduced in response to EU Directives and to stricter enforcement of national regulations, including a code of Good Farming Practice, as well as to the more widespread participation by farmers in the Rural Environment Protection Scheme (REPS). In the intensive farming areas of Munster and south Leinster, substantial investment in waste storage facilities will be required.

As already indicated, the continued growth in road traffic and overall energy consumption points to a further deterioration in air quality, especially in urban areas. However the reduction in cattle and sheep numbers resulting from the reform of the CAP can be expected to lead to some reduction in gaseous emissions from agriculture in the coming decade. Also, the sequestration of carbon dioxide (potentially up to 12%) by the national afforestation programme (Sections 1.6 and 2.2) will be beneficial. However, odour problems from the disposal of animal manure may become more pronounced, especially in the intensive farming areas (Section 4.2). Such emissions are not likely to be tolerated, especially by non-farming households residing in farming areas.

Forestry has both positive and negative environmental attributes. However, in the intensive forestry areas (Section 3.3), forestry could have an adverse environmental impact, especially in the upland areas with their unique natural and cultural resources.

The spatial concentration of commercial farming in Munster and south Leinster and the withdrawal of agriculture from less productive farming areas, in particular upland and wetland areas, will impact on the biodiversity and archaeological heritage in these areas (Section 3.2). This situation is already evident in the Burren (Co. Clare) and elsewhere.

Growing international concerns with soil deterioration are reflected in the proposed EU Soils Directive. The problems relate to the contamination of soil and water resources in areas adjacent to rural housing settlements not connected to proper waste treatment facilities is a growing problem (Sections 1.6, 2.4). Also, pressures to dispose of wastes, such as dried sewage sludge on agricultural land could increase the risk of contaminating soil, and ultimately food products, by chemical residues.

Given the necessary consultation and appropriate incentives (Section 4), the long-standing problem of waste disposal will be progressively addressed by the establishment of privately operated industrial-scale landfills, regulated by the Environment Protection Agency (EPA), in conjunction with the judicious location and strict operation of incinerators. Problems associated with the disposal of farm wastes will, as previously mentioned (Section 2.4), be largely addressed. However, in regions of the country, notably the Cavan/Monaghan area, which have high concentrations of industrial scale pig, poultry and mushroom production, the current management

systems are not sustainable. Large-scale treatment systems are required.

The reduction in farmer numbers, together with enlargement of farms to the scale necessary to maintain international competitiveness (Section 2.1), will result in the longstanding familial association with archaeological sites becoming significantly eroded. Thus the coming decade constitutes a high risk period for Ireland's archaeological heritage. Indeed, some evidence indicates that the rate of destruction of archaeological sites may be increasing in coastal areas, and especially in the commercial farming counties, due mainly to land improvements (removal of banks, ditches etc) associated with more intensive grassland farming. A similar situation may pertain in relation to forestry.

While there is increasing consensus about the negative environmental impacts of agriculture and forestry, there is also growing recognition of, and demand for, the public goods associated with both sectors. In this regard, access to rural landscapes and to natural and cultural resources is an issue of growing importance and, also, of conflict. With the increasing demands on rural access, the public goods associated with agriculture, forestry and marine will be increasingly valued in coming decades. An important issue in relation to the future of these environmental public goods is the impact of climate change.

3. BASELINE PERSPECTIVE TO 2025: POPULATION, EMPLOYMENT AND SPATIAL DIMENSIONS

3.1 Population and employment

A business as usual perspective to 2025 must take cognisance of employment and population projections (Section 1.2), especially their spatial dimensions (see Thematic Papers No.2 and No.3). Two crucial questions in this regard are: (i) can the unprecedented national economic performance of the past decade be sustained, and if so, (ii) will the benefits flow out to rural communities in all parts of the country – given that such widespread geographical dispersal did not happen during the past ten years?

There are several grounds to be doubtful of the long-term sustainability of recent economic growth, especially as it relates to rural areas. This growth was

achieved through a confluence of fortuitous circumstances, without any significant rise in underlying productivity (Section 1.1). Most future growth will have to come from productivity increases. This, in turn, will require high-tech enterprises and a major expansion in the contribution of market services to the macro economy. Employment in these sectors tends to locate in the larger urban centres. At first sight the expansion in rural employment over the past decade (Section 2.1) looks optimistic, but the real picture is camouflaged by some less sanguine features. Many rural areas still have a high dependence on an agricultural economy, which is heavily subsidised at levels that cannot be expected to continue through to 2025. Overall, manufacturing employment has been static, while job growth in agency-assisted companies has favoured the larger urban locations and, regionally, the east. Much of the current production-oriented FDI manufacturing could, as previously stated (Section 1.1), move to lower-cost economies. Indigenous agency-assisted enterprises have shown little real growth in sales or exports. Construction employment, a major source of jobs for rural workers, cannot be maintained at current exceptional levels. Tourism is expected to expand further but its regional distribution remains quite selective (Section 2.1). In addition to these vulnerabilities, Irish rural areas are particularly exposed to the price of fossil fuels and constraints on gaseous emissions.

Even a continuation of past trends could lead to serious policy failures, especially if judged on the criterion of achieving balanced regional development. Dublin and the eastern counties will continue to increase their share of national population and employment. The other major urban centres will also continue to increase size, as will population in peri-urban areas – maintaining incessant pressure on infrastructures and utilities. Urban growth in the regions will be enhanced by dedicated enterprise policies, services provision and regulatory measures – in line with the National Spatial Strategy. Cluster developments, in the sense of a critical mass of enterprises benefiting from new technology, pools of expertise and specialised supports, will be feasible in some provincial locations. However, the ‘rural spill-over’ will be limited, given the human resource and infrastructural weaknesses at rural level (Section 1.2). The BMW Region, especially the north-west, will continue to lag behind the economic performance of the rest of the country, because of its weak urban structure and associated factors. There will be

significant rural problems also in the traditionally strong farming areas currently adjusting to farm output restrictions and eventually to world market prices. For rural areas, generally, but especially those outside the commercial farming areas, much will depend on how functionally connected they are to urban-centred economic developments. For those outside the main urban catchment areas, specially focused programmes of local economic development will be necessary. Some coastal and high amenity rural areas, such as the lakelands, will see further increases in population, as people with high incomes or assets are able to exercise greater choice as to where they will live – provided of course that the attractions of the physical environment are not eroded by careless, short-sighted planning.

3.2 Agri-food industry

While the contribution of agriculture to the economy is expected to decline (Section 2.1), farming and much of the food processing industry as well as sectors supplying services to the agricultural and food industry, will continue to provide a base of employment and income generation in rural areas.

In terms of full-time equivalents, farming in 2025 may provide upwards of 25,000 to 35,000 jobs. While not all in rural locations, there could be a further 40,000 to 50,000 employed in the food and drinks industry. Also, there will be a sizable number of rural dwellers (say 5,000 – 10,000) with jobs in small and medium scale companies, providing specialised services to the agri-food and other sectors. In total, upwards of 70,000 to perhaps 100,000 may be employed directly and indirectly in the agri-food sector in 2025. Thus, the agri-food sector will continue to play an important role in the rural economy. In particular, it will provide a bulwark against the risk of over-dependence on foreign multi-national companies.

The structural changes outlined in Section 2.1 will be attended by greater geographical differentiation in farm production. This will lead to rural Ireland in 2025 being characterised by the following three agriculturally defined spatial areas, which have important implications for the rural economy.

- *Intensive farming areas*: The projected numbers of full-time commercial farmers, mainly dairy farmers, and associated food processing companies will be concentrated predominantly in Munster and south Leinster, leading to

growing conflicts in these regions between economic and environmental sustainability.

- *Extensive farming areas:* Most of the projected numbers of part-time farmers will be concentrated in the border, midlands and western region, where they will be engaged mainly in extensive beef/sheep production. A sizeable proportion of full-time commercial beef producers will also be located in this region.
- *Marginal farming areas:* The withdrawal of agriculture from marginal farming areas will adversely effect the unique natural and cultural environment of upland and wetland areas. This would place in jeopardy the amenity-tourism value of environmentally important rural regions and reduce their opportunity to develop alternative multifunctional land uses. In many such areas, traditional landscapes are being replaced with extensive monocrop forestry or scrub encroachment, as is already evident in the Burren (Co. Clare) and other counties in the west of Ireland.

3.3 Forestry

Employment in forestry is currently in the region of 12,000 full-time job equivalents (see Thematic Paper No.5). However, difficulties are being encountered in attracting and retaining new forest workers. There is a need for nationally accredited forestry training courses allied to proper career structures, similar to those pertaining in other countries, in order to attract and retain the young people required to raise productivity and international competitiveness of the forestry sector.

With the necessary training for those engaged in forest management, harvesting and transport, and processing (including farmers as well as those employed in the sector), combined with a well balanced state/private mix in terms of funding and investment, including sustained funding for a strategic research programme, forestry could in the decades ahead make a sizeable contribution to the rural economy. The sector has the potential to provide sustainable employment for up to 20,000 rural dwellers and also contribute to farm incomes. The designation of regions/areas as preferred locations for forests could lead to rural Ireland in 2025 being characterised by two distinct types of forestry, which would have important implications for the rural economy.

- *Commercially managed forest:* The predominance of commercial plantations on marginal land will be further accentuated by the withdrawal of agriculture from the less productive farming areas and the concentration of forestry along the western seaboard, and in other counties with sizeable upland and/or under-utilised areas, such as Leitrim and Cavan, and other regions with more difficult agricultural soils.
- *Non commercial public goods forest:* These areas will be managed mainly for biodiversity, recreation and other public goods, and will include forests owned and managed by the National Parks and Wildlife Service, and other public bodies as well as private owners. A key issue will be the provision of public goods, in particular biodiversity, at the landscape level and not necessarily in each individual land parcel. To conserve and encourage biodiversity linkages between landscape units will be an important component of land management.

4. STRATEGIC CHALLENGES AND INITIATIVES

As already indicated (Section 1.1), much of the production-oriented or low-tech assembly that characterises many of the FDI companies in Ireland could move to lower cost economies, also possibly, back office and service type jobs (see Thematic Papers No.1 and No.2). The consequences of such an occurrence for the national economy and the employment boom of recent years need no elaboration. Among the measures being taken to reduce the risk is the substantially increased research funding being provided to universities for fundamental research. This will lead to a much greater output of PhD graduates, which FDI companies are increasingly recruiting. The availability of higher numbers of PhD graduates may provide an incentive for some FDI companies to remain in Ireland.

A substantial number of those living in rural areas are employed in FDI enterprises. With the economic impetus these companies and others provide, employment in building and road construction has boomed in recent years. Waning of this building boom, combined with the expected downturn in agriculture (Section 2) would have very adverse

consequences for the rural economy. In such circumstances, accessible jobs from growth among exporting businesses would be of critical importance.

The major challenge facing the wider rural economy is to achieve the optimum balance between business competitiveness on the one hand and environmental and social sustainability on the other. This will require a sustained commitment of resources to building demand-driven regional research and innovation systems, involving effectively operating networks between local business and enterprise, education/training and research agencies (Section 6.3). It will also require supportive environmental and socio-economic research. Given the opportunity costs involved, the public organisations concerned are often not in a position to provide services that are specially tailored to meet the requirements of individual regions/local areas. Funding specifically earmarked for use in commissioning/contracting the delivery of research, education/training and other support services needs to be made available to regional/local agencies. Otherwise their needs, in terms of research and innovation, will continue to be poorly provided for.

The core challenges facing the natural resource based sectors of the rural economy, and the key initiatives that now need to be taken, are outlined below. Further details on those and other important challenges and initiatives in relation to the agri-food, forestry and environment dimensions of the rural economy are set out in the Thematic Papers contained in Part 2.

4.1 Agri-food industry

Three key challenges face the agri-food industry. These are: (i) responding to declining real agricultural prices; (ii) achieving an appropriate scale of operation; and (iii) increasing product differentiation (see Thematic Paper No. 4). Competitiveness in the predominant dairying and beef sectors requires the attainment of much increased scale in both production and processing. In milk production the delivery of 1 million litres or more of milk per farm business has frequently been suggested as a necessary production target. Also, as has been advocated in a number of national reports – most recently the McKensy and Prospectus Reports – major rationalisation is required in dairy and beef processing. Ireland's seasonal milk production system and the consequential plant capacity requirements and associated under-utilisation

problems, have crucial implications for the scale of capital investment required in dairy and also beef processing facilities. In addition to this large capital requirement, the processing sector must attain the massive scale required to maintain international competitiveness. As mentioned in Section 2.1, these pressures can be expected to result in Ireland having, in the coming decade(s), just two major dairy processing companies and a comparable number of beef export processing groups. Governance issues may of course adversely delay this essential rationalisation process.

The progressive lowering of real agricultural prices will severely challenge and could threaten the economic viability of the dairying and beef production. These are the core sectors of agriculture, where Ireland is considered to have some competitive advantages. With its current scale and excessive dependence on undifferentiated products, the primary food processing industry will be subjected to parallel pressures. If the primary producer does not produce, the first stage processor cannot survive. The secondary processing sector, in particular the prepared consumer food component, which has been the most dynamic sector of the food processing industry in recent decades, is already sourcing significant volumes of its raw materials on world markets. As with the FDI sector, the prepared consumer food companies may ultimately find it more profitable to re-locate to cheaper economies, including the new EU Member States. The manufacture of prepared consumer foods and also some other high value food products is not dependent on having an indigenous farm production sector.

The new policy framework, allied to the growing competitive environment, increasingly demands the manufacture of market required food products of consistent quality and guaranteed safety, produced in a manner compatible with environmental and animal welfare requirements. Meeting these demands will require the development of new livestock production systems, that match animal nutritional requirements and genetic potential, and that produce in an environmentally sustainable manner, consistent quality raw materials for the food processing industry. These must be internationally competitive not only in price, but also functionally. In the knowledge driven international markets, the agri-food industry must have the business, technological and innovative capacities to support a more differentiated product portfolio, ranging from the continued manufacture of high volume commodity

products, to food ingredients and to short shelf life and other high value products, such as functional foods.

In the immediate years ahead, the agri-food industry must position itself within the knowledge economy. In particular it must have the technological, innovative and business capacities required to obtain the optimum balance between the economic dictates of cost-efficient farm production, food manufacture and supply, while at the same time meeting growing consumer and societal demands regarding food quality, safety, nutrition and diet-health relationships – as well as protecting the environment, and meeting animal health and welfare concerns. Coping with this testing new context will require fundamental step changes in agri-food and rural economic research, in terms of strategic directions, capacities and organisational/delivery structures.

4.2 Forestry

Reduced afforestation grants/premiums, and increased wood supplies, from other EU Member States, allied to uncertain roundwood prices and the mitigation and adaptation aspects of climate change are major challenges facing the industry (see Thematic Paper No 5).

Increased awareness and realisation of the benefits of forests and the major potential of wood energy (including the use of forest carbon sinks in the EU Emissions Trading Directive), greater recreational use of forests, as well as delivering better water and biodiversity services would be beneficial to the rural economy. However, there are major challenges facing the sector as detailed in Thematic Paper No. 5. In the immediate decades ahead the main national contributions of the forestry sector will be in public goods provision, in particular recreational uses and carbon sequestration. To maximise this important contribution, financial incentives for the public goods provided by forestry are essential. The provision of forestry environmental payments, is in this regard an important initiative. Increased and sustained investment in nationally accredited forestry training courses, technology research and development is also essential in order to optimize the public good provision and improve the competitiveness of the sector.

4.3 Marine

With the adoption of a proactive and partnership strategy for marine resource development, supported by the application of science and technology, key initiatives in the marine sector could result in the following positive outcomes by 2025.

- Ireland could be a strategic node in European-North American and Baltic-Mediterranean shipping routes, with a developed re-distribution point serving European short sea routes. An associated Maritime Financial Service Centre could be established.
- Oil and gas could be brought ashore, and renewable ocean energy could provide up to 30% of national electricity demand. A thriving and environmentally sustainable marine aggregates industry could also be developed.
- Ireland has the potential to be a prime tourist destination for marine and leisure activities, in an attractive environmental setting.
- New opportunities for a more economically and environmentally sustainable seafood sector can be expected from reforms of the Common Fisheries Policy, a reassessment of costs (energy requirements, crew available, etc.) and innovative partnerships to exploit Ireland's geographical proximity to important EU Atlantic fishing grounds, linked to integration along the whole seafood processing chain.
- Greater local control over regional fisheries, through Regional Councils would invigorate the inshore sector supporting a specialised fleet.
- The demand for seafood, especially in health and specialist food markets, coupled with the strong green image of products caught off western Europe, will provide an opportunity for innovative partnerships to supply value-added niche European and global seafood markets.
- Aquaculture can expand considerably in terms of production levels, species diversity and products.
- New commercial developments will be most notable in the science-based sectors where lucrative marine bio-prospecting activity could provide important support for local biotechnology companies.
- By exploiting ICT capabilities and new sensor technologies, Irish companies could

successfully penetrate monitoring and surveillance product and services markets.

The three critical requirements for the positive scenario outlined above are:

- (i) A strong proactive and leadership role by the State in putting the sustainable development of the country's marine resource centrally on the economic development and political agenda.
- (ii) Raising the intensity of research, technological development and innovation (RTDI), through a focused Marine RTDI Funding Programme, to develop the necessary scientific understanding, technologies and innovative business models that can realise efficiencies and create new marine resource development opportunities for both local and global markets.
- (iii) Raising environmental issues and concerns to a pre-eminent position, maintaining a high quality environment, balancing longer-term environmental impacts against short-term economic gains, and introducing into economic development models assessments of the monetary value of public goods and services.

4.4 Rural landscapes

Continued infrastructural developments and geographical concentration of intensive agriculture and forestry (Sections 3.2 and 3.3), combined with the potential impacts of climate change are crucial challenges for the future management of rural landscapes. Demands on rural space, including pressures on water and other environmental resources, will become more acute, especially in the eastern region, due to the combined effects of further population growth and climate change (see Thematic Paper No.6).

EU Directives, provided they are fully and properly implemented in a timely manner, provide a basis for cautious optimism that the environmental degradation of recent decades will be arrested. However, as previously indicated, sustained financial and experienced human resources need to be committed to conflict resolution in relation to the location of roads, utilities and other infrastructure, as well as public access to rural landscapes. Otherwise these issues could become substantial impediments to continued economic growth.

The daunting challenge involved in striking the optimum balance between economic developments

and environmental management, points to the concept of envisaging the environment as a virtual economic entity, within which a dynamic range of competing developmental, environmental and social pressures have to be systematically accommodated, without the demands of one sector impacting unduly on others.

Inherent to this concept is the need repeatedly referred to, for the value of public goods, especially those provided by agriculture, forestry and the marine sectors to be quantified and priced, for their full value to society to be included adequately in the process of policy formulation. In this regard the establishment of a strong national capability in environmental economics is an urgent priority in building Ireland's environmental research capability.

The complex array of interactive issues involved in reconciling the seemingly conflicting demands of environmental development and environmental management, need to be better understood, in order to be managed effectively. This will require the sustained commitment of resources to a nationally managed environmental research programme. In this regard, there is need to build on the research programmes being financed and managed by the Environmental Protection Agency. In particular, closer integration of scientific and policy-oriented resources is essential in generating the knowledge required by policy and decision makers in devising solutions to emerging problems. Further to this, the major structural changes expected in agriculture, in conjunction with climate change, underline the pressing need to establish cost effective baselines against which the impacts of those and other major changes, on both the natural and cultural environment, can be objectively assessed and timely corrective action taken where necessary.

To ensure the environmental management of intensively farmed regions (Section 3.2), urgent attention also needs to be given to the development of a Public Goods Incentive Scheme, designed to encourage full-time commercial farmers to conserve natural habitats and archaeological sites, whilst not unduly inhibiting the profitability of their farm businesses.

Unlike REPS, the proposed Public Goods Incentive Scheme would not have predetermined limitations on the productivity of the entire farm. The focus of the scheme would be those part(s) of the farm that have significant public goods, especially natural habitats, archaeological sites and historic

landscapes. In addition to the conservation of specified heritage sites, payment of the incentives would be conditional on adherence to environmental directives, regulations and the Code of Good Farming Practices. Also the proposed incentives could be devised so as to address the issue of public access to natural habitats, archaeological sites and historic landscapes.

4.5 Population, employment and spatial dimensions

A key objective of public policy is not only to maintain the rural population in aggregate numbers, but also to achieve a balanced spatial distribution of people and jobs (see Thematic Paper No.3). Some of the initiatives required to realise this aim have in fact been already well identified in the White Paper on Rural Development (1999), the National Spatial Strategy (2002), and in various other national plans. However, the rhetoric of declared policy has not been matched by sufficient commitment to implementing the actions identified as necessary.

What is now needed are: (i) responsive and effective institutional structures to formulate and implement policies for multisectoral rural development; and (ii) strategic and regionally-specific synchronisation of existing policies and plans, together with some new actions and taking account of the changed EU policy environment beyond 2006. The National Spatial Strategy should be implemented with sustained political commitment and in a manner joined up with future national development plans. These plans should retain the good practices already established under previous EU funding requirements, including the setting of targets, and performance indicators, and the establishment of regional monitoring systems. The plans should have an explicit focus on the NUTS 3 regions. The current BMW and Southern and Eastern regional division is too gross and unrealistic a categorisation to respond to Ireland's regional variations. Special attention needs to be given to generating local economic development in those areas lying outside the catchment zones of the larger urban centres, where neither agriculture nor urban generated growth will maintain population. Within this context, the implementation of the 2002-2012 County Strategies needs to be given a much stronger impetus than hitherto.

While EU structural funding levels will be reduced, future rounds of EU cohesion policy

funding will emphasise regional competitiveness, including exploitation of the full potential of natural resource based employment, upgrading old economy enterprises, and developing internationally-oriented clusters at regional locations. Regional and sub-regional development could also be supported by strengthening inter-urban networks which are in fact emerging organically. A western corridor needs to be developed as a counter to the Greater Dublin Region.

The commitment under the reformed CAP to move supports from production agriculture to rural development, (Pillar 2 of the CAP), is welcome. However, the currently designed Pillar 2 is too feeble a response and also too much centred on agricultural structures to offer any real hope of making a significant contribution to developing a strong rural economy in Ireland. It needs to be much broader in scope. Tourism policy also needs a clear rural and regional dimension, and in which the public good functions of agriculture and other natural resources are adequately recognised.

Most importantly, the future development of the rural economy needs a dedicated research support system linked to public policy-making, and to guide the optimal use of rural resources and rural space. This would be an integral component of regional research and innovation systems (Section 6.3).

5. COMPETITIVE AND SUSTAINABLE RURAL ECONOMY TO 2025

5.1 Economic prospects

Unless the underlying rate of productivity growth is significantly improved, the level of out-performance of the past decade or more will not continue; instead, the economy is projected to grow by some 3 to 5% per annum (Thematic Papers No. 1 and No. 2). As a result the size of the economy in 2025 will be double that in 2002 and incomes per person would be 60% higher.

Sustaining the assumed productivity growth trend of 2% a year per person employed would require continued expansion in the contribution of market services. These will occupy the position of lead sector instead of high technology manufacturing. This scale of expansion would be required to alleviate the impact, especially in rural areas, of the expected contraction of employment in agriculture, building construction, traditional manufacturing industries, and eventually perhaps, food processing.

Ireland's rural and regional economies are, as already indicated, intrinsically affected by developments in, and the growth of, the national economy. Over one-quarter of the rural population is employed in agriculture and the building industry, where long-term contraction is to be expected. However, contraction of these industries may be offset if rural regions can share in the overall growth in the export-oriented service sector. Between 1991 and 2002 the proportion of rural residents engaged in the professions and other service type occupations nearly doubled. With the continued preferences for living in high amenity rural/coastal areas there is the possibility of a switch to the provision of services in the structure of rural employment in the years to 2025. Allied to this, there is growing societal demand for wholesome food products of assured safety and consistent quality, produced in a manner that meets environmental and animal welfare requirements. Also the demand is rising for public goods associated with agriculture, forestry and the marine. These trends would enhance the service content of the rural economy.

Notwithstanding the aforementioned opportunities, a major concern for rural and regional economies is the outcome of negotiations on World Trade Organisation's Agreement on Agriculture. In particular prices for livestock products could fall due to reduction in protection of the EU market and consequent competition from imports at world market prices.

The cost of energy will almost certainly increase by 2025, but possibly not so much as to be a major constraint to its use (see Thematic Paper No.1). Much of the projected 60% global increase in energy purchased by 2030 will be supplied by oil and gas. However, there may be an elevated risk of crisis-induced spikes in energy prices, as happened in early 2005 when prices jumped to over US\$50 per barrel. Indeed some observers contend that there will be difficulties with energy supplies and prices from 2015 onwards, unless renewable sources come on stream. While not discounting such eventualities, the scope for greater efficiencies in energy use is such that, when combined with replacement of hydrocarbons, access to energy is not likely to be a critical constraint on economic growth up to 2025. Apart from crisis-induced episodes, supply and demand are likely to be more or less balanced at real prices no higher than recent peaks. However, because of the persistent travel inherently involved and the requirement for more extended transport networks, rural Ireland is

particularly vulnerable to both the price of fossil fuels and constraints on gaseous emissions.

As already indicated, Ireland is far in excess of the 13% increase in greenhouse gas emissions allowed for in the commitments made in the Kyoto Agreement. Even allowing for the purchase of emission permits, payment of carbon taxes and reduced agricultural emissions due to the expected fall in cattle and sheep numbers, greenhouse gas emissions projected for 2010 would still be some 25% above those in 1990. With evidence of global warming becoming more troubling since the signing of the Kyoto Agreement, constraints on greenhouse gas emissions are likely to increase up to 2025. This would have major implications for economic growth and underlines the important role that an expanded forestry programme and other forms of carbon sequestration together with renewable energy sources, can play in alleviating the impact.

5.2 Achievable perspective

Assuming a sustained national growth rate of the order of 3 to 5% together with the necessary investment in infrastructure and in the development of an indigenous knowledge economy, rural and coastal Ireland in 2025 could be envisaged as having a balanced mix of business enterprise sectors, supported by enhanced telecommunications and transport networks (see Thematic Papers).

- The service sector will be the predominant driver of growth, with much of the employment concentrated in urban centres.
- The manufacturing sector will also be important, especially exporting businesses built upon sustainable comparative advantages.
- Old economy enterprises will be up-graded, with agriculture, forestry and the marine making important contributions to the rural economy.
- Ireland could have a sizable knowledge bio-economy, built upon the comparative advantages of the natural resource based sectors including agri-food, forestry and the marine.
- Locally trading companies could be a vibrant sector of the rural economy, with tourism in rural and coastal areas providing knowledge-based environmental goods and services, focused on Ireland's unique landscapes.
- There could be a sizable number of internationally oriented clusters of companies

exploiting the full potential of natural resources in food, forestry, the marine and tourism.

Obstacles to achieving these prospects include:

- Stagnation in the macro economy and failure to extend growth to the rural regions.
- Inadequate provision of infrastructure to link people and businesses in rural areas to the centres of economic activity.
- Degradation of Ireland's rural and coastal landscapes constitutes a most worrying threat. Of particular concern is the further spread of one-off scattered housing in the countryside, especially holiday homes. Extensive scrub encroachment together with monoculture afforestation in upland and wetland areas is also a concern.
- Failure to create institutional structures and governance systems with the sustained commitment and capabilities to respond to the challenges facing the rural economy.
- Lack of the necessary knowledge to inform public policy and strategic planning.

6. KNOWLEDGE RURAL ECONOMY

The economic opportunities presented in Section 5 are in many instances realistically achievable. *The key strategic question is: are they likely to be achieved?*

6.1 Institutional framework

Implementation of many of the strategic initiatives outlined in Section 4 requires in particular inter-departmental and cross-agency commitments to ensuring that sectoral policies and programmes contain responses focused on the defined needs of the rural economy and communities (see Thematic Papers No.1 and No.2). The needs of the rural economy must be seen comprehensively, as important dimensions of regional development and not simply as problems to be solved by the reformed Common Agricultural Policy. The CAP has no increased funding for rural development in real terms; and moreover, its concept of rural development is severely restrictive. With the next round of EU Cohesion policy funding largely dedicated to convergence and competitiveness, the

opportunity exists for Ireland to seek increased financial support to build regional/rural competitiveness. Given the prevailing weaknesses in the existing institutional framework, it is difficult to be confident of the timely and proper implementation of the strategic initiatives identified in Section 4, unless the overarching measures set out below are put in place and, most importantly, are properly resourced and effectively operated.

6.2 Rural Policy Implementation Group

The compartmentalised policies and budgetary provisions of the different government departments and agencies involved in developments pertaining to the rural economy do not provide the institutional framework necessary to mobilise decision makers and stakeholders (in both the public and private sectors) to undertake the collective strategic initiatives (Section 4) and also the overarching measures (outlined below) that are required to re-position rural Ireland in the knowledge economy. A Rural Policy Implementation Group on resource deployment in rural areas is the cardinal requirement. The Group should comprise senior officials from appropriate government departments and development agencies, together with senior managers of rural businesses and leaders of relevant voluntary organisations. Its establishment would ensure that rural enterprise initiatives (Section 4) have an explicit presence in the policies, budgetary provisions and the implementation strategies of government departments and development agencies.

A prime concern of the proposed Group would be the establishment of the financial and other preconditions necessary for the implementation of national and regional reports, in particular the National Spatial Strategy (2002), the White Paper on Rural Development (1999) and the Report of the Enterprise Strategy Group (2004) which places a strong emphasis on the development of indigenous businesses. The Group would provide a coherent institutional framework for developing the strategic consensus necessary to mobilise funding and other resources for collective initiatives (Section 4) in relation to the multi-dimensional issues involved in building a knowledge rural economy. Its work would be underpinned by research on the functioning of the rural economy and the quantification of the likely effects of policy initiatives and other external influences.

6.3 Regional innovation and research systems

Provision of the rural knowledge infrastructure, that is adequately and specifically funded to support innovation and demand driven research on regionally specific issues, is urgently required (see Thematic Papers). The central role of knowledge in driving national and regional innovation and economies points to the need for the development of new models for the organisational structure and delivery of research and innovation. To meet the specific context-dependent needs of rural regions, an analogue of the US Land Grant Colleges may be appropriate. These colleges have a strong extension role in delivering new knowledge to potential adopters in rural areas. Such an extension model would position the higher education organisations to act more directly as intermediaries in developing clusters of indigenous businesses. In particular it would provide a structured system for meeting not just the research requirements of rural regions and indigenous businesses, but also their education and training needs, as further outlined in Section 6.4 below. A widespread anomaly in relation to these repeatedly defined needs, are the major discrepancies in the relatively small, and often decreasing, proportions of national and EU science budgets allocated to knowledge-transfer as opposed to knowledge-creation.

An innovation driven approach to research needs a radically different funding system from that conventionally applied to higher education institutions and state research institutes. To raise the capacity of rural regions to generate, absorb and integrate research and technological innovations and transfer them into economic growth, the fundamental requirement is a dedicated strategic funding system. This needs to be designed so as to enable rural regions:

- to capitalise on their comparative advantages, by mobilising all the resources available, towards the attainment of context-dependent and demonstrably attainable goals; and also
- to take advantage of best practices and models available in relation to the governance, organisation and delivery of integrated research and innovation systems.

6.4 Knowledge transfer, innovation and human resource capacities

Innovation requires the capacity to combine knowledge from different disciplines/sectors and apply it to real world problems, in an environment of cost constraints and financial risk. It is not just dependent on research quality or quantity.

The current pre-occupation with funding basic research, primarily in the universities, is important. It is not, however, a precondition for, and will not *per se*, drive technological or other innovations. Research has been described as the transformation of money into knowledge; innovation as the transformation of knowledge into money. Basic research is of vital importance in providing the knowledge platform required to support the delivery of up-to-date education programmes. It is also essential as previously indicated (Section 1) in providing the increased numbers of properly trained researchers, required to support continued economic growth and in Ireland retaining its position as a beneficial location for FDI companies.

The university education system is mainly concerned with the development and provision of new knowledge. The development of knowledge related skills is strategically important but not formally provided for by the current system. To ensure their continued employment prospects, research graduates need to rapidly acquire a complex array of knowledge-related skills, for instance in communications, problem solving, preparing research proposals and research budgeting and management, while at the same time keeping abreast of developments in their own fields. To meet these life-long learning requirements, the universities and other third level institutions need to have a more proactive and systemic approach to the provision of postgraduate training programmes, especially for young professionals embarked on careers in both the public and private sectors. In addition to this, the long standing and well documented deficit in the provision of nationally accredited industry training programmes, for both managers and operatives employed in a wide range of sectors, needs to be properly and urgently addressed. Training is an essential conduit in technology transfer. By providing the required training programmes, the Institutes of Technology in particular, have a crucial role to play in raising the technological absorptive and innovative capacities of regions and companies.

7. CONCLUSIONS

The re-positioning of the rural Ireland in the knowledge economy and ensuring its future competitiveness, are fundamentally dependent on the implementation of the three overarching measures outlined in Section 6. These are the establishment of:

- A Rural Policy Implementation Group
- Integrated Regional Research and Innovation Systems
- Education and Training Programmes specifically designed to raise the human resource capacity of rural regions and especially of businesses

Based on previous experiences with policy recommendations, it is not likely that these essential overarching support measures for a competitive and sustainable rural economy will be readily implemented. In their absence, the rural economy in 2025 will not attain the economic prospects outlined in Section 5.2. Instead it will approximate more to the Baseline or Business As Usual Perspective set out in Sections 2 and 3.

The rural economy in 2025 will to a significant degree be dependent on our own national strategic choices. *We Cannot Plan the Future - We Can Plan for the Future*. The cardinal question is *Can We Act on the Plans?* by developing the necessary institutional framework and commitment of resources. We need to develop better, not more public institutions.

Constructing an effective institutional framework to support continued economic growth nationally and at regional level is the single biggest developmental challenge facing Ireland.

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PART TWO

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1. Economic Conditions in the 2025 Baseline Scenario

B. Riordan¹

INTRODUCTION: SCENARIOS AND METHODS

This paper provides the starting point for subsequent papers in this Foresight project. It provides a scenario for 2025 based on current trends. It focuses on the likely prospects for economic growth, and in particular growth in Gross National Product (GNP) *per capita*, for the period up to 2025. Subsequent Thematic Papers provide scenarios for specific sectors and regions within the context of this ‘baseline’ scenario.

An alternative scenario resulting from implementation of specific initiatives will also be analysed, initiatives would include:

1. More intensive development of the knowledge economy;
2. Strengthening of the incentives to take account of the external costs and benefits of choices made at work and in private life, including:
 - a. Location of work and home;
 - b. Travel and transport demands;
 - c. Services sought, for example: venues and shops, water and sewage, connections for mains electricity and for communications;
 - d. Environmental impacts including: water pollution, gaseous emissions as, for example Greenhouse Gasses; land use and effects on visual amenity.

As a result society and the economy perform more efficiently with outcomes examined in subsequent papers. These will be contrasted with the likely outcomes from the trend, or ‘Business as usual’, baseline scenario whose overall features are outlined in this paper.

1. ECONOMIC GROWTH IN IRELAND – A CONTINUATION OF THE 1990S MODEL TO 2025?

Our assessment of the process underlying Irish economic growth and hence the assumptions about rates of economic growth up to 2025 are based on the 2003-2010 *Benchmark* forecast in the ESRI Medium Term Review 2003-2010². Detailed projections are provided in Table 1.

The drivers of long-run growth in the ESRI model stress, on the one hand, the key role of international economic conditions and, on the other hand, domestic supply conditions. In the short run international factors, including: exchange rates, interest rates and growth in international markets, will influence demand for exports, but in the long run the key driver will be the evolution of global economic growth. Likewise, on the domestic supply side, international competitiveness in terms of relative prices, wages and broader input costs and regulatory burdens, will profoundly affect economic performance in the short to medium run. In the long run, however, prosperity will be determined by our ability to increase underlying productivity.

The lesson from the “Celtic Tiger” era of the 1990s is that we achieved an exceptional growth performance mainly by dint of demographic factors, particularly increased labour-force participation, especially of women, and immigration, rather than by significantly improving the underlying rate of productivity growth. This was possible because of the unique features of a small economy like ours, which has the capacity to grow its labour force significantly through labour migration and the exploitation of opportunities for enhanced labour-force participation. These demographic factors were supported by the pursuit of prudent macroeconomic policies, the maturing of sustained investments in human capital, and the influence of the Social Partnership model in

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² Bergin, A. *et al.* (2003). Economic and Social Research Institute, Dublin.

Acknowledgement to members of the Working Group, particularly G Boyle, P Commins and P Crehan for generously enabling me to draw on their thinking, knowledge and their own drafts in the preparation of this document.

the setting of competitive wages. These developments in turn led to an unprecedented increase in Foreign Direct Investment (FDI), which boosted the stock of capital resources and generated other positive externalities too.

It would be fortuitous indeed if the confluence of these factors continues to operate in the period up to 2025. The boost to growth from enhanced labour-force participation, for instance, is likely turn to a natural slowdown. The emphasis will then shift to the prospects for sustaining, and hopefully increasing, the underlying rate of productivity growth. Our ability to achieve this outcome is likely to affect substantially our capacity to get enhanced growth in living standards.

We now consider some of the factors that have operated in the past to underpin economic performance with a view to assessing whether the influence of these trends will continue to be as benign in future.

Over the next decades average rates of growth in the economies of our main trading partners are likely to be about two percent a year, according to consensus forecasts. Their growth would be beneficial for growth in Ireland, providing markets for exports and inward investment.

Ireland is seen to continue to gain from various circumstances that have favoured a performance ahead of our trading partners over past years. However, evolution of the structure of population and the economy has reduced the scope for the same degree of out-performance in the future. The assumed changes, shown in Table 1, indicate that most of the growth would come from sustaining the two percent growth in productivity per person at work, achieved in many earlier years. The cumulative effect would be to raise the value of output per person at work by 58 percent between 2002 and 2025. This, combined with some further structural evolution, would deliver a 60 percent rise in Gross National Product *per capita* between 2002 and 2025. It would also yield a similar rise in people's disposable income.

Achievement of the projected rise in output and incomes is likely to involve major expansion in the contribution of market services to the economy, already seen in the rise of the International Financial Services Centre (IFSC). These will take over the role of lead sector from high technology manufacturing. In contrast, employment would contract in agriculture, building, the traditional manufacturing industries and, eventually, food processing.

Demand, particularly for improved services, would also rise with the anticipated growth in incomes. Of particular relevance for the rural economy would be enhanced consumer preferences for environmental goods, which tend to be associated with high incomes, such as the requirement to have a pleasant countryside for recreational pursuits. These are clearly public goods and externalities of agriculture and forestry. Payment for their supply is partly provided in the Rural Environment Protection Scheme (REPS). However, it does not cover all of the land, largely due to the capping of payments, nor does it cover all of the public goods that could be provided by land occupiers. Demand for food would also go further down the route of looking for assurances that every product is reliably enjoyable, safe and produced in environments that are animal-welfare friendly.

Ireland's rural and regional economies are likely to be substantially affected by developments in the overall development and growth of the economy. Analysis of employment data in the 1991 and 2002 Censuses, from Prof Jim Walsh and Cian O'Connor, indicates how rural Ireland may gain as well as lose in the context of the overall projections. In their analysis they took rural to be all of the people not living in urban areas of 1,500 people or more. This showed that 40 percent of the population was rural and they accounted for 39 percent of people in occupations in 2002. However, the pattern of these occupations does not auger well for the future as over 25 percent were in agriculture and building industries where long-term contraction is to be expected. However, the professions and other service type occupations seem to have been as prominent in rural non-agricultural employment as in the urban areas. In addition, the numbers of rural residents in these service occupations nearly doubled between 1991 and 2002. Some of this work may have actually been done in urban centres, though it is notable that the proportion of people in the professions and other service occupations did not differ greatly between counties close to major centres and those further away.

2. GLOBAL GOVERNANCE, TRADE AND MOBILITY OF CAPITAL

Continuation of the current international arrangements is a cardinal assumption. This is a scenario that has benefited Ireland in the past, however, it does imply that competitive performance

in international trade in goods and services is an essential part of the 'business as usual' baseline scenario. The consequence of any competitive weakness is illustrated by the net outflow of jobs from foreign owned businesses over the period 2001 to 2004.

One downside for the rural and regional economy in this global trade scenario is that the EU commitment to implementation of the World Trade Organisation's Agreement on Agriculture includes a risk of reduced prices for livestock products through competition from imports at world market prices.

3. ENERGY SUPPLY, DEMAND AND THE GHG CONSTRAINT

The cost of energy in 2025 will almost certainly be higher than in 2002, but possibly not so much as to be a major constraint on its use. Reasons for this increase are mainly:

1. A rise in the international price of oil and,
2. Taxes, charges and other measures to constrain emissions of greenhouse gasses (GHG).

In addition, there will be a greater risk of supply disruptions pushing prices to crisis levels, illustrated by prices in late 2004 of \$50 per barrel. These considerations will now be examined in more detail.

3.1 The oil and gas market

The World Energy Outlook 2004 projects a 60 percent increase in energy purchases by 2030 reflecting strong growth in China, India and throughout Asia. In the baseline scenario much of this expansion would be supplied by oil and gas at a price equivalent in terms of money values in 2000 of \$25 per barrel. The report's analysis of the consequences of a price of \$35 per barrel clearly demonstrates the responsiveness of supplies of oil and gas to higher prices. It also shows an increase in the role of providers of energy from unconventional sources. In addition, an energy saving scenario demonstrates the scope for reducing consumption thus supporting the view that depletion of oil and gas deposits over the next 25 years need not do serious harm to the global economy. Thus these sensitivity tests of the baseline scenario above, support the view that, over the years, supply and demand will be balanced at real prices no higher than recent peaks. However, there may be an elevated risk of crisis-induced spikes in energy prices.

3.2 Greenhouse gas (GHG) emissions

Projections of GHG emissions to 2030 in the World Energy Outlook 2004 are 'calling into question the sustainability of the current energy system' in the words of its publisher, the International Energy Agency. An early response to this threat was the Kyoto Protocol and the commitments in it by EU, Russia, and other countries, to constrain the emissions of GHG in 2008 to 2012 relative to 1990.

Projections show Ireland overshooting its commitment by a wide margin. The ESRI *Benchmark* forecast in its Medium Term Review 2003-2010 includes an assumed addition of 20 euro per ton of carbon dioxide emitted to the costs of all users of hydrocarbon fuels. For large industrial users this would come in as the cost of buying additional emission permits. Other users, including transport and home heating, are assumed to pay a carbon tax. However, even with these measures and the fall in numbers of cattle and sheep also reducing emissions, the levels projected for 2010 would still be 25 percent above those in 1990. Ireland is thus far in excess of the 13 percent increase allowed within the EU burden sharing arrangements for fulfilling the commitment made at Kyoto. The Review states that from January 2005 the excess would be covered by purchase of emission allowances through the EU Emissions Trading Scheme. This enables companies to sell the allowances they have been awarded in their National Allocation Plan or to buy from others.

Constraints on GHG emissions are likely to increase in the years to 2025, as Kyoto has always been but a first step in reducing emissions and, since its signing, the evidence of GHG global warming has become far more troubling. However, such is the scope for increasing efficiencies in energy use and in some replacement of hydrocarbons as a source of energy, that it seems unlikely that access to energy will be a major constraint on activities in Ireland up to 2025.

Rural Ireland is particularly vulnerable to both the price of fossil fuels and constraints on GHG emissions. Rural living involves considerable travel and more extended transport networks. Members of some households will also be engaged in dairying, or the raising of cattle and sheep with their attendant emissions of GHG. Other households will be engaged in marine occupations that are quite sensitive to the price of fuel. In an alternative to the 'business as usual scenario' the vulnerability of these households to increases in fuel prices and constraints on GHG

emissions could be recognised. Thus, for example, in seeking to curb the major contribution of travel and transport to growth in GHG emissions, a policy of congestion charging would be less damaging to the rural economy than restraint though large increases in the cost of motor fuels.

Alleviation of the problems GHG emissions might be provided by rural Ireland including:

- Harnessing of wind and wave energy becoming a major rural activity;
- Sequestration and absorption of carbon dioxide provided by expansion of afforestation;
- Biofuels as a source of energy has been seen as an option, but is unlikely to feature largely in the energy market scenario set out above unless accorded tax incentives (J. I. Burke, Teagasc, Briefing Note).

4. THE KNOWLEDGE ECONOMY – IRELAND TO THE FORE?

Our understanding of the drivers of economic growth has undergone an enormous transformation in recent years. It is still recognised that the accumulation of capital is the key to growth but the emphasis has now very much shifted towards the nature of capital. Capital can be considered as: private physical capital (plant and machinery, etc.); public physical capital (infrastructure); human capital; knowledge capital; institutional capital and social capital.

While the role of “knowledge capital” has begun to be appreciated as much more significant in recent years, it has also begun to be increasingly recognised that the quality of our institutions and the extent and quality of “social capital” that exists in our community play a crucial role in driving national prosperity and quality of life.

“Knowledge capital” is unique relative to other forms of capital. Once created it becomes available for productive use, until it becomes obsolete, without any further cost. Thus investment in “knowledge capital” holds out the prospect of increasing returns. The critical role of “knowledge capital” is captured well in the following quotation:

‘the price of a car depends less and less on the raw material prices and the wages of the

people working these materials directly, but increasingly on the expenditure made by the manufacturer in research and development, engineering-design, logistics, advertising, marketing, accounting, etc.’³

A knowledge economy is characterised by a high emphasis on knowledge creation and diffusion, the close integration of research and innovation, continual learning and the creation of demand-driven regional innovation systems (indigenous innovation) involving the formal co-ordination of the roles of various knowledge generators, namely: universities, institutes of technology, research organisations and the R&D departments of industries. Major components of the knowledge economy include: innovation, research and development, education, training and communications.

Until now productivity gains seem to have come through a combination of a quite well educated workforce with the ‘know how’ brought in largely with foreign firms through foreign direct investment (FDI). The role of these mainly high technology firms in leading growth is projected to diminish, thus the scenario for growth to 2025 will be more reliant on enhancing the local knowledge economy. The prospects for each of these main components in the ‘business as usual’ scenario will now be briefly noted.

4.1 Innovation for business

It may be harsh to assess performance by the number of patents originating in Ireland, where the rate per million of population was 70 compared to 140 for the EU, averaged over the years 1998-2000. However, another indicator of our current reliance on imported technology are the large payments made to foreign firms for the use of intellectual property rights.

A Vice-president of Siemens once said that the difference between research and innovation is as follows:

- Research is the transformation of money into knowledge, and
- Innovation is the transformation of knowledge into money.

These two processes are at the heart of the knowledge economy and fundamentally different in that they:

³ European Commission (2004) *Foresight and the Transition to Regional Knowledge-based Economies, Final Report of the expert group “Blueprints for Foresight Actions in the Regions”*, Directorate General for Research, Brussels.

- Require different styles of imagination and creativity,
- Operate on different time-scales, and
- Occur in different social-relational contexts.

Innovation requires problem solving and the ability to combine knowledge from different disciplines, and to apply it pragmatically and imperfectly to real world problems, subject to harsh time and cost constraints, in an environment of financial risk.

In the Knowledge Economy, knowledge is a commodity to be sourced globally. The sourcing of research and technology is really not very different from sourcing accountancy, legal expertise or medical advice from your doctor. In the future a widespread capacity to manage the acquisition of complex knowledge services will be the greatest source of competitive advantage for companies and without it Ireland will lose out.

4.2 Research and development

The National Development Plan includes relatively large funds to support Research and Development, particularly in universities, through the Higher Education Authority and Science Foundation Ireland (SFI). However, even a recent report noted that spending on R&D in Ireland was well below that in other members of the OECD.⁴

Further, there is a view that while university based research has a fundamental role to play in the future it is more in the realm of developing problem solving and knowledge management skills rather than treading the traditional path. The most significant contribution of university based research to job creation and competitiveness thus lies not in the creation of new campus spin-off companies, but in providing high quality human capital endowed with advanced knowledge skills for living and working in a knowledge economy. The required shift in emphasis could be reflected in a new contract between society and university along the lines of "*Do what you want in research and here is the money to support you. Spend it well to stay curious, keen and on-top of your discipline, what is expected in return is that you systematically use your research and your teaching as a platform for developing knowledge economy skills ...*"

4.3 Education

The educational attainments of the labour force rose considerably from 1993 to 2003. Between these years the percentage with third level education rose from 21 to 32 percent. Conversely those with only primary education fell. This process is projected to continue so that by 2013 those with third level will account for 40 percent of the workforce (ESRI 2003 p53). However there remains the other 60 percent who have no more than a leaving certificate. Further, recent reports show the persistence of educational disadvantage.

In future the 'shelf-life' and need-likelihood of factual knowledge will continue to shorten. What will be of strategic importance will not be 'factual knowledge' but the development of knowledge related skills. At present our educational systems are mainly concerned with the development of factual knowledge. Currently students acquire knowledge-skills by accident, or by exposure and on their own, not as a result of formal attempt to cultivate such knowledge.

In future education will be expected to foster skills to independently:

- Discover and understand complex work related problems;
- Communicate their insights to peers and non-peers alike;
- Identify the knowledge required to solve problems;
- Acquire that knowledge through self directed learning and collaboration;
- Monitor their progress and evaluate performance and other risks;
- Respond to any shortfalls by re-formulating their problem solving strategies;
- Simplify solutions and communicate them to peers and non-peers, and
- Collaborate in all stages of this work with peers and non-peers alike.

For the moment educational systems make no really systematic attempt to provide people with these skills. Given the increasing importance of technical and scientific knowledge, the demand for people with knowledge skills and the increasing career-mobility

⁴ OECD (2004) *Main Science and Technology Indicators*.

of individuals, the aspirations to be a knowledge economy are unsustainable.

4.4 Training

There is long standing deficit in provision of nationally accredited industry training programmes across a wide range of sectors. This is true of qualification of people entering the work force and of skill development for those at work. Participation in 'life long learning', for example, was at a lowly 10 percent the end of 2003⁵. In particular, the technological absorptive capacity of indigenous companies seems to be seriously limited by training deficiencies. The problem is illustrated in the food industry. Here Ireland is well endowed with research achievements at the three-world class centres dedicated to food research. However, one of the obstacles to the transfer of knowledge and technology from research to application in industry is considered to be lack of a training programme geared to nationally accredited standards. More widespread and effective training is imperative in the coming years.

4.5 Communications

On most measures Ireland is well short of the leaders. Households, and even businesses, without computers are proportionately more numerous in Ireland than in our major competitors. Access to broadband connection to the 'information highway' is more restricted in Ireland with only half of the country's telephone lines being capable of giving access⁶. There may also be a deficiency in formal network arrangements to ensure communication between potential users and providers of innovations. These deficiencies have been well documented and improvements are to be expected.

4.6 Implications for rural Ireland

An indigenous 'knowledge economy' could be particularly effective in generating employment in rural areas and getting it away from the greater Dublin area (GDA), and the few other centres, that currently attract most of the foreign direct investment

(FDI). The centripetal draw of the GDA also seems to be true of employment in internationally traded services where only nine percent of the employment is in the Border, Midland and West (BMW) region.

In summary, this brief review of Ireland's place in the 'knowledge economy' stakes indicates serious weaknesses. This is especially bad news for rural Ireland were the future actually turn out to be like this 'business as usual' scenario.

5. FUTURE CLIMATE CHANGE IN IRELAND⁷

Direct output from General Circulation Model (GCM) simulations are largely inadequate for regional scale impact analysis due to their relatively coarse spatial resolution. Statistical downscaling was therefore used to project likely changes from the 1961-90 averages in Irish climate.

5.1 Estimated effects in Ireland

The results suggest that the impact on Ireland will grow and effects by 2055 include:

- Current mean January figures are predicted to increase by 1.5°C mid-century with a further increase of 0.5°C-1.0°C by 2075.
- By 2055, the extreme south and southwest coasts may have a mean January temperature of 7.5-8.0°C. By then, winters in Northern Ireland and in the north Midlands would be similar to those presently experienced along the south coast.
- Since temperature is a primary meteorological parameter, secondary parameters such as frost frequency and growing season length and efficiency can be expected to undergo considerable changes over this time interval.
- July temperatures will increase by 2.5°C by 2055 and a further increase of 1.0°C by 2075 can be expected. Maximum July temperatures in the order of 22.5°C will prevail generally with areas in the central Midlands experiencing maximum July temperatures of 24.5°C.

⁵ CSO, *Quarterly Household National Survey*, January 2004.

⁶ *Sunday Business Post*, 12 September 2004, p8.

⁷ Text from Dr John Sweeney. NUI Maynooth.

- Overall increases in precipitation are predicted for the winter months of December- February. On average these amount to an additional 11 percent. The greatest increases are suggested for the northwest where increases of approximately 20 percent are suggested by mid century. Little change is suggested as occurring on the east coast and in the eastern part of the Central Plain.
- Marked decreases in rainfall during the summer and early autumn months across eastern and central Ireland are predicted. Nationally, these are of the order of 25 percent with decreases of over 40 percent in some parts of the south-east.

5.2 Impact on Agriculture

The scenarios produced were used as input to crop simulation models for a range of present and potential future crops. The simulation results show that the expected climate changes will have major effects on Irish agriculture. However, even by 2055 these impacts, though significant, cannot be regarded as potentially catastrophic. Impacts by 2055 would include:

- For livestock production, the expectation of more frequent summer droughts will require significant supplementation of grazed grass.
- Maize silage is increasingly likely to replace grass silage, potentially increasing grazing land areas. At the same time, increased production of grain maize is expected.
- Barley is another potentially important source of energy for supplemental feeding of livestock. The expected increases in cereal grain production may be expected to reduce the cost of feed barley. However, the extra costs associated with irrigation may offset this if it proves necessary, thereby bringing the economic viability into question, especially if barley is in competition with maize as a forage crop.
- Soybean is an important supplemental source of livestock protein and is currently imported. Soybean has the potential to replace maize as the marginal crop in Irish agriculture.
- Although warmer temperatures would be expected to result in shorter winter housing times for livestock, a trend towards wetter winters may raise the risk of problems of poaching and soil damage. The balance of

grazing season length against winter rainfall will dictate the stored feed requirement, and the actual climate will dictate the choice of forage crop grown. Opportunities to spread slurry or dirty water in winter will be substantially reduced and increased slurry storage requirements are likely to be needed. Drought stress will become increasingly important by 2055.

Irish agricultural land use distribution will alter in response to climate change. A sharpening of east-west contrasts is likely to occur with livestock production dominating more to the west, and arable production dominating east of the Shannon. Planning for irrigation is needed, particularly in the east, to ensure that water costs are acceptable and summer surface and ground water resources are not overused.

6. AN OVERVIEW OF THE 'BUSINESS AS USUAL' SCENARIO FOR 2025

In the years to 2025 rural Ireland will continue to operate in an economy growing at rates above those general in the EU. Features of the national economy in this scenario would be:

- Incomes 60 percent above 2002 levels in purchasing power;
- Economic growth increasingly driven by expansion of sales of market services at home and, especially, abroad, and continued expansion of high technology manufacturing with foreign direct investment (FDI);
- Consumer demand growth would be particularly strong for environmental goods and most services, demand for food would continue to shift from more to better in terms of assurances that every product is reliably enjoyable and safe;
- The importance of the knowledge economy would become more evident.

Rural areas would face differentiated challenges in the midst of the growing national economy. Opportunities for rural Ireland would include:

1. Loosening of location as an inseparable part of doing specific jobs;
2. Provision of environmental and recreational public goods;
3. Increasing demand for food of reliable eating quality and safety;

4. Generation of electricity from wind and wave energy.

Threats to the level of economic activity in rural areas would include:

1. Decline in numbers at work in agriculture, building, old technology manufacturing and, eventually, the food industry - employments of particular importance in rural areas;
2. Further concentration of growth in the greater Dublin area (GDA) spearheaded by expansion of employment in internationally traded market services;
3. Deficiencies in the development of Ireland's knowledge economy, particularly disadvantaging more distant parts of rural Ireland;
4. Constraints on agriculture from declining buying power of agricultural prices and national obligations to curtail emissions of greenhouse gases (GHG) and water pollutants;

5. Decline in the amount of sea fish landed due to dwindling stocks of fish and increased costs of fuel;
6. Fall off in rural tourism continuing and exacerbated by static productivity and the rise in earnings per hour available from other activities tending to drive up the cost of traditional rural hospitality.
7. Early effects of global warming tending to move rainfall from east to west and from summer to winter, resulting in greater risks of drought in the south east. Wetness of the ground from the fall onwards would curtail the grazing season and require increased storage of slurry.

In conclusion this 'business as usual' baseline scenario is but a starting point for considering what measures might be taken to capitalise on the opportunities and avoid its worst aspects.

Table 1: Baseline projection of Ireland's Economic Growth to 2025.

Items	2002	2025	Increase (percent)
Total population (thousand)	3,910	4,900	25%
Age group 15 to 64 years			
(percentage of population)	67%	64%	
(thousand)	2,616	3,140	13%
Labour force participation rate (percent)	68%	72%	
Labour force (thousand)	1,798	2,153	20%
Unemployed (Principal Econ. Status)(percent)	7%	6%	
Unemployed (thousand)	122	140	10%
Numbers employed (thousand)	1,720	2,210	20%
Productivity(euro(2002)per person employed) with a 2% growth per year			
Gross National Product per person employed	60,742	96,000	58%
GNP: million euro (2000)	104,474	210,000	90%
GNP per caput: thousand euro (2002)	26,645	43,000	60%

Note: data in this table derived from:

- a) Those in CSO projections based on the 2002 Census with assumptions F2 and M2.
- b) ESRI Medium Term Review 2003-2010. Bergin, A. *et al.* (2003). Economic and Social Research Institute, Dublin.

2. The Broader Rural Economy

P. Commins¹

INTRODUCTION

This paper was prepared on the basis that the rural economy is not a geographically separate entity from the urban or general national economy. The functional interdependencies between rural and urban areas are increasing. Commuter catchment areas are becoming more extensive. Locational decisions (by families or firms) are less constrained by geographical factors. Some services needed by rural residents are being centralised in main urban centres, while at the same time rural areas meet the needs of urban-based workers and populations, especially in housing and recreation. The proposed National Spatial Strategy is based on consolidating rural-urban relationships. A 40 km radius around 13 of our larger urban centres would include all but 10% of the national population. Even using size-of-place criteria, the 1999 White Paper on Rural Development considered the “rural” to be all the territory outside the five major urban areas; in which case some 60% of the national population is rural.

For these reasons, the “broader rural economy” should be considered, for present purposes, in terms of regional or sub-regional economies where the drivers of change will be linked to developments in the national economy, and to how the national economy, in its “openness” to international forces, will be positioned in the wider global economy over the next two decades.

In terms of thematic coverage, the paper’s focus is on (i) enterprise and employment; (ii) infrastructures for innovation and access; and (iii) some aspects of social development. A fourth set of issues is also relevant, namely, settlement patterns, population and spatial development but these are covered in a separate paper (see Thematic Paper No. 3).

The structure of the paper follows the template set for the preparation of sectoral papers.

1. DRIVERS OF CHANGE IN THE RURAL ECONOMY

(i) Restructuring in the agri-food sector

The longer term outcome of supply and demand forces on the agri-food sector is marked by a number of well-established features: downward pressure on farmgate prices and incomes; an impetus to increase scale in production and processing; replacement of labour with capital; spatial differentiation in land use with commercial farming becoming concentrated in the more productive land areas; and increasing reliance on non-farm sources of income.

(ii) Restructuring in the broader economy

Rural communities are also coming under the influence of the pressures of economic restructuring in the economy generally, especially as restructuring affects opportunities for employment. Longer-term trends are described as “tertiarisation” and “dematerialisation”. The former term denotes the relative decline of primary production and of the conventional manufacturing sector, and the expansion of service-type occupations. The latter concept refers to the fact that “intangible inputs” and services, rather than raw materials, have become an increasingly important component in the value of goods. These inputs include such factors as research and development, design, logistics, marketing, etc. The contribution of “services” to GDP exceeds 70% in some developed economies, compared to 55% in Ireland.

(iii) Striving for competitiveness

Competition is becoming more open, international, and intense. There is a strong concern with controlling and lowering costs, with multinational enterprises seeking out the locations where economic activity can be pursued on a least-cost basis.

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(iv) Growing importance of innovation and the knowledge economy

A knowledge economy is characterised by a high emphasis on knowledge generation and application, the close integration of research and innovation, continual learning/relearning, information processing, and reliance on information and communications technologies.

Of interest to rural economies is the growing concern to develop “regional innovation systems”. The focus is on the **system** – the totality of infrastructures for generating or accessing knowledge, for transmitting knowledge, and for supporting its productive application in dealing with regionally specific challenges.²

As the services content and knowledge inputs in final products increase, the traditional distinctions between manufacturing and services become less clear; the relevant distinction is between “old economy” and “new economy” enterprises.

(v) Globalisation

Geographical barriers are reduced as capital, enterprise, financial flows, products and services move across the globe in networks that are increasingly disconnected from the frontiers that mark out the boundaries of sovereign states.

(vi) International tourism

As a specific element of global trading, international tourism has grown rapidly and is expected to maintain its rate of growth over the next 20 years. The main drivers of this growth are: higher levels of disposable income, increased leisure time, increasing availability of affordable transport, reduction of cross-border travel formalities, and wider access to information through information technologies.

(vii) Policies

Rural change is driven by policies which support trade liberalisation, influence the location of investment, assist regional development or foster rural development. Some policies have a “restraining” influence on market liberalisation –

especially those requiring compliance with “good” environment management.

(viii) Counter trends to the dominant economic model of change

The foregoing drivers of rural change are, for the most part, integral to the development of a modern market-driven economy. This type of economy is also characterised by values that espouse the free market, by consumption patterns and lifestyles that support mass markets, and by ideologies that favour individual freedom and limited state regulation of economic affairs.

However, there is evidence of counter trends that challenge this dominant economic model. Apart from emerging “anti-globalisation” movements, these are evident in concerns for the physical environment; for sustainable development, environmentally and socially; for safety, authenticity or traceability in food; for shorter food supply chains; for the social inclusion of marginalised groups and cohesion across regions; and for an appropriate balance between work demands and quality of life.

2. KEY TRENDS AND EMERGING ISSUES

(i) Labour outflow from farming

The movement of labour away from farming will continue, mostly because of non-entry in the first place rather than because of career changes. The key challenge will be to provide employment for rural youth, ideally in their own regions.

However, jobs as such will not be sufficient.³ Job provision will need to be complemented by opportunities for up-skilling and re-skilling especially in light of the need to develop a knowledge-based workforce. The idea of life-long learning is replacing traditional education-work-retirement demarcations.

(ii) Realignment of land use

The extensification or even withdrawal of agriculture from regions with predominantly sub-viable farms will adversely affect the unique natural and built environment in upland or wetland areas. One

² “Innovation” is a broad term covering, e.g. new products or services, new processes, new markets, or novel approaches in organisational structures or networks, etc.

³ Household Budget data show low earnings for non-farm workers in farm households (Commins 2003).

consequence is a likely reduction in the amenity/tourism value of these areas with the risk of jeopardising the opportunity to develop multifunctional and “public good” land use strategies (see Thematic Paper No. 6 on Rural Environment).

(iii) Rising costs of doing business

Although not specifically a rural issue, costs in Ireland have risen substantially above those of our competitors, e.g. housing, insurance, energy, broadband, refuse disposal, dining etc. (ESG 2004:21). By comparison, of the ten highest ranking countries in the league table of competitiveness, five are Nordic despite their high taxes (Economist October 16-24, 2004:102). The ESG noted (p.22) in this context that domestic competition in Ireland is underdeveloped while there are also public sector inefficiencies.

(iv) Heavy reliance on foreign direct investment (FDI)⁴

The country’s economic performance over the past decade has been driven largely by the internationally traded goods and services sector, and by the growth of FDI. In 2002 the stock of FDI in Ireland was second highest in the world, in per capita terms, after Hong Kong. Foreign firms account for the following (of agency supported firms):

All Firms	15%
Jobs	50%
Corporation Tax Yield	47%
Expenditures in Ireland	51%
Exports	90%

However, FDI firms have a number of weaknesses. They:

- Are strongly production oriented (whereas modern growth is in traded services);
- Are at low points in the value chain;
- Are reliant on their external parent organisations for R&D and for marketing (activities that underpin competitive strength).

The central issue here is the growing attractiveness of other countries for the type of FDI that Ireland has secured in the past (Time Magazine October 11, 2004). Since 2001 there has been a net outflow of 15,000 Irish jobs from the internationally trading foreign-owned base⁵. This means reduced opportunities for the sub-supply and indigenous base (ESG 2004:19). Judged from data pertaining to the BMW region, rural areas have a disproportionate share of low technology, old economy enterprises (textiles, clothing, wood products, leather, etc.) (BMW 2004:33).

(v) Low investment in R&D and low innovation rates

Ireland’s gross expenditure on R&D remains significantly below that of, e.g., the Nordic countries (1.4% of GNP compared to 3-4%). Business expenditure on R&D is concentrated in large and foreign-owned firms (ESG 2004:30). Moreover, the R&D focus has been on technology for products or processes, while non-technological innovation has been neglected (e.g. in marketing, supply chain management, etc.). The rate of European patent applications (per million inhabitants) in Ireland is about half that in the EU 15 and one-quarter that of Finland (ESG 2004:30).

(vi) Rural (urban generated) employment growth

Census data show widespread employment expansion in rural areas – more than offsetting labour losses in farming. Apart from the likelihood that the jobs are low-paying (see footnote 3 above), it seems from data on the BMW region that this employment boom is based on building construction, wholesale and retail services, and public services. Manufacturing employment has declined; nationally it is currently at its lowest point since 1996.

The issue is whether this kind of employment growth is sustainable given that construction, in particular, has attained inordinate prominence in the economy over the past decade⁶.

⁴ Data here and under the next heading are mainly from the ESG Report (2004).

⁵ This mobility also means opportunities for Irish firms to remain competitive by moving to low cost environments.

⁶ In 2004 Ireland built almost 80,000 new dwelling units. Britain has 15 times as many people but builds only twice as many houses as Ireland. The sector accounts for 15% of GNP here, or over twice as much as Britain (Economist 16 October 2004).

(vii) Regional concentration of tourism

Total visitor numbers to Ireland increased at an annual average rate of 5.5% between 1990 and 2002. In the promotion of tourism nationally Ireland is represented very much as a rural holiday destination; yet, rural areas have not benefited commensurately from the growth in visitor numbers and revenue. The regional distribution of revenue has strongly favoured Dublin and the South West, with the lower growth rates recorded in the more rural regions of the North West, Shannon Region and the West. Furthermore, some outdoor pursuits (cycling, hill-walking, angling) have been on the decline (even before the foot-and-mouth crisis). Visitors report falling customer satisfaction ratings, especially in regard to value for money and gaps in infrastructure.

The report of the Tourism Policy Review Group (2003) recognized that Irish tourism will encounter greater competition in the future as transport and information technologies will change the way tourism business is conducted, and visitors seek value for money, as well as quality holidays.

(viii) Deficits in infrastructures (for innovation and access)

Low regional innovation rates (see above) are related to low institutional capacities, reflected in the lack of formalised collaborative arrangements among stakeholders for generating and diffusing knowledge. The relevant stakeholders are third level colleges, research organisations, R&D departments of industries, enterprise support agencies, training agencies, etc.⁷ Debate about developing knowledge-based enterprises at regional level refers to the need to establish “clusters” that would allow for the attraction of specialised labour (“knowledge workers”), creation of linkages with research supports in third level education institutions, and critical mass in providing supporting financial and trade services.

At the level of the individual the complement of such regional institutional capacity is the competencies of managers and other employees, their adaptability, entrepreneurship and attitudes to risk and investment.

Access infrastructures include in particular physical communications and transport systems, as

well as telecommunications. Irish infrastructure is poorly developed and inefficient relative to most developed countries (ESG 2004: 23). Most expenditure in road projects under the EU Structural Funds has gone to national primary routes in the Dublin region and to major inter-urban routes. In the BMW region expenditures on roads have fallen below budget. Broadband services in the country are still quite poor, and expensive. In particular, access to the “last mile” disadvantages rural small-businesses (ESG 2004: 101).

(ix) Deficits in the “soft” (social) infrastructure

Whatever its future sustainability, the economic growth of the last decade has benefited rural communities. Yet, there is a noticeable failure in social development. These are evident in declining social capital (declining voluntarism in local communities, weaknesses in associational capacity for mutual benefit or community development, lack of civic leadership, etc.), continuing social exclusion, and failure to provide local amenities and services that contribute to a better quality of life (Frawley et al. 2005).

A holistic approach to “rural economic development” requires that the concept be broadened to include actions that also focus on sustainable communities through social development.

3. BASELINE PERSPECTIVE TO 2025

This perspective and the preferred perspective (see section 4) are both based on the assumption that economic development is a systemic process. That is, it involves a number of components, which are mutually supportive or “synergised”, creating a system whereby the whole is greater than the sum of the parts. Conversely, “underdevelopment” can occur, when several key interconnected elements are missing or out of mutual harmony. This idea is relevant in understanding the prospects for the future of the Irish rural economy where a complex of factors has been involved in economic growth, but a different complex of interrelated factors underpins economic decline. In the latter circumstance we face a malign scenario for a number of reasons.

⁷ EU Blueprints for Foresight Actions in the Regions indicate that a regionally-based demand driven approach to research and innovation needs a totally different funding approach from that applied to universities or national research institutes.

(i) Decline of the “tiger” economy

While a baseline perspective conventionally assumes no major alteration in the drivers and current trends of rural change, the assumption cannot be readily accepted in the case of the Irish rural economy. The reason is that the recent pathway of economic change in Ireland is not firmly established; it contains within it the seeds of its own eventual failure. The boom of the 1996-2005 period has been due to a fortuitous confluence of factors that are a series of “one-offs”, and not repeatable (Economist 16 October 2004). These factors include: high levels of EU subsidies; low energy costs; the FDI boom under favourable taxation regimes; the unprecedented activity in construction; the “catch-up” and unrepeatable type investments in infrastructure; and demographic circumstances such as available labour. Of particular importance is the fact that the growth has been growth in outputs but not in productivity or efficiencies. The “break-off” of this unique set factors over the next two decades, coupled with the erosion of competitiveness (already obvious), will mean the “unwinding” of the progress of the past decade with detrimental consequences for the rural economy.

(ii) Elimination of agricultural subsidies

The low levels of market-based income in farming have been concealed by farm subsidies. These will be much reduced in scale in future reforms of the CAP and under WTO rules, because of their political unsustainability without clear and measurable public good benefits. Such benefits will command a lower “price” than currently, putting unprecedented pressure on farm incomes.

(iii) Inadequacy of EU policy

Current EU policy statements refer to a greater orientation of the CAP towards rural development. The rhetoric is unlikely to be supported in reality. The rural development measures are narrowly focused on agri-structural problems and not on the broader rural economy. Besides, there is no increase in future rural development funding, in real terms (Ahner 2004).

(iv) Inadequacy of institutions

There is little evidence that the aspirations in the White Paper on Rural Development (1999) will be realised. One reason is that many of the actions

envisaged as necessary in the White Paper require inter-departmental or cross-agency initiatives but the institutional framework for these does not exist and is unlikely to be created on the basis of experience since the White Paper was published.

(v) Erosion of manufacturing base

Much of the FDI manufacturing base that is concerned with production-oriented or low-tech assembly will move to lower cost economies. Indeed, many service jobs or back-office jobs will also move to, e.g. the Far East. The construction sector will retreat to a more normal pattern, in contrast to its current unusual prominence in the economy. While key sub-sectors of enterprise will be sustained, especially high value-added manufacturing in food, pharmaceuticals, medical technology, software and communications technology, their location will be spatially selective with limited benefit to rural regions. Currently, for example, the BMW region has a due proportionate share of the country’s manufacturing employment (27%), but disproportionately low shares of the country’s financial and international services employment (9%), or high-tech jobs (9%). The spatial distribution of employment will be restricted by higher energy costs.

(vi) Failure of indigenous entrepreneurship and enterprise

Rural regions, by and large, have a high dependence on “labour-intensive, threatened” types of employment. Their vulnerability will not be offset by new enterprises, indigenous entrepreneurs, innovation in new products, or non-technological innovation (e.g. in marketing). The main reasons for this are lack of impetus and spin-off from the FDI sector, failure to develop regionally specific supports for indigenous innovation, and lack of technological absorptive capacity.

(vii) Stagnation in rural tourism

Even if recent (1990s) trends in Irish tourism are maintained – despite falling competitiveness, opening up of new destinations, and dissatisfaction ratings – the benefits will not be captured by rural communities, on current evidence.

(viii) Failure to maintain necessary infrastructures

The attrition in the productive and wealth creation base of the economy will limit the investments in infrastructures for innovation and access especially at rural regional level. While there will be national level RDT and innovation infrastructures there will not be sufficient funding to complement this at sub-national levels. Third-level institutions are currently experiencing financial stringency. The “new funding approach” needed for regionally based knowledge economies will not be feasible (see footnote 7).

(ix) Failure in social development

Similarly, lack of funds will inhibit the provision of rural amenities and services essential to an enhanced quality of life for rural dwellers (e.g. in medical services, communications, fostering the social economy, policing, etc.).

(x) Rural migration and demographic imbalance

Given the above malign – even doomsday – scenario, a return to involuntary migration and brain-drains from rural areas is inevitable. The consequence is the re-emergence of imbalances in population structure, rural depopulation, redundant or under-used investments, and the higher servicing costs inherent in a low-density rural population.

4. PREFERRED PERSPECTIVE IN 2025.

(i) Growth rates will be maintained

For a benign scenario, the ESRI assumptions for short-term growth rates in the Irish economy will be realised and these rates will be maintained over the longer-term. These will be in the order of 3% to 5% (see Thematic Paper No. 1). While the primary sector (agriculture, fishing) will make a reduced relative contribution to GNP, manufacturing will remain important but the services sector will be the most prominent driver of growth.

(ii) Sectoral mix will be well balanced

This is because:

- Key components of the enterprise base, especially those exporting, will be maintained;
- Opportunities in internationally traded services will play a significant role in the country's economy (ESG 2004: xi);

- Although Ireland will not, realistically, achieve world class performance in all areas of economic activity, enterprise will succeed by reinforcing those niche areas where sustainable comparative advantage can be built (ESG 2004:39);
- Locally-trading businesses will thrive in a buoyant economy;
- There will be widespread upgrading of “old economy” enterprises;
- Enterprise closure rates will be offset by new start-ups.

(iii) The business environment will enhance competitiveness

Some practices that inhibit competitiveness will be eliminated, e.g. inappropriate regulatory policies, barriers to entry to markets, the sheltered status enjoyed by sectors of business activity (ESG 2004:92).

(iv) Ireland will build, at regional levels, the knowledge base and enterprise capability to develop product and services of higher value

This will be done by:

- Significant public funding of research and innovation systems directed towards building demand driven regional technological bases;
- Focused investment in key areas of technology appropriate to national and regional needs (not just high-tech technological enabling capacity);
- Assisting enterprises to access and absorb/exploit innovations;
- Strengthening linkages between enterprise and knowledge sources;
- Complementing production capabilities by expertise in market development.

(v) Regional and sub-regional specificities will be recognised in economic development

This will be achieved by:

- Building knowledge infrastructures at regional level with particular regard to knowledge transfer and applications;

- Exploiting the full potential of natural resource based industries especially in food, the marine, forestry, tourism;
- Developing internationally-oriented “clusters” at regional locations.

(vi) Rural-based tourism will be a significant contributor to the development of the rural economy

This will happen because:

- Pro-competition policies will have a positive impact on lowering travel costs;
- There will be a clear focus on rural Ireland’s unique attractions in terms of its distinctive physical landscape, culture and heritage; its capacity to respond to growing concerns about health; and the search for “back to nature” experiences;
- Marketing will target specific categories of visitor to whom these attractions will appeal;
- Competitive pricing of tourism products.

(vii) Rural areas will enjoy a world-class telecommunications infrastructure, as well as a much improved access to physical communication and transport networks

This will be possible because:

- Of continued updating of infrastructure investments at regional and local level;
- Of remote access and networked connectivity to sources of knowledge, information and to ways of meeting other customer needs.

(viii) Material prosperity in rural areas will be complemented by a satisfying quality of life

This will be possible because:

- The attractive qualities of physical environment and heritage will not be destroyed;
- Rural people will have amenities and services on a par with what is available in the contemporary society;
- There will be opportunities and rewards (material and intrinsic benefits) for participation in civic affairs, leisure pursuits and professional or personal development.

(ix) Rural social exclusion will be eliminated

This will be achieved by:

- State action (such as the National Anti-Poverty Strategy);
- More widespread material prosperity;
- A well-functioning social economy at local community level.

5. INITIATIVES FOR A BETTER FUTURE IN 2025

As a general comment under this heading, members of the Foresight Consultative Forum observed that there were already in the public domain many proposals that could achieve the betterment of the rural economy. The problem was that these were not acted upon – for a number of reasons but especially because there were not appropriate and effective “cross-agency” structures at a sub-national level. There is also no strong and coherent policy constituency to lobby for a “better broader rural economy”.

The following initiatives were identified:

- 1) ***Institutional Framework:*** The current framework is not effective in responding to the needs of multi-dimensional rural economic and social development. The need is not so much for additional structures but for arrangements to integrate and better coordinate the activities of existing structures in delivering public policy measures to rural communities. Regional development should have a more explicit presence in the agenda of central government departments and state agencies.
- 2) ***National Development Planning:*** The practice of national development planning, so well established under previous rounds of EU Structural Funds, should be continued even when such funding ceases. Procedures such as setting targets and performance indicators as well as regional monitoring systems should be retained. It is important, however, to place a more explicit focus on the lower level and smaller scale (NUTS 3) regions, where the progress on rural regional development can be more transparently assessed.
- 3) ***Knowledge-driven Regional Development:*** Regionally based research and innovation systems are needed – forms of infrastructure

different from the existing models. These may be some analogue of the US land grant colleges, which have had a strong extension role in delivering new knowledge and technical information to potential commercial adopters. An extension model would also include “brokers” who could help to strengthen the weak “absorptive capacity” for innovation among indigenous enterprises. In this context also, regional innovative clusters could be fostered. A special emphasis would be given to the research and training inputs needed to raise the performance of indigenous enterprises.

- 4) **EU CAP Policy:** Continue to shift from Pillar 1 to Pillar 2 (production agriculture to rural development) in the CAP but, more importantly in the longer term, consider the development of the “broader rural economy” as an issue in regional development and in the National Spatial Strategy – not as a problem to be dealt with by common agricultural policy measures even when the scope of this policy is widened.
- 5) **EU Regional Policy:** Levels of EU structural aid will be reduced. However, about 18% of the next round of EU cohesion policy funding will be dedicated to regional competitiveness. Ireland should seek support under this heading to build the competitiveness of its regions.
- 6) **Regional Ring-fencing:** Public investments should be earmarked and then ring-fenced for use within the respective regions.
- 7) **County Development Strategies to 2012:** Proposed by all counties, these now need to be implemented – a task which requires clear commitments from agencies at central level.
- 8) **Rural and Regional Proofing:** The White Paper on Rural Development proposes that all sectoral policies will contain a regional and rural focus to ensure that policy implementation represents appropriate responses to the needs of rural communities. This idea needs to be given more effective weight in policy.
- 9) **Social Progress Accounting:** Conventional measures of economic performance at NUTS 3 regional levels need to be supplemented by a system of “social progress” recording to measure performance on social provision, access to services, skills upgrading.
- 10) **Tourism:** Tourism policies should have a clearer rural and regional dimension. The White Paper

(p. 45) noted that rural tourism lacks a cohesive strategy within the context of overall tourism policy. Such a strategy should recognise the public good functions of agriculture and the country’s other natural resources.

- 11) **Infrastructures:** National development plans (see above) should provide, within a strategic framework, a range of modern infrastructures in rural areas. Innovative approaches to telecommunications offer the prospect of by-passing conventional technologies in connecting smaller population towns to “the information highway”.
- 12) **Social Economy:** The social economy is a basis for providing services which are not supplied by the market or the public sector e.g. caring services, cultural activities and local amenities. This sector should be developed with greater impetus, with a focus on developing the capacity of citizen-based organisations to operate in partnership with statutory agencies.

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3. Some Spatial Dimensions: Population and Settlement Patterns

P. Commins¹, J.A. Walsh² and D. Meredith³

INTRODUCTION

The spatial dimensions of economic change and development cannot be reduced to a simple rural-urban dichotomy. Referring loosely to ‘the rural economy’ as if it were a single, homogeneous or even a self-contained entity may be convenient but it leads to understating the significance of substantial regional and sub-regional variations within rural Ireland. Spatial differences arise from the geographically uneven distribution of natural resources but, increasingly, they are also created by the layout of the urban system, and by the extent to which urban-generated economic activities have spill-over impacts on rural areas. In turn, the urban system itself is a hierarchy of centres whose individual sizes and territorial distribution have been determined historically by a complex mix of

economic, geographical and political factors – as well as by myriads of individual decisions. Once established, settlement patterns exert their own reciprocal influence on locational decision-making and act as constraints or stimulants to further economic development options (NESC 1997).

State policy aims to facilitate a balanced geographic distribution of economic activity, and the harmonious development of both rural and urban areas. A main conclusion from this paper is that Ireland’s rural areas represent several quite distinctive rural economies (see Table 1) and that, in some important respects, spatial divergences are in fact increasing, contrary to policy aims. An accompanying set of maps illustrates the main points (see Appendix).

Table 1: Rural Areas Typology and Population Changes

Area Type ¹	% of total area	% of total population 2002	% change		% of total increase 1991-2002
			1991-1996	1996-2002	
Urban	6.2	61.1	4.4	8.9	73.3
Rural Type 1	14.5	11.6	1.8	10.9	13.2
Rural Type 2	19.3	10.4	2.0	8.1	9.7
Rural Type 3	19.9	5.4	-2.7	2.8	0.0
Rural Type 4	22.8	6.3	-1.9	2.2	0.2
Rural Type 5	8.9	2.7	-0.4	1.7	0.3
Rural Type 6	8.4	2.5	5.4	9.2	3.3
State Total	100.0	100.0	2.9	8.0	100.0

¹ Urban areas = places with at least 1,500 persons and >150 persons/km²

Rural type 1 = peri-urban areas

Rural type 2 = very strong farming areas in transition to a non farm economy

Rural type 3 = strong agricultural areas adjusting to output restriction

Rural type 4 = structurally weak areas

Rural type 5 = very marginal areas

Rural type 6 = high amenity and diversifying consumption spaces

Source: Derived from Census of Population 1991, 1996, 2002

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1. DRIVERS OF CHANGE

1.1 Economic forces

The spatial agglomeration (concentration) of economic activities is a universal feature of developing societies. Urbanisation is a persistent trend and the spatial footprints of urban areas extend far beyond their boundaries. However, deconcentration and counterurbanisation also occur in advanced economies, especially where geographical barriers are reduced by modern technology and communications. Services and amenity provision takes on a hierarchical character. Modern services (such as specialised health care) become concentrated in larger urban centres because of the need for higher numbers of users. This feature tends to disadvantage rural areas which remain dependent on lower levels of service.

The spatial distribution of population, types of settlement and of economic activity is strongly influenced by longer term economic restructuring – in natural resource exploitation, industrial organisation and services delivery. There are obvious geographical variations in the basic resources of Irish agriculture but over time, as farm productivity (output per person) increased, there has been growing differentiation of economic performance between farming regions of the State. The Irish farm economy has been increasingly differentiated territorially between a less prosperous west and north-west and the more favoured counties of the east and south (Lafferty, Commins and Walsh 1999). Apart from differences in the basic resource endowments, the important factors associated with spatial variations in agricultural production are the scale of farm business and farming system.

Economies of scale also make for spatial concentration in non-farm enterprises. A notable feature of economic restructuring in the broader rural economy is the rapid growth of the services sector – especially producer services (tourism, retailing, finance, marketing, software provision, etc.). These ‘new economy’ activities vary in their location patterns. However, higher level information-intensive activities (such as financial services) tend to locate in central places, usually at the top end of the urban hierarchy where a modern business milieu exists. Routine ‘back-office’ operations, on the other hand, can follow the same dispersal patterns as manufacturing branch plants. Tourism and recreational activities do not particularly require

centralised locations (although urban tourism is now significant).

1.2 Technology

In production agriculture, machine technology replaces labour and therefore reflects the spatial patterns in farm labour outflow. In the rural economy in general, modern transport and communications technology can help to overcome the barriers of geography. E-commerce is creating revolutionary changes in the conduct of business. Crude transportation costs and traditional peripherality considerations no longer matter as much as they did 20 years ago.

However, infrastructural provision tends to prioritise those locations where other economic activities are already expanding and creating demand. Thus, in practice, information and communications technologies (ICT) have established a ‘digital divide’ – a basis of exclusion not alone among categories of people or of businesses, but by consolidating divergence between regions.

Advances in engineering and biotechnology may also have spatial impacts. Spatial clustering strategies are now advocated for the commercial application of new technologies, especially where ‘platforms’ are created at locations which link up R and D capabilities, third level education and venture capital.

1.3 Social forces

Trends in social values and lifestyles have implications for rural spatial development. Coupled with rising incomes, these trends are expressed in demands for rural housing and living space, changes in land use, e.g. towards less intensive farming, and attitudes towards environmental conservation. Preferences for rural living, taken alongside the decline of jobs in farming and the centralisation of employment provided by other sectors, result in the expansion of commuting zones and the emergence of settlement patterns that resemble forms of ‘extended suburbanisation’. Increasingly then, rural areas are multifunctional, changing from primarily areas of production to encompass areas of consumption in order to meet the lifestyle needs of society in general for housing, leisure, amenity and active recreational activity – as well as for infrastructures, utilities and waste disposal. This greater diversification of the use of rural space inevitably leads to conflict over its

uses, as different social values are brought forward by the different claimants to rights over the countryside and rural space.

1.4 Policy measures

A wide range of policies recognise the importance of managing territorial development and expressly or indirectly influence the spatial distribution of population and economic activity. Farm price policies tend to favour regions of high agricultural output. Regionally focused farm policies (such as those for disadvantaged areas) are intended to benefit specific areas. Similarly, regional and rural development measures seek to direct the location of economic activities. Physical planning strategies are aimed at influencing local settlement patterns. At EU level, policy has moved to curb excessive tendencies towards the spatial concentration of population and economic development. Linked to this concern is a desire to connect rural areas to the economies of urban centres. Policy measures refer to such terms as “balanced regional development”, “territorial cohesion”, “rural-urban networks” and “polycentric urban networks”. Ireland’s National Spatial Strategy reflects this aspiration for the better management of territorial development.

In the wider European policy context there is a shift from direct state intervention in maintaining national strategic industries and economic activities (e.g. in agriculture, transport and communications) to policies favouring market liberalisation, deregulation and privatisation. This trend poses problems for rural development whose aims fall mainly under the heading of ‘public goods’ and thus tend not to be dictated by market forces which will favour urban locations at the expense of rural development (Department of Agriculture and Food 1999:20).

2. SPATIAL TRENDS

The analysis under this heading seeks to make a number of points. Both in the farming and non-farming sectors, there is considerable diversity in the Irish rural economy, encompassing strong and weak farming areas, areas becoming diversified with new rural-based employment, and areas linked closely to urban-generated economic activity. These different ‘rural economies’ are not necessarily spatially contiguous with administrative boundaries, which

has implications for cross-boundary collaboration in ‘packaging’ policy interventions locally. In respect of some trends, there is increasing spatial divergence representing a failure to meet the State policy aspirations for balanced regional development.

2.1 Farming and land use: widening regional gaps

Regional differences in Irish farming and land use have widened further during the 1990s (Commins and Walsh 2004). Agricultural census data for 1991 and 2002 show that: (i) the farm business size polarization between Objective 1 regions and the other regions was accentuated further; (ii) the switch away from dairying (the enterprise yielding the highest gross margins) was most pronounced in the western and border regions; and (iii) tree planting rates on farms in the Objective 1 region counties greatly exceeded the rates in the other counties. Participation in the agri-environment programme is also higher in the north west, west and midlands.

2.2 Continuing spatial imbalances in population

Ireland’s spatial demography is marked by two persistent trends: spatial concentration and urbanisation. Between 1961 and 2002 the population of Dublin together with its perimeter counties (Meath, Kildare, and Wicklow) increased by 70%. This concentration in the east is best described as urban sprawl. In the same 40-year period population in the four other ‘municipal centre’ counties (Cork, Waterford, Limerick and Galway) increased by 36 percent. The increase in the remaining counties was just 18 percent. A more refined analysis is presented in Section 2.3 below.

2.3 Differential trends by type of rural area

A typology of rural areas for 1996⁴ is shown in Map 1. This is based on Census of Population data and uses the restrictive definition of ‘rural’ as places outside of settlements having at least 1,500 persons and a density of >150 persons per km².

Table 1 shows the following:

- Urban areas (inclusively defined) have 61% of the national population and accounted for 73%

⁴ Based on McHugh (2001) a typology of this kind is unlikely to be static but this 1996 version is adequate for present purposes.

of the State's population growth during the 1990s.

- Between 1996 and 2002, when national population increased rapidly, the highest rates of expansion were in the peri-urban rural areas (Type 1).
- 'Structurally weak' and marginal rural areas (Types 4 and 5) are concentrated in the west and north-west, with narrow extensions into other regions, such as west Clare down to west Cork. In recent years most farms in these areas obtained almost 100% of their farm incomes from non-market payments. The same areas have the highest incidence of part-time farming.
- In the south and east it is possible to distinguish between two categories of traditionally strong agricultural areas (Types 2 and 3). This was because Type 2 shows some of the characteristics of the structurally weak rural areas.
- Areas with negligible or weak population growth during the 1990s (Types 3 and 4) account for a relatively small share of the national population – 11.7% - but for 30.1% of the rural population.
- Apart from the peri-urban areas, there was rapid population growth mostly in coastal areas of high amenity (west Galway, north-west Clare, south-west Kerry, west-Cork and Wicklow). While these types of areas represent only 2.5% of the State's population they account for 25% of the increase in the 1990s in the rural areas beyond the peri-urban zones.

2.4 Qualitative differences by region

Population concentration and urbanisation involve more than mere numerical shifts; they also have implications for the qualitative characteristics of the population in the different types of area. Demographic vitality, as a ratio of younger to older age groups is strongest in urban areas and peri-urban rural areas (Map 2). These spatial differences, which are very much the outcome of internal migration, give a clear advantage to urban catchment areas with the advent of a knowledge-based economy. Higher levels of education follow a similar pattern (Map 3).

2.5 Settlement size and contiguity

The number of larger population centres (over 10,000 persons) increased from 23 to 33 between 1986 and 2002. The demographic problems of the north-west, and of the midlands to a lesser extent, lie in their weak urban structure. These regions have comparatively few settlements of more than 5,000 persons). The importance of this point is underlined by the fact that high tech enterprises tend to locate in larger centres.

While settlement size is an important factor in population growth so is the contiguity of settlements and the emergence of regional inter-urban routes. The radial routes from Dublin are clear examples but similar though less pronounced patterns are evident for Galway-Limerick, Tralee-Killarney and Sligo-Letterkenny. These links offer prospects for strengthening urban networks outside of the Greater Dublin Area. Smaller villages, traditionally linked to the agricultural economy and lying outside inter-urban routes (e.g. in north Kerry and west Clare) tend to lose population.

2.6 Expansion in rural employment

There has been widespread growth in rural employment during the 1990s (Map 4). The number obtaining work more than offset the labour declines in agriculture in the great majority of rural censal districts. Furthermore, the expansion in the numbers of self-employed was quite widespread. The increased employment in rural areas was mainly due to unprecedented building and construction, commercial and retail services and, to a lesser degree, to manufacturing. The higher percentage of females at work is clearly related to access to urban centres (Map 5).

While rural employment growth is a positive trend from a rural development standpoint, its longer-term sustainability cannot be deemed to be ensured. It is underpinned by a period of exceptional progress in the building industry; there is poor or static growth generally in the manufacturing sector; and employment on farms -though in decline- owes much to the heavy subsidization of farm-incomes. Moreover, as shown in the next section, most employment gains in agency-supported enterprises are captured by a minority of regions.

2.7 Spatial differences in employment in agency-supported enterprises

During the decade 1995 to 2004, permanent full-time employment in companies supported by state agencies⁵ increased by 22%, with jobs in foreign companies increasing by 24%⁶. The rapidly expanding sectors were International Financial Services and Other International Services. Severe declines in the Textiles, Clothing and Leather sector reflected losses by indigenous companies, possibly as a consequence of relocation to low-cost economies (Forfas 2005:21).

There were sharp regional (NUTS 3: - Regional Authority Regions) differences in the overall trends. The highest increases were in Dublin (+40%), Mid East (+32%), the South West (+29%), and the West (+23%). Dublin and the Mid East combined account for 65% of the national increase, and for 72% of the jobs growth in foreign-owned companies. By contrast, the Border Region witnessed a decline of 8%, while both the Border and Midlands experienced losses in employment in foreign owned companies.

The data show the spatially selective nature of the erosion of 'old economy' enterprises, and of the expansion in 'new economy' jobs. Surprisingly, even the Mid-West and South East, both with strong regional centres, showed only moderate rates of job growth in agency assisted companies.

2.8 Expansion of commuting

Associated with the rural employment growth noted in section 2.6, especially the urban-generated jobs, is a greater reliance on private transport and the extension of commuting zones⁷. Nationally (rural and urban combined), the numbers travelling to work remained static from 1981 to 1991 but more than doubled during the 1990s. In rural areas the percentage of residents travelling more than 10 miles to work almost doubled (to 40%) between 1991 and 2002. Just over 86% of households in rural areas now have at least one car.

The incidence of long distance commuting (30 miles or more) is highest in the outer rings around the major urban centres, especially Dublin and Galway. (Map 6) Waterford is somewhat an exception,

presumably because of the competing influence of Carlow, Kilkenny and Wexford in the south-east.

2.9 Implications for rural housing developments

Population growth and the tendency towards separate household formation (and thus smaller households) have resulted in increased housing construction in rural areas. The incidence of young households ('pre-family' couples and young families) is quite widespread but is highest in the urban hinterlands and commuting zones. Single rural dwellings (defined as detached houses with their own septic tanks) are concentrated in the commuting zones and close to the national road network. Single rural dwellings constructed during 1991 to 2002 show wide geographical dispersal but with concentrations near to the commuting zones, south east coast, and in Donegal.

2.10 The 'digital divide'

Private transport and communications technologies are important means of access for rural areas. As already noted most rural households have a car; those without cars are predominantly in the northwest and in the coastal area from Galway down to the southwest. Access to the Internet, however, shows a clear-cut digital divide between urban and rural areas (Map 7). Taken together, the urban concentration of internet access and higher education levels (Map 3) point up the weakness of rural areas in benefiting from the types of employment that characterise a modern economy.

3. BASELINE PERSPECTIVE TO 2025

A baseline perspective assumes that recent trends will continue into the future, with no major 'shock' occurrences or policy changes other than those already signalled. There are in fact some policy changes in sight which have the potential to throw recent 'positive' trends off course. Furthermore, for a number of reasons, it is difficult to see some trends, which have favoured the rural regions, being sustained with the same momentum as in recent years of unprecedented economic (urban-generated) development.

⁵ IDA Ireland, Enterprise Ireland, Shannon Development, and Udaras na Gaeltachta

⁶ Based on annual averages for two three year periods, 1995-1997 and 2002 - 2004.

⁷ The reference here is to daily commuting; weekly commuting occurs but no Census data exists to analyse such activities.

Firstly, apart from any negative commodity price trends, the substantial contributions of subsidies to the operating surplus in farming will not continue to increase as they have done since the mid-1990s⁸ especially after the 2006-2013 EU programming period. The impact of any real reduction is likely to be more severe in the structurally weak and marginal farming areas because these subsidies now represent nearly all their operating surplus. Secondly, allocations from EU structural funds, especially to the BMW region, will be much lower than in the past. In addition there will be EU restrictions on the scope for national government to provide regional aid apart from selected incentives such as those expressly for supporting competitiveness. Thirdly, environmental legislation will impose new compliance costs on businesses. Energy costs, including those involved in commuting, may also be additional factors. Costs in general, together with a less favourable taxation environment, will dispose foreign enterprise to seek lower cost locations outside Ireland. Fourthly, beyond these policy issues, it seems unrealistic to expect the volume of building construction – which has been of great significance to rural areas – to be sustained at the exceptional rates of recent years. There is also the risk that some lower skill industrial activities will move to overseas locations.

Without positing a truly pessimistic scenario, the following perspective for 2005 – 2025 is outlined:

- Urbanisation and spatial concentration of economic activity and population will continue, with Dublin and neighbouring counties continuing to increase their share of the State's inhabitants. The growth of the other urban centres will continue, in response to the locationally selective nature of future enterprise investment. The proposed NSS Gateways will be significant centres in this process. Recent CSO population projections indicate that, on the basis of recent trends, all regions will increase population but the fastest rate of growth will be in the Mid-East.
- Cluster development, involving, a critical mass of companies benefiting from the advantages deriving from pools of expertise, skills and specialised support will be possible in limited locations. Important components of this

development will be enterprises engaged in high value-added manufacturing in food, pharmaceuticals, medical technology, communications and software technology, as well as internationally traded services.

- Rural economic and social viability will depend on the nature and strength of linkages to the limited number of major urban centres, or on the capability of providing an attractive living environment with high amenity values. Commuting zones are unlikely to expand beyond current catchments. Areas outside these will have low levels of entrepreneurship and population decline. Any major downturn in building construction could have very negative consequences for rural areas as workers in this sector have readily transferable skills and can even move outside the country easier than their counterparts in the industrial sectors.
- The BMW region, especially the north-west, will continue to lag behind the economic performance of the rest of the country, for several reasons, including:
 - its weak urban structure and the sectoral shift towards an internationally traded services economy will continue to favour location in larger urban centres
 - transition to even lower income agriculture
 - its continued high dependence on 'old economy' enterprises with low rates of innovation
- Associated with the spatial differentiation of production, agriculture will experience further spatial contraction of commercial farming; spatial expansion of economically marginal and part-time farming – even in traditional strong farming areas; and further expansion of forestry in the west and north-west, particularly if incentives are provided in the wake of the withdrawal of commodity subsidies.
- Roadway reconstruction and improvements will be confined to the major routes along which housing will continue to locate, with poor access remaining the lot of areas served by secondary and minor roads.

⁸ In the BMW region the percentage increased from 41% to 83% between 1995 and 2003. The corresponding increase in the S and E region was from 28% to 58% (CSO 2002, 2004).

4. ATTAINABLE PERSPECTIVE TO 2025

A preferred and attainable scenario for rural spatial and demographic development by 2025 would include the following:

- There will be reduced disparities in economic performance and social progress across the country's regions. This degree of greater regional convergence requires accelerated economic development in the different rural sub-regions.
- The NSS concept of selected 'Gateway' centres, dispersing development to linked sub-towns and rural hinterlands, will be realised. 'New economy' enterprises will be a significant part of Gateway centre development outside the Dublin region.
- County (and city) development strategies, already agreed, will be successfully implemented.
- Rural towns and villages will be attractive as places of residence because of quality local amenities, infrastructures and services (e.g. schools, childcare, access to medical services).
- The special circumstances of the marine sector and of coastal areas and communities will be recognised in regional development plans, and coastal zone management will be a prominent feature of spatial planning.
- While rural areas face particular problems with higher energy costs, significant developments will be underway in harnessing the potential of the country's natural resources for energy generation, e.g. in the marine sector, forestry and biofuels.
- Advanced high-speed broadband will be widely available to homes and businesses.
- While there will be costs associated with a wide range of environmental regulations, the maintenance of a high quality physical environment and associated 'green image' will offer new market opportunities in areas specialising in food production and tourism.

5. INITIATIVES FOR A BETTER FUTURE

- 1) *Linked Spatial and Sectoral Planning*: A first initiative is to declare a clear operational

programme for implementing the National Spatial Strategy. As the Strategy has no legislative basis, commitment to it can be expressed by sustained and transparent actions to implement it. In addition, the NSS needs to be synchronised with future National Development Plans (NDPs). These NDPs need to retain the good practices already established under EU programming, e.g. by setting measurable targets and performance indicators, and maintaining regional monitoring systems. Equally important, NDPs should have a regional focus at a level equivalent to the current Regional Authority regions (i.e. at NUTS 3 level). The present division of the country between the BMW and S and E regions – devised as a political stratagem in the context of EU funding – is an unrealistic categorisation for responding to Ireland's spatial differences. Institutional arrangements may also need to be revised (see No. 6 below).

- 2) *County Strategies*: Councils have already prepared detailed multi-sectoral county strategies for 2002 – 2012. Some of the momentum behind the preparation of these seems to be lost. It needs to be restored by the re-affirmation and renewal of commitment by the stakeholders.
- 3) *Local Economic Development in Outlying Rural Areas*: With the development of gateways and hubs under the NSS, and urbanisation trends generally, the old designation of 'disadvantaged areas'⁹ has less meaning. The important distinction over the next two decades will be between rural areas linked to urban centres or networks, and the areas lying outside these catchments and their urban generated labour markets. There is a clear case for a focussed programme of local economic development for 'outlying' areas, many of which are still highly dependent on agriculture, marine and other local resources. The typology presented in Map 1 showed that some outlying areas are capable of increasing population. What is called for is a tailored approach in which agencies such as County Enterprise Boards and LEADER companies would take a more proactive role in stimulating local development. In this context, account can also be taken of the particular needs and potential of coastal communities.

⁹ Generally some amalgam of counties in the West and North West.

In some areas, easily identifiable from the population census, the demographic circumstances are such that the focus will not be on economic development primarily but on the delivery of services such as healthcare and local transport.

- 4) *Collaboration Across Administrative Boundaries*: Spatial variations manifested in different rural economies cut across administrative boundaries (coastal areas, outlying areas, etc.). The ‘packaging’ of nuanced strategies for local economic development will need closer collaboration by different county and regional administrations.
- 5) *Urban Networks and Inter-Urban Corridors*: Linkages and exchanges between urban centres can be effective in consolidating regional and sub-regional development. This polycentrism can exist at different sizes of centres and spatial levels. Such networking should be fostered (examples are Tralee – Killarney, Sligo – Letterkenny). In particular, a western inter-urban corridor linking Cork, Limerick, Galway and Sligo could be promoted as a balance to the Greater Dublin Region.
- 6) *Revise Institutional Arrangements*: Institutional and administrative systems tend to become rigid, inward-focused and self-serving. What is required in terms of rapid change is adaptability, responsiveness and flexibility. There is a need to critically assess existing structures as to their adequacy to oversee the design and implementation of a programme of regional policies and spatial strategies.
- 7) *Knowledge Building for Spatial Planning*: Spatial planning requires (i) a long-term strategic approach and political commitment, (ii) a dedicated research support system to guide the optimal use of rural space, especially in managing competing claims and conflicts over space use (which will most likely increase with more diversified development in the rural economy). There is currently an acute shortage of data to support the NSS, such as information on the flows and exchanges between ‘rural’ and ‘urban’ areas, modelling of likely future trends under different events or scenarios, or factors influencing locational decisions by major stakeholders in space use.

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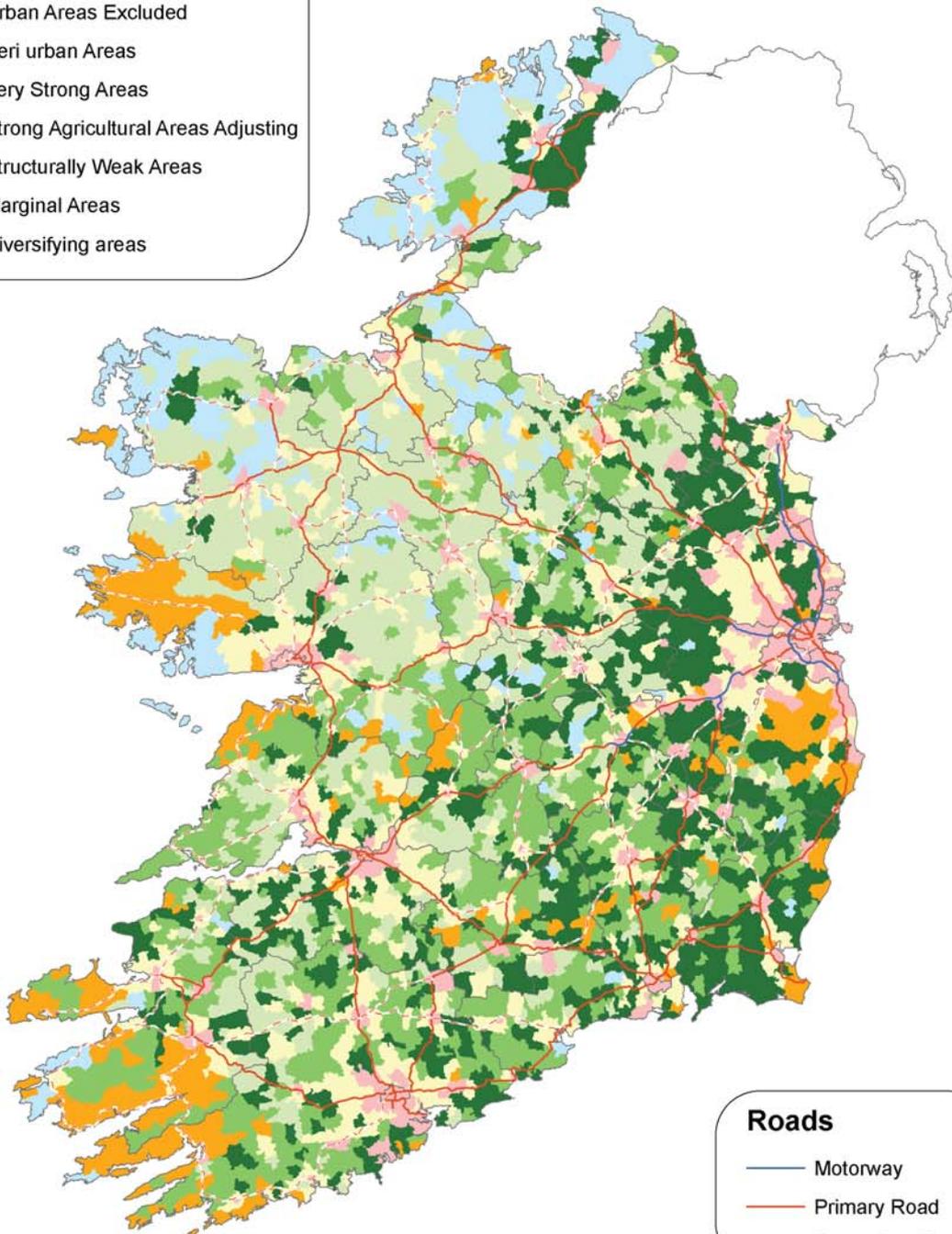
**APPENDIX TO THEMATIC PAPER 3:
MAPS OF SPATIAL DISTRIBUTION PATTERNS**

1. Rural typology, 1996
2. Demographic vitality ratio
3. Education ceased at third level
4. Persons 15+ at work
5. Female labour force participation
6. Persons travelling 30+ miles to work
7. Households with Internet access

Rural Typology, 1996

Area Type

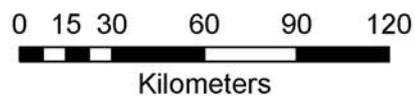
- Urban Areas Excluded
- Peri urban Areas
- Very Strong Areas
- Strong Agricultural Areas Adjusting
- Structurally Weak Areas
- Marginal Areas
- Diversifying areas



Roads

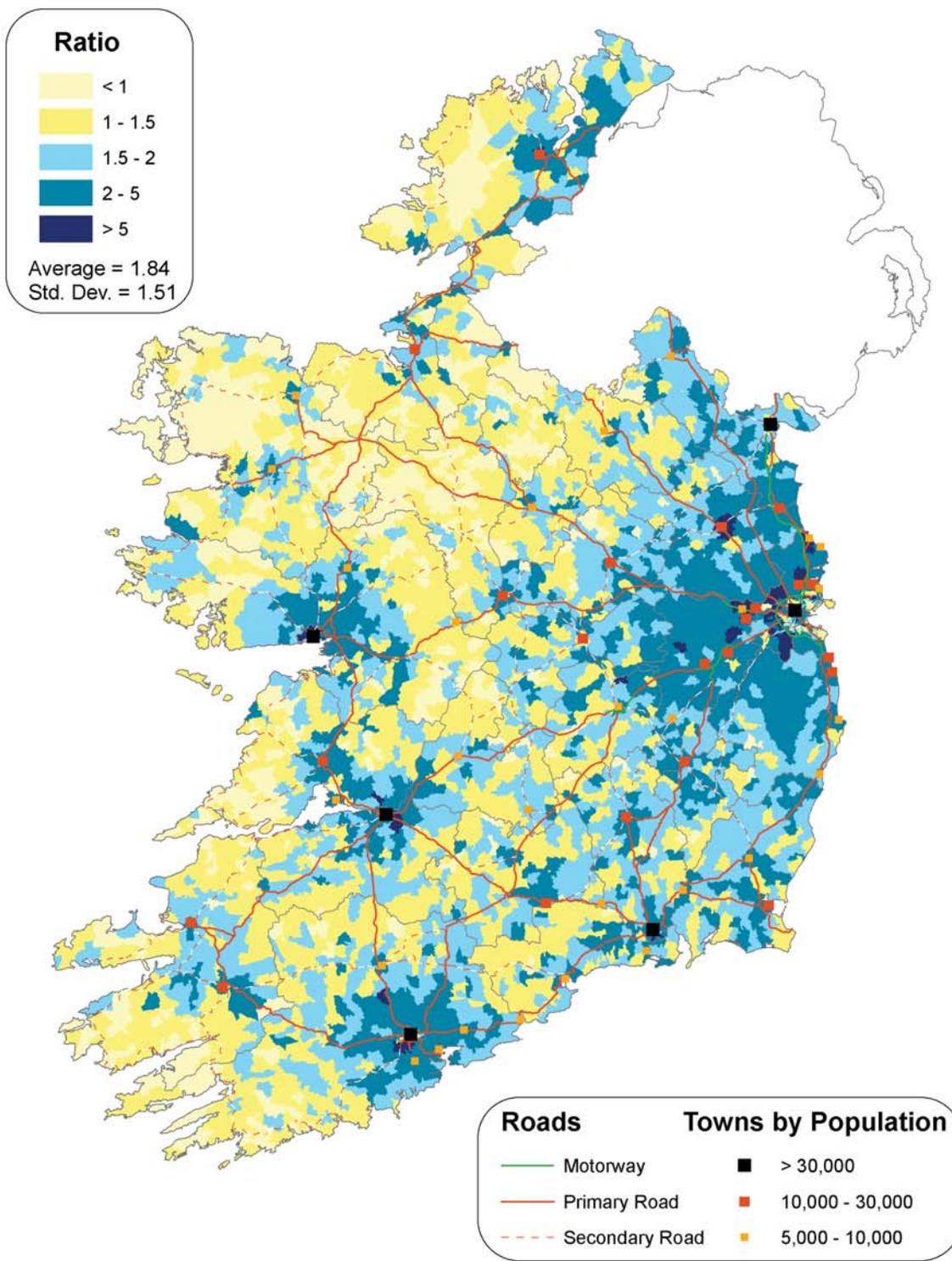
- Motorway
- Primary Road
- Secondary Road

Analysis based on 29 variables
Census data provided by Central Statistics Office.
Digital boundaries provided by Ordnance Survey Ireland.
Prepared by Dr. C. McHugh & Prof. J. Walsh



Map 1

Demographic Vitality Ratio



20 - 39 year olds as a ratio of 65+ year olds

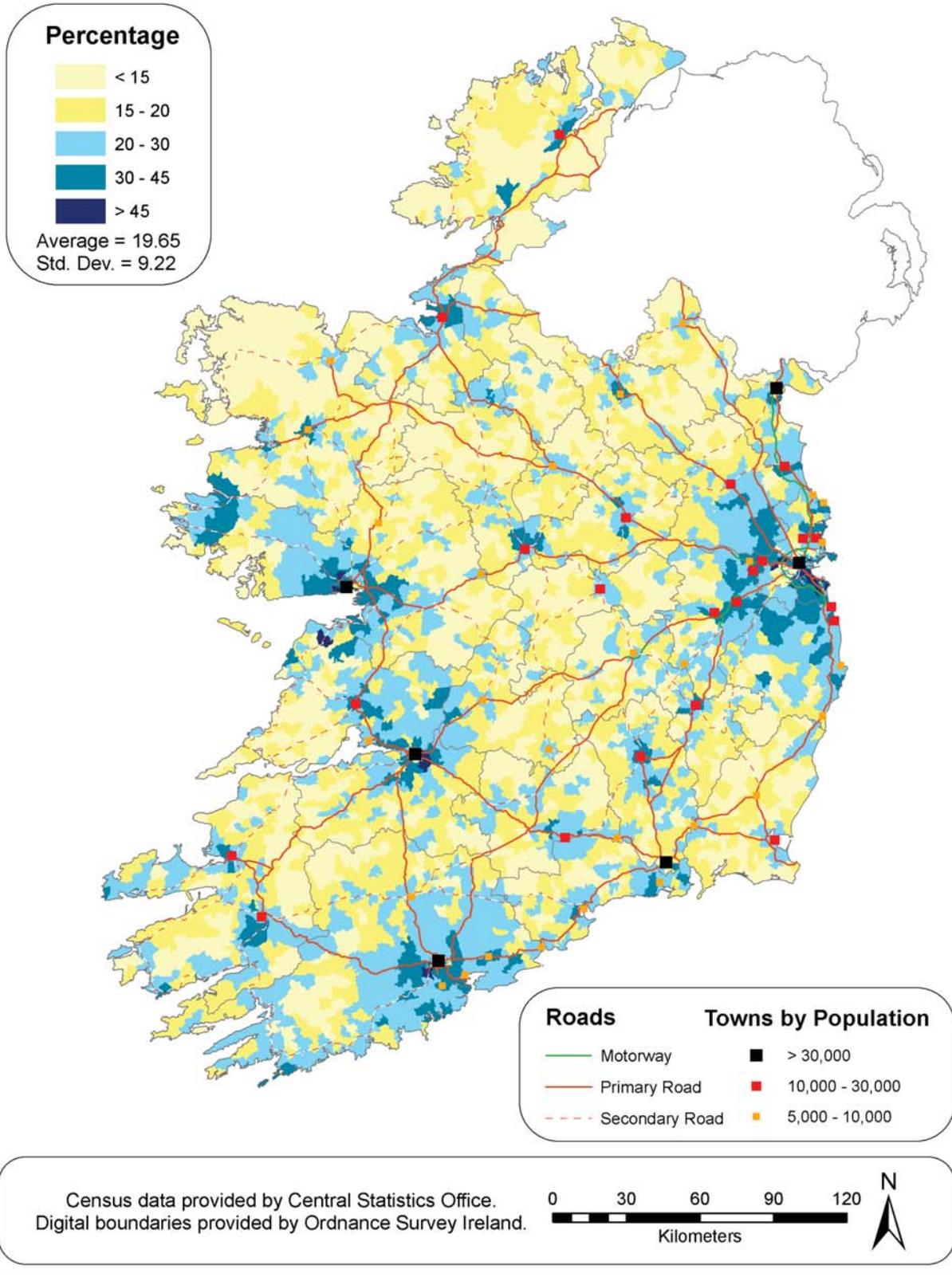
Census data provided by Central Statistics Office.
Digital boundaries provided by Ordnance Survey Ireland.

0 30 60 90 120
Kilometers

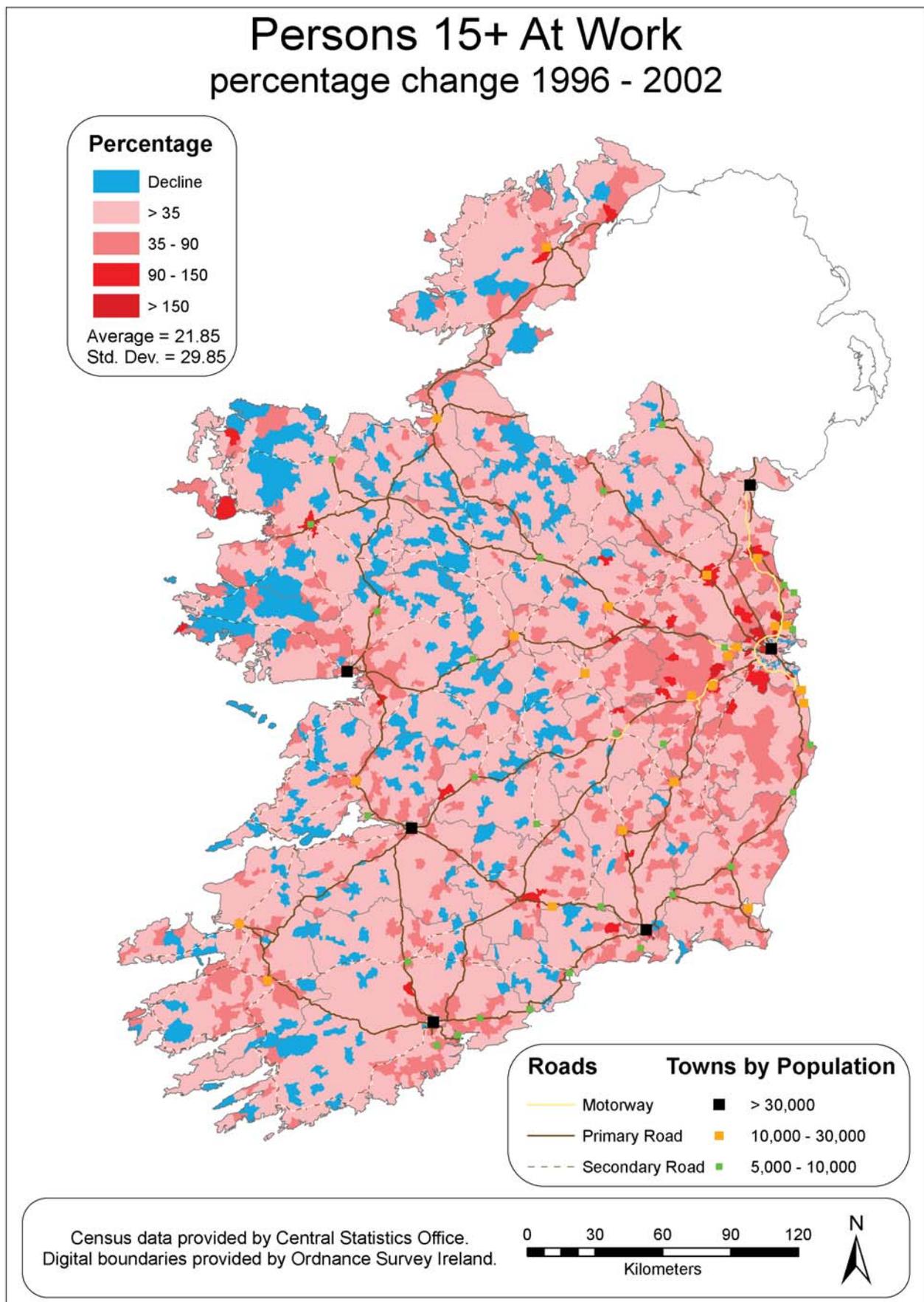
N

Map 2

Education Ceased at Third Level as percentage of total persons 15+, 2002

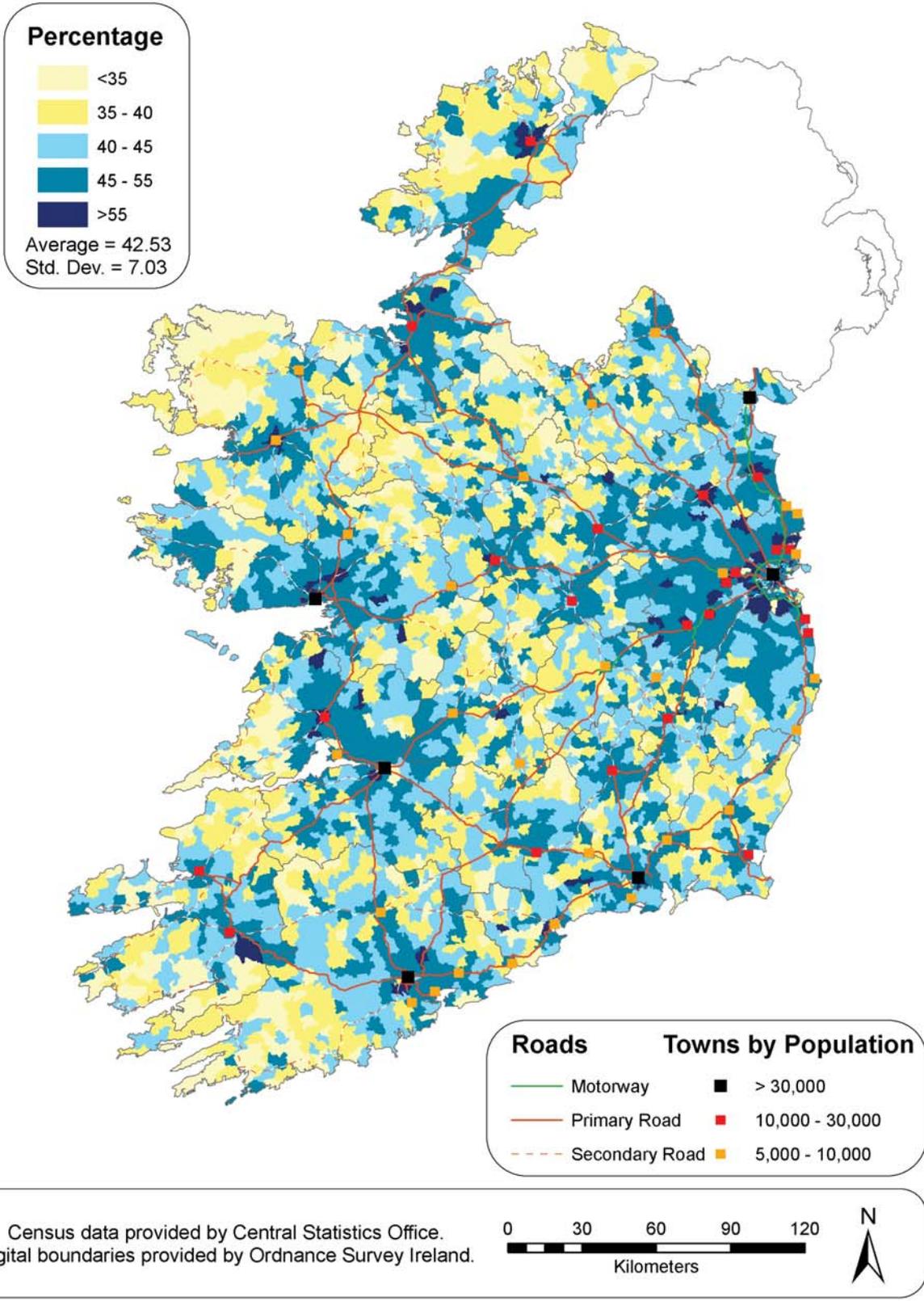


Map 3



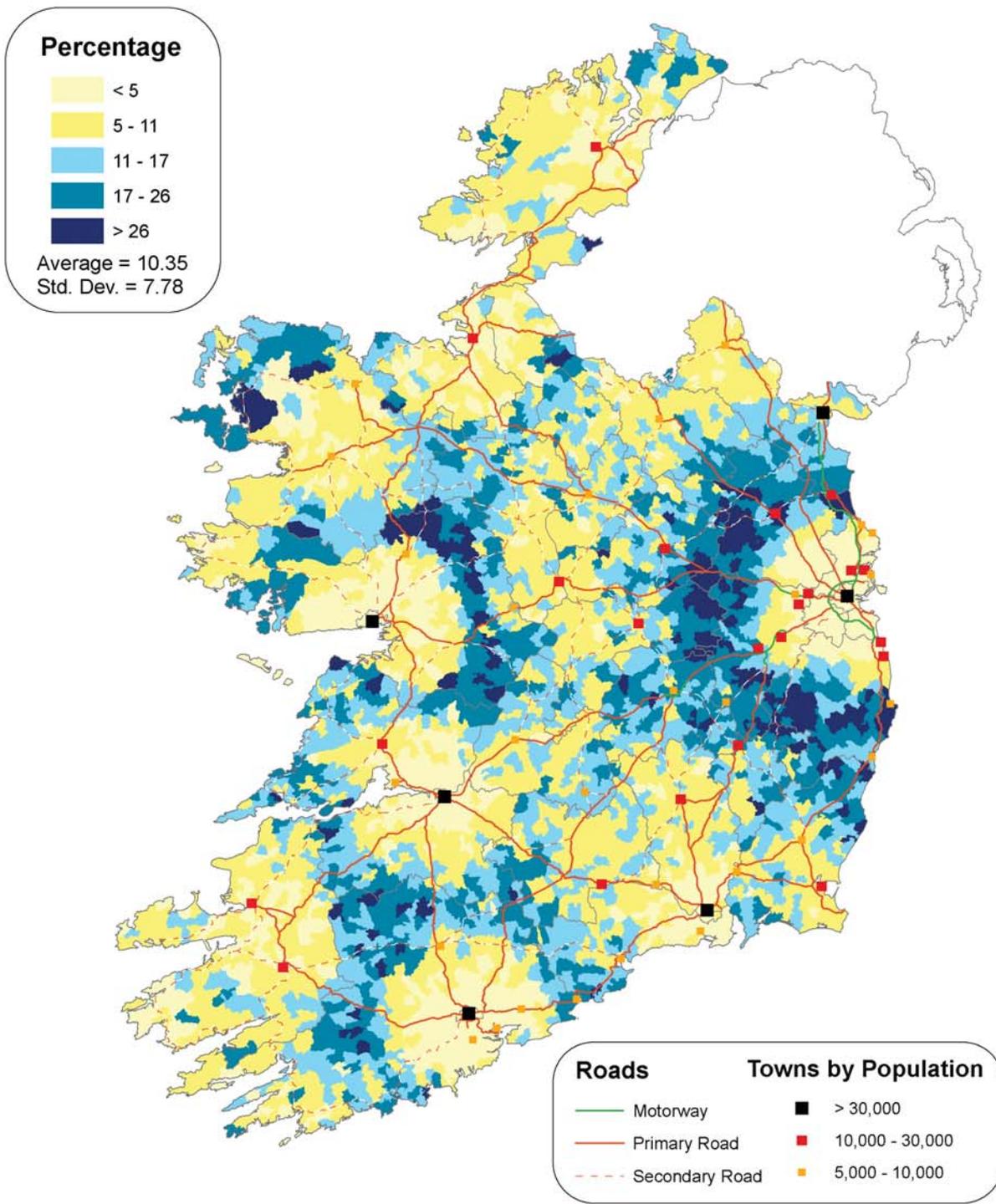
Map 4

Female Labour Force Participation as a percentage of total females aged 15+, 2002

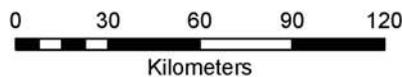


Map 5

Persons Travelling 30+ Miles to Work as percentage of total at work, 2002

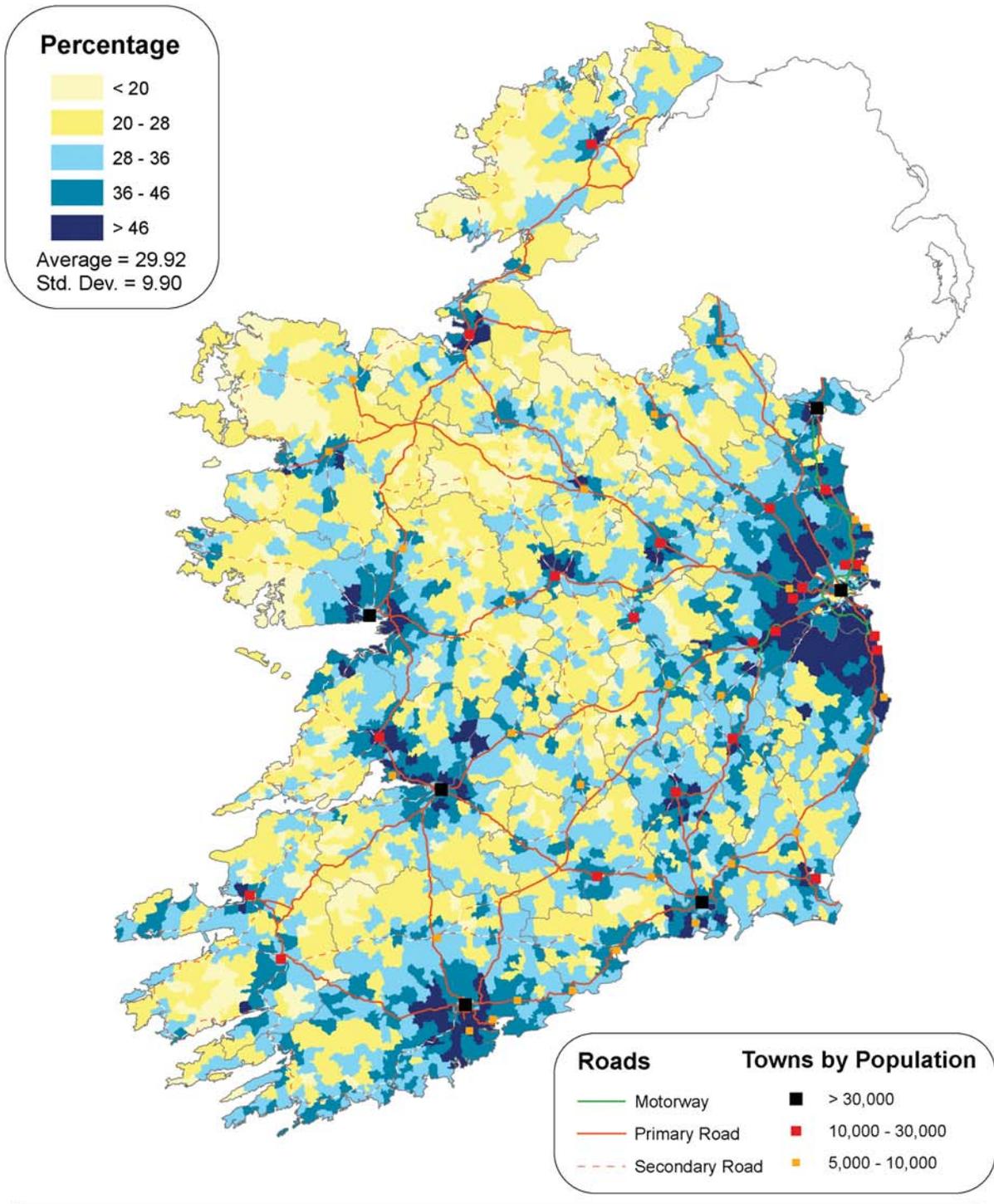


Census data provided by Central Statistics Office.
Digital boundaries provided by Ordnance Survey Ireland.



Map 6

Households with Internet Access as percentage of total households, 2002



Census data provided by Central Statistics Office.
Digital boundaries provided by Ordnance Survey Ireland.

0 30 60 90 120
Kilometers



Map 7

4. Foresight Study of the Agri-Food Sector

E. Pitts¹

1. DRIVERS OF CHANGE IN THE AGRI-FOOD SYSTEM

International

The major driving forces for change in agriculture and food are defined by de Witt (2003) as

- Increasing globalisation and liberalisation
- Changing food demands of a growing world population
- Increasing concerns with the ecosystem
- Rapid developments in life sciences and information and communications technology

National

- Changes in agricultural policy
- Impact of the "Celtic Tiger" phenomenon and in particular of relatively full employment

2. KEY TRENDS AND EMERGING ISSUES

(a) Farming structure

Trends in the structure of agricultural sector have been reviewed by Crowley et al. (2004) and are summarised below.

The period between 1991 and 2002 Ireland witnessed significant social, cultural and economic change. The population boom of the late 1970s fed into the labour force at a time when the economy was growing at record rates. During the period the population grew by 11.1%. Population growth was not confined to urban centres but also encompassed rural areas. Despite the increase of population in rural areas, fewer inhabitants were employed in traditional rural economic activities, such as farming, forestry and fishing.

Income from agriculture, forestry and fishing grew by only 24.4% between 1990 and 2002 compared with a 200% increase in non-agricultural wages, salaries and pensions. (Central Bank of Ireland (2003). In spite of population growth in rural

areas, the numbers employed in the traditional rural activities, including agriculture, declined. At the same time, income within the non-farming economy grew dramatically. The decline in farmer numbers has been partly due to the booming Irish economy, with attractive alternative careers for young people, together with continuous decline in farming prospects. Even some of the best farmers are leaving, because of the relatively poor return on assets and poor opportunities for added value. These changes signal the progressively weakening role agriculture plays not only nationally but also in rural areas and their economies.

All counties exhibited an increase in the average farm area between 1991 and 2000. The largest percentage increases occurred in the northwest and along the border, in regions associated with smaller farm size. Higher rates of land leasing occurred in the south and east, which already have, on average, the largest farms.

The vast majority of areas saw increases in the average scale of farm business between 1991 and 2000, around a State average increase of 78%. Areas exhibiting the largest percentage increases in scale of farm business appeared to correlate with those that had the largest increases in farm area.

Between 1991 and 2000, the area of agricultural land used remained almost unchanged (Department of Agriculture and Food 2003). While the number of farms declined, and numbers employed in the regular farm labour force fell and total time spent on farm work declined, the average farm size rose by 21% suggesting that, overall, agriculture became less labour intensive (CSO 2002).

The key trends shown by this analysis are therefore

- (a) substantial decline in farm labour force and reduced labour intensity in farming
- (b) substantial structural change in terms of farm size, even in a period of relative stagnation in the sector as far as output is concerned, and with little actual land sales

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- (c) substantial increase in the participation of farmers and their families in the wider economy through part time or full time jobs
- (d) more substantial structural change in less intensive areas of the North and West and a modest closing of the differences in scale between these areas and the South and East.

(b) Food processing industry

The Food and Drinks sector has shown steady growth in the value of output. Gross Value Added in food grew at an average growth rate of 6% per annum between 1995 and 2001. Gross Value Added in Drinks and Tobacco has shown a similar level of growth. With the faster growth in the wider economy in the late 1990s, the combined share of food, drink and tobacco of GDP fell from 8.7% in 1995 to 6.0% in 1999 and to 5.5% in 2002. Employment in the Food Drinks and Tobacco industry grew from 45,100 in 1995 to 47,200 in 1999 and 51,600 in 2002, accounting in that year for 2.9% of total employment. In recent years the food processing industry has become increasingly dependent on immigrant labour.

(c) Emerging worldwide trends

De Witt synthesises the assessments made in a number of future studies made by FAO, IFPRI and OECD about developments in the agriculture and food sector. The main results are

- World demand for agricultural products will continue to grow but slower than in previous decades, because of a slower growth in population and the fact that many have enough food already. There will be progress in meeting nutritional needs because of increasing production and increasing purchasing power
- Patterns of food consumption are becoming more similar, because of increased income, changing preferences, globalisation and tendencies towards convenience. The volume of higher quality and more expensive foods (such as meat and dairy products) consumed will increase
- Free trade will increase integration, productivity and income growth. Developing countries will in general become net importers of food, despite trade liberalisation. This will arise partly from poor transmission of higher world market prices to their farmers and because production

potential will be limited by agro-ecological conditions

- Cereals supply and demand will continue to increase. Production growth in developing countries is not likely to satisfy increased internal demand, which will be supplied by traditional exporters. Yield improvements will account for about 70% of production increase and land expansion for about 20%.
- Meat and dairy products will provide a growing share of the human diet, with poultry expanding most rapidly. The increased demand will be met by a movement away from extensive grazing systems to more intensive industrial systems, using improved genetic material, modern feeding systems and skilled management.
- In relation to forestry there will be a movement away from poorly regulated wild forests towards forests, which are managed in a sustainable way.
- Land degradation will remain a serious problem. There is no reason to fear for water shortages. Loss of wildlife habitats to farming will proceed but at a slower pace. Environmental policies and sustainable farming practices will help to reduce the conflict between intensification and environmental protection.
- Greenhouse gas emissions from agriculture are expected to continue to increase. But the expected increase in crop production could lead to an increase in carbon locked up in cropland soils.
- Because of its potential impact on food security, research into biotechnology and ICT is important for developing countries. Both technologies offer huge potential for increasing crop yields, conservation, and improvement of nutrition.
- In developed countries there is a growing demand for food products aimed at improving health and the focus of agriculture here needs to switch from production in the narrow sense to a broader concept of providing health-promoting and safe food.
- Food hygiene is expected to improve through use of biotechnology in food processing. A rapid increase in use of convenience foods and in electronic home shopping is foreseen.
- Major new markets will emerge for nutraceuticals and functional foods.

- The relationship between agriculture and the environment is seen as out of balance in most countries. Intensive food production leads to habitat fragmentation and destruction, atmospheric acidification, eutrophication, desalinisation, erosion and desertification. New economic planning tools will be needed to take account of these factors.
- Global environmental monitoring is on the way. Soon it will be possible to detect minute environmental changes and farmers will be able to anticipate weather conditions several months ahead. These technologies and precision farming techniques will allow optimum use of nutrients, water and energy and minimise negative environmental impacts of agriculture.
- Biological methods will replace chemical in plant protection and nutrition.
- The requirement for society to become less dependant on non renewable resources, while increasing its demand for energy and materials, will provide new markets for the agricultural sector. Alternative energy sources could include gas derived from plants, wood or straw, fuel from micro-organisms and algae, fuel derived from vegetable oils or methanol. There are also possibilities for development of materials such as plastics and glues from renewable crops rather than fossil fuels.

(d) European policy trends

Within the European Union there is a substantial change in the policy environment with increased emphasis on the multifunctionality of agriculture. Policy is no longer based on considerations of production alone but also on a range of public goods generated by the agricultural sector, including beautiful landscapes, resources for recreational and leisure activities, and bio-diversity. The precise policy instruments to reflect this change of emphasis are only beginning to be worked out and one can expect a considerable impact in the medium term of these measures, starting with the decoupling measures announced as part of the Luxembourg agreement. In general in Europe the policy environment is less sympathetic towards agricultural and food production than in the past. This trend is replicated in Ireland with the declining share of the sector in total output, the corresponding growth in

other economic activities and increasing interest in environmental and heritage issues at the expense of the purely economic.

3. PROJECTIONS TO 2015

(a) **Farm numbers:** Projections of farm numbers were made in the Report of the Agri Vision 2015 Committee. These included

- Total farm numbers to fall to 105,000 from 136,000 in 2002
- Of these 40,000 will be economically viable but three quarters will be operated on a part time basis i.e either farmer or spouse has an off farm job
- 45,000 will be economically non viable but either spouse will have an off farm job
- dairy farm numbers will fall to 15,000

(b) **Agriculture in economy:** Including forestry and fishing, agriculture accounted for 2.9% of National GDP in the year 2002, (Department of Agriculture, Food and Rural Development, website, 2004), However its share of some regional economies is considerably greater. The highest level in 1999 was 8% in the Border region.

Taking a conservative estimate of 3% per annum growth in the volume of output in the rest of the economy (nationally or in a region), and a 3% per annum rate of inflation, the **nominal** growth of the rest of the economy in a 10 year period would be over 70%. Such a growth in the rest of the economy accompanied by a static output in nominal terms in agriculture, (see below for projections from FAPRI-Ireland project) would lead to a further reduction in the share of agriculture in overall output. A continuation of these trends to 2015, would mean that the contribution of agriculture to Border and national output could fall to 3.5% and 1.5% respectively.

It should be noted that the value of agricultural output would have to double that projected for 2015 for the sector to retain its current share of national output.

(c) **Aggregate impact of Luxembourg agreement:** Analysis by the FAPRI- Ireland team shows that with the implementation of the Luxembourg agreement,

- Aggregate nominal income in farming (with decoupling) will in 2012 be close to the average levels achieved in 2000-2002.
- Relative to the average of 2000 to 2002, by 2012, there is a decline in livestock value of 6 percent under the Baseline, and a decline in milk value of 14 percent. Relative to the baseline, the value of goods output from agriculture declines by over 1 percent under the full decoupling scenario.
- On the inputs side, relative to the 2000 to 2002 period, Baseline input expenditures increase by 3 percent by 2012. Under the two maximum decoupling scenarios input expenditures decrease by 8 percent and 7 percent respectively relative to the Baseline in 2012.
- Changes in the values of outputs and input mean that under the Baseline between 2000-2002 and 2012, sectoral income is projected to decline by 9 percent. Under the two maximum decoupling scenarios, income levels in 2012 are higher than in the corresponding Baseline period due, in the main, to the reduction in input expenditure. Consequently, in 2012 nominal income levels with full and almost full decoupling remain close to the 2000-2002 level.
- Using the projections of agricultural activity already described, projected future GHG emissions from agriculture are projected to fall relative to current levels, as milk yields rise and dairy cow numbers decline. Lower numbers of drystock and lower fertiliser use also contribute to the reduction. The maximum decoupling scenario results in lower levels of GHG emissions from agriculture. Relative to the Baseline, emissions are projected to fall by 8 percent by 2012.

These projections were made using the best available econometric estimation of the likely reaction of farmers to changes in prices of inputs and outputs. It is possible that there are dynamic or other effects, which could lead to a different outcome.

Alternative Scenarios: The new policy arrangements provide freedom to farm what one wants, some (perhaps a substantial) reduction in bureaucracy and an environment where profits are derived from the marketplace, after a decade where "farming subsidies" was of increasing importance.

This may provide a new dynamic not captured in the econometric models.

The potential for expansion of the dairy sector is frequently cited. For this to become a reality quotas would have to disappear. Current policy has them in place until 2013. Belief in the capacity to expand is based on a presumed comparative advantage in dairy production.

A recent study of the competitiveness of the dairy sector (Thorne, 2004) compared with seven other EU countries reveals that

- Using partial productivity indicators such as yield per cow or per hectare Ireland had one of the lowest levels of productivity
- Using "cash costs as a percentage of output" as a measure of competitiveness, Ireland had a low level of costs and therefore a high degree of competitiveness. This measure is appropriate for judging response to reductions in output prices, and indicates Irish dairying would survive better than most of its EU neighbours in the expected environment of the next few years.
- Using "economic costs" (including return on owned land and labour) as a measure of competitiveness, Ireland had a high level of costs and therefore a low degree of competitiveness. This was particularly due to the high price of land in Ireland (excluding land prices, Ireland is competitive). This is the most appropriate measure of competitiveness, if one is considering ability to invest and expand for the long term.

This study suggests that the ability of the dairy sector to expand if quotas disappeared will be limited by the high price of land. This result also applied to beef and cereals markets.

Another scenario, with specific environmental implications relates to the possibility of trading in environmental goods, which is a reality in some countries. Already under the Kyoto protocol there is provision for trading in the right to emit greenhouse gasses, and there have been reports of US farmers benefiting from these provisions. In the medium term, markets may develop for carbon sinks or for renewable crops for energy production (with or without public subsidy). The concept of paying farmers for environmental goods is already accepted. Given the speed of policy change seen within the EU in recent years, provisions such as these are likely by 2015.

4. PERSPECTIVES TO 2025

For a period as far ahead as twenty years, conventional projection techniques have severe limitations. They are usually based on continuance of existing policies and trends. In twenty years, discontinuities can be expected. That is why we speak of perspectives in the plural.

4.1 Conventional perspective

Let us however start with a conventional perspective, which assumes that the future will see a continuation of past trends. The global drivers of change over the last 20 years have caused in Ireland

- Replacement of labour by capital in farming and consequent decline in farm labour force
- Increasing scale of farming and the food industry
- Increased incidence of part time farming
- Lower real agricultural prices and increased dependence by farmers on subsidies (A US study indicates that real commodity prices have fallen by over two-thirds over the last fifty years)
- Failure of farm incomes to match off farm incomes, and rural depopulation
- Relative stagnation in farm output
- Substantial decline in the relative share of agriculture in national output.
- Growing markets for added value food products.
- Our perspective to 2015, assumed a continuation of these trends. The review carried out by De Witt of a number of future studies made by FAO, IFPRI and OECD shows a broad continuation of current trends.

Such a future to 2025 would involve a continuation of the past trends in Irish agriculture with continuing

- perhaps as few as 10,000 full time commercial farmers in 2025
- further lowering of real agricultural prices. (Irish farming with its undifferentiated product mix will be particularly negatively affected by reductions in commodity prices)
- further reduction in importance of agriculture in wider economy

- significant land area occupied by non agricultural interests for “lifestyle” reasons.

While land use for energy production, for forestry, and for leisure uses will increase at the expense of farming, less productive land will be abandoned, as already occurs in France, USA, and Australia. Continued reduction in real agricultural prices would threaten the economic viability of farming, even in sectors such as beef and dairying, where we are thought to have some competitive advantages. This particularly would apply in the context of continued strong economic growth in the home economy, providing good and secure incomes from working a 5 day week in the industrial or service economy, while the farming sector was subjected to fluctuating and declining world prices and required 7 day working.

The pig and poultry sectors could decline to insignificance, while food processing would also be under severe pressure because of declining cost competitiveness.

The competitiveness of the main dairy and beef sectors in a largely free trading environment will depend either on attainment of massive scale to compete with other countries (a minimum milk delivery of 1 million litres has been suggested) or the abandonment of commodity production in favour of providing specific beef and milk products for specific consumer markets on a consistent supply basis, and thereby attaining higher producer prices. The pursuit of competitive scale would see a very dramatic reduction in farmer numbers and in employment in the food processing industry.

The primary processing industry would be subjected to the same pressures of declining prices and the continuing problems associated with the power of the retailers, requiring increasing scale and capitalisation to remain competitive. It would in addition be severely affected by any reduction in output volume of the agricultural sector. If the primary producer does not produce, the first stage processor cannot survive.

The secondary processing and prepared consumer foods sector is already purchasing significant volumes of raw materials on the world market. Its future is not so dependent on the native agricultural sector. However it is already using, in addition to imported raw materials, substantial volumes of imported labour. In strategic terms it might find it optimal (as is the case with other manufacturing sectors), in time, to relocate its production to cheaper foreign locations eg in New Member States.

4.2 Alternative perspectives in 2025

As stated earlier, in a twenty year perspective one expects discontinuities and emergence of new trends. Below are some of the possibilities, which could affect the global or food economy or specifically Irish society in this timeframe which could contribute to a different future.

Scarcity of water: An IFPRI study suggests that in a business as usual scenario, world demand for water for non irrigation uses will rise by 62% by 2025 over 1995. Farmers use of irrigation water will increase by only 4%. Developing countries unable to increase their food production will dramatically increase their reliance on food imports, some poor countries being hit particularly hard. A genuine water crisis is possible if current trends worsen. Declining food production will lead to increased prices for rice and cereals, but reduced trade and increased food insecurity. It is probable that such a scenario would lead to higher agricultural prices in Ireland. (Concern about water availability also appears in studies from Australia)

Attitudes towards the environment: The conventional perspective incorporates an increasing concern for and regulation of the environment. One can envisage a situation however where concern for the environment replaces production as the main concern of society (a recent French study explored such a scenario). This can arise either at national level or through international pressure. In such a situation the countryside would be viewed by society as primarily a store of environmental assets to be conserved and developed. Agricultural production would have a lower status, and be valued only in so far as it contributed to such an objective. Intensive agriculture would be seen as antithetical and would be severely constrained. Such a scenario cannot be considered unlikely. The extent to which society already is willing to preserve toad or grass species at considerable economic cost is considerable.

Climate change: Global warming is broadly now accepted as a fact by most scientists. Conventional wisdom suggests that the most severe effects (whether positive or negative) will not be seen for fifty years. Nevertheless there is a large unknown factor. Studies have suggested that global warming in Ireland, while bringing greater weather variability and more frequent storms, would bring warmer summers and higher cereal yields and could force a change in agricultural production patterns, with the

possibility of wine production and possible need to control water use. However an alternative scenario suggests that the Gulf Stream, the principal source of our mild climate could reverse its flow bringing considerable climate change with much harder winters and warmer summers.

Growth of the Chinese economy: In recent years the Chinese Economy has grown at an extremely rapid rate making China an important global producer and market. The current high oil prices (and those of several other commodities) are being maintained because of high demand levels from China. The growth of a Chinese middle class, numbered in hundreds of millions, has important implications for demand for food products, as they aspire to higher levels of consumption of meat and dairy products. Dramatic increases in dairy consumption have already taken place, from a low base. At the same time China is increasing its own production of food products, not wishing to be too heavily dependent on imports. China is now the largest world producer of Whole Milk Powder.

In a twenty year perspective it is impossible to gauge what the precise impact of its dramatic economic growth will be (and whether it can continue). In particular it is not possible to gauge the impact on world meat and dairy products markets of increasing supplies of food products and of increasing demand from China. If their supplies kept pace with internal demand growth, there might not be much of an impact on world markets. However if demand growth substantially exceeded supply growth, this could have a substantial positive impact on world commodity prices.

Knowledge economy: Economic growth, particularly in developed economies, is increasingly seen as dependent on new technologies, arising from the application of the results of research and development in industry and services. The typical applications cited are in information technologies and biotechnologies. The development of biotechnologies is seen as still in its infancy, with dramatic annual developments eg in reading the human and other genomes. Industrial applications using these discoveries are likely to transform the pharmaceutical industry and may have significant impacts on food production, accelerating the recent trends into functional foods.

5. PREFERRED PERSPECTIVE FOR 2025 – A MARKET LED AGRIFOOD SECTOR

The preferred perspective for the agriculture and food industries in 2025 is that the sector then is

- a valued supplier
- of branded products
- which are differentiated.

This preferred position is a long way from the commodity orientation of much of the farming and food sectors in the past. It is deemed necessary as (a) the ability of the agricultural sector to supply commodity products competitively in a free trading world is considered doubtful (b) the returns generated from commodity production would not provide adequate income levels, particularly in the context of continuing prosperity.

It is presumed that most output would be supplied to a sophisticated European market, which provides premia, for specialised, niche and branded products, above the levels achievable from commodity production. These markets would require, in general, all year round production.

In this scenario, both farmers and processors are highly focussed on meeting the precise demands of the target market and their production and logistic systems are integrated. While scale is not as critical as in commodity production, the sophisticated production, logistic and marketing systems required, will require a degree of management and other skills unlikely to be found among smaller firms. The concentration on specialised markets will not remove the necessity to achieve significant scale.

6. INITIATIVES FOR A BETTER FUTURE FOR 2025

A review of the requirements to achieve a marketing led agri-food sector, described above, produces some relatively surprising results.

The Beef sector does not have a strong market position in EU markets, being seen as a residual supplier. Processors have limited market power, low margins and face declining supply. Nevertheless it is felt that the oft criticised beef (and lamb) sector has made substantial advances in recent years and is now well on the way to supplying product for real rather than intervention markets. The structure of the processing sector has improved, with four leading groups, each of which is orienting towards supply of

specialised products, with noticeable achievements in selling Irish branded beef in Italy and Netherlands. The change in the subsidy system should bring an increased marketing focus at producer level. There is therefore a degree of optimism that the beef sector can be oriented to meet the short, medium and longer term needs required to achieve a better future in the farming and food sectors by 2025.

The outlook for the dairy sector is not seen so positively. Neither at producer or processor level is there a commitment to change to production of specialised consumer products requiring all year round production. Competitors have higher levels of productivity, reinvestment, R&D, Marketing spend and value added. The sector is still very substantially dependent on production for commodity markets and on export subsidies.

The “Conventional Perspective”, described in Section 4 above, is quite pessimistic for the agri-food sector. In order to avoid the worst outcomes action needs to be taken in the following areas.

Cost reduction: In the farming sector the costs of compliance with various EU Directives inhibits initiative and reduces incomes. The transition to the new subsidy scheme provides an opportunity to design compliance mechanisms, which ensure that EU objectives in the areas of the environment, animal health and food safety are met, while not placing unreasonable demands on producers. In the food processing sector the recommendations made in the most recent report of the National Competitiveness Council are particularly relevant. Costs have been increasing at a faster rate here than in competing economies and this will in the short or long term affect competitiveness of the sector. The food sector is a relatively heavy user of energy and requires a more deregulated and competitive energy supply industry. Continued availability of immigrant labour will assist competitiveness. Given the regional location of most food companies, and the growing demands of retailers for more efficient supply, continued development of the road infrastructure is critical.

Land market: Consolidation of land holdings (in management if not necessarily in ownership) is necessary if a competitive farming sector is to be maintained. Reintroduction of roll over relief in the capital gains tax code would assist farmers seeking to enlarge their holdings, as would concessions in the stamp duty code. Land prices, however, are now substantially determined outside the sector.

Competition law: Given the requirement for scale in the food processing industry to compete in the future, a review of the operation of Irish competition law as it is applied to the industry is required.

Milk quotas: The administration of the milk quota regime favours smaller holdings and restricts the growth in scale of the enterprises, required to meet future needs.

Production techniques need to be developed to enable the sector to produce to consumer requirements of easy access to their preferred food product characteristics throughout the year. New nutritional strategies may be required to complement our grass resources and enable us to provide consistent supply to market specification. New pricing structures to encourage such supply will be required.

Innovation: Innovation is an essential element in future competitiveness of the food processing industry. Research for the sector, which is currently supply driven, needs to develop a more demand oriented approach, if it is to meet the needs of industry. Innovation needs to be focussed on areas of comparative advantage, bearing in mind that the bases of this advantage have been changing dramatically.

Industry structure: The recommendations of the “Prospectus report” on the future of the dairy sector should be implemented. These can be summarised as (a) a significant increase in scale, productivity and cost efficiency and a need to increase the volume of high added value products on the market.

Food biotechnology: Products based on biotechnology are expected to have a substantial increase on their low market share in the period to 2025. The sector, which is in its infancy, is seen as one in which Ireland has the ingredients for comparative advantage. This sector needs to be developed through the right mix of skill building, foreign direct investment, technology development and acquisition, and market research.

Functional Ingredients represent a major worldwide development opportunity in the period to 2025, with high levels of disposable income, increasing concerns for health, and an aging and therefore more illness –prone population. The sector in Ireland is at an early stage of development but has positive characteristics in its dairy ingredient businesses, its close contacts with the babyfood

industry and its strong beverage sector. This sector also needs a long term development strategy.

Many of these recommendations coincide with those of the Agri Vision 2015 Committee.

5. Foresight Report on the Forestry Sector in Ireland

J. Fennessy¹

Forestry is a complex activity – a renewable resource with a minimum 40 year cycle, an alternative agricultural land-use, an agent of landscape change, a wildlife habitat, an environment for recreation, a carbon sink, and, not least, the source of raw material for a range of timber-based industries. It requires long term planning and foresight - decisions made today will impact on wood production, delivery of environmental services, and the social effects of forestry over the next four to five decades.

Government forest policy is set out in *Growing for the Future*². Along with a range of measures across the forestry sector, it targets an afforestation programme of 20,000 ha per annum from 2000, to achieve a forest area of some 1.2 million ha by 2030 or 17% of the land area, leading to a critical mass of annual roundwood production of some 10 to 12 million cubic metres by 2035. Critical mass is defined as achieving economies of scale to provide for an internationally competitive, world class, processing sector.

In the period since 1996 the importance of the environmental and social dimension of forestry has grown, mainly as a result of instruments such as the Kyoto Protocol arising from the Rio process, the support for the principles of sustainable forest management (SFM) and changing societal views on forests and the practice of forestry. The key challenge facing forestry in the period to 2025 could therefore be formulated as: how to deliver expected environmental public goods, while at the same time developing a world class processing sector, and addressing social issues such as rural development and recreation. Meeting this challenge will require an innovative and holistic approach involving all sector stakeholders, public sector intervention as well as private sector investment. Foresight is a useful tool in the process of determining the nature and scale of the actions required to meet this challenge.

1. DRIVERS FOR CHANGE

Forestry is not a stand-alone, self-contained sector but has linkages with agriculture, rural development, industry, finance, trade and the environment. There are a number of drivers of change operating in the forestry sector, some of which are unique to forestry. These include the Ministerial Conferences for the Protection of Forests in Europe (MCFPE), the United Nations Forum on Forests (UNFF), forest certification, sustainable forest management demands for an internationally legally binding instrument (LBI) on forests, globalisation, economic and structural constraints, international, European Union and national legislation/regulation and existing national policies and proposed new policies.

1.1 Economic/structural pressures

- Costs and overall competitiveness of the sector (including the wood supply chain)
- Increasing competition from lower cost suppliers from eastern Europe and the southern hemisphere
- Price of wood energy relative to fossil fuels and other renewables
- National, regional and global wood and wood products supply/demand dynamics
- Relative strength of the agricultural sector
- Effect of increasing urbanisation and population growth on the demand for recreation space/leisure activities and public purpose forestry
- Growers' expectations and demands, including the issue of cessation of state premium payments post year 20 and the need for income from wood sales
- Roading/access to forest plantations and efficiency of processing and haulage of timber

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² Department of Agriculture, Food and Forestry (1996) *Growing for the Future: A Strategic Plan for the Development of the Forestry Sector in Ireland*

- Emergence of markets for carbon and other environmental products and services.

1.2 Regulatory/legislative

The debate on the conservation and sustainable management of forests worldwide takes place in various processes and initiatives, which are jointly called “the international forest regime”. This includes global processes such as the UN Forum on Forests (UNFF), and regional processes such as the Ministerial Conference on the Protection of Forests in Europe. Other elements of the international forest regime are conventions and processes, such as the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), the UN Framework Convention on Climate Change (UNFCCC) with its Kyoto Protocol, and the UN Convention to Combat Desertification (UNCCD). Forests are also dealt with under the UN Commission on Sustainable Development, which prepared the World Summit on Sustainable Development (WSSD).

In 2000, the international community created a new international arrangement for the forest dialogue, comprising the UNFF and the Collaborative Partnership on Forests (CPF). Heads of relevant multilateral organisations formed the CPF to complement the intergovernmental UNFF. It consists of all major forest related international governmental organisations. The UNFF has adopted a Plan of Action to facilitate the implementation of the IPF/IFF Proposals for Action and in 2005, is expected to produce recommendations for “parameters of a mandate for developing a legal framework on all types of forests”. Other regulatory and legislative factors that influence forestry include:

- EU Rural Development Regulation as it impinges on forestry and the whole rural development sector
- EU Renewable Electricity and Liquid Biofuels Directives
- Draft EU Energy Efficiency Directive for domestic and industrial construction
- Biodiversity and Climate Change Conventions (including carbon sequestration in forests)
- National forest legislation

- EC environment directives (such as the Water Framework Directive and the Nitrates Directive) and related national legislation
- Health and safety at work legislation
- Product and process-based national and international (CEN - *Comite Europeen de Normalisation* European Standards Committee) standards.

1.3 Institutional

- Institutional capacity to provide the complete range of support and extension services to the dynamic and growing forestry sector
- Co-ordination among state agencies and departments relating to forests and forest industry development.

1.4 Existing national policies and policy appraisals

- Strategic Plan – *Growing for the Future*
- Consideration of findings and recommendations of *A Review and Appraisal of Ireland’s Forestry Development Strategy*³.
- National Sustainable Development Plan
- National Climate Change Strategy
- National Spatial Strategy
- National Biodiversity Plan
- National Development Plan
- Relativities between rural development measures such as the Rural Environment Protection Scheme (REPS) and forestry measures, especially forestry premiums
- CAP Rural Development Plan 2000-2006

1.5 Research and development

- Impact and implementation of public and business-related R&D findings across the sector

2. KEY TRENDS AND EMERGING ISSUES

The key trends and emerging issues in the forestry sector are outlined in this paragraph. Their specific

³ Bacon, P., and Associates (2004) *A Review and Appraisal of Ireland’s Forestry Development Strategy*.

impacts are dealt with in sections 2.1 and 2.2. One of the key trends over the past decade has been the influence of global, regional and international agreements, such as the Rio Process, on forest policy and practice. Increasingly, the multiple functions of forests are being recognised in national forest policies and strategies. Forestry is no longer regarded as a stand-alone activity but is more and more seen in relation to other sectors such as conservation and human health and welfare. This is reflected in changes in societal perceptions of forestry and how it values forests.

The role of the state in providing new areas of forest has all but disappeared over the past decade while there is a greatly increased role being played by the private sector and in particular farm forests.

2.1 Trends and issues that may have a negative impact upon forest industry development

- Fall off in the afforestation programme and consequent reductions in wood supply and public goods provision, if level of afforestation grant is not maintained at 100% of cost
- Lack of any statutory forum to guide development, monitor policy implementation or provide high level advice to the state authority
- Increased competition on home and export markets from emerging economies and non traditional suppliers
- Growth in forest area, especially in the farm forestry sector is dependent on developing an efficient cost-effective harvesting and transportation system across the national road network
- Natural growth rate advantage has been eroded through an increased cost base; to maintain competitiveness will require increasing cost efficiency along all segments of the wood supply chain
- Need for co-ordination of initiatives targeted at rural development across different state agencies and government departments
- Increasing difficulty in attracting new entrants to the forest workforce in the absence of any form of career structure as in other countries
- Need for integrated forest management planning for private forests to be co-ordinated at national level

- Requirement for forest certification (public and private forests) to allow full access to domestic and export markets
- Land-use designation needs to be defined at catchment, county and regional levels, linking forest to productivity, provision of environmental goods/services including landscape issues

2.2 Trends and issues, which may have a positive impact on forest industry development

- Forecasted growth in domestic roundwood supply, particularly in the private sector, and its potential and future utilisation
- Use of high technology processes to add value and place wood and engineered wood products in non traditional market segments
- Growth in number of farm forestry owners
- Growing importance of environmental goods/services provided by forests, such as biodiversity, carbon sequestration and recreation
- Growing demand for and increased awareness of wood for renewable energy generation
- New measures in post 2006 Rural Development Regulation targeted at forest management
- Integrated one-type-fits-all forest model for the provision of biodiversity, roundwood, carbon sequestration, recreation space etc., or segregated model using separate areas for wood production on the one hand, and areas for public goods such as biodiversity and water protection on the other
- The likely impact of the Single Payment (Decouplement) Scheme on farm management practices, with a consolidation of intensive management on to larger farm units. Extensive farm management will be more widely practised with farmers moving to off-farm employment which may be either full or part-time
- Ability to charge for non-market services such as biodiversity enhancement and carbon sequestration (forest sinks)

3. CHALLENGES, OPPORTUNITIES AND THREATS

There are many challenges; opportunities and threats have been dealt with in a general way in the previous sections. Here they are specifically listed to aid the foresight process.

Challenges

- Developing the forestry sector in a manner and to a scale that it is internationally competitive
- Developing the necessary forest contractor and support infrastructure to enable the sector to meet national targets for afforestation and to harvest the increasing wood volumes from the private sector
- Realising the production and processing potential of the state and private forestry sector, particularly the 190,000 ha planted by the private sector since the mid 1980s
- Development of alternative markets for small roundwood suited to the nature and geographical spread of the resource
- Application of knowledge economy to add value to wood and wood products
- Increasing competition from low cost wood economies
- Retaining and attracting new entrants to the contractor and forest workforce
- Growing quality wood, fit for market, at a price that is internationally competitive that can secure increased market share for home-grown forest products in domestic and export markets (including the energy market)
- Development of a national and fully integrated inventory, forest management planning and forecasting system that is user friendly and suited to the needs of the sector
- Developing policies and measures that enable the provision of public goods by forests (such as recreation, biodiversity and carbon sequestration) to be rewarded and reconciliation of a competitive forestry sector with the provision of such goods under government policy
- Securing continued EU and state investment for measures that will bring more land owners to forestry and will encourage effective management of forests

- Developing a market for forest land through investment by pension funds and private individuals
- Promoting the marketing of wood and wood products – possible need for the establishment of a new body similar to An Board Bia
- Securing continued and increased investment (particularly from business) in innovation in the sector
- Meeting regulatory demands in a cost-effective way and where possible reducing regulation and red-tape
- Encouraging farm forest owners to become proactive in managing their forest asset.

Opportunities

- Changes to CAP, consequent reduction in land prices to lead to increased land availability for forestry
- Farmers wanting to diversify, who see forestry as an acceptable and valuable land use option
- The inclusion of forest carbon sinks in EU Emission Trading Scheme (ETS) for the second commitment period of the Kyoto Protocol
- Need for Ireland to be Kyoto-compliant and recognise opportunities for carbon storage in forests and wood products
- New measures identified in the draft Rural Development Regulation such as restoring forestry production potential, forest-environment payments etc.
- Growth in demand for renewable energy and potential for this to be partly met by wood energy
- Use of home-grown timber in timber-frame houses allied to continuing building boom with associated increased demand for wood and wood-based systems, and greater acceptance of wood (timber frame housing) in house construction
- Expand timber processing into value added areas such as Engineered Wood Products (EWP)
- Increased leisure time and population with increasing demands for recreation activities that forests can fulfil (such as walking and hunting) and potential for specialised urban woodlands

- Growing importance of biodiversity provision of which woodlands are accepted as a major source
- Need for riparian management under the Water Framework Directive and emphasis of the positive role that forests play in protecting and enhancing water quality

Threats

- Dramatic fall off in afforestation programme post 2006 if level of afforestation grant is not maintained at 100% of costs
- Possible loss of tax-free status for the operation of forests
- Over-regulation of sector resulting in erosion of competitiveness
- Coming on-stream of wood supply from new EU Member States with lower costs and prices and the possible impact on current markets
- Fall in the real price for roundwood
- Increased volume of recycled paper and wood resulting in the depression of the market for virgin fibre and small roundwood
- Unsustainable raw material supply pattern based on continued under achievement in the afforestation programme
- Substitution of wood by other products
- Reduction in the level of house building long-term, resulting in decreased demand for structural timber
- Over reliance on Sitka spruce (an exotic species) and the ever-present danger of introduced disease and insect attack
- Impact of climate change on production potential of current species mix.

4. BASELINE PERSPECTIVE IN 2025

The baseline perspective as presented here assumes a continuation of present policy but recognises the possibility of reduction of government and EU support with the possible removal of grants and premium in a total doomsday scenario. The baseline perspective also assumes the afforestation target as set by *Growing for the Future* and recently endorsed

by the Bacon Report, but it recognises the average annual levels being achieved at present⁴.

- No afforestation grant, and no annual premium leading to reduced level of annual planting arising from policies such as the proposed Rural Development Regulation
- Inadequate infrastructure and forest management planning resulting in farm forestry becoming a stand-alone enterprise with limited thinning/harvesting in private sector forests
- Limited contribution of forestry to rural development through the provision of rural based employment despite the under utilised potential
- Small, scattered private forest resource with holdings of 8 ha average size
- Afforestation based on designated land use at regional and catchment level
- Approximately 15% of land area covered by forests (see Table 2), based on 15,000 ha per annum afforestation from 2007, as presented by the Strategy Plan *Growing for the Future*
- Little investment of private, no-farmer equity in afforestation
- Land prices significantly lower in real terms than current levels due to a weakness in demand for land
- Continued dominance by state sector of wood supply (Table 1)
- Real price of roundwood lower than current prices
- Limited development of home market timber share by processing and panel sector, and timber-frame construction at 40-50% of housing market with home-grown component mainly panelboard
- Limited use of wood energy and biomass contributing little to national energy supply based on current trends.
- Greater recognition of public goods provided by forests and incentives available for their management and provision in state and private forests (for example water quality improvement through the use of riparian woodlands).

⁴ The Report *Growing for the Future* assumes an annual afforestation level of 20,000 ha per annum from 2000 onwards, however approximately 15,000 ha per annum has been achieved to date.

Table 1: Forecasted roundwood supply in the Republic for year 2025.

Owner	Assortment			Total
	<i>Pulpwood</i>	<i>Small sawlog</i>	<i>Large sawlog</i>	
	000,000 m ³			
Coillte	0.66	1.02	1.61	3.29
Private	0.90	0.90	0.80	2.60
Total	1.56	1.92	2.41	5.89

Source: Phillips, H (2003). Economic impact of forestry. Unpublished paper, COFORD.

Table 2: Forest area in 2025 (assuming planting at 14,000 ha 2004 and 15,000 ha 2005 and thereafter).

Owner	Area (ha)
Coillte	406,000
Private	611,000
Total	1,017,000
Percent total land area	14.4%

- Part-certified forest estate with barriers to entry for uncertified private producers.
- Forest contractor and services support infrastructure continues to be at best marginally profitable and having difficulty recruiting and maintaining workforce.
- Greater species diversity with sound basis for preferred species mix
- Diversified supply of roundwood from private and state forests with strong supply-side competition
- Internationally competitive wood product manufacturing with strong internal competition for roundwood
- Wood energy supplying 15-20% of heat demand by 2025
- Implementation of economies-of-scale in harvesting and wood processing and fully integrated supply chain
- Fully certified forest estate with no market access barriers for home-grown wood
- Maximum penetration of the home timber market, with timber-frame manufacturing accounting for 60-70% of home construction, with home-grown timber supplying the bulk of the demand
- Continued development of home market share by processing and panel sector through added value and wood technology
- Expansion of existing panel mills and the attraction of one new entrant at world-class scale.

5. PREFERRED PERSPECTIVE IN 2025

- Operation of a Farm Forestry Forum to oversee the development of the sector and to monitor policy implementation
- The identification and separation of production, protection and public purpose forests in terms of management, support and infrastructure
- Increased contribution to rural development through the provision of sustainable rural based employment of 20,000 and diversification of income for farm forest owners
- Achievement of forest cover of 1.0 million ha
- The development of a comprehensive EU Forest Strategy
- Full recognition and financial support by state of role of state forests in the provision of public goods and a public goods incentive scheme for private forests
- Increased institutional capacity to deliver on extension services, national development and support mechanisms

6. INITIATIVES FOR A BETTER FUTURE IN 2025

- Management planning in all forests supported by Forest Service inventory and area related databases
- Comprehensive designation of forest land-use at a national, regional and catchment level taking into account environmental, productive and scale issues, including a critical review of peat-land forestry
- Recognition, quantification and reward by state and EU for public goods provided by forests
- Critical examination of current role of state in commercial forestry
- Continued state and EU investment in afforestation
- Integration of REPS and Forest Service Environmental Guidelines on farms with a forest enterprise
- Commitment from Government to longer term multi-annual budgeting for sector
- Support for improved silvicultural systems linked to forest management and wood quality
- Development of mechanisms, tools and/or methodologies that can be used to maximise the contribution of forestry to rural development
- System of support for sawmilling sector to upgrade and keep abreast of changing technology
- Public-private partnerships to encourage investment by private sector companies and pension funds in afforestation and wood processing
- Integrated promotion and support for wood energy by government agencies and departments, fully capturing the environmental externalities in levels of grant aid and pricing mechanisms
- Management practices to be led by state-of-the-art R&D findings, and increased investment by state and business in research and development
- Promotion by state and industry of benefits of forestry to the public, policy makers and legislators
- Development of long term contracts between processors and forest owners, to include forest access, thinning, clear-felling and reforestation operations
- Creation of a forest owners association and/or forest owners co-operative to facilitate forest management planning and timber production at the macro level
- Continue capacity building through training and education of farm foresters and forestry professionals (e.g. Continuous Professional Development)
- Put in place a structured comprehensive approach to education and training at forest operative and contractor level.

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6. The Rural Environment

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INTRODUCTION

The objective of this chapter is to provide a summary of the stakeholders opinion on the challenges for the rural environment by 2025 and the step(s) required to achieve a vision or preferred option for it compared with an outcome based on a business as usual scenario. The goals for the major elements of rural environment (e.g. water, air, soil, etc) are discussed as these set the parameters for the preferred option. The impact of the drivers of change on the stakeholders, particularly agriculture, and the consequential implications for the rural environment are presented. Finally, some initiatives that are considered necessary to ensure the preferred option can be achieved are proposed.

1. DRIVERS OF CHANGE

There are existing and emerging international and national drivers of change determining the future of the rural environment. These provide the context for the business-as-usual and preferred option scenarios.

1.1 International drivers of change

The following are the important international drivers that will determine the economic, social and environmental sustainability of the rural environment in the years ahead:

- Further reform of EU Common Agricultural Policy (CAP) and EU enlargement.
- Outcome of negotiations under the World Trade Organisation which are expected to result in more liberal world trade and much greater globalisation of markets.
- Compliance with existing and new EU Directives in relation to the quality of water, air, soil and biodiversity.

- Decreasing fossil fuel reserves and increased energy demands.
- Climate change is acknowledged as a very significant international challenge for the rural environment in the twenty first century. Actions required to achieve compliance with the Kyoto protocol will impact by 2025. However, the impacts of actual changes in climate on agriculture are not fully expected before 2025.

1.2 National drivers of change

The national drivers reflect the international drivers of change as a consequence of our participation in the EU. However, some national initiatives/agendas that will impact on the future shape of the rural environment include:

- Implementation of the National Spatial Strategy with its strong focus on the development of Urban Gateways and Hubs.
- Increasing conflict in relation to land use in the rural environment, leading to declining consensus on the location of housing, utilities and infrastructure as well as public access to rural landscapes, archaeological and other heritage resources.
- Projected demographic changes, especially the overall ageing of the population.

2. THE CHALLENGES FOR THE RURAL ENVIRONMENT

The preferred option for the rural environment in 2025 is one that is healthy and safe for humans, protects and preserves the natural and built environment and maintains the productivity of the ecosystem in its broadest sense. Seven major elements within the rural environment will contribute

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to creating this vision and are considered briefly in this section of the study:

- Water Quality
- Air Quality
- Biodiversity
- Soil Quality
- Waste Management
- Cultural Environment

These are briefly reviewed in terms of the objectives for these elements and the factors that may determine whether or not they are achieved.

A major focus is the growing recognition of these elements in terms of public goods. In this regard, access to rural landscapes, archaeological and other heritage resources are issues of importance and conflict. There will be a need to quantify the relative value of these public goods and develop their potential to contribute to the local economies in terms of creating a sustainable rural environment for all stakeholders.

2.1 Water quality

The objective is for water resources that are ecologically sustainable, safe for drinking, contribute to the water-conserving function within the landscape and provide recreational functions.

- Agriculture in the rural environment will continue to exert considerable pressure on water resources. This will be associated with the diffuse loss of nitrogen and phosphorus, and increasingly with pathogens. Other activities or land uses in the rural environment such as housing, utilities, infrastructure etc will also contribute to contamination of the water resources.
- There is consensus regarding the significant impact of agriculture on water quality. However, there is some debate regarding the contaminant sources within agriculture i.e. farmyards and fields.
- Over the coming decade, strategies will be implemented at farm level to reduce the volumes of dirty water produced as well as management systems, including irrigation systems, short term storage facilities and wetlands.
- Increasing legislative requirements, (e.g. under the Nitrate Directive and the Water Framework Directive) and the availability of farm support

systems will result in the elimination of slurry storage deficits that might contribute to water pollution risks from farmyards.

- Diffuse losses from agriculture to water will continue to decrease as a consequence of a continuing fall in fertilizer nitrogen and phosphorus inputs arising from the decline in the size of the national herd and improved nutrient management at farm level.
- Delineation of areas considered to create or be at risk of creating high levels of water pollution will help reduce the potential for water pollution. However, these will also have implications in terms of the suitability of high risk areas for the development of intensive agricultural production systems. This will be a contentious area between those farming the land and those involved in managing the water resources.
- In the coming decade resolution will be required for potential conflict between the proposed model of low cost grass based systems for intensive agriculture and improvements in water quality.
- The contribution of urban wastewater treatment plants to water pollution will decline as a consequence of the significant investment programme under the National Development Plan. There will be an associated increase in sewage sludge requiring management options including land application. However, contamination of water resources by septic tanks is likely to increase especially with the continued growth of “one-off” houses in the rural environment.
- The increased pressure of the growing population will bring water supply into sharp focus. In a country not known for its water shortages, recent summer droughts have put some public water supplies under pressure and highlight the potential fragility of the situation.

2.2 Air quality

The objective is to provide clean air so that there is no unacceptable risk to health of humans, animals, plants or cultural assets.

- Currently, there are no serious air pollution problems in Ireland. However, the continued growth in road traffic and overall energy

consumption pose the biggest threat to air quality in the immediate years ahead but this will have greater relevance in urban compared with rural areas.

- The stability of our climate is being threatened by the build up of greenhouse gases (GHG) in the atmosphere. The impact of this climate change on the rural environment is now unavoidable. Therefore, the need to develop new models that will accommodate the requirements of a sustainable rural environment should receive consideration in the short rather than the longer term.
- Ireland is committed to initially limiting its national contribution to GHG emissions to 13% above 1990 levels in the period 2008 – 2012. Considering our 2002 emissions were 29% above 1990 levels it is inevitable that implementation measures must be applied in the short term to achieve compliance. Measures will be imposed on agriculture to reduce its GHG contribution as it represents 30% of total national emissions.
- From an agricultural perspective, measures to reduce GHG emissions include reductions in both stock numbers and the use of inorganic nitrogen fertilizer. The recent de-coupling of payments under CAP reform may contribute to a reduction in the size of the national herd and the associated reduction in nitrogen fertiliser use may help agriculture achieve its GHG targets. However, this represents just the start of a longer term process of limiting GHG emissions; new and more stringent measures will eventually be applied to agriculture, and these will have implications (particularly on the more intensive farms).
- The sequestration of carbon dioxide by the much expanded forestry programme of the past decades should be beneficial. COFORD estimates suggest that the potential direct contribution by forestry towards a reduction in carbon dioxide levels in air may be of the order of 8.4% in the period 2008-2012. With other forestry activities contributing a further 3.6% this would amount to a 12% reduction in total.
- Emission limits for substances (sulphur dioxide, nitrogen oxides and ammonia) that contribute to acidification, eutrophication, and ground level ozone have been set under the EU National Emissions Ceiling Directive. Reducing

ammonia emissions associated with agriculture will have the greatest impact in the rural environment. The decline in animal numbers in response to changes in agricultural policy will contribute towards the achievement of the ammonia emission targets. However, some concerns have been expressed about the feasibility of this objective. A change over from the conventional splash-plate to low slurry spreading techniques such as the trailing shoe or band spreader may ensure our emission targets are met. While there are logistical and cost problems with the changeover, there should be the additional benefits to the rural environment of reduced odour emissions from the land spreading operation and an improved potential for crop recovery of the nitrogen in the manure.

2.3 Biodiversity

The objective is to protect and enhance various aspects of biodiversity within the rural environment. This includes the agricultural landscape and the land farmed for food production as well as its biological diversity. The rural environment encompasses other features of the landscape including wetlands, peat lands, forestry and mountain landscapes that have biological, water conservation and recreational values.

- Although Ireland's biological heritage has suffered, much of it is still relatively intact. Much of the Irish flora and fauna is dependent on traditional farming practices, and less intensive farming in some regions of the country is helping to maintain Ireland's biodiversity. However, the number and scale of threats are increasing.
- The EU has already agreed 'to protect and restore habitats and natural systems and halt the loss of biodiversity by 2010' (Gothenburg Council, 2001). The achievement of this aim is likely to last for a much longer time, but clearly indicates a high-level commitment to conserving and protecting biodiversity. The Biodiversity Action Plan for Agriculture is evidence of EU determination to integrate biodiversity considerations into the CAP.
- The European Environment Agency has published a first set of EU headline biodiversity indicators which has gained widespread stakeholder support. These will underpin

reporting by the Commission to Council and Parliament on progress of the EC Biodiversity Strategy and its Action Plans.

- To date, the Birds and Habitats Directive have dominated the conservation of biodiversity, and have focused on the designation of sites of high conservation value. There is increasing recognition that a network of geographically-separated, designated sites is inadequate to protect and conserve biodiversity, and that there needs to be more effort at conserving wildlife habitats more generally. This is translating into an increased emphasis in CAP on the conservation and enhancement of farmland wildlife habitats. These include: streams and rivers, riparian zones, field margins, hedgerows, woodland areas, mature trees, small areas of species-rich grassland, ponds and lakes, and so on. Although of a more modest conservation value that makes them ineligible for designation, the accumulative area and wildlife diversity (plants, mammals, invertebrates, birds, mosses, lichens etc.) of these farmland wildlife habitats make them a highly important biodiversity resource.
- Toward the latter aim, CAP reform will place an increasing importance on the conservation of farmland habitats. There will be increased funding available to pay farmers for their creation, maintenance and enhancement. There will also be increased funding available for the training and provision of relevant advice by farmer advisory services. Coupled with these increased payments and opportunities, however, will be a demand for increased rigour in ensuring that wildlife measures are appropriately designed and implemented, and monitored to ensure their effectiveness.
- The expected spatial differentiation in agriculture with the concentration of commercial farming in east Munster and south Leinster and the progressive reduction of full time farming in the regions with sub-viable farms will impact on the biodiversity of both rural areas. In the commercial farming areas the growing competition for land combines with increasingly intensive agricultural production systems, will lead to greater levels of habitat loss and decline in natural population. In these areas the conflicting goals of ensuring the continued international competitiveness of

commercial farming and conservation of the natural and built environment will present important challenges in reaching a consensus on the correct balance. In the longer term (after 2050) climate change may result in some intensive grassland farming moving towards the west and north to avoid summer drought.

- In the regions with predominately sub-viable farms there will be a need for developments of alternate methods of land management to maintain and conserve biological populations. Ideally such land management systems should facilitate the development of improved environmental goods and novel economic paradigms that would contribute to the economic and environmental sustainability such regions.

2.4 Soil quality

The objective is to protect soil quality which provides the foundation for life in the terrestrial rural environment. Soil quality refers to the status of a soil which will support its multiple properties and functions, within natural or managed ecosystem boundaries, in a sustainable manner.

- The need to protect soil quality will receive increasing attention in the coming years following the 2002 publication of the European Commission's communication "Towards a Thematic Strategy for Soil Protection". There are links between soil and the other environmental media, for example, the links between soil fertility levels and water quality and soils may either act as sources or sinks for GHGs.
- While Irish soils are generally considered to be of good quality, there is growing pressure on them from land use changes, agricultural activities, erosion, disposal of organic and other wastes, industrial development and urbanisation.
- The first major implication of soil protection in policy occurred in 2003 with the mid-term reform of the Common Agricultural Policy. There is now a requirement to maintain all farmland in good agricultural and environmental condition. Criteria such as erosion, organic matter and soil structure are included in these regulated cross-compliance measures.

- An EU Soil Protection Framework is expected by 2008 and will outline what is known about soil quality in Europe, the current threats to soil, the importance of soil and the way forward in relation to guaranteeing their sustainable use. It is expected that this document will provide a framework for future EU soil protection.

2.5 Waste management

Total waste generation in Ireland was estimated at 75 million tonnes in 2001. Agriculture contributed 75% to this total. It consists primarily of animal manures and contaminated water from animal yards and facilities.

- The objective is to ensure that both wastes are managed using land spreading in such a way that the nutrients they contain are used for crop production and negative impacts to the environmental media are avoided. Land spreading (recycling) represents a recovery rather than waste disposal option. The quantities produced are likely to decline in the coming decade as a consequence of the expected reduction in the size of the national animal herd due to the evolution of CAP. However, securing sustainable manure management strategies based on land spreading, for intensive pig and poultry farms remains an immediate priority.

Manufacturing, building and municipal wastes currently account for 7%, 5% and 4% of national waste production, respectively. As their generation is linked with economic growth, the levels of production will tend to increase.

- The landfill option accounts for the bulk of the 8.2 million tonnes per annum of these wastes. However, the remaining national capacity of this option is less than eight years. This clearly indicates not only the need to significantly increase the recycling of wastes but also the need to develop new landfill facilities. Generally these will tend to be larger with the need for buffer zones around them.
- Waste thermal treatment plants are proposed in some of the regional waste management plans. The location of these new waste management facilities is already, and will continue, to create a significant tension in the rural environment. The manufacturing sector is the largest generator of hazardous wastes especially the pharmaceutical and chemical enterprises. The

implications of the management of these wastes for the rural environment are considered to be small.

2.6 Cultural environment

The objective is for rural areas to provide a good, healthy living environment and contribute to regional and global environments. Cultural assets, in addition to natural assets, must be protected and developed. Buildings and amenities in the rural environment should be located and designed in a way that promotes the sustainable management of its resources.

- Demands on rural space will increase. In particular inter-facial areas between urban and rural areas will experience pressures from competing spatial demands. Also high amenity areas, especially coastal regions, will experience development and population growth. Developments in the marine industry will in particular affect the economic viability of coastal regions and these could conflict in some instances with other land-based activities.
- With the amalgamation of smaller farms, the longstanding familial association with traditional buildings and archaeological sites will be significantly eroded. Thus the immediate years ahead constitute a high risk period for Ireland's built and archaeological heritage. Some evidence suggests that the rate of destruction of archaeological sites may be increasing in the more commercial farming counties due mainly to land improvements (removal of banks and ditches, etc.) associated with more intensive grassland farming.

3. THE 2025 VISION OF THE RURAL ENVIRONMENT

There are difficulties in predicting accurately a vision of the rural environment in 2025. However, an integral part of the Foresight process is to attempt such a vision. There are two parts to this process. The first concerns the 2025 baseline or a vision of the rural environment in a business-as-usual scenario. The second element concerns the preferred vision, if it is different from the baseline. The economic and social context of the vision has been described (c.f. B. Riordan – Section in this report).

3.1 The baseline perspective

- Agriculture will continue to be a major stakeholder in the rural environment in 2025.
- It is now generally accepted that there will be at most between 15,000 and 20,000 full-time commercial farmers by 2015. The majority of these will be intensive dairy farmers in the most productive south and east of the country.
- The intensive dairy farm may continue to be based on the well-established Moorepark model of a “cow per acre” producing 5,000 to 6,000 kg of milk from a grass-based diet. However, some concerns in relation to the seasonality of Irish milk production and herd fertility may result in alternative production systems.
- The baseline vision for 2025 agriculture in the rural environment is the continued geographic concentration of the intensive full time dairy farmers with numbers falling to about 10,000. There will be an associated increase in the scale of farm units, and perhaps eventually the appearance of an even more industrialised scale of “company farming” involving corporate ownership of multiple highly specialised production units. Such a radical rationalisation could occur, partly in response to the need for increased scale, and partly in response to the complexities of adherence to legislative controls and the difficulties of maintaining the necessary levels of labour on the traditional family farm.
- A small number (about 1000) of intensive beef producers using some type of “feed lot” operation is also likely to emerge, again perhaps with the eventual emergence of company-based ownership.
- The number of full-time tillage farmers will decline resulting in a much smaller number (about 500 to 1000) of large-scale (>400 ha) tillage farmers, mainly utilising contracted machinery and labour.
- The role of biotechnology in the development of intensive agriculture will continue to expand with the potential for negative market and environmental implications.
- Increasing energy costs will have implications for agriculture and will provide challenges and opportunities for the rural environment.
- The future of intensive pig and poultry production appears to be very uncertain with increased competition from producers in cheap labour regions both within new EU member states and beyond. Stringent environmental regulations, and the need for cost effective manure management strategies will be challenges going forward.
- By 2015, there will be 35,000 part time farmers, deriving 50% or more of their income from farming. In general, these will be located in less agriculturally productive regions of country that include parts of the western seaboard. These will operate at a range of scales from relatively intensive beef production systems to those essentially providing and being paid for desirable levels of environmental goods.
- Increasingly, the main income to sustain the latter will come from the provision of direct payments to maintain systems of sustainable land management that provide multifunctional benefits and services in support of landscape conservation and the preservation of natural and cultural heritage. The provision of these higher added-value public goods will be supported through REPS-type schemes, justified on the basis of being necessary for a wide range of environmental, social, and cultural reasons. In at least some regions, they will have a beneficial influence on other areas of economic activity such as recreation, sport and tourism. In this scenario there is potential for abandonment of land for farming in some areas of the country.
- The 2025 baseline perspective for marginal production areas where part-time farming will predominate is less clear. However, there will be a drystock component ranging from semi-intensive systems to very extensive, sub-viable production in areas of marginal production capacity.
- In tandem with these agriculturally-related developments within the rural environment other stakeholders will continue to extend their influence on it. For example, the area under forestry will continue to expand with potential for both positive and negative impacts on water and air quality, biodiversity and landscape.
- The rural environment will come under increasing pressure as agricultural employment declines and urban generated employment and activities increase in their importance. These impacts will tend to be greatest in the regions associated with the greater Dublin area which

will continue to account for up to 40% of the national population. This will create additional land use and environmental conflicts because these are the areas in which intensive agriculture is expected to develop.

- The high amenity rural areas will experience increased pressures in terms of housing and tourist developments. Resolving conflicts between public access to land in private ownership and the payment for public goods will require solutions.

3.2 The preferred 2025 option

The 2025 vision for the rural environment is a place that is healthy and safe for humans, protects and preserves the natural and built environment and maintains the productivity of the ecosystem in its broadest sense. This can only be achieved through the management by all the stakeholders of the environmental resources that represent the rural environment.

- The preferred vision of Irish agriculture in 2025 is one where the wider industry fully achieves a multi-functional role as both the supplier of safe and high quality food and the means of fulfilling a complimentary range of environmental and public goods objectives in order to sustain rural viability in both an economic and environmental sense. Indeed, this truly multifunctional view of agriculture sees the maintenance of a rural environment of the highest possible quality, as an essential requirement for the successful production and marketing of safe, premium quality food, which many European consumers are increasingly likely to demand.

4. INITIATIVES FOR A BETTER FUTURE IN 2025

There is a need for the creation of a national rural environmental forum (REF) to provide leadership, strategy and integration in the drive for environmental knowledge. This is one of three overarching strategic initiatives that should be undertaken collaboratively by the public and private organisations responsible for and engaged in generating economic activity in rural areas. The implementation of the required policies to achieve the 2025 vision of a sustainable rural environment requires environmental knowledge. This knowledge

could be generated through a REF and transferred so that society can achieve a just and equitable resolution to the conflicts that will arise where the environmental capacity of the rural environment can be best matched to the demands of its multi-user stakeholders.

Some of the key challenges identified that must be addressed by such a national rural REF to achieve the preferred rural environment option include:

- There is a need to recognise and identify the public good value of the environment, which agriculture, marine and forestry provide. This will be essential to achieving the optimum balance between the economic dictates of the EU policy of international competitiveness and environmental sustainability.
- There is a requirement for the continued development and identification of indicators and targets for these, particularly in relation to the maintenance of the rural environment and their associated natural, aesthetic and cultural features.
- The need to resolve the growing conflict between the price competitiveness of the agriculture and food industries and society's concerns in relation to food safety and quality, the environment, animal diseases and welfare and, to an increasing extent, developments in biotechnology.
- Production intensity will continue to increase in the most agriculturally productive areas of the country unless steps are taken to develop alternative models for “competitive” agriculture within a wider European context. These models will not only be in terms of the lowest possible unit costs and commodity prices, but will also capitalise on the already strong environmental value-added image of Irish food production in many of Europe’s most important markets. These same areas are also likely to be the most desired for alternative economic development. Such combined pressures will result in increased environmental pressures.
- In marked contrast, agricultural activities in marginal production areas are likely to be abandoned, resulting in depopulation and the loss of traditional landscapes unless appropriate incentives are provided to reverse this trend. In spite of a continued decline in its national economic importance, farming activities (or

their absence as dictated by agricultural policy) will continue to have a profound influence on the face of the Irish countryside and the quality of the rural environment.

- Waste management infrastructure will continue to develop and is and will continue to be inextricably linked with the quality of the rural environment. The generation of the knowledge necessary to inform the policy makers and public in relation to these developments will be an important pillar in a sustainable rural environment.
- There will be a requirement to develop strategies to address the conflict between the need to protect the water resource from farming activities and the needs of agriculture. These will include strategies to mitigate the pollution potential of the production system (e.g. development of precision farming techniques and treatments for manures to reduce pathogen concentrations) or to recompense the farmer whose production activities must be restricted to protect the water (i.e. for the provision of a quantifiable environmental service).
- The likely impact of climate change on future agriculture is a topic that requires much more research-based consideration. While the details of exactly how and when climate change will start to impact remain unclear, it is now widely accepted that it will happen. Changes in rainfall patterns in southern and eastern areas where the most intensive production systems are concentrated could increase the demand for water for crop irrigation and the potential for nitrate leaching due to summer droughts and lower winter rainfall. Potential problems with flooding in low-lying coastal areas as a consequence of global warming and changing patterns of agricultural use need to be assessed. It may be prudent to initiate the research necessary to provide the strategies and technologies required to sustain the rural environment sooner rather than later.
- Increasing energy costs will have a very significant impact on the 2025 vision of agriculture. This relates most obviously to impacts on the costs of the main drivers of production such as fuel, fertilisers, pesticides and mechanisation. While it may appear to offer an opportunity to agriculture in terms of the use of land for energy crops, wind turbines, wave

energy and other forms of energy generation, the impacts of the high cost of energy on production must not be underestimated. Indeed the potential impact of energy costs on the achievement of environmental goods/services will also have to be considered. For example, where will the balance lie in terms of peat land conservation and its use as an energy source?

- The encroachment of new housing developments into the countryside and particularly “once-off” housing development will have important implications for the price of agricultural land in the most desired and some potentially most productive areas, and will cause significant negative environmental impacts and create high levels of conflict and public concern on both sides of the debate. In the same vein, public recreational and tourist access to land that is owned and managed by farmers will give rise to conflict.
- Consideration will have to be given to the impact of carbon emission targets and agriculture in 2025. There are potentially positive and negative aspects to this. The positive aspect is the role of agriculture in acting as a sink for carbon. It appears that the expected fall in animal numbers will go a long way to achieving our national air emission targets by 2012. However, it should be remembered that achievement of these targets represents only a first step, rather than an end point. It is therefore likely that the proposed more stringent reduction targets for 2020 and beyond will significantly impact on agricultural practices.

Manure management problems remain in regions of the country with high concentration of pig, poultry and mushroom production units, notably Cavan and Monaghan. Achieving economically viable management options (transport to other regions, processing etc), will determine the viability of these enterprises.