

Report from the international conference:

Sustainable sports and leisure facilities

Lillehammer, Norway.

EDITORIAL

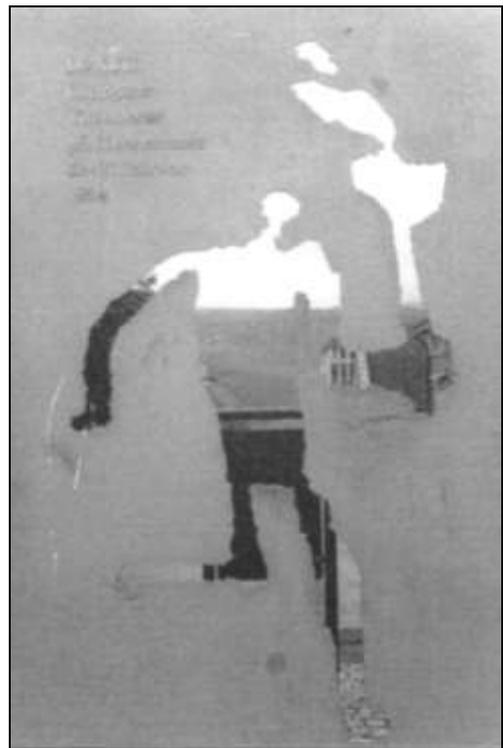
Sustainability should become an integral focus of all architectural practice. This will take time, since it implies new attitudes, knowledge, and skills on the part of our profession; it also depends on developments in the rest of society. It implies working together in new ways with engineers, biologists, builders and others, for sustainable solutions require integrated, cross-disciplinary and participatory methods.

In this issue we highlight an international conference and workshops on sustainability which was jointly organised by the two UIA Work Programs, Sports and Leisure and The Road from Rio. The driving force behind this was Marianne B. Natvig, chief town planner in the 1994 Winter Olympics town of Lillehammer. We hope that the issues discussed will be of wide interest to planners and architects in all countries.

The UIA Work Program "The Road from Rio" has been run since 1997 as a project within the Norwegian Architects Association. One of its aims is to contribute to bringing an environmental focus into the work of all the Work Programs. This conference, organised in cooperation between our Work Program and the Sports and Leisure WP, is an activity in this direction.

The international conference "Sustainable sports and leisure facilities" which took place on 17. - 19. September 1999 in Lillehammer, Norway, brought together more than 70 architects, planners and sports authorities in order to examine and discuss more sustainable and environmentally friendly sports and leisure facilities. The conference studied both the evaluation of the "Green Winter Games" in Lillehammer in 1994, in the light of follow-up experiences, and practical experiences with recent environmentally designed sports buildings. In addition there were presentations of future projects and a workshop was held. This report contains a short resume of the views presented and the conclusions made. In addition two of the papers presented are included.

The conference was organised by the Municipality of Lillehammer, the National Association of Norwegian Architects and the International Union of Architects (UIA): Sports and Leisure Program and The Road from Rio Program.



Lillehammer Olympic Games 1994

OTHER WP PROJECTS

The Road from Rio has a range of international contacts, and is developing several international initiatives, including:

- *Planning of an environmental centre: the ecology organisation CESTA in El Salvador*
- *Environmental codes of practice: South African Institute of Architects*
- *Environmental specifications for architecture competitions*

Planning towards the next UIA World Congress in Berlin in 2002 is also under way.

Conference views and conclusions

EVALUATION OF THE "GREEN WINTER GAMES" IN LILLEHAMMER

In his lecture Ketil Kiran, President of the National Association of Norwegian Architects, expressed a widely shared opinion about the idea of a "Green Winter Olympics":

A realistic assessment might quickly conclude that it would be hard to arrange any event like the Winter Olympics in a wholly sustainable way, however capable those involved might be. I am not just thinking about individual buildings and sites, such as the much-discussed location of Olympia hall at Åkersvika [in a nature protection area]. Equally important, on a larger scale it is doubtful whether a relatively sparsely populated region can carry such an event; or whether the region as a whole can make post-Games use of the specialised sports facilities.

An answer to this criticism is, indirectly, formulated by Annar Skrefsrud, head of administration, Lillehammer municipality, in her lecture "Evaluation of the Olympic Winter Games in Lillehammer 1994":

For Lillehammer, the Olympic Winter Games in 1994 were not really our definite aim. When Lillehammer decided to apply to host the 1994 Olympic Winter Games, it was first and foremost as a way of achieving important regional and municipal objectives.

The objectives, citing the Norwegian Government, were:

The growth and development of the Eastern Region [of Norway] to the end of the century.

This is the background on which the "Green Winter Games" have to be evaluated. These goals were primarily mainstream; growth in industry and tourism, new infrastructure, new and modern sports venues and international marketing. These main goals were achieved, and Skrefsrud could state that "for Lillehammer and the region the Olympic Winter Games were really a great success".

As a supplement to these main aims there was the environmental focus, or what Skrefsrud called the "Greening of the Games". The potential was great and the results satisfying:

When Lillehammer started the planning of the 17th Olympic Winter Games the Olympics had a rather poor reputation in environmental matters. To a large extent the environmental work in connection with the Lillehammer Games was obliged to concentrate on reversing this trend. ...

We learned that planning, research and intelligent development can make the games more environmental friendly, [and] that a great international event like the Olympics can be a splendid showcase for the scientific and commercial achievements made possible by environmentally friendly planning and organisation.

An important part of the environmental focus was the post-Games use of buildings and sport facilities. As Ketil Kiran stated there have been problems for some buildings. Two examples of successful after-use could

however be presented. Firstly, the conversion of the Olympic International Radio and Television Centre into Lillehammer College, made possible by a design giving maximum flexibility. Secondly, the bobsleigh and luge track at Hunderfossen. This track was regarded as a "bitter pill" that came with the appointment as Olympic Winter City for 1994. At that time Norway had no athletes practising bobsleigh and the budget of the track was 200 mill. NOK, which was equivalent to the combined cost of the ski jump and cross country and biathlon venues - the national sports in Norway! Due to creative engineering however, the horror-vision of the track having to be demolished because of outrageous maintenance costs and no interest from tourists, never came true. To date (1999) the "wheel bob" has carried 50.000 summer tourists.

NEW CHALLENGES

In his lecture "The organisation of sports: From Experience of Nature to Environmental problems", Architect Atle Røvig formulated a rather fundamental criticism of the development of the Games over the last decades. Increasing specialisation and everlasting changes in rules and standards necessitates continuous rebuilding of arenas, an activity that has great impact on the environment:

More beautiful (but vulnerable) natural sites of great ecological importance will be used for arenas, tracks, services and infrastructure. More natural resources will be spent on building, reconstruction and maintenance of arenas and tracks, and the pollution from technical equipment used in these processes will increase. Buildings and other constructions of architectural and historical importance will be destroyed.

A radically different, more environmentally sound approach was suggested:

Compared with summer sports one will find a stunning difference. Important summer activities like athletics, football and tennis, still take place in arenas formed by rules and standards unchanged in this century. Each time increased training makes it possible for athletes to throw a javelin more than one hundred metres, a successful throw might result in injured spectators. But instead of demanding new, larger arenas, one always decides to change the javelin. As a consequence, improvements in arenas have mainly been limited to services.

Ian McKenzie, Architect, Scottish Sport Council and Member of the UIA Sports and Leisure Program, was thinking along the same path when, in addition to environmentally sound design and management, he emphasised the importance of planning with regard to demand. How to build is of course important in an environmental perspective. Before that however, come the even more important considerations about *what* and *where* to build, and for which disciplines?

SportScotland uses a computer based Facilities Planning Model to determine if there is a need for a facility and, if there is, what scale it should be.

Another aspect is physical and urban planning. Marianne B. Natvig, Architect, Member of UIA Sports and Leisure

Programme and Head of Urban Planning Section in Lillehammer Municipality, argued that to make sport facilities more sustainable, they have to be an integral part of the general master plan of the city:

This also enables us to accomplish Local Agenda 21 as part of our planning. Sports facilities, because of their dimension, influence both the social, the cultural and built environments as well as the natural surroundings - in the same way as other facilities. Because of the need for space and transportation they can influence the existing structure and environment in negative ways.

It is not only each sports building or transport arrangement that we must think of. To see such events within their full, regional development perspective, is a genuinely sustainable way of thinking.

The question of sustainability though, goes beyond the design and planning of technical requirements. According to Chris Butters, it also includes our way of living, and implicitly which sports we are practising and how:

There is no ultimate definition of "sustainable development", but wide agreement on the general direction it implies: a big shift towards both lifestyles and technical systems which are more intelligent, softer (on the environment), life-cycle based and far more resource effective.

Howard Liddell from Gaia Architects in Scotland equally argues that sustainability of the built environment can not be reached if it is regarded as an isolated matter:

The most appropriate analogy for the procurement of sustainable development is that of a 3-Legged Stool. If any of the three legs is missing the whole thing falls over. The often quoted tripos of economy, society and environment is not new, it equates to the Work, Folk and Place categories assigned to development in the 19th century by the Scottish philosopher, marine biologist and town planner, Patrick Geddes.

Butters and Liddell expand on these views in the papers which are included in this newsletter in complete form.

THE FUTURE

Geraint John, Director of the UIA Sports and Leisure Work Program stated that:

The International Olympic Committee has made Environment its third priority, added to Sports and Culture.

This is promising for the future. But maybe one could be even more ambitious. At Lillehammer the Olympic Games were regarded a way of achieving important regional and municipal objectives. What if these objectives were primarily environmental ones?

Wojciech Zablocki, Architect, Professor at Lodz University in Poland and member of UIA Sports and Leisure Programme, presented such a project.

Our Olympic plan, called "Warsaw 2012", intends to make from the wild river [Wisla], a backbone of the city...

In designing Lillehammer 1994 the whole landscape had to be considered; from the ski arenas (at top), through the town, down to the Mjøsa lake.





This backbone is conceived like a recreation and sport landscape-park, preserving and exposing the best species of wild plants as part of [an] ecological corridor.

If this can be combined with a sober look at the criteria for setting requirements and standards, ambitions for the number of spectators (expensive added stadium seats are not very sustainable in an age of televised events - airlight energy consumption - pollution - economic consequences for after use), in addition to environmental design and management, then the Olympics can become a far more sustainable event.

Sustainable sports and leisure: health, equity and technology

Chris Butters

Director, UIA Work Program "The Road from Rio"

SUSTAINABILITY IN SPORTS AND LEISURE

Since this conference is organised primarily by architects, a main focus is naturally on planning and design issues; but, as Enrico Carbone notes, there are three central aspects which need to be highlighted: the organisation, the service, and the physical facilities themselves. And it is the integration of these three in a healthy, sustainable, environmentally sound way, which is the goal.

It is important to remember all three, because sustainability is as much a question of processes as it is one of technical products. The way sports facilities are organised and run is as important in ecological terms as the buildings themselves; just as the technical specifications for sports have a lot to say for their environmental impacts, as well as for their usefulness as healthy activities for a worldwide public.

I wish to stress also the "Leisure" aspect. In the broad sense, Sports and Leisure includes facilities for tourism, activities in the wild, golf courses and recreation parks. Atle Røvig notes the potential contradictions in this, where nature becomes commercialised and "developed" to a degree which contradicts its very purpose. For example, parks and golf courses are seen as "green spaces", islands of nature in an urban world, whereas in fact the greenery is sometimes supplied by more chemical fertiliser, pesticide and other manipulation of ecosystems than the average industrial farm.

An intention of this conference is to work towards guidelines for sustainable sports and leisure facilities. I would like to propose three brief points in this regard.

HEALTH

A central purpose of sports and leisure activity is health – healthy mind through healthy body. This is the sustainability or health of humanity itself, no less. It is not only that sports facilities may mean violent manipulation

CHALLENGES AND INSPIRATION

The Road from Rio welcomes proposals for similar cooperation from other UIA Work Programs in the future, so that sustainability can become a natural focus of all our activities. This conference assembled over 70 experts from 12 countries. Important lessons were learned from Lillehammer. It was also clear that more examples of sustainable sports and leisure facilities need to be collected. In follow up from our conference, a project in this direction has now been initiated under the leadership of Marianne Natvig and is under way. Concrete results!

The conference recognised that there are hard questions which will need to be asked in the future. Sports and leisure activities are determined both by commercial interests, and by sports lovers. However, they must be encouraged to see the broader perspective and, as in other sectors, to "green" their activities. There are many ways to do this, and examples given at the conference are a source of inspiration. At the same time, it is encouraging that sporting organisations are already giving a high priority to sustainability issues.

of the natural environment, but equally that some sports lead to violent manipulation of the human ecosystem – our bodies. I wish to put forward the idea that we need to consider what types of sport might be given lower priority due to their inherent characteristics of causing long term bodily damage. It is not my point to stress how sport at the elite level may lead to unhealthy overdevelopment of muscles or even drugs, but to stress the general healthiness of different sports as they affect the masses of people who play them at the popular level.

EQUITY

Secondly, we should consider the extent to which different sports provide opportunities to a broad population, including the poor. This is because equity is a fundamental component of sustainable development. In other words, sports which by their nature are very exclusive or dependent on very sophisticated equipment, should be given a lower priority than sports which can easily be enjoyed by people everywhere. Power boat racing or skydiving are perhaps examples of the first kind, whereas a humble football can be kicked around in a huge stadium or equally (well, nearly) in a dusty slum. The first two also have the serious environmental drawback of requiring large amounts of polluting fossil fuel: that is, the "ecological footprint" of these activities is very large. This proposal may be controversial, but in a world of inequality and limited resources we must have the courage to confront this kind of choice sooner or later.

TECHNICAL REQUIREMENTS

Thirdly, we must develop technical specifications for sports facilities which give reduced impacts on environment. If international standardisation means that every bob track in the world must have, say, a forty metre straight at an incline of 20 degrees followed by a 60 degree right hand bend ...etc...etc – then what this means is blasting and bombing natural landscapes into shape and building up huge concrete or other structures.

One of the problems of course is the reduced flexibility that comes with standardisation – the landscape has to be adapted to the standards! Those who plan sports standards, must therefore be urged to select solutions which reduce the load on environment, both as regards specification, design and running of facilities.

THE GLOBAL CHALLENGE AND POTENTIAL

I wish to highlight the trend towards sustainability in planning and architecture, the reasons behind it and the way the global issues relate to our work as architects: this is so that we can place our work firmly within the broader framework of the ecological and social context of sustainability. Secondly I wish to outline the most important aspects of environmentally sound design and planning, as an introduction to the detailed case studies presented at this conference. In particular the workshop arranged by Howard Liddell and I presents examples of ecological architecture including some very innovative sports buildings which he has completed recently.

There is no final definition of "sustainable development", but wide agreement on the general direction it implies - a big shift towards both lifestyles and technical systems which are more intelligent, softer (on the environment), life-cycle based, and far more resource effective.

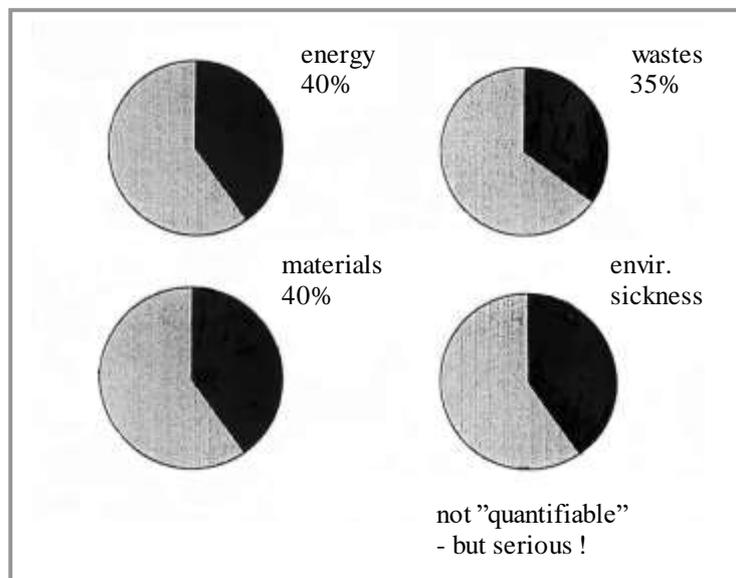
Our world is both finite, and a closed system, except for the "thermodynamic window" of solar energy. Our economies are not organised according to the basic rules of that system. They are thus both unsustainable and extremely wasteful. There are other ways to organise economics, however. Today we have many technological possibilities – I would say that technology is much less of a problem than the fact that our economic rules are seriously wrong; they favourise use of fossil and finite resources, they favourise capital and technology over human skills, and they penalise good behaviour such as energy saving and long-term community values.

The best research of recent years has shown the enormous potential for more effective resource use. This is not a question of becoming 15 or 20 per cent more efficient, but of three or four times more efficient.

It has been shown conclusively that the poorer countries will never be able to achieve a western level of resource use – we would need about ten planets, as Gandhi observed intuitively all of fifty years ago. However, if we could reduce our own resource consumption by a factor of about four, then there would indeed be enough for the developing countries to get up to a level the same as ours. This means that we would meet somewhere about the level of one kilowatt per capita.

ASPECTS OF ECOLOGICAL DESIGN

These aspects are classified in several different ways, one of which is the fivefold division into 1 - energy, 2 - material resources, 3 - indoor environment, 4 - water and waste systems and 5 - outdoor environment which includes land use, biodiversity, vegetation and so on. The case of energy is a particularly important example of the new thinking. Energy is always a prime factor in resource politics; most of the world's environmental problems are related to energy use too. Our so-called developed countries (I say so-called because in my view we are in a clear phase of overdevelopment) consume 4-5 kilowatts per capita, whereas the poor countries consume typically one-tenth as much – a few hundred watts per capita.



The 40% sector - Our sector – buildings – is responsible for over 40% of total energy use in typical industrialised countries, 40% of the total materials flows and wastes, and a large amount of indoor health problems.

The building sector, we now know, is responsible for about forty per cent of the energy consumption in industrial societies; as well as about forty per cent of the materials and of the wastes. Maybe forty percent of illnesses related to pollution too - that would be controversial but certainly our buildings, especially the modern ones, are responsible for many health problems.

Those figures mean, however, that we planners and designers are responsible for a very big part of the global problem. It is a larger share of the problem than the industrial sector, or the transport sector (typically about 30% and 20% respectively) and this is a fact which has only been realised recently. Most research is still focused on technical fixes for transports, commerce and industrial production. We need far more attention to design! Climatically well adapted buildings using natural energy, don't need much climatisation. The point is that with good, wholistic design solutions a lot of the technology becomes unnecessary.

CONCLUDING REMARKS

There are already several documents which spell out general environmental guidelines for sports and leisure facilities, at least as they apply to the Olympic and European organisations. Our main task is to contribute to making these more concrete and getting them applied in practice. "Think globally, act locally" is still the valid axiom of sustainability - but "think globally, act verbally" certainly isn't – what we need is not more talk but more action.

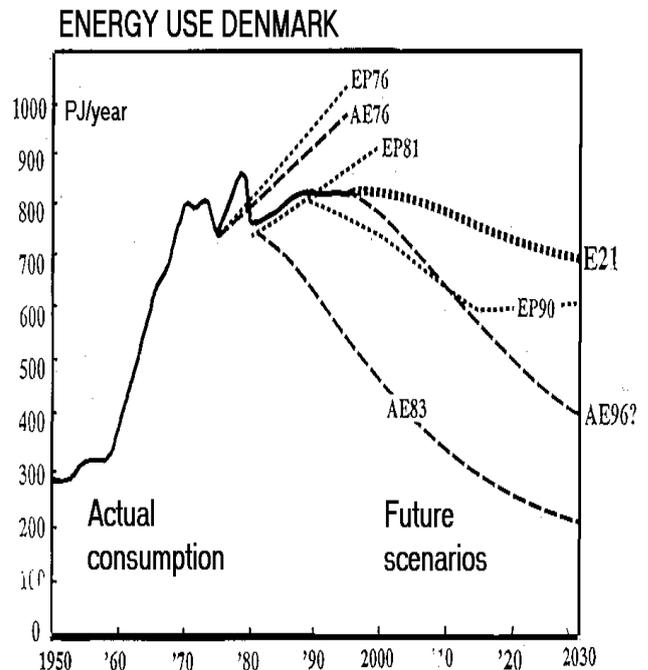
Ecological building is growing in importance, as most of the keynote addresses at the recent World Congress of architects in Peking bore witness to. And it should become our major focus, the guiding line in all design, in the new millennium. We are entering a time when global awareness, as well as life-cycle economics, are really taking effect. Public bodies, property developers and major investment companies are increasingly open to long-term solutions which provide real environmental quality. As one of Norway's big company directors said at

a recent conference in Oslo, there are increasing possibilities of "business and ethics in happy union".

Of course we need to be watchful when such ideas enter mainstream thinking. The qualitative, deeper values may get obscured. But in general, it is a very positive time. And few areas seem to be more appropriate for sustainable thinking than that of sports and leisure facilities, for their goal reflects the fundamental triad handed down to us and valid to this day from the first ecologists such as the sociologist Le Play and the biologist and town planner Patrick Geddes: the triad of organism, function and environment. Healthy people, functioning healthily, in a healthy world.

THE SHAPE OF SUSTAINABILITY

Traditional "growth" curves must give way to scenarios showing more effective resource use – in this case energy projections for Denmark. The curves go down – leading to same quality of life with only one-third the amount of resources, energy, wastes and pollution. This includes sustainable buildings. Only in this way can rich countries leave enough for the rest of the world.



Sustainability and Design of Sports Buildings

Howard Liddell,
Gaia Architects, Scotland

INTRODUCTION



Ecological Design is often seen as a style and as a nostalgic one at that. It is, however, an approach to construction, which can express itself in any style which is not unnecessarily profligate of resources. This paper is based on twenty years of experience in seeking to procure sports buildings for communities, that can be sustained by the local and global environment, whilst also

trying to support and enhance human health in all its forms. The first section deals with a holistic approach essential to the process of engendering community ownership of sports activities, and which will have long term physical, economic and environmental viability.

SUSTAINABILITY AND SPORTS BUILDINGS

The most appropriate analogy for sustainable development is that of a 3-Legged Stool. If any of the three legs is missing the whole thing falls over. The often quoted tripos of economy, society and environment is not new; it equates to the Work, Folk and Place categories assigned to development in the 19th century by the Scottish philosopher, marine biologist and town planner, Patrick Geddes. These are useful focal points in seeking to establish principles for balanced development and are used in this paper to explain the focus of approach on a range of Case Study projects of our experience.

In the selected projects the methodology was similar in nature. Whilst in each case it was essential to deal with all three aspects of Work, Folk and Place (economy, community and environment), I have selected case

studies which emphasise one of these aspects more than the others, but against a backdrop of all three.

CASE STUDIES 1 - WORK (ECONOMY)

In 1980 the small community of Aberfeldy in the centre of Scotland decided that after years of unsuccessfully asking its local authority to provide a swimming pool, it would take matters into its own hands and look for its own funders. Over a period of three years, a group of local people raised all the necessary capital to build a £1million centre. But in the course of doing this they had to reassure funders that this would be a viable centre.

This meant they had to show that the pool would not incur large losses. To do this it was necessary to three main things:-

- (1) develop a wider range of facilities instead of just swimming in order to offset the losses which a wet centre on its own would incur
- (2) make sure that the scale of provision for each activity was optimised to the scale the community could support.
- (3) design a building which would achieve efficiencies in running cost's - primarily the staffing through high visibility and energy - through efficient plan form and high levels of insulation. By commissioning a detailed study which established the case for a building optimised in revenue terms, capital funders were reassured that they were not putting money into a "white elephant". The project was completed in 1984 and the significance of the revenue aspects, over the capital, was reinforced when the community owners had cause to have the building valued. At a £1million build cost its market value was found to be only £50,000, on the basis that there is a very limited market for taking over a building which requires a constant annual subsidy.

So sports buildings are generally negative equity and are

all about revenue rather than capital. Perhaps the nearest equivalent is the motor car. It needs constant revenue inputs and is worth less than its purchase price from the moment you buy it. It is nevertheless regarded as a modern essential. The question is then how the community and the environment best cope with it.

In another project a very good deal on electricity tariffs was taken up by a client, with the apparent benefit of lower installation costs. The plant room was built accordingly. However, even before the project was completed, the electricity industry in Britain was privatised and the tariffs were negated within 3 years. The client is now converting the building to an alternative fuel only 5 years after completion. It is also at considerably greater expense than would have been the case had it been part of the original contract.

CASE STUDIES 2 - FOLK (COMMUNITY)

Many communities visited the Aberfeldy project in the course of looking to establish their own facilities and a group in Ullapool asked Gaia to help them make the case for a local swimming pool and to assist in the fund raising and then the design and construction. Just as the Aberfeldy project was a mould breaker on the capital funding side, the Ullapool project was innovative in its community involvement aspects. The Prospectus, which became the basis for the capital fund-raising effort, was produced through a whole series of very well attended community workshops. The first workshop was based on a Chinese menu of activities, each of which was given a capital and a revenue score. Groups were asked to put together a total project comprising a number of activities - some profitable some requiring subsidy.

Once a proposal was assembled it was put through a portable computer and a total capital and revenue model printed out. The groups could then go back and re-jig the figures to get a more satisfactory value for money. This workshop was followed by a further one on the design, then a final one on the management aspects. The most significant thing about the emphasis on involvement during the process was the extent to which it became a catalyst in building support for the project. The community took ownership of it and mounted a very successful fund-raising campaign (£150,000 for a catchment area of about 2,500 people over a 3 year period).

Since this experience we have never underestimated the importance of the process in the course of project procurement. For their part SportScotland has also understood the impact of such an approach on communities beyond just Sports Provision, and a recent project in Kinlochleven - the injection of £350,000 as 50% of the cost of a Community and Sports facility - has had an enormous impact on the morale of a small highland rural area, where the closing of an aluminium smelter imposed a huge unemployment burden, where such a sum is huge - far beyond the mere provision of Sport.

CASE STUDIES 3 - PLACE (ENVIRONMENT)

As well as the appropriateness of the scale and the range of facilities in matching a community's needs, there is also the appropriateness of the location and its impact on both the local and the global environment. It is quite common for example, in our experience, for communities to resist the placing of their facilities adjacent to the local school. This carries old baggage and is seen as something they have left behind and moved on from.

Once we have persuaded groups to accept the financial sense of locating close to schools - who are a good user of down time hours - then we have to seek to clothe this in an acceptable manner by having a separate entrance and a separate identity.

In the case of Drumchapel - a peripheral community west of Glasgow - the environmental aspects of the project were originally very extensive. It was a Sports Centre in the middle of a 27 hectare park which was to be developed as an environmental interpretation centre and where the building was to be the very apotheosis of environmental design. It has taken many years to obtain funding - and in the meantime many of the original objectives have been achieved on other initiatives. However there are still two of the main technically innovative aspects in place, and it was a mould breaking demonstration project as a clear example of the 4 elements of ecological design - Earth, Air, Fire and Water. The following is a description of the design approach under each heading:-

Earth

The landscape context of the project was also in zones and themed under Earth (trees, vegetation and soil and natural, eco-labelled materials); Air - (windmills, wind harps, wind barriers, shelter belts), Fire - (solar power, barbecue points, red planting and conservation of energy approach); Water - (use of on site collection, stream features, micro hydro plant, alongside traditional water mill, with a reed bed treatment system for greywater, plus a water conservation policy). Within the building itself, the use of the site's primary materials of earth and wood became the starting point of the design. The earth walls and the roundpole roof structure, whilst not taken forward on this project have been used on others to great effect and indeed are the subject of European funded Research.

Air

The design of the building within the landscape was one which took account of the prevailing winds and the airflows across the site as well as the most appropriate positioning for access and proximity to the town centre. The building also sought to act as a shelter for the outdoor pitches - which themselves were orientated for minimum solar intrusion. However, the most significant aspect of the air element lies in its linkage with the fire element, in the use of dynamic insulation - or pore ventilation. This was pioneered in design terms for the UK in this project - albeit that it will now be the second example, the first being in Callander (described below). The strategy for the air flows through the building is also combined with the Earth (materials) principle in the specification of low emission finishes and in key areas the use of hygroscopic materials, to assist the maintenance of optimum levels of relative humidity.

Fire

The first principle of the fire element is to avoid its use where possible through conservation and the avoidance of the need for resource depleting fuels. Where possible this will be through passive rather than technological means. Beyond this it is nearly always necessary to input at least some fuel. But this is on the basis of as much recovery as possible.

Water

Even dry centres have a significant water load - both hot and cold - to deal with. With the advent of legionella this

has led to a tendency to move away from storing large volumes of hot water and towards more instantaneous heating. However this carries with it enormous penalties in terms of very high but short term loads with resultant punitive tariffs because of peak loading factors. The politics of water are world wide but have been highlighted in the UK over the past few years with privatisation and the resultant higher costs of water. The other major area of usage is in the sewage cycle and conservation, separated systems and dry systems are being investigated far more seriously than was previously the case .

MCLAREN COMMUNITY LEISURE CENTRE, CALLANDER, SCOTLAND

All four elements in one: Healthy Buildings for Healthy Pursuits. The Dynamic Insulation/ Pore Ventilation techniques of Drumchapel were further developed on a swimming pool project near Glasgow, which has also only recently gained its full funding. In the meantime a project opportunity emerged at Callander in central Scotland for the development of both wet and dry side use of dynamic insulation, and the client was agreeable to this. It was initiated in 1996 and completed in 1998. Since then it has been monitored, and the early results are showing that the system is working according to its design principles.

What is perhaps most interesting, in what appears to be a very specific technical approach, is in the fact that it is not seeking merely to resolve a single problem - but many at once. In doing this the building touches on all four of the elements described above

- earth in the importance of the materials specification,
- air in terms of the cleanness of the ventilation intake ,
- fire in the saving of energy in both conduction and convection and
- water in terms of the creative use of moisture mass and the mitigation of the harmful effects of moisture.

SUSTAINABLE DEVELOPMENT MODEL

In each of the case studies, the community priorities were identified and then matching resources were sought to meet the identified local aspirations.

Agencies would inevitably seek reassurance of the long term viability of any project in which they were being asked to invest. This is the point at which the kind of criteria evolved under Agenda 21 come into play. By having a strategy which meets the concerns of Agenda 21, projects almost inevitably score amongst potential funders as having been looked at in a balanced and holistic manner.

To this end Gaia have developed a working Model - based on experience of the case studies and of other non-sports projects (see diagram). This describes the process of procurement through to implementation, but significantly it also suggests the establishment of audit mechanisms using locally determined indicators in order to complete the loop of inception to feedback and through to inception again. The model can not be described here, but it is proving to be a most useful tool for

sustainable and process-oriented planning and design.

CONCLUSION: THE CYCLIC APPROACH TO BUILDING

The sustainability of development is a much talked about yet still little understood process. This paper has sought to give some concrete examples of how it can actually be delivered on site.

"Dynamic ventilation" at McLaren



The four main areas of activity in the McLaren Centre at Callander – the sports hall the squash courts, the bowling hall and the swimming pool – will all be dynamic insulation areas where the air will be drawn through the ceiling and taken out at low level. This not only reduces the heat loss in the insulation itself it also draws down the "hot air cushion" that normally sits just under the ceiling. Reducing this stratification saves a lot of energy.



The UIA WP The Road from Rio wishes to express thanks for funding received from the Norwegian Ministries of Foreign Affairs, Environment, and Regional Affairs, as well as the support of the National Association of Norwegian Architects.

Next issue

The forthcoming newsletter will focus on urban ecology, highlighting both projects and processes. Suggestions for the newsletter are welcomed. Publication date: April 2001.

Editor: architect Stein Stoknes

The Road from Rio

secretariat: WP Director, architect DPLG MNAL Chris Butters, NABU
Norwegian Architects for Sustainable Development
Josefinesgt. 34, 0351 Oslo, Norway
tel (47)23332554 fax (47)23332550 email chris.butters @mnal.no