

Doncaster: Earth Centre: an International Centre for Sustainable Development and Living

Abstract:

The Earth Centre was conceived of in 1989, as a response to the World Commission on Environment and Development call in 1987 for "vast campaigns of education, debate and public participation" concerning sustainable development. The Centre is thus designed to be an exhibition of sustainable development practices and an international center for related research and education. The Earth Centre is found to be significant as a model for the following reasons:

- It offers the general public culturally accessible and even fun experiences with sustainable development;
- It demonstrates alternative approaches for the redevelopment of damaged post-industrial (coal-mining) landscapes;
- An integration of ecological, cultural and economic objectives is manifested here;
- New methods for information and communications systems are explored.

Concept and aims

Whereas the Dearne Valley landscape in and around the approximately 400 acres of the Earth Centre had been ravaged as it was primarily exploited for its coal deposits between the 1860s and the 1980s, the eventual closing of area mines meant a loss of about 10,000 jobs. The Earth Centre thus has taken on both the ecological challenge of restoring a devastated environment, and the social challenge of creating new jobs and economic structures. Altogether the Earth Centre aims to show that emerging sustainable technologies, products and services can be the engines of economic renewal. A principle assumption here is that there is no single blueprint for sustainability, but rather that a wide range of new ideas need to be explored and developed.

Although the Earth Centre is not located in an urban area (the search for a site actually began in London, but land values were prohibitive there), many millions of people do live in the region and visitors are strongly encouraged to avoid driving in their own auto to get there. People walking, bicycling or taking the train to the adjacent station receive a 40% discount compared to car drivers. The Earth Centre encompasses a huge range of projects and initiatives, including the following:

- Planet Earth Exhibitions;
- Ecology Park and Gardens;
- Wilderness Adventure Play and Rokkaku Trail;
- Water Works and Water Systems;
- Solar Canopy and Renewable Energy Initiatives.

Planet Earth

This collection of exhibitions presents perspectives concerning our collective effect on the Planet. As the initial architecture encountered by Earth Centre visitors, the Planet Earth is designed to persuade the public that "sustainable architecture" can indeed be modern and exciting. The Planet Earth Galleries are built into a hillside and along with the green roof employ excellent insulation, and as all Earth Centre structures, are designed to be highly energy efficient. Planet Earth works with a "labyrinth" concept, a sophisticated system for heating and cooling, that through a lattice system combines an underlying structure with a network which air is cycled through. The labyrinth uses a concept similar to that of the Roman Hypocaust, whereby an underground network of concrete and blockwork walls exchange heat energy with air as it passes by, thus serving as a thermal storage system.

Solar Canopy and Renewable Energy Initiatives

Covering the main plaza at the entrance before the Planet Earth Galleries, this solar power plant will feed electricity directly into the regional power grid. With an area of 1300 square meters and a peak electrical capacity of 107 kilowatts, it will be Europe's largest flat roof PV installation. The Canopy will consist of semi-transparent modules with mono-crystalline silicon embedded in resin with gaps to allow daylight to pass through, all laminated in glass. The Canopy also serves to collect rainwater which is then used for local irrigation.

There will also be a solar-powered taxi-boat to offer visitors short trips up and down the river Don. This is an S B Collinda, a 20ft katamaran equipped with Solarex PV cells.

Fifteen acres that are planted with willows will be regularly harvested to feed the UK's first "combined cycle gasification" biomass power station, which works by super-heating wood chips to produce inflammable gases which are then burnt in a gas turbine.

Further into the future, the "Ark" is designed to incorporate 250 KW of PV cells and the opportunities to explore alternative solar systems. A nearby landfill site is being looked at which could fuel a smaller power station with its methane.

Earth Centre Ecology Park and Gardens

The Ecology Park covers approximately 375 acres of land, and is open free of charge year-round. The former landscapes of the abandoned coal mines began to be reclaimed during the early 1990s, which has involved the planting of over 100,000 trees including 15 acres of willow. To be seen and experienced in this Park are the new forests as well as some ancient woodlands, two rivers and a variety of wetlands. While the land is obviously still scarred, steps have been taken here to increase the local biological diversity and to make it accessible, prioritizing walkers as well as cyclists and horseback riders.

Aside from the Ecology Park, a great diversity of smaller gardens have been created at the Earth Centre, including demonstrations of organic gardening methods, fruit orchards, willow sculptures, forest and bog gardens, and other flower and sculptural gardens.

Wilderness Adventure Play and Rokkaku Trail

Exhibits and experiences have also been designed to inspire and provoke children and youth. The Wilderness Adventure Play and Rokkaku Trail are for example created to provide young people with sensory experiences in terms of seeing, hearing, feeling, touching as well as tasting. The Trail encourages people to take off their shoes and experience a variety of textures. The Play area is an integration of environmental experiences as well as futuristic-looking features such as a 16 meter-high adventure play tower.

An Earth Centre Education project is active not only with the general design and organization of exhibitions but specifically with school groups that can select among a wide range of prepared workshops and learning packages. Programs are developed for schools in the region that will work with and educate both the teachers and their students.

Water Works and Water Systems

These projects and exhibitions present information on the future of water and its consumption. An integrated local water network is being created to deal with rainwater as well as all local waste water, and to work with the local river, streams, groundwater systems and created wetlands.

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Included is a "Living Machine" sewage treatment plant. This local water treatment system processes all waste water coming from Earth Centre toilets, basins and kitchens, operating entirely through biological reactions, using both bacteria and nutrient-demanding tropical plants in the warmth of a greenhouse. The toilet flushing system is in itself a demonstration, applying a low pressure vacuum technology that only uses about 10% of the water compared with a conventional system.

The Earth Centre Living Machine - one of about 25 in the world - operates through three main stages: open aerobic reactors, clarifiers, and ecological fluidised beds. Fluid then passes through an ultraviolet (UV) filter and on to a "Bio Fence" through which large amounts of green algae are produced. The treated water is released into a created wetland, from which it is pumped into a storage tank for irrigation, being combined with some water drawn from the river Don.

Implementation

The Earth Centre project has been essentially initiated and coordinated by Jonathan Smales, who grew up in a poor coal mining community in the region, and later went on to be a general manager and director of Greenpeace. Smales and other Earth Centre organizers found a site in South Yorkshire, England in 1990. Initial work with infrastructure and landscaping began in 1994 in this area that had for over the last century been the site of the Denaby Main and Conisbrough coal mines. In 1995 the project was recognized as a "Millennium Project" and awarded substantial funding for further development and implementation. In 1995 the site was first opened to the public, and has since been opened for some period of each following year as the construction has continued.

Phase I was essentially completed by the year 1999, with two thirds of the effort going toward landscaping, infrastructure and gardens. The other third was spent on buildings and attractions.

Phase II got underway in the year 2000, and spending is projected to go about 80% toward projects and visitor attractions emphasizing educational services. This includes the Solar Canopy and the 28-metre high "Future Works" tower, a lightweight tubular structure with a glass skin. The tower will house the New Millenniums Cities Show, including exhibitions concerning sustainable lifestyles in the 21st Century, as well as ecological housing, transportation and communications technologies.

Phase III is to create a showcase for sustainable science and technology. This is planned to include the construction of a local light-rail network and the development of offices, housing, research labs, retail space and hotels all based on principles of sustainable development. The highlight here is expected to be the "Ark," a futuristic 9,000 square meter exhibition and events space, which Earth Centre organizers claim could be as "influential in its aesthetic and technological innovation as the Crystal Palace was for the Great Exhibition in 1851."

Financing and resources used

A £450,000 grant in 1992 from the Dearne Valley Partnership City Challenge was enough for some serious feasibility studies which helped to get the Centre rolling.

The project really first took off with the £50 million award of the Millennium Commission, which backed with lottery funds is investing around £1.2 billion in the construction and development of more than 200 different projects throughout the UK.

Initiatives range from schemes of national importance to smaller, community-based developments. Altogether more than 3,000 sites are involved - 27 projects have received grants of between £15 million and £50 million.

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The European Regional Development Fund contributed £9 million to support economic initiatives at the Earth Centre.

A grant of £5.4 million was awarded to the Earth Centre in 1996 by English Partnerships, a national governmental agency charged with restructuring and redevelopment projects in former industrial areas.

Corporate partnership initiatives have brought together more than £5 million, and grants from trusts, foundations and landfill tax credits add up to another £1.5 million.

About £41.5 million were spent on Phase I and another £22 million are expected to be spent on Phase II. Phase III is estimated to cost about another £30 million.

Results and impacts

The Earth Centre is working with the realization that sustainability, while perhaps the key issue of the 21st Century, is not an easy concept to communicate. A challenge thus taken on by the Centre is to provide significant numbers of people with the opportunities to personally explore and look into a world of sustainability. It is hoped that many of these visitors will then act in some sustainable fashion - but this is of course a long-term process, and so the results will be seen in the coming years. But as of the year 2000, the Centre has already created an attractive destination which itself is a demonstration of a wide range of sustainable technologies. Opportunities are extended to the visitors to further encourage them to continue to learn and act.

Jonathan Smales argues that sustainable development is a diversity of processes and ideas. Smales has said "we want to show that a greener future should be better than what we have now - not just living in a cold wet cave with the TV switched off. And we want to emphasise the diversity of possible lifestyles. There may be limits within which we have to live, but there are thousands of choices to be made within that."

References

Earth Centre (2000) Press Pack 2000

Earth Centre (2000) Education 2000

Earth Centre (2000) Progress 2000 Tours Information

Geographical Supplement (1999) The Earth Centre: A Geographical Special Supplement. June 1999.

Earth Centre

www.earthcentre.org.uk

Doncaster, United Kingdom

www.doncaster.gov.uk

Millennium Commission, United Kingdom

www.millennium.gov.uk

english partnerships

<http://www.eaue.de/winuwd/196.htm>

www.cnt.org.uk

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Cities:

Doncaster:

The Earth Centre is located in the area of Denaby Main, in a former coal mining area of the Dearne Valley. Both the Don and the Dearne rivers flow by the Earth Centre site, and the 12th century Conisbrough Castle is in the vicinity. The closest city is Doncaster, about 22 miles away. Doncaster is an industrial centre in the county of South Yorkshire, with a population of 290,000. Sheffield is then 71 miles away, and London is about an hour and a half away by train.

Population:

290000

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