EDUCATION AND R&D IN
AGRICULTURE AND FOOD SCIENCE

ECONOMIC APPRAISAL

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APPENDICES

ECONOMIC APPRAISAL

A TOOLBOX RATHER THAN ALL THE ANSWERS

This economic appraisal is slightly different from the norm in that its purpose is primarily to inform the current debate on the provision of education and R&D in agriculture and food science, rather than deciding on the actual details, and therefore costs, of the particular way forward for the Department. This is partly because the Review Panel was considering how the resources as presently available could best be used i.e. a redeployment of the current resources rather than an alteration of the level. While the Review Panel has suggested certain alternative systems, the actual structures and details of these systems have still not been decided. Accordingly there has had to be an element of judgement within the economic appraisal when considering alternative options. These assumptions should not in themselves be taken to be actual tenets of the Review Panel's alternative options but primarily to allow the costing of options.

This economic appraisal has been carried out in accordance with both DFP guidance (The Northern Ireland Preface to the Green Book – November 1997) and HM Treasury guidance (Appraisal and Evaluation in Central Government - 1997). The following paragraphs have been adapted from the former document to briefly explain the use and purpose of an economic appraisal.

Economic appraisal is indispensable to good decision making and accountability. Used properly, it leads to better decisions by policy makers and managers. It encourages both groups to question and justify what they do and provides a framework for rational judgement about the use of limited resources. Good appraisal should take account not only of formal analysis but also of wider strategic or managerial considerations. The principles of appraisal should be applied, with proportionate effort, to every proposal - whether a project, programme or policy - which entails spending or saving public money, including European Union funds, or otherwise changing the ways in which public resources are used.

Appraisal is a systematic process for examining alternative uses of resources. It is designed to assist in defining problems and finding the solutions which offer the best value for money (VFM). It is a way of thinking expenditure proposals through, right

from the emergence of the need for a project to its implementation. It is the established vehicle for planning and approving projects and other expenditures. Good appraisal leads to better decisions and VFM. It facilitates good project management and project evaluation. Appraisal is not optional; it is an essential part of good financial management which is vital to decision-making and crucial to accountability.

It is important to begin applying appraisal early in the gestation of any proposal which has expenditure or resource implications. The justification for incurring any expenditure at all should be considered. Appraisal should be applied from the emergence of a need right through to the recommendation of the most cost-effective course of action. It should not be regarded merely as the means to refine the details of a predetermined option.

CONSIDERATION OF OPTIONS

Comparison of alternative courses of action is at the heart of appraisal. The range of options considered in appraisals should be as wide as possible. Where there are many options, they may be sifted to produce a manageable number for in-depth appraisal. However, where options are considered but eliminated before full appraisal, the grounds for elimination should be explicitly stated. If, for example, they fail to satisfy the principal objectives of the proposal, or violate constraints in terms of finance, manpower availability, policy commitments, site suitability and so on, the precise manner in which they are unsatisfactory should be explained.

The options selected for in-depth appraisal should normally include a **base case option.** This should generally be the "status quo" option, which should represent the genuine minimum input necessary to *maintain services at, or as close as possible to, their current level*. The base case should be appraised just like any other option, even where it is not considered to be a realistic option. Its function is to provide a benchmark so that the VFM of the alternative 'do something' options may be judged by reference to current service provision. An exception to the requirement to appraise a status quo base case is where the appraisal concerns the introduction of a wholly new service, that is, where there is no existing provision to appraise. The option of literally doing nothing (i.e. ceasing provision altogether) should be considered, but should not generally be used as the base case.

BASIS FOR MEASUREMENT OF COSTS AND BENEFITS

Costs and benefits should generally be valued on an economic cost (or "opportunity cost") basis, so that all the resources used or released by the options are considered. It generally means the use of current market values. Care should be taken to cost *all* the resources used in each option, not just those for which cash will change hands. For example, assets used by options should be costed at full market value even if they are already in public ownership.

Costs and benefits should be measured by reference to a common baseline, to enable fair comparison of options. There are two aims in view here: to clarify the differences between the options; and to ensure that all the resources used in the project are accounted for. The approach which addresses both of these aims best is to use a zero baseline. In other words, the **total** resource consequences of all options, including the 'status quo' base case option, should be included. DFP generally expects this approach to be adopted. However, the project boundary should be sensibly defined. For example, in this appraisal we have focused primarily on the costs associated with the delivery of education and R&D in Northern Ireland and not on the total DARD remit.

SECTION 1: TERMS OF REFERENCE

The Minister of Agriculture and Rural Development established an independent Review Panel in September 2001 to examine the arrangements for undergraduate and postgraduate education and research and development (R&D) in agriculture and food science. The specific terms of reference for this Review were:

- to carry out a comprehensive review of the existing arrangements in relation to undergraduate and postgraduate education and R&D in agriculture and food science and to make recommendations;

- to examine the long established link between DARD and the School of Agriculture and Food Science (SAFS) at the Queen's University of Belfast and to address the effectiveness of that link in terms of service delivery and cost;

- to examine similar provision in the DARD Colleges (Enniskillen, Greenmount & Loughry) and any other similar services provided directly within DARD, having regard to any similar provision in other education institutions in Northern Ireland;

- to consult extensively with stakeholders and others as appropriate.

- if the Review was to recommend change, then it should:
  - set out any options for change and identify the cost implications of any such options and appraise them fully in accordance with the latest current economic appraisal guidance.
  - address the implications for R&D and the delivery of science and technology advice;
  - address the impact on the Department's statutory testing programme and its management;
  - address the implications for the DARD Colleges;
  - address the implications for the Agricultural Research Institute of Northern Ireland (ARINI); and
  - address the implications for the link between DARD and the School of Agriculture and Food Science at QUB.

SECTION 2: STRATEGIC CONTEXT

2.1 DARD AIMS and OBJECTIVES

2.1.1 The Department of Agriculture and Rural Development (DARD) is currently responsible for the provision of education and R&D in agriculture and food science in Northern Ireland. The main functions of DARD are described below, followed by details of how the Science Service and the Agri-Food Development Service, both Top Management Units within DARD, contribute to the existing arrangements.

2.1.2 The Department's purpose is:

"To promote sustainable economic growth and the development of the countryside in Northern Ireland, by assisting the competitive development of the agri-food, fishing and forestry sectors, being both proactive and responsive to the needs of consumers for safe and wholesome food, the welfare of animals, and the conservation and enhancement of the environment".

2.1.3 In pursuit of this purpose the Department's aims are:

Aim 1: To improve the economic performance of the agri-food, fishing and forestry sectors;

Aim 2: To protect the public, animals and property;

Aim 3: To conserve and enhance the rural environment; and,

Aim 4: To strengthen the economy and social infrastructure of disadvantaged rural areas.

2.2 THE SCIENCE SERVICE AIMS and OBJECTIVES

2.2.1 The mission of the Science Service is:

"To support the aims of DARD and the sustainable development of the Northern Ireland Agri-food Industry through excellence in analytical and diagnostic services, education, research and technology transfer".

2.2.2 The aims of the Science Service are:

- To assist in the formulation and implementation of Departmental policies by providing specialist analytical and diagnostic services, undertaking surveillance regimes, conducting research and development, and providing expert advice;
- To provide teaching and support for the School of Agriculture and Food Science, of the Queen's University of Belfast (QUB).

2.2.3 In support of its aims, the main objectives of the Science Service are to:

- Support Government in the conduct of its role and responsibilities
- Underpin the local NI agri-food business sector by scientific programmes designed to improve competitiveness, ensure environmentally sensitive management, promote health and safety, promote animal health and welfare, contribute to the maintenance of high plant health standards, sustain rural communities and make best use of available resources
- Support the agri-food industry in its pursuit of quality
- Protect the consumer and the wider public
- Provide facilities and access for both industry and public sector bodies for contracted research and development
- Develop the science base in NI to contribute to the national and international effort, where appropriate
- Provide a basis for technology transfer from DARD's research and development programmes and from other national and international programmes
- Provide a source of competent graduates and postgraduates for the benefit of the agri-food and Government sectors
- Provide a base for continued professional development of DARD and the agri-food industry.

2.3 THE WORK OF THE SCIENCE SERVICE

2.3.1 The main areas of Science Service work – statutory / regulatory, diagnostic, R&D, teaching and specialist advice – are all very closely integrated and interdependent. The tertiary education function is controlled by statute and is a Government priority. The R&D work is essential to support and complement the other main functions and is an underpinning requirement of the education function.

Research & Development (R&D)

2.3.2 The aims of the Science Service research programme are:

- To underpin the Northern Ireland Agri-food business sector by improving competitiveness, ensuring environmentally sensitive management, promoting health and safety and sustaining rural communities;
- To support DARD in its responsibilities for protection of the consumer and the environment;
- To provide access to specialist expertise and facilities for both industry and public sector bodies for contracted research;
- To develop the science base of Northern Ireland and contributes to local, national and international research efforts, where appropriate.

2.3.3 The research programme addresses the following areas:

- Crop and grass production
- Livestock production
- Animal health and welfare
- Food quality and processing
- Food safety
- Fisheries and their environment
- Environmental management
- Economics and rural development
- Forestry

2.3.4 In addition to activities undertaken within the Department, some Science Service staff work in the Agricultural Research Institute for Northern Ireland (ARINI). ARINI is a Non-Departmental Public Body (NDPB), partially funded by DARD.

Science Service - Technology Transfer

2.3.5 The aims of the technology transfer programme are:

- To provide expert advice to support Government and the NI Agri-food Industry in achieving and developing its aspirations, and to QUB in the delivery of coherent programmes of undergraduate and postgraduate education.
- To provide a basis for technology transfer from DARD research and development programmes and other national and international programmes, and diagnostic and surveillance programmes

2.3.6 Technology transfer programmes are in place across the range of Science Service work. An important aspect is the publication of research findings in peer-refereed scientific literature to ensure the work is novel and of high national and international standing. Results are communicated to farmers, growers, environmentalists and consumers via an active programme of meetings, open days, demonstrations and production of articles and leaflets. In addition, articles are often published in the farming press.

University Education

2.3.7 The aims of the DARD Science Service education programme are:

- To provide teaching and support for the School of Agriculture and Food Science, QUB;
- To provide a source of competent graduates and postgraduates for the benefit mainly of the Agri-food, Rural and Government sectors;
- To provide a base for continued professional development of DARD and the Agri-food industry.

2.4 THE WORK OF THE AGRI-FOOD DEVELOPMENT SERVICE

2.4.1 The Agri-Food Development Service (AFDS) is a Top Management Unit within DARD. Its work can be subdivided into two main areas:

- People Development Programmes
- Policy and Support Programmes

Through these Programmes AFDS contributes to the Departmental Aims and Strategic Objectives by –

- Assisting the development of a competitive agri-food industry in line with market opportunities by developing the competences and values or people;
- Developing environmentally responsible farming;
- Implementing education and training policy, statutory schemes and obligations; and
- Providing technical support to DARD and other Government Departments.

People Development Programmes

2.4.2 **Aim:** To improve the competitiveness of businesses in the agri-food industry, strengthen the rural economy and achieve environmentally responsible farming through developing the competences and values of people.

The People Development Programmes include:

- **People Development through Higher and Further Education Courses**
  To develop the competences and values of people through their participation on Higher and Further Education courses relevant to the agri-food industry and rural communities.

- **Lifelong Learning through Short Courses**

To develop the competences and values of people working in the agri-food industry through their participation in short courses.

- ***Lifelong Learning to enhance Competitiveness***
  To develop the competences and values necessary to adopt the technology / systems / processes; exploit market opportunities and adopt best practice as identified within the AFDS Strategic Priorities for competence development.

- **Lifelong Learning to develop environmentally responsible farming and rural enterprise**
  To develop the competences and values necessary to implement the DARD Countryside Management Strategy, ensure adoption of best practice as identified in Codes of Good Agricultural Practice and enhance the contribution of farmers to the rural economy and community development.

Policy Implementation and Support Programmes

2.4.3 **Aim**: To implement education and training policy, statutory schemes and obligations and provide technical support to DARD and other Government Departments.

The additional programmes include:

- **Policy Implementation**
  To implement the Government policy through the delivery of: education and training, strategic development and administration – audits, inspection, enforcement, licensing and guidance relating to agriculture, horticulture, food and countryside management.

- **Policy Support**
  The provision of specialist technical advice in food, land based and related areas to inform policy development and implementation decisions.

- **Organisation Services and Development**

  To support and improve the efficient delivery of the people development and policy programmes through organisation and staff development and the provision of publication, exhibition information and financial services.

SECTION 3: CURRENT SITUATION

3.1 DARD ORGANISATION

3.1.1 This section details the present system for the provision of education and R&D in agriculture and food system. This is otherwise known as the base case / status quo option.

3.1.2 The Head of the Department is the Permanent Secretary. Reporting to him directly are 2 senior officials responsible, respectively, for Food, Farming and Environmental Policy, and for Central Services, Fisheries and Rural Development, together with the Chief Agricultural Officer (CAO), the Chief Scientific Officer (CSO) and the Chief Veterinary Officer (CVO). The areas of responsibility of these five officials are known as Top Management Units (TMU's). Each TMU comprises a number of Senior Management Units (SMU's). Together the five senior officials and the Permanent Secretary form the Departmental Management Board. The Chief Executives of the Rivers Agency and Forest Service, each of which is a single SMU, also report to the Permanent Secretary. SMU's are the core business units of the Department and under these are brigaded all the Department's activities.

3.2 SCIENCE SERVICE ORGANISATION

3.2.1 To deliver its programmes the Science Service is organised into 5 scientific SMU's supported by a Corporate Services SMU.

Corporate Services (includes the Faculty of Agriculture at QUB) - CSD
Food Science - FSD
Applied Plant Science - APSD
Agriculture and Environmental Science (includes ARINI) - AESD
Agricultural and Food Economics - AFED
Veterinary Science - VSD

Appendix A details the location of Divisions across the Science Service Sites.

3.3 RESEARCH & DEVELOPMENT

3.3.1 The Science Service is responsible for conducting R&D required for Departmental policy purposes. This is complemented by externally funded research conducted through the QUB School of Agriculture and Food Science. R&D work is funded from within the Science Service Public Expenditure Survey baselines.

3.3.2 DARD-funded research, conducted in house by the Science Service to underpin Departmental policy requirements, comprises a number of research programmes each of which is comprised of individual research ***projects***. In addition to the DARD policy driven research programme, DARD Science Service also conducts research via research ***contracts***. The CSO, on advice from SMU Heads, authorises the involvement of Science Service staff on external contracts. The management of external contracts is facilitated through the SAFS and external contract charges are paid by the customer to QUB.

3.3.3 Research ***contracts*** can be delivered by one of two methods:

- If additional staff are not required, the work is undertaken as a DARD contract, i.e. the contractual relationship is between DARD and the external funding body. The financial relationship follows the contractual relationship and DARD invoices the funding organisation for the work undertaken.
- If additional staff are required, then the work is undertaken via Queen's University, Belfast (QUB). In these circumstances the contractual relationship is between QUB and the funding organisation. The financial relationship is also therefore between the funding organisation and QUB and the QUB research office is used to recruit and pay additional QUB staff and for the purchase of consumables and capital. QUB takes responsibility for billing the funding organisation and for recovering the identified funding.

  The normal practice for apportioning income relating to indirect costs incurred in QUB contracts is on the following basis

- First 15% of total costs to QUB
- The next 15% (if any) of total costs to DARD
- All remaining overheads (if any) spilt 50:50 DARD:QUB.

QUB is responsible for providing an annual reconciliation of expenditure on each research contract together with details of any overheads recovered and for the return to DARD of any overheads due.

R&D in ARINI

3.3.4 The Agricultural Research Institute of Northern Ireland (ARINI) was established in 1927 with the aim of undertaking research into crop and animal production. ARINI is a Non-Departmental Public Body (NDPB) partially sponsored by DARD. Other income is derived from the sale of produce, research contracts with external customers and charged services.

3.3.5 The remit of ARINI is primarily "to strengthen the agricultural and food industries in NI so that they may make their maximum contribution to the rural and total NI economy, taking account of the needs of the community for conservation of the environment, welfare of animals and quality of food". The Institute also provides technology transfer and education facilities in support of DARD responsibilities for the development of people and businesses within the Agri-Food Industry. The work of the Institute covers a wide range of agricultural sectors such as Dairy, Beef, Pigs, Sheep, Crops and Farm Mechanisation.

3.3.6 ARINI research project leaders are staff of the Agriculture Group within the Agricultural and Environmental Science Division (AESD) of DARD. In addition the Institute provides resources for research carried out by other Research Divisions of DARD. The Institute continues to provide farm demonstration opportunities for undergraduates within the SAFS at QUB. Aspects of the research programme are integrated with postgraduate studies leading to post-primary degrees. It also provides specialist advice support for agricultural advisory work carried out by DARD.

3.4 UNIVERSITY EDUCATION

SCHOOL OF AGRICULTURE AND FOOD SCIENCE, QUB

3.4.1 By virtue of the Agriculture Act (NI) 1949 as revised, and the Queen's University Act (NI) 1928, DARD is responsible for the provision of teaching and support for a range of undergraduate and postgraduate studies in the QUB School of Agriculture and Food Science (SAFS). The SAFS is an integral part of QUB, within the Faculty of Science and Agriculture, but funded by the DARD.

3.4.2 The School Board consists of 88 members of DARD Science staff who hold full or honorary posts in the University (68 Lecturers, Senior Lecturers, Readers, Professors plus 20 Honorary Lecturers, Readers and Professors). In addition there are 8 external representatives, one from Greenmount College, one from Loughry College, the Vice-Chancellor (ex-officio), the CSO and Permanent Secretary of DARD and 2 other nominated appointments.

3.4.3 The 88 School members represent a large majority (approximately 85%) of the DARD Science Service project leaders and, on average, approximately 25% of their time is associated with SAFS functions. According to the time recording system, in 2000-01 there were 34.16 full time equivalent **(**FTE) staff involved in Faculty activities as detailed in Table 3.1.

Table 3.1: SAFS FTE Staff involved in Faculty Activities - based on 2000-01 Time Recording Data

Grade		Total	Total
Admin Staff			
AA	Admin Assistant	0.62	
AO	Admin Officer	0.80	1.42
Scientific Staff			
ASO	Assistant Scientific Officer	4.64	
SO	Scientific Officer	2.96	
HSO	Higher Scientific Officer	2.43	
SSO	Senior Scientific Officer	5.35	
PSO	Principal Scientific Officer	10.45	
SPSO	Senior Principal Scientific Officer	1.07	
DCSO	Deputy Chief Scientific Officer (Grade 5)	0.61	27.51
Economists			
SAE	Senior Agric. Economist	0.87	
PAE	Principal Agric. Economist	0.82	
DCAE	Deputy Chief Agric. Economist (Grade 6)	0.53	2.22
Veterinary Staff			
SVR01	Senior Veterinary Research Officer 1	0.19	
SVR02	Senior Veterinary Research Officer 2	0.18	
VRO	Veterinary Research Officer	0.29	0.66
Support Staff			
XIND	Industrial Staff	0.84	
LA	Laboratory Attendant	1.25	
SGB2	Support Grade Band 2	0.26	2.35
Grand Total			**34.16**

3.4.4 There are seven primary undergraduate degrees taught in the SAFS. These can be broadly categorised into four subject areas:

Agriculture	Agriculture, Agricultural Technology, Agricultural Science, Animal Science
Food Science	Food Science
Economics	Agricultural Economics and Management (AEM)
Inter-School	Microbiology

3.4.5 Five of the seven primary degrees are taught predominantly by staff in SAFS. The degree in Agricultural Technology is taught jointly with Greenmount Agricultural College. In addition to the SAFS staff there are 21 QUB Recognised Teachers at Greenmount, employed within DARD AFDS, who

contribute to this degree and who coordinate some of the modules. The degree in Microbiology is an Inter-School degree, meaning that students can register in either SAFS or in the School of Biology and Biochemistry. SAFS staff contribute approximately 30% of the teaching within this degree.

3.4.6 The other five primary degrees, taught primarily by SAFS, are also managed by SAFS with inputs from other QUB Schools, which provide a number of Stage 0 modules (e.g. Introductory Biology, Introductory Chemistry), Stage 1 modules (e.g. Biochemistry, Chemistry, Economics) and a few appropriate specialist modules (e.g. Animal Behaviour, Brain and Behaviour). Loughry College also contributes part of the Specialist Skills module in the Level 1 AEM degree and part of the Agricultural Marketing, Policy and Communication module in Level 3 of the Agriculture degree. All other modules (approximately 100) are co-ordinated and taught by SAFS staff. This utilises a wide spectrum of expertise from staff based at Newforge Lane, ARINI, the Northern Ireland Horticultural and Plant Breeding Station (NIHPBS), Veterinary Science Division (VSD) and the Plant Testing Station (PTS).

3.4.7 Postgraduate taught courses (i.e. MSc, Postgraduate Diploma, Certificate) are available through the School in Food Science, Food Safety Management and in Communications. The Communications course is given at Loughry College.

3.4.8 During the academic year 2000-01 the SAFS had a total of 336 students registered on its courses. Appendix B records SAFS student numbers over the last five years.

Table 3.2: SAFS Student Numbers 2000-2001

	Home/EC Students		Overseas	
	Ft	**Pt**	**Ft**	**Pt**
Undergraduate	145	13		
Postgraduate taught	3	27		
Postgraduate taught (Loughry)	21	52		
Postgraduate research	38	32	4	1
Total	**207**	**124**	**4**	**1**

3.4.9 Students registered with SAFS but taught at Loughry College do not incur significant expenditure within the School and are therefore excluded giving a revised figure of 263 students.

3.4.10 Having further taken into account the interschool transfer of students as discussed above, the final FTE number of students receiving education support from SAFS is calculated as 201 students with 118 undergraduates and 83 postgraduates.

Table 3.3: SAFS Full Time Equivalent Students 2000-2001

	Home	**Overseas**	**Total**
Undergraduate	118	-	118
Postgraduate taught	28	2	30
Postgraduate research	47	6	53
Total	**193**	**8**	**201**

3.5 FURTHER EDUCATION

THE DARD COLLEGES

3.5.1 The three DARD colleges – Enniskillen, Greenmount and Loughry – are an integral part of AFDS and all staff at the colleges are DARD employees. Almost all professional Grade Staff based at Colleges have direct input to delivery of education courses. This can vary from a few hours of direct student contact per year, mainly on HE courses, for some of the technologists and Department Heads, up to more than twenty hours per week for lecturers and senior lecturers. The estimated the number of full-time staff equivalents involved in HE and FE in 2000/01 is recorded in table 3.4.

Table 3.4: Estimated Numbers of Staff involved in Education Delivery at DARD Colleges 2000/01

	Total Professional Staff with input to Education Delivery	Total Full-time Professional Staff Equivalents on FE Delivery	Total Full-time Professional Staff Equivalents on HE Delivery (incl PG)
Enniskillen	13	5	5
Greenmount	64	27	9
Loughry	44	3.5	14
Overall[1]	121	35.5	28

[1] The DARD College Short Courses, Community Education Programmes, Challenges and other new initiatives are not included in the above.

3.5.2 The colleges provide an integrated education, training, technology transfer and business development facility for the agri-food industry and as such represent the focal point of much of the Industry development work done by DARD. The AFDS approach to education and training is to develop the 'competences required in employment'. Consequently courses at all levels incorporate a high level of skills training, which tends to be more expensive than classroom and laboratory based programmes. This approach reflects industry needs and is compatible with what the Government is trying to achieve nationally through vocational education and training.

3.5.3 The 3 colleges offer courses in subjects closely related to agriculture, horticulture, equine studies, countryside management and rural development, food technology and food supply management. Courses are offered at a range of levels including postgraduate and primary degree, HNC / HND, ND / NC / First Diploma, and NVQ levels 2-4. Students on these courses may also acquire supplementary qualifications required for employment inn the industry e.g. Pesticide Application certificates, Food Hygiene. A wide range of short courses are also offered on a part-time / day release basis, some of which also lead to recognised qualifications.

3.5.4 DARD funds all Further and Higher Education courses, both full-time and part-time, provided by the college. The Department also funds postgraduate study at the colleges. Short courses are provided free, under the Agricultural Training Scheme, to farmers, growers and workers, although fees are payable for statutory tests undertaken as part of these courses. Fees are payable for other short courses provided by the colleges e.g. amenity horticulture and food-related short courses.

3.5.5 In 2000/01 there were nearly 900 FTE[1] students at the 3 DARD Colleges, the majority of which were on full-time courses. Student numbers at the DARD Colleges for the last five years are given in Appendix C.

Table 3.4: Full-time Equivalents Students Enrolled at the DARD Colleges in 2000/01 by Course Type

	Enniskillen	Greenmount	Loughry	All 3 Colleges
Full-time	104.30	254.80	210.51	**569.61**
Part-time	12.49	76.40	36.52	**125.41**
Short	35.64	64.10	46.21	**145.95**
Community Education	14.55	40.80	2.45	**57.80**
Total	**166.98**	**436.10**	**295.69**	**898.77**

[1] The AFDS definition of a full time student equivalent for full time and part time courses is 150 days of formal programmed course delivery; for short courses the divisor is 120 days. Other systems typically require a lower level of input per student equivalent.

3.5.6 These DARD College FTSEs are not calculated on the same basis as DEL College FTEs, this being to the detriment of the DARD Colleges. The FTEs for full-time and part-time students at DARD colleges for 2000/01 using the FESR methodology provided for us by DEL:

Table 3.5: FTEs at DARD Colleges 2000/01 (FESR Methodology)

	Further Education	Higher Education (incl Post Grad.)	All Students
Enniskillen	90	90	180
Greenmount	508	127	635
Loughry	47	229	276
Overall[1]	645	446	1091

[1] The DARD College Short Courses and Community Education Programmes are not included in the above. Many of the Short Courses as well as the new Challenge Programmes and courses associated with initiatives such as the Good Farming Practice and Good Business Sense would be classified as part-time courses under the FESR system.

SECTION 4: NEED

4.1 The Northern Ireland Executive's Programme for Government recognises the importance of education and training at all levels. It has decided that it is important to focus on:

- ensuring high quality education and training for all;
- providing an education and training system which recognises and responds to the diversity of our society and the needs of its young people, promotes a culture of tolerance, unlocks creative potential and ensures equality of provision for all;
- equipping our young people with the skills and qualifications to gain employment in a modern economy;
- providing lifelong learning opportunities to enable people to update their knowledge, skills and qualifications;
- assisting and supporting the socially excluded to enable them to enter or return to the workforce; and
- preserving our cultural and information resources and making them available to the widest possible audience.

4.2 Agriculture and Horticulture play a vital role in the NI economy. In 1998 Agriculture, Hunting, Forestry and Fishing contributed 4.0% of GDP in NI compared to 1.3% in the UK overall. In June 2001 the agricultural sector provided employment provided 2.3% of total employee jobs – over twice the contribution for the UK as a whole of 1.0%. There were also an estimated 4,520 people involved in the in manufacture and supply of inputs to agriculture in 1999.

4.3 The achievement of sustained prosperity within the Northern Ireland agri-food industry will require the development of technical, management, information

technology, marketing, environmental and welfare competences. Improvements in common skills such as communication and problem solving will also be necessary to counter the low uptake of traditional provision, the large number of micro SMEs and the dispersed nature of the workforce.

4.4 Assistance is needed for enterprises within the agriculture and horticulture sector to identify, develop, demonstrate and embed commercially, new or improved technologies, which will enhance productivity and competitiveness. Assistance is also needed for the development, demonstration and embedding of sound environmental management practice.

4.5 The relevant 2001/02 DARD Public Service Agreement targets are

- By 31/3/02, increase the proportion of the agriculture workforce, 49,000, holding qualifications at NVQ level 3 or higher to 9% as compared to the 1997/98 base position of 6.6%
- 39 students to successfully attain undergraduate degrees and 37 students to successfully attain postgraduate degrees

Table 4.1: Employment Destination of Graduates (1998-2000)

Degree	Total Graduates	Remain in NI	Job in Agri-food	Higher Education
Agriculture	66	58 (88%)	27 (41%)	32 (48%)
Agricultural Economics & Management	54	48 (89%)	21 (39%)	23 (43%)
Food Science	34	23 (68%)	21 (62%)	7 (21%)
Total	**154**	**129 (84%)**	**69 (45%)**	**62 (40%)**

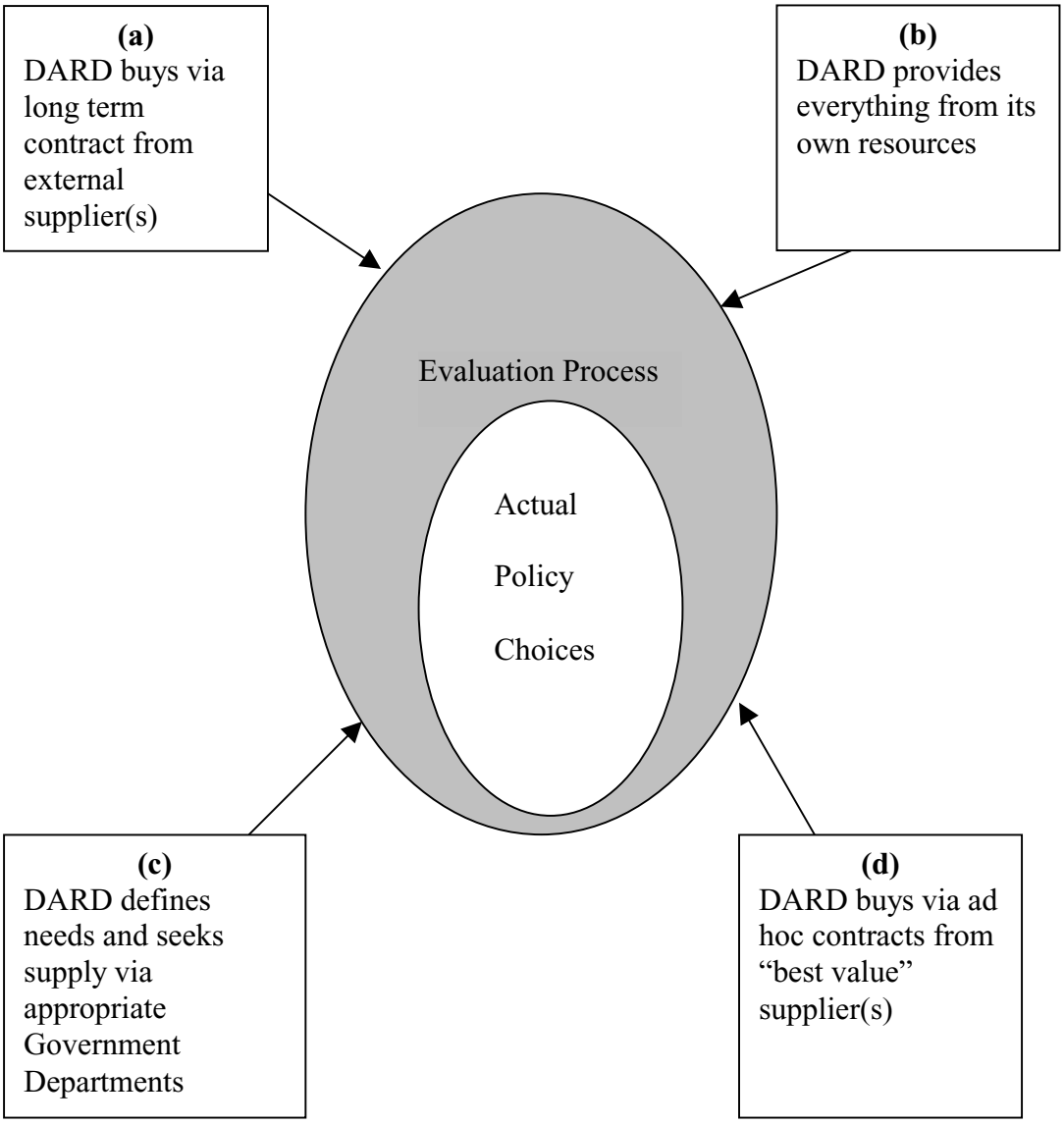
4.6 It is interesting to note that the vast majority (84% of total) of agricultural graduates remain within NI thus meeting the local labour market's need for agricultural graduates. This is evident from the 45% of total graduates who go on to work within the Agri-food sector, combined with a further 40% who go on to higher education.

SECTION 5: OPTIONS FOR THE FUTURE

5.1 THE APPROACH TO SELECTION OF OPTIONS

5.1.1 The Review Panel was asked to suggest options for the future, including an economic analysis of the alternatives. In order to explore what might be possible, the Review Panel firstly identified four distinctly different approaches to the delivery of the education and R&D services. The following diagram illustrates these.

Diagram 5.1



5.1.2 Governments, faced with deciding on the allocation of resources to education and R&D for agriculture and food, have to do so in the context of the many other claims on those resources, both within the Department directly concerned, and in the context of the wider calls on public resources. This process is referred to in Diagram 5.1 as 'Actual Policy Choices'. To make such choices a Minister requires authoritative, independent analyses of the need for these services and of the ways in which they might be provided. This is described in the Diagram as the 'Evaluation Process'.

5.1.3 These requirements exist whatever system of supply is chosen and we recognise the critical role of the central organisation in the decision taking process for R&D, education, development and technology transfer. We therefore gave very careful consideration to that process, and our recommendations are dealt with in detail in Section 9.

5.1.4 We then considered four approaches based on fundamentally different perceptions about the appropriate way to provide education and R&D services. These are represented in Diagram 5.1 by the boxes (a) – (d). In brief these in turn would involve DARD:-

(a) Buying what it requires on long term contracts from known providers. It would not employ staff or acquire its own facilities to provide education or carry out scientific R&D. Such contracts could be with universities or with R&D institutions in the public or private sector anywhere in the world or with private consultancy agencies.

(b) Providing all the services it needs directly, employing its own staff, creating its own institutions for teaching at all levels and providing and equipping fully the required scientific laboratories. Interface with the industry at all levels would be by DARD staff.

(c) Taking the view that the provision of education and R&D in agriculture and food, including advice to industry, should be treated on the same basis as any other sector of the economy. Services would be provided

by other appropriate government departments and the role of DARD would be to argue the case for the agri-food sector.

(d) Taking the view that it should, in all cases, buy its requirements on an ad hoc basis from the market, seeking the least cost provider and committing itself to no more than the particular contract.

5.1.5 It is clear to us that none of these distinct positions represents a pattern of provision that is likely to be appropriate in the situation of Northern Ireland. However, consideration of their tendencies helped to identify features which might well be important in addressing the more realistic options explored in the following paragraphs.

5.2 OPTIONS FOR THE FUTURE INTRODUCTION

5.2.1 At the outset it is worth stressing that the Review Panel considered carefully the continuation of the existing system, with incremental changes in some aspects of current activity as one of the options to be explored. We concluded that more fundamental changes were called for. However, in that process we wish to preserve and develop many of the strong points of a structure that has served Northern Ireland well over the past 70 years.

5.2.2 The features of the status quo which, in our opinion, need to be addressed are as follows:-

Customer Contractor principle
Focus on the Agri-Food industry
Transparency of the system
Competitive R&D contracts
Monitoring R&D quality
Exploitation of complementarities
Impact of Public Sector rules
Funding of R&D
Localisation of provision
Economies of scale
Integration of services
Technology Transfer
Relationship with Government
Services to Government

These issues, taken together with our understanding of the wider context within which this Review takes place, set the backcloth to our consideration of options for any new arrangements.

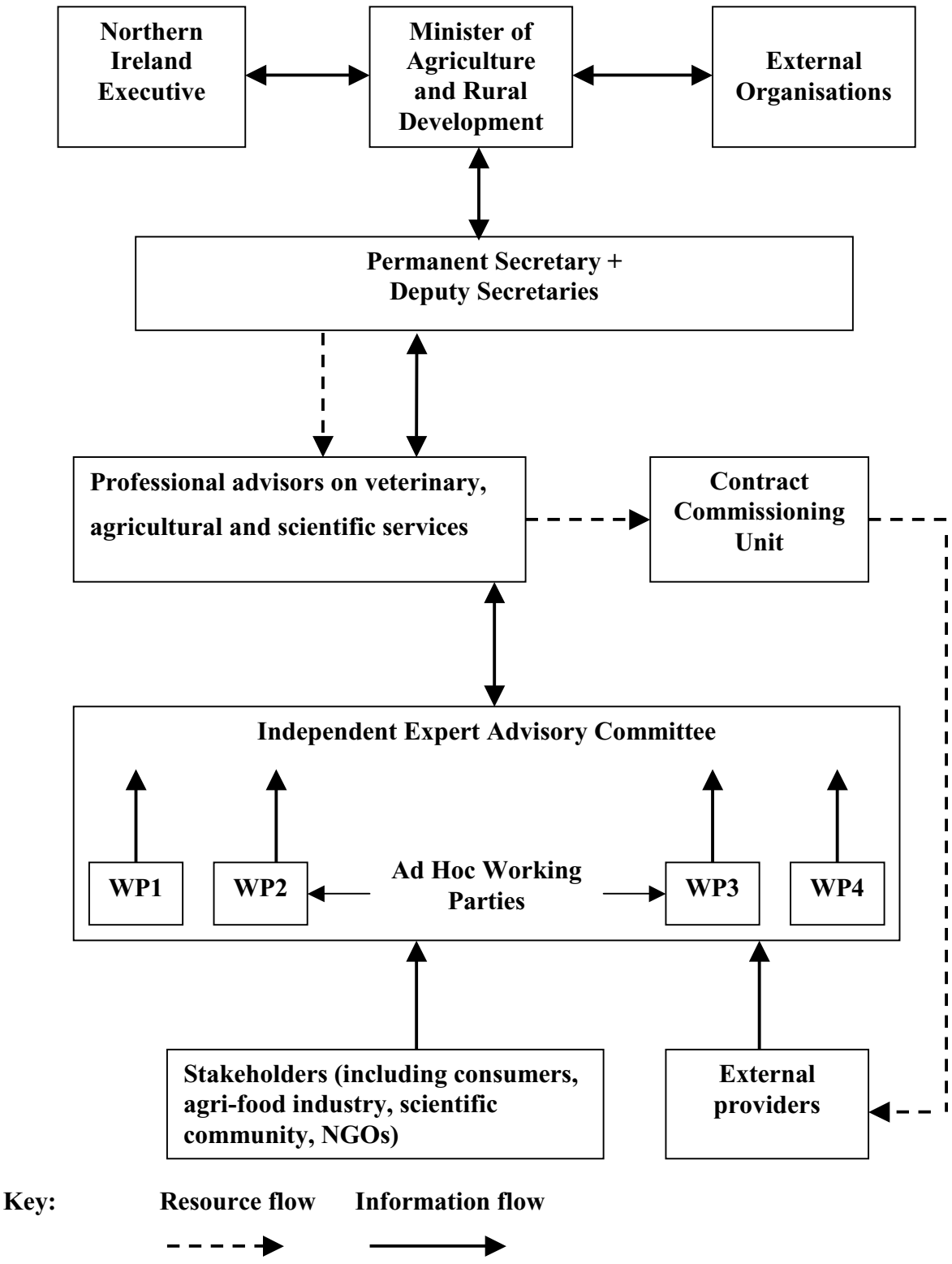
5.3 METHOD OF APPROACH IN THIS SECTION

5.3.1 In approaching this part of our task, we address the key issue of the central decision taking process which we regard as the foundation of any alternative system. We then set out and discuss four possible options which singly or in concert might deliver the optimum new system. In explaining the common central decision taking structure and each of the options by which services can be delivered, we have made use of a number of diagrams. (In each diagram the solid lines represent flows of information and advice, and the broken lines represent flows of funds and instructions.)

5.4 THE CENTRAL DECISION TAKING PROCESS

5.4.1 The objective of the system (outlined in Diagram 5.1) is to ensure that there is a clear separation of customer and contractor, that decisions are informed by both scientific and technical concerns, that they are in line with the overall policy of the government of Northern Ireland and that the decision taking process is transparent. The system, which would deal with R&D and technology transfer as well as education in agriculture and food science, allows for access at a number of levels by industrial and other interests. All proposals would be assessed by an Independent Expert Advisory Committee, which would consider proposals originating within DARD and from external agencies.

Diagram 5.1 - Central Decision Taking Structure for Education and R&D and Technology Transfer for Agriculture and Food Science



5.4.2 The main characteristics of this system are:-

(a) Policy decisions would, as at present, be taken by the Minister of Agriculture and Rural Development on advice from the Permanent Secretary and the Minister would continue to be open to representations from all stakeholders and from colleagues within the Executive and the Assembly.

(b) The Permanent Secretary would be advised by senior professional staff, namely the Chief Scientific, Chief Veterinary and Chief Agricultural Officers, here described as the Professional Advisors. It would be their task to assess proposals put forward in terms of their scientific content, their economic significance and their cost. They would be independent of the providers of the services over whom they would have no managerial control, a situation which would differ significantly from the existing arrangements. The role of these providers is described in the options considered below.

(c) Implementing DARD policy involves commissioning work and monitoring performance. Responsibility for the detailed scientific evaluation and monitoring of performance of the agreed work would lie with the Professional Advisors. The preparation and negotiation of contracts with suppliers would be undertaken by a contract commissioning unit which would report to the Professional Advisors and liaise with the Permanent Secretary.

(d) Provision would be made for the Professional Advisors to receive formal advice from an Independent Expert Advisory Committee. It is suggested that this should consist of an independent chairman and approximately ten members. Its members would be appointed using clearly defined criteria; they would be people of the highest quality from science and industry selected in accordance with their scientific skills and professional interests. The Professional Advisors would have observer status at these meetings.

(e) The Independent Expert Advisory Committee would receive representations regarding education and R&D in agriculture and food science from consumers, the agri-food industry and other stakeholders, including scientists, potential providers of R&D, local government and non-governmental organisations (NGOs). The Committee would establish ad hoc working parties to take an independent and expert view of particular proposals. Although it would not include any DARD officials or personnel from any service provider, it would be able to invite such staff and any other experts it chooses, to make presentations to the committee or to serve on its working parties.

(f) The minutes of the Independent Expert Advisory Committee meetings and the recommendations it makes should be published and submitted formally to the Professional Advisors. They would consider all proposals in the light of the advice given, the available resources and government policy before making their own formal recommendations to the Permanent Secretary. In order to maintain transparency, such recommendations should also be published.

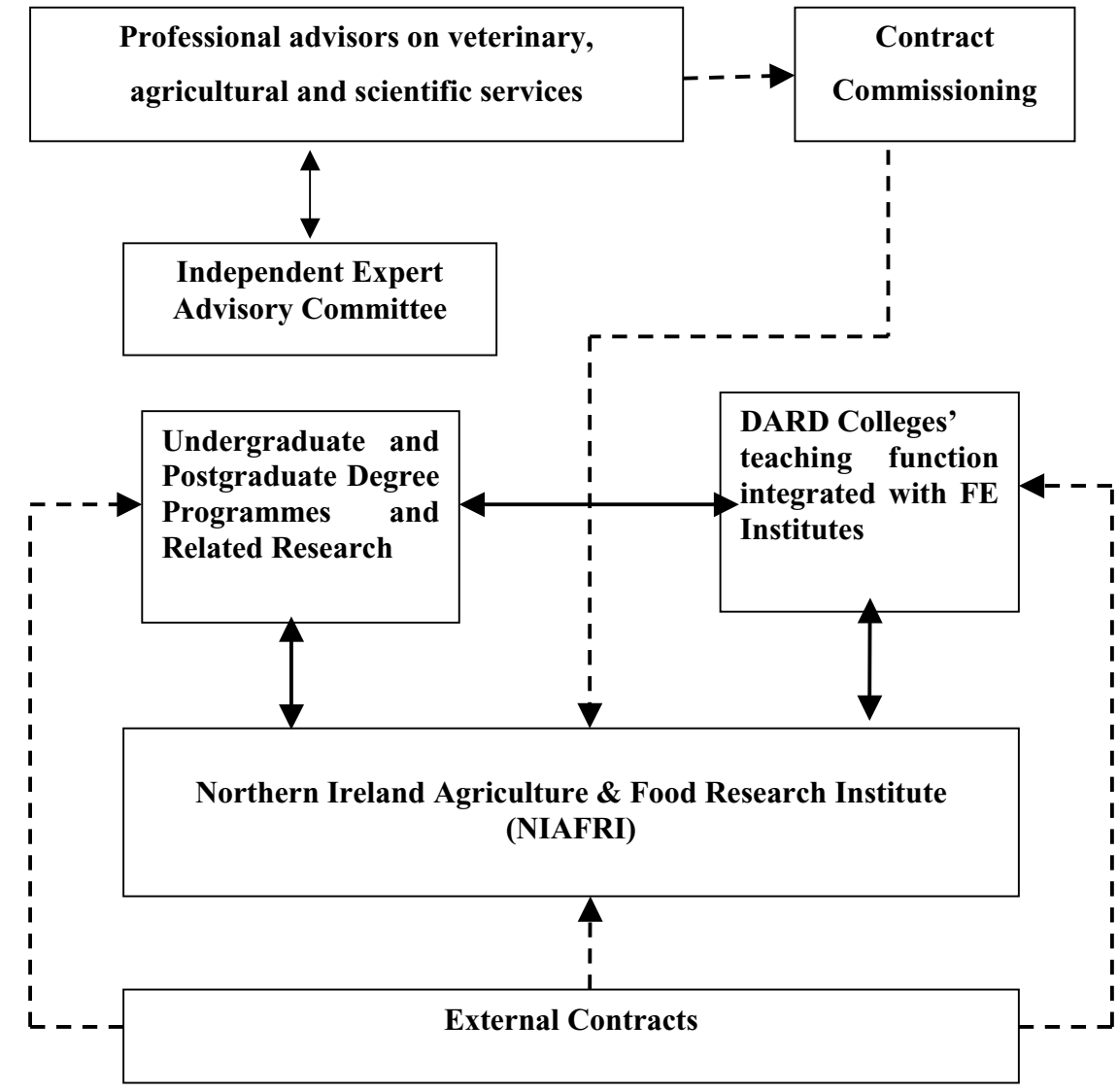
5.4.3 **Conclusion**

The Review Panel is firmly of the view that, whatever method is to be used to provide the education and R&D and technology transfer services, the central decision taking process must be seen to be transparent, to separate clearly the customer from the contractor and to be open to input from any interested party. We believe that the structure outlined above would deliver these desired outcomes.

5.5 OPTION 1: THE SEPARATION FROM DARD OF THE PROVISION OF EDUCATIONAL AND SCIENTIFIC SERVICES

Option 1 is outlined in Diagram 5.2.

Diagram 5.2



5.5.1 Under Option 1, undergraduate and postgraduate teaching previously provided from within the Science Service in agriculture and food science would be provided by a Northern Ireland university. The selection of the university and the terms on which this is realised would be subject to negotiation. The principal funding source would be DEL with DARD having a continuing policy input.

5.5.2 Teaching programmes currently undertaken in DARD Colleges would be continued but within the framework of the FE college system. The teaching function of the DARD Colleges would be integrated within appropriate Institutes of Further Education. While DEL would be the funding source, DARD would have a policy input.

5.5.3 R&D and technology transfer would be undertaken by a new Northern Ireland Agricultural and Food Research Institute which, for the purposes of this Review we have termed NIAFRI. This would be an NDPB. It would bring together all the existing divisions within the Science Service (excluding SAFS) and ARINI as well as a new facility concentrating on technology transfer, comprising the relevant personnel and resources currently in the Science Service and AFDS ie the DARD Colleges' technology transfer and development work.

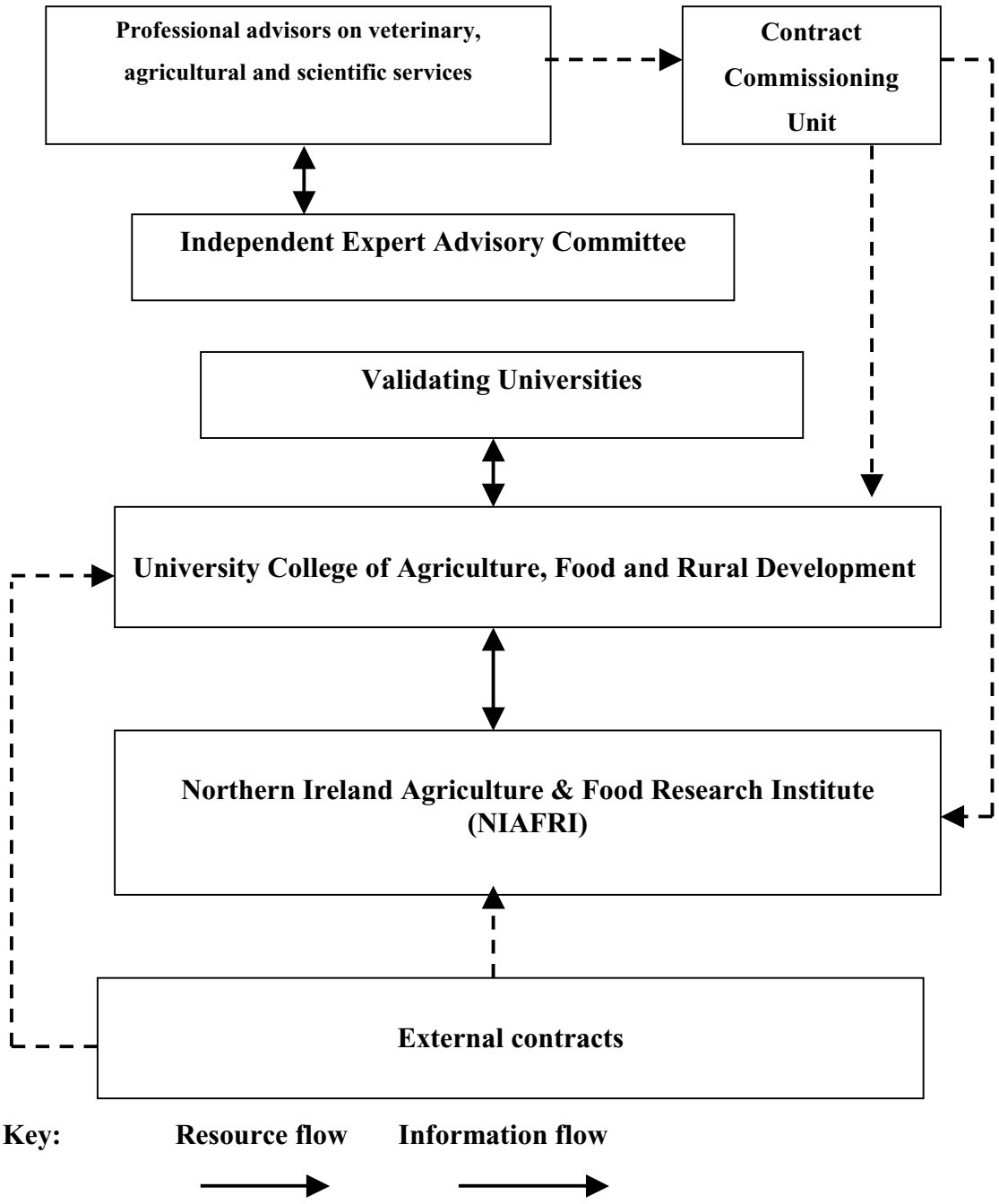
NIAFRI would be funded directly by DARD for the services it provides and it could also seek funds from other sources for its R&D. Programmes of R&D would be commissioned according to the central decision taking process outlined in Section 5.4. NIAFRI would put forward its programme annually and funding would be awarded on a rolling basis, providing reasonable security but allowing, over time, for changes in direction. In addition, as an NDPB, NIAFRI would be able to compete for and secure, and retain additional funding from external contracts in Northern Ireland, GB, EU and further afield.

5.5.4 The central decision taking process would ensure that the DARD R&D budget is available for open competition.

5.6 OPTION 2: A UNIVERSITY COLLEGE OF AGRICULTURE, FOOD AND RURAL DEVELOPMENT (A VARIATION ON EDUCATIONAL PROVISION WITHIN OPTION 1)

Option 2 in outlined in Diagram 5.3

Diagram 5.3



5.6.1 Option 2 would bring together all the current agricultural and food teaching activities funded by DARD, at both SAFS and the DARD Colleges, into a new University College. This would include a full range of courses from certificate through to degree. The R&D and technology transfer activities would be continued in the NIAFRI framework dealt with in Option 1.

5.6.2 The funding of the University College would be via conventional routes for further and higher education, namely DEL, with continuing policy input by DARD.

5.6.3 The University College would establish links with an established university for validation of its degree programmes. It seems likely that the validating university would be in Northern Ireland but this option does not exclude the development of links in other directions, should these prove more relevant.

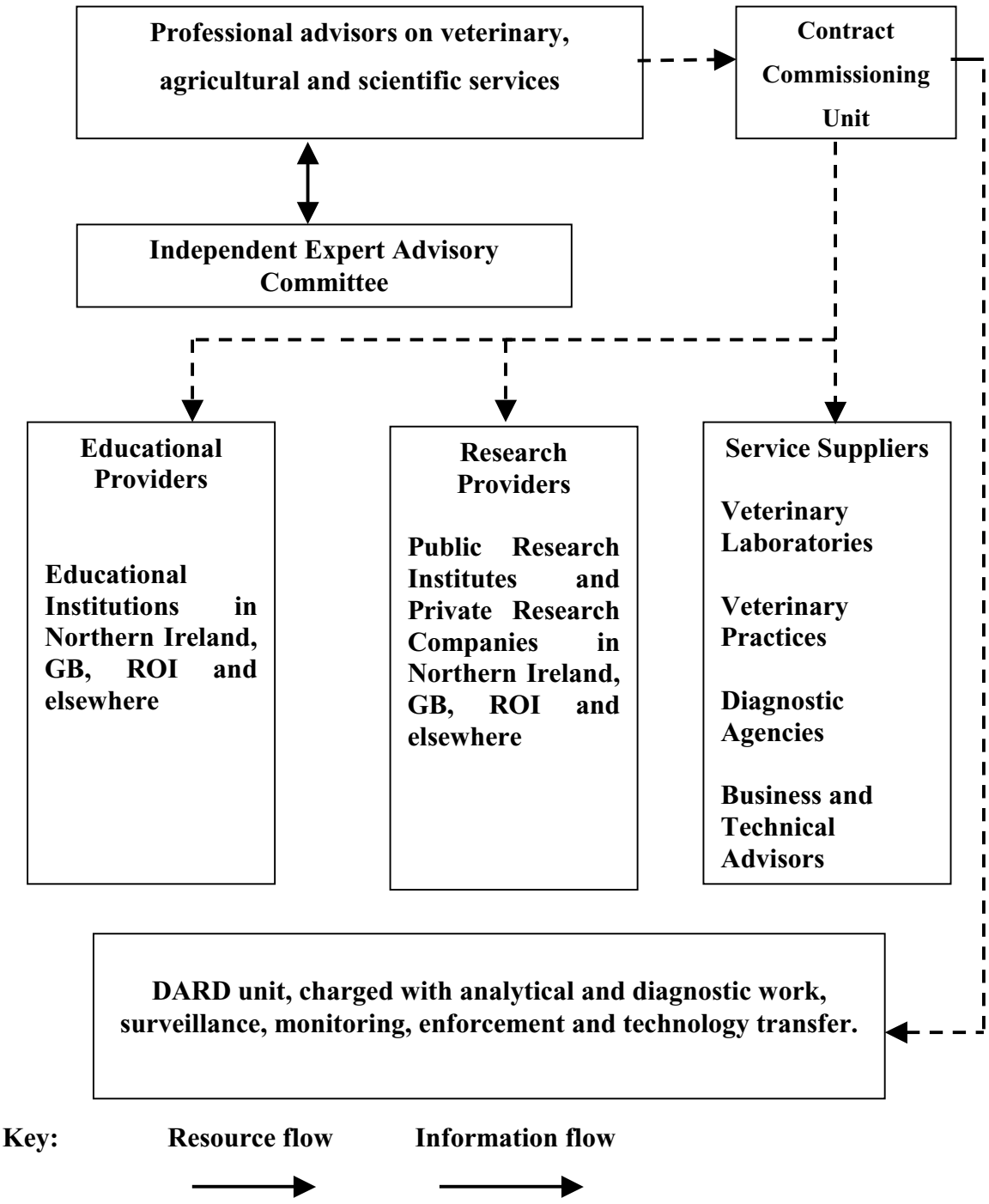
5.6.4 DARD would develop linkages with the University College. This would involve a process of mutual consultation and facilitate the efficient use of resources in Northern Ireland as a whole.

5.6.5 The University College would undertake external work on a contractual basis. It would be expected to have a strong industry interface in its teaching, R&D and technology transfer.

5.7 OPTION 3: DARD PURCHASES ITS REQUIREMENTS FROM OTHER AGENCIES

Option 3 is outlined in Diagram 5.4

Diagram 5.4



5.7.1 Option 3 describes an approach that would seek to secure as many of the requirements of DARD as possible by ad hoc contractual arrangements. Only those functions that could not be contracted out would be provided internally.

5.7.2 In this model, DARD would have to specify its requirements and invite potential providers to compete to carry out the various functions required by contract.

5.7.3 The model implies that there would be willing and competent institutions capable of bidding for the work and carrying it through to the standard required. This need not mean the movement of work out of Northern Ireland. Should an arm's length contractual system be adopted, some of the institutions currently funded by DARD might be taken over by existing staff through one or more management buyouts. In principle, many of the resources required already exist within the DARD service. This approach would effectively put them on a commercial contractual basis. The quality of service provided by both the DARD Colleges and Science Service, their links with local industry and understanding of local conditions, suggest that they could together provide a strong, Northern Ireland based competitor for both teaching and R&D.

5.7.4 Despite these possibilities, it is impossible to predict what pattern of provision might remain in Northern Ireland. Importantly, this raises the issue of what activities it is essential to retain on a local basis. Such services would have to be offered through what is described here as the DARD unit, charged with delivery of various scientific services.

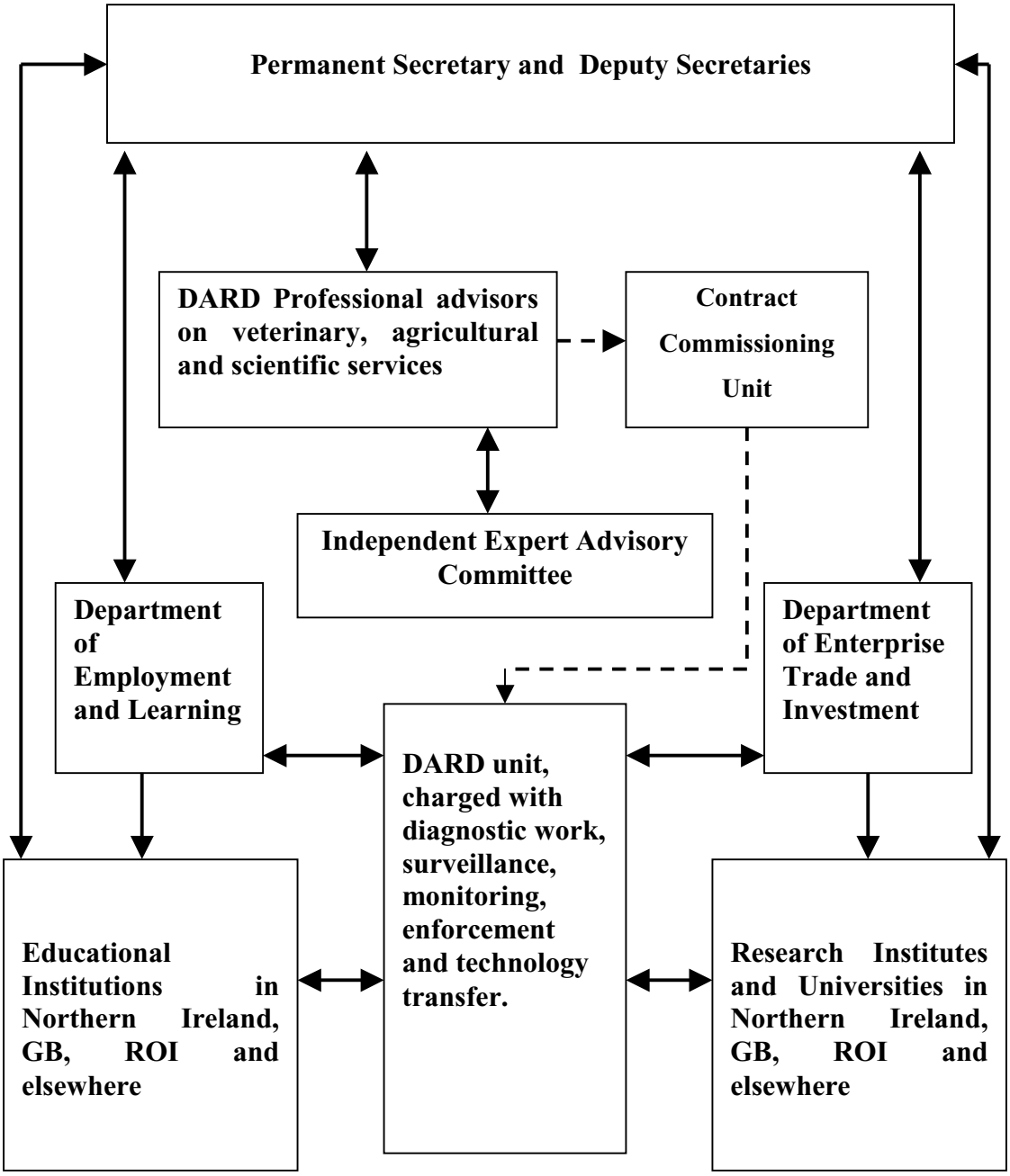
5.7.5 Technology transfer, too, could be provided on a contractual basis by staff presently involved in this type of activity. However, experience in England suggests it may be more difficult to retain a coherent organisation. The more successful advisors may see merit in going it alone rather than having to share in the overhead costs of a larger organisation. There would be strong competition from accountancy based companies, and organisations such as the Scottish Agricultural College and the Agricultural Development and Advisory Service as well as from independent agricultural consultants.

5.7.6 For government, the critical decision would be what resources DARD needs to continue to own and manage in order to carry out its functions. In some cases, direct provision might be favoured on grounds of cost – although the strongly competitive nature of the market for R&D suggests that this is unlikely to be the case in that sector. More probably, it is likely to be judged that provision by DARD is justified for social, political or legal reasons. This is critically true where intervention has to be intrusive or invoked for the purpose of enforcing the law. The implication is that a core capacity in surveillance, diagnostics and monitoring would be needed both to reassure the public and to provide a prompt response in emergency situations.

5.8 OPTION 4: DARD AS AN ADVOCATE RATHER THAN A PROVIDER

Option 4 is outlined in Diagram 5.5.

Diagram 5.5



Key: **Resource flow** **Information flow**

5.8.1 Under Option 4 the agri-food sector would be treated like any other industrial activity. Its needs for education and R&D would be handled in the same way as for other sectors. The government department responsible would have a duty to represent within government the special needs of its sector - in this case, it would be to ensure that departments responsible for education and industrial development are aware of the needs of the agri-food sector. The government department would only use resources to do those things directly which are in the public interest but which cannot be delivered by other departments.

5.8.2 DARD would still require an Independent Expert Advisory Committee and would need to ensure that there are adequate consultative procedures. The Professional Advisors would have a mixed function of advice to the Department and of commissioning and overseeing the work of DARD involved in delivering those essential activities that other departments cannot provide. They would also need to maintain close contact with the industry and be open to its requests for R&D work.

5.8.3 The DARD unit with responsibility for scientific services would have a general watching brief on the provision of agri-food services by other departments and an important role in ensuring that the industry's priorities would not be overlooked.

5.8.4 The institutional pattern of provision for education that emerged would be for DEL to determine. This does not mean that it would necessarily be radically different from that envisaged under Option 1. As with that option, there would be some pressure to reassess this level of provision in the context of the continuing development of the Northern Ireland economy.

5.8.5 There is no certainty, under this approach, that specifically agricultural research institutes would continue to exist in Northern Ireland.

5.8.6 DARD has major responsibility for ensuring the health of plants and animals, for example. This requires detailed knowledge of the industry and a strong capacity to identify problems early, to recognise their severity, to identify

appropriate remedies and to take action when necessary to protect the community. This has been a very strong feature of the existing system and it suggests that the DARD scientific unit would continue to need substantial resources.

SECTION 6: MONETARY COSTS AND BENEFITS

6.1 INTRODUCTION

6.1.1 This section details the monetary costs and benefits associated with the base case option / current system as outlined in Section 3 and the four alternative options as described in the previous section. The expenditure numbers are complex given that education and R&D provision is carried out across the various divisions within DARD as well as outside of the Department. Furthermore the current financial systems do not allocate each division's costs specifically to education, technology transfer and R&D, which is not unsurprising given the integrated nature of such work. Therefore at times subjective assumptions have had to be made in order to provide such a split. We have however undertaken to provide as good a picture as we can secure of the current provision and are acutely aware of the possibility of some doublecounting due to interlinkages in provision. It is expected that doublecounting (if any) within the costings should nonetheless be of an insignificant amount. Costs have been classified into capital or recurrent costs (running or staff costs).

BASE CASE /STATUS QUO OPTION:

6.2 EDUCATION MONETARY COSTS and BENEFITS

SAFS MONETARY COSTS and BENEFITS

SAFS Capital Costs

6.2.1 VLA is currently completing a revaluation of the DARD estate. While this exercise has not yet been completed or agreed, the following table incorporates the revised data as is currently available. The SAFS accommodation costs at Newforge Lane have been estimated on the basis of a calculated SAFS use of total site floorspace of 29%.

Table 6.1: Calculation of SAFS Occupation of Land & Buildings at Newforge Lane

	M^2
Gross area of Newforge Estate	17,900
Gross floor area of School	5,142
School % of total estate	**29%**

Revised VLA valuations per 2000 (incomplete)

Existing Use - operational value (£)	**Newforge Lane**	**% Allocation**	**School Apportionment**
Buildings	20,239,555	29	5,869,471
Land	7,500,000	29	2,175,000
Total	**27,739,555**	**29**	**8,044,471**

6.2.2 Table 6.2 estimates SAFS total occupation of equipment, plant and vehicles at £277,874, based on the asset register. We have assumed a higher asset base for Veterinary Science Division (VSD) than for Newforge – (60:40), before adjusting for SAFS floorspace thus allowing for the more basic equipment required in teaching laboratories. The School has IT services, but as all computer equipment belongs to the DARD, it is treated as if they do not belong to SAFS, given that SAFS has no / limited control over what items are upgraded or replaced and when, but simply follow the Departmental policy. Assets are grouped together in pools according to their estimated life, however within pools are assets of varying ages.

Table 6.2: Calculation of SAFS Occupation of Equipment, Plants &Vehicles

1. Summary of Existing Asset Register

Major Category	***Equipment pools***	**£**
Equipment	10 SCIENCE	3,048,494
	15 SCIENCE	138,343
	20 SCIENCE	11,134
	5 OTHER	4,592
	5 SCIENCE	100,419
Equipment Total		**3,302,982**
Plant Total	15 YEARS	**15,647**
Vehicles	10 HEAVY	22,263
	7 HEAVY	57,624
	LIGHT	74,913
Vehicles Total		**154,800**
GRAND TOTAL		**3,473,429**

2. Calculation of SAFS Equipment Occupation

Estimated VSD: Newforge split (60:40)	**1,389,372**
SAFS Newforge (20%)	**277,874**
Apportioned Equipment	264,239
Apportioned Plant	1,252
Apportioned Vehicles	12,384

SAFS Recurrent Costs

6.2.3 The budget for maintenance of the DARD Specialised Estate (Non-office accommodation) has been subjected to constraints and cuts over the years. The result is that the budget is at a low level and does not cover all the year on year demands which exist. Works activity has been slowed down for a number of years and as a consequence it is recognised that arrears of maintenance across the entire estate has resulted. In 1998, DFP Construction Service were requested to undertake condition surveys on the property situation in the Science Service and AFDS estates. From an analysis of the figures produced it is clear that DARD has been able only to cover critical current and remedial maintenance costs, given its year on year expenditure of at least £500,000 on statutory, and health and safety repairs. Furthermore the Disability Discrimination Act requirements need to be addressed within the next 2 years. While some inroads have been made in the arrears, the Construction Service exercise would clearly need to be revisited in order to clarify the current maintenance situation.

6.2.4 The relevant estimated costs of maintenance over a ten year period as highlighted by the Construction Service surveys in 1998 are outlined in the following table. The estimated SAFS share of these costs is as before based on SAFS's occupation of Newforge Lane, adjusted by inflation[2] to give an estimated cost in 2001. Given the timelapse of this report and some of this backlog has been done, we have assumed that the higher levels of maintenance expenditure should apply only to a 3 year period, rather than for 5 years.

Table 6.3: Calculation of SAFS's Share of Buildings Maintenance at Newforge

DFP Construction Service Report (1998)

		% Allocation	School Apportionment
Maintenance costs (£)	**Newforge**		
0-5 years	6,734,390	29	1,952,973.10
5-10 years	2,985,220	29	865,713.80
	9,719,610	**29**	2,818,686.90

Inflation Adjusted costs per yr (1998-2001)	**Total**	**Per Year**
Years 1-3	2,084,446	**416,889**
Years 4-10	923,993	**184,799**

6.2.5 Table 6.4 details SAFS's estimated direct accommodation costs based on floorspace. Similar costs have been grouped together in the net present cost spreadsheets. Rates have however been excluded from these calculations given that it can be considered to be a transfer payment.

[2] Based on a RPI index of 163.4 in June 1998 and 174.4 in June 2001.

Table 6.4: Estimated Breakdown of SAFS Departmental Running Costs (DRC)
Based on year ending 31 March 2001

Expenditure Category	Newforge	% Allocation	School Apportionment
	£		£
Electricity	179,170.79	29	51,959.53
Gas	2,162.68	29	627.18
Oil	119,271.97	29	34,588.87
Rates	428,451.14	29	124,250.83
Water	15,775.13	29	4,574.79
Cleaning	89,826.66	29	26,049.73
Catering	18,034.50	29	5,230.01
Security	100,504.80	29	29,146.39
Telephone	63,641.37	29	18,456.00
Windows	642.75	29	186.40
Laundry	3,563.11	29	1,033.30
Total	**1,021,044.90**		**296,103.03**

6.2.6 All costs associated with the delivery of education services at SAFS are borne by DARD. Teaching and supervisory duties are undertaken in the main by DARD employed staff in DARD funded and maintained accommodation. The teaching staff in SAFS are employed by DARD but hold formal joint DARD / QUB appointments to their academic posts. The direct costs of teaching – materials and supplies, audio visual and IT equipment are supplied, managed and maintained by DARD.

6.2.7 Table 6.5 summarises the 2000-01 SAFS direct cost of stores (in-house credit purchases), non-stores (purchases direct from suppliers), expensed capital, staff and travel & subsistence. Appendix D details these costs broken down by activity. The staff costs by activity are estimated based on the time recording system's allocation for each activity, multiplied by an average unit cost per grade. These figures were then adjusted upwards by 3.21% in order that they reconcile with the total staff costs that were actually recorded for 2000-01. Staff costs include all on-costs (Employers National Insurance Contributions and Superannuation) together with an overhead rate as applied by DARD to all staff to take account of central services such as DARD Personnel and Finance.

Table 6.5: Summary of 2000-01 SAFS Direct Expenditure

Expenditure Category	£
Stores	19,489.55
Non-stores	61,237.81
Expensed capital	8,840.64
Staff costs	1,225,284.39
Travel & subsistence	80.00
Total	**1,314,932.39**

6.2.8 In addition to the DARD staff involved in delivering teaching, a number of directly employed QUB staff are present on site. These include a small number of teaching assistants and postgraduate students who receive demonstrator fees, as well as staff employed in the School Office, the library and other support services. The cost of these staff, together with all other direct resources – library books, journals, external examiners etc., is met monthly by DARD on a 100% recharge basis. The cost of QUB staff, together with all other direct resources – library books, journal, external examiners etc., is listed in the following table. As some of these costs are not incurred exclusively on behalf of the SAFS, certain subjective assumptions have had to be made in order to apportion costs.

Table 6.6: Allocation of SAFS 2000-01 Outturn Costs between DARD & SAFS Activities
Source: QUB audited statements

		Split		Allocation	
		DARD	SAFS	DARD	SAFS
	£	%	%	£	£
Salaries & Wages					
Library	139,484.54	60	40	83,690.72	55,793.82
General	372,622.16	50	50	186,311.08	186,311.08
Porter	18,678.81	60	40	11,207.29	7,471.52
External Examiners	9,358.58		100	-	9,358.58
Extra Demonstrators	3,930.55		100	-	3,930.55
	544,074.64			281,209.09	262,865.55
Current Supplies					
Teachings Aids	9,484.53		100	-	9,484.53
Lib. Books / Periodicals	107,730.68	60	40	64,638.41	43,092.27
Sec. Centre	978.05	50	50	489.03	489.03
Faculty Office	13,889.42		100	-	13,889.42
Departments	40,242.32		100	-	40,242.32
	172,325.00			65,127.44	107,197.57
Computing					
Salaries	31,969.87	70	30	22,378.91	9,590.96
Consumables	48,417.49	70	30	33,892.24	14,525.25
Capital	1,889.57	70	30	1,322.70	566.87
	82,276.93			57,593.85	24,683.08
TOTAL	**798,676.57**			**403,930.37**	**394,746.20**

6.2.9 Table 6.7 apportions the indirect and overhead costs of QUB to Agriculture and Food Science specifically as undertaken as part of the overall 1999-2000 Transparency Review process. The estimated agriculture share of University central and support costs is £883,937. However in this appraisal we are concerned primarily with the economic or opportunity cost of these services and given that only a small percentage of these costs can be escaped there is little real justification for including more than a presumed marginal cost of £150,000 in the spreadsheets.

Table 6.7: Agriculture Share of University Central and Support Costs, 1999-2000 Transparency Review – Cost Pool Apportionments

Cost Pool	Total £	Agriculture Share £	Agriculture % Share	Apportionment Basis Used
Computing Services	2,905,398	88,748	3.05	Staff & Student Nos
Administration	5,942,166	254,829	4.29	Staff Numbers
Student Services	8,076,532	135,661	1.68	Student Numbers
Library (Agriculture)	5,172,400	319,424	6.18	Actual Costs
Audio Visual Services	472,061	23,082	4.89	Staff Numbers
Research Services	443,064	39,389	8.89	Research Contract Exp.
General Overheads	2,813,663	81,342	2.89	Direct Spend
Total	**25,825,254**	**942,475**	**3.65**	
Adjustments:				
Share of Central Services Premises		176,256	3.65	
Faculty Science & Agri - Transparency Review based		28,974	9.70	
Share of Main Libraries (based on SLA)		22,680	0.72	
Library – already recharged to DARD		-286,448		
DARD share of overheads		**883,937**		

6.2.10 Staff in the Faculties of Engineering, Science and Agriculture and Legal, Social and Educational Sciences provide teaching for Agricultural Science, Animal Science, Food Science and AEM students. In 2000-01 QUB received a grant from the Department for Employment and Learning in respect of service teaching of SAFS students for £159,000. This income is distributed to relevant schools on the basis of the number of full-time equivalent students from Agriculture and Food Science that are taught by each School as shown in Table 6.8.

Table 6.8: Distribution of 2000-01 Agriculture Science Teaching Incomes
Source: QUB Registrar's Office

	FTEs	Income Distribution £
Faculty of Legal, Social and Educational Sciences		
Management and Economics	7.50	
European Studies	1.17	
	8.67	£32,505
Faculty of Science and Agriculture		
Biology and Biochemistry	12.75	
Geography	0.17	
Archaeology and Palaeoecology	1.29	
Maths and Physics	1.33	
Chemistry	8.20	
Psychology	2.33	
Planning	1.67	
Gibson Institute	1.00	
	28.74	£107,750
Faculty of Engineering		
Chemical	2.83	
Computer Science	2.17	
	5.00	£18,745
Grand Total	**42.41**	**£159,000**

SAFS Monetary Benefits

6.2.11 QUB receives tuition fees in respect of all SAFS students. Estimated tuition fee income is based on the numbers of students as provided by the School Office and the fee rates provided by the Higher Education Funding Council of England (HEFCE) and the Education & Library Boards. The University retained fees of £489,876 in 2000-01 in lieu of validation fees for SAFS courses and for the use of central resources by SAFS students.

Table 6.9: 2000-01 Student Numbers and Estimated Tuition Fees

	Fee Rate		Number of Students		Total Home & EC Teaching Fee Income	Education & Library Boards Fees (£1,075)	Total Postgraduate Research & Overseas Fee Income
	Home £	OS £	Home No:	OS No:	£		
Undergraduates							
Full time	1,050		145		152,250		
Exam only	45		7		315		
Part time							
1 module	164		2		328		
2 modules	328		0		-		
3 modules	492		4		1,968		
Comp work exp.	520		5		2,600		
Postgraduates							
Taught							
Food Science							
FT	2,740		3		8,220		
Food Safety Man							
1 unit	420		18		7,560		
2 units	840		6		5,040		
Project	840		3		2,520		
Communications[1]							
Research							
FT	2,740	7,100	38	4			132,520
PT	920	2,340	17	1			17,980
Thesis	180		15				2,700
Total			**336**	**5**	**180,081**	**155,875**	**153,200**

[1] Fees for Communications Students (Loughry College) are excluded here given that Education and Finance Division makes the payment directly to QUB.

DARD COLLEGES MONETARY COSTS and BENEFITS

DARD Colleges Capital Costs

6.2.12 Land and buildings are revalued at five year intervals by VLA. While there is a revaluation exercise currently underway, as it is not yet finalised the following valuations are as recorded in 1997.

Table 6.10: DARD Colleges Asset Values 2001

	Enniskillen £	Greenmount £	Loughry £	Total £
Buildings[1]	1,752,190	2,306,400	4,950,180	9,008,770
Land[1]	3,168,220	8,811,000	4,113,700	16,092,920
Equipment	7,034	36,593	485,732	529,359
Plant	0	56,737	330,130	386,867
Vehicles	36,536	89,472	25,996	152,004
Total	**4,963,980**	**11,300,202**	**9,905,738**	**26,169,920**

[1] as valued by VLA in 1997.

6.2.13 In the foreseeable future, major new asset additions will be the Greenmount Lifelong Learning Centre (expected cost £3.5m; to be commissioned mid-2002) and, subject to a successful bid for Programme for Government funding, a Food Information Centre at Loughry (projected costs of £2.8m; to be commissioned in 2006). The Greenmount Lifelong learning Centre should be completed, opened and operating by the middle of the 2002-03 financial year. Hopefully the Loughry Centre, if approved, should be operational by the middle of the 2006-07 financial year.

6.2.14 In addition, it is anticipated that DARD will spend, on average, a further £1.1m per year on capital assets at its colleges. Typically £0.5m per year will be on Plant, Vehicles and Equipment – on average 70% on replacement / updating of existing items, including upgrading of ICT equipment for teaching and 30% on additional items. Typically £0.6m per year will be spent on the buildings – on average 70% (£0.42m) on maintenance of existing facilities and 30% (£0.18m) on additional items. The 1998 DFP Construction Surveys highlighted slightly higher levels of annual maintenance in years 0-4 of £1.42m[3] but similar levels of maintenance in years 5-10 (£0.95m). Given the timelapse of this report, the £1.1m figure is used in the spreadsheets, with approximately 60% of that would typically be the 'education' component and 40% on technology.

[3] Inflated as before using a RPI index of 163.4 in June 1998 and 174.4 in June 2001.

DARD Colleges Recurrent Costs

6.2.15 As the Greenmount Lifelong Learning Centre and the Food Information Centre at Loughry are additional buildings there is expected to be General Administrative Expenditure (GAE) and utilities of £100k per year for the Greenmount Centre and £80k for the Loughry Centre.

6.2.16 Table 6.11 provides a detailed breakdown of the 2000-01 departmental running costs associated with each of the 3 Colleges.

Table 6.11: Detailed Breakdown of 2000-01 College Departmental Running Costs

	Enniskillen £	Greenmount £	Loughry £	Total £
Electricity	53,203	146,138	195,011	394,352
Heating	44,871	48,148	55,398	148,417
Rates	103,376	99,101	168,323	370,800
Water	16,426	9,802	25,381	51,609
Cleaning	5,140	53,141	51,807	110,088
Security	38,442	12,502	0	50,944
Wardening	16,700	67,999	32,037	116,736
Residential	24,256	79,684	82,203	186,143
Total	**302,414**	**516,515**	**610,160**	**1,429,089**

6.2.17 Table 6.12 provides the breakdown of the 3 Colleges Total Education and Technology Costs, along with all other overhead costs associated with the operation of the Colleges. The Production Unit costs include the equine units at Enniskillen, the amenity horticulture facilities at Greenmount and the food processing facility at Loughry as well as the farms. Unfortunately the previous costing system did not allow College staff to record and report separately on their non-education / technology activities such as support to Policy Divisions and the Minister. Accordingly the costs of education and technology are inflated. Each category includes (where appropriate) salaries / wages, travel & subsistence, General Administrative Expenditure (i.e. contract cleaning, contract security, consultancy, books and journals, other library expenses), utilities (electricity, rates, water, oil and gas) and current expenditure (i.e. livestock feed, veterinary fees, fuel for tractors and vehicles, other consumables).

6.2.18 As Rates can be considered a transfer payment, an arbitrary adjustment has been made for both Greenmount and Loughry Colleges in order to exclude Rates from the College total with a 50:50 spilt of Rates (as given in table 6.11) between education and technology.

Table 6.12: Cost of 2000-01 College Education & Technology Transfer Activities

Gross Expenditure	**Enniskillen £**	**Greenmount £**		**Loughry £**	
	Education	**Education**	**Technology**	**Education**	**Technology**
Direct Course Costs					
Teaching / Tech Staff	251,387	1,123,246	2,650,361	763,616	386,511
Support Staff	105,207	310,632	155,868	160,650	59,641
Other Support Services	287,024	647,019	41,689	561,292	640,111
	643,618	**2,080,897**	**2,847,918**	**1,485,558**	**1,086,263**
Student Accommodation					
Residential	104,242	353,356	80,183	237,760	54,466
Wardening	16,700	67,999	-	32,037	-
	120,942	**421,355**	**80,183**	**269,797**	**54,466**
College Overheads					
Production Units	524,670	1,053,701	517,849	102,667	27,519
Administration	339,411	472,184	191,305	230,778	217,987
Estate / Gate	28,202	106,521	81,458	111,474	77,463
	892,283	**1,632,406**	**790,612**	**444,919**	**322,969**
Total	1,656,843	4,134,658	3,718,713	2,200,274	1,463,698
Total excluding Rates	**1,553,467**	**4,085,108**	**3,669,163**	**2,116,113**	**1,379,537**

6.2.19 The estimated cost of Further Education, Higher Education, and short courses and education programmes provision at each of the 3 Colleges is given in the following table.

Table 6.13: Estimated Breakdown of 2000-01 College Education Costs

Gross Expenditure	FE	HE	Short Courses & Community Education Programmes	Gross Total Cost excluding Rates
Enniskillen	619,214	619,214	315,039	1,553,467
Greenmount	2,813,911	703,478	567,719	4,085,108
Loughry	324,695	1,589,883	201,535	2,116,113
Total	**3,757,820**	**2,912,575**	**1,084,292**	**7,754,687**

6.2.20 Education and Finance Division paid in 2000-01 £26,440 to QUB in respect of the postgraduate Communications courses. The fees charged by QUB for these courses is only an administration fee given that they are taught in Loughry College, with £760 being charged for full time students and £320 for part time students in 2001-02. The equivalent fees for other Queens students would be £2,805 and £950. In addition student awards (including postgraduate awards mainly for students on QUB programmes) of £942k were administered centrally at headquarters at the same rates as Education and Library board payments to non-agricultural students.

DARD Colleges Monetary Benefits

6.2.21 The receipts, which form the majority, of college income are derived from various activities – for example the sale of farm produce, payments by students for accommodation and meals, hire of facilities, conferences, rental income from land.

Table 6.14: Income from 2000-01 College Education & Technology Transfer Activities

	Enniskillen £	Greenmount £		Loughry £	
	Education	Education	Technology	Education	Technology
Receipts					
Other Support Services	5,193	3,375	107	191,172	124,806
Residential	79,987	273,672	-	155,557	-
Production Units	103,107	486,107	232,103	9,737	-
Administration	35,585	65,306	10,125	-	-
Estate / Gate	92	463	249	-	-
Total	**223,964**	**828,923**	**242,584**	**356,466**	**124,806**

6.2.22 Included within the above total receipts are the tuition fees received by the Colleges. The relevant amounts have however been shown separately in table 6.15. This is the parental contribution to HE student fees and (apart from one foreign student) the colleges do not receive any contribution from any other source e.g. Education and Library Boards. None of these tuition fees are as such transferred to the Universities.

Table 6.15: 2000-01 College Tuition Fee Income

College	Tuition Income £
Enniskillen	28,609
Greenmount	70,960
Loughry	95,628
Total	**195,197**

6.3 R&D MONETARY COSTS and BENEFITS

SCIENCE SERVICE R&D MONETARY COSTS and BENEFITS

6.3.1 Given that the main areas of Science Service work – statutory / regulatory, diagnostic, R&D, teaching and specialist advice – are all very closely integrated, a number of subjective assumptions have had to been made in order to attribute certain site costs specifically to R&D. For instance, the apportionment of a particular site's direct accommodation costs (e.g. cleaning, catering, security) to it's individual divisions has been made on the basis of occupied floor space. This allocation has been undertaken at a high level on the basis that apart from the Faculty building, all other buildings are single occupancy and it has therefore been assumed that any non-core activities within a building are not significant and can therefore be ignored. In a similar manner, floorspace is used to calculate divisional occupation of both land and buildings and depreciated accordingly.

6.3.2 Allocation of costs against activities within divisions has been made on the basis of percentage of staff time spent as given by the 2000-01 time recording system. In addition, it has been assumed that R&D normally occurs on the margins of core activities and that it will only be given explicit accommodation once it reaches a critical size. Therefore accommodation costs should not be applied on a pro-rata basis to R&D. The following table details the sliding scale of apportionment used. For example if a division reports the percentage of staff time spend on R&D as 30%, then the apportioned 30% of accommodation costs are adjusted by a factor of 60% to take account of the marginal nature of R&D. This relationship weakens as the volume of R&D as a percentage of total activity increases.

Table 6.16: Apportionment of R&D Running Costs based on Percentage of Staff Time Spent in 2000-01

Percentage staff time (2000-2001 Time Recording System)

	FSD	APSD	AESD	BIOM	VSD	AFED
Advice	2%	3%	1%	1%	1%	1%
Faculty	22%	6%	5%	9%	1%	71%
Research Projects	**33%**	**59%**	**59%**	**33%**	**16%**	**20%**
Research Contracts	**3%**	**1%**	**2%**	**3%**	**3%**	**8%**
Science & Technology	40%	31%	32%	55%	80%	0%
	100%	100%	100%	100%	100%	100%
% Research Activities	**36%**	**60%**	**61%**	**36%**	**19%**	**28%**

Assumptions
Research marginal to other activities, therefore space is not allocated on a pro-rata basis

% Staff Time on R&D	R&D adjustment to pro-rata costs
0-24%	50% of pro-rata space
25-49%	60% of pro-rata space
50%+	70% of pro-rata space

Total Research Allocation	**21.6%**	**42.0%**	**42.7%**	**21.6%**	**9.5%**	**16.8%**
Research Projects	19.8%	41.3%	41.3%	19.8%	8.0%	12.0%
Research Contracts	1.8%	0.7%	1.4%	1.8%	1.5%	4.8%

NB: Totals may not sum due to rounding

Science Service R&D Capital Costs

6.3.3 The following table incorporates the revised VLA data as is currently available. R&D is carried out in all the divisions in Newforge Lane with the exception of the School of Agriculture and Food Science, which is only involved in teaching and occupies 29% of this site. The Applied Plant Science Division (APSD) is spread across three sites – Crossnacreevy, Loughgall and Newforge Lane. Omagh Veterinary Inspection Centre (VIC) forms part of the Veterinary Science Division (VSD). The following table estimates R&D occupation of land as £2,868,700 and buildings as £6,725,887, based on each division's occupation of sites, which is then adjusted by the R&D apportionment (as previously calculated in Table 6.16).

Table 6.17: Calculation of R&D Occupation of Land & Buildings

Revised VLA valuations per 2000 (incomplete)

Existing Use - operational value	Newforge Lane	APSD C'creevy	APSD L'gall	VIC Omagh	VSD	TOTAL
Buildings	20,239,555	986,060	300,000	577,491	7,958,564	**30,061,670**
Land	7,500,000	525,000	500,000	100,000	4,600,000	**13,225,000**
Total	27,739,555	1,511,060	800,000	677,491	12,558,564	**43,286,670**

1. Allocation of Newforge Lane

	FSD	APSD	AESD	BIOM	AFED	Total
Operational Value	**15%**	**18%**	**36%**	**1%**	**1%**	**71%**
Buildings	3,035,933	3,643,120	7,286,240	202,396	202,396	**14,370,084**
Land	1,125,000	1,350,000	2,700,000	75,000	75,000	**5,325,000**

2. Allocation across Divisions

Operational Value	FSD	APSD	AESD	BIOM	VIC	VSD	AFED	Total
Buildings	3,035,933	4,929,180	7,286,240	202,396	577,491	7,958,564	202,396	24,192,199
Land	1,125,000	2,375,000	2,700,000	75,000	100,000	4,600,000	75,000	11,050,000
Total	4,160,933	7,304,179	9,986,239	277,395	677,491	12,558,564	277,395	35,242,199

3. Calculation of Divisional R&D Occupation

% Research Allocation								
Research Projects	19.8%	41.3%	41.3%	19.8%	8.0%	8.0%	12.0%	
Research Contracts	1.8%	0.7%	1.4%	1.8%	1.5%	1.5%	4.8%	
	21.6%	42.0%	42.7%	21.6%	9.5%	9.5%	16.8%	

Operational Value	FSD	APSD	AESD	BIOM	VIC	VSD	AFED	Total
Buildings	655,762	2,070,256	3,111,224	43,717	54,862	756,064	34,002	**6,725,887**
Land	243,000	997,500	1,152,900	16,200	9,500	437,000	12,600	**2,868,700**
Total	898,762	3,067,756	4,264,124	59,917	64,362	1,193,064	46,602	**9,594,587**

6.3.4 The following table calculates R&D occupation of boats, equipment, plants and vehicles at £931,851, based on each division's asset register adjusted by the R&D apportionment. Equipment is not allocated to Biometrics / AFED because neither Division is scientific and therefore has no laboratories or scientific equipment. All Divisions have IT services, but as all computer equipment belongs to the DARD, it is treated as if they are do not belong to the division, as divisions have no / limited control over what items are upgraded or replaced and when, but simply follow the Departmental policy.

Table 6.18: Calculation of R&D Occupation of Equipment

1. Summary of Existing Asset Register

Major Category	*Equipment pools*	CSD	FSD	APSD	AESD	VSD	Total
Boats	10BOATS	-	-	-	901	-	901
	20BOATS	-	-	-	390,853	-	390,853
Boats Total		0	0	0	391,754	0	391,754
Equipment	10OTHER	-	38,016	35,828	17,896	49,746	141,486
	10SCIENCE	-	383,501	111,590	543,888	1,305,614	2,344,593
	15SCIENCE	-	42,411	21,266	-	92,592	156,269
	20SCIENCE	-	24,498	-	16,477	20,861	61,836
	3OTHER	-		-	9,510	-	9,510
	5OTHER	-	28,848	29,897	21,474	22,917	103,136
	5SCIENCE	7,567	62,847	60,014	164,961	147,765	443,154
Equipment Total		7,567	580,121	258,595	774,206	1,639,495	3,259,984
Plant	15YEARS	-	-	7,688	-	-	7,688
Plant Total		0	0	7,688	0	0	7,688
Vehicles	10HEAVY	-	-	1,205	16,186	27,877	45,268
	5YEARS	6,676	-	31,577	3,957	2,117	44,327
	6HEAVY	-	-	15,172	-	-	15,172
	7HEAVY	4,471	-	8,189	8,676	24,773	46,109
Vehicles Total		11,147	0	56,143	28,819	54,767	150,876
Grand Total		18,714	580,121	322,426	1,194,779	1,694,262	3,810,302

2. Calculation of Divisional R&D Equipment Occupation

% Research Allocation	FSD	APSD	AESD	VSD	Total
Total Research	21.6%	42.0%	42.7%	9.5%	
Allocated boats	0	0	167,279	0	**167,279**
Allocated equipment	125,306	108,610	330,586	155,752	**720,254**
Allocated plants	0	3,229	0	0	**3,229**
Allocated vehicles	0	23,580	12,306	5,203	**41,089**
Total					**931,851**

Science Service R&D Running Costs

6.3.5 The estimated R&D share of maintenance costs (as determined by DFP Construction Service in 1998) is as before based on each division's occupation of sites, which is then adjusted by the R&D apportionment. These costs were adjusted by inflation to give an indication of 2001 costs and then divided by the relevant numbers of years to give a cost per year. Given the timelapse of this report, I have assumed that the higher levels of maintenance expenditure apply to a 3 year period, rather than for 5 years.

Table 6.19: Calculation of R&D Share of Buildings Maintenance

1998 DFP Construction Service Report

Maintenance	Newforge	APSD C'creevy	APSD Loughgall	VIC Omagh	VSD Stoney Rd	TOTAL
0-5 years	6,734,390	938,030	3,255,375	947,300	5,357,235	17,232,330
5-10 years	2,985,220	298,500	1,137,900	296,200	1,513,680	6,231,500
	9,719,610	1,236,530	4,393,275	1,243,500	6,870,915	23,463,830

1. Allocation of Newforge

Maintenance	FSD 15%	APSD 18%	AESD 36%	BIOM 1%	AFED 1%	Total 71%
0-5 years	1,010,159	1,212,190	2,424,380	67,344	67,344	**4,781,417**
5-10 years	447,783	537,340	1,074,679	29,852	29,852	**2,119,506**

2. Allocation across Divisions

Maintenance	FSD	APSD	AESD	BIOM	VIC	VSD	AFED	Total
0-5 years	1,010,159	5,405,595	2,424,380	67,344	947,300	5,357,235	67,344	**15,279,357**
5-10 years	447,783	1,973,740	1,074,679	29,852	296,200	1,513,680	29,852	**5,365,786**

3. Calculation of Annual Divisional R&D Buildings Maintenance

% Research Allocation							
Research Projects	19.8%	41.3%	41.3%	19.8%	8.0%	8.0%	12.0%
Research Contracts	1.8%	0.7%	1.4%	1.8%	1.5%	1.5%	4.8%
	21.6%	42.0%	42.7%	21.6%	9.5%	9.5%	16.8%

Maintenance	FSD	APSD	AESD	BIOM	VIC	VSD	AFED	Total
0-5 years	218,194	2,270,350	1,035,210	14,546	89,994	508,937	11,314	**4,148,546**
5-10 years	96,721	828,971	458,888	6,448	28,139	143,800	5,015	**1,567,982**

4. Inflation Adjusted Maintenance costs per year (1998-2001)	**Total**	**Per Year**
Years 1-3	4,427,823	**885,565**
Years 4-10	1,673,537	**334,707**

6.3.6 Table 6.20 details R&D's estimated direct accommodation costs based on floorspace and adjusted by R&D apportionment. Rates have been excluded from the net present cost calculations given that it is a transfer payment.

Table 6.20: Allocation of Direct Accommodation Costs to R&D

Based on Science Service Finance System Reports for 2000-01

1. Allocation of Costs Across Sites

	Newforge	FSD	APSD Newforge	APSD C'creevy	APSD Loughgall	AESD	BIOM	AFED
% Allocation of Newforge Space		**15%**	**18%**	**NA**	**36%**	**1%**	**1%**	**1%**
Rates	124,251	64,268	77,121	37,143	17,882	154,242	4,285	4,285
Cleaning	26,050	13,474	16,169	6,378	17,336	32,338	898	898
Catering	5,230	2,705	3,246	-	-	6,492	180	180
Security	29,146	15,076	18,091	-	-	36,182	1,005	1,005
Water	4,575	2,366	2,840	2,507	32,433	5,679	158	158
Electric	51,960	26,876	32,251	13,636	43,271	64,501	1,792	1,792
Gas	627	324	389	-	-	779	22	22
Telephone	18,456	9,546	11,455	360	4,774	22,911	636	636
Oil	34,589	17,891	21,469	1,557	10,531	42,938	1,193	1,193
Windows	186	96	116	0	1,023	231	6	6
Laundry	1,033	534	641	1,146	299	1,283	36	36
Total	1,021,045	153,157	183,788	62,726	127,549	367,576	10,210	10,210

2. Allocation of Costs Across Divisions

	FSD	APSD	AESD	BIOM	VIC	VSD	AFED	Total
Rates	64,268	132,147	154,242	4,285	11,271	194,245	4,285	
Cleaning	13,474	39,882	32,338	898	3,285	55,347	898	
Catering	2,705	3,246	6,492	180	72	1,364	180	
Security	15,076	18,091	36,182	1,005	319	15,306	1,005	
Water	2,366	37,779	5,679	158	604	6,110	158	
Electric	26,876	89,158	64,501	1,792	4,898	128,710	1,792	
Gas	324	389	779	22	140	0	22	
Telephone	9,546	16,589	22,911	636	4,013	58,278	636	
Oil	17,891	33,557	42,938	1,193	25,617	44,183	1,193	
Windows	96	1,139	231	6	240	2,715	6	
Laundry	534	2,086	1,283	36	773	3,646	36	
Total	153,157	374,063	367,576	10,210	51,232	509,904	10,210	**1,772,456**

3. Calculation of Divisional R&D Costs

	FSD	APSD	AESD	BIOM	VIC	VSD	AFED
Research Projects	19.8%	41.3%	41.3%	19.8%	8.0%	8.0%	12.0%
Research Contracts	1.8%	0.7%	1.4%	1.8%	1.5%	1.5%	4.8%
Research Projects	30,325	154,488	151,809	2,022	4,099	40,792	1,225
Research Contracts	2,757	2,618	5,146	184	768	7,649	490

	Research Projects	Research Contracts	Research Total
Electricity	80,041	4,133	84,175
Gas	565	23	588
Oil	41,098	2,284	43,382
Water	19,004	498	19,502
Rates	148,807	7,607	156,414
Cleaning	37,471	1,913	39,384
Catering	4,730	196	4,926
Security	26,969	1,205	28,174
Telephone	23,389	1,585	24,974
Windows	823	58	881
Laundry	1,862	111	1,973
Total	**384,760**	**19,612**	**404,372**

6.3.7 Table 6.21 summarises Science Service direct expenditure by Research Projects and Research Contracts on staff costs, travel and subsistence, non-stores (cash purchases direct from suppliers), stores (in-house credit purchases) and expensed capital. Appendices E and F list these Research Projects and Research Contracts costs by activity. The staff costs by activity are estimated based on the time recording system's allocation for each activity, multiplied by an average unit cost per grade. These figures were then adjusted upwards by 3.21% in order that they reconcile with the total staff costs that were actually recorded for 2000-01. Staff costs include all on-costs (Employers National Insurance Contributions and Superannuation) together with an overhead rate as applied by DARD to all staff to take account of central services such as DARD Personnel and Finance.

Table 6.21: Summary of Science Service 2000-01 Research Projects and Contracts Direct Expenditure

	Research Projects	Research Contracts	Research Total
Staff costs	5,566,721.96	398,286.34	5,965,008.30
Travel & subsistence	2,388.91	36.23	2,425.14
Stores	166,639.86	4,879.46	171,519.32
Non-stores	698,550.04	13,845.73	712,395.77
Expensed capital	124,033.23	0.00	124,033.23
Total	**6,558,334.00**	**417,047.76**	**6,975,381.76**

SAFS/QUB R&D Monetary Costs and Benefits

6.3.8 Table 6.22 details the monetary costs and benefits of the research that is carried out in the SAFS. To avoid doublecounting in the net present value spreadsheets, the Science Service direct expenditure on research contracts of £417,048 (see Table 6.21) is netted of the £2,341,392 SAFS research direct expenditure.

Table 6.22: QUB SAFS Research Overhead Income 2000-01

	£	%
Income	2,830,516	
Direct Expenditure	2,341,392	
Overheads	**489,124**	20.9% of direct expenditure
Overhead Split	**£**	**%**
QUB	325,828	66.61
DARD	163,296	33.39
Total	**489,124**	

ARINI R&D Monetary Costs and Benefits

6.3.9 ARINI monetary costs and benefits are taken from its accounts year as at 31st March 2001. Although ARINI is involved in part in technology transfer and education, as well as research, for simplicity it has had to be assumed that all of its costs relate purely to research. Annual depreciation on buildings is based on a 40 year straight line basis on a original book value of £5,982,488 and on machinery equipment is based on a 10 year straight line basis on a original book value of £2,738,982.

Table 6.23: Summary of Relevant ARINI Costs taken from Accounts Year Ending 31 March 2001

Capital costs	**Net Book Value**	**Depreciation Basis**	**Annual Depreciation**
Tangible Fixed Assets			
Buildings	**5,322,595**	25yr straight line	239,300[1]
Machinery & Equipment	**993,715**	10yr straight-line	273,900[2]
	£	**£**	
Recurrent costs			
Cost of sales:-		**555,083**	
Gross Administration and other costs:-			
Sundry services and stores	55,638		
Fuel	24,284		
Licences, insurance, fees	104,990		
Experiments sundries	123,205		
Demonstrations	4,279		
Laboratory supplies	32,577		
Office and administration	90,912		
Auditors remuneration	2,750		
Library	8,967	**447,602**	
Establishment Charges:-			
Fuel	24,283		
Rents, rates, water	54,711		
Electric power	81,252	**160,246**	
Maintenance and Repairs:-			
Machinery and equipment	138,673		
Buildings	477,745		
Estate	36,347	**652,765**	
Direct staff costs incl. Social security & pension costs		**1,943,862**	**3,759,558**
Income from Activities			
Farm produce and sundry sales		739,940	
Research fees		519,767	**1,259,707**

[1] Based on a gross asset value of £5,982,488.
[2] Based on a gross asset value of £2,738,982.

6.4 OPTION 1: THE SEPARATION FROM DARD OF THE PROVISION OF EDUCATIONAL AND SCIENTIFIC SERVICES

Option 1 Monetary Costs

6.4.1 The costs given in Table 6.24 are intended as a guide to the likely additional cash costs involved in implementation of this option. The costs are based on a

number of assumptions. Once the final decision has been made on the system to be adopted, these assumptions may not be tenable. The main assumptions are:

- The total number of staff in the overall system is largely unchanged;
- The programme of education and R&D remains at the same level as before;
- No land or buildings are disposed of (except for transfers between organisations in accordance with the O'Hare proposals). While ownership of the actual assets may change under this option, the total capital costs are assumed to remain constant in the system as a whole.

Running costs

6.4.2 The overall additional annual budget cost of implementation is estimated at £2.47million. However many of the cash costs identified in this table will have zero impact in economic appraisal terms as they simply are transfer payments from one part of Government to another e.g. Rates and VAT costs. Therefore only additional costs of £396k are included within the net present value spreadsheets of option 1, as this is the estimated extra cost excluding the transfer payments of £2,074k[4].

6.4.3 In addition, areas where possible long-term savings may be achieved have also been identified. This would be expected to result in long term savings as the R&D programme becomes more focused on certain areas of expertise and the unit costs of teaching reduce as DEL funding formulae apply and courses are taken by students from other disciplines as modules. The possibility of these R&D savings has not been built into the spreadsheets.

[4] To avoid doublecounting it is assumed that £30k of this amount (for the change in salary scales) will have to be met within the HEFCE and DEL notional funding allocations, as shall be calculated later.

Table 6.24: Estimated Costs of Implementation of Option 1

Detail	Cost (£) Annual	Source of Cost	Possible Long-Term Savings	Comments
Central Decision Taking Process and Advisory Expert Board	160,000	Advisory Experts + 3 extra contract experts (Other contract support from internal transfers)		Introduction of this system will affect the organisation of DARD as a whole.
SAFS to QUB/UU	6,000 6,000	Based on 25 staff moving – assuming 0.5% to allow for change of scales. Based on further 25 staff moving to cover DARD College degree provision	Lower unit costs using DEL funding formula even if funded through DARD. Higher number of students to include other disciplines	Degree provision at DARD Colleges assumed to move to QUB/UU as well as SAFS.
Teaching function of Colleges to FE Colleges	460,000[1] 200,000[2] 24,000 150,000[1]	VAT now payable (assumed 4% of total) Cost of achieving PGCE Assuming 0.5% to allow for change of scales Rates now payable	Lower unit costs using DEL funding formula even if funded through DARD. Higher number of students to include other disciplines. Based on 100 staff at £6,000 per head Based on 100 staff moving	This figure covers VAT on all college provision including development and technology transfer (assuming total £11.5m). PGCE required for FE Colleges
Establish NIAFRI as NDPB	1,114,000[1] 350,000[1]	VAT now payable Rates now payable	Based on 4 % of total Science Service Expenditure	Full cover for VAT may not be necessary. NIAFRI may take in significant external contracts that would cover their own VAT. New head of NIAFRI required. Total number of senior staff (Down to Grade 5) in the overall system has been assumed to be unchanged.
Include ARINI with NIAFRI				Possible costs due to dismantling ARINI trust
Establish technology transfer facility within NIAFRI		VAT (costs covered above)		
Competitive bidding for DARD funded R&D			Possible long term savings by focusing on certain R&D areas. More financial input from industry	Policy input could direct focus to certain areas and other areas may be discontinued.
TOTAL **TOTAL**	2,470,000 396,000 (excluding transfer payments)			

[1] While these are monetary costs associated with the implementation of this option, in economic appraisal terms they simply represent transfer payments and for this reason are excluded from the net present values spreadsheets.

[2] Based on an expected cost of £600k over three years.

Transfer of SAFS to QUB/UU

6.4.4 Developing a notional HEFCE allocation for SAFS is highly subjective. However the most recent HEFCE funding methodology for teaching (HEFCE 01/14 *Funding Higher Education in England: How the HEFCE allocates its Funds*), provides a working model from which an assumed resource can be calculated. Core funding for teaching represents approximately 56% of the total amount allocated by the HEFCE. Therefore to develop a total resource allocation model it must be assumed that SAFS would receive levels of funding from the other HEFCE programmes at the sector average level.

6.4.5 Under the HEFCE model the teaching resource is described as:

Resource = HEFCE grant + tuition fees.

The HEFCE grant is calculated on the basis of a standard resource per FTE and takes into account:

- The number of students
- Subject related factors
- Student related factors
- Institution related factors

For SAFS, the relevant factors that need to be taken into account are:

- The number of part-time students
- An adjustment for the difference in superannuation rates between HE and NICS

6.4.6 Using the worked example in Annex A of HEFCE 01/14, an adjusted FTE for students on taught courses has been calculated at 322.6 which, based on a standard unit of resource per FTE of £2,805, provides core funding of £905k together with an assumed tuition fee income of £205k. This gives a total teaching resource of £1,109k.

6.4.7 When calculating a notional unit of resource under the HEFCE model the calculation has been based on HEFCE's assumed fee rates together with an allowance for fees in respect of overseas and postgraduate research students. It is hoped that the assumptions provide reasonable comparators and are not offered as actuals.

Table 6.25: Calculation of SAFS Notional Resource Allocation

Teaching Funds

Mode	FTE	Cost weighted FTE	Part time 5% x	Pensions 10% x	Total weighted FTE	Standard Resource 2,805
	(a)	(b)	(a)	(b)		
UG	115	230		23	253	709,665
UG	3	6	0.15	0.6	6.75	18,934
PGT	3	6		0.6	6.6	18,513
PGT	25	50	1.25	5	56.25	157,781
PGR	47	94				
					322.6	**904,893**

Assumed Tuition Fees

Mode	FTE	Assumed FTE Rate	Total
UG	115	1,075	123,625
UG	3	790	2,370
PGT	3	2,805	8,415
PGT	25	2,805	70,125
PGR	47		-
			204,535
Estimated Standard Resource			**1,109,428**

6.4.8 Based on the HEFCE's published data of total allocations for 2001-02[5], unadjusted core teaching funding accounts for 56.53% of the total HEFCE funding awarded to traditional universities. If it is assumed that SAFS would perform along the norms of this section of the HEFCE sector, then it can be assumed that the SAFS notional teaching resource of £1,109k will represent the same percentage of its total notional funding i.e.:

[5] HEFCE 01/57 Recurrent Grants for 2001-02: Final Allocations

Table 6.26: 2000-01 Total SAFS Resources

	£
Teaching resource	1,109,428
Estimated as 56.53% of total resource	
Estimated total public resource	**1,962,547**

6.4.9 The notional HEFCE funding is £2,115,747, somewhat lower than the actual SAFS expenditure of £2,856,206.

Table 6.27: 2000-01 Comparable Units of Resource

	Notional HEFCE	**Actual** SAFS
Notional funding	1,962,547	
Actual resources employed[1]		2,375,330
Estimated tuition fees (UG)		336,676
Estimated tuition fees (PGR and Overseas)	153,200	153,200
Total	**2,115,747**	**2,865,206**

[1] Excludes depreciation of assets and includes maintenance of £184,799 rather than £416,889.

DEL Funding of DARD Students at FE Colleges

6.4.10 To estimate what would be the cost of DEL provided agricultural education for both FE and HE students, we have had to assume that the funding as provided by DEL will reflect all of the costs of provision. We are only able to estimate approximately the level of DEL funding of the DARD College students should they transfer to FE colleges. This is because a funding formula would be applied based on the measurement of student activity and achievement, otherwise known as a Student Powered Unit of Resource. This formula ensures that all colleges are funded on the same basis. While the maximum DEL funding generated by a FTE FE student is £3.6k and £3.7k for HE per annum, there are a wide range of student and institutional premiums that might apply depending on for instance the numbers of part-time, disabled and mature students, as well as specialist and small institutions. Given the existence of substantial earmarked funds, and capital and maintenance funding, we have used a broad-brush figure of £5k per FE FTE and £5.9k per HE FTE.

6.4.11 The estimated total DEL funding is calculated as £5,865,400. As the additional costs of implementation, as outlined in Table 6.24, of which £460k of VAT and £150k of Rates are purely transfer payments, will have to be met within this budget, a revised figure of £5,255,400 is inputted into the net present value spreadsheets. We have assumed that the costs of Short Courses and Community Education Programmes remain largely unchanged.

Table 6.28: Estimated DEL Funding of the DARD College Students

	FTEs[1]	DEL Funding per FTE[2]	Total funding £
Further Education	645	£5,000	3,225,000
Higher Education	446	£5,900	2,631,400
Total	1,091		**5,865,400**
Total excluding Rates and VAT			**5,255,400**

[1] Based on FESR Methodology
[2] Based purely on a broad brush estimate

6.4.12 The estimated DEL funding of £5,255,400 combined with total college income of £1,185,389 (assumed to remain constant) results in total funding of £6,440,789. Under the current system the DARD College funding is:

Table 6.29: Estimated Breakdown of 2000-01 College Education Costs

Gross Expenditure	FE	HE	Allocated Maintenance	Allocated Capital invest	Gross Total Cost excluding Rates
Enniskillen	619,214	619,214			
Greenmount	2,813,911	703,478			
Loughry	324,695	1,589,883			
Total	**3,757,820**	**2,912,575**	**240,000**[1]	**420,000**[1]	**7,330,395**

[1] 60% of total maintenance budget of £400,000
[2] 60% of total capital investment budget of £700,000

6.4.13 Thus the immediate resource implications of this option are not significantly lower given that the services currently provided continue to be provided, although by different routes. In the longer run, two types of economic benefit should be realised. Firstly, the process of R&D selection should lead to a

pattern of expenditure that better reflects the needs of Northern Ireland. Secondly, the introduction of a greater element of competition for R&D contracts should lead to a downward pressure on costs. Whilst the impact on Northern Ireland as a whole would be neutral, this option would lead to a significant redistribution of funding between institutions.

6.5 OPTION 2: A UNIVERSITY COLLEGE OF AGRICULTURE, FOOD AND RURAL DEVELOPMENT

6.5.1 This option provides for the funding of education directly by DEL; it also provides for the funding of NIAFRI. It has not been possible to cost this option as DEL would need to undertake a major costing exercise given that they have no previous experience of agricultural provision. However given the assumption of a continued level of service, this looks like a rearrangement of existing funding. The new University College would however have to carry all the overheads of providing a diverse range of courses. It might also require considerable capital funding if a new campus had to be provided. Whilst arrangements with local institutions might ease some part of these costs, it seems probable that the outcome would be subject to higher unit costs of provision than under Option 1.

6.6 OPTION 3: DARD PURCHASES ITS REQUIREMENTS FROM OTHER AGENCIES

6.6.1 It is impossible to cost these ad hoc contractual arrangements as it depends on the bargaining power of DARD as well as the competitiveness of the market. The main motive for pursuing such an approach is the argument that competition leads to the least resource cost for providing a given level of service. If competition is effective, it affects both the cost at which services can be purchased and the quality of the services delivered. This is a powerful argument but there are some considerations that would need to be addressed.

(a) In those areas of science where economies of scale are substantial, contractual provision seems likely to lead to more work being bought

outside Northern Ireland. Balancing this, some Northern Ireland institutions might succeed in maintaining skills and increasing scale by expanding their market to compete on an international scale. Within this market, it is important not to overlook the degree to which other countries may continue to subsidise their own R&D establishments.

(b) In terms of public expenditure, this need not be a bad outcome for the overall Northern Ireland economy, if the R&D bought is of equivalent quality and relevance and subsidised by taxpayers in other countries. In short, the benefits would be accessible to Northern Ireland citizens at less than their true cost.

6.7 OPTION 4: DARD AS AN ADVOCATE RATHER THAN A PROVIDER

6.7.1 As with the other options explored here, the major resource impact, assuming that an equivalent level of service is to be retained, would be to redistribute rather than radically change the costs involved.

SECTION 7: CALCULATE NET PRESENT VALUES

7.1 Appendix G uses the monetary cost and benefits as given in the previous section to calculate net present values for the base case and option 1. It has not been possible to calculate net present values for options 2-4 for the reasons outlined at the end of the previous section. A 10 year appraisal period was chosen given the likely need for a further review of this provision in the future. The base year is 2000/01 given that is the latest financial data available. A 6 per cent discount rate is applied as advocated in the Green Book / NI Preface to the Green Book.

7.2 **ASSET ASSUMPTIONS**

For simplicity's sake in the spreadsheets we have assumed the total replacement of all equipment / plant / vehicles at a particular point in time. In real life new assets are often replaced partially on an annual basis. This assumption has however no bearing on the total capital cost over the 10 year period, given that we have made an adjustment for asset values in year 10.

7.3 **EDUCATION**

SAFS

7.3.1 **Land and Buildings**

As the residual value of land and buildings in 10 years time (the appraisal period) has not been provided as part of the VLA exercise, we have therefore assumed that during this period the value of land remains constant, while annual buildings depreciation of £146,737 is based on a straight-line basis over a 40 year period.

7.3.2 **Equipment / Plant / Vehicles**

Assets are grouped together in pools according to their estimated life, however within pools are assets of varying ages. We have therefore assumed that the current asset value reflects 50% of the original value of the asset. Therefore straight line depreciation has been calculated based on an original asset value of twice the current pool value. For simplicity a 10% depreciation rate (as calculated for R&D in Table 7.3) was applied, resulting in annual total

depreciation of £55,575 as shown in Table 7.1. Given these assumptions, the replacement of all equipment would be due in 2006/07 at double its current value.

Table 7.1: Estimation of SAFS Annual Depreciation of Equipment, Plants & Vehicles

Calculation of SAFS Equipment Occupation	
SAFS Newforge (20%)	**277,874**
Apportioned Equipment	264,239
Apportioned Plant	1,252
Apportioned Vehicles	12,384
Calculation of Annual SAFS Equipment Depreciation	
10% Depreciation (as per R&D) based on twice current value	**55,575**
Annual Equipment Depreciation	52,848
Annual Plant Depreciation	250
Annual Vehicles Depreciation	2,477

DARD COLLEGES

7.3.3 **Land and Buildings**

As before, given that the residual value of land and buildings in 10 years time has not been provided as part of the VLA exercise, we have assumed that during this period the value of land remains constant, while annual total buildings depreciation of £225,219 (see Table 7.2) is based on a straight-line basis over a 40 year period.

7.3.4 **Equipment / Plant / Vehicles**

The shelf life for equipment is usually 10 years, for plant it is 10 years and for vehicles it is 5-10 years. As assets have been grouped together, in pools according to their estimated life, however within pools are assets of varying ages. We have therefore had to assume that the current asset value reflects 50% of the original value of the asset. Therefore straight line depreciation has been calculated based on an original asset value of twice the current pool value. For simplicity a 10% depreciation rate (as calculated for R&D in Table 7.3) was applied, resulting in annual depreciation at the 3 DARD Colleges of £105,872 for equipment, £77,373 for plant and £30,401 for vehicles. Given these assumptions, the replacement of all equipment would be due in 2006/07 at double its current value.

Table 7.2: Estimation of DARD Colleges Annual Depreciation of Buildings, Equipment, Plants and Vehicles

	Enniskillen £	Greenmount £	Loughry £	Total £
Buildings[1]	1,752,190	2,306,400	4,950,180	9,008,770
Buildings Depreciation	**43,805**	**57,660**	**123,755**	**225,219**
Equipment	7,034	36,593	485,732	529,359
Equipment Depreciation	**1,407**	**7,319**	**97,146**	**105,872**
Plant	0	56,737	330,130	386,867
Plant Depreciation	**0**	**11,347**	**66,026**	**77,373**
Vehicles	36,536	89,472	25,996	152,004
Vehicles Depreciation	**7,307**	**17,894**	**5,199**	**30,401**

[1] as valued by VLA in 1997.

7.4 RESEARCH & DEVELOPMENT

7.4.1 Science Service R&D Land and Buildings

As the residual value of land and buildings in 10 years time has not been provided as part of the VLA exercise, we have again assumed that during this period the value of land remains constant, while annual buildings depreciation of £168,147 is based on an assumed straight-line basis over a 40 year period, as given in the VLA's recent revaluation.

Table 7.3: Calculation of R&D Depreciation of Science Service Buildings

1. Calculation of Divisional R&D Occupation

% Research Allocation							
Research Projects	19.8%	41.3%	41.3%	19.8%	8.0%	8.0%	12.0%
Research Contracts	1.8%	0.7%	1.4%	1.8%	1.5%	1.5%	4.8%
	21.6%	42.0%	42.7%	21.6%	9.5%	9.5%	16.8%

Operational Value	**FSD**	**APSD**	**AESD**	**BIOM**	**VIC**	**VSD**	**AFED**	**Total**
Buildings	655,762	2,070,256	3,111,224	43,717	54,862	756,064	34,002	**6,725,887**

2. Calculation of Annual Divisional R&D Buildings Depreciation

Annual Depreciation	**FSD**	**APSD**	**AESD**	**BIOM**	**VIC**	**VSD**	**AFED**	**Total**
Research Projects	15,028	50,894	75,230	1,002	1,155	15,917	607	**159,833**
Research Contracts	1,366	863	2,550	91	217	2,984	243	**8,314**
Total Research	16,394	51,757	77,780	1,093	1,372	18,901	850	**168,147**

7.4.2 **Science Service R&D Equipment / Plant / Vehicles**

Assets are grouped together in pools according to their estimated life, however within pools are assets of varying ages. As before it is assumed that the current asset value reflects 50% of the original value of the asset. Therefore straight line depreciation has been calculated based on an original asset value of twice the current pool value. This results in a 10.9% deprecation rate on the estimated original values across the whole asset pool. For simplicity a 10% depreciation rate was applied, resulting in annual depreciation of £186,370, and the replacement of all equipment in 2006/07 at double the current value.

Table 7.4: Estimation of Science Service R&D Annual Depreciation of Equip, Plant & Vehicles

1. Summary of Existing Asset Register

Major Category	*Equipment pools*	CSD	FSD	APSD	AESD	VSD	Total
Boats	10BOATS	-	-	-	901	-	901
	20BOATS	-	-	-	390,853	-	390,853
Boats Total		0	0	0	391,754	0	391,754
Equipment	10OTHER	-	38,016	35,828	17,896	49,746	141,486
	10SCIENCE	-	383,501	111,590	543,888	1,305,614	2,344,593
	15SCIENCE	-	42,411	21,266	-	92,592	156,269
	20SCIENCE	-	24,498	-	16,477	20,861	61,836
	3OTHER	-		-	9,510	-	9,510
	5OTHER	-	28,848	29,897	21,474	22,917	103,136
	5SCIENCE	7,567	62,847	60,014	164,961	147,765	443,154
Equipment Total		7,567	580,121	258,595	774,206	1,639,495	3,259,984
Plant	15YEARS	-	-	7,688	-	-	7,688
Plant Total		0	0	7,688	0	0	7,688
Vehicles	10HEAVY	-	-	1,205	16,186	27,877	45,268
	5YEARS	6,676	-	31,577	3,957	2,117	44,327
	6HEAVY	-	-	15,172	-	-	15,172
	7HEAVY	4,471	-	8,189	8,676	24,773	46,109
Vehicles Total		11,147	0	56,143	28,819	54,767	150,876
Grand Total		18,714	580,121	322,426	1,194,779	1,694,262	3,810,302

2. Calculation of Depreciation

Major Category	*Equipment pools*	CSD	FSD	APSD	AESD	VSD	Total
Boats	10 BOATS	0	0	0	180	0	180
	20BOATS	0	0	0	39,085	0	39,085
	10OTHER	0	7,603	7,166	3,579	9,949	28,297
Equipment	10SCIENCE	0	76,700	22,318	108,778	261,123	468,919
	15SCIENCE	0	5,655	2,835	0	12,346	20,836
	20SCIENCE	0	2,450	0	1,648	2,086	6,184
	3OTHER	0	0	0	6,340	0	6,340
	5OTHER	0	11,539	11,959	8,590	9,167	41,254
	5SCIENCE	3,027	25,139	24,006	65,984	59,106	177,262
	15YEARS	0	0	1,025	0	0	1,025
Plant	10HEAVY	0	0	241	3,237	5,575	9,054
Vehicles	5YEARS	2,670	0	12,631	1,583	847	17,731
	6HEAVY	0	0	5,057	0	0	5,057
	7HEAVY	1,277	0	2,340	2,479	7,078	13,174
		6,974	129,086	89,578	241,483	367,277	834,398
Annual Depreciation % based on assumed original asset values							**10.9%**

3. Calculation of Divisional R&D Equipment Occupation

% Research Allocation	FSD	APSD	AESD	VSD	Total
Total Research	21.6%	42.0%	42.7%	9.5%	
Allocated boats	0	0	167,279	0	**167,279**
Allocated equipment	125,306	108,610	330,586	155,752	**720,254**
Allocated plants	0	3,229	0	0	**3,229**
Allocated vehicles	0	23,580	12,306	5,203	**41,089**
					931,851

4. Calculation of Annual Divisional R&D Equipment Depreciation

10% Depreciation	FSD	APSD	AESD	VSD	Total
Total Research	25,061	27,084	102,034	32,191	**186,370**

7.5 Net Present Values

7.5.1 The following table summarises the net present values as calculated for the base case and for option 1 in Appendix G. Based on the various assumptions made, Option 1 has a lower net present cost of £212m as compared to £224m for the base case.

Table 7.5: The Net Present Values of the Base Case and Option 1

Option Title	**Net Present Value (£)**
Base Case / Status Quo	224,303,570
1: Separation from DARD of the Provision of Educational & Scientific Services	212,070,246

SECTION 8: NON-MONETARY COSTS AND BENEFITS

8.1.1 Non-monetary costs and benefits of education and R&D exist in both the public and the private sectors. The lists below identify some of the important areas in which they arise. For this purpose it is essential to recognise that this list is only illustrative and that, in evaluating options, all those affected need to ensure that non-monetary considerations which apply to them are fully taken into account.

(a) Environmental non-monetary costs and benefits:

- impact on wildlife, habitat and the aesthetic value of the countryside;
- pollution of soil, water and air;
- provision of access for unpaid recreation etc.

(b) Impacts on rural communities:

- number of people employed;
- impact on the built environment as demand rises for specialist buildings and transport facilities change.

(c) Impacts on animal welfare:

- animal feeding, breeding and housing;
- selection of animals for intensive or extensive systems of production.

(d) The integrity of the system, its impact on public confidence and the trust people feel in their food supply. This requires transparency, including:

- a clear separation of the customer and the contractor so that objective judgements are seen to be made about R&D funding and educational provision;
- evidence that the surveillance function prevents unsafe food reaching consumers or animal disease affecting livestock thereby giving assurance that the diagnostic, analytical and enforcement procedures work.

(e) Managerial non-monetary costs and benefits:

- efficiency - avoidance of duplication, focus on issues of importance to the public, incentives to minimise cost, delivery of high quality service;
- a capacity to recognise and to respond to a changing environment, in emergency situations and in relation to more gradual changes in the economy, in society and in the expectations of the public.

(f) Effective communication with the stakeholders:

- ensuring awareness of relevant new technology, providing decision takers with information to enable them to apply new advances in a cost-effective and safe manner;
- ensuring that all stakeholders have a voice in the development of R&D programmes.

(g) Social and community costs and benefits:

- enhancing the capacity of the public to make informed judgements about the food and farm sector, education including lifelong learning, in relation to productive methods, environmental impacts and diet-related health consideration;
- creating opportunities for individuals to attain their potential through appropriate education along both formal and informal channels.

(h) Personal job satisfaction:

- many people, including farmers and scientists, derive satisfaction from their work; in agriculture, contact with nature, producing food and maintaining family responsibilities all embody non-monetary values.

8.1.2 This list illustrates some of the very wide range of costs and benefits to which money numbers based on transactions in a market place cannot be attributed. Attempts are sometimes made to provide surrogate money numbers based on a variety of techniques. These can involve, for example, asking people hypothetical questions about their willingness to pay, observing spending behaviour - for example, how much they spend on travel or how specific environmental characteristics may relate to differences of property prices in adjacent areas. A great deal of ingenuity is deployed inventing such measures. Where this leads to relatively consistent results, this adds confidence to the procedure.

8.1.3 Such measures can help to inform discussion but they do not solve the problem of incorporating non-monetary values in economic appraisals. In part, this is because the numbers generated can often depend upon the particular questions posed, the way in which they were framed and the people who were consulted. Still more, to conduct such analyses over the entire range of relevant non-monetary values is clearly impracticable.

8.1.4 This inability to attach defensible money numbers to alternative systems which involve non-monetary costs and benefits was acknowledged by the Review Panel. We, therefore, in considering alternatives had to consider whether options were likely to be more or less efficient in giving recognition to such values when decisions about future educational and R&D systems are made.

8.1.5 Such decisions are essentially the outcome of political processes and it is in no way the role of a Review Panel to substitute its own judgements for those of the population, expressed through the mechanisms of government.

However, the concerns expressed about aspects of the existing system, such as the transparency of the system, the freedom of individuals to express dissenting views and the ability of stakeholders to make their priorities known, all reflect the practical importance of these considerations.

In the following paragraphs the Review Panel draw attention to a number of specific non-monetary aspects under each alternative option. However, we are clear that these have to be supplemented by evidence from all those affected and will include issues not mentioned in this analysis.

OPTION 1: THE SEPARATION FROM DARD OF THE PROVISION OF EDUCATIONAL AND SCIENTIFIC SERVICES

8.1.6 The non-monetary benefits of this option are discussed fully within Section 9.

OPTION 2: A UNIVERSITY COLLEGE OF AGRICULTURE, FOOD AND RURAL DEVELOPMENT

8.1.7 There are non-monetary issues relating to the extent to which degrees from the new college would be accepted as equivalent to those currently delivered by established universities. It is also important that in any region, a range of higher education options is available to students and to employers. This is currently represented by the more traditional QUB approach – and the less traditional DARD College approach. A consequence of amalgamating both into the University College would be to eliminate one or other approach or to generate a composite one. In either case, the richness and diversity of choice currently available in Northern Ireland to students and to industry would be severely curtailed.

OPTION 3: DARD PURCHASES ITS REQUIREMENTS FROM OTHER AGENCIES

8.1.8 The non-monetary costs and benefits are likely to dominate. There is an understandable wish to retain local talent in Northern Ireland. Where day-to-day contact with the agri-food industry is involved, local knowledge and the

trust of the local community is necessary to ensure an effective service. Bringing in external experts, who are working to secure a profit for their companies, may fail to deliver what is needed, not because of lack of skill but from loss of confidence in them by the community.

8.1.9 A critical feature of any system concerned with rapid response to disease or food safety issues is the ability to mobilise a greatly increased cohort of trained and trusted staff at short notice. In this sense, retaining a larger wholly owned DARD capacity could be seen as an insurance policy.

OPTION 4: DARD AS AN ADVOCATE RATHER THAN A PROVIDER

8.1.10 Even though a radical change in costs is not expected, this is not a negligible consideration because it would mean that spending on agriculture and food would have to be clearly justified in the overall provision of science and educational services. The special role of agriculture in the life and economy of Northern Ireland has been the foundation of this provision in the past. It is still of great importance but, as the economy develops, it is likely to diminish.

OVERVIEW OF THE OPTIONS

8.1.11 The Review Panel has considered differing ways in which the service now provided might be organised. None of them have shown possibilities of rapid and dramatic savings if the current level of provision is to be maintained. Any of them would impose considerable change on the operation of the present system. However, our view is that they represent ways in which some important deficiencies of the present system could be addressed.

We conclude, therefore, that a fundamental change in present procedures is possible and called for. In bringing this about, a guiding principle must be that a new system will lead to a continuing pressure towards the more efficient use of resources.

SECTION 9: RECOMMENDATIONS

9.1 INTRODUCTION AND RECOMMENDATIONS

The Review Panel proposes the following system for the delivery of education and R&D and related technology transfer in agriculture and food science in Northern Ireland. In arriving at our conclusions, we have taken account of the information, opinions and data provided to us and of the wider context.

Our recommendations consist of seven related elements, which are:

- a new central decision taking system;
- transfer of the School of Agriculture and Food Science to either the Queen's University of Belfast or the University of Ulster;
- transfer of the teaching function of each of the DARD Colleges to the neighbouring Institute of Further and Higher Education (FE Institute);
- establishment of a Non-Departmental Public Body to be called, for the purposes of this report, the Northern Ireland Agriculture and Food Research Institute;
- inclusion of the Agricultural Research Institute of Northern Ireland within NIAFRI;
- establishment of a new technology transfer facility within NIAFRI;
- introduction of a competitive bidding process for DARD funded R&D.

These elements are outlined below.

9.2 THE CENTRAL DECISION TAKING PROCESS

9.2.1 Our proposed new central decision taking process has been outlined in Section 5.4 and it is restated here for completeness.

The objective of the system (outlined in Diagram 5.1) is to ensure that there is a clear separation of customer and contractor, that decisions are informed by both scientific and technical concerns, that they are in line with the overall policy of the government of Northern Ireland and that the decision taking process is transparent. The system, which would deal with R&D and technology transfer as well as education in agriculture and food science, allows for access at a number of levels by industrial and other interests. All proposals would be assessed by an Independent Expert Advisory Committee, which would consider proposals originating within DARD and from external agencies.

The main characteristics of this system are:-

(a) Policy decisions would, as at present, be taken by the Minister of Agriculture and Rural Development on advice from the Permanent Secretary and the Minister would continue to be open to representations from all stakeholders and from colleagues within the Executive and the Assembly.

(b) The Permanent Secretary would be advised by senior professional staff, namely the Chief Scientific, Chief Veterinary and Chief Agricultural Officers, here described as the Professional Advisors. It would be their task to assess proposals put forward in terms of their scientific content, their economic significance and their cost. They would be independent of the providers of the services over whom they would have no managerial control, a situation which would differ significantly from the existing arrangements. The role of these providers is described in the options considered below.

(c) Implementing DARD policy involves commissioning work and monitoring performance. Responsibility for the detailed scientific evaluation and monitoring of performance of the agreed work would lie with the Professional Advisors. The preparation and negotiation of contracts with suppliers would be undertaken by a contract commissioning unit which would report to the Professional Advisors and liase with the Permanent Secretary.

(d) Provision would be made for the Professional Advisors to receive formal advice from an Independent Expert Advisory Committee. It is suggested that this should consist of an independent chairman and approximately ten members. Its members would be appointed using clearly defined criteria; they would be people of the highest quality from science and industry selected in accordance with their scientific skills and professional interests. The Professional Advisors would have observer status at these meetings.

(e) The Independent Expert Advisory Committee would receive representations regarding education and R&D in agriculture and food science from consumers, the agri-food industry and other stakeholders, including scientists, local government and non-governmental organisations (NGOs). The Committee would establish ad hoc working parties to take an independent and expert view of particular proposals. Although it would not include any DARD officials or personnel from any service provider, it would be able to invite such staff and any other experts it chooses, to make presentations to the committee or to serve on its working parties.

(f) The minutes of the Independent Expert Advisory Committee meetings and the recommendations it makes should be published and submitted formally to the Professional Advisors. They would consider all proposals in the light of the advice given, the available resources and government policy before making their own formal recommendations to the Permanent Secretary. In order to maintain transparency, such recommendations should also be published.

9.2.2 The benefits which would be facilitated by this process are:

- a clear distinction between those commissioning the R&D and those delivering it;

- the provision within DARD of professional advice on its R&D, technology transfer and education programmes, irrespective of where these functions are delivered;

- a transparent mechanism for external experts to comment and advise on the education, R&D and technology transfer programmes;

- a method by which interested organisations can have input to those programmes and to know what advice had been given and what decisions have been taken within the system;

- a facility to establish working groups to assist the external advisors on specific topics;

- a facility within DARD to commission and monitor the outputs delivered**.**

9.2.3 There is yet another unmet challenge and it is that DARD must choose to pursue a limited range of disciplines and topics to be covered by its own R&D programmes. This is neither surprising nor worrying - much larger countries have accepted for some time that they cannot afford to cover all desirable R&D areas and topics, such is the huge cost of international quality R&D. This new structure would facilitate rational choices being made for Northern Ireland regarding R&D priorities.

9.2.4 Decisions by the Minister of Agriculture and Rural Development on which areas of R&D to pursue should in our view be taken in the light of the overall R&D programmes, for agriculture and food, throughout the rest of the UK and in ROI. We feel that much could be gained through a co-ordinated approach to achieve this objective.

9.3 UNDERGRADUATE AND POSTGRADUATE TEACHING AND RELATED R&D

9.3.1 The Review Panel recommends the transfer of the existing undergraduate and postgraduate teaching and related R&D provision to the Queen's University of Belfast or the University of Ulster. The choice of university would be a matter for negotiation between DARD and the named universities based, perhaps, on a competitive tendering process.

9.3.2 The details of the proposed transfer of students and staff would be a matter for the appropriate legislation and for detailed discussion between the university, DARD, the relevant Trade Unions and individuals; the Review Panel has neither the competence nor the remit to engage in such important and detailed discussions. However, the following indicative arrangements may help to resolve potential ambiguities regarding our recommendations.

(a) All current undergraduate and postgraduate students – and all new enrolments in the future – would transfer to the appropriate school in the university. It is expected that the university would then address issues such as increasing student intake, diversifying programmes and attracting foreign students.

(b) A number of existing Science Service staff would be transferred to the university on an agreed basis, together with their R&D interests.

(c) Should the university researchers require access to R&D facilities within NIAFRI, or to engage NIAFRI staff to provide part-time teaching, this could be accommodated via a service level agreement which would also provide for appropriate financial transfers.

(d) Should NIAFRI wish to involve the university in any of its R&D programmes, formal contracts could be drawn up to provide for this, as and when required. Such contracts would provide for the transfer of funds between the two bodies.

(e) Appropriate accommodation for students and staff – laboratories, classrooms, staff common room, staff offices, for instance – could be identified and made available to the university by agreement with NIAFRI or DARD.

(f) Access to facilities at Newforge Lane and at other NIAFRI sites could be made available to university and NIAFRI staff and students on terms to be agreed.

(g) Appropriate funding would transfer to DEL and be applied using the relevant funding formula. This may require transitional funding arrangements.

(h) DARD would continue to have a policy input into the university's agriculture and food teaching and R&D provision.

9.3.3 We believe that many benefits would flow from our proposals.

(a) It would allow the university to pursue an R&D policy for agriculture and food science in Northern Ireland which would be complementary to established DARD policy. This alternative source of R&D, with its attendant expertise could become an independent critic of, or commentator on, DARD policy, something which is prominently and worryingly absent from current arrangements.

(b) Because of the university's independence from government, it could seek private sector funding to support teaching and R&D functions, it being the case that donors are not willing to contribute philanthropic funds to government.

(c) Full integration into the university would encourage the development of a greater interaction between agriculture and food science teaching and R&D and the many other academic specialisms represented in the university. We believe that this would broaden the scope of R&D

undertaken and the breadth of academic taught programmes would expand well beyond the current range of options.

(d) Government Accounting Rules regarding earned income – whereby such income is liable to be returned to the Exchequer – would not apply under this new arrangement. This would encourage staff to seek alternative sources of income.

(e) The arrangement would greatly facilitate more extensive R&D and teaching interaction with the wider university community. It would also facilitate a greater influence by the university on the R&D activities of the staff involved and hence on future RAE gradings.

(f) The ambiguous and unsatisfactory position of the management of SAFS - referred to by respondents - would be resolved in that the management arrangements would align with those in the university.

(g) Resource allocation would be brought into line with that of the university with the potential for a reduction in unit costs of taught courses. There would be greater transparency regarding the allocation of resources between the university and the science activity of NIAFRI, thereby removing most of the considerable and unresolved ambiguity which exists within the current system.

9.4 THE DARD COLLEGES

Teaching function

9.4.1 We recommend that the teaching function both staff and related resources, at DARD Colleges should be integrated with appropriate local Further Education Institutes. The pairings which seem appropriate to each college are as follows, though we suggest that final decisions on this matter should emerge from a detailed consideration by DEL and DARD and the relevant institutes. The suggested pairings are:

- Enniskillen College with Fermanagh College;
- Loughry College with East Tyrone College;
- Greenmount College with North East Institute.

9.4.2 In the course of arriving at our recommendation, we considered a number of possibilities including:

- merging the DARD Colleges into one institution, which we rejected because economies could not be achieved due to the distance between the colleges and the low combined student numbers;

- merging them individually or collectively with a university, which we rejected because this would undermine the special focus of these colleges, as they would be dominated by university philosophies regarding the approach to provision, curricular content and student transfer.

9.4.3 Many details within these proposals will be determined by appropriate legislation and negotiation between DARD, DEL, the FE Institutes, Trade Unions and individuals. The following ideas, therefore, represent broad brushstrokes which provide a more general picture as to how the new arrangement would be put into operation.

(a) The DARD Colleges teaching functions, both staff and resources, would become integrated with the FE Institutes.

(b) The membership of the Board of Governors of each of the enlarged Institutes could be augmented to ensure that the agri-food industry would be adequately represented**.** It would be appropriate also to put in place an Advisory Board for Agriculture, Food and Rural Development, including industry representatives, in each of the three FE Institutes.

(c) This teaching function being, under these proposals, part of the general further education/higher education provision, would become the responsibility of DEL. This would mean that the relevant funding would

transfer to DEL with an appropriate funding formula applying. It is recommended that transitional funding arrangements should be put in place to allow for a gradual hand over of funding responsibilities from DARD to DEL. However, DARD should continue to have a policy input into the teaching provision which was formerly in the DARD Colleges.

Technology Transfer

(d) The technology transfer activities and resources of the colleges would be transferred to a technology transfer facility within NIAFRI. It is stressed that these resources could remain in their current location in order to ensure local involvement and service – a particular and strong feature of the current arrangements.

Development work

(e) The development work of the DARD Colleges, currently carried out under the technology transfer banner, would transfer to an appropriate applied R&D unit within NIAFRI, with resources remaining at their present locations.

9.4.4 The rationale for our proposals is as follows:

(a) The evidence we received indicated substantial satisfaction with the quality and range of the education provided, though there were some claims from industry that its needs, particularly at the lower levels of course and skills provision, are not being fully met. Their commitment to technology transfer was accepted as being dedicated and of a good standard. We believe that our proposals would ensure that the standards delivered by the existing system would at least be maintained.

(b) Some reservations were expressed regarding existing attention to, and capability in, rural development and diversification which, for success,

depend on subjects and disciplines which are not generally found in agricultural colleges.

(c) The data on the student population of each college – contained in the Appendix D – show that each college, though excellent, is rather small and economically unviable with full-time equivalent student numbers of 331, 247 and 117 giving a total of 695. A contrast with the size of Further Education Institutes was made where the average student population was 1,300 full time equivalents, which the Review Panel noted was significantly greater than the combined full-time equivalent student numbers of all three colleges.

(d) The inevitable consequence of such small size is that unit costs per student are necessarily increased due to the small size of the DARD Colleges. We believe that such costs are unsustainable, even in the short term, particularly when national budgets will be put under further pressure.

(e) It is reasonable to assume that student numbers in traditional agriculture will fall as employment opportunities decline. If left as they are, the DARD Colleges are likely to face a bleak future within the next decade.

9.4.5 Our proposal would have a number of positive aspects:

(a) As the teaching function of the DARD Colleges would be part of an incorporated institute there would be greater freedom to innovate and to attract and retain income from sources other than government and to interface with and be influenced by the needs of the agri-food industry.

(b) The outcome would mean no diminution of support for or presence in the local communities associated with each existing college. Indeed it would make the college facilities available and attractive to a wider range of people.

(c) It would reduce costs through the economies of scale which would flow from being a part of a larger institution.

(d) It would, potentially, add to enrolments in agriculture and food programmes since the FE and HE students in the institutes could avail themselves of modules in the former DARD Colleges in order to enhance the range of skills which they could develop.

(e) The students at the former DARD Colleges could broaden their range of knowledge and skills in complementary areas by studying modules in a wide range of subjects including management, marketing, foreign languages and economics.

(f) Incorporation status would make it possible for extra income to be earned and retained in relation to the teaching function which would otherwise have been liable to be returned to the Exchequer under Government Accounting Rules.

(g) Much new activity could be anticipated:

- new programmes could evolve as industry requirements change;
- a wider range of educational provision for the local community adjacent to the college and for the agri-food industry throughout Northern Ireland could be developed;
- development of provision to support rural development and diversification would be expected.

9.5 NORTHERN IRELAND AGRICULTURE AND FOOD RESEARCH INSTITUTE

9.5.1 The Review Panel's recommendation is that a Non-Departmental Public Body (NDPB) - named the Northern Ireland Agriculture and Food Research Institute for the purposes of this report – should be established. NIAFRI would consist of all of the existing Divisions within the Science Service (excluding SAFS)

together with ARINI as well as the relevant personnel and resources currently engaged in the technology transfer activity of AFDS ie the technology transfer and development work currently undertaken by DARD Colleges. The details of the technology transfer changes are developed in Section 9.7.

9.5.2 We recommend most strongly that NIAFRI should have an autonomous governing body consisting of an independent chairman and also members of the highest quality from science and industry, including from outside Northern Ireland, chosen in accordance with their scientific skills and professional interests.

It should have a Chief Officer – with an appropriate title. He or she, together with the heads of units, would constitute the top management team of NIAFRI.

9.5.3 The NIAFRI Management Statement and Financial Memorandum should ensure that its functions and scope would be defined clearly, requiring that it would inter alia:

- continue to receive funds from DARD in respect of many of its functions;
- be accountable to the Comptroller and Auditor General;
- retain income earned for any valid purpose of NIAFRI;
- be free to establish companies, owned in whole or in part by NIAFRI;
- respond to requests for assistance by DARD or the Northern Ireland Executive in emergencies;
- provide services such as teaching, R&D, diagnostic and testing to other bodies and be remunerated for such services;
- collaborate with any body within Northern Ireland, GB or any other country;

- undertake, as competent authority, a range of appropriate statutory functions on behalf of DARD; legal guidance available to us indicates that NIAFRI could undertake this role, provided it is clearly set out in the Management Statement and Financial Memorandum;

- should be subject to scrutiny of its programme of work by the Independent Expert Advisory Committee, which forms part of our recommended central decision taking process;

- develop a focused R&D programme which would complement or be complemented by those of neighbouring jurisdictions, thereby extending the overall range of R&D for the benefit of Northern Ireland.

9.5.4 The Review Panel considered, in separating the Science Service from DARD, whether an Executive Agency or a Non-Departmental Public Body would be the most appropriate new organisational arrangement. Whereas it was clear that an NDPB could, depending on how its status and remit were defined, be as non-autonomous as an Executive Agency, it was equally clear that an Executive Agency could not have the same freedom of operation and execution provided for it, as could an appropriately established NDPB.

9.5.5 The rationale for and benefits of our proposals are seen as:

(a) The freedoms which the NDPB status could confer on NIAFRI are vitally important, not only for the service which it must provide, but also for its ability to innovate and to lighten the burden of financial support from the shoulders of government. Being a formal part of the Civil Service – which the status quo (or indeed Executive Agency status) formalises – brings with it constraints in operational freedom which are entirely proper to the Civil Service but which are equally inappropriate for organisations which are meant to be innovative, entrepreneurial and responsive to external needs and to engage with the business community.

(b) The establishment of NIAFRI would create a broadly based, multi-disciplinary body spanning all of the major agriculture and food disciplines. It would ensure a broad response to and engagement in R&D, regulatory, diagnostic and other aspects of the needs of the agri-food sector in Northern Ireland. It would also lend itself to taking on a range of wider government R&D e.g. environmental as well as other government scientific work including water quality monitoring.

(c) There is also the substantial issue of Government Accounting Rules which, while appropriate for Civil Service bodies, would operate as a disincentive to attracting funding from external resources.

9.6 THE AGRICULTURAL RESEARCH INSTITUTE OF NORTHERN IRELAND

9.6.1 Having considered and balanced all of the evidence made available to us, we recommend that ARINI should be an integral part of NIAFRI. It would, as a result, have a close relationship with the other units of NIAFRI and, therefore, the disciplines which they represent.

9.6.2 The rationale for and potential benefits of our proposal include the following:

(a) The evidence presented to the Review Panel contained some very favourable comment on the work of ARINI. However, some concerns were expressed regarding the lack of independence of ARINI from DARD and the lack of a close relationship with relevant parts of the Science Service – and vice versa. There was also concern expressed regarding the relatively narrow R&D span of ARINI and the need to place these disciplines in closer proximity, in organisational terms, to the many disciplines represented by the Science Service. Our proposal can serve to meet these concerns.

(b) There were mixed messages regarding the influence which industry had on the ARINI R&D programme, and much adverse comment on the relatively low priority perceived to be accorded by it to technology

transfer to the agri-food industry. The existence of the new technology transfer facility in NIAFRI would provide the underpinning support structure which can guarantee the regular and complete transfer of knowledge regarding the outcomes of the latest ARINI R&D projects to the agri-food industry; it would also have that, necessarily greater, autonomy, vis-à-vis DARD, which is significantly absent from the current arrangements.

9.7 TECHNOLOGY TRANSFER

9.7.1 We recommend the establishment within NIAFRI of an integrated technology transfer facility, perhaps a division, in agriculture and food science in Northern Ireland. It would:

- integrate the technology transfer work currently carried out at the DARD Colleges and by the Science Service and ARINI; and

- harvest the outcomes of R&D - published or unpublished – in universities and R&D institutions in Northern Ireland and world wide for the benefit of the agri-food industry in Northern Ireland.

9.7.2 (a) This facility would be responsible for the effective delivery of technology transfer throughout Northern Ireland. Its work should be included in a multi-annual rolling plan for NIAFRI which would include technology transfer. NIAFRI's annual report should include specific account of technology transfer and be subject to regular and detailed scrutiny by DARD.

(b) As already outlined in Section 9.4.3 (d) above the technology transfer resources, both human and physical, currently within the DARD Colleges would be united with corresponding resources currently within the Science Service and ARINI under a new technology transfer facility within NIAFRI. This does not imply a change in the present distribution of technology transfer resources throughout Northern Ireland. However, in the longer term this will have to respond to changing needs.

9.7.3 The rationale for, and potential benefits of, this arrangement are:

(a) In Chapter 4 of the Review Panel Report, we pointed out the important role which technology transfer plays in bringing the outcomes of R&D programmes to the attention of the agri-food industry and the challenge that exists for the institutions to help that industry in applying these outcomes to improve existing processes and products and in helping to develop new products.

(b) It is clear that the existing Science Service and AFDS, including the DARD Colleges and ARINI, have all had an important and, we suggest, an interlinking role in relation to technology transfer.

(c) It is also clear from the evidence presented that whereas there are many successes to which the current system can properly lay claim, the picture is not uniformly positive. Evidence suggests that some parts of the current system pay too little attention to the technology transfer function and, in addition, there appears to be inadequate collaboration between the various players.

(d) DARD has opted to invest in R&D related to its highest priorities and yet, there is R&D being undertaken in other countries whose results, where applicable to local circumstances in Northern Ireland, could make a very significant contribution to Northern Ireland's agri-food industry. A technology transfer facility in NIAFRI would better ensure that the agri-food industry in Northern Ireland is kept abreast of relevant world wide developments.

9.8 COMPETITIVE TENDERING FOR R&D FUNDING FROM DARD

We recommend that, in principle, all R&D funds should be open to competitive tendering. It is for DARD to determine what resources or capacity it needs to have control over or to have available to it. DARD would also take into account the need to retain certain scientific facilities in Northern Ireland.

The central decision taking process described in Section 5.4 would provide the mechanism for DARD to make informed, objective and transparent decisions on R&D funding. The funding for technology transfer, diagnostics, analytical, monitoring, surveillance and enforcement work would be dealt with separately.

The rationale for, and benefits to be derived from, this proposal are listed below.

(a) Evidence was presented to the Review Panel criticising what was regarded as a non-competitive system in relation to the allocation of R&D funds. We received representations arguing that a significant percentage of R&D funds should be made available for competitive bidding by universities and R&D bodies.

(b) It was also put to us that the structure currently in place within DARD and the Science Service, if applied to a competitive bidding process or competition, would necessarily be judged by one of the competitors and that this would generate issues regarding transparency and balance in relation to the resultant decisions. This issue would be resolved under our proposals to distinguish between customer and contractor in the new central decision taking process for education, R&D and technology transfer, which we have already described in Section 5.4.

9.9 SUMMARY

Major changes to the agri-food industry have been taking place for some years now and there is every likelihood that these changes will accelerate and will become increasingly difficult to anticipate or to make an adequate response. In this context, adhering to the status quo – or to a system close to the status quo- will not, in our view, serve Northern Ireland well.

It is the strongly held view of the Review Panel that the full implementation of our proposals will further enhance the quality and cost effectiveness of the services provided to the agri-food industry in Northern Ireland.

The Review Panel advocates the full adoption of our recommended new system as providing the best future for all of the services – educational, R&D, technology transfer, diagnostic, analytical, monitoring, surveillance and enforcement work – which Northern Ireland will require.

APPENDIX A

SCIENCE SERVICE SITES

Agriculture and Food Science Centre, Newforge Lane, Belfast

Food Science Division
Applied Plant Science Division
Agricultural and Environmental Science Division
Agricultural and Food Economics Division
Biometrics Division

Veterinary Sciences Division, Stormont, Belfast

Veterinary Sciences Division, Omagh

Northern Ireland Plant Testing Station, Crossnacreevy

Northern Ireland Horticultural and Plant Breeding Station, Loughgall

River Bush Salmon Station, Bushmills

Marine Research Vessel "Lough Foyle", based in the Port of Belfast

The Agricultural Research Institute of Northern Ireland, Hillsborough

Note: ARINI is a quasi-autonomous Non-Departmental Public Body, established in 1927 by Act of Parliament. It is managed by a Board of Trustees, including some DARD officials. The Director of the Institute and its project leaders are DARD civil servants.

APPENDIX B

STUDENTS ENROLLED AT THE SCHOOL OF AGRICULTURE AND FOOD SCIENCE

SAFS, UNDERGRADUATE DEGREE COURSES

Agriculture, BAgr

Agricultural Science, BAgr/BSc

Agricultural Technology, BSc, (in collaboration with Greenmount Agricultural College)

Animal Science, BSc

Agricultural Economics and Management, BSc

Food Science, BSc

Food Technology, BSc

Microbiology, BSc

Plant Science, BSc (not available for entry after 2001)

Table 1

Bachelor Degrees awarded by the SAFS at QUB

Subject Area	**1997**	**1998**	**1999**	**2000**	**2001**	**% Δ 97 - 01**
Agriculture	11	19	21	26	20	81.8
Animal Science	**NA**	NA	NA	NA	NA	NA
Food Science	16	9	5	13	13	-18.8
Food Technology	5	8	1	0	0	-100.0
Plant Science	0	0	0	0	0	0
Microbiology	3	1	1	0	1	-66.7
Agricultural Economics and Management	14	19	20	17	14	0
Agricultural Science	0	3	3	6	2	0
Agricultural Technology	NA	NA	NA	NA	NA	NA
Total	**49**	**59**	**51**	**62**	**50**	**2.0**

NA = Not applicable. The first graduates from Animal Science and Agricultural Technology are due to graduate in July 2002.

Table 2

New Undergraduate Enrolments in QUB SAFS

Number of New Enrolments	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**% Δ 96/97 - 00/01**
Agriculture	26	36	25	16	11	
Animal Science				7	5	
Food Science	22	20	15	16	13	
Food Technology	3	1	3	0	2	
Plant Science	0	0	0	0	0	
Microbiology	0	3	7	1	0	
Agricultural Econ. & Management	26	23	19	13	5	
Agricultural Science	8	4	3	2	1	
Agricultural Technology			6	8	8	
Total	**85**	**87**	**78**	**63**	**45**	**-47.1**

Although a number of new courses have been introduced during this period, numbers enrolling on some of the courses offered (Agricultural Economics and Management, and Agricultural Science) have fallen in 2000/01 to less than 20 per cent of the number of students who commenced study in 1996/97. Overall first year enrolment has fallen by just over 47 per cent during this five year period.

SAFS, POSTGRADUATE COURSES

MSc/Graduate Diploma in Food Science

MSc/Certificate in Food Safety Management, Part-time

Table 3

Postgraduate Enrolments in QUB SAFS

Number Of Postgraduate Students	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**% Δ 96/97 - 00/01**
Research	**120**	**107**	**132**	**103**	**86**	**-28.3**
Full-time	66	52	59	47	41	-37.9
Part-time	31	34	32	24	21	-32.3
Thesis only	23	21	41	32	24	4.4
Taught Courses[1,2]	**12**	**9**	**34[3]**	**55**	**38**	**216.7**
TOTAL	**132**	**116**	**166**	**158**	**124**	**-6.1**

[1] Postgraduate students enrolled in SAFS in the MSc/Dip/Cert in Communication, located at Loughry, are not included in these figures but are included in the total for DARD Agricultural Colleges.

[2] Postgraduate students in Rural Studies at the Gibson Institute are not included in these figures.

[3] The taught course in Food Safety Management was introduced in 1998/99.

The total number of postgraduate student enrolments in the School of Agriculture and Food Science at QUB has fallen only slightly (-6.1%) over the last five years.

APPENDIX C

STUDENTS ENROLLED AT THE DARD COLLEGES

Table 1

Total Students Enrolled at the Colleges

Enrolments	96/97	97/98	98/99	99/00	00/01	% Δ 96/97 - 00/01
Enniskillen[1]						
Full-time	94	140	130	142	137	45.7
Part-time	190	181	137	130	99	-47.9
Total	**284**	**321**	**267**	**272**	**236**	-16.9
Greenmount						
Full-time	388	414	353	353	315	-18.8
Part-time	426	453	387	444	404	-5.2
Total	**814**	**867**	**740**	**797**	**719**	-11.7
Loughry						
Full-time	257	274	279	281	247	-3.9
Part-time	68	121	128	185	205	201.5
Total	**325**	**395**	**407**	**466**	**452**	39.1
Three Colleges						
Full-time	739	828	762	776	699	-5.4
Part-time	684	755	652	759	708	3.5
Total	**1,423**	**1,583**	**1,414**	**1,535**	**1,407**	-1.1

[1] Student numbers at Enniskillen College include enrolments on the National Diploma in Equine Studies. Fermanagh College is the lead partner in this course but students are based in Enniskillen College.

Table 2

Total Students Enrolled at the Colleges, Full-time Equivalents

Enrolments	96/97	97/98	98/99	99/00	00/01	% Δ 96/97 - 00/01
Enniskillen						
Full-time	77	98	102	108	105	36.4
Part-time	33	30	28	25	12	-63.6
Total	**110**	**128**	**130**	**133**	**117**	6.4
Greenmount						
Full-time	288	302	261	273	255	-11.5
Part-time	87	84	85	68	76	-12.6
Total	**375**	**386**	**346**	**341**	**331**	-11.7
Loughry						
Full-time	191	216	212	217	210	9.9
Part-time	19	29	31	32	37	94.7
Total	**210**	**245**	**243**	**249**	**247**	17.6
Three Colleges						
Full-time	556	616	575	598	570	2.5
Part-time	139	143	144	125	125	-10.1
Total	**695**	**759**	**719**	**723**	**695**	**0**

The calculation of FTEs for full-time students takes account if students who are out on work placements and those whose course does not last for the full academic year.

It is interesting to note that the total number of FTE students at the 3 DARD colleges remained constant during this five year period at 695, with the vast majority (over 80%) of students being full-time.

Table 3

Undergraduate Higher Education Courses at the Colleges

Enrolments	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**% Δ 96/97 - 00/01**
Enniskillen						
Full-time	27	49	63	79	89	229.6
Part-time	-	11	42	30	28	-
Total	**27**	**60**	**105**	**109**	**117**	**333.3**
Greenmount						
Full-time	79	105	105	126	118	49.4
Part-time	2	5	18	67	52	2500.0
Total	**81**	**110**	**123**	**193**	**170**	**109.9**
Loughry						
Full-time	153	176	184	175	178	16.3
Part-time	6	29	76	112	130	2066.7
Total	**159**	**205**	**260**	**287**	**308**	**93.7**
Three Colleges						
Full-time	259	330	352	380	385	48.7
Part-time	8	45	136	209	210	2525.0
Total	**267**	**375**	**488**	**589**	**595**	**122.9**

Table 4

Taught Postgraduate Higher Education Courses at the Colleges

Enrolments	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**% Δ 96/97 - 00/01**
Loughry						
Full-Time	19	14	22	28	23	21.1
Part-Time	62	92	52	73	72	16.1
Total	**81**	**106**	**74**	**101**	**95**	**17.3**

Table 5

Further Education Courses at the Colleges

Enrolments	96/97	97/98	98/99	99/00	00/01	% Δ 96/97 - 00/01
Enniskillen						
Full-time	67	91	67	63	48	-28.4
Part-time	190	170	95	100	71	-62.6
Total	**257**	**261**	**162**	**163**	**119**	**-53.7**
Greenmount						
Full-time	309	309	248	227	197	-36.3
Part-time	424	448	369	377	352	-17.0
Total	**733**	**757**	**617**	**604**	**549**	**-25.1**
Loughry						
Full-time	85	84	73	78	46	-45.9
Part-time	-	-	-	-	3	-
Total	**85**	**84**	**73**	**78**	**49**	**-42.4**
Three Colleges						-33.3
Full-time	461	484	388	368	291	-36.9
Part-time	614	618	464	477	426	-30.6
Total	**1,075**	**1,102**	**852**	**845**	**717**	**-33.3**

Table 6

Provision of Short Courses at DARD Colleges

	95/96	96/97	97/98	98/99	99/00	% Δ 96/97 - 00/01
Number of days training	8,376	14,231	18,176	17,505	18,372	**119.3**
Number of students trained	7,397	10,808	14,099	10,477	9,601	**29.8**

Appendix E: Summary of Research Projects Direct Expenditure - Financial and Time Recording Data

Activity	T&S	Non Stores	Stores	Capital	Expensed Capital	Staff	TR data reconciled to DAISY (3.21%)	Total
41400	-	-	-	-	-	670.19	691.70	691.70
41401	-	9,578.64	67.96	-	-	9,381.13	9,682.26	19,328.86
41403	-	21.28	-	-	-	1,793.37	1,850.94	1,872.22
41409	-	224.80	-	-	-	12,043.44	12,430.03	12,654.83
41412	46.75	3,256.83	353.77	-	-	33,562.02	34,639.36	38,296.71
41413	-	2,347.73	-	-	-	27,456.48	28,337.83	30,685.56
41414	-	198.15	-	-	-	-	-	198.15
41417	-	3,748.18	-	-	-	35,368.92	36,504.26	40,252.44
41418	-	-	-	-	1,435.00	-	-	1,435.00
41421	-	-	-	-	-	5,020.24	5,181.39	5,181.39
41423	-	-	89.92	-	-	-	-	89.92
41426	-	10,165.77	926.04	-	-	120,740.87	124,616.65	135,708.46
41428	-	15,739.80	-	5,026.00	-	216,494.93	223,444.42	244,210.22
41430	150.00	8,770.93	278.06	-	-	87,620.30	90,432.91	99,631.90
41431	-	464.76	26.23	-	-	-	-	490.99
41433	-	892.26	220.65	-	-	4,033.23	4,162.70	5,275.61
41439	-	7.38	-	-	-	861.40	889.05	896.43
41440	-	-	-	-	-	23,429.50	24,181.59	24,181.59
41441	-	-	-	-	-	554.90	572.71	572.71
41444	-	796.44	-	-	-	9,273.97	9,571.66	10,368.10
41448	-	5.09	-	-	-	-	-	5.09
41450	-	-	-	-	-	4,150.54	4,283.77	4,283.77
41452	-	-	-	-	-	213.24	220.09	220.09
41457	-	-	-	-	-	290.30	299.62	299.62
41464	-	126.16	-	-	-	-	-	126.16
41465	-	223.69	-	-	-	285.64	294.81	518.50
41468	-	539.36	-	-	-	20,134.55	20,780.87	21,320.23
41469	-	1,850.14	39.30	-	-	49,310.71	50,893.58	52,783.02
41470	-	-	-	-	-	5,705.17	5,888.31	5,888.31
41471	-	689.29	134.53	-	-	54,692.24	56,447.86	57,271.68
41473	-	-	-	-	-	135.66	140.01	140.01
41475	-	26,305.22	682.34	-	9,248.27	67,282.46	69,442.23	105,678.06
41478	-	-	-	-	-	165.65	170.97	170.97
41487	-	-	-	-	-	666.45	687.84	687.84
41489	-	300.12	-	-	-	9,977.86	10,298.15	10,598.27
41490	-	-	-	-	-	27.61	28.50	28.50
41499	-	3,685.04	485.95	-	2,544.00	9,904.63	10,222.57	16,937.56
41512	-	-	-	-	-	2,089.50	2,156.57	2,156.57
41516	-	-	-	-	-	34.08	35.17	35.17
41520	-	-	-	-	-	466.78	481.76	481.76
41521	-	11,872.28	8,268.46	-	826.77	39,258.47	40,518.67	61,486.18
41524	-	-	-	-	-	4,179.04	4,313.19	4,313.19
41530	-	307.50	67.43	-	-	8,020.59	8,278.05	8,652.98
41541	-	36.08	-	-	-	3,179.89	3,281.96	3,318.04
41542	-	15,454.66	-	-	8,495.00	202,752.65	209,261.01	233,210.67
41551	-	550.00	-	-	-	-	-	550.00
41575	- -	147.00	-	-	-	598.39	617.60	470.60
41582	-	-	-	-	-	3,345.45	3,452.84	3,452.84
41583	-	30.00	47.70	-	-	-	-	77.70
41586	-	40.00	398.09	-	-	1,117.00	1,152.86	1,590.95
41588	-	1,945.44	-	-	-	220.85	227.94	2,173.38
41589	-	254.60	-	-	-	-	-	254.60
41590	-	-	66.73	-	-	789.09	814.42	881.15
41598	-	-	-	-	-	8,333.66	8,601.17	8,601.17
41611	-	1,831.02	198.71	-	-	26,175.55	27,015.79	29,045.52
41612	-	42.40	-	-	-	-	-	42.40
41613	-	300.00	-	-	-	649.70	670.56	970.56
41614	-	11,141.96	981.98	-	-	9,042.72	9,332.99	21,456.93
41616	-	205.30	-	-	-	-	-	205.30
41617	-	122.34	1,307.84	-	-	5,380.13	5,552.83	6,983.01
41618	-	-	-	-	-	34.08	35.17	35.17
41621	-	-	-	-	-	40,284.52	41,577.65	41,577.65
41623	-	2,756.50	201.10	-	-	-	-	2,957.60
41625	-	-	639.27	-	-	3,421.14	3,530.96	4,170.23
41627	-	-	-	-	-	1,490.06	1,537.89	1,537.89
41630	-	138.44	504.49	-	-	-	-	642.93
41632	-	-	-	-	-	6,220.14	6,419.81	6,419.81
41635	-	-	67.35	-	-	-	-	67.35
41636	-	-	4,194.76	-	-	561.37	579.39	4,774.15
41637	-	782.58	7,848.95	-	-	763.44	787.95	9,419.48
41638	-	-	27.20	-	-	-	-	27.20

41639	-	-	-	-	-	2,067.19	2,133.55	2,133.55
41640	-	-	121.41	-	-	-	-	121.41
41645	-	-	-	-	-	842.41	869.45	869.45
41646	-	5,164.94	1,739.85	-	-	39,667.71	40,941.04	47,845.83
41647	-	-	97.00	-	-	2,124.54	2,192.74	2,289.74
41649	284.34	27,416.37	1,368.40	-	7,421.65	126,749.49	130,818.15	166,740.23
41651	-	-	-	-	-	7,725.70	7,973.69	7,973.69
41652	-	-	-	-	-	17,033.63	17,580.41	17,580.41
41655	-	-	250.51	-	-	-	-	250.51
41656	-	-	-	-	-	9,328.05	9,627.48	9,627.48
41657	-	-	-	-	-	16,259.92	16,781.86	16,781.86
41660	-	220.00	13.52	-	-	187.62	193.64	427.16
41661	-	260.89	92.12	-	-	945.23	975.57	1,328.58
41662	-	577.34	473.12	-	-	204.48	211.04	1,261.50
41663	-	-	-	-	-	5,065.50	5,228.10	5,228.10
41664	-	-	-	-	-	19,618.37	20,248.12	20,248.12
41665	-	-	-	-	-	7,988.44	8,244.87	8,244.87
41667	-	-	-	-	-	102.25	105.53	105.53
41669	-	-	50.49	-	-	364.22	375.91	426.40
41672	-	-	11.35	-	-	-	-	11.35
41677	-	1,328.25	406.64	-	-	14,197.30	14,653.03	16,387.92
41679	-	7,182.39	-	-	-	-	-	7,182.39
41680	-	8,715.51	2,332.66	-	-	-	-	11,048.17
41681	-	63.20	6.72	-	-	-	-	69.92
41682	-	4,902.30	124.25	-	-	-	-	5,026.55
41684	-	2,106.23	292.40	-	-	9,454.04	9,757.51	12,156.14
41685	-	-	-	-	-	-	-	-
41686	-	2,860.18	20.33	-	-	22,726.18	23,455.69	26,336.20
41687	-	250.26	-	-	-	-	-	250.26
41689	-	-	-	-	-	112.24	115.84	115.84
41692	-	-	66.59	-	-	10,823.34	11,170.77	11,237.36
41693	-	-	-	-	-	1,432.52	1,478.50	1,478.50
41694	-	6,588.77	1,371.06	-	-	9,013.57	9,302.91	17,262.74
41695	-	812.60	507.50	-	-	-	-	1,320.10
41696	-	5,874.74	4,948.66	-	1,990.00	64,246.88	66,309.20	79,122.60
41697	-	-	-	-	-	4,852.86	5,008.64	5,008.64
41699	-	-	-	-	511.90	603.25	622.61	1,134.51
41700	-	10,508.66	6,064.58	-	2,770.50	30,924.34	31,917.01	51,260.75
41701	-	12,109.39	3,227.72	-	-	32,848.86	33,903.31	49,240.42
41702	-	605.67	108.96	-	-	25,438.79	26,255.38	26,970.01
41703	-	621.58	121.98	-	-	5,313.93	5,484.51	6,228.07
41704	-	184.00	76.32	-	-	5,655.11	5,836.64	6,096.96
41705	-	820.58	228.15	-	321.55	27,955.75	28,853.13	30,223.41
41706	-	-	1.33	-	-	-	-	1.33
41708	-	3,828.89	-	-	-	44,247.14	45,667.47	49,496.36
41709	-	4,406.46	-	-	-	41,413.33	42,742.70	47,149.16
41710	-	14,627.34	4,475.77	-	9,343.42	85,950.67	88,709.69	117,156.22
41711	-	-	-	-	-	1,805.20	1,863.15	1,863.15
41713	-	12.77	-	-	-	-	-	12.77
41714	-	3,860.00	-	-	-	35,479.72	36,618.62	40,478.62
41715	-	-	-	-	-	1,545.79	1,595.41	1,595.41
41716	-	-	-	-	-	55,583.40	57,367.63	57,367.63
41717	-	-	-	-	-	4,703.44	4,854.42	4,854.42
41718	-	17,290.24	628.33	-	-	45,593.63	47,057.19	64,975.76
41720	-	26.90	-	-	-	-	-	26.90
41721	-	-	-	-	-	440.47	454.61	454.61
41723	-	-	340.37	-	-	9,164.43	9,458.61	9,798.98
41726	-	1,947.89	4,012.41	-	-	38,925.10	40,174.60	46,134.90
41727	-	2,467.63	558.17	-	-	39,062.79	40,316.71	43,342.51
41729	-	6,095.00	75.54	-	-	4,858.58	5,014.54	11,185.08
41730	-	-	44.60	-	-	2,286.56	2,359.96	2,404.56
41733	-	1,965.50	254.24	-	1,176.47	11,892.48	12,274.23	15,670.44
41734	-	9,378.58	876.68	-	964.00	701.55	724.07	11,943.33
41737	-	-	15.08	-	-	-	-	15.08
41738	-	-	-	-	-	1,038.26	1,071.59	1,071.59
41739	-	82.20	-	-	-	839.82	866.78	948.98
41741	-	4,302.66	3,859.58	-	-	2,648.18	2,733.19	10,895.43
41743	-	-	-	-	-	3,793.27	3,915.03	3,915.03
41744	-	4,098.92	-	-	-	35,334.84	36,469.09	40,568.01
41745	-	10.00	-	-	-	-	-	10.00
41747	-	78.54	18.50	-	-	54,484.45	56,233.40	56,330.44
41748	-	-	-	-	-	82,653.89	85,307.08	85,307.08
41749	-	-	-	-	-	17,801.97	18,373.41	18,373.41
41750	-	838.36	465.08	-	-	15,371.35	15,864.77	17,168.21
41751	-	-	-	-	-	5,192.27	5,358.94	5,358.94
41754	-	10,622.62	1,316.12	-	-	54,263.26	56,005.11	67,943.85
41755	-	15,832.21	3,935.51	-	-	52,893.16	54,591.03	74,358.75

41756	-	8,750.72	2,145.54	-	1,800.00	62,603.94	64,613.53	77,309.79
41757	-	3,400.73	412.59	-	-	15,403.80	15,898.26	19,711.58
41758	-	2,941.31	309.52	-	-	888.26	916.77	4,167.60
41759	-	11,465.24	905.28	-	4,990.00	67,607.17	69,777.36	87,137.88
41760	-	-	493.41	-	1,372.50	-	-	1,865.91
41761	-	-	-	-	-	1,435.74	1,481.83	1,481.83
41762	-	2,350.18	689.59	-	-	284.68	293.82	3,333.59
41763	-	-	-	-	-	18,302.37	18,889.88	18,889.88
41764	9.13	7,026.48	4,132.84	-	1,673.29	59,671.26	61,586.71	74,428.45
41765	-	-	-	-	-	1,725.37	1,780.75	1,780.75
41766	-	-	-	-	-	16,058.69	16,574.17	16,574.17
41767	120.00	5,893.10	4,512.16	-	-	66,761.22	68,904.26	79,429.52
41768	-	-	-	-	-	13,685.22	14,124.52	14,124.52
41775	-	-	-	-	-	68.16	70.35	70.35
41776	-	105.11	-	-	-	5,762.75	5,947.73	6,052.84
41778	-	38.44	-	-	-	-	-	38.44
41780	-	-	3.00	-	-	-	-	3.00
41781	-	-	-	-	-	8,509.48	8,782.63	8,782.63
41785	-	-	- 194.88	-	-	836.70	863.56	668.68
41786	-	-	-	-	-	2,767.37	2,856.20	2,856.20
41789	-	-	-	-	-	511.19	527.60	527.60
41795	-	8,195.36	1,271.96	-	-	60,684.08	62,632.04	72,099.36
41797	-	2,493.11	-	-	-	335.65	346.42	2,839.53
41798	-	1,882.95	-	-	998.00	27.61	28.50	2,909.45
41803	-	18,312.04	5,522.94	-	-	30,775.83	31,763.73	55,598.71
41805	-	-	-	-	-	7,599.70	7,843.65	7,843.65
41809	-	-	-	-	-	14,148.51	14,602.68	14,602.68
41810	-	-	-	-	-	8,629.77	8,906.79	8,906.79
41811	-	690.70	-	-	-	15,991.94	16,505.28	17,195.98
41812	110.40	1,211.89	694.92	-	-	33,158.47	34,222.86	36,240.07
41814	-	-	-	-	-	19,146.02	19,760.61	19,760.61
41815	-	2,985.99	1,240.98	-	-	59,283.70	61,186.71	65,413.68
41816	-	-	-	-	-	22,772.48	23,503.48	23,503.48
41817	-	9,530.77	2,413.73	-	5,200.00	36,376.09	37,543.76	54,688.26
41821	-	-	-	-	-	2,261.38	2,333.97	2,333.97
41822	110.40	4,847.48	1,963.43	-	-	50,246.97	51,859.90	58,781.21
41826	-	16,641.90	155.83	-	3,850.00	20,483.23	21,140.74	41,788.47
41827	-	-	-	-	-	19,769.52	20,404.12	20,404.12
41828	-	9,807.07	150.64	-	-	50,125.52	51,734.55	61,692.26
41829	4.25	6,423.54	69.43	-	-	15,615.46	16,116.72	22,613.94
41830	-	5,006.84	1,439.01	-	-	46,988.88	48,497.22	54,943.07
41831	-	238.70	13.83	-	-	956.03	986.72	1,239.25
41832	-	1,325.61	-	-	-	24,894.00	25,693.10	27,018.71
41833	-	8,292.22	1,338.98	-	5,274.00	64,956.92	67,042.04	81,947.24
41834	-	-	-	-	-	6,864.67	7,085.03	7,085.03
41835	-	13,528.05	19,905.05	-	-	48,599.29	50,159.33	83,592.43
41836	-	9,143.20	-	-	-	56,500.31	58,313.97	67,457.17
41837	-	1,901.72	-	-	-	8,967.81	9,255.68	11,157.40
41838	-	-	-	-	-	534.02	551.16	551.16
41839	130.00	406.64	1,393.38	-	316.79	13,706.99	14,146.98	16,393.79
41840	-	-	-	-	-	5,023.04	5,184.28	5,184.28
41841	-	2,129.36	490.51	-	-	13,130.13	13,551.61	16,171.48
41842	-	515.40	- 56.14	-	-	17,186.22	17,737.90	18,197.16
41843	-	332.46	-	-	-	78,155.55	80,664.34	80,996.80
41844	-	2,681.21	-	-	-	5,536.96	5,714.70	8,395.91
41845	-	5,982.00	265.06	-	7,590.82	17,977.99	18,555.08	32,392.96
41846	-	1,756.00	45.48	-	-	4,556.07	4,702.32	6,503.80
41847	-	950.44	-	-	-	6,860.90	7,081.13	8,031.57
41848	-	7,418.50	-	-	2,542.75	9,541.12	9,847.39	19,808.64
41849	-	14,077.72	68.33	-	-	52,015.53	53,685.23	67,831.28
41850	-	640.72	55.06	-	1,320.00	5,431.75	5,606.11	7,621.89
41851	-	625.00	-	-	-	19,743.90	20,377.68	21,002.68
41852	-	-	-	-	-	1,974.72	2,038.11	2,038.11
41853	-	3,606.33	288.02	-	7,743.07	11,150.26	11,508.18	23,145.60
41854	-	-	-	-	-	4,578.76	4,725.74	4,725.74
41855	-	96.22	-	-	-	-	-	96.22
41856	-	-	-	-	-	219.08	226.11	226.11
41857	-	-	-	-	-	1,949.30	2,011.87	2,011.87
41858	-	13,332.58	2,457.89	-	-	61,592.49	63,569.61	79,360.08
41859	-	14,333.20	9,922.13	-	2,659.80	77,598.52	80,089.43	107,004.56
41861	-	-	-	-	-	554.92	572.73	572.73
41862	-	-	-	-	-	1,434.70	1,480.75	1,480.75
41863	-	2,066.32	395.37	-	2,425.00	21,745.72	22,443.76	27,330.45
41864	-	3.40	1,995.90	-	-	103,265.59	106,580.42	108,579.72
41865	-	1,500.00	-	-	-	2,693.89	2,780.36	4,280.36
41866	-	-	-	-	-	9,920.44	10,238.89	10,238.89
41867	-	157.95	61.80	6,314.67	-	21,727.81	22,425.27	28,959.69

41868	-	1,707.13	43.77	-	-	374.89	386.92	2,137.82
41869	-	-	-	-	-	6,158.42	6,356.11	6,356.11
41870	-	1,633.04	2,217.45	-	-	46,456.58	47,947.84	51,798.33
41872	-	1,402.78	670.44	-	-	9,611.15	9,919.67	11,992.89
41873	-	2,021.30	441.80	-	-	25,159.17	25,966.78	28,429.88
41874	-	-	-	-	-	11,134.35	11,491.76	11,491.76
41875	-	892.42	150.34	-	-	55,733.34	57,522.38	58,565.14
41876	-	-	-	-	-	9,156.86	9,450.80	9,450.80
41877	100.40	395.06	559.28	-	1,793.30	17,347.07	17,903.91	20,751.95
41878	-	5,384.73	-	-	4,300.00	76,300.64	78,749.89	88,434.62
41880	-	2.54	154.01	-	-	9,954.92	10,274.47	10,431.02
41881	-	-	-	-	-	7,308.12	7,542.71	7,542.71
41882	-	-	-	-	-	9,718.58	10,030.55	10,030.55
41883	-	1,182.98	47.09	-	-	29,181.15	30,117.86	31,347.93
41884	975.00	12,462.10	3,234.08	-	8,652.00	126,751.80	130,820.53	156,143.71
41885	-	8,370.77	4,547.18	-	4,950.08	43,107.84	44,491.60	62,359.63
41886	-	7,225.12	336.20	-	2,068.00	31,878.44	32,901.74	42,531.06
41887	-	24.00	90.90	-	-	88,584.88	91,428.45	91,543.35
41888	-	1,316.23	223.21	-	-	13,347.60	13,776.06	15,315.50
41889	-	-	40.95	-	-	12,158.18	12,548.46	12,589.41
41891	-	8,533.96	317.59	-	5,465.30	37,978.04	39,197.14	53,513.99
41892	-	-	-	-	-	88,080.00	90,907.37	90,907.37
41894	-	-	-	-	-	1,805.40	1,863.35	1,863.35
41895	-	-	-	-	-	68,390.51	70,585.85	70,585.85
41896	-	2.98	-	-	-	2,928.92	3,022.94	3,025.92
41897	-	793.25	-	-	-	12,245.54	12,638.62	13,431.87
41898	-	1,557.80	-	-	-	1,299.18	1,340.88	2,898.68
41899	-	22,593.66	-	-	-	7,184.50	7,415.12	30,008.78
41900	-	-	-	-	-	30,810.70	31,799.72	31,799.72
41901	-	-	-	-	-	49,595.05	51,187.05	51,187.05
41902	-	-	-	-	-	6,039.12	6,232.98	6,232.98
41903	-	1,038.23	140.59	-	-	20,509.24	21,167.59	22,346.41
41904	916.92	2,339.04	371.73	-	-	30,026.77	30,990.63	34,618.32
41905	-	-	-	-	-	2,492.08	2,572.08	2,572.08
41906	-	-	-	-	-	58,911.33	60,802.38	60,802.38
41907	-	3,324.46	5,606.05	-	-	34,628.40	35,739.97	44,670.48
41910	-	2,731.56	4,110.01	-	-	43,259.51	44,648.14	51,489.71
41911	-	-	-	-	-	1,628.19	1,680.45	1,680.45
41913	-	2,201.06	314.80	-	-	18,960.67	19,569.31	22,085.17
41914	-	6,854.63	-	-	-	16,423.51	16,950.70	23,805.33
41915	-	6,691.28	1,619.50	-	-	15,277.24	15,767.64	24,078.42
41916	-	529.92	115.20	-	-	7,460.47	7,699.95	8,345.07
41917	-	470.11	-	-	-	5,974.43	6,166.21	6,636.32
41918	-	1,687.89	235.66	-	-	19,876.43	20,514.46	22,438.01
41919	-	3,735.06	579.53	-	-	19,515.25	20,141.69	24,456.28
41920	-	-	-	-	-	6,294.52	6,496.57	6,496.57
41921	-	-	-	-	-	27,967.72	28,865.48	28,865.48
41922	-	-	-	-	-	1,401.96	1,446.96	1,446.96
41923	-	-	375.52	-	-	5,319.54	5,490.30	5,865.82
41924	-	-	-	-	-	719.09	742.17	742.17
41927	-	-	-	-	-	34.39	35.49	35.49
41928	-	-	-	-	-	2,059.79	2,125.91	2,125.91
41929	-	-	-	-	-	1,904.18	1,965.30	1,965.30
41972	-	10,651.33	-	-	-	14,830.96	15,307.03	25,958.36
43394	-	-	-	-	-	112.34	115.95	115.95
43397	-	3,204.00	-	-	-	11,870.67	12,251.72	15,455.72
Research Projects	**2,957.59**	**698,550.04**	**166,639.86**	**11,340.67**	**124,033.23**	**5,393,587.80**	**5,566,721.96**	**6,569,674.67**
Total	229,762.90	5,789,672.94	496,949.66	1,208,721.65	224,663.80	15,723,648.38	16,228,377.49	24,178,148.36
	-	-	-	-	-	-		

APPENDIX G

OPTION NUMBER & TITLE: Base Case / Status Quo **DISCOUNT RATE: 6%pa**
APPRAISAL DATE: June 2002 **BASE YEAR: 2000/01**

YEAR	1	2	3	4	5	6	7	8	9	10	TOTAL
	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	
CAPITAL COSTS:											
School of Agriculture and Food Science											
Newforge Buildings (29%)	5,869,471									-4,402,103	1,467,368
Newforge Lane - Land (29%)	2,175,000									-2,175,000	0
Apportioned Equipment	264,239					528,477				-264,239	528,477
Apportioned Plant	1,252					2,504				-1,252	2,504
Apportioned Vehicles	12,384					24,768				-12,384	24,768
Agri-Food Development Service											
Greenmount Lifelong Learning Centre		3,500,000								-2,843,750	656,250
Loughry Food Information Centre						2,800,000				-2,555,000	245,000
Purchase/replacement of Plant, Vehicles & Equip.	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
Purchase of additional Buildings	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	1,800,000
Enniskillen College											
Buildings	1,752,190									-1,314,143	438,048
Land	3,168,220									-3,168,220	0
Equipment	7,034					14,068				-7,034	14,068
Vehicles	36,536					73,072				-36,536	73,072
Greenmount College											
Buildings	2,306,400									-1,729,800	576,600
Land	8,811,000									-8,811,000	0
Equipment	36,593					73,186				-36,593	73,186
Plant	56,737					113,474				-56,737	113,474
Vehicles	89,472					178,944				-89,472	178,944
Loughry College											
Buildings	4,950,180									-3,712,635	1,237,545
Land	4,113,700									-4,113,700	0
Equipment	485,732					971,464				-485,732	971,464
Plant	330,130					660,260				-330,130	660,260
Vehicles	25,996					51,992				-25,996	51,992
Science Service - R&D											
Apportioned Buildings	6,725,887									-5,044,415	1,681,472

Apportioned Land	2,868,700									-2,868,700	0
Apportioned Boats	167,279					334,558				-167,279	334,558
Apportioned Equipment	720,254					1,440,508				-720,254	1,440,508
Apportioned Plant	3,229					6,458				-3,229	6,458
Apportioned Vehicles	41,089					82,177				-41,089	82,177
ARINI											
Buildings	5,322,595									-2,929,595	2,393,000
Machinery and Equipment	993,715			993,715			993,715			-242,145	2,739,000
A. TOTAL CAPITAL COSTS (ANNUAL)	*52,015,013*	*4,180,000*	*680,000*	*1,673,715*	*680,000*	*8,035,910*	*1,673,715*	*680,000*	*680,000*	*-47,508,161*	*22,790,192*
B. TOTAL CAPITAL COSTS (CUMULATIVE)	*52,015,013*	*56,195,013*	*56,875,013*	*58,548,728*	*59,228,728*	*67,264,637*	*68,938,352*	*69,618,352*	*70,298,352*	*22,790,192*	
RECURRENT COSTS:											
School of Agriculture and Food Science											
Running costs											
Apportioned Buildings Maintenance	416,889	416,889	416,889	184,799	184,799	184,799	184,799	184,799	184,799	184,799	2,544,258
Electricity/gas/oil	87,176	87,176	87,176	87,176	87,176	87,176	87,176	87,176	87,176	87,176	871,756
Water	4,575	4,575	4,575	4,575	4,575	4,575	4,575	4,575	4,575	4,575	45,748
Cleaning/catering/security	60,426	60,426	60,426	60,426	60,426	60,426	60,426	60,426	60,426	60,426	604,261
Telephone/windows/laundry	19,676	19,676	19,676	19,676	19,676	19,676	19,676	19,676	19,676	19,676	196,757
Stores	19,490	19,490	19,490	19,490	19,490	19,490	19,490	19,490	19,490	19,490	194,896
Non-stores	61,238	61,238	61,238	61,238	61,238	61,238	61,238	61,238	61,238	61,238	612,378
Expensed capital	8,841	8,841	8,841	8,841	8,841	8,841	8,841	8,841	8,841	8,841	88,406
QUB current supplies	107,198	107,198	107,198	107,198	107,198	107,198	107,198	107,198	107,198	107,198	1,071,976
QUB computing consumables/capital	15,092	15,092	15,092	15,092	15,092	15,092	15,092	15,092	15,092	15,092	150,921
QUB - estimated central resource use	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
Staff Costs											
DARD employed staff + T&S	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	1,225,364	12,253,644
QUB employed staff (incl. computing)	272,457	272,457	272,457	272,457	272,457	272,457	272,457	272,457	272,457	272,457	2,724,565
DEL grant for service teaching of SAFS students	159,000	159,000	159,000	159,000	159,000	159,000	159,000	159,000	159,000	159,000	1,590,000
Agri-Food Development Service											
Lifelong Learning Centre Est. GAE & Utilities		50,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	850,000
Food Information Centre Est. GAE & Utilities						40,000	80,000	80,000	80,000	80,000	360,000
College maintenance	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000	420,000	4,200,000
Student awards	942,000	942,000	942,000	942,000	942,000	942,000	942,000	942,000	942,000	942,000	9,420,000
Enniskillen College											
FE Education	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	6,192,141
HE Education	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	619,214	6,192,141
Short Courses & Com. Ed. Prog.	315,039	315,039	315,039	315,039	315,039	315,039	315,039	315,039	315,039	315,039	3,150,388
Greenmount College											
FE Education	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	2,813,911	28,139,109
HE Education	703,478	703,478	703,478	703,478	703,478	703,478	703,478	703,478	703,478	703,478	7,034,777
Short Courses & Com. Ed. Prog.	567,719	567,719	567,719	567,719	567,719	567,719	567,719	567,719	567,719	567,719	5,677,189

Technology	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	3,669,163	36,691,625
Loughry College											
FE Education	324,695	324,695	324,695	324,695	324,695	324,695	324,695	324,695	324,695	324,695	3,246,945
HE Education	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	1,589,883	15,898,835
Short Courses & Com. Ed. Prog.	201,535	201,535	201,535	201,535	201,535	201,535	201,535	201,535	201,535	201,535	2,015,345
Technology	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	1,379,537	13,795,365
Science Service - Total R&D											
Running costs											
Apportioned Buildings Maintenance	885,565	885,565	885,565	334,707	334,707	334,707	334,707	334,707	334,707	334,707	4,999,646
Electricity/gas/oil	128,144	128,144	128,144	128,144	128,144	128,144	128,144	128,144	128,144	128,144	1,281,441
Water	19,502	19,502	19,502	19,502	19,502	19,502	19,502	19,502	19,502	19,502	195,018
Cleaning/catering/security	72,484	72,484	72,484	72,484	72,484	72,484	72,484	72,484	72,484	72,484	724,841
Telephone/windows/laundry	27,828	27,828	27,828	27,828	27,828	27,828	27,828	27,828	27,828	27,828	278,281
Stores	171,519	171,519	171,519	171,519	171,519	171,519	171,519	171,519	171,519	171,519	1,715,193
Non-stores	712,396	712,396	712,396	712,396	712,396	712,396	712,396	712,396	712,396	712,396	7,123,958
Expensed capital	124,033	124,033	124,033	124,033	124,033	124,033	124,033	124,033	124,033	124,033	1,240,332
Staff Costs											
Direct staff costs	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	5,965,008	59,650,083
Travel and subsistence	2,425	2,425	2,425	2,425	2,425	2,425	2,425	2,425	2,425	2,425	24,251
SAFS net research direct expenditure	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	1,924,344	19,243,440
ARINI											
Cost of sales	555,083	555,083	555,083	555,083	555,083	555,083	555,083	555,083	555,083	555,083	5,550,830
Administration and other costs	447,602	447,602	447,602	447,602	447,602	447,602	447,602	447,602	447,602	447,602	4,476,020
Establishment charges	160,246	160,246	160,246	160,246	160,246	160,246	160,246	160,246	160,246	160,246	1,602,460
Maintenance and repairs	652,765	652,765	652,765	652,765	652,765	652,765	652,765	652,765	652,765	652,765	6,527,650
Direct staff costs	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	1,943,862	19,438,620
C. TOTAL REVENUE COSTS (ANNUAL)	*30,565,613*	*30,615,613*	*30,665,613*	*29,882,665*	*29,882,665*	*29,922,665*	*29,962,665*	*29,962,665*	*29,962,665*	*29,962,665*	*301,385,491*
D. TOTAL REVENUE COSTS (CUMULATIVE)	*30,565,613*	*61,181,225*	*91,846,838*	*121,729,502*	*151,612,167*	*181,534,832*	*211,497,496*	*241,460,161*	*271,422,826*	*301,385,491*	
E. TOTAL COSTS (ANNUAL) (=A+C)	*82,580,625*	*34,795,613*	*31,345,613*	*31,556,380*	*30,562,665*	*37,958,575*	*31,636,380*	*30,642,665*	*30,642,665*	*-17,545,496*	*324,175,682*
F. TOTAL COSTS (CUMULATIVE)	*82,580,625*	*117,376,238*	*148,721,850*	*180,278,230*	*210,840,895*	*248,799,469*	*280,435,849*	*311,078,514*	*341,721,178*	*324,175,682*	
BENEFITS											
QUB Tuition Fees	489,876	489,876	489,876	489,876	489,876	489,876	489,876	489,876	489,876	489,876	4,898,760
Enniskillen College Total Income	223,964	223,964	223,964	223,964	223,964	223,964	223,964	223,964	223,964	223,964	2,239,640
Greenmount College											
Education Total Income	828,923	828,923	828,923	828,923	828,923	828,923	828,923	828,923	828,923	828,923	8,289,230
Technology Total Income	242,584	242,584	242,584	242,584	242,584	242,584	242,584	242,584	242,584	242,584	2,425,840
Loughry College											

Education Total Income	356,466	356,466	356,466	356,466	356,466	356,466	356,466	356,466	356,466	356,466	3,564,660
Technology Total Income	124,806	124,806	124,806	124,806	124,806	124,806	124,806	124,806	124,806	124,806	1,248,060
QUB: SAFS Research Income	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	2,830,516	28,305,160
ARINI											
Farm produce and sundry sales	739,940	739,940	739,940	739,940	739,940	739,940	739,940	739,940	739,940	739,940	7,399,400
Research fees	519,767	519,767	519,767	519,767	519,767	519,767	519,767	519,767	519,767	519,767	5,197,670
G. TOTAL BENEFITS (ANNUAL)	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*6,356,842*	*63,568,420*
H. TOTAL BENEFITS (CUMULATIVE)	*6,356,842*	*12,713,684*	*19,070,526*	*25,427,368*	*31,784,210*	*38,141,052*	*44,497,894*	*50,854,736*	*57,211,578*	*63,568,420*	
NET UNDISCOUNTED COST* (=E-G)	76,223,783	28,438,771	24,988,771	25,199,538	24,205,823	31,601,733	25,279,538	24,285,823	24,285,823	-23,902,338	260,607,262
DISCOUNT FACTOR	1.0000	0.9434	0.8900	0.8396	0.7921	0.7473	0.7050	0.6651	0.6274	0.5919	
NET PRESENT COST* (Annual)	**76,223,783**	**26,829,136**	**22,240,006**	**21,157,532**	**19,173,432**	**23,615,975**	**17,822,074**	**16,152,501**	**15,236,925**	**-14,147,794**	**224,303,570**
NET PRESENT COST* (Cumulative)	**76,223,783**	**103,052,919**	**125,292,925**	**146,450,457**	**165,623,889**	**189,239,864**	**207,061,938**	**223,214,439**	**238,451,364**	**224,303,570**	

TOTAL NET PRESENT COST =**

£224,303,570

* A minus sign in this row denotes a net benefit.

** A number in brackets denotes a net present value rather than a net present cost.

APPENDIX H

GLOSSARY OF ACRONYMS

AESD	**Agriculture and Environmental Science Division (includes ARINI)**
AFED	**Agricultural and Food Economics Division**
APSD	**Applied Plant Science Division**
ARINI	**Agricultural Research Institute of Northern Ireland**
BIOM	**Biometrics Division**
CAO	**Chief Agricultural Officer**
CSO	**Chief Scientific Officer**
CVO	**Chief Veterinary Officer**
CSD	**Corporate Services Division**
DARD	**Department of Agriculture and Rural Development**
DEL	**Department of Employment and Learning**
DETI	**Department of Enterprise and Trade**
EU	**European Union**
FE	**Further Education**
FE Institutes	**Institutes of Further and Higher Education**
FSD	**Food Science Division**
FTE	**Full Time Equivalent**
GB	**Great Britain**
HE	**Higher Education**
HNC	**Higher National Certificate**
HND	**Higher National Diploma**
IT	**Information Technology**
NA	**Not Applicable**
NC	**National Certificate**
NCVQs	**National Certificate of Vocational Qualifications**
ND	**National Diploma**
NDPB	**Non-Departmental Public Body**
NI	**Northern Ireland**
QUB	**The Queen's University of Belfast**
R&D	**Research and Development**

SAFS	**School of Agriculture and Food Science**
SLA	**Service Level Agreement**
SMA	**Senior Management Units**
UU	**The University of Ulster**
VIC	**Veterinary Inspection Centre**
VSD	**Veterinary Science Division**

APPENDIX I

PANEL MEMBERSHIP

Dr Daniel O'Hare, Chairman

Dr O'Hare was Founding President of Dublin City University from March 1977 until September 1999. He holds a BSc and MSc in Chemistry from the National University of Ireland and a PhD from the University of St Andrews, Scotland and Honorary Doctorates from the Queen's University of Belfast, the University of Ulster, Trinity College Dublin and the National University of Ireland. He is currently Chairman of the Food Safety Authority of Ireland, the Expert Group on Future Skills Needs, the Information Society Commission, Ballymun Regeneration, The Task Force on the Physical Sciences and the Independent Hospitals Association of Ireland. He also serves as a member of the Food Safety Promotion Board. He sits on the Board of Directors of Media Lab Europe and is a non-executive Director of Calor Limited.

Professor Sir John Marsh CBE FRAgS FRASE CBiol FIBiol*;*

Professor Marsh is a past Director of the Centre for Agricultural Strategy at the University of Reading. He has also served as Secretary and President of the Agricultural Economics Society and as Chairman of the Agricultural Wages Board for England and Wales. He is a Governor of the Royal Agricultural College, Cirencester and a member of the Governing Body of the Scottish Crop Research Institute. He is Chairman of The Society for the Responsible Uses of Resources in Agriculture and on the Land, RURAL, and is President of the British Institute of Agricultural Consultants, BIAC .

Mrs Catherine Dixon, BA Law

Mrs Dixon is a solicitor and managing partner of James H Rodgers and Co. in Portadown, Northern Ireland. She specialises in Children and Family Law. She has been a member of the Council of the Law Society of Northern Ireland since 1988, and was President in 1999. She has served on the Council of Legal Education for Northern Ireland since 1990. She is also a member of the Children's Order Advisory Committee to the Lord Chancellor. She is currently Deputy Chairman of The Police Retraining and Rehabilitation Trust.

APPENDIX J

SECRETARIAT AND CONTACT DETAILS

Secretary to the Review Body	**Dr Bernie Stuart** **Mr Brian Murphy OBE**
Assistant Secretary to the Review Body	**Miss Lyanda McFarlane** **(until February 2002)** **Mrs Sheelagh McCausland** **(from February 2002)**
Secretarial Support	**Mrs Jean Maginnes**
DARD Science Service Liaison	**Dr Trevor Gilliland**
DARD Agri-Food Development Service Liaison	**Mr Ian Titterington**
DARD Rural Development Division Liaison	**Miss Jennifer McLernon**

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