Best Practice in Environmental Education Centres

by

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This project is submitted in part fulfilment of the requirements of HETAC for the award of

M.Sc. in Environmental Protection

Institute of Technology, Sligo

June, 2010

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ABSTRACT

Environmental education (EE) and education for sustainable development (ESD) is provided in a variety of formal and non-formal settings, including EE and ESD centres. This provision is uncoordinated due to the lack of a National Strategy on Education for Sustainable Development in Ireland. No initiative is in place to encourage an environmental management system (EMS) similar to ISO14001. The creation of a directory of current best practices in centres coupled with an EMS will enhance the development of sustainable environmental systems. The purpose of this dissertation is to provide an overview of best practice in environmental education (EE) and education for sustainable development (ESD) centres. A survey was carried out to obtain an overall view of best practice in EE and ESD centres as demonstrated by aspects of the built environment and the day-to-day running of each centre.

The research found that there are seventy EE or ESD centres spread throughout the country. Only three centres have an EMS in place. All but one centre was interested in a green award scheme similar to An Taisce's Green Flag for schools, which is based on an EMS. The survey showed that centres are more proactive in the aspects of insulation and litter and waste management, while scores for good practice in the use of energy and sustainable transport were low. A checklist of good practices has been included in the study to help centres add to or improve on environmental aspects within a centre.

A central register for new and existing EE and ESD centres should be created. Self-monitoring of best practice in centres based on an EMS should be encouraged. A network for centres and an association for EE and ESD educators would enable the sharing of knowledge and experience. Ultimately, the publication and implementation of Ireland's National Strategy on Education for Sustainable Development is recommended to promote good practice in all sectors of education.

ACKNOWLEDGEMENT

I wish to acknowledge the assistance of my supervisor, Dr. Billy Fitzgerald. His suggestions and comments have provided valuable guidance in the completion of the research project.

CONTENTS

KEY TO ACRONYMS

CAT	Centre for Alternative Technologies
CBD	Convention on Biological Diversity
CELT	Centre for Environmental Learning and Training
Comhar SDC	Comhar Sustainable Development Council
COP	Conference of Parties
DES	Department of Education and Science
DoEHLG	Department of Environment, Heritage and Local Government
DPS	Discover Primary Science
EMAS	Eco-Management and Audit Scheme
EMS	Environmental Management System
ESD	Education for Sustainable Development
EU	European Union
FEE	Foundation for Environmental Education
FSC	Field Studies Council
IEN	Irish Environmental Network
INTO	Irish National Teachers Organisation
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organisation
IUCN	International Union for Conservation of Nature and Natural Resources
IWT	Irish Wildlife Trust
KEEP	Kerry Earth Education Project
NAEE	National Association for Environmental Education
NCCA	National Council for Curriculum and Assessment
NGO	Non-Government Organisation
NPWS	National Parks and Wildlife Service
NSDS	National Sustainable Development Strategy
OEC	Outdoor Education Centre
OECD	Organisation for Economic Cooperation and Development
RCE	Regional Centres of Expertise
SEAI	Sustainable Energy Authority Ireland
SESE	Social, Environmental and Scientific Education

UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VEC	Vocational Education Committee
VERT	Village Education, Research and Training
WCED	World Commission on Environment and Development
WWT	Wildfowl and Wetlands Trust

INTRODUCTION

Environmental education (EE) and education for sustainable development (ESD) centres throughout the country provide a variety of programmes, for a wide range of participants in a non-formal setting. The centres work in isolation from one another. Evidence of good practice exists in these centres; however, there is an absence of a means to share knowledge, skills and experience. No list is available containing basic particulars, such as names and contact details of these centres, as well as information on environmental practices, programme provision and target groups. This data would be a valuable resource in the advancement of best practice and development of an environmental management system (EMS) for this sector.

Other institutions have an EMS in place that allow for continual review and subsequent improvements to be made in their environmental practices. An Tasice's Green Schools initiative is an example of an EMS that has had a positive effect on environmental behaviour and attitudes. Similar initiatives exist for the hotel industry and third level colleges. The introduction of such a scheme for EE and ESD centres would identify the level of good environmental practice currently in place with regard to various aspects in the day-to-day running of a centre and those of the centre's built environment. Areas where action is required could be recognised and improvements could be made.

The aim of the thesis is provide an overview of best practice in EE and ESD centres in Ireland. This will be achieved through the following objectives:

1. Investigate the development of environmental education (EE) and education for sustainable development (ESD)
2. Identify what is best practice in EE and ESD
3. Examine criteria used in environmental audits
4. Identify a set of criteria with which to carry out an environmental audit of environmental education centres
5. Carry out an audit of each centre that provides EE and ESD
6. Catalogue results

7. Illustrate examples of best practice

8. Produce a checklist of best practice for EE and ESD centres

9. Make recommendations for this sector of education

SECTION 1 LITERATURE REVIEW

1.1 Environmental Education Organisations

1.1.1 United Nations Educational, Scientific and Cultural Organisation (UNESCO)

UNESCO was founded in November 1945. The formation came about as the world war ended and representatives from forty-four countries decided that a new organisation was needed that would bring together the "intellectual and moral solidarity of mankind" to focus on a culture of world peace. It is a specialist agency of the United Nations (UN), and was set up to uphold peace, promote sustainable development and alleviate poverty through education, science and culture (UNESCO, 2010). UNESCO's mission is:

> ...to contribute to the building of peace, the eradication of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information.
>
> (UNESCO, 2009*a*)

Ireland joined in 1961 and is one of 193 member states. In 1968, UNESCO recognised that the earth was being exploited without due concern for the future. The organisation set about the promotion of development that would consider future needs, and hence sustainable development. This was achieved through the hosting of international conferences and the provision of advice and assistance to help governments employ effective science and technology. The United Nations Decade of Education for Sustainable Development (2005-2014) was instigated by UNESCO to highlight the important role of education in the promotion of sustainable development. UNESCO has its headquarters in Paris and has fifty field offices around the world.

1.1.2 United Nations Environment Programme (UNEP)

UNEP was established in 1972 after the UN Conference on the Human Environment. Its mission is:

... to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

(UNEP, 2005)

The work of the UNEP includes:

- Assessing global, regional and national environmental conditions
- Developing international agreements and national environmental instruments
- Strengthening institutions for the wise management of the environment
- Integrating economic development and environmental protection
- Facilitating the transfer of knowledge and technology for sustainable development
- Encouraging new partnerships and mind-sets within civil society and the private sector

UNEP promotes the wise use of the earth's natural resources and supports sustainable development. It operates as an educator, facilitator, advocate and catalyst by working with national governments, non-government organisations, the media, businesses and society in general. UNEP runs conferences and campaigns that target young people and hosts a website which sets out to educate youth and children about sustainable development. The organisation is also involved in education for all levels of society. The UNEP operates from regional offices around the globe.

1.1.3 ECO-UNESCO

ECO-UNESCO is Ireland's Environmental Education and Youth Organisation and was first established in 1986 under the name of ECO. It then affiliated to the World Federation of UNESCO Clubs, Centres and Associations and became ECO-UNESCO. The organisation aims to raise awareness, understanding and knowledge of the environment among the youth of the country. It also promotes the conservation and protection of the environment. ECO-UNESCO fulfils their aims through the promotion of active participation in environmental projects. The organisation runs the Young Environmentalist Awards Programme which recognises and rewards the efforts of young people that contribute to locally or globally to improving the environment. Training programmes and educational resources are also provided by ECO-UNESCO.

ECO-UNESCO is based in The Green House, Andrew Street in Dublin. Funding for the organisation comes from the Department of Education & Science: Youth Affairs Section, Department of the Environment, Heritage and Local Government, Department of Foreign Affairs - Ireland Aid, local authorities, commercial sponsorship, fundraising, membership subscriptions and publication sales (ECO-UNESCO, 2010).

1.1.4 An Taisce

An Taisce was founded in 1946 as an environmental charity to protect the environment and heritage of Ireland for present and future generations. The organisation promotes environmental awareness through its educational programmes especially the Green-Schools initiative. It acts as an impartial monitor where European Union (EU) legislation is being applied at local level and is involved in making submissions on both local and national planning policy. The charity is a Prescribed Body through Section 24 of the 2000 Planning and Development Act to give input on the formation of national policy. An Taisce is one of the Prescribed Bodies under Section 28(1) of the 2002 Regulations for planning applications. Their role is to act as a key consultant to advise on planning applications that refer to amenities, protected structures, heritage sites, national monuments and nature conservation and applications that have environmental impact statements. An Taisce is also a statutory Prescribed Body which acts as an important consultant on waste and the natural environment in relation to forestry applications, Integrated Pollution Control and Waste Licences and is involved in consultation on aquaculture applications (An Taisce, 2010*a*).

The Education Unit of An Taisce was set up in 1993. The education programmes include two national initiatives: National Spring Clean and Irish Business Against Litter and many international programmes including: Green-Schools, Clean Coasts, Blue Flag Programme, Learning About Forests and Young Reporters for the Environment (Green-Schools, 2009).

An Taisce receive some funding from state agencies and also sponsorship from businesses for certain programmes and projects. In 2008, An Taisce received €80,000 from the Government from the Environmental Fund, to be used in improving their participation in the planning process. The organisation relies on membership fees and charitable donations

to carry out much of its work (An Taisce, 2009). The headquarters for An Taisce is Tailors' Hall in Christchurch, Dublin.

1.1.5 Comhar Sustainable Development Council (Comhar SDC)

Comhar SDC was set up in 1999. It aims to advance a national agenda for sustainable development in Ireland and to assist in the creation of a national consensus in this regard. The members come from a cross section of stakeholders including environmental groups, community groups, and statutory bodies and from the professional and economic sectors. It advises the government on sustainable development, has laid down a set of principles, and has identified action plans and targets based on these principles. The principles for sustainable development are used as a benchmark in the formulation of policies (Comhar SDC, 2002). Comhar SDC is also involved in outreach work, informing the public on sustainable development. The organisation sponsors the ECO-UNESCO Young Environmentalist Award and the Tidy Towns initiative. Their office is in the Irish Life Centre, Dublin and has three permanent civil servant staff along with four researchers.

The terms of reference for Comhar SDC, as agreed by the Government include: the advancement of the national agenda on sustainable development and the evaluation of progress towards sustainable development. They also have a role in the development of models and tools to aid progress towards sustainable development in Ireland and to give advice to organisations and individuals on the implementation of these (Comhar SDC, 2010). Funding for Comhar SDC comes from the proceeds of the Environmental Fund collected through the plastic bag and landfill levies (Office of the Houses of the Oireachtas, 2009).

1.2 Origins and Developments of Environmental Education: An International Perspective

The origins of environmental education may have begun with the influence of the philosopher Jean-Jacques Rousseau who encouraged a focus on the environment to be maintained in education in his book, *Emile*, published in 1762 (McCrea 2006). Palmer (1998) suggest that environmental education may have evolved through the influence of

many of the 'great' eighteenth and nineteenth century writers and educators including Rousseau, Froebel, Dewey and Montessori. In 1892, a Scottish professor of botany, Sir Patrick Geddes, set up a field centre in Edinburgh (Palmer and Neal, 1994). Geddes is credited by many as the first person to connect the quality of education to the quality of the environment.

In October 1948 the International Union for the Protection of Nature, now called the International Union for Conservation of Nature and Natural Resources (IUCN), was founded following an international conference in Fontainebleau, France (IUCN, 2009). It was here that Thomas Pritchard, Deputy Director of the Nature Conservancy in Wales, used the term "environmental education" and is reported to be "the first public professional use of the term" (North American Association for Environmental Education, 2006).

In 1967, an oil tanker, the Torrey Canyon, carrying 34,986,000 gallons of crude oil was wrecked off the west coast of England, raising public awareness of the hazards to the environment, leading to an increase in membership of environmental organisations (Landon, 2006). The following year, UNESCO Biosphere Conference was held in Paris and it was here that the plea for environmental education to be introduced in schools was first muted through the revision of the curriculum. The conference also encouraged technical training and promoted the instigation of national coordinating organisations for environmental education through the world (Palmer, 1998).

The IUCN conference 'International Working Meeting on Environmental Education in the School Curriculum' was held in Nevada USA in 1970. One of the first definitions of environmental education was agreed at this conference and is now widely accepted.

> Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among humans, their culture and biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviours about issues concerning environmental quality.
>
> (IUCN, 1970)

The Declaration of the United Nations Conference on the Human Environment was published in June 1972. The document set down twenty six principles in order to promote a

global effort in the conservation of the human environment (UNEP, 1997). Principle 19 stated the need for the education of the young and adults alike in order to increase "the basis for an enlightened opinion and responsible conduct" in all sectors of communities.

World Environment Day was established by the United Nations General Assembly in 1972 marking the opening of the Stockholm Conference on the Human Environment. Another resolution, adopted by the General Assembly the same day, led to the creation of UNEP. World Environment Day, which is held each 5th June, is organised by UNEP (UNEP, 2005). The day was established to stimulate environmental awareness around the globe and to increase political attention and action.

The Belgrade Charter: *A Global Framework for Environmental Education* was adopted at the International Environmental Education Workshop held in Belgrade, October 1976. The charter identified eight guiding principles for environmental education programmes. It stated that environmental education should:

1. Consider the environment in its totality – natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic.
2. Be a continuous life-long process, both in school and out of school.
3. Be interdisciplinary in its approach.
4. Emphasize active participation in preventing and solving environmental problems.
5. Examine major environmental issues from a world point of view, while paying due regard to regional differences.
6. Focus on current and future environmental situations.
7. Examine all development and growth from an environmental perspective
8. Promote the value and necessity of local, national and international cooperation in the solution of environmental problems.

(UNESCO-UNEP, 1976)

The Belgrade Charter recommended that environmental education should be included in both formal and non-formal education. It called for government policy to be introduced globally in order to develop environmental education. Consequently, the First Inter Governmental Conference on Environmental Education was held in Tbilisi, Georgia, in October 1977, hosted by UNESCO in conjunction with UNEP. The conference was attended by sixty six UNESCO member states (Palmer, 1998). The declaration called for a

holistic approach with a broad interdisciplinary base. It recognised the need for environmental education that urged a sense of stewardship and encouraged the inclusion of active participation in resolving environmental problems. The final report of the Tbilisi Conference contained forty one recommendations. The first recommendation stated that:

> A basic aim of Environmental Education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.
>
> (UNESCO, 1977)

Three important goals of environmental education were listed in the second recommendation of the document:

1. To foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas
2. To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment
3. To create new patterns of behaviour of individuals, groups, and society as a whole towards the environment.

(UNESCO-UNEP, 1978)

The World Conservation Strategy Report was published by IUCN, UNEP and World Wildlife Foundation (WWF) in 1980. In the document, it stated that man has "a limitless capacity for building and creating, matched by an equally great power of destruction and annihilation" (IUCN, UNEP and WWF, 1980).

In 1985, the ozone hole of the Antarctic was first discovered. The Vienna Convention for the Protection of the Ozone Layer was adopted by 28 countries, in March 1985 at the Conference of Plenipotentiaries on the Protection of the Ozone Layer. Intergovernmental cooperation on monitoring and research was encouraged and it is possibly the first time in international negotiations that the "precautionary principle" was accepted (UNEP, 2001).

The Montreal Protocol on Substances that Deplete the Ozone Layer was signed in 1987 after major negotiations and is now ratified by196 countries. The Protocol was introduced to phase down the use of Chlorofluorocarbons, halons and manmade ozone depleting compounds. For the first time in the formulation of an international environmental agreement, trade sanctions were incorporated to help achieve the goals (UNEP, 2009).

A decade after the First Inter Governmental Conference on Environmental Education in Tbilisi, the 'Tbilisi plus Ten' Conference in Moscow was held in 1987. It is not until this conference that the principles set out in Tbilisi in 1977 were endorsed (Palmer, 1998). In the same year as the 'Tbilisi plus Ten' conference, 1987 marked the publication of *Our Common Future*, a report of the World Commission on Environment and Development (WCED). In this report, commonly known as the Brundtland Report, the chairman, Gro Harlem Brundtland, stated that the WCED were asked by the General Assembly of the United Nations, to draw up 'A Global Agenda for Change'. In Chapter 2, a definition of sustainable development was stated:

> Sustainable development is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. It contains within it two concepts:
>
> - The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
> - The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.
>
> (UN, 1987)

Paragraph 16, Chapter 2 asked: "How are individuals in the real world to be persuaded or made to act in the common interest?" The question was addressed immediately stating "The answer lies partly in education, institutional development, and law enforcement". The Brundtland Report recommended that a Universal Declaration and a Convention on Environmental Protection and Sustainable Development be prepared; this included 22 articles in Annex 1 of the document (UN, 1987). The European Community designated 1987 as the European Year of the Environment. In 1988, the Council of Ministers adopted a resolution on environmental education to make environmental education an intrinsic part of the upbringing of each European citizen. The resolution recognised the following:

> The objective of environmental education is to increase the public awareness of the problems in this field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources.
>
> (Stokes, Edge and West, 2001)

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the UNEP and the World Meteorological Organisation to give a better understanding to the public and to policy makers with regard to climate change. The IPCC set about the task to research the environmental, economic and social impacts of climate change and to look for strategies to enable its control. The panel published their first report in 1990 which stirred reaction among policy makers and the public alike. That year, at the Second World Climate Change Conference, a call for a framework treaty was made. Negotiations commenced and the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change met for five sessions and compiled the Convention on Climate Change (UN, 1997).

The UN Conference on Environment and Development (The Earth Summit) took place in Rio de Janerio, Brazil in 1992. The assembled leaders of 178 countries signed the Convention on Climate Change and the Convention on Biological Diversity. This endorsed the Rio Declaration and the Forest Principles and hence accepted Agenda 21 as the comprehensive plan of action to be followed at local, national and global levels. Principle 21 of the Rio Declaration states:

> The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.
>
> (UN, 1992*a*)

Agenda 21 is a blueprint on how to make development socially, economically and environmentally sustainable. The preamble to Agenda 21 commences with the following statement:

> Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can - in a global partnership for sustainable development.
>
> (UN, 1992*b*)

Chapter 36 of Agenda 21, Education, Public Awareness and Training, is based on the principle of The Declaration and Recommendations of the Tbilisi Intergovernmental Conference on Environmental Education held in 1977. Recognition of the need for both formal and informal education was given and the document reiterated that education for sustainable development should be cross curricular. The term "Education for Sustainable Development" was established encompassing Environmental Education. It was defined in broader terms to include environment, society and economy (Ugurlu and Aladag, 2009).

The Convention on Climate Change adopted at Rio called for the dissolution of the International Negotiating Committee that had drafted the Convention. In 1995, the Conference of Parties (COP) was established as the ultimate authority of the Convention (UN, 1997). COP 1 led to the setting up of the *Ad hoc* Group on the Berlin Mandate (AGBM) whose role was to develop a protocol or legal instrument for adoption at the 1997 Convention to be held in Kyoto, Japan. The text of the protocol, drafted by the *Ad hoc* group, was approved at COP 3 and was made available for signing at the UN headquarters in New York from March 1998 for one year. In that time 84 nations had signed the protocol. Article 10 part (e) of the Kyoto Protocol states that all parties shall:

> Cooperate in and promote at the international level, and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public awareness of, and public access to information on, climate change.
>
> (UN, 1998)

In 1998, the Fourth Conference of the Parties (COP 4) discussed, for the first time, Article 13 of the Convention on Biodiversity which relates to public education and awareness (Convention on Biological Diversity, 2009). The convention called on contracting parties to promote the conservation of biological diversity through educational programmes and by using the mass media. Cooperation between international organisations was encouraged in order to develop programmes in education and raising awareness. UNESCO was asked at COP 4 to consider starting such a global initiative on biodiversity education, training and public awareness. A decision was made at the conference to integrate public education and awareness issues into every sector and theme of the work of the Convention on Biodiversity. The following year, at COP 5, the Convention invited governments, organisation and institutions to incorporate the development of education and communication in biodiversity into their national action plans on biodiversity. The International Day for Biological Diversity was established. It is held annually on the 22 May with the theme for the day changing each year.

In 2000, at the UN Millennium Summit held in New York, 189 heads' of nations agreed on the eight Millennium Development Goals that will halve poverty by 2015. Goal seven was to ensure environmental sustainability with one of the targets to:

> "...integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources".
>
> (UN, 2009*b*)

The Organisation for Economic Cooperation and Development (OECD), Environmental Strategy for the First Decade of the 21st Century was adopted by the OECD Ministers, in 2001. The strategy recognised that sustainable development can only be achieved through the integration of economic, social and environmental concerns. Five objectives of the strategy were outlined and were to be implemented by 2010. Objective 4 recommends an increased effort now needed "to address the social and environmental interface, with focus on health and safety, urbanisation and spatial development, environmental equity, environment and employment, participation and environmental education" (OECD, 2001). At national level, member states are urged to carry out an analysis of environmental education that can promote public awareness and increase participation in the establishment and implementation of environmental policy.

At the World Summit in Johannesburg in 2002, the broad approach to sustainable development encouraged in Agenda 21 was re-affirmed. The importance of education systems across the globe promoting the knowledge, skills and values in sustainable development was agreed. A recommendation was made to the United Nations General Assembly to consider adopting a Decade of Education for Sustainable Development, starting in 2005 (UN, 2005).

The United Nations Decade of Education for Sustainable Development commenced in 2005 and will run until 2014. UNESCO, in its publication UN Decade of Education for Sustainable Development 2005-2014, poses the question "Why a decade of education for sustainable development?" and goes on to answer it:

> Education is a motor for change. That is why in December 2002, the United Nations General Assembly, through its Resolution 57/254, declared a Decade of Education for Sustainable Development (2005-2014). It also designated UNESCO as the lead agency for the promotion of this Decade.
>
> (UNESCO, 2005)

UNESCO has certain expectations of the decade. These include education for sustainable development that will equip all citizens to face present day and future challenges and aid leaders to make the appropriate decisions to ensure a viable world. This education aims to assist people to acquire the necessary skills that will allow them be active participants in society, be respectful of the planet in every aspect and to engage in promoting democracy for all. Work towards reaching this ideal will need to consider education in sustainable development plans, must create public awareness of the importance of sustainable development and include good media coverage of sustainable development issues. In order to achieve the objectives above the following areas will be targeted in the decade:

Promoting and improving quality education:

> Basic education needs to focus on sharing knowledge, skills, values and perspectives throughout a lifetime of learning in such a way that it encourages sustainable livelihoods and supports citizens to live sustainable lives.

Reorienting educational programmes:

Rethinking and revising education from nursery school through university to include a clear focus on the development of knowledge, skills, perspectives and values related to sustainability is important to current and future societies.

Building public understanding and awareness:

Achieving the goals of sustainable development requires widespread community education and a responsible media committed to encouraging an informed and active citizenry.

Providing practical training:

All sectors of the workforce can contribute to local, regional and national sustainability. Business and industry are, thus, key sites for on-going vocational and professional training, so that all sectors of the workforce can have the knowledge and skills necessary to make decisions and perform their work in a sustainable manner.

(UNESCO, 2005)

Good practices are promoted in the development of appropriate education programmes. To this end, UNESCO has developed a free training programme intended for educators, teachers, text book writers and the decision makers (www.unesco.org/education/tlsf). The programme includes five themes and twenty five modules. Education through information and communication technologies has been made available through multi-media centres in local communities with the support of UNESCO. A centre in Nepal was established to gives access to teachers in remote regions to teaching materials through the internet. Other examples of good practice were shown in the 'YouthXchange' programme (www.YouthXchange.net). This programme has been developed to change youth lifestyles in the hope of guiding young people along a path to a viable lifestyle and responsible consumerism. Vevey, Switzerland was given as an example of good practice in sustainable development in an urban area. The town implemented Agenda 21 in 1998 and has adopted the Lisbon Action Plan on the European sustainable cities campaign.

Some challenges have been identified by UNESCO for the Decade. One such challenge is to develop adequate teaching to go beyond environmental education and progress to education for sustainable development. It is hoped that throughout the decade an inventory on education for sustainable development programmes be carried out. It is envisaged that

this will enable the acceleration of this new vision of education into national plans. A further challenge identified is the need to get the mass media onboard in order to facilitate the dissemination of quality information to all. "Establishing partnerships and creating synergies among the initiatives and programmes" is also identified as a challenge in the Decade. Kofi Annan, Secretary General of the United Nations voices another challenge to be confronted stating

> "Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people".
>
> (UNESCO, 2005)

1.3 Origins and Developments of Environmental Education : An Irish Perspective

An Taisce, the National Trust for Ireland was founded in 1948. Robert Llyod Praeger becomes the first president of the organisation. In his first radio address, he remarks that "even the most backward countries" had organisations which existed to protect and preserve the environment (An Taisce, 2010). The same year, International Union for Conservation of Nature and Natural Resources (IUCN) was founded with the signing of a constitution for the protection of nature yet Ireland was not one of the signatories.

It was not until the 1970's, that environmental awareness started to grow in Ireland, ignited by European Conservation Year in 1971 and sustained by the energy crisis of that decade. Some controversial planning decisions were made in the decade which resulted in intense activity by environmental non-government organisations (Jeffery, 2001). The primary school curriculum was improved in 1971 with the introduction of Nature and Environmental Studies (The Irish Council for Science, Technology and Innovation, 1998). However, this new element in the curriculum simply consisted of the identification of some common trees and learning about the different types of ecosystems (Brady, 1991).

In the article *An Overview of Environmental Education in Ireland* by Brady (1991), the scale of the task ahead for environmental educators became evident with the release of the European Community Commission survey on environmental attitudes into the member states. It was found that Irish people were willing to sacrifice environmental protection for

economic development (European Community Commission, 1983 cited in Brady, 1991). Of the then ten member states, Ireland was the only state that had this attitude.

The Irish National Teachers Organisation (INTO) held a Consultative Conference on Education in 1989. The conference resulted in the production of many reports one of which looked at school text books (INTO, 1989). The provision for environmental studies was included in their work and they noted that there were no guidelines issued for text books on Environmental Studies or Junior Science. They did, however, welcome the development of a draft curriculum in Social and Environmental Studies by some cluster groups around the country.

At secondary school level, the Junior Certificate Environmental and Social Studies syllabus, developed by the National Council for Curriculum and Assessment (NCCA), was introduced in 1990. This subject draws on Geography, History and Civics. It has an element of experiential learning with both a geographical field studies assignment and a historical investigation being allocated twenty percent of the total marks each (NCCA, 2000*a*).

The Environment Action Programme was published in January 1990 by the Government, coinciding with Irelands "Green" Presidency of the European Commission Council of Ministers (Brady, 1991). In it, new policy measures were outlined one of which included the improvement of access to environmental information by the public, both adults and children alike. In September 1990, ENFO was established. The founding of ENFO was part of the Government's commitment to public access to information on the environment as required by EU Directive 90/313. The information centre, located in the centre of Dublin, allowed for easy access to information that would be appealing to all. ENFO provided a 'drop in' centre with ready access to information leaflets, posters, videos, CD ROMs, games and an exhibition centre. A library was developed for both public, specialist enquires, and an internet site was created, making information available to all. Education Officers provided in-house lectures and outreach services to schools and exhibition material could be sourced from the centre (ENFO, 2001). The ENFO office was closed by the Department of the Environment in September 2009 due to "restructuring" of the service. This marked the end to the only library in the country dedicated to the environment (The Irish Times, 2009).

Local Authorities and Sustainable Development: Guidelines on Local Agenda 21 was published in 1995. Local Authorities were advised that a Local Agenda 21 should involve all sectors of the community with a broad collaborative approach. The need for the provision of information and the raising of awareness along with the need for consultation and feedback with the community as a whole was recognised. In Chapter 4: Local Agenda 21: Action in the Community, dealt with the provision of information. Local Authorities were encouraged to provide information, supporting environmental education at every level in their area. They are asked to: liaise with local schools/colleges, support the initiatives of local voluntary groups, compile and publish local environmental information, set up focus points, hold open days, draw on their own information policy statements and maintain statutory registers (Ireland, Department of the Environment and Local Government, 1995).

In 1995, Ireland ratified the Convention on Biological Diversity (CBD) and thus the State agreed to be bound by the Convention (Ireland, Department of the Arts, Heritage, Gaeltacht and the Islands, 2002). The plan recognised the need for public support in order to succeed and set about promoting a greater understanding of the issues. The measures identified to achieve this included the development of an internet based Clearing House Mechanism as required under the CBD and the provision of financial aid to relevant non-government organisations (NGOs).

The government's white paper on education, *Charting Our Education Future*, was published in 1995. One aim set down regarding environmental education was to ensure that the young generation would develop an awareness of their national and European heritage along with respect for the environment. The emphasis on the scientific aspects of the social and environmental programme, particularly in the senior classes was encouraged in the White Paper (Ireland, Department of Education and Science, 1995).

Sustainable Development: A Strategy for Ireland was published in 1997 as the first National Sustainable Development Strategy (NSDS). The strategy recognised that awareness and education are important in progress towards solving environmental problems. Informed individuals can develop values, attitudes and behaviour in relation to their environment (Ireland, Department of the Environment, 1997).

Also in 1997, An Taisce, started the Green-Schools Programme. The programme is an environmental management system and award scheme known internationally as Eco-Schools. It promotes the need for a long term approach and whole school action for the environment (Green-Schools, 2009).

A new subject, Civic, Social and Political Education (CSPE), was introduced, at Junior Certificate level in all second level schools in September 1997. The aim of the subject is to develop citizens with "a sense of belonging, a capacity to gain access to information and structures relating to the society in which they live and an ability and confidence to participate in democratic society" (NCCA, 2000*b*). The central concept of CSPE is citizenship. Seven concepts are studied under this key concept including stewardship and looks as the topics of recycling, pollution and litter and waste management. The subject requires an action project to be undertaken. This practical component fosters active citizenship.

The Heritage Council, a statutory body, works with local groups to increase awareness of our national heritage. The Council launched the Heritage in Schools Scheme as a pilot project in 1999 (Heritage Council, 2010). The scheme is administered by the INTO and now provides 150 heritage specialist to primary schools nationwide. The specialists offer programmes on both the built and natural environment supporting the aims and objectives of the SESE curriculum.

Comhar, the Sustainable Development Council (SDC), was established in 1999 to help advance the national agenda for sustainable development. Comhar SDC identified with the recommendations of the Brundtland Report and suggested that sustainable development must incorporate environmental protection, economic development, and social development in an integrated manner. Each aspect must be addressed equally to maintain a balance. It advised that the principles must be considered in tandem and emphasised the need for consensus based decision making (Comhar SDC, 2002).

The National Sustainable Development Strategy (NSDS) was revised in 2002 with the publication of *Making Ireland's Development Sustainable: Review, Assessment and Future Action* prior to the World Summit on Sustainable Development in Johannesburg. The 2002 strategy recognised the key role of education in the three pillars of sustainable development: environmental, economic and social (Ireland, Department of the

Environment and Local Government, 2002*a*). The report highlighted the need to ensure that the variety of opportunities for environmental education can be accessed at classroom level.

In 2003, the Department of Education and Science (DES) launched the new Social, Environmental and Scientific Education (SESE) curriculum for primary schools (Giblin, 2004). The NCCA stated that the new SESE curriculum "fosters an appreciation of the interrelationships of all living things and their environments and encourages children to become active agents in the conservation of environments for future generations" (NCCA, 1999).

The DES has the responsibility to develop a national strategy for Education for Sustainable Development (ESD) in Ireland. A process of consultation commenced in 2005 with the DES establishing a steering group, under the auspices of the National Commission on UNESCO, to direct the development of this strategy. This National Steering Committee for Sustainable Development consisted of representatives from the DES, Heritage and Local Government, Irish Aid and Department of Foreign Affairs, NCCA, Curriculum Unit of City of Dublin Vocational Educational Committee (VEC), Comhar SDC, Higher Education Authority and Dr. Roland Tormey from University of Limerick. The steering committee decided that it would be necessary to consult widely in order to develop the key objectives for the national strategy. Gaps in ESD should be identified and activities in place need to be recorded. A research project was undertaken by ECO-UNESCO in 2007 to provide an overview of good practice in education and training in ESD. Questionnaires were emailed to a variety of stakeholders. A total of forty-five were returned from the 1200 sent, with the majority from the non-formal environmental education sector. This research highlighted the lack of a long-term strategy that would allow for the coordination of resources and funding for ESD initiatives and programmes (ECO-UNESCO, 2007*a*). Consultation through the hosting of a national forum at which a discussion paper on a national strategy could be presented was suggested. The DES invited tenders to undertake the consultation on the development of a discussion document and appointed ECO-UNESCO to carry out the task (Ireland, Department of Education and Science, 2008).

In 2007, the discussion paper entitled *Developing a National Strategy on Education for Sustainable Development in Ireland* was prepared and then presented at a national

conference on *Education for Sustainable Development* held in December 2007. ECO-UNESCO (2007*b*) noted that, in Ireland, there was no environmental education strategy despite environmental education forming a part of the curriculum in schools. Those consulted in the preparation of the paper stressed the importance of the formation of a vision for education for sustainable development. This vision required embedding ESD at all levels of the education system and in all sectors of the community to include youth, adults and the community. Political leadership to ensure an integrated national approach was recommended. The business community was encouraged to get involved in ESD projects. The primary school sector was asked to include more outdoor learning in the curriculum. The promotion of sustainable school buildings was promoted and a call for the widening of the Clean Coasts, Green Homes, Green Schools and Green Colleges initiatives was made (ECO-UNESCO, 2007*b*).

The implementation of whole school/institution approach to ESD, in order to create a climate, ethos and values in which education for sustainable development could thrive, was encouraged. Active learning methodologies were recommended while links with NGOs and other businesses in the field were promoted. It is also recommended that the Higher Education Authority should incorporate ESD content, values and methodologies into higher education programmes. The promotion of a Green Town and Green Business initiative as public awareness strategies were suggested. Funding to encourage involvement by NGOs and community interest in ESD action projects was suggested. The development of ESD networks, the continued professional development in ESD by professional bodies and the promotion of research and development in the higher education sector was recommended. A high standard of environmental management in education institutions was highlighted. Schools were encouraged to save water, reduce energy consumption and continue to reduce waste. Sustainable travel to and from school was also suggested as a possible action under this objective.

Around the globe, the UN Decade of Education for Sustainable Development brought about the establishment of Regional Centres of Expertise (RCE) for Education for Sustainable Development. RCE-Ireland was approved by the UN in September 2007. The membership includes representatives from the third level education sector including the teacher training colleges, Comhar SDC, ECO-UNESCO, City of Dublin Curriculum Development Unit, Ubuntu Network (supporting primary and post primary teachers in

Development Education and ESD), along with other NGOs involved in ESD. The network aims to promote and support action and research that will achieve "the integration of ESD principles and practices into formal, informal and non-formal education in Ireland" (RCE-Ireland, 2009).

In 2009, RCE-Ireland, together with a number of environmental and development NGOs put together a draft 'vision' for the rest of The United Nations Decade of Education for Sustainable Development 2005-2014 (Comhar SDC, 2009). This voluntary vision was prompted by the fact that these stakeholders felt that there was a lack of awareness of the aims of the Decade in Ireland. They noted that, as we entered into the second half of this designated decade, there was little action on the strategies proposed by them and those of the other stakeholders involved in the consultation process. Their vision reiterated the four key objectives set out in the 2007 discussion paper and recommended key actions for both the state sector and the civil society sector under each objective. The fourth objective supported the promotion of high standards of environmental management in public institutions. Here, under action by the civil sectors, NGOs were asked to expand on the environmental management projects already in place in schools to compliment the Green Schools programme.

The DES, the body responsible for developing and implementing a strategy for ESD, has not transferred the draft strategy for ESD, proposed in late 2007, into a National Strategy.

1.4 The Development of Environmental Education Centres

The earliest form of environmental education centre established in America began with a series of outdoor adventure programmes initiated by Joseph Cogswell around 1824 (Pienaar, 1993, cited in Melville, 2007). The activities were based on hiking, camping and nature study experiences for students from a school in Massachusetts. Similar adventure programmes continued into the 1940's, throughout America, using the outdoors as a resource in experiential learning (Freed, 1991).

In the United Kingdom, Sir Patrick Geddes established the first field studies centre in 1892 at the Outlook Tower in Edinburgh. The methodology employed at the centre brought

students in direct contact with nature and set the foundation for modern environmental education (Sterling, 1992).

The Field Studies Council (FSC) was established in the UK in 1943 by a London schools inspector, Francis Butler. The FSC was founded as a pioneering educational charity committed to bringing environmental understanding to all (Wilson, 1993). It has a network of seventeen centres throughout the UK, one of which is located in Derrygonnelly, Co. Fermanagh (Field Studies Council, 2009). The aim of FSC is to encourage field studies for all ages and abilities. They provide international outreach training projects, research programmes, information and publication services and professional training and leisure courses. The FSC also aims to provide centres that are well equipped and maintained. Over half of the FSC centres have Eco-Centres status, showing their commitment to the environment. Most of the finance for FSC is through course fees. Funding for projects targeting disadvantaged children comes from the Department of Children, Schools and Families, Big Lottery Fund and Heritage Lottery Fund.

The setting up of the first FSC centre at Flatford Mill in 1945, on the Essex-Suffolk border, was seen as the instigator in the upsurge of interest in environmental education, not only in schools and universities, but among the ordinary citizens (Wheeler, 1991 cited in Berry, 1993).

In 1946, Sir Peter Scott, artist and naturalist, founded the Wildfowl and Wetlands Trust (WWT). Its mission is to conserve wetlands and their biodiversity. WWT has nine visitor centres in the UK, with one in Northern Ireland at Castle Espie, on the shores of Strangford Lough (Real World Learning Partners, 2006). Special programmes are tailored to suit the National Curriculum but WWT also provides environmental, science and sustainability education for all levels. Their out-of-classroom learning is supported with web-based resources for students and teachers.

The Centre for Alternative Technologies (CAT) was founded in Wales in 1973 by a businessman and environmentalist, Gerard Morgan-Grenville (CAT, 2009). The centre was built on a disused slate quarry and was originally established to demonstrate eco-friendly principles and as a place to test out new technologies. The Visitor Centre was added later and is now used to demonstrate and teach ways of incorporating sustainable practices into everyday life. Key areas addressed include renewable energy, energy efficiency, sustainable building, organic growing and alternative sewage systems. Interactive displays

are used to show global issues on subjects such as energy generation and sustainable transport.

The centre runs a range of residential courses including a Masters in Science. Courses for school children are based on the National Curriculum and are delivered by a dedicated education department. The centre also provides a free information service and a consultancy service. CAT is a limited company and is financed through admission charges, membership fees and donations. It has ninety permanent staff and volunteers working at the centre all year, with sixty additional staff in the summer months. The centre has approximately 65,000 visitors annually.

The Eden Project was constructed on the site of an old china clay quarry near St. Austell, in Cornwall (The Eden Project, 2010). The Visitor Centre opened in May 2000 to mark the new millennium and the full site opened in 2001. The centre consists of multi-domed, greenhouses that contain plants from three different biomes which demonstrate life in distinct climates found around the globe. The Eden Project's mission is "to promote the understanding and responsible management of the vital relationship between plants, people and resources, leading to a sustainable future for all". Exhibitions, themed events, workshops and educational programmes are used to demonstrate what nature offers and encourage people to care for the environment in return. The project received lottery funding for its construction. The Eden Trust, an educational charity, owns it. All monies now raised are used to further the aims of the charity. The Eden Project attracts over a million visitors a year from schools, colleges, universities and the public.

Ireland has a much smaller number of national environmental organisations in comparison to the UK (Brady, 1991). Some of the first providers of informal environmental education in Ireland are outlined below.

Sherkin Island Marine Station, off the South West coast of Cork, was founded in 1975 by Matt Murphy and his late wife, Eileen as a marine research centre (Sherkin Island Marine Station, 2006). The aims of the centre are to:

- Establish baseline data on the marine life of the coastline from Cork Harbour and Bantry Bay and record the natural changes in the plant and animal communities.
- Raise the level of awareness of the marine environment in Ireland and the potential of the sea to create jobs.

- Help introduce young people to nature via *Sherkin Comment* and through educational programmes.

The marine station is privately owned and funded. Volunteer scientists staff the centre from April to November. Sherkin Island Marine Station runs an annual environmental conference and has produced useful publications such as *A Beginners Guide to Irelands Seashore, A Beginners Guide to Irelands Wild Flowers* and *An A-Z of Geology*. The centre also offers an outreach environmental education programme to schools.

The Irish Wildlife Trust (IWT) was established as the Irish Wildlife Federation in 1979 as a charitable conservation body. The trust campaigns on European Union and national policy and legislation. They provide education and awareness on issues such as threatened habitats and loss of biodiversity through their outdoor classroom programmes, and produce a magazine to promote conservation (IWT, 2010). IWT along with ECO-UNESCO were the two non-governmental organisations involved in the early years of environmental education and awareness (Brady, 1991).

The Irish Peatlands Conservation Council was established in 1982 at the Bog of Allen Nature Centre, Lullymore, Co. Kildare. It is a voluntary organisation with charity status and employs seven staff supported by a hundred volunteers (Irish Peatlands Conservation Council, 2010). The council owns and manages three peatlands and promotes awareness through education and publicity. Their mission is "to conserve a representative sample of bogs and fens of Ireland for future generations to enjoy". The centre is located at Lodge Bog and has a peatland museum, a wildlife conservation garden and a planting house which is home to a variety of carnivorous plants.

Outdoor Education Ireland is a network of twelve Outdoor Education Centres (OECs) spread throughout the country (Outdoor Education Ireland, 2009). Each is run by its own VEC and supported by the DES. The centres provide both adventure and environmental education courses for the schools, colleges and youth and community groups. The centres also provide courses for individuals. The first OEC was established in 1972 in Achill, Co. Mayo but environmental education courses were not offered at that time.

The National Parks and Wildlife Service (NPWS) have eight education centres throughout the country (NPWS, 2010). Their first education centre was established in 1992 at Wicklow Mountains National Park. It developed out of a demand by visitors to the park for

information and hence the guiding staff commenced an education programme. NPWS education programme aims to:

- Promote respect, understanding and care for heritage and particularly for the natural world.
- Encourage the development of environmentally friendly practices.
- Inform the public about the National Parks and Wildlife service and their role in conservation.

1.5 Funding for Environmental Education Centre

The DES provides financial support to Outdoor Education Centres in conjunction with the VECs (Outdoor Education Ireland, 2009). Funding from the DES was originally approved on the basis that VEC centres would be self-financing but the Department would contribute a grant to cover the cost of core staff involved in the running of the centres (Office of the Houses of the Oireachtas, 2006).

Other centres, for example, CELT in Co. Clare and St.Brigit's Garden in Galway charge an admission or course fees but supplement their income through grants. Some centres, such as the Irish Peatlands Conservation Council, reduce their staffing cost by availing of volunteers. The Department of the Environment, Heritage and Local Government and the Local Authorities pay grants to small-scale, non-profit environmental projects from the Local Agenda 21 Environmental Partnership Fund (Ireland, Department of Environment, Heritage and Local Government, 2010). The fund is in place to promote sustainable development at local level in each of the Local Authority areas. In 2009, a total of €636,111 was paid by the Minister to 408 projects. The amount granted by the Department was then matched by the respective Local Authority where the project was based. The type of projects which were considered for funding included environmental education initiatives and also environmental exhibitions, community gardens, allotments, compost schemes and rainwater harvesting systems.

Environmental education centres can also apply for funding from the Heritage Council. The Heritage Council provides funding to environmental education projects through its Heritage Education, Community and Outreach scheme (The Heritage Council, 2009). The scheme aims to support new approaches and initiatives that link communities with their

heritage and promote the active participation of the public. The finance for the Heritage Council and the grants they administer are funded from the National Lottery.

A number of environmental education centres, for example CELT and Irish Seed Savers, have received funding through the EU, Rural Development Programme, LEADER ,(*Liason Entre Actions pour le Development d'lEconomie Rurale*), (CAP Rural Development Division, 2007). This EU Community initiative promotes the development of rural areas by supporting innovative, locally based, bottom-up development strategies. The funding is available to both statutory and non-statutory groups. Axis 3: Rural Life and Economy, encourages diversification of the rural community through non-agricultural enterprises, tourism activities and conservation. The grants are administered at local level by thirty-six Local Action Groups across the country. The Local Action Groups, their staff and funding are allocated by the Department of Community, Rural and Gaeltacht Affairs. Each local group receives €1-2m annually, but Axis 2: Environment and Countryside, which includes the Rural Environmental Protection Scheme (REPS), receives an 80% share of the fund (National Rural Network, 2010). A similar funding programme is available for projects in the border counties through the INTERREG programme (Co-operation Ireland, 2010).

Recommendations for funding of environmental education centres have been made to the Department of Environment, Heritage and Local Government by An Taisce for inclusion in the next National Biodiversity Plan. They recommended that the Department should support and finance both environmental and experiential education centres and, in doing so, give recognition to these centres. An Taisce also recommended that the centres should be promoted in a similar manner to those in Belgium. Here, students are required to attend an environmental education centre for a certain amount of days (An Taisce, 2010*b*).

1.6 Best Practice in Education for Sustainable Development

As part of the Decade for Education for Sustainable Development, UNESCO and The United Nations Economic Commission for Europe (UNECE) produced a document, *Good Practices in the UNECE region: Education for Sustainable Development in Action,* to illustrate examples of good practice among their member states. They define good practice in ESD as:

> An innovative project/programme/teaching and learning process implemented to support sustainable development and which has met or is in the process of meeting its objectives.
>
> (UNESCO/UNECE, 2007)

The document outlined criteria that member states used to select projects or programmes for inclusion in the report. One criterion stated that practices should make a difference by having "a positive and tangible impact on the living conditions, quality of life of the individuals, groups or communities concerned".

The Office for Standards in Education (2003) produced a resource for schools in the United Kingdom to assist in the promotion of ESD. Good practice guidelines included the active participation of students in energy conservation, recycling programmes and improvements in the whole school environment.

The Botanic Gardens Conservation International, (2010) also produced guidelines for ESD for those working in botanic gardens and similar site based education centres. The guidelines referred to "hallmarks of good practice" and include the adage "practice what you preach"; promoting the operation of education centres in a manner that is compatible with the environmental message of centres' programmes (McLeish 1997 cited in Willison, 2006).

UNESCO's Associated School Programme Network (ASPnet) has identified good practice priority topics including "water conservation, more rational use of energy, preserving the environment, halting climate change, self reliance, empowerment, and improving health and living conditions" (UNESCO, 2009*b*).

1.7 Environmental Management Systems

Environmental Management Systems (EMS) can benefit an organisations competitive performance and help fulfil their social responsibility while demonstrating good citizenship (An Bord Tráchtála/The Irish Trade Board, 1996). Many nations and various professional organisations have developed their own environmental auditing schemes in response to a growing movement towards a more environmentally aware society (Wenk, 2005). To be

effective, performance needs to be assessed using a structured management system (International Standards Organisation, 1996). The most extensively adopted EMS is the internationally certified standard published by the International Standards Organisation ISO 14001 (Kerret, 2008). Within the European Union, the Eco-Management and Audit Scheme (EMAS) has been designed for companies and other organisations to assist in the evaluation, management and improvement in their environmental performance (European Commission, 2008).

> Arguably the only form of environmental education consistent with the concept of sustainability is one founded at the level of community on whole institution approaches in which the formal, operational and hidden curriculums are in concert with each other and emphasise in their practice the importance of action and affection as well as cognition and (pragmatic) rationality.
>
> (Robinson and Shallcross 1998 cited in Shallcross, 2003)

EMAS is a whole institution approach that is now used by many schools, universities and other educational institutions. It enables, not only efficient resource use but also assists in environmental education and guarantees improved environmental behaviour in homes and in professional life (European Commission, 2006). Researchers suggest that, since many young people spend much time in school buildings, any coordinated approach using an environmental management system in the school, is an excellent model for this generation to imitate (Howe and Disinger, 1989 cited in Green Heart Education, 2007). Whole school approaches were recognised as best practice in environmental education and education for sustainable development where the values and attitudes taught in the classroom are also reflected in the daily running of the school (Robinson and Shallcross, 1998 cited in Shallcross, 2003). Robinson and Shallcross stated that this practice reinforces values through active participation thus "values are caught, rather than only being taught" (Shallcross, 2003).

The Foundation for Environmental Education (FEE), an international non-governmental organisation, established the Eco-Schools programme basing the methodology on both EMAS and ISO14001 (FEE, 2008). The environmental management system for Eco-Schools is structured using seven steps similar to the EMAS model and encourages whole school involvement. The system includes the formation of a committee which includes representatives from the student body, teaching and non- teaching staff, management and parents. An environmental review is carried out in order to identify targets for action and improvement. This is then followed with an action plan outlining achievable goals and

target dates for achievement. Ongoing monitoring and evaluation takes place and plans altered accordingly. Information and practices are integrated into the curriculum and a publicity programme is established to create awareness in the community. A green code is set in place setting down the schools commitment to good environmental practices (Green-Schools, 2009).

FEE Eco-Schools Programmes are run in many countries around the world, including Europe, Africa, Asia and South America. Programme titles differ, for example, New Zealand schools are involved in the Enviroschools Programme, Sweden has a Green Schools Award, and Green Schools Project runs in China while OECD countries can participate in the Environment and Schools Initiatives called Eco-Schools. Australia has recently started their initiative, Australian Sustainable Schools (AuSSI). Despite the range of localities and titles, every programme has a whole school approach that is based on EMS but differ in that the programmes are tailored by each country or state to suit their individual needs (Henderson and Tilbury 2004).

Ireland participates in the FEE Eco-Schools initiative. Here it is known as Green-Schools and is coordinated by An Taisce, operating in partnership with the Local Authorities. The aim of the Green-Schools Programme is "to move from environmental awareness in the curriculum to environmental action in the school and wider community" (Green-Schools, 2009).

The Green-School Programme covers various themes including Litter and Waste Management, Energy, Water, and Travel. Schools commence the programme with the Litter and Waste Management theme. They first analyse their litter problem and then establish an action plan. Most schools introduce recycling and composting along with an awareness campaign. Targets are set and the scheme is monitored. Success is measured in order to continue to manage the programme. Waste is dealt with under the same scheme with waste minimisation encouraged (Green-Schools, 2010*a*).

Once the programme on tackling litter and waste management is completed, the school can apply for their green flag. To renew the award, schools then take on subsequent themes including Energy, Water and Travel. The energy theme encourages the school to carry out their own energy audit. A brainstorming session, to include as many people as possible,

then can take place in order to create an action plan. "Low cost" initiatives such as replacing light bulbs with compact fluorescent lights (CFLs), along with "no cost" measures such as a "switch off" campaign, are common in the energy theme. Water conservation is approached in a similar manner, promoting good practice in water usage in the school. Examples of initiatives in the transport theme include the "Walking Bus" and "Walk on Wednesday" (WOW). Biodiversity and European Global Citizenship are two new themes recently added to the programme.

It is evident that the Green-Schools Programme is changing lifestyles at all levels of society as encouraged by UNESCO.

> ....the effectiveness of awareness raising and education for sustainable development must ultimately be measured by the extent to which they change the attitudes and behaviours of people as both consumers and citizens. Changes in lifestyles as reflected in individual behaviour, households and at a community level must take place.
>
> (UNESCO, 1997)

Research has shown that the Green-Schools initiative has had a positive impact, not only on the students in the participatory schools, but also on the parents of the students and the wider community as a whole (Mather, 2006). An Taisce have reported that, in 2008, the Green-Schools Programme has resulted in twelve tonnes of waste being diverted from landfill every day in Ireland (An Taisce, 2009). The 2001 study carried out by An Taisce on the performance of Irish Green-Schools found that, in homes where students attended a school participating in the Green-Schools Programme, levels of home composting and the recycling of paper, glass and aluminium were higher (An Taisce, 2001 cited in Mather, 2006). It is estimated that 3.7million units of electricity were saved in 2008 through the energy theme, while schools participating in the transport programme saved approximately 500,000 litres of transport fuel in the same year. In 2008/2009, 3,200 schools were registered with the Green-Schools, representing 80% of Irish schools. The Green Flag was awarded to 1,700 of these schools.

An Taisce has also introduced the Green Campus Programme based on the Green-Schools Programme (Green-Schools, 2010*b*). In 2007, at the 4th International Conference on Environmental Education, higher education institutes were asked to "practice what they preach" by designing building that would conserve energy, recycle waste, reduce paper use, minimise fuel use in campus vehicles and improve the outside environment by bush

and tree planting (Mohamedbhai, 2007). The Green Campus initiative is based on the seven-step methodology corresponding to the criteria of ISO 14001:2000 Environmental Management System Standards.

The Green Key Programme, also coordinated by FEE, is an international award for hotels, youth hostels, conference centres and holiday centres (FEE, 2008). Businesses have a responsibility in education for sustainable development due to their close links with their employees, customers and providers of products and services (Tilbury, Adams and Keogh, 2005). One of the four goals of the Green Key Programme is to encourage the hospitality sector to educate staff, administrators and tourists through the promotion of sustainable practices. The criteria, which must be fulfilled to earn the Green Key eco-label, come under twelve headings and encourage waste minimisation, water conservation and a reduction in energy requirements. The criteria also require the establishment of an environmental policy, action plans and the incorporation of an environmental education and communication policy (FEE, 2009).

FEE has the Eco-Centres initiative running in Wales. It is both a programme and an award scheme managed by "Keep Wales Tidy", based on the Eco-Schools scheme and designed to promote and acknowledge whole-centre action on environmental protection. As with the Eco-Schools programme, seven essential elements are employed. The review stage has specific criteria, such as those used in EMAS, providing a checklist to help identify targets for participating centres. This checklist is similar to the criteria used in the tourism sector awards. Eco-Centres initiative is an ongoing scheme, which encourages centres to tackle manageable goals followed by more ambitious targets in the future (Keep Wales Tidy, 2007).

1.8 Legislation Pertaining to Environmental Education Centres

Legislation needs to be adhered to by managers to ensure centres are within the realm of the law. Legislation also guides environmental managers in the development of environmental management plans. The following outlines some of the legislation that centres may need to consider in achieving best practice in the built environment and the day to day running of the these centres.

1.8.1 Planning Regulations

Planning permission is required under the Planning and Development Regulation, 2001, for any development of land or property, unless listed as exempt (Ireland, Department Environment and Local Government, 2002*b*). Development includes a material change of use of the building or land and any work on the building or land such as alteration or demolition. The local planning authority considers each application to see if it meets with the objectives of their development plan.

The Planning and Development Regulations, 2008 (S.I. No. 235) provide for exemptions to developments in respect to renewable technologies. The Regulation applies to industrial buildings, agricultural holdings and business premises and provides exemptions for wind turbines, combined heat and power (CHP) plants, biomass boiler units and solar panels, subject to certain conditions (Planning and Development Regulations 2008, S.I. No. 235).

1.8.2 Water Pollution Licence

Commercial environmental education centres, discharging effluent to surface waters or to ground waters, will require a licence under Section 4 of the Local Government (Water Pollution) Acts, 1977 and 1990 (Wexford County Council, 2008). Effluent in this case refers to domestic-type wastewater or sewage. Discharge of effluent to a public sewer, which may contain substances that could be a problem at the wastewater treatment plant, requires a licence under Section 16 of the Local Government (Water Pollution) Acts, 1977 and 1990. This would apply to a centre that may have a restaurant and where effluent may contain a large amount of fats and oils.

1.8.3 Building Regulations

The Building Control Regulations, 1997-2009, apply to the basic design and construction of new buildings and to any extensions or material alterations to existing buildings (Ireland, Department Environment, Heritage and Local Government, 2007). The purpose of the Regulations is to promote good practice in design and construction and deals with many areas including ventilation, hygiene, drainage and waste disposal and the conservation of fuel and energy.

1.8.4 Energy Performance in Buildings Directive

From 1 January 2009, all public bodies, including public educational establishments, occupying a space excess of 1000m^2 must have a Display Energy Certificate, positioned in a location that is clearly visible to the public (European Communities (Energy Performance of Buildings) (Amendment) (No.2) Regulations, 2008). The certificate shows total energy usage in the building. It is benchmarked for buildings of the same type. The certificate has an A-G scale and has to be updated and renewed annually (Sustainable Energy Ireland, 2009).

1.8.5 Waste Management (Food Waste) Regulations

Waste Management (Food Waste) Regulations, 2009, apply to major sources of food waste from places such as those that prepare food, state buildings, restaurants, canteens, hotels and larger guest houses (Waste Management (Food Waste) Regulations, 2009). The waste producer must separate the food waste and make it available for separate collection or, alternatively, can biologically treat this waste on their premises under specified conditions. The Regulations are in force since the beginning of January 2010 but small businesses that produce less than 50Kg of food waste per week are exempt until July 2011.

SECTION 2 RESEARCH METHODS

2.1 Identification of Centres

The focus of the research was on centres offering non-accredited courses and programmes in environmental education (EE) or education for sustainable development (ESD). A comprehensive list was compiled as no such list exists in the literature. This was compiled through a scoping exercise.

A number of centres were already known to the author while some were found through the literature review. The majority of centres were found through web searches. Key words and phrases including "environmental education", "education for sustainable development", "ecology courses" and "Social, Environmental and Scientific Education (SESE)" yielded many websites for a variety of centres. CELT, a provider of ESD and EE had a comprehensive list of links available on their website that generated many contacts. Additional results were found through examination of advertisements in magazines, including *Primary Times*, *Sustainability* and *Green Pages.*

A brochure was requested from each of the centres which were found through the scoping exercise. Centres were contacted via email. The brochures and websites were then examined. The research has been confined to centres that embraced the definition of EE and ESD as found in the literature review (Section 1.6). Those that did not provide a programme in EE or ESD, or integrate the principles of either into their programmes or providers that did not have premises were not included in this study.

2.2 Survey Design

A survey was designed in the form of a questionnaire to carry out an audit of each centre. The questions in the survey were based on environmental initiatives undertaken by both the tourism and education sectors in Ireland and Europe was found through the review of the literature. Each of the following initiative was examined:

1. The Green Key (An eco-label for leisure organisations)
2. Green Schools (An Taisce)

3. Green Campus (An Taisce)

4. Eco-Centres (Keep Wales Tidy)

Information was sought from An Taisce regarding the Green Schools and Green Campus initiatives. An Taisce provide guidelines from Eco-Centres, Scotland. The criteria used in the initiatives listed above were then adapted to form a basis for the survey. The survey was designed to elicit information on the following aspects of the centres:

1. Litter and Waste Management

2. Energy Conservation and Use

3. Water Conservation

4. Insulation of Buildings

5. Sustainable Transport

6. Sustainable Purchasing (Office, Kitchen and Housekeeping)

7. Contribution to Conservation

The survey layout was designed so that it would not appear too difficult to complete for the recipient and thus encourage its completion and return. The survey was then pre-tested by an employee of an environmental education centre to complete and ambiguity was identified and remedied. The survey composed of two A4 pages and required a "yes" or "no" or "not applicable" answer on the seven aspects detailed above which could be abbreviated to "Y","N" or "N/A". Other general information on centre capacity, staffing, and course provision was also requested, requiring some written detail. Guidance for completion was outlined in an accompanying letter. Respondents were offered a copy of the results as an incentive. A copy of the survey and the letter are included in Appendix A.

2.3 Data Collection

2.3.1 Implementation of Survey

The centres were contacted by telephone at the initial stages of the research. The context of the survey was explained and managers were asked to complete the survey by telephone

interview. The telephone surveys were too time consuming therefore it was decided to continue by email. The bulk of the surveys were then emailed to centres using the email contact on web sites or in centre brochures. Where responses were not received after five working days had elapsed, a follow-up telephone call was necessary to encourage completion and return of the survey. In some instances, the telephone contacts advised of other centres known to them and these were then added to the initial list of centres identified.

2.3.2 Site Visits

Site visits were included as part of the investigation to substantiate the data received through the survey. Information in the brochures and on webs sites could also be verified. The more subjective attributes of centres could also be recorded.

The following centres were visited:

- Dolmen Centre, Co. Donegal
- Gartan Outdoor Education Centre, Co. Donegal
- Kerry Earth Education Project (KEEP), Co. Kerry
- Lough Key Forest Park Education and Activity Centre, Co. Roscommon
- Nano Nagle Centre, Co. Cork
- Rediscovery Centre, Dublin
- Sonairte: The Ecology Centre, Co. Meath

These sites were selected to include those identifying themselves as organic farms, outdoor education centres, environmental education centres or a centre for education for sustainable development. The selection incorporated both residential and non-residential centres. The funding of the centres was also consider, thus included state, and privately funded centres, along with those having charitable status.

The site visit protocol involved making an appointment to meet an appropriate person on site and requesting permission to take photographs. Visits comprised of a guided tour.

Notes were taken while photography was used to record aspects of good practice in the built environment within the premises.

2.4 Data Analysis

A comprehensive list of centres was tabulated. The information generated through the survey was incorporated into a "Microsoft Excel" spreadsheet. Each of the aspects of good environmental practice was given a separate tab within the spreadsheet. The aspect named "Sustainable Purchasing" was sub-divided into two headings as "Purchasing: Office" and "Purchasing: Kitchen and Housekeeping".

A simple scoring system was incorporated in the tables in order to ascertain the level of good practice in each centre. A total score for each centre, under each of the aspects was determined. A summary spreadsheet was used to calculate overall score and then rank the centres accordingly. Totals and averages for each aspect were tabulated. The spreadsheets were also added to a CD located inside the cover of the thesis.

SECTION 3 RESULTS

3.1 Identification of Centres

Seventy centres were found that provided environmental education (EE) or education for sustainable development (ESD) and fulfilled the other criteria deemed necessary to be included in the research. A list of centre names in each county is given in Table 3.1, while a map showing their distribution across the country is illustrated in Plate 3.1. A more detailed list including addresses, telephone numbers, email and website addresses for each centre is given in Appendix B Table 1.

No centres were found in five of the twenty-six counties, namely Carlow, Cavan, Longford, Louth, and Westmeath. The geographical spread showed that the coastal counties had the highest percentage of centres with County Galway having nine centres (Figure 3.1). Eight centres are located in County Wicklow while County Dublin has seven, one of which is at the initial stages of construction. County Kildare has three centres representing the highest percentage of centres for inland counties.

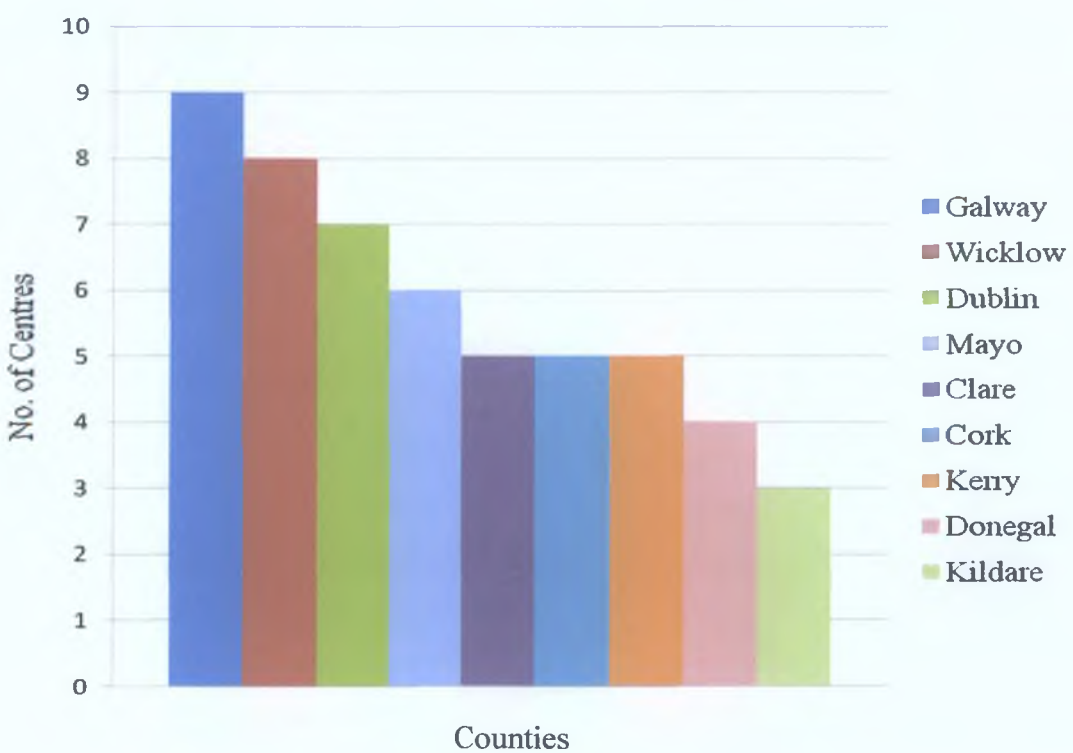

Figure 3.1: Number of Centres per County

County	Map No.	Centre
Clare	1	Boghill Centre
	2	Burren Outdoor Education Centre
	3	Centre for Environmental Learning & Training (CELT)
	4	Lahinch Seaworld & Leisure Centre
	5	Irish Seed Savers
Cork	6	Fota Island
	7	Irish Natural Forestry Foundation
	8	Lifetime Lab
	9	The Hollies Centre for Practical Sustainability
	10	Nano Nagle Centre
Donegal	11	Breesy Centre
	12	Dolmen Centre
	13	Gartan Outdoor Education Centre
	14	Glenveagh National Park
Dublin	15	Airfield
	16	North Bull Island
	17	Cultivate
	18	Dublin Zoo Education Centre
	19	ECO UNESCO
	20	National Botanical Gardens
	21	Rediscovery Centre
Galway	22	An Gáirdín
	23	Brigit's Garden
	24	Burrenbeo
	25	Connemara National Park
	26	Delphi Mountain Resort
	27	Galway Atlantaquaria
	28	Killary Adventure Centre
	29	Kinvara Sustainable Living
	30	Petersburg Outdoor Education Centre
Kerry	31	Cappanalea Outdoor Education Centre
	32	Eco Adventure, Killarney
	33	Institute of Permaculture & Nature Awareness
	34	Kerry Earth Education Project (KEEP)
	35	Killarney National Park

Table 3.1: List of Centres Providing EE and ESD (1 of 2)

County	Map No.	Centre
Kildare	36	Bog of Allen Nature Centre
	37	Lullymore Heritage & Discovery Park
	38	Irish National Stud, Japanese & St. Fiachra's Gardens
Kilkenny	39	Castlecomer Discovery Park
Laois	40	Dunmore Country School
Leitrim	41	Lough Allen Adventure Centre
	42	The Organic Centre
Limerick	43	Kilfinane Outdoor Education Centre
Meath	44	Sonairte: The Ecology Centre
Mayo	45	Achill Outdoor Education Centre
	46	Ballycroy National Park
	47	Horizon Adventure & Education Centre
	48	Museum of Country Life
	49	The Sustainability Institute
	50	Uisce
Monaghan	51	Ballybay Wetlands Centre
	52	Tanagh Outdoor Education Centre
Offaly	53	Birr Castle Demesne
	54	Birr Outdoor Education Centre
Roscommon	55	Croghan Organic Garden
	56	Lough Fey Forest Park Education and Activity Centre
Sligo	57	North Midlands Education Centre
Tipperary	58	Village Education, Research and Training (VERT)
Waterford	59	Lismore Heritage Centre
	60	The Coppercoast GeoPark
Wexford	61	Shielbaggan Outdoor Education Centre
	62	Wexford Wildfowl Reserve
Wicklow	63	An Tairseach
	64	Baltinglass Outdoor Education Centre
	65	Carraig Dúlra
	66	Eco Adventure Enniskerry
	67	Kippure Estate
	68	Knocksink Wood Nature Reserve
	69	National Sea Life Centre
	70	Wicklow Mountains National Park

Table 3.1: List of Centres Providing EE and ESD (2 of 2)

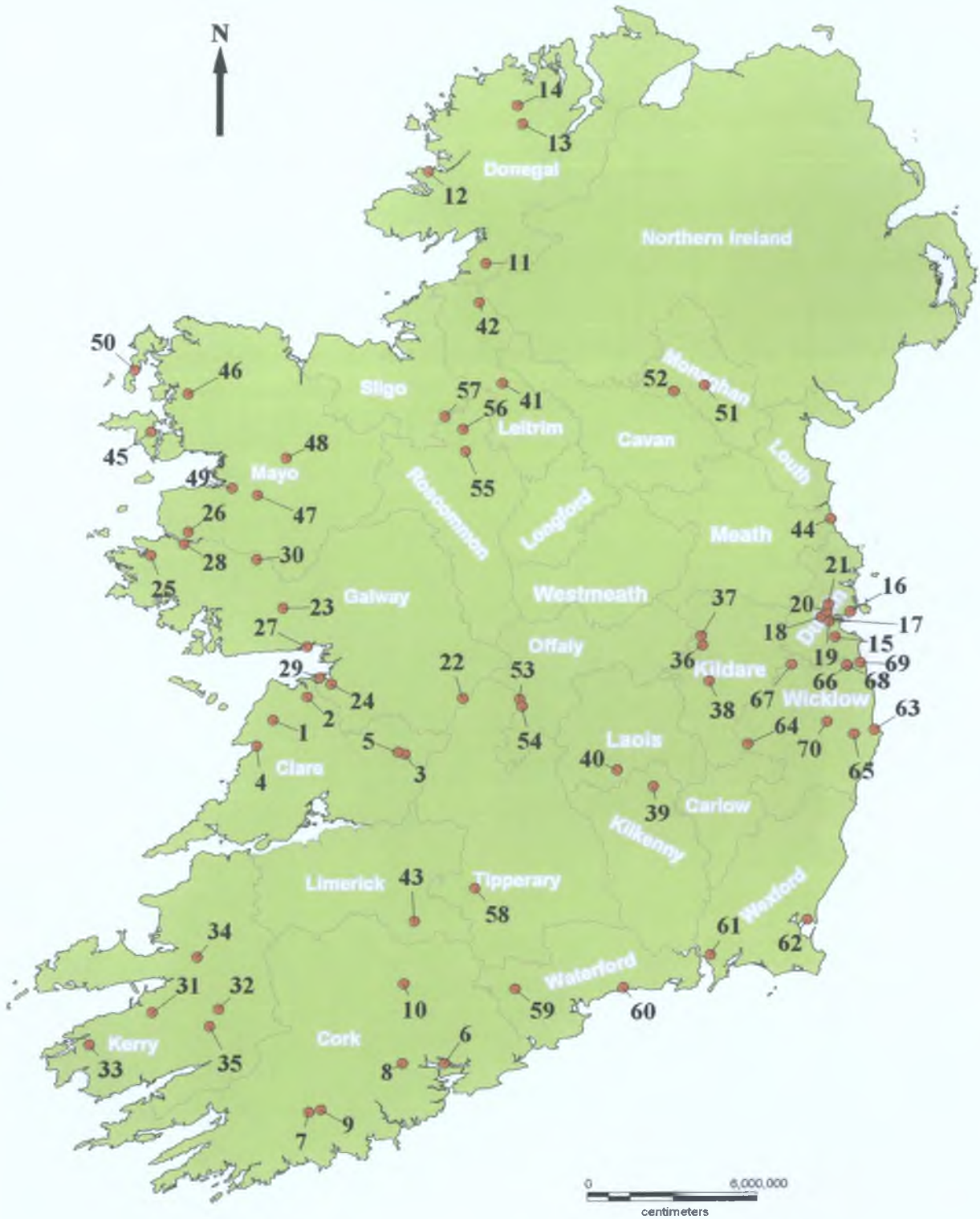

Figure 3.2: Location of EE and ESD Centres

(Key to Numbers in Table 3.1)

There is one centre in each of the counties Kilkenny, Laois, Limerick, Meath, Sligo and Tipperary. The only centre in County Tipperary currently operates from church halls but a new centre is planned for the "EcoHostel" now under construction at The Village in Cloughjordan.

Leinster has the highest number of centres, provincially, having twenty-five centres, seventeen of which are located in the Dublin/Wicklow area (Table 3.1). Connacht has twenty centres, with a minimum of one centre in each county. There are nineteen centres in Munster and again, each county has at least one centre. Six centres serve the three counties of Ulster in the Republic but there is none in County Cavan. Based on the census of 2006 (Central Statistics Office, 2007), Connacht has the most centres per head of population, having one centre per 25,206.

Province	Ulster (ROI)	Connacht	Munster	Leinster
No. of Centres	6	20	19	25
Population	267,264	504,121	1,173,340	2,295,123
No. Centres per Capita	44,544	25,206	61,754	91,805

Table 3.2: Number of Centres per Province Population

3.2 Survey Returns

Four centres were surveyed by telephone interview. The survey was sent to the remaining sixty-six centres. The survey was carried out over the winter season when some centres were closed or short staffed resulting in a delay in response. Thirty-nine completed surveys were returned, giving a return rate of nearly 56%. The trend in return time is shown in Figure 3.3.

More than half of the returned surveys were received in the first week; with the highest return rate, occurring one day after the survey was sent. By the end of second week, a further 16% of the total was returned. This coincides with the time after which a reminder email was sent or a telephone call made to the centres office.

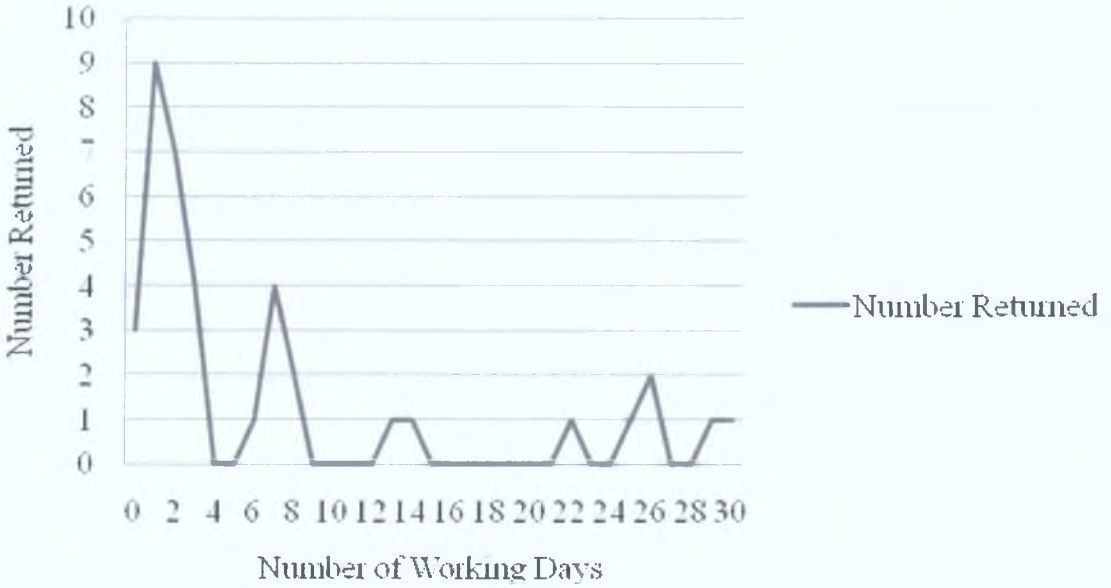

Figure 3.3: Trend in Survey Return Time

3.3 Survey Respondents

The survey was targeted at managers of centres but someone other than the manager as indicated in the return emails completed most. The respondent was most frequently a member of the environmental education staff. Some respondents reported that they did not know the answer to some of the questions for example; visitor numbers, but sought the information from their manager. A representative of the centres environmental management team completed two surveys returned.

3.4 Survey Findings – General Information

3.4.1 Centre Setting

Centres were asked to identify their location as either rural or urban. It was found that 66% of centres that replied are located in a rural location (Appendix B Table 2). Only one of the twelve identified as a residential centre is located in an urban setting.

3.4.2 Centre Funding

A choice of three categories, namely charity, private or state was given. Privately funded centres represent 27% of the total number surveyed (Figure 3.4). The state funds one third of the centres with a further two centres being funded by both state and charitable sources. Three Outdoor Education Centres (OECs) are included in the category of state funded, but these centres supplement their funding through course fees. Nearly a third of centres are charities. The Lifetime Lab is the only centre receiving funding from both the private and state sector. A more detailed breakdown is available in Appendix B Table 2.

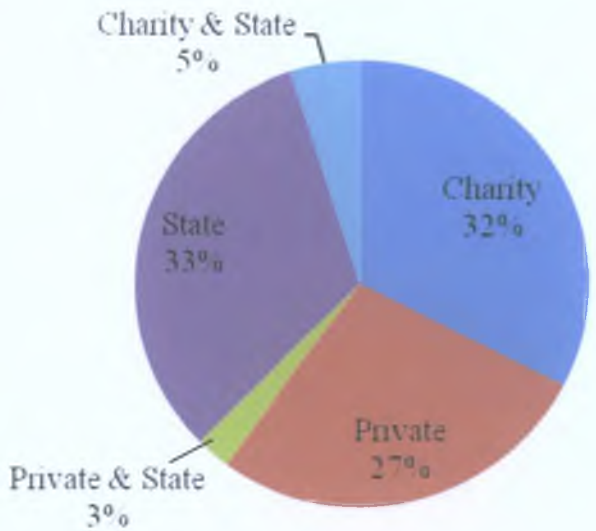

Figure 3.4: Funding of EE and ESD Centres

3.4.3 Environmental Policy and Management Systems

Environmental policies are in place in 62% of the centres (Appendix B Table 2). The response to the question on centres having a recognised EMS in place proved various answers. Some answers stated the centre had a "Leave No Trace" (LNT) policy in place. Two said it was not applicable while one said they did not understand what it meant. Three organic centres inserted the farm certification details while 12 centres left the answer blank. Only one centre has ISO14001 certification (Section 1.7) and two have the Eco-Flower, a label under a European voluntary scheme for products and services. Three centres plan to introduce an environmental management system while the Rediscovery Centre, is working on its own template. 17% of centres plan or have EMS in place.

3.4.4. Interest in "Green Flag" for Centres

All respondents answered the query regarding their interest in an award scheme similar to the Green Schools. Over three quarters of the centres gave a positive response one of which is involved in a similar initiative namely the Green Business Award. Five centres said they might be interested in such an initiative.

3.4.5 Programme Provision

There is a wide variety of courses and programmes provided by the centres surveyed. For the purpose of analysis, the programmes were grouped into twenty catergories (Appendix B Table 3). The results for the most popular courses provided are shown in Figure 3.5.

Nature studies for primary school children is provided by nearly three quarters of the centres, thirteen of which are recognised as Discover Primary Science centres. Field studies in ecology is the next most popular programme offered, while natural heritage courses for adults, are accessible at 41% of the centres. Other prevalent programmes include biodiversity, organic horticulture and geography field studies. Eco-building and renewable energy courses are confined to a smaller sector while four centres offer recycling programmes.

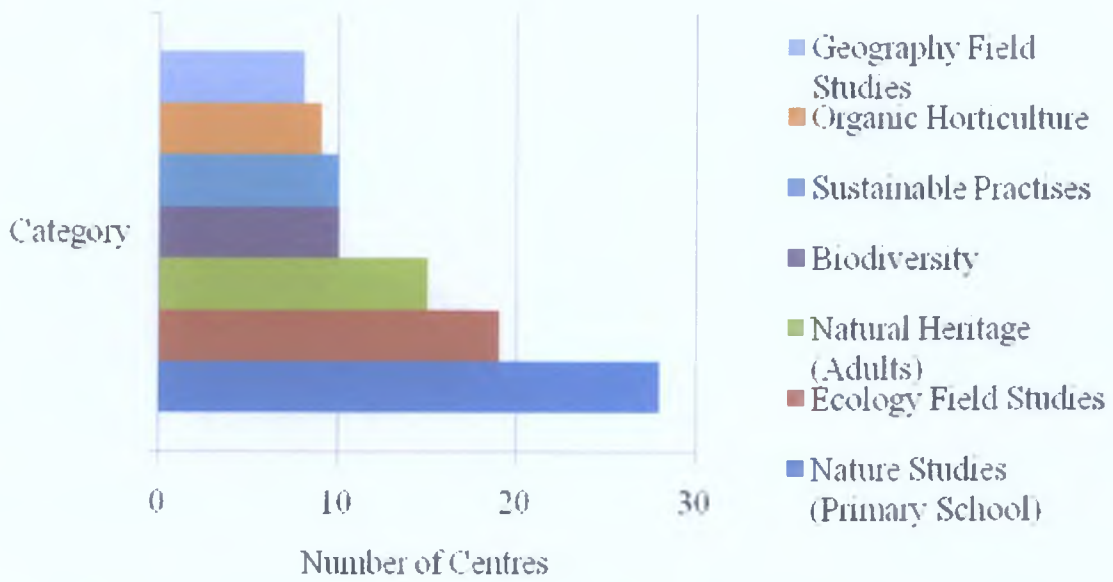

Figure 3.5: Trend in Programme Provision

Most centres provide a range of courses. Sonairte in Co. Meath provides programmes in twelve of the categories identified while the Nano Nagle Centre in Co. Cork offers similar courses in eleven of the groupings. The Rediscovery Centre in Ballymun specialises in recycling programmes while the outdoor education centres tend to offer courses in the primary and post primary categories, alongside or integrated with their adventure education programmes.

3.4.6 Target Groups

Many of the respondents did not specify exact groups but stated they were open to all as shown in Appendix B Table 4. There are specific courses intended for primary and post primary students with nearly two thirds of the centres catering for this category. The fourteen Discover Primary Science (DPS) centres run programmes based on the SESE curriculum for the primary school sector. Kilfinane OEC targets both primary and second level schools while both Brigit's Garden and Lullymore Heritage Park target primary school. Wicklow National Park noted that 90% of their groups are from schools but welcome all other groups including Active Retirement. Seven centres particularly mentioned that they provided courses suitable for third level students though these are not formal courses. The Breesy Centre, Co. Donegal attracts both corporate groups and language students. Community groups are welcomed at Irish Seed Savers, Co. Clare, KEEP, Co. Kerry, VERT, Co. Tipperary and Wexford Wildfowl Reserve. The latter also invites the Wexford Naturalist Field club to their site. Courses especially for teachers are available at seven centres (Appendix B Table 4).

3.4.7 Visitor Numbers and Centre Capacity

Visitor numbers given by respondents referred to the annual number of visitors to the site as a whole with the exception of Fota Wildlife Park, Co. Cork and Killarney National Park, Co Kerry. Both of these centres gave the attendance figure for their respective education centres. Seven centres, two of which are newly opened, did not state their visitor numbers,

while another did not know the figure. The full details on visitor numbers and centre capacity can be found in Appendix B Table 2.

The highest annual number of visitors was recorded for the National Botanical Gardens receiving 600,000 visitors in 2009. This represents 43% of the total annual figure for visitors to all the education sites surveyed. The National Museum of Country Life, Co. Mayo, Connemara National Park, Co. Galway and Glenveagh National Park in Donegal had the second largest figure, each having 100,000 as their annual figure, together representing approximately a fifth of the total figure for the whole country.

The county of Dublin has the highest number of people accessing sites where EE or ESD programmes were documented (660,600 *per annum*) with 90% of them attending the National Botanical Gardens. The centres in Co. Galway catered for the second largest number in the seven centres surveyed (208,300 *per annum*) while Co. Donegal ranks third, recording just over half the number of the Galway centres (113,000 *per annum*). The lowest figure was reported in Co. Leitrim having 0.4% of the annual total with Co. Kerry just slightly ahead with 0.9% of the market.

The question requesting centre capacity, sub headed residential and non-residential, required the insertion of a figure. Nearly 45% of the respondents used yes or no answers, thus making it difficult to ascertain total capacity. Calculations based on the twenty-one centres that detailed non-residential capacity can cater for 2,418 course participants each day. Sonairte, Co. Meath has the largest capacity, recording space for 500 visitors while the six outdoor education/adventure centres can cater for 27% of the total between them. The Dolmen Centre in Co. Donegal can host 250 visitors at any one time making it the second largest venue.

3.4.8 Staff Numbers and Training

Three centres omitted an answer on the number of staff working in EE or ESD at their centre while a further four centres did not document if personnel were trained in both. The total number of EE or ESD staff is 158 staff, 91% trained to do so. In-service training is provided by 84% of the centres for their staff. Two centres in Co. Clare, namely CELT and Irish Seed Savers recorded the highest number of staff in EE and ESD at fifteen in each centre (Appendix B Table 2). Thirteen people are employed in the education centre at

Airfield in Dublin and eleven staff work at Fota Wildlife Park in Co. Cork. Seven centres have only one person working in EE or ESD, three of which are outdoor education/adventure centres.

3.5 Survey Findings - Aspects

The data on the findings of the survey are documented in Appendix B Tables 5-12 with a summary table in Appendix B Table 13. Results and scores are missing for some centres under different headings for various reasons. An incomplete survey was returned from CELT due to technical problem with their email. VERT is a planned centre therefore; results are given based on data for the present site of operation. The Rediscovery centre is under construction but data has been included from the architects building specifications for most aspects.

Certain aspects are not applicable to some centres, for example, kitchen purchasing, therefore scores has been adjusted to account for this. If respondents left a "yes/no" box empty, it was assigned zero in the scoring system.

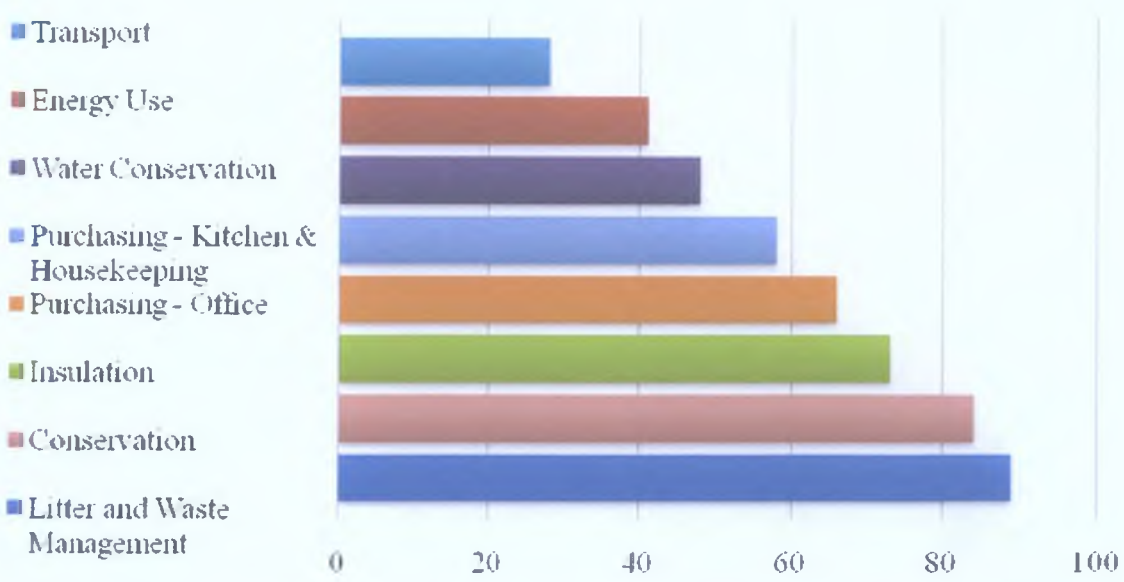

Figure 3.6: Aspect Average Score (%)*

(* Figures represent the average scores of all the centres for each aspect)

The highest average score (89%) was achieved for litter and waste management which represents the score achieved for fufilling features with in the aspect of litter and waste management. The next best average score was for contribution to conservation at 84% (Figure 3.6). The lowest average score of 28% was in sustainable transport.

3.5.1 Litter and Waste Management

The top average score was achieved in litter and waste management when compared with all eight aspects (Figure 3.6). Fourteen centres scored 100% while another fourteen scored 90%. Half of the centres received the top score of 100% for recycling. Composting was the most popular feature practiced in litter and waste management (Appendix B Table 5). Eight centres do not compost any food waste. Plastic containers are not recycled in two centres while five do not recycle waxed cartons.

Mains sewerage is available to 47% of the centres. Eleven centres use reed beds or peat fibre to treat their waste while over one quarter of the centres use septic tanks as their sole sewage treatment method.

3.5.2 Sustainable Energy Use

Energy use is ranked second last when compared with all the other aspects (Figure 3.6). One centre achieved the top score of 83% for their energy use. Two centres received the next highest score of 77% (Appendix B Table 6). Nearly half on the centres scored below the average score of 41%. No form of renewable energy is used in 42% of the centres. Centres with renewable energies use at least two forms with the exception of two sites. Solar energy is used in seventeen centres making it most popular renewable while wood is used by nearly one third of the centres (Figure 3.7).

Eleven centres use geothermal energy, which represents 29% of the respondents. CELT in Clare is the only centre using hydropower but the National Botanical Gardens plans its introduction in the near future.

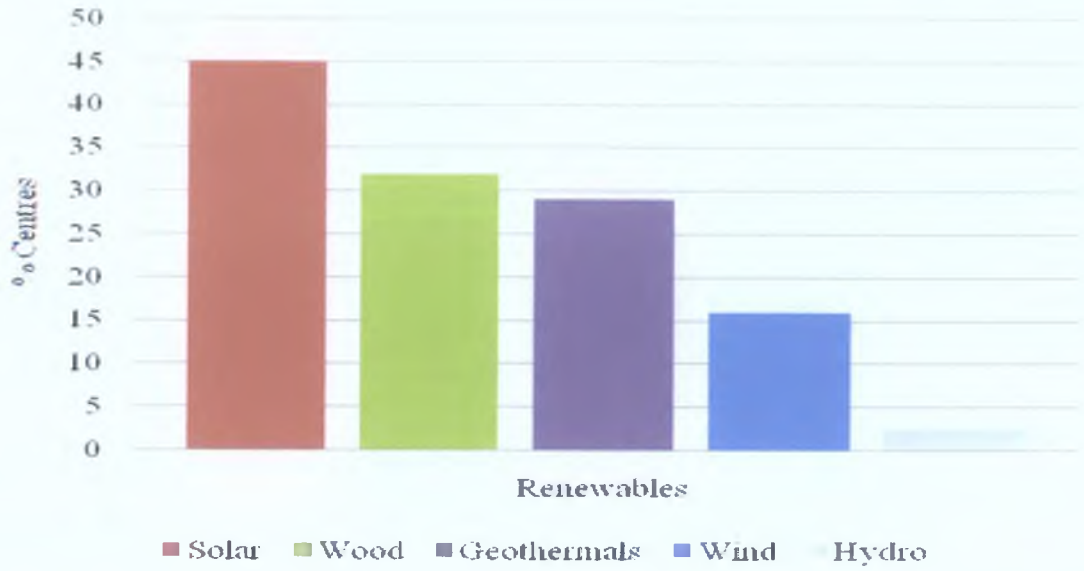

Figure 3.7: Sources of Renewable Energy

The Dolmen Centre, Co. Donegal and the Nano Nagle Centre, Co. Cork use wind, solar, wood and geothermal energy in their centres. Nearly one third of centres do not have room or radiator thermostats fitted. Eight centres have low emission boilers, which accounts for 23% of boilers used. Compact fluorescent lights (CFLs) are used in twenty-seven of the centres, making this the most common way by which centres reduce their electricity consumption. Just over half of the centres have either time switches or motion sensors for their lighting.

3.5.3 Insulation

Three quarters of the centres achieved above the average score of 73% (Figure 3.6). The most prevalent form of insulation used is that in the roof or attic at 84% while double or triple glazing is the next most frequent (Appendix B Table 7). One centre has no insulation while a second only has draught excluders. Three centres reported that this aspect was not applicable to them, one of which is an aquarium.

3.5.4 Water Conservation

Kerry Earth Education project was the only centre to achieve full marks for water conservation. Twenty-four centres achieved a score above average (48%). Just over a third

of centres carry out leak testing while only four recycle "grey" water (Appendix B Table 8). The most common method employed in water conservation was the use of stoppers in sinks and wash hand basins.

3.5.5 Sustainable Purchasing-Office

Four centres achieved 100% for sustainable practices in their office purchasing (Appendix B Table 9). The average score was 66% (Figure 3.6). Close on half of the centres are above average for this aspect with reuse of paper for printing being the most frequent practice. Brochures for nine centres are printed on neither recycled or chlorine free paper.

3.5.6 Sustainable Purchasing-Kitchen and Housekeeping

Bog of Allen Centre, Nano Nagle Centre and VERT scored the highest in this aspect (Appendix B Table 10). Fourteen centres use only eco-friendly consumables while four centres purchase none of these. Washing-up liquid is the most commonly purchased eco-consumable. Eighty percent of centres try to buy Irish foodstuff, with over three quarters look to source their food locally. Thirteen centres grow their own vegetables and six supply their own meat or other food such as eggs.

3.5.7 Sustainable Transport

The lowest average score for any aspect was in transport (Figure 3.6). Five centres do not use centre vehicles while KEEP is the only centre that uses a bio fuel vehicle (Appendix B Table 11). Seven centres have low CO_2 vehicles but the most frequent practice is limiting of journeys. Only 14% of centres that can avail of public transport have initiative to encourage their staff to use it. Eleven are involved in the "Cycle to Work" scheme.

3.5.8 Contribution to Conservation

Sixteen centres achieved above average for contribution to conservation (Figure 3.6). About one fifth of centres do not have a plan for greening their sites, most of which are in

rural locations (Appendix B Table 12). All centres that could plant native trees did so while only one centre did not have an area set aside for wildlife.

3.5.9 Centres Compared and Ranking

The average score achieved by each centre and their ranking according to this score are illustrated in Table 3.3. KEEP, Co. Kerry achieved an overall score of 92%, which place them first out of thirty-seven centres given a ranking. They attained the highest possible score in six out of the seven aspects assessed (Figure 3.8). The Nano Nagle Centre in Co. Cork, ranked second also scored the highest mark in six aspects. Both the National Botanical Gardens in Dublin and the Boghill Centre in Co. Clare scored 80% putting them in joint third place.

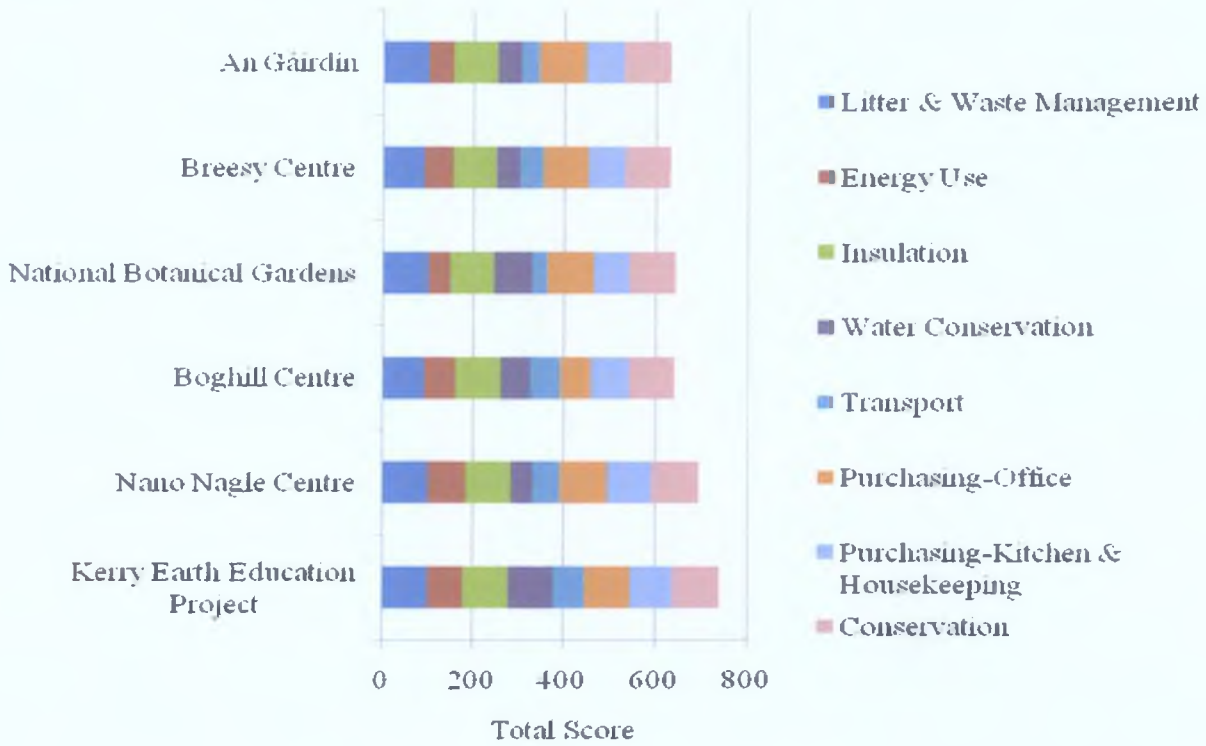

Figure 3.8: Breakdown of Total Aspect Scores

Sixteen centres achieved the average score of 62%. A further ten achieved between 50% and 61%. Only two centres scored lower than 40%. A summary of aspect scores can be found in Appendix B Table 13.

Centre	Average Score	Rank	Centre	Average Score	Rank
Kerry Earth Education Project	92	1	Ballycroy National Park	54	21
Nano Nagle Centre	87	2	Kilfinane OEC	54	21
Boghill Centre	80	3	Bog of Allen Nature Centre	53	23
National Botanical Gardens	80	3	Connemara National Park	51	24
Breesy Centre	79	5	Glenveagh National Park	51	24
An Gáirdín	79	5	Burren OEC	50	26
Irish Seed Savers	78	7	Kippure Estate	48	27
Dolmen Centre	77	8	Wicklow Mountains National Park	47	28
An Tairseach	74	9	Killary Adventure Centre	47	28
Sonairte: The Ecology Centre	74	9	Lullymore Heritage & Discovery Park	45	30
Lifetime lab	73	11	Kinvara Sustainable Living	43	31
Rediscovery Centre	72	12	Knocksink Wood	43	31
Ballybay Wetlands Centre	71	13	Wexford Wildfowl Reserve	42	33
Airfield	67	14	Museum of Country Life	40	34
Lough Fey Forest Park	65	15	Killarney National Park	40	34
Brigit's Garden	63	16	Burrenbeo	37	36
Fota Wildlife Park	61	17	Galway Atlantaquaria	30	37
Lough Allen Adventure Centre	61	17	CELT	79	(5)
Gartan OEC	59	18	VERT	(100)	
Castlecomer Discovery Park	57	19	**Mean Average Score**	**62%**	

Table 3.3: Average Score and Ranking by Aspects Totals

3.6 Site Visits

Survey responses were verified by the site visits. It was evident that though a centre may not be carrying out a particular practice in all areas of their centre, they insert "yes" for that aspect. Push taps may be fitted in some areas but not in all. Forms of renewable energy indicated were not always part of the main heating system but rather more for demonstration purposes. For example, Sonairte in Meath only uses geothermal energy in a polytunnel. In the main, the surveys were accurate. From a subjective view, it was clear that centres are passionate about their contribution to a sustainable world. A new classroom using recycled materials was under construction at KEEP, Co. Kerry. They are also installing an old industrial food container for water collection from the roof a polytunnel. Sonairte, Co. Meath had a team of volunteers preparing the site for the new season.

Good practices not included in the survey were seen during the site visits. Some centres had a shop selling eco-friendly products and local produce. Information on environmental issues was freely available in some sites with others having community notices on view. Picnic benches made from recycled materials are used at the Dolmen Centre, Co. Donegal. Lough Fey Forest Park, Co. Roscommon has a tree canopy walk providing a unique learning setting but minimises impact on the environment. The Rediscovery Centre runs a furniture-recycling workshop, repairing old furniture and selling it online or at the local farmers market. The Nano Nagle Centre, Co. Cork keeps ducks in the vegetable plot to control slugs. Gartan OEC, Co. Donegal uses an in vessel composter which can deal with both raw and cooked food including meat and fish.

Examples of good practice in each of the aspects were seen during the site visits. An account of these working examples is in Section 4.8 and provides a resource for those wishing to improve or develop a centre for ESD or EE.

SECTION 4 DISCUSSION

4.1 Research Limitations

4.1.1 Identification of Centres

Seventy centres providing environmental education (EE) and/or education for sustainable development (ESD) were recorded in this study. The list includes those centres that fitted the criteria defined in the methodology and found through the scoping exercise. Further investigation by means of a more extensive internet search, using extra keywords and different search engines, may uncover additional centres. Environmental publications other than those used in this research may contain extra contacts. Statutory and non-statutory bodies may have lists available within their archives that are not readily accessible to the public. Information may also be available in each local public library.

The lack of a central register of EE and ESD centres became evident in the course of this research. The establishment of such a resource would enable centres to register themselves to a directory. This register could be hosted on a website such as "Ask about Ireland" (www.askaboutireland.ie), which is maintained and updated by An Chomhairle Leabharlanna with the support of the DoEHLG. A link to the ENFO web page is available containing further links to a limited number of government and non-government environmental organisations but nothing on EE and ESD providers.

4.1.2 Survey Design

The survey design was based on recognised review documents used in green award initiatives. The criteria applied in this research paper are limited because this a desktop study and therefore the extent of features within each aspect could not be assessed. A balance had to be maintained between length and detail of the survey. A long, detailed survey may not have achieved a good response rate: a shorter survey may not have yielded sufficient data for justifiable results. The survey questions were chosen to give an overall view of practice in each aspect. A more detailed audit, similar to the Green Flag for Greener Hotels, incorporating a weighted scoring system, could be used for future quantitative research.

The results and analysis are based on the answers returned in the self-audit surveys. Site visits to a sample of centres did verify that respondents presented a true picture of sustainable practices in operations and the built environment in those centres. It cannot be extrapolated that this would be the same for all centres. Improvements in practices are ongoing in EE and ESD centres therefore the tables in Appendix B will need updating over time.

The extent to which a practice is performed throughout a centre was not quantified in this study. Site visits demonstrated this in different aspects. A centre may have recorded having double-glazing or other features but this may not apply to the entire centre. While a centre may have recorded a positive response, it may only be representing one part of the centre. The extent and type of waste generated by a centre was not assessed. A review of products purchased by the centre or sold on site and its packaging was not within the scope of the research. Respondents were not asked to identify if recycling was available to staff and/or visiting students alike. The percentage of waste recycled was not requested. Some centres reported the use of renewable energy but the survey did not assess the percentage of energy produced in this way, for example, in terms of kWh. The extent of practices performed and improvements made could be assessed using an environmental management system (EMS) such as EMAS (Section 1.7).

Answer boxes that were left blank were taken as a negative response if all other responses were "yes". A number of respondents entered the word "some" under certain criteria but this was recorded as a positive answer in the analysis of the survey. An online questionnaire may have prevented such occurrences but may not have yielded the same return rate of surveys.

The four surveys completed through telephone interviews revealed that respondents did not want to show their centre in a bad light. It could therefore be deduced that the same could be the case for the other surveys carried out by email.

Over half of the surveys (56%) were completed and returned. Direct email addresses were not readily available for centre managers. Many were sent using an administrative email address given on each centres website (e.g. info@centrename.ie). Outstanding surveys may not have reached the appropriate person to complete. Some centres noted that the email and the attached survey were retrieved from their junk mail. This could explain why some were not returned.

The time of the year can affect response rates. Some centres may close during the winter season while others may be short staffed at different times of the year.

4.1.3 Site Visits

The seven sites visited were selected based on information from the websites and the returned surveys. The number of sites visited was limited by the geographical location of the centres and time available to the researcher.

The site visits were made during March and April, which are the quieter months in the centres. The time of the year may affect the extent of good practice. Systems for litter and waste management may come under pressures in the busier season. More waste may be generated and the infrastructure may not be available to deal with it. Lower energy consumption may be recorded in the summer months. Visits at different times of the year would therefore be useful.

4.2 Geographical Location of Centres

Centres for EE and ESD are spread throughout the country as illustrated on Plate 3.1. Every coastal county has at least one centre with Galway having the most. The North Midlands Education Centre, though based in Ballinafad, Co. Sligo was established to serve North Leitrim and counties Roscommon, Monaghan, Cavan, Longford, and Westmeath but not Sligo. Neither Cavan, Longford nor Westmeath have a centre but can avail of the North Midlands facility. There is a concentration of centres in Leinster, particularly in counties Dublin and Wicklow, serving the largest province by population.

4.3 Survey Outcomes – General Information

4.3.1 Centre Funding

There is an even distribution of centres in the private, state and charity sector. Closer examination of how centres are funded shows that it is not so clear-cut. Some of the centres that identified themselves as being privately funded have also availed of grants

through State schemes. A number of these centres have received financial support through European Community Initiatives Fund such as INTERREG and LEADER (Section 1.5). State bodies give matching funding as part of these grants. Many have also availed of Agenda 21 grants through their local authority and the Department of Environment, Heritage and Local Government (DoEHLG). The matching funding by the DoEHLG comes from the Environmental Fund which is a beneficiary of the plastic bag and landfill levies as prescribed under the Waste Management (Amendment) Act, 2001 (Ireland, DoEHLG, 2010).

Centres recognised as charities have received funding from Department of Education and Science and the Department of Arts, Sports and Tourism. A few have received support from National Lottery Fund and corporate sponsorship. Some centres have benefited from FÁS employment schemes. Many of the centres charge fees for their courses thus generating a source of income. A number of centres collect membership fees to supplement their income, which in turn allows members reduced rates on courses.

It is evident from the research that the majority of EE and ESD centres need financial support to continue with their work. Applying for such funding is a time consuming process and requires dedication from managers to maximise results. Only some will be successful in securing long-term support. Under the theme "Public Awareness and Education", the National Biodiversity Plan, published in 2002, contains an aim to promote an understanding of biodiversity and the objectives of the Convention on Biological Diversity. Two measures are outlined: the development of a "clearinghouse mechanism" in the form of an internet-based network and the provision of financial support to NGOs for the promotion of biodiversity. Action was detailed for the development for the clearinghouse mechanism. No action was included for the financial support of the NGOs (Ireland, Department of Arts, Heritage, Gaeltacht and the Islands, 2002).

The Department published an interim report on the plan in 2005. The status of the development of a targeted education and awareness strategy to further the objective of the biodiversity plan refers to the work done by ENFO. Details on the drop-in centre, the availability of leaflets, the provision of outreach and a library are outlined. The ENFO office has since closed (Section 1.3). The service is now delivered through a web-based facility. This measure will save the Department of Finance €1m (Ireland, Department of Finance, 2009).

An Taisce in conjunction with Working and Educating for Biodiversity (WEB), a group representing environmental organisations, made recommendations for the National Biodiversity Plan 2008-2012. Under the theme "Education, Training and Awareness", they call for action to support and finance environmental education centres. (An Taisce, 2010*b*).

Comhar SDC acknowledges that the likelihood of increased public funding in ESD is limited (ECO UNESCO, 2007*b*). They recommend that present financial supports need to be re-oriented to ensure ESD projects benefit. ECO-UNESCO identified the problem of a lack in long-term funding to support ESD programmes and initiatives (ECO-UNESCO, 2007*a*). Their research showed that many projects were being run on "small budgets by enthusiastic individuals". They recommend the development and implementation of a national strategy on ESD and the provision of adequate funds to further this strategy. ECO-UNESCO, commissioned by the DES, carried out an overview of ESD in Ireland to form the basis for the development of a national strategy on ESD in Ireland. A discussion document was produced and submitted to the DES in 2007. The EE and ESD sector await the completion and publication of the strategy.

4.3.2 Environmental Policy and Management Systems

Nearly two thirds of centres have an environmental policy in place. Only one centre in the top ten ranking does not have a policy in place. Most of those without a policy are in the bottom ten. Replies regarding centre participation in an environmental management system (EMS) demonstrated a lack of awareness and understanding of such systems. Three centres have EMS in place while three centres are working towards one. Ten centres did not reply. Four centres entered names of environmental policies (Leave No Trace and organic grower's certification); while one admitted they did not know what EMS was. In contrast, when it came to stating an interest in a Green Flag Award, all respondents replied, yet this is based on EMS. This demonstrates that awards such as Green Schools and Green Business Award have created an awareness of green standards. Centres were not scored on any of these questions though their inclusion would contribute to good practice.

Details regarding An Taisce's pilot scheme for a Green Centres Award were communicated in an email to the author (March 2010). Three centres will participate, two

of which are included in this research study. The award will be based on the Eco-Centres initiative operating in Scotland. The Green Centres Award will be a positive step for all EE and ESD centres in Ireland. The initiative encourages a "whole institution approach" that is recognised by the UNECE as good practice in ESD (UNESCO/UNECE, 2007). Nearly 90% of the centres have expressed an interest in achieving such an award demonstrating the dedication to the pursuit of best practice. The introduction of a green award initiative for centres would further promote good practice and increase participation in an EMS. Self-monitoring of best practice in terms of review audits and continual improvement should be carried out. This could be achieved through the application of an EMS with a similar approach as EMAS and ISO14001 (Section 1.7).

4.3.3 Programme Provision and Target Groups

Programme provision was categorised into twenty headings for the purpose of analysis. A mixture of these is contained in many of the programmes, while some are offered on their own. Nature studies for primary school children is the most frequently provided programme by centres. The same centres offer courses in biodiversity, conservation, composting and creative nature activities. Nearly every centre caters for the primary school sector, which gives great scope to schools to include outdoor learning for this age group as recommended in the draft National Strategy on ESD in Ireland (ECO-UNESCO, 2007*a*). Centres offering Discover Primary Science (DPS) days for primary schools have benefitted from funding from Forfás towards the purchase of equipment relevant to the programmes provided.

Post primary school programmes include ecology and geography field studies, transition year programmes and adventure education. Schools that use EE and ESD centres to assist in the completion of specific curriculum areas have an opportunity to expose their students to aspects of sustainable development in practice. Some centres provide innovative programmes for transition year students in renewable energy, biodiversity, organic horticulture and other sustainable living practices.

Third level students and adults can avail of courses in sustainable practices, organic and polytunnel horticulture and renewable energy that are accessible at over a third of the centres while a few centres specialise in eco-building and permaculture.

VERT (Village Education, Research and Training) based at the new eco-village in Cloughjordan, Co. Tipperary, hopes to become nationally recognised as a centre at the "cutting edge" in education in sustainable development topics for all sectors (The Village, 2010).

4.4 Survey Outcomes - Aspects

The results of all the aspects surveyed showed that centres achieved the best overall score for litter and waste management (Section 3.5). Average scores in the areas of litter and waste management, conservation, insulation and sustainable purchasing were all above 60%. Litter waste management achieved the highest average score of 88% with 71% of centres achieving the average or above. Insulation is the best overall aspect as 73% are achieving above the average score. Improvements need to be made by centres in their energy use, water conservation and sustainable transport.

4.4.1 Litter and Waste Management

Seventeen centres do not compost cooked food waste while half of them do not compost at all. New legislation will force a change in this aspect. The Waste Management (Food Waste) Regulations, 2009 came into effect in January 2010. Major producers (> 50Kg per week) must comply by July 2010 while producers of less than 50Kg per week will have until July 2011 to comply. This will mean that centres will have to segregate food waste from other waste. The separated waste can be treated onsite by an approved system as outlined in the regulations. Centres can opt to make the waste available for collection by an approved waste collector (local authority or person holding a collection permit relevant to the classes of food waste and organic waste) or to send the waste to an authorised treatment facility as defined in the regulations.

Scores for the recycling of waste were high. The lowest score was in the recycling of wax cartons followed by plastic containers. The infrastructure is not always in place for the recycling of packaging waste and centres will need to look at this in their purchasing policy. One centre noted they had a policy of "pre-cycle" whereby any items purchased by the centre must be fully recyclable. This centre did not buy tinfoil or products using it.

Nine centres use reed bed for wastewater treatment. Two centres use peat fibre as the secondary treatment of sewage. Some centres felt it was difficult to get planning permission for the use of a reed bed at their centre. A quarter of the centres surveyed use septic tanks as the sole means of treatment of sewage. Reed beds or secondary treatment, such as proprietary makes of peat fibre bio-filters, should be considered by these centres for the advancement of good practice.

4.4.2 Sustainable Energy Use

The amount of energy used by a centre was not assessed. This parameter compared to visitor numbers would be useful in future research in the analysis of energy consumption. Neither passive heat nor natural lighting was examined in the survey though it is used in some of the centres visited.

Centres scored badly in the aspect of energy use under the individual components used in the survey. Many could improve on their score by the introduction of some "low cost, no cost" measures. A "no cost" measure for centres would be the lowering of thermostats for hot water below 60°C or the introduction of "switch off" signs to promote more sustainable energy use.

Three quarters of the centres use boilers in their heating system though only eight are reported to be low emission type. Substantial investment will be needed by some centres in order to improve their energy consumption. Sustainable Energy Authority of Ireland (SEAI) estimate a 25% saving on fuel bills can be achieved by upgrading a central heating boiler (SEAI, 2010*a*). Centres can avail of grants from SEAI to install a renewable heating system through the Renewable Heat Deployment Programme (Re-Heat) (SEAI, 2010*b*). The programme supports the installation of wood chip or wood pellet boilers, solar thermal systems or heat pumps.

A scheme could be developed to encourage local industry to offset their own carbon footprint by providing finance to centres to enable improvements in energy use. Sponsoring industries could be encouraged to bring their employees to participate in environmental awareness programmes in the EE and ESD centres.

4.4.3 Water Conservation

Water conservation does not seem to an important aspect in many centres. Only thirteen centres carry out leak testing. An average of 43% of water can be lost before it reaches a property and it is estimated that this increases within property (Kelly, 2010). One centre mentioned that they sourced their water from the mountains. They were not concerned about the amount being wasted in sinks, wash hand basins and toilets, though they used water butts. Awareness campaigns should be put in place in place that make people aware of the hidden costs and environmental effects in its supply and subsequent treatment as a waste. The promotion of the installation of shower flow controllers and tap aerators would be beneficial. These two low cost mechanisms will reduce water consumption and save on energy in the heating of water.

4.4.4 Sustainable Purchasing

Scores for office, kitchen and housekeeping purchasing practices were high in centres overall. The lowest scores in housekeeping were in the purchase of eco-friendly dishwasher detergent, hand wash and kitchen paper. It might just take an awareness initiative or a change in centre purchasing policy to bring about changes.

4.4.5 Sustainable Transport

There is a lack of fuel-efficient vehicles used in centre transport yet a good awareness of limiting journeys was recorded. Only three of the centres in an urban location offered the "Cycle to Work" scheme for their staff. Lift sharing was only encouraged at seven of the centres. The present infrastructure limits improvements in sustainable transport for many centres. Awareness campaigns could help to reduce the impact of this aspect by encouraging lift sharing and the use of public transport where feasible.

4.5 Site Visits

The purpose of the site visits was to verify the information in the surveys and to see good practice in action. Four of the centres visited are ranked in the top ten with two of them,

namely Kerry Earth Education Project (KEEP) and the Nano Nagle Centre ranked first and second respectively. The surveys for each of the seven sites were found to be accurate though did show the limitations of the survey as outlines in paragraph 4.1.2 above. Information in the brochures and on the websites was found to be accurate for the centres visited.

Many features of good practice were recorded in the areas surveyed in the questionnaire. The visits were also useful in viewing other features such as an "eco-shop", information stands on local activities and environmental issues, and a "fair-trade" cafe. Passion and enthusiasm cannot be quantified but these were evident among the staff at each of the centres visited. Discussions regarding plans to further develop best practice demonstrate that this is a dynamic field of education.

4.6 Best Practice in EE and ESD

4.6.1 Defining Best Practice in EE and ESD

Many definitions of best practice have been put forward in the literature. UNESCO defines it as "an innovative project, programme, teaching and learning process implemented to support sustainable development". The Botanic Gardens Conservation International guidelines for ESD centres states that good practice is "promoting the operation of education centres in a manner that is compatible with the environmental message of centres' programmes" (Section 1.6). However, good or best practice definitions are illustrated by examples of projects and programmes that support sustainable development.

The term "best practice" has been used in this research to refer to the practices in the day to day running of a centre and aspects in the built environment (Section 1.6). Examples of best practice in action viewed during this research are included in Section 4.7.

4.6.2 National Policy for ESD

The absence of a national strategy has led to an uncoordinated approach in ESD. There is a need to put a policy in place as recommended in the discussion paper entitled *Developing a National Strategy on Education for Sustainable Development in Ireland* outlined in Section 1.3. The subsequent publication of the stakeholder's vision for the UN Decade of

Education for Sustainable Development, 2005-2014, identifies the need for the development of ESD networks and the continued professional development in ESD.

4.6.3 Networking for EE and ESD Centres

Sharing of ideas within the environmental and sustainable development education sector exists to a limited degree. A wealth of good practice in action was found in the course of the research. A structure that would facilitate the pooling of knowledge, skills and expertise would benefit all centres. This could be made possible through networking. Communication through an online bulletin board could form the basis for sustainable networking. The venue for face-to-face meetings could rotate around the centres providing an opportunity for members to see a variety of good practice over time.

Many centres provide in-service training for their staff. The establishment of a training network would be feasible with centres providing courses on an exchange basis. Many centres are small, low budget operations. Organising a specialist course for staff may not be financially feasible. Such courses could be organised through the network and made available to all members. Many centres need to provide training in first aid, Leave No Trace, child protection and manual handling. These could all be provided through the network.

Links with networks in Northern Ireland and the United Kingdom would be possible, increasing the knowledge base and access to specialist courses. The Field Studies Council (Section 1.4) offers professional development courses in varied areas for teachers and environmental professionals. A similar resource could be established through the network.

4.6.4 National Association for EE and ESD

The Irish Environmental Network (IEN) represents organisations involved in the "well-being, protection and enhancement of the environment" (IEN, 2010). They represent their members at government level concerning policy making and funding. Members must have environmental protection and/or environmental sustainability as their objective. Organisations including An Taisce and Irish Wildlife Trust are members. Only seven centres included in this study belong to the network.

The National Association for Environmental Education (NAEE) was set up in the United Kingdom to support those involved in EE and ESD (NAEE, 2003). It promotes both EE and ESD in the formal education sector and the wider community. The association is run on a voluntary basis to support educators in this sector and works in partnership with NGOs, government departments, agencies and charities. Members are kept up to date on new resources, events and developments in EE and ESD while contact with other members is facilitated. A similar organisation in Ireland would enable better coordination and communication in the EE and ESD sector.

4.6.5 Future Research

Research has shown that the Green Schools initiative has had a positive impact on environmental behaviour (Section 1.7). EE and ESD centres have a transient student and will be more difficult to assess if whole institution approaches have a lasting positive effect on behaviour. A study carried out in Canada found that integrated programmes in outdoor learning centres had some positive effect on participants (Smith, 2008). Results showed that there was evidence of a shift towards positive environmental behaviour. The study showed that the longer the individual was on the programme, the more "pro-environmental" they were in their actions. The impact of EE and ESD centres on visitor behaviour and attitudes warrants research.

4.7 Examples of Best Practice in EE and ESD

4.7.1 Litter and Waste Management

Visiting students to the Nano Nagle Centre, Co. Cork are actively encouraged to recycle waste during the course of their stay. Students take the collected material to an old shipping container where sorting is carried out (Plate 4.1). Disused vegetable crates, lined with newspaper, and of different colours are used for the separation of each class of recyclable. Information posters promoting recycling enhance the appearance of the unit. An area for compostable waste is located close by.

Plate 4.1: Sorting Shed for Recycling at Nano Nagle Centre, Co. Cork

Plate 4.2a & b: In Vessel Composter in Gartan OEC

Gartan Outdoor Education Centre, Co. Donegal installed an "in vessel" composter (Plate 4.2a & b). It can also be used to compost garden waste. Food is separated from dry recyclables by the students visiting the centre, to encourage active participation. The unit can convert both uncooked and cooked food, including meat and fish into compost in

fourteen days. An accelerator is added with the food waste and composting starts with a high water volume creating anaerobic conditions to start the process. The composting generates its own heat and with the additional heat provided by the unit, the waste reaches the temperatures required to destroy any pathogens, snail eggs and intestinal worms that are present (Tidy Planet, 2010).

Plate 4.3: Constructed Wetland (Reed Bed) at the Dolmen Centre, Co. Donegal

A constructed wetland or reed bed is used at the Dolmen Centre for sewage treatment (Plate 4.3). The natural system depends on microorganisms, plants and invertebrates to clean the wastewater. The licensing authority has reported excellent quality effluent. Willow, growing alongside the Donegal site, is coppiced annually and used by local crafts people.

4.7.2 Sustainable Energy Use

Sonairte, Co Meath use demonstration models in their education programmes. Different examples of wind turbines can be seen in operation (Plate 4.4a & 4.4b). An example for energy efficiency information is shown in Plate 4.5. is presented through interactive display. Information signs for each energy source are located nearby (Plate 4.4b). A small-scale geothermal system is used in one of the polytunnels (Plate 4.6).

Plate 4.4a & b: Demonstration Wind Turbines, Sonairte. Co. Meath

Plate 4.5: Energy Saving Information Board, Sonairte, Co. Meath

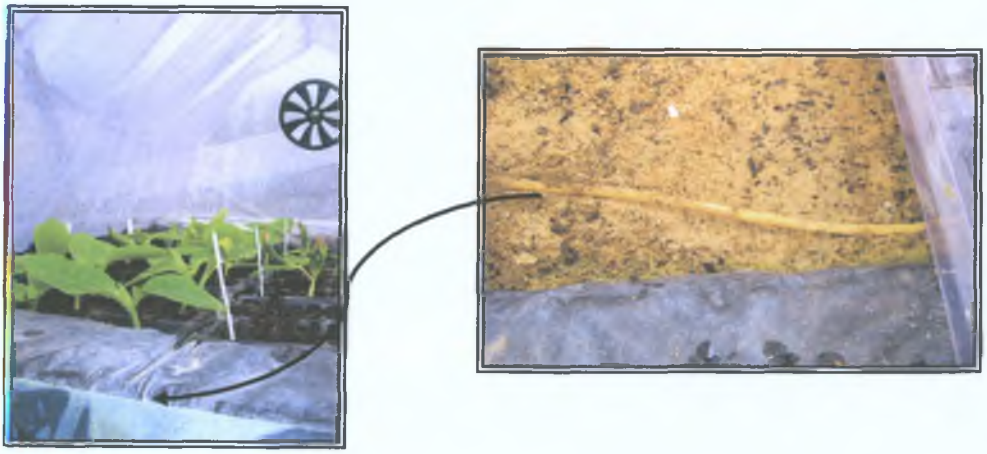

Plate 4.6: Geothermal Use - Polytunnel in Sonairte

A combination of geo-thermals, wind, wood pellet boiler and solar panels are used for energy production at the Nano Nagle Centre. The centre has an "Energy Cabin" which contains a biomass boiler and has thermal solar collectors on the sidewall (Plate 4.7)

Plate 4.7: The "Energy Cabin", Nano Nagle Centre, Co. Cork

A solar photovoltaic system, a small wind turbine for lighting, a large 2.5kW wind turbine coupled with passive energy and light are planned for the Rediscovery Centre in Dublin as depicted in Plate 4.8.

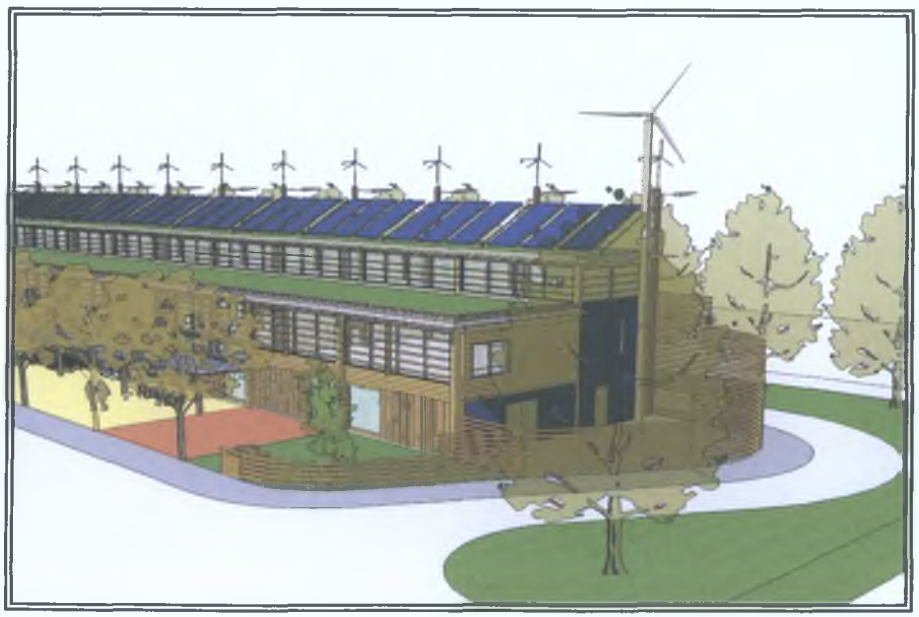

Plate 4.8: 3-D View of the Rediscovery Centre (Courtesy of Rediscovery Centre)

It is hoped that the combined energy produced will be sufficient so that excess can be sold to the national grid.

Biomass boilers using pellets (Plate 4.9a & b) or chips are used in Lough Key Forest Park, Co. Roscommon, Gartan Outdoor Education Centre, Co. Donegal and the Nano Nagle Centre, Co. Cork. A biomass boiler is being installed in the Dolmen Centre, Co. Donegal

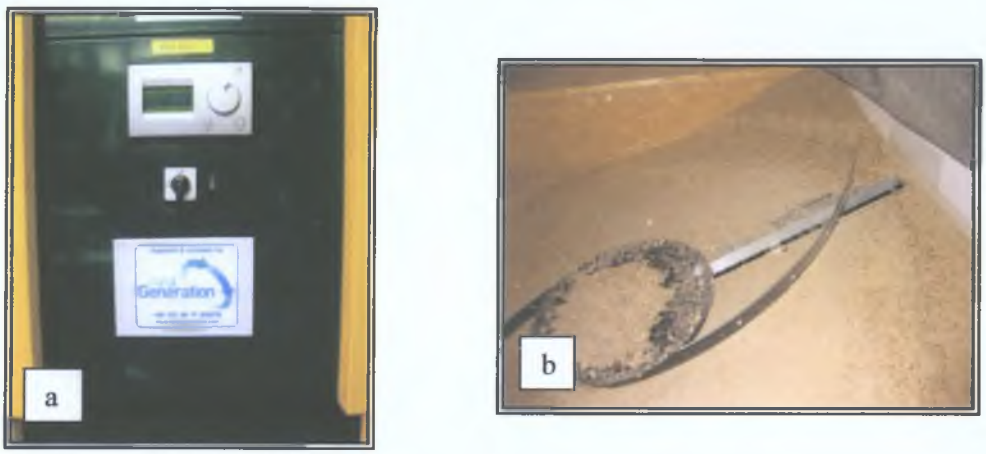

Plate 4.9: (a) Biomass Boiler and (b) Automatic Feed in a Wood Pellet Boiler, Lough Key Forest Park, Co. Roscommon

Plate 4.10: (a) South-Facing Facade & (b) Glazed Entrance & Hallway, Nano Nagle Centre, Co. Cork

Building design in the Nano Nagle Centre (Plate 4.10a & b) and Lough Key forest Park include large area of glass for passive light and solar heat. This is also to be incorporated into the design of the Rediscovery Centre.

4.7.3 Water Conservation

Kerry Earth Education Project made a large pond for the collection of rainwater to supply all the domestic water (Plate 4.11).

Plate 4.11: Pond at KEEP for Rainwater Collection

The pond can also be used for the collection of invertebrates as part of activities in their primary school programme. It has increased biodiversity as it attracts ducks, frogs and dragonflies to the site. A recycled intermediate bulk container (IBC) was being installed to collect water for use on the farm from a polytunnel roof (Plate 4.12).

Plate 4.12: Proposed Rainwater Collect at KEEP

Other water saving device are shown in Plates 4.13 and 4.14.

Plate 4.13: Retrofit Water Conservation Device for WC

Plate 4.14: "Hippo Bags" in WC Cistern

4.7.4 Contribution to Conservation

Plate 4.15: Tree Canopy, Lough Key Forest Park

Lough Key Forest Park has a tree canopy walk designed to have minimum impact on the environment (Plate 4.15). It brings visitors through the treetops where the full tree habitat can be experienced. Bat boxes have been placed among the trees to help conserve the species. Low impact access to the wetland environment is achieved by using boardwalks in

Ballybay Wetland Centre and the Bog of Allen Nature Centre. Nest boxes for birds are used in the Nano Nagle Centre. Wildlife areas are maintained in KEEP and Sonairte. The Rediscovery Centre plans green roof gardens, planting boxes and bird boxes for its new centre.

Plate 4.16: Cardboard to Control Weeds

Plate 4.17: Saplings in Recycled Cartons

Many of the centres used old cardboard for weed control (Plate 4.16). Sonairte display a recipe for fertiliser from the wild flower, comfrey. The Nano Nagle centre keeps ducks in the vegetable garden for slug control. KEEP, in conjunction with the local primary school, collect seed from trees and plant them in recycled milk cartons (Plate 4.17). The children return to the centre to plant out the saplings.

4.7.5 Sustainable Transport

The Village Education, Research and Training Centre (VERT) hope to use car-share hire business when they are up and running (www.gocar.ie). The Rediscovery Centre has a battery-operated car and intends to replace their fleet with similar vehicles in the future.

4.7.6 Insulation

Natural insulation such as sheep's wool or hemp can be used in roof or attic space and is kinder to the environment. It takes less energy to produce, is easier to handle and is compostable. Recycled newspaper is used to insulate the floors at the eco-cabins at KEEP.

4.7.7 Sustainable Purchasing

Plate 4.18: Eco-Shop, Sonairte

Plate 4.19: Picnic Benches & Bin Made from Recycled Material, Dolmen Centre

The eco-shop in Sonairte supplies eco-friendly consumables for the home (Plate 4.18). It stocks local food produce and craft items. A wide range of environmental publications is also available. Picnic benches and outside bins are made from recycled material at the Dolmen Centre (Plate 4.19). Eco-friendly hand wash and washing-up liquid are visible throughout KEEP, Sonairte and the Nano Nagle Centre.

Polytunnels are used at many centres and provide homegrown vegetable for use on site and to sell at farmers markets. Soft fruit such as raspberries are grown at KEEP. The Nano Nagle Centre produces eggs and beef.

4.7.8 Sustainable Building

Straw bale offices can be seen at both Irish Seed Savers in Co. Clare and at KEEP in Kerry (Plate 4.20). Students from The Organic College, Drumcollogher, Co. Limerick, assisted

in the construction. Straw bale walls have *excellent insulating properties and are fire-resistant. Lough Key Forest Park, Co.* Roscommon (Plate 4.21), Ballybay Wetlands Centre, Co. Monaghan and Gartan Outdoor Education Centre, Co. Donegal have used timber construction in their new builds. Timber is a renewable product but should be sourced locally from sustainable forests.

Plate 4.20: Straw Bale Office, KEEP

Plate 4.21: Visitor Centre, Lough Key Forest Park

Eco-friendly paints have been used throughout the Nano Nagle Centre. The rediscovery centre will have a south facing aspect while windows on the northern side will be kept to a minimum. PVC and MDF will be avoided because of their non- biodegradability.

4.7.9 Environmental Information

Some centres provide an information notice board or stand making leaflets available to the public. Signage is used to explain the benefits of the various aspects incorporated into the centre (Plate 4.22).

Plate 4.22: Informative Signage, KEEP, Co. Kerry

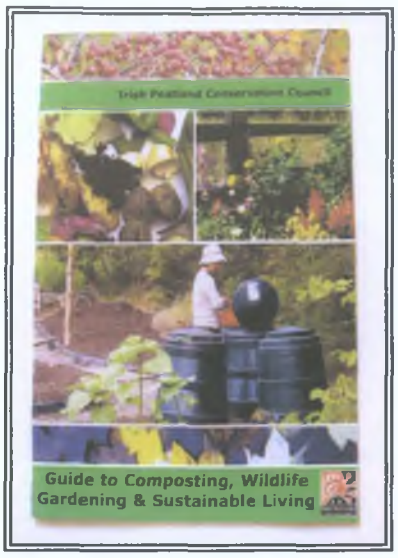

Plate 4.23: Guide to Composting, Bog of Allen Centre, Co. Kildare

The Bog of Allen Nature Centre has produced books on environmental themes. They are available to buy at their onsite shop or online. They have also produced a free pamphlet on composting (Plate 4.23). KEEP and Irish Seed Savers have published a guide to designing, creating and using an organic school garden. The Nano Nagle Centre invites people to visit the centre to view all the green aspects integrated into their centre.

4.8 Checklist for Sustainable Practices

Many features of best practice were noted in the course of the research both through the review of the literature and on site visits. A checklist has been compiled under each aspect of environmental practice for use in present and future EE and ESD centres and is included in Appendix D. The checklist includes a section to record who will implement the practice, the resources required, proposed completion date and the actual date of completion. The recording columns are narrow in the document but a copy with more appropriate spacing is included on the CD inside the cover of the thesis. The template should serve as a guide to implementing and/or improving on good environmental practices.

4.9 Recommendations

- The National Strategy on Education for Sustainable Development needs to be completed, published and implemented. Adequate funding for its implementation must also be put in place.
- A central online register for new and existing centres providing environmental education (EE) and education for sustainable development (ESD) should be created. This could be coordinated by either a state or semi-state body,
- A network for EE and ESD centres should be established.
- A national association for EE and ESD educators should be founded to facilitate partnership between all the sectors involved in this area of education.
- Information on professional training available in the centres and through other institutions could be collected and made available through the network mentioned above.
- Quantitative research needs to be carried out to assess the level of best practice in environmental education and education for sustainable development to compliment the information collated in this study.
- Self-monitoring of best practice in EE and ESD centres should be carried out based on an environmental management system with a similar approach to EMAS or ISO14001.
- The pilot scheme in the green award initiative by An Taisce should be extended to all EE and ESD centres. The effect of this or similar initiatives on visitors should be monitored in terms of changes in their environmental behaviour and attitudes.
- A catalogue of programmes and activities could be established and include details on demonstration models, innovative devices and interactive activities available at centres.
- Local industries could be encouraged to sponsor a green energy project in EE and ESD centres. The employees of the sponsoring industry could participate in environmental awareness programmes provided by the centres.
- Awareness campaigns on the conservation of water should include reasons why this resource should be conserved, highlighting the cost involved in its purification and subsequent wastewater treatment.

REFERENCES

An Bord Tráchtála/The Irish trade Board (1996), *Environmental Management Systems & ISO 14,000*, Ireland: An Bord Tráchtála/The Irish trade Board.

An Taisce (2009), *The National Trust for Ireland, Annual Report 2008-2009*, Dublin: AnTaisce.

An Taisce (2010*a*), *Prescribed Role of An Taisce* [online], available: http://www.antaisce.org/Whoweare/OurRole/PrescribedBodyRoleofAnTaisce/tabid/210/language/en-US/Default.aspx [accessed 12 Feb 2010].

An Taisce (2010*b*), *Biodiversity-Recommendations Towards the Next NBD*, [online], available: http://www.antaisce.ie/naturalenvironment/Biodiversity/RecommendationstowardsnextNBP/tabid/301/language/en-IE/Default.aspx [accessed 6 Jan 2010].

Berry, R.J. (1993), 'Ethics, Attitudes and Environmental Understanding for All', *Field Studies*, 8 (2), 245-255.

Botanic Gardens Conservation International (2010), *Education Centre* [online], available: http://www.bgci.org/education/weblinks/ [accessed 17 Jan 2010].

CAP Rural Development Programme (2007), *Ireland, CAP Rural Development Programme 2002-2013*, Dublin: CAP Rural Development Division.

CAT (2009), *What we do* [online], available: http://www.cat.org.uk/information/aboutcatx.tmpl?init=1 [accessed 12 Feb 2010]

Comhar SDC (2002), *Principles for Sustainable Development*, Dublin: Comhar.

Comhar SDC (2009), *The United Nations Decade of Education for Sustainable Development 2005 -2014: An Irish Stakeholder Vision*, Dublin: Comhar.

Comhar SDC (2010), *Comhar: What we do* [online], available: http://www.comharsdc.ie/about/terms_of_ref_mandate.aspx [accessed 12 Feb 2010].

Convention on Biological Diversity (1999), COP 5 Decision V/17 [online], available: http://www.cbd.int/decision/cop/?id=7159 [accessed 11Nov 2009].

Convention on Biological Diversity (2007), *Article 13: Public Education and Awareness* [online], available: http://www.cbd.int/cepa/article13.shtml [accessed 11 Nov 2009].

Convention on Biological Diversity (2009), *Background and Status* [online], available: http://www.cbd.int/cepa/background.shtml [accessed 11 Nov 2009].

Co-operation Ireland (2010), *INTERREG IIIA Programme*, [online], available: http://www.cooperationireland.org/funding/interregiiia [accessed 3 June 2010].

ECO-UNESCO (2007*a*), *Education for Sustainable Development in Ireland*, Dublin: ECO-UNESCO.

ECO-UNESCO (2007*b*), *Developing a National Strategy on Education for Sustainable Development in Ireland*: *Discussion Paper,* Dublin: ECO-UNESCO.

ECO-UNESCO (2010), *What is ECO-UNESCO?,* [online], available; http://www.ecounesco.ie/about.aspx [accessed 12 Feb 2010].

ENFO (2001), *ENFO retrospective 1990 – 2000, 10 Years of Environmental Awareness,* Dublin: ENFO.

European Commission (2006), Editorial, *EMAS Newsletter,* European Commission, 4, (*December*).

European Commission (2008), EMAS Factsheet: *EMAS and ISO/EN ISO 14001: Differences and Complementarities*, Luxembourg: European Commission Publications Office.

European Communities (Energy Performance of Buildings) (Amendment) (No.2) Regulations, 2008, S.I. No. 591 of 2008, Dublin: Stationery Office.

FEE (2008), *FEE Annual Report 2008*, Copenhagen: FEE.

FEE (2009), *The Green Key: An Eco-Label for Leisure Organisation*, Copenhagen: FEE.

Field Studies Council (2009), *Annual Report and Accounts 2008*, Shropshire: FSC Publications.

Freed, D.F. (1991), *Participation in and Adventure-Challenge Programme and Behaviour Change in Emotionally Impaired Students,* unpublished thesis (PhD), The Ohio State University.

Giblin, C. (2004), *Optimisation of Environmental Education in Ireland: National Parks& Wildlife Service and Nature Education*, Galway: National University of Ireland.

Green Heart Education (2007), *Greening School Behaviour* [online], available: http://www.greenhearted.org/greening-school-behaviour.html [accessed 7 Jan 2010].

Green-Schools (2009), *Green Schools Handbook*, Dublin: Green-Schools Office.

Green-Schools (2010*a*), *Green-Schools Litter and Waste* [online], available: http://www.greenschoolsireland.org/Index.aspx?Site_ID=1&Item_ID=98 [accessed 29 Jan 2010].

Green-Schools (2010*b*), *Green-Schools Green Campus* [online], available: http://www.greenschoolsireland.org/index.aspx?Site_ID=1&Item_ID=467 [accessed 10 Feb 2010].

Greig, S., Pike, G. And Selby, D. (1987), *Earth Rights, Education as if the Planet Really Matters*, London: World Wildlife Fund and Kogan Page Ltd..

Henderson, K. and Tilbury.D. (2004), *Whole-School Approaches to Sustainability: An International Review of Sustainable School Programs*, Australia: The Department of the Environment and Heritage.

IEN (2010), *About Us* [online], available: http://www.ien.ie/about/ [accessed 12 Feb 2010].

International Standards Organisation (1996), *Environmental Management Systems – Specifications with Guidance for Use*, Switzerland: ISO.

INTO (1989), 'School Texts': The Education Committee, *Consultative Conference on Education*, Ennis, 26-27 May, 1989, Dublin: INTO, 1-12.

Irish Peatlands Conservation Council (2010), *Who we are* [online], available: http://www.ipcc.ie/aboutIPCC.html [accessed 15 Feb 2010].

Ireland, Department of Education and Science (1995), *Charting Our Future*, Dublin: Stationery Office.

Ireland, Department of Education and Science (2008), UN Decade for Sustainable Development: Development of a Strategy for ESD in Ireland, *The Irish Times: Business 2000* [online], available: http://www.business2000.ie/pdf/pdf_11/deptEducation_11th_ed.pdf [accessed 10 Nov 2009].

Ireland, Department Environment, Heritage and Local Government (2007), *Building Standards* [online], available: http://www.environ.ie/en/DevelopmentandHousing/BuildingStandards/ [accessed 17 Feb 2010].

Ireland, Department of Environment, Heritage and Local Government (2010), *Local Agenda 21 Environmental Partnership Fund* [online], available: http://www.environ.ie/en/Environment/LocalAgenda21/EnvironmentalPartnershipFund/ [accessed 16 Feb 2010].

Ireland, Department of Finance (2009), *Report of the Special Groups on Public Service Numbers and Expenditure Programme, Detailed Papers,11,* Scribd [online], available: http://www.scribd.com/doc/17406546/Full-Bord-Snip.Report [accessed 3 Jan 2009].

Ireland, Department of the Arts, Heritage, Gaeltacht and the Islands (2002), *National Biodiversity Plan,* Dublin: Stationery Office.

Ireland, Department of the Environment (1997), *Sustainable Development: A strategy for Ireland,* Dublin: Stationery Office.

Ireland, Department of the Environment and Local Government (1995), *Local Authorities and Sustainable Development: Guidelines on Local Agenda 21*, Dublin: Stationery Office.

Ireland, Department of the Environment and Local Government (2002*a*), *Making Ireland's Development Sustainable: Review, Assessment and Future Action,* Dublin: Stationery Office.

Ireland, Department of the Environment and Local Government (2002*b*), *Planning for the Business Person*, Dublin: Stationery Office.

IUCN (1970), International Working Meeting on Environmental Education in the School Curriculum, Final Report in Miller, R.G., (chair) *International Working Meeting on Environmental Education in the School Curriculum*, Nevada, USA, 20 June-11 July, 1970, Morges, Switzerland: IUCN, 1-42.

IUCN (2009), *About IUCN* [online], available: http://www.iucn.org/about/index.cfm [accessed 13 Jan 2010].

IUCN, UNEP and WWF (1980), *World Conservation Strategy: Living Resource Conservation for Sustainable Development*, Gland, Switzerland: IUCN, UNEP and WWF.

IWT (2010), *Irish Wildlife Trust, What do we do?* [online], available: http://www.iwt.ie/index.php?option=com_content&view=article&id=46&Itemid=8 [accessed 15 Feb 2010].

Jeffrey, D.W. (2001), 'The Roles of Environmental Non-Governmental Organisations in the Twenty-First Century', *Biology and Environment*, 101B, (1-2), 151–156.

Keep Wales Tidy (2007), *Eco-Centres Handbook,* Wales: Keep Wales Tidy.

Kelly, O. (2010), "Meters to Charge for Water Loss", *Irish Times* [online], 26 Jan, available: http://www.irishtimes.com/newspaper/ireland/2010/0126/1224263119437.html [accessed 2 June 2010].

Kerret, D. (2008), 'ISO 14001 as an Environmental Capacity Building Tool – Variations among Nations', *Environmental Science and Technology*, 42(8), 2773 – 2779.

Landon, M. (2006), *Environment, Health and Sustainable Development*, Berkshire: Open University Press.

Mather, R. (2006), 'Eco-Schools and Green Schools' in Lee, J. And Williams, M., eds., *Environmental and Geographical Education for Sustainability: Cultural Contexts*, New York: Nova Science Publishers Inc., 139-153.

Melville, H.R. (2007), *Enabling Environmental Education in an Environmental Education Centre: Narrative Account of Opportunities and Constraints,* unpublished thesis (M.Ed.), Stellenbosh University, South Africa.

Mohamedbhai, G. (2007), 'Promoting Sustainable Development-What Role for Higher Education?' in Matsuura,K., chair, *4th International Conference on Environmental Education*,Ahmedabad, India, 24 – 28 Nov, Paris: UNESCO.

NAEE (2003), *NAEE,* [online], available: http://www.naee.org.uk/ [accessed 7 Nov 2009].

National Rural Network (2010), *National Rural Network: Leader in Ireland*, [online], available: http://www.nrn.ie/leader-approach/2009/07/leader-in-ireland/ [accessed 16 Feb 2010].

NCCA (1999), *Primary Curriculum, Science, Social, Environmental and Scientific Education*, Dublin: Stationery Office.

NCCA (2000*a*), *Environmental and Social Studies* [online], available: http://www.curriculumonline.ie/en/Post-Primary_Curriculum/Junior_Cycle_Curriculum/Junior_Certificate_Subjects/Environmental_and_Social_Studies/ [accessed 3 Jan 2010].

NCCA (2000*b*), *CSPE Guidelines. Section 1:An Overview of CSPE* [online], available: http://www.curriculumonline.ie/en/Post-Primary_Curriculum/Junior_Cycle_Curriculum/Junior_Certificate_Subjects/Civic,_Social_and_Political_Education/Civic,_Social_and_Political_Education_Guidelines/Section_1_An_Overview_Of_CSPE/ [accessed 3 Jan 2010].

North American Association for Environmental Education (2006), *The Roots of Environmental Education: How the Past Supports the Future* [online], available: http://eetap.org/media/pdf/History.Final.20060315.pdf [accessed 7 Nov 2009].

NPWS (2010), *NPWS Education* [online], available: http://www.wicklowmountainsnationalpark.ie/NPWSEducation.html [accessed 12 Feb 2010].

OECD (2001), *OECD Environmental Strategy for the First Decade of the 21st Century*, Paris: OECD.

Office of Standards in Education (2003), *Taking the first step forward... towards an education for sustainable development: Good practice in primary and secondary schools*, London: Office of Standards in Education.

Office of the Houses of the Oireachtas (2006), *Seanad Debate: Vol. 185 No.11* [online], available: http://debates.oireachtas.ie/DDebate.aspx?F=SEN20061205.xml&Page=1&Ex=915#N915 [accessed 16 Feb 2010].

Office of the Houses of the Oireachtas (2009), *Parliamentary Debates: Joint Committee on Climate Change and Energy Security* [online], available: http://debates.oireachtas.ie/DDebate.aspx?F=CLJ20090204.xml&Page=1&Ex=72#N72 [accessed 11 Feb 2010].

Outdoor Education Ireland (2009), *Outdoor Education Ireland: The Network of VEC Outdoor Education Centres,* s.l.: Outdoor Education Ireland.

Palmer, J. A. (1998), *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise*, USA: Routledge.

Palmer, J. and Neal, P. (1994), *The Handbook of Environmental Education*, [online], available: http://www.amazon.com/reader/0415093147/ref=rdr_sb_li_hist_1&state=01101#reader_0415093147 [accessed 30 Oct 2009].

Planning and Development Regulations 2008, S.I. No. 235 of 2008, Dublin: Stationery Office.

RCE-Ireland (2009), *Regional Centre of Expertise for Education for Sustainable Development*, Dublin: Comhar SDC.

Real World Learning Partners (2006), *Out-of-Classroom Learning: Practical Information and Guidance for Schools and Teachers,* UK: The Royal Society for the Protection of Birds.

Rediscovery Centre (2010), *Rediscovery Centre* [online], available: http://www.rediscoverycentre.ie/ [accessed 30 May 2010].

Shallcross, A.G. (2003), *Education as Second Nature: Deep Ecology and School Development through Whole Institution Approaches to Sustainability Education,* unpublished thesis (PhD.), Manchester Metropolitan University.

Sherkin Island Marine Station (2006), *Sherkin Island Marine Station: The Station* [online], available: http://www.sherkinmarine.ie/station.htm [accessed 17 Feb 2010].

Smith, T. (2008), 'Integrated Programs and Pro-Environmental Behaviour', *Pathways: The Ontario Journal of Outdoor Education*, 20 (4), 8-11.

Sterling, S. (1992), *Coming of Age-A Short History of Environmental Education*, UK: National Association for Environmental Education.

Stokes, Edge & West (2001), *Environmental Education in the Educational Systems of the European Union,* Luxembourg: Office of the Official Publications of the European Communities.

SEAI (2010*a*), *Replacing Your Boiler* [online], available: http://www.seai.ie/Power_of_One/Heat_Your_Home_For_Less/Replacing_Your_Boiler/ [accessed 30 May 2010].

SEAI (2010*b*), Renewable Heat Deployment Programme (Re-Heat) [online], available: http://www.seai.ie/Grants/Renewable_Heat_Deployment_Programme/ [accessed 1 June 2010].

Sustainable Energy Ireland (2009), *Display Energy Certificate (DEC) for Large Public Buildings*, [online], available: http://www.sei.ie/Your_Building/BER/Large_Public_Buildings/ [accessed 17 Feb 2010].

The Eden Project (2010), *Organisational Information: Our History,* [online], available: http://www.edenproject.com/organisational-information/our-history/index.php [accessed 12 Feb 2010].

The Heritage Council (2009), *The Heritage Council: Grants 2010,* Kilkenny: The Heritage Council.

The Irish Council for Science, Technology and Innovation (1998), *Science in Primary Schools,* Dublin: Advisory Science Council.

The Irish Times (2009), 'Environment office to close', *The Irish Times,* 17 Aug, [online], available: http://www.irishtimes.com/newspaper/ireland/2009/0817/1224252680438.html [accessed 4 Jan 2010].

The Village (2010), *Educational Services* [online], available: http://www.thevillage.ie/index.php?option=com_content&view=article&id=82 [accessed 22 May 2010].

Tidy Planet (2010), Food Waste and Composting Frequently Asked Questions [online], available: http://www.quickcompost.co.uk/faq-food-waste-composting-accelerated-compost-rocket-composter.shtml#7 [accessed 29 May 2010].

Tilbury, D., Adams, K. and Keogh, A. (2005), *A National Review of Environmental Education and its Contribution to Sustainability in Australia: Business and Industry Education,* Canberra: Australian Government Department of the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES).

Ugurlu, N.B. and Aladag, E. (2009), *Natural Resources and Education for Sustainable Development* [online], available: http://www.herodot.net/conferences/Ayvalik/papers/environ-04.pdf [accessed 4 Dec 2009].

UN (1987), *Report of the World Commission on Environment and Development Our Common Future (The Brundtland Report),* Geneva: UN.

UN (1992*a*), *Report of the United Nations Conference on the Environment and Development, Rio Declaration on the Environment and Development*, Rio de Janerio, Brazil 3-14 June 1992, Geneva: UN.

UN (1992*b*), *United Nations Conference on Environment and Development, Agenda 21*, Rio de Janerio, Brazil 3-14 June 1992, Geneva: UN.

UN (1997), *The Climate Change Convention* [online], available: http://www.un.org/ecosocdev/geninfo/sustdev/climate.htm [accessed 11 Nov 2009].

UN (1998), *Kyoto Protocol to the United Nations Framework Convention on Climate Change,* Geneva: UN.

UN (2005), *Plan of Implementation of the World Summit on Sustainable Development*, Geneva: UN.

UN (2009*a*), *Gateway to the UN System's Work on Climate Change* [online], available: http://www.un.org/wcm/content/site/climatechange/lang/en/pages/gateway/the-negotiations/the-un-climate-change-convention-and-the-kyoto-protocol, [accessed 11 Nov 2009].

UN (2009*b*), *The Millennium Development Report 2009*, New York: UN.

UNEP (1997), *Stockholm 1972 – Declaration of the United Nations Conference on the Human Environment* [online], available: http://www.unep.org/documents/default.asp?documentID=97&ArticleID=1503 [accessed 9 Nov 2009].

UNEP (2001), *Vienna Convention for the Protection of the Ozone Layer,* Kenya: UNEP.

UNEP (2005), *United Nation Environment Programme: Environment for Development*, Kenya: UNEP.

UNEP (2009), *The Ozone Hole* [online], available: http://www.theozonehole.com/montreal.htm [accessed 11 Nov 2009].

UNEP, Ozone Secretariat (2009), *Ratification Status* [online], available: http://ozone.unep.org/Ratification_status/ [accessed 11 Nov 2009].

UNESCO (1977), Intergovernmental Conference on Environmental Education, Final Report in Shah, M.R., chair, *Intergovernmental Conference on Environmental Education*,Tbilisi, USSR,14-26 Oct, 1977, Paris: UNESCO.

UNESCO (1997), *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action* [online], available: http://www.unesco.org/education/tlsf/TLSF/theme_a/mod01/uncom01t05s01.htm [accessed 9 Nov 2009].

UNESCO (2005), *UN Decade of Education for Sustainable Development 2005 – 2014*, Paris: UNESCO.

UNESCO (2009*a*), UNESCO: *What is it? What does it do?* Paris: UNESCO.

UNESCO (2009*b*), *Second Collection Good Practices: Education for Sustainable Development,* Paris: UNESCO.

UNESCO (2010), *About Us* [online], available: http://www.unesco.org/new/en/unesco/about-us/ [accessed 12 Feb 2010].

UNESCO/UNECE (2007), *Good Practices in the UNECE region,* 2nd ed., Paris: UNESCO.

UNESCO-UNEP (1976), 'The Belgrade Treaty', *Connect, UNESCO-UNEP Environmental Newsletter, 1*(1), 1-8.

UNFCCC (2009), *Status Ratification* [online], available: http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php [accessed 11Nov 2009].

Waste Management (Food Waste) Regulations, 2009, S.I. No. 508 of 2009, Dublin: Stationery Office.

Wenk, M.S. (2005) *The European Union's Eco-Management and Audit Scheme (EMAS),* Netherlands: Springer.

Wexford County Council (2008), *Advice Note 3, Version 1: Guidelines for Water Pollution Licensing and Discharge of Effluent to Waters*, s.l.: Wexford County Council.

Willison, J. (2006), *Education for Sustainable Development: Guidelines for Action in Botanic Gardens*, U.K.: Botanic Gardens Conservation International.

Wilson, P.A. (1993), 'Developing Field Courses for Schools Past, Present and Future', *Field Studies*, 8 (2), 239-243.

APPENDIX A

Centre Name						Rural or Urban Setting	
Manager							
Centre Status (please tick)	Charity		Private		State Funded		
Types of Environmental Education (EE) Courses Provided							
Target Groups							
Other Courses Provided with EE Element							
Target Groups							
Environmental Management System in Place (eg.ISO14001,EMAS or Eco Flower)							

							Y/N
No. staff		No. staff working in EE		No. staff trained in EE		Training provided to Staff in EE	
Centre Capacity	Residential			Annual number of visitors		Environmental policy in place	
	Non Residential						
No. staff from local area (within 5mile radius)							

Litter and Waste Management		Insert Y or N For Yes/No
Do You recycle the following?		
Paper		
Card/ cardboard		
Glass		
Tin cans		
Wax Cartons		
Plastic Bottles		
Plastic Containers		
Compost	Cooked	
	Uncooked	
Sewage Treatment		
Mains		
Septic Tank		
Biological (Please specify type) Type:		

Energy Conservation and Use		
Energy Source	Wind	
	Solar	
	Renewable: Wood	
	Geo-thermals	
	Hydro	
Grid	ESB/Airtricity/Bord Gáis (State supplier)	
Space Heating	Thermostats – Room or Radiators	
	Low Emission Boiler	
Water Heating	Thermostat Below 60°	
Lighting	CFLs	
	Motion Sensors	
	Time Switches	
	'Switch off' Signs	
Low Energy Usage Appliances		

Appendix A Table 1: Best Practice in Environmental Education Survey (1 of 2)

Water Conservation			Transport	
Does the centre have the following?	Insert Y or N for Yes/ No		**Centre Vehicles**	Insert Y or N for Yes/ No
Water Butts (Collect rain water for watering, toilet flushing etc.)			Bio-fuel	
Push Taps			Low Co_2	
Stoppers for sink & wash hand basins			Limit journeys	
Low/Dual Flush/ Water saving device for toilets			**Staff Transport**	
Leak Testing carried out regularly			Lift share incentive	
Recycling 'grey' water (water used for showers etc reused in flushing etc)			Public transport incentive	
			Cycling to work incentive	
Insulation			**Landscape**	
Walls			Plan for greening the site	
Roof/Attic Space			Use own compost	
Draughts Excluders			Area set aside for wildlife	
Double Glazing			Native plants used — Trees	
Triple Glazing			Native plants used — Shrubs	
Other				

Purchasing					
Office		**Kitchen**		**Eco-friendly Consumables**	
Brochure on recycled paper		Grow your own veg.		Washing up liquid	
Brochure on chlorine free paper		Supply own meat		Dishwasher detergent	
Dual sided copying		Supply other foodstuff (e.g. Eggs)		Hand wash	
Recycle paper used for printing		List: _____		Kitchen paper	
Refill ink cartridges		Source groceries locally		Toilet rolls	
Recycle ink cartridges		Source Irish		Rubbish bags	
Use refillable pens		Bulk buy		Toilet cleaners	
Recycle batteries		Look for limited packaging		Weed Killer	

Appendix A Table 1: Best Practice in Environmental Education Survey (2 of 2)

Dear Sir/Madam

I am a postgraduate student in Sligo Institute of Technology. I am carrying out a survey of environmental education centres for a research project for an MSc in Environmental Protection. My thesis is entitled Best Practice in Environmental Education Centres. The purpose of the survey is to record what centres are doing with regard to good practice in their operations and built environment. I hope to establish a catalogue of best practice for environmental education centres and/or centres for education for sustainable development.

I would be grateful if you could complete the attached two-page form at your convenience and return to me by email or post to the address below. Most of the questions require a yes/no answer, which can be abbreviated to "Y" or "N". Please insert N/A, (not applicable), if the question is not relevant to your centre. Please include anything else you would like to add with regard to good practice at your centre.

I appreciate your time in completing the form. If you would like feedback on my results, I will send my findings to you on completion of the thesis.

Yours faithfully

Mary Butler

Ardrumman

Ramelton

Co. Donegal

Appendix A Document 1: Survey Request Letter

APPENDIX B

Centre	Address	Telephone	Email	Website	Map No.
Achill Outdoor Education Centre	Cashel, Bunacurry, Achill, Co. Mayo	098 47304	info@achilloutdoor.com	www.achilloutdoor.com	45
Airfield	Upper Kilmacud Road, Dundrum, Dublin 14	01 2984301	info@airfield.ie	www.airfield.com	15
An Gáirdín	St. Brigid's Road, Portumna, Co. Galway	0909 741689	angairdin1@gmail.com	www.angairdin.com	22
An Tairseach	Dominican Farm & Ecology Centre, Wicklow Town	0404 61833	ecenw@eircom.net	www.ecocentrewicklow.ie	63
Ballybay Wetlands Centre	Derryvalley Farm, Ballybay, Co. Monaghan	042 9748022	info@ballybaywetlands.ie	www.ballybaywetlands.ie	51
Ballycroy National Park	Ballycroy, Westport, Co. Mayo	098 49888	ballycroyvisitorcentre@environ.ie	www.ballycroynationalpark.ie	46
Baltinglass Outdoor Education Centre	Weaver Square, Baltinglass, Co. Wicklow	059 6481002	info@baltinglassoec.com	www.baltingglassoec.com	64

Appendix B Table 1: Centre Contact Details (1 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Birr Castle Demesne	Birr, Co. Offaly	057 9120336	mail@birrcastle.com	www.birrcastle.com	53
Birr Outdoor Education Centre	Roscrea Road, Birr, Co. Offaly	057 9120029	birr@oec.ie	http://www.offalyvec.ie	54
Bog of Allen Nature Centre (IPCC)	Lullymore, Rathangan, Co. Kildare	045 860133	bogs@ipcc.ie	www.ipcc.ie	37
Boghill Centre	Boghill, Kilfenora, Co. Clare	065 7074644	boghill@eircom.net	www.boghill.com	1
Breesy Centre	Cashelard, Ballyshannon, Co.Donegal	071 9822925	info@breesycentre.com	www.breesycentre.com	11
Brigit's Garden	Rosscahill, Co. Galway	091 550905	info@brigitsgarden.ie	www.brigitsgarden.ie	23
Burren Outdoor Education Centre	Turlough, Bell Harbour, Co. Clare	065 7078066	burroec@eircom.net	www.burrenoec.com	2

Appendix B Table 1: Centre Contact Details (2 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Burrenbeo	Burrenbeo Trust Ltd., Main Street, Kinvara, Co.Galway	091 638096	info@burrenbeo.com	www.burrenbeo.com	24
Cappanalea Outdoor Education Centre	Oulagh West, Caragh Lake, Co Kerry	066 9769244	info@cappanalea.ie	www.cappanalea.ie	31
Carraig Dúlra	Glenealy Landscape Centre, Glenealy, Co. Wicklow	0404 69570	info@dulra.org	www.dulra.org	65
Castlecomer Discovery Park	The Estate Yard, Castlecomer, Co. Kilkenny	056 4440707	info@discoverypark.ie	www.discoverypark.ie	39
Centre for Environmental Learning (CELT)	CELT Office, C/O East Clare Community Co-op, Scarriff, Co. Clare	061 640765	info@celtnet.org	www.celtnet.org	3
Connemara National Park	Letterfrack,Co. Galway	095 640765	carole.reynolds@environ.ie	www.connemaranationalpark.ie	25
Croghan Organic Garden	Croghan, Boyle, Co. Roscommon	071 9668963	croghanorganicgarden@eircom.net	www.croghanorganicgardens.com	55

Appendix B Table 1: Centre Contact Details (3 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Cultivate	The Greehouse,St. Andrew Street, Dublin 2	01 6745773	Directly through website	www.cultivate.ie	17
Delphi Mountain Resort	Leenane, Connemara, Co. Galway	095 42208	info@delphiescape.com	www.delphimountainresort.com	26
Dolmen Centre	Kilclooney, Portnoo, Co. Donegal	074 9545010	dolmencentre@eircom.net	www.dolmencentre.com	12
Dublin Zoo Education Centre	Phoenix Park, Dublin 8	01 4748932	education@dublinzoo.ie	www.dublinzoo.ie	18
Dunmore Country School	Durrow, County Laois	057 8736598	toulget@eircom.net	www.dunmorecountryschool.ie	40
Eco Adventure Enniskerry	Knockree Hostel, Enniskerry, Co. Wicklow	01 2767988	info@ecoadventureireland.ie	www.ecoadventureireland.ie	66
Eco Adventure, Killarney	Killarney International Hostel, Killarney, Co. Kerry	064 6634092	info@ecoadventureireland.ie	www.ecoadventureireland.ie	32

Appendix B Table 1: Centre Contact Details (4 of 10)

Centre	Address	Telephone	Email	Website	Map No.
ECO UNESCO	The Greehouse,St. Andrew Street, Dublin 2	01 6625491	info@ecounesco.ie	www.ecounesco.ie	19
Fota Island	Carrigtwohill, Co. Cork	021 481 2678	info@fotawildlife.ie	www.fotawildlife.ie	6
Galway Atlantaquaria	Salthill, Galway	091 585100	atlantaquaria@eircom.net	www.nationalaquarium.ie	27
Gartan Outdoor Education Centre	Church Hill, Co. Donegal	074 9137032	office@gartan.com	www.gartan.com	13
Glenveagh National Park	Church Hill, Co. Donegal	074 9137090	glenveaghbookings@environ.ie	www.glenveaghnationalpark.ie	14
Horizon Adventure & Education Centre	Kilavalley, Westport, Co Mayo	098 35844	schools@horizonireland.com	www.horizonireland.com	47
Institute of Permaculture & Nature Awareness (IPNA)	Caherciveen, Co. Kerry	066 9481944	KerryTracker@gmail.com	www.ipna.ie	33

Appendix B Table 1: Centre Contact Details (5 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Irish National Stud, Japanese Gardens & St. Fiachra's Garden	Tully, Kildare, Co. Kildare	045 521251	www.irish-national-stud.ie	stud@irish-national-stud.ie	36
Irish Natural Forestry Foundation (INNF)	Manch, Ballineen, Co. Cork	023 8822823	enquiries@inff.ie	www.inff.ie	7
Irish Seed Savers	Capparoe, Scarriff, Co. Clare	061 921856	info@irishseedsavers.ie	www.irishseedsavers.ie	4
Kerry Earth Education Project (KEEP)	Gortbrack Organic Farm, Ballyseedy, Tralee, Co. Cork	066 7137042	earthedkerry@gmail.com	www.gortbrackorganicfarm.com	34
Kilfinane Outdoor Education Centre	Kilfinane, Co. Limerick	063 91161	info@kilfinaneoec.com	www.kilfinaneoec.com	43
Killarney National Park	Knockreer House, Killarney, Co. Kerry	064 35960	Knpeducationcentre@eircom.net	www.killarneynationalpark.ie	35
Killary Adventure Centre	Leenane, Co. Galway	095 43411	adventure@killary.com	www.killaryadventure.com	28

Appendix B Table 1: Centre Contact Details (6 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Kinvara Sustainable Living	Knockakilleen, Doorus, Kinvara, Co. Galway	091 638099	kinvarasustainableliving@gmail.com	www.kinvarasustainablelivin g.com	29
Kippure Estate	Manor Kilbride, Blessington, Co. Wicklow	01 4582889	info@kippure.com	www.kippure.com	67
Knocksink Wood Nature Reserve	Enniskerry, Co. Wicklow	01 2866609	wickloweducationcentre@environ.ie	www.wicklowmountainsnationalpark.ie/KnocksinkEducation.html	68
Lahinch Seaworld & Leisure Centre	The Promenade, Lahinch, Co. Kildare	065 7081900	Directly through website	www.lahinchseaworld.com	5
Lifetime Lab	Lee Road, Cork, Co. Cork	021 4941500	lifetimelab@corkcity.ie	www.lifetimelab.ie	8
Lismore Heritage Centre	Lismore, Co. Waterford	058 54975	lismoreheritage@eircom.net	www.discoverlismore.com	59
Lough Allen Adventure Centre	Cleighran Beg, Ballinaglera, Co Leitrim	071 9643292	alleninfo@eircom.net	www.loughallenadventure.com	41

Appendix B Table 1: Centre Contact Details (7 of 10)

Centre	Address	Telephone	Email	Website	Map No.
Lough Fey Forest Park Education & Activity Centre	Boyle, Co. Roscommon	071 9673122	info@loughkey.ie	www.loughkey.ie	56
Lullymore Heritage & Discovery Park	Lullymore, Rathangan, Co. Kildare	045 870238	info@lullymoreheritagepark.com	www.lullymore heritagepark.com	38
Museum of Country Life	Turlough Park, Castlebar, Co. Mayo	094 9031751	educationtph@mueseum.ie	www.muesum.ie	48
Nano Nagle Centre	Ballygriffin,Mallow, Co. Cork	022 26411	enquiries@nanonaglebirthplace.ie	www.nanonaglebirthplace.ie	9
National Botanical Gardens	Glasnevin, Dublin 9	01 8040300	felicity.gaffney@opw.ie	www.botanicgardens.ie	20
National Sea Life Centre	Bray, Co. Wicklow	01 2866939	slcbray@merlinentertainments.biz	www.sealifeeurope.com/local/index.php?loc=bray&lang=en	69
North Bull Island	Bull Island	01 8338341	cra@dublincity.ie	www.dublincity.ie/RecreationandCulture/DublinCityParks/VisitaPark/pages/northbullisland.aspx	16

Appendix B Table 1: Centre Contact Details (8 of 10)

Centre	Address	Telephone	Email	Website	Map No.
North Midlands Education Centre	NPWS, Ballinafad, Co. Sligo	071 9666704	nmidland_edcentre@environ.ie	www.northmidlandseducationcentre.ie	57
Petersburg Outdoor Education Centre	Clonbur, Co. Galway	094 9546483	info@petersburg.ie	www.petersburg.ie	30
Rediscovery Centre	c/o Ballymun Regeneration Ltd., Civic Centre, Main St., Ballymun, Dublin 9	01 2225680	Sarah.miller@dublincity.ie	www.rediscoverycentre.ie	21
Shielbaggan Outdoor Education Centre	Ramsgrange, The Hook, Wexford	051 389550	info@shielbagganoec.com	www.shielbagganoec.com	61
Sonairte: The Ecology Centre	The Ninch, Laytown, Co. Meath	041 9827572	info@sonairte.ie	www.sonairte.ie	44
Tanagh Outdoor Education Centre	Dartrey, Rockcorr, Co. Monaghan	049 5552988	tanaghoec@eircom.net	www.tanaghoutdooreducation.com	52
The Coppercoast GeoPark	Knockmahon Lodge, Bunmahon, Co. Waterford	051 292828	info@coppercoastgeopark.com	www.coppercoastgeopark.com	60

Appendix B Table 1: Centre Contact Details (9 of 10)

Centre	Address	Telephone	Email	Website	Map No.
The Hollies Centre for Practical Sustainability	Castletown, Enniskeane, Co. Cork	023 8847001	thomas_riedmuller@yahoo.ie	www.theholliesonline.com	10
The Organic Centre	Rossinver, Co. Leitrim	071 9854338	info@theorganiccentre.ie	www.theorganiccentre.ie	42
The Sustainability Centre	Corrig,Sandyhill, Westport, Co. Mayo	098 26281	office@sustainability.ie	www.sustainability.ie	49
Uisce	Elly Bay, Belmullet, Co. Mayo	097 82111	eolas@uisce.ie	www.uisce.ie	50
Village Education, Research & Training (VERT)	Main Street, Cloughjordan, Co. Tipperary	087 2569348	education@thevillage.ie	www.thevillage.ie	58
Wexford Wildfowl Reserve	North Slob, Ardcavan Lane, Wexford	053 9123406	deirdre.twoomey@environ.ie	www.wexfordwildfowlreserve.ie	62
Wicklow Mountains National Park	Kilafin, Laragh, Co. Wicklow	0404 45656	wickloweducationcentre@environ.ie	www.wicklowmountainsnationalpark.ie	70

Appendix B Table 1: Centre Contact Details (10 of 10)

Centre	Visitor Numbers	Residential (R)/ Non Residential(N)	Non Residential Capacity	Residential Capacity	No. Staff In E.E	No. Staff Trained E.E	In service Training in E.E	Funding C=Charity P=Private S=State	Location R= Rural U=Urban	Environmental Policy	Interest in Green Flag
Airfield	60,000	N	?		13	13	√	C	U	■	■
An Gáirdín	300	N	40		4	3	√	C	U	■	Maybe
An Tairseach	?	R&N	60	23	7	7	√	C	U	■	■
Ballybay Wetlands Centre	1000	N	100		1	1	√	P	R	■	■
Ballycroy National Park	New	N	30		4	1	√	S	R		■
Bog of Allen Nature Centre	1500	N	?		1	4	√	C	R		■
Boghill Centre	680	R&N	70	40	6	6	√	P	R	■	■
Breesy Centre	?	R&N	100		3	3	√	S	R	■	■
Brigit's Garden	18,000	N	?		4	4	√	C	R	■	■
Burren OEC	8000	R&N	60	54	3	3	√	S	R	■	■
Burrenbeo	10,000	N	?		5	5	?	C	U	■	■
Castlecomer Discovery Park	18,690	N	120		4	4	√	C & S	U	■	■
CELT	500	N	150		15	15	√	C & S	R	■	■
Connemara National Park	100,000	N	30		1	1	√	S	R		■
Dolmen Centre	5000	N	250		3	3	√	C	R	■	?
Fota Wildlife Park (Education Centre)	12,000	N	?		11	11	√	P	R	■	■
Galway Atlantaquaria	80,000	N	?		3	2	√	P	U	■	■
Gartan OEC	8000	R&N	120	80	1	1	√	S	R		■
Glenveagh National Park	100,000	N	?		3	3	√	S	R	■	■
Irish Seed Savers	5000	N	30		15	15	√	C	R		■
Kerry Earth Education Project	800	R&N	?	?	2	2	√	P	R	■	No

Appendix B Table 2: General Information on Centres (1 of 2)

Centre	Visitor Numbers	Residential (R)/ Non Residential(N)	Non Residential Capacity	Residential Capacity	No. Staff In E.E	No. Staff Trained E.E	In service Training in E.E	Funding C=Charity P=Private S=State	Location R= Rural U=Urban	Environmental Policy	Interest in Green Flag
Kilfinane OEC	12,000	R&N	60	50	1	1	√	S	R	■	■
Killarney National Park (Education Centre)	12,000	R&N	110	24	3	3	√	S	R		■
Killary Adventure Centre	?	R&N	160	100	?	?	?	P	R		Started
Kinvara Sustainable Living	?	N	?		2	?	?	P	R		■
Kippure Estate	6500	R&N	200	120	1	1	√	P	R	■	■
Knocksink Wood	Unknown	N	?		3	3	√	S	R		Maybe
Lifetime Lab	20,000	N	?		2	N/A	No	P & S	U	■	■
Lough Allen Adventure Centre	5600	R&N	48	36	2	2	√	S	R	■	N/A
Lough Fey Forest Park	60,000	N	?		1	1	No	P	R		■
Lullymore Heritage & Discovery Park	40,000	N	?		?	?	?	C	R		■
Museum of Country Life	100,000	N	?		5	0	No	S	R		?
Nano Nagle Centre	15,000	R&N	120	30	6	6	√	C	R	■	■
National Botanical Gardens	600,000	N	?		8	8	√	S	U	■	Maybe
Rediscovery Centre	600	N	30		1	3	√	C	U	■	P
Sonairte: The Ecology Centre	10,000	N	500	6	8	8	√	C	R		■
VERT	New	R& N	N/A		N/A	N/A	N/A	C	R	■	■
Wexford Wildfowl Reserve	28,000	N	30		1	1	No	S	R		■
Wicklow Mountains National Park	54,000	N	?		5	?	√	S	R		Maybe
Totals	**1,393,170**		**2418**	**563**	**158**	**144**	**√ =29**			**24**	**■ =30**

Appendix B Table 2: General Information on Centres (2 of 2)

EE/ESD Programmes	Programme Provider (By Map Number)	Total No.
Adventure Activity (EE Emphasis)	2, 11, 13, 28, 41, 43, 67	7
Biodiversity	3, 5, 6, 22, 23, 29, 34 ,35 ,44, 46, 58	10
Composting	5, 10, 14, 36, 34, 44	6
Conservation	1, 5, 6, 20, 34, 63	6
Creative Nature Activities	1, 14, 23, 43	4
Discover Primary Science	5, 6, 8, 14, 15, 22, 23, 27, 34, 35, 36, 37,39, 48	14
Eco-Building	1, 12, 44, 58	4
Ecology Field Studies	1, 2, 3, 6, 10, 13, 15 ,27, 35, 36, 43, 44, 46, 51, 56, 62, 63, 67, 68, 70	20
Farm Studies	10, 15	2
Geography Field Studies	2, 10, 12, 13, 35, 36, 67, 70	8
Natural Heritage (Adults)	1, 5, 6, 10, 13, 14, 15, 22, 23, 24, 25, 34, 36, 37, 44, 51	16
Nature Studies (Primary School)	1, 5, 6, 10, 11, 13, 14, 15, 20, 22, 23, 24, 25, 27, 34, 35, 36, 37, 39, 43, 44, 46, 48, 51, 56, 62, 63, 68, 70	29
Organic Horticulture	5, 10, 20, 22, 29, 34, 39, 44, 63	9
Permaculture	3, 10, 44, 58, 63	5
Polytunnel Horticulture	5, 10, 22, 29, 34, 44	6
Recycling	8, 10, 21, 58	4
Renewable Energy	8, 10, 12, 39, 44, 58	6
Sustainable Practises	1, 3, 8, 10, 12, 22, 34, 44, 58, 63	10
Teacher Training in EE/ESD	8, 13, 36, 34, 62, 63	6
Traditional Skills	3, 5, 22, 29, 44, 48	6

Appendix B Table 3: Programme Provision

Centre	All	Adults	Families	Corporate	Third Level	Second Level	Primary School	Teachers	Community Groups	Tourists
Airfield		■	■		■	■	■			
An Gáirdín		■	■			■	■			
An Tairseach	■									
Ballybay Wetlands Centre		■			■	■	■			
Ballycroy National Park		■	■			■	■			■
Bog of Allen Nature Centre		■	■		■	■	■	■		
Boghill Centre	■					■				
Breesy Centre				■						
Brigit's Garden							■			
Burren OEC		■			■	■	■			
Burrenbeo	■									
Castlecomer Discovery Park		■	■			■	■		■	
CELT	■									
Connemara National Park	■									
Dolmen Centre	■									
Fota Wildlife Park (Ed. Centre)					■	■	■	■		
Galway Atlantaquaria	■					■				
Gartan OEC		■	■		■	■	■	■		
Glenveagh National Park	■		■			■	■			■

Appendix B Table 4: Target Groups (1 of 2)

Centre	All	Adults	Families	Corporate	Third Level	Second Level	Primary School	Teachers	Community Groups	Tourists
Irish Seed Savers	■								■	
KEEP		■				■	■	■	■	
Kilfinane OEC						■	■			
Killarney National Park (Ed. Centre)		■				■	■			
Killary Adventure Centre	■									
Kinvara Sustainable Living		■				■				
Kippure Estate						■	■			
Knocksink Wood	■									
Lifetime Lab		■	■			■	■	■		
Lough Allen Adventure Centre	■									
Lough Fey Forest Park		■	■			■	■			
Lullymore Heritage & Discovery Park							■			
Museum of Country Life	■						■			
Nano Nagle Centre	■					■	■	■		
National Botanical Gardens	■									
Rediscovery Centre	■									
Sonairte: The Ecology Centre	■									
VERT					■	■	■			
Wexford Wildfowl Reserve	■					■	■	■	■	
Wicklow Mountains National Park	■					■	■			
Totals	**19**	**13**	**9**	**1**	**7**	**23**	**24**	**7**	**4**	**2**

Appendix B Table 4: Target Groups (2 of 2)

Centre	Recycling							Composting		Sewage Treatment		Total Max = 10	Score %
	Paper	Card	Glass	Cans	Wax Cartons	Plastic Bottles	Plastic Containers	Cooked Food	Uncooked Food	Mains	Reed Bed/ Peat Fibre		
Airfield	1	1	1	1	1	1	1	1	1	1	0	10	**100**
An Gáirdín	1	1	1	1	1	1	1	1	1	1	0	10	**100**
An Tairseach	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Ballybay Wetlands Centre	1	1	1	1	1	1	1	0	1	1	0	9	**90**
Ballycroy National Park	1	1	1	1	1	1	1	0	0	0	0	7	**70**
Bog of Allen Nature Centre	1	1	1	1	0	1	1	1	1	0	1	9	**90**
Boghill Centre	1	1	1	1	1	1	1	1	1	0	0	9	**90**
Breesy Centre	1	1	1	1	1	1	1	1	1	0	0	9	**90**
Brigit's Garden	1	1	1	1	1	1	1	0	1	0	1	9	**90**
Burren OEC	1	1	1	1	1	1	1	0	1	0	0	8	**80**
Burrenbeo	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Castlecomer Discovery Park	1	1	1	1	1	1	1	1	1	0	0	9	**90**
CELT	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Connemara National Park	1	1	1	1	1	1	1	0	0	1	0	8	**80**
Dolmen Centre	1	1	1	1	1	1	1	0	0	0	1	8	**80**
Fota Wildlife Park (Ed. Centre)	1	1	0	0	0	0	0	0	1	0	0	3	**30**
Galway Atlantaquaria	1	1	1	1	1	1	1	0	0	1	0	8	**80**
Gartan OEC	1	1	1	1	1	1	0	1	1	0	1	9	**90**
Glenveagh National Park	1	1	1	1	1	1	1	1	1	0	1	10	**100**
Irish Seed Savers	1	1	1	1	1	1	1	1	1	0	0	9	**90**

Appendix B Table 5: Litter & Waste Management Scores (1 of 2)

Centre	Recycling							Composting		Sewage Treatment		Total Max = 10	Score %
	Paper	Card	Glass	Cans	Wax Cartons	Plastic Bottles	Plastic Containers	Cooked Food	Uncooked Food	Mains	Reed Bed/ Peat Fibre		
Kerry Earth Education Project	1	1	1	1	1	1	1	1	1	0	1	10	**100**
Kilfinane OEC	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Killarney National Park (Ed. Centre)	1	1	1	1	1	1	1	0	0	1	0	8	**80**
Killary Adventure Centre	1	1	1	1	1	1	1	1	1	0	1	10	**100**
Kinvara Sustainable Living	1	1	1	1	1	1	1	1	1	0	0	9	**90**
Kippure Estate	1	1	1	1	1	1	1	0	1	0	1	9	**90**
Knocksink Wood	1	1	1	1	1	1	1	0	1	0	1	9	**90**
Lifetime Lab	1	1	1	1	1	1	1	0	0	1	0	8	**80**
Lough Allen Adventure Centre	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Lough Fey Forest Park	1	1	1	1	0	1	1	0	0	1	0	7	**70**
Lullymore Heritage & Discovery Park	1	1	1	1	0	1	1	0	1	0	0	7	**70**
Museum of Country Life	1	1	1	1	0	1	1	0	0	1	0	7	**70**
Nano Nagle Centre	1	1	1	1	1	1	1	1	1	0	1	10	**100**
National Botanical Gardens	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Rediscovery Centre	1	1	1	1	1	1	1	1	1	1	0	10	**100**
Sonairte: The Ecology Centre	1	1	1	1	1	1	1	1	1	0	1	10	**100**
VERT	Planned											-	N/A
Wexford Wildfowl Reserve	1	1	1	1	1	1	1	0	1	1	0	9	**90**
Wicklow Mountains National Park	1	1	1	1	1	1	1	0	1	1	0	9	**90**
Total (Max= 38)	**38**	**38**	**37**	**37**	**33**	**37**	**36**	**22**	**30**	**18**	**11**	Mean:	**88.4211**

Appendix B Table 5: Litter & Waste Management Scores (2 of 2)

Centre	Renewable Energy					Space Heating		Lighting				HotH$_2$O	Other	Total Max = 13	Score %
	Wind	Solar	Wood	Geo-thermals	Hydro	Thermostats Room/ Rads	Boiler Low Emission	CFLs	Motion Sensors	Time Switches	Switch Off Signs	Thermostats < 60°C	Low Energy Appliances		
Airfield	0	0	0	0	0	1	1	1	0	0	1	1	1	6	**46**
An Gáirdín	0	1	0	1	0	1	0	1	0	0	1	1	1	7	**54**
An Tairseach	0	1	1	0	0	0	0	1	1	1	0	0	0	5	**38**
Ballybay Wetlands Centre	0	1	1	1	0	1	1	1	0	1	1	1	1	10	**77**
Ballycroy National Park	0	1	0	1	0	1	N/A	0	0	0	0	1	0	4	**33**
Bog of Allen Nature Centre	0	0	0	0	0	0	0	0	0	0	1	1	0	2	**15**
Boghill Centre	0	1	1	1	0	1	0	1	1	0	1	1	1	9	**69**
Breesy Centre	0	1	0	1	0	1	0	1	1	1	1	1	0	8	**62**
Brigit's Garden	0	0	0	0	0	1	0	1	0	0	0	0	1	3	**23**
Burren OEC	0	0	0	0	0	0	0	1	0	0	1	0	1	3	**23**
Burrenbeo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Castlecomer Discovery Park	0	0	0	1	0	1	1	1	1	0	0	0	N/A	5	**42**
CELT	0	0	1	0	1	1	0	1	0	1	1	1	1	8	**62**
Connemara National Park	0	0	0	0	0	1	0	1	0	0	0	0	0	2	**15**
Dolmen Centre	1	1	1	1	0	1	N/A	1	0	0	0	1	1	8	**67**
Fota Wildlife Park	0	1	0	0	0	0	0	0	1	1	1	1	1	6	**46**
Galway Atlantaquaria	0	0	0	0	0	1	0	0	0	1	0	1	0	3	**23**
Gartan OEC	0	0	1	0	0	1	0	0	1	0	1	1	1	6	**46**
Glenveagh National Park	0	1	1	0	0	1	0	1	0	0	1	0	1	6	**46**
Irish Seed Savers	0	1	0	0	0	1	0	1	0	0	1	1	1	6	**46**

Appendix B Table 6: Energy Use Scores (1 of 2)

Centre	Renewable Energy					Space Heating		Lighting				HotH$_2$O	Other	Total Max = 13	Score %
	Wind	Solar	Wood	Geo-thermals	Hydro	Thermostats Room/ Rads	Boiler Low Emission	CFLs	Motion Sensors	Time Switches	Switch Off Signs	Thermostats < 60°C	Low Energy Appliances		
Kerry Earth Education Project	0	1	1	1	0	1	1	1	1	1	0	1	1	10	**77**
Kilfinane OEC	0	0	0	0	0	0	0	1	1	0	1	1	0	4	**31**
Killarney National Park	0	0	0	0	0	0	0	1	1	0	0	1	0	3	**23**
Killary Adventure Centre	1	0	1	0	0	1	0	0	1	1	0	0		5	**38**
Kinvara Sustainable Living	0	0	0	1	0	0	0	0	0	0	0	0	0	1	**8**
Kippure Estate	0	0	0	0	0	1	1	1	0	0	1	1	1	6	**46**
Knocksink Wood	0	0	0	0	0	0	0	1	0	0	1	0	0	2	**15**
Lifetime Lab	1	1	0	1	0	1	1	1	1	1	1	1	1	11	**85**
Lough Allen Adventure Centre	0	1	1	0	0	0	0	0	0	0	1	1	0	4	**31**
Lough Fey Forest Park	0	1	1	0	0	1	1	1	0	1	0	1	1	8	**62**
Lullymore Heritage & Discovery Park	0	0	0	0	0	0	0	1	0	0	1	0	1	3	**23**
Museum of Country Life	0	0	0	0	0	1	0	0	0	1	1	0	0	3	**23**
Nano Nagle Centre	1	1	1	1	0	1	N/A	1	1	0	1	1	1	10	**83**
National Botanical Gardens	0	0	0	0		1	0	1	1	1	1	0	1	6	**46**
Rediscovery Centre	1	1	0	0	0	1	1	1	1	0	1	1	1	9	**69**
Sonairte: The Ecology Centre	1	1	0	0	0	1	0	1	0	0	1	0	0	5	**38**
VERT	Planned													-	**N/A**
Wexford Wildfowl Reserve	0	0	0	0	0	1	0	0	0	1	0	0	1	3	**23**
Wicklow Mountains National Park	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**8**
Totals (Max=38)	**6**	**17**	**12**	**11**	**1**	**26**	**8**	**27**	**14**	**13**	**23**	**22**	**21**	Mean	**41.1**

Appendix B Table 6: Energy Use Scores (2 of 2)

Centre	Walls	Roof/ Attic Space	Draught Excluders	Double Glazing	Triple Glazing	**Total** Max = 4	**Score %**
Airfield	1	1	1	0	0	3	**75**
An Gáirdín	1	1	1	1	0	4	**100**
An Tairseach	1	1	1	0	0	3	**75**
Ballybay Wetlands Centre	1	N/A	1	1	0	3	**100**
Ballycroy National Park	1	1	0	1	0	3	**75**
Bog of Allen Nature Centre	0	0	0	0	0	0	**0**
Boghill Centre	1	1	1	1	0	4	**100**
Breesy Centre	1	1	1	1	0	4	**100**
Brigit's Garden	1	1	1	1	0	4	**100**
Burren OEC	1	0	1	1	0	3	**75**
Burrenbeo	0	0	1	1	0	2	**50**
Castlecomer Discovery Park	1	1	1	1	0	4	**100**
CELT	Incomplete					-	-
Connemara National Park	1	1	0	1	0	3	**75**
Dolmen Centre	1	1	1	1	0	4	**100**
FotaWildlife Park	1	1	0	0	0	2	**50**
Galway Atlantaquaria	N/A	N/A	N/A	N/A	N/A	0	**0**
Gartan OEC	1	1	1	1	0	4	**100**
Glenveagh National Park	0	1	1	1		3	**75**
Irish Seed Savers	1	1	1	0	1	4	**100**

Appendix B Table 7: Insulation Scores (1 of 2)

Centre	Walls	Roof/ Attic Space	Draught Excluders	Double Glazing	Triple Glazing	**Total** Max = 4	**Score %**
Kerry Earth Education Project	1	1	1	1	0	4	**100**
Kilfinane OEC	0	1	0	1	0	2	**50**
Killarney National Park	0	0	1	0	0	1	**25**
Killary Adventure Centre	1	1	0	1	0	3	**75**
Kinvara Sustainable Living	N/A	N/A	N/A	N/A	N/A	0	**0**
Kippure Estate	1	1	1	1	0	4	**100**
Knocksink Wood	0	0	0	1	0	1	**25**
Lifetime Lab	1	1	1	0	0	3	**75**
Lough Allen Adventure Centre	1	1	0	1	0	3	**75**
Lough Fey Forest Park	1	1	1	0	1	4	**100**
Lullymore Heritage & Discovery Park	1	1	1	1	0	4	**100**
Museum of Country Life	N/A	N/A	N/A	N/A	N/A	0	**0**
Nano Nagle Centre	1	1	1	1	0	4	**100**
National Botanical Gardens	1	1	1	1	0	4	**100**
Rediscovery Centre	1	1	1	0	1	4	**100**
Sonairte: The Ecology Centre	1	1	1	1	0	4	**100**
VERT	Planned					-	
Wexford Wildfowl Reserve	Unknown	Unknown	0	1	0	1	**33**
Wicklow Mountains National Park	Unknown	1	1	1	0	3	**100**
Totals (Max=37)	**26**	**27**	**25**	**25**	**3**	Mean	**73.18918919**

Appendix B Table 7: Insulation Scores (2 of 2)

Centre	Water Reuse		Sinks & WHB		Toilets	Leaks	Total Max = 6	Score %
	Water Butts	Recycle Grey Water	Push Taps	Stoppers for Sinks & WHB	Low/Dual Flush/Water Saving Device	Regular Leak Testing		
Airfield	1	1	0	1	0	0	3	**50**
An Gáirdín	1	0	0	1	1	0	3	**50**
An Tairseach	1	1	1	1	1	0	5	**83**
Ballybay Wetlands Centre	1	0	1	1	1	0	4	**67**
Ballycroy National Park	1	0	1	1	1	0	4	**67**
Bog of Allen Nature Centre	1	0	0	1	1	0	3	**50**
Boghill Centre	1	Planned	0	1	1	1	4	**67**
Breesy Centre	1	0	0	1	1	0	3	**50**
Brigit's Garden	0	0	1	1	0	0	2	**33**
Burren OEC	0	0	1	0	0	1	2	**33**
Burrenbeo	0	0	0	0	0	0	0	**0**
Castlecomer Discovery Park	0	0	1	0	1	0	2	**22**
CELT	Incomplete						-	**N/A**
Connemara National Park	0	0	1	1	0	0	2	**33**
Dolmen Centre	0	0	1	1	1	1	4	**67**
Fota Wildlife Park	1	0	1	1	1	1	5	**83**
Galway Atlantaquaria	1	0	1	1	0	1	4	**67**
Gartan OEC	0	0	1	1	1	0	3	**50**
Glenveagh National Park	0	0	1	1	0	1	3	**50**
Irish Seed Savers	1	0	0	1	1	0	3	**50**

Appendix B Table 8: Water Conservation **Scores** (1 of 2)

Centre	Water Reuse		Sinks & WHB		Toilets	Leaks	Total Max = 6	Score %
	Water Butts	Recycle Grey Water	Push Taps	Stoppers for Sinks & WHB	Low/Dual Flush/Water Saving Device	Regular Leak Testing		
Kerry Earth Education Project	1	1	1	1	1	1	6	**100**
Kilfinane OEC	0	0	1	1	1	1	4	**67**
Killarney National Park	0	0	0	1	0	0	1	**17**
Killary Adventure Centre	1	0	0	0	0	0	1	**17**
Kinvara Sustainable Living	1	0	0	0	0	0	1	**17**
Kippure Estate	0	0	1	1	1	0	3	**50**
Knocksink Wood	0	0	1	0	0	0	1	**17**
Lifetime Lab	0	0	1	1	1	1	4	**67**
Lough Allen Adventure Centre	0	1	1	1	1	1	5	**83**
Lough Fey Forest Park	0	0	1	1	1	0	3	**50**
Lullymore Heritage & Discovery Park	0	0	1	1	0	0	2	**33**
Museum of Country Life	0	0	0	1	1	0	2	**33**
Nano Nagle Centre	0	0	0	1	1	1	3	**50**
National Botanical Gardens	1	0	1	1	1	1	5	**83**
Rediscovery Centre	1	0	1	N/A	1	1	4	**67**
Sonairte: The Ecology Centre	1	0	1	0	1	0	3	**50**
VERT	Planned						-	**N/A**
Wexford Wildfowl Reserve	0	0	0	1	0	0	1	**17**
Wicklow Mountains National Park	0	0	0	0	0	0	0	**0**
Total (Max=37)	**17**	**4**	**23**	**28**	**23**	**13**	Mean	**48.37837**

Appendix B Table 8: Water Conservation Scores (2 of 2)

Centre	Brochure		Paper Usage		Ink Cartridges		Others		Total Max=8	Score %
	On Recycled Paper	On Chlorine Free Paper	Dual Sided Copying	Recycled Paper used for Printing	Refill Ink Cartridges	Recycle Ink Cartridges	Use Refillable Pens	Recycle Batteries		
Airfield	1	1	1	1	1	1	0	1	7	**88**
An Gáirdín	1	1	1	1	1	1	1	1	8	**100**
An Tairseach	1	0	1	1	0	0	0	0	3	**38**
Ballybay Wetlands Centre	0	0	1	1	1	1	0	1	5	**63**
Ballycroy National Park	1	1	1	1	0	1	0	1	6	**75**
Bog of Allen Nature Centre	0	0	1	1	0	1	0	1	4	**50**
Boghill Centre	0	1	1	1	0	1	0	1	5	**63**
Breesy Centre	1	1	1	1	1	1	1	1	8	**100**
Brigit's Garden	1	0	0	1	0	1	0	1	4	**50**
Burren OEC	1	0	1	1	1	1	1	1	7	**88**
Burrenbeo	1	0	1	1	0	0	0	0	3	**38**
Castlecomer Discovery Park	0	0	1	1	1	1	0	1	5	**63**
CELT	1	1	1	1	1	0	1	0	6	**75**
Connemara National Park	1	1	1	1	0	1	0	1	6	**75**
Dolmen Centre	1	0	1	1	1	1	0	1	6	**75**
Fota Wildlife Park	1	1	1	1	1	1	0	0	6	**75**
Galway Atlantaquaria	0	0	0	1	0	1	0	1	3	**38**
Gartan OEC	0	0	1	1	1	1	0	1	5	**63**
Glenveagh National Park	1	0	0	0	0	0	0	0	1	**13**
Irish Seed Savers	1	1	1	1	1	1	1	1	8	**100**
Kerry Earth Education Project	1	1	1	1	1	1	1	1	8	**100**

Appendix B Table 9: Sustainable Purchasing - Office Scores (1 of 2)

Centre	Brochure		Paper Usage		Ink Cartridges		Others		Total Max=8	Score %
	On Recycled Paper	On Chlorine Free Paper	Dual Sided Copying	Recycled Paper used for Printing	Refill Ink Cartridges	Recycle Ink Cartridges	Use Refillable Pens	Recycle Batteries		
Kilfinane OEC	0	0	1	1	1	1	0	1	5	**63**
Killarney National Park	1	0	1	1	1	1	0	1	6	**75**
Killary Adventure Centre	0	0	0	1	0	0	0	0	1	**13**
Kinvara Sustainable Living	1	0	1	1	0	1	0	1	5	**63**
Kippure Estate	0	0	1	0	0	0	0	1	2	**25**
Knocksink Wood	0	1	1	1	0	1	0	1	5	**63**
Lifetime Lab	1	0	1	1	0	1	0	1	5	**63**
Lough Allen Adventure Centre	1	0	0	0	1	1	0	1	4	**50**
Lough Fey Forest Park	0	0	1	1	1	1	0	1	5	**63**
Lullymore Heritage & Discovery Park	0	0	0	0	0	0	0	0	0	**0**
Museum of Country Life	1	1	1	1	0	1	0	1	6	**75**
Nano Nagle Centre	1	1	1	1	1	1	1	1	8	**100**
National Botanical Gardens	1	1	1	1	1	1	1	1	8	**100**
Rediscovery Centre	1	1	1	1	0	1	0	1	6	**75**
Sonairte: The Ecology Centre	1	1	1	1	1	1	1	1	8	**100**
VERT	N/A	N/A	1	1	1	1	N/A	1	5	**100**
Wexford Wildfowl Reserve	0	0	1	1	1	1	0	1	5	**63**
Wicklow Mountains National Park	0	1	1	1	0	1	0	1	5	**63**
Totals	**24**	**17**	**33**	**35**	**21**	**32**	**9**	**32**	Mean:	**66.2564**
Maximum	38	38	39	39	39	39	38	39		

Appendix B Table 9: Sustainable Purchasing - Office Scores (2 of 2)

Centre	Food Source			Sustainable Food Purchasing				Eco-Friendly Consumables							Total Max= 14	Score %
	Grow Own Veg	Supply Own Meat	Supply Other Foodstuff	Buy Locally	Source Irish Foodstuff	Buy in Bulk	Seek Limited Packaging	Washing Up Liquid	Dishwasher Detergent	Hand Wash	Kitchen Paper	Toilet Rolls	Rubbish Bags	Toilet Cleaners		
Airfield	1	0	0	1	1	1	0	1	1	1	1	1	1	1	11	**79**
An Gáirdín	1	0	1	1	1	1	1	1	N/A	1	1	1	1	1	12	**86**
An Tairseach	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13	**93**
Ballybay Wetlands Centre	0	0	0	1	1	0	1	1	1	1	1	1	1	1	10	**71**
Ballycroy National Park	0	0	0	0	0	0	0	1	0	0	1	1	1	0	4	**29**
Bog of Allen Nature Centre	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	7	**100**
Boghill Centre	1	N/A	1	1	1	1	1	1	1	0	0	1	1	1	11	**85**
Breesy Centre	0	0	0	1	1	1	1	1	1	1	1	1	1	1	11	**79**
Brigit's Garden	1	0	0	1	1	1	1	1	1	1	1	1	1	1	12	**86**
Burren OEC	0	0	0	1	1	1	1	0	0	0	0	0	1	0	5	**36**
Burrenbeo	0	0	0	1	1	1	1	1	1	1	0	0	0	1	8	**57**
Castlecomer Discovery Park	0	0	0	1	1	1	1	1	1	1	1	1	1	1	11	**79**
CELT	0	0	0	1	1	1	1	1	N/A	1	1	1	1	1	10	**77**
Connemara National Park	0	0	0	0	0	0	0	1	0	0	1	1	1	0	4	**29**
Dolmen Centre	0	0	0	1	1	1	1	1	1	1	1	1	1	1	11	**79**
Fota Wildlife Park	0	0	0	1	1	1	1	1	0	1	1	1	1	1	10	**71**
Galway Atlantaquaria	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0	0	**0**
Gartan OEC	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	**7**
Glenveagh National Park	0	0	0	0	0	0	0	1	1	0	0	0	0	1	3	**21**
Irish Seed Savers	1	0	0	1	1	1	1	1	1	1	1	1	1	1	12	**86**
Kerry Earth Education Project	1	0	1	1	1	1	1	1	1	1	1	1	1	1	13	**93**
Kilfmane OEC	0	0	0	1	1	1	1	0	0	0	N/A	1	0	0	5	**38**

Appendix B Table 10: Sustainable Purchasing - Kitchen & Housekeeping Scores (1 of 2)

Centre	Food Source			Sustainable Food Purchasing				Eco-Friendly Consumables							Total Max= 14	Score %
	Grow Own Veg	Supply Own Meat	Supply Other Foodstuff	Buy Locally	Source Irish Foodstuff	Buy in Bulk	Seek Limited Packaging	Washing Up Liquid	Dishwasher Detergent	Hand Wash	Kitchen Paper	Toilet Rolls	Rubbish Bags	Toilet Cleaners		
Killarney National Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	N/A	0	1	0	1	**20**
Killary Adventure Centre	0	0	0	0	0	1	1	0	0	0	0	1	0	1	4	**29**
Kinvara Sustainable Living	1	1	1	1	1	0	0	1	0	0	1	1	0	1	9	**64**
Kippure Estate	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	**7**
Knocksink Wood	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	1	0	0	0	1	3	**50**
Lifetime Lab	0	0	0	1	1	0	1	1	1	1	0	1	1	1	9	**64**
Lough Allen Adventure Centre	0	0	0	1	1	0	0	1	1	1	1	1	1	1	9	**64**
Lough Fey Forest Park	0	0	0	1	1	1	1	1	1	1	0	0	0	1	8	**57**
Lullymore Heritage & Discovery Pk	1	0	0	1	1	0	0	0	0	0	0	0	0	0	3	**21**
Museum of Country Life	0	0	0	1	1	1	0	0	0	0	0	0	0	0	3	**21**
Nano Nagle Centre	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	**100**
National Botanical Gardens	1	0	0	1	1	1	1	Unknown				1	1	1	8	**80**
Rediscovery Centre	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Centre to be completed							-	**N/A**
Sonairte: The Ecology Centre	1	N/A	0	0	1	1	1	1	1	1	1	1	1	1	11	**85**
VERT	1	1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	12	**100**
Wexford Wildfowl Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0	0	0	1	0	0	2	**29**
Wicklow Mountains National Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	0	0	0	0	1	2	**33**
Totals	**13**	**4**	**6**	**25**	**26**	**24**	**22**	**28**	**19**	**21**	**20**	**26**	**23**	**26**	Mean	**58**
Maximum	32	30	32	32	32	32	32	38	34	38	36	38	37	37		

Appendix B **Table 10:** Sustainable Purchasing - Kitchen & Housekeeping Scores (2 of 2)

Centre	Centre Vehicles			Staff Transport			Total Max = 6	Score %
	Bio-fuel	Low CO_2	Limit Journeys	Lift Share Incentive	Public Transport	Cycle to Work Incentive		
Airfield	0	0	0	0	0	0	0	**0**
An Gáirdín	0	1	1	N/A	0	0	2	**40**
An Tairseach	0	1	1	N/A	N/A	N/A	2	**67**
Ballybay Wetlands Centre	0	0	1	0	0	0	1	**17**
Ballycroy National Park	0	0	1	0	0	0	1	**17**
Bog of Allen Nature Centre	0	0	1	0	0	0	1	**17**
Boghill Centre	0	0	1	1	1	1	4	**67**
Breesy Centre	0	0	1	N/A	1	N/A	2	**50**
Brigit's Garden	0	0	1	0	N/A	0	1	**40**
Burren OEC	0	0	1	0	0	0	1	**17**
Burrenbeo	0	0	0	0	0	0	0	**0**
Castlecomer Discovery Park	0	0	0	N/A	N/A	N/A	0	**0**
CELT	Incomplete						-	**N/A**
Connemara National Park	0	0	1	0	0	0	1	**33**
Dolmen Centre	N/A	N/A	N/A	1	N/A	0	1	**50**
Fota Wildlife Park	0	1	1	0	0	0	2	**33**
Galway Atlantaquaria	0	0	0	N/A	0	0	0	**0**
Gartan OEC	0	0	1	0	N/A	1	2	**40**
Glenveagh National Park	0	0	0	0	0	1	1	**17**
Irish Seed Savers	planned	0	1	1	0	1	3	**50**

Appendix B Table 11: Sustainable Transport Scores (1 of 2)

Centre	Centre Vehicles			Staff Transport			Total Max = 6	Score %
	Bio-fuel	Low CO_2	Limit Journeys	Lift Share Incentive	Public Transport	Cycle to Work Incentive		
Kerry Earth Education Project	1	1	1	1	0	0	4	**67**
Kilfinane OEC	0	0	1	0	0	0	1	**17**
Killarney National Park	0	0	1	0	0	0	1	**17**
Killary Adventure Centre	0	0	1	0	0	1	2	**33**
Kinvara Sustainable Living	N/A	N/A	N/A	0	0	0	0	**0**
Kippure Estate	N/A	N/A	N/A	0	N/A	N/A	0	**0**
Knocksink Wood	0	0	0	0	0	0	0	**0**
Lifetime Lab	0	0	1	0	1	1	3	**50**
Lough Allen Adventure Centre	0	0	0	0	0	1	1	**17**
Lough Fey Forest Park	0	0	1	1	0	0	2	**33**
Lullymore Heritage & Discovery Park	0	0	1	1	0	0	2	**33**
Museum of Country Life	N/A	N/A	N/A	0	0	1	1	**33**
Nano Nagle Centre	0	0	1	1	N/A	1	3	**60**
National Botanical Gardens	0	1	0	0	0	1	2	**33**
Rediscovery Centre	0	1	1	0	1	1	4	**67**
Sonairte: The Ecology Centre	0	1	1	0	0	0	2	**33**
VERT	N/A	N/A	N/A	N/A	N/A	N/A	-	**N/A**
Wexford Wildfowl Reserve	0	0	0	0	0	0	0	**0**
Wicklow Mountains National Park	0	0	0	0	N/A	0	0	**0**
Totals	**1**	**7**	**23**	**7**	**4**	**11**	Mean:	**28.13513**
Maximum	33	33	33	32	30	33		

Appendix B Table 11: Sustainable Transport Scores (2 of 2)

Centre	Planning		Planting		Practices		Location	Total Max = 6	Score %
	Plan for Greening Site	Area for Wildlife	Native Trees	Native Shrubs	Use Own Compost	Eco-Friendly Weed Killer/ Not Use	R = Rural U = Urban		
Airfield	1	1	1	1	1	1	U	6	**100**
An Gáirdín	1	1	1	1	1	1	U	6	**100**
An Tairseach	1	1	1	1	1	1	U	6	**100**
Ballybay Wetlands Centre	1	1	1	0	1	1	R	5	**83**
Ballycroy National Park	1	1	1	1	0	0	R	4	**67**
Bog of Allen Nature Centre	1	1	1	1	1	1	R	6	**100**
Boghill Centre	1	1	1	1	1	1	R	6	**100**
Breesy Centre	1	1	1	1	1	1	R	6	**100**
Brigit's Garden	1	1	1	1	1	0	R	5	**83**
Burren OEC	1	0	1	0	1	0	R	3	**50**
Burrenbeo	0	1	1	1	0	0	U	3	**50**
Castlecomer Discovery Park	Site managed by Coillte						U	-	**N/A**
CELT	Incomplete						R	-	**N/A**
Connemara National Park	1	1	1	1	0	0	R	4	**67**
Dolmen Centre	1	1	1	1	1	1	R	6	**100**
Fota Wildlife Park	1	1	1	1	1	1	R	6	**100**
Galway Atlantaquaria	N/A	N/A	N/A	N/A	N/A	N/A	U	0	**N/A**
Gartan OEC	0	1	1	1	1	0	R	4	**67**
Glenveagh National Park	1	1	1	1	1	0	R	5	**83**
Irish Seed Savers	1	1	1	1	1	1	R	6	**100**
Kerry Earth Education Project	1	1	1	1	1	1	R	6	**100**

Appendix B Table 12: Contribution to Conservation Scores (1 of 2)

Centre	Planning		Planting		Practices		Location		
	Plan for Greening Site	Area for Wildlife	Native Trees	Native Shrubs	Use Own Compost	Eco-Friendly Weed Killer/ Not Use	R = Rural U = Urban	**Total** Max = 6	**Score %**
Kilfinane OEC	0	1	1	1	1	0	R	4	**67**
Killarney National Park	0	1	1	1	0	N/A	R	3	**60**
Killary Adventure Centre	1	1	1	0	1	0	R	4	**67**
Kinvara Sustainable Living	1	1	1	1	1	1	R	6	**100**
Kippure Estate	0	1	1	1	1	0	R	4	**67**
Knocksink Wood	1	1	1	1	0	N/A	R	4	**80**
Lifetime Lab	1	1	1	1	1	1	U	6	**100**
Lough Allen Adventure Centre	0	1	1	1	1	0	R	4	**67**
Lough Fey Forest Park	1	1	1	1	0	1	R	5	**83**
Lullymore Heritage & Discovery Park	1	1	1	1	1	0	R	5	**83**
Museum of Country Life	1	1	1		1	0	R	4	**67**
Nano Nagle Centre	1	1	1	1	1	1	R	6	**100**
National Botanical Gardens	1	1	1	1	1	1	U	6	**100**
Rediscovery Centre	1	1	1	1	1	1	U	6	**100**
Sonairte: The Ecology Centre	0	1	1	1	1	1	R	5	**83**
VERT	1	1	1	1	1	1	R	6	**100**
Wexford Wildfowl Reserve	1	1	1	1	1	0	R	5	**83**
Wicklow Mountains National Park	1	1	1	1	1	N/A	R	5	**83**
Total	**29**	**35**	**36**	**32**	**30**	**19**		Mean:	**84.4444**
Maximum	36	36	36	36	36	35			

Appendix B Table 12: Contribution to Conservation Scores (2 of 2)

Centre	Litter & Waste Management	Energy Use	Insulation	Water Conservation	Transport	Purchasing - Office	Purchasing - Kitchen/ Housekeeping	Conservation	**Total Score** Max = 800	**Adjusted Total Score**	**Rank**
Airfield	100	46	75	50	0	88	79	100	538	67	14
An Gáirdín	100	54	100	50	40	100	86	100	630	79	5
An Tairseach	100	38	75	83	67	38	93	100	594	74	9
Ballybay Wetlands Centre	90	77	100	67	17	63	71	83	568	71	13
Ballycroy National Park	70	33	75	67	17	75	29	67	433	54	21
Bog of Allen Nature Centre	90	15	0	50	17	50	100	100	422	53	23
Boghill Centre	90	69	100	67	67	63	85	100	641	80	3
Breesy Centre	90	62	100	50	50	100	79	100	631	79	5
Brigit's Garden	90	23	100	33	40	50	86	83	505	63	16
Burren OEC	80	23	75	33	17	88	36	50	402	50	26
Burrenbeo	100	0	50	0	0	38	57	50	295	37	36
Castlecomer Discovery Park	90	42	100	22	0	63	79	N/A	396	57	19
CELT	100	62	Incomplete Survey			75	77	-	314	79	(5)
Connemara National Park	90	15	75	33	33	75	29	67	417	52	24
Dolmen Centre	80	67	100	67	50	75	79	100	618	77	8
Fota Wildlife Park	30	46	50	83	33	75	71	100	488	61	17
Galway Atlantaquaria	80	23	0	67	0	38	0	N/A	208	30	37
Gartan OEC	90	46	100	50	40	63	7	67	456	59	18
Glenveagh National Park	100	46	75	50	17	13	21	83	405	51	25
Irish Seed Savers	90	46	100	50	50	100	86	100	622	78	7

Appendix B Table 13: Total Aspect Scores & Centre Ranking (1 of 2)

Centre	Litter & Waste Management	Energy Use	Insulation	Water Conservation	Transport	Purchasing - Office	Purchasing - Kitchen/ Housekeeping	Conservation	**Total Score** Max = 800	**Adjusted Total Score**	**Rank**
Kerry Earth Education Project	100	77	100	100	67	100	93	100	737	92	1
Kilfinane OEC	100	31	50	67	17	63	38	67	433	54	21
Killarney National Park	80	23	25	17	17	75	20	60	317	40	34
Killary Adventure Centre	100	38	75	17	33	13	29	67	372	47	28
Kinvara Sustainable Living	90	8	0	17	0	63	64	100	342	43	31
Kippure Estate	90	46	100	50	0	25	7	67	385	48	27
Knocksink Wood	90	15	25	17	0	63	50	80	340	43	31
Lifetime lab	80	85	75	67	50	63	64	100	584	73	11
Lough Allen Adventure Centre	100	31	75	83	17	50	64	67	487	61	17
Lough Fey Forest Park	70	62	100	50	33	63	57	83	518	65	15
Lullymore Heritage & Discovery Park	70	23	100	33	33	0	21	83	363	45	30
Museum of Country Life	70	23	0	33	33	75	21	67	322	40	34
Nano Nagle Centre	100	83	100	50	60	100	100	100	693	87	2
National Botanical Gardens	100	46	100	83	33	100	80	100	642	80	3
Rediscovery Centre	100	69	100	67	67	75	N/A	100	578	72	12
Sonairte: The Ecology Centre	100	38	100	50	33	100	85	83	589	74	9
VERT (Under Construction)	N/A	N/A	N/A	N/A	N/A	100	100	100	300	100	N/A
Wexford Wildfowl Reserve	90	23	33	17	0	63	29	83	338	42	33
Wicklow Mountains National Park	90	8	100	0	0	63	33	83	377	47	28

Appendix B Table 13: Total Aspect Scores & Centre Ranking (2 of 2)

APPENDIX C

Checklist for Good Practice in EE and ESD Centres

Practice	Co-ordinator	Resources required	Target Date	Completion Date
General				
Put an Environmental Policy in place				
Have an introductory talk for guests regarding sustainable practices				
Set Targets				
Display targets set and achievements to date				
Litter and Waste Management				
Litter				
Check recycling facilities to know what can be recycled				
Purchase goods in recyclable packaging where possible				
Encourage centre users to purchase goods in recyclable packaging if possible				
Replace plastic refuse sacks with biodegradable or recyclable bags or use of old containers as waste bins where appropriate.				
Provide recycling bins in all areas				
Line recycling bins with newspaper rather than using plastic bags				
Provide composting bins both inside and outside of building				
Provide information notices stating volume of unnecessary waste in landfills				
Investigate possibility of introducing a means to recycle cooked food.				
Investigate the possibility of developing a wormery for composting				
Get register to avoid junk mail: Contact IDMA Tel: (01) 830 4752				
Office				
Purchase recycled stationery when possible				
Monitor amount of paper purchased				

Practice	Co-ordinator	Resources required	Target Date	Completion Date
Reuse envelopes				
Use scrap paper as memo paper				
Use dual sided photocopying				
Provide information and instructions on paper saving at photocopier				
Reuse ink cartridges				
Recycle reused ink cartridges				
Waste				
Consider using reed bed treatment system for sewage				
Consider secondary treatment for septic tank effluent				
Energy Use				
Investigate use of renewable energy sources (Geothermal systems, Solar – solar panels, photovoltaic panels, etc)				
Reduce central heating thermostat settings but maintain appropriate comfort levels				
Include display of room temperature gauges indicating appropriate temperature readings				
Install thermostats on heating devices including radiators.				
Use of reflective sheets behind radiators				
Purchase of A rated appliances				
Display of reminder notices to switch off electrical equipment and light switches				
Utilise passive / natural light energy sources				
Utilise of solar powered lamps and lights inside and out where appropriate				
Use of low energy light bulbs in all fittings				
Provide communal area for tea / coffee making facilities				
Close curtains at night time if available				
Attach spring load closing mechanisms to doors				

Practice	Co-ordinator	Resources required	Target Date	Completion Date
Provide outdoor air drying facilities for clothing including outdoor wear				
Insulate pipes and hot water storage tanks				
Sustainable Building				
Ensure that building design and construction methods and materials reflect best practice in advance of building adaptations or new building construction				
Orientate buildings towards the south				
Avoid overshadowing on south side				
Use building fabrics designed to reduce demand / energy consumption				
Choose high quality specifications and insulation levels				
Insure careful detailing to achieve air tightness and avoid cold bridging				
Avoid north facing windows				
Use of draught lobbies and side doors				
Use low pressure hot water heating system				
Ensure all radiators to have thermostatic valves for local control				
Building to have heating zones, dependent on use and activity				
Install a solar photovoltaic system & use solar thermal panels as appropriate				
Explore possibility to connect back to grid so as to advance building towards zero energy				
Maximise natural light using roof lights and tall windows				
Avoid solvent based paints and wood stains				
Avoid PVC and MDF products				
Use natural products for insulation (sheep's wool, hemp)				
Use of recycled materials where possible (newspaper for insulation)				
Consider end of life of all materials used in the building				

Practice	Co-ordinator	Resources required	Target Date	Completion Date
Purchasing				
Buy only what can be recycled				
Consider end of life of all products				
Purchase eco - friendly products such as wash up liquids, washing powders, toilet paper, paints, varnishes etc.				
Purchase ethically sound products such as those that are "Fair Trade"				
Grow own vegetables or shop locally for them				
Use fresh ingredients and unprocessed foods				
Buy locally				
Buy Irish				
Avoid plasma TVs				
Avail of WEEE service				
Refuse surplus packaging as appropriate				
Buy second-hand as appropriate such as for furniture				
Water Conservation				
Collect rainwater using water butts for reuse for example in garden or to be used to top up a pond to encourage greater biodiversity				
Display information signs to encourage reduced water usage such as during showering and tooth brushing				
Continuous flush of urinals to be curtailed during night time hours				
Monitor and promptly repair of water leakages				
Install cistern displacement device to reduce toilet flush volumes				
Install tap aerators and flow controls in shower heads				
Sustainable Transport				
Provide central collection point for guests				
Consider having bicycles available for guest and staff to use on site				
Encourage lift share among staff				
Encourage use of public transport where available e.g. through provision of bus / train time tables				
Use of sustainable centre transport vehicles (bio diesel, electric cars, limit journeys, etc)				

Practice	Co-ordinator	Resources required	Target Date	Completion Date
Contribution to Conservation				
Plant native trees and shrubs				
Leave log piles to provide a habitat for invertebrates				
Maintain an area for wildlife				
Incorporate nesting boxes for birds into the surroundings				
Place bat boxes on trees				
Collect seeds for planting				
Transplant saplings away from dense growth				
Provide bird feeders in winter				
Use gravel or bark on pathways				
Consider rotating area used for walking trails				
Use garden furniture made from recycled material or wood from native sustainable forests				
Have a compost heap				
Do not use pesticides				
Use natural means to control pests: egg shells to control slugs, marigolds to prevent aphids				
Create a pond to add to biodiversity.				
Collect rainwater in water butts to water plants				
Avoid weed killers: use card board or mulch instead				
Avoid the use of peat as compost: make your own				
Use willow for fences and garden structures e.g. willow dome				
Organise a regular litter collect around the site				
Miscellaneous				
Include outdoor signage to identify plants and information on conservation				
Provide an information point with information on good environmental practices, local events and facilities				
Have an eco-shop				
Invite visitors to view best practice in your centre				
Include demonstration models and interactive displays to illustrate good practice				