

Is there such a thing as an 'eco-city'?

From ecocity to sustainable habitat

Chris Butters

Although most of the world is living in cities, it still makes limited sense to talk about "sustainable cities". We need to be more precise with our definitions, and the often unstated paradigms underlying them. The simple reason is system boundaries; an urban unit, defined by its city limits, cannot be sustainable, in ecological, economic or community terms. Many of the blueprints advanced for ecocities in recent years, from Arcosanti to Dong Tan in China to the dreams of Gulf States, such as Masdar, only tick a few of the boxes required to achieve sustainability in the full (and only meaningful) sense of the term.

Ecology: huge efforts of geoengineering in deserts may be possible given extreme sweat capital (Arcosanti) or billions of oil dollars (Masdar), providing a high degree of ecological self sufficiency including water, renewable energy, food, and even biological diversity; but only at a cost that can never be relevant for any significant number of people or countries. And when the oil money, or the sweat capital, runs out? Human settlements have with reason always been connected to natural resources, soil, and water. To recall the words of Artur Glikson: "The only basis of planning is the ecological basis".

Economy: cities survive and evolve thanks to functional and economic diversity. Masdar could possibly survive for a while as a financial, touristic or hi-tech hub – but what else? There is little economic basis for a new city in a desert. Even virtual

activities such as finance require people, hence inputs and outputs of matter and energy. No wonder that cities have been sited close to seas, rivers and crossroads. And being such high end projects, Masdar and other ambitious Gulf ecocities are already scaling back, if not dying on the drawing board, due to global – not local – economic downturn. There aren't enough jet-setters to buy islands shaped like countries or financiers to open new stock exchanges. The keys to economic sustainability are diversity and resilience.

Community: this is the aspect that seems most absent in the Middle East visions, with no natural local community. Those ecocities must be populated from scratch – presumably by a rich class plus a labour class imported from other Asian countries! It is indeed, theoretically possible to create new community from nothing. But we know how difficult that is.

What these visions lack is a holistic view; of human and natural habitat understood as an indivisible whole. No isolated community can be self sufficient, but on the level of a region or microregion a large degree of sustainability can be attained. Some goods and services, such as information, are independent of geography and distance, but sustainability does imply maximum local self sufficiency in food, energy and most basic goods. Not only to reduce transport, but equally for economic, social and management reasons. This does not imply isolationism; there is ample room for a degree of specialization in cities and communities – as in natural habitats.

Pioneering ideas in a sustainable direction were Ebenezer Howard's Garden Cities, and Lewis Mumford's regional or watershed planning (such as the TVA); genuinely holistic spatial concepts that thoughtfully embraced ecology, economy and community. Or to use the terms of Patrick Geddes: Place, Work and Folk. Unhappily, the modernist approach as in the New Towns was the opposite, with specialized spatial zoning; whereas one of the absolute keywords that has emerged for sustainable settlements is mixed use.

Some useful part-solutions

There are very interesting recent projects that point the way. Most are at the level of

urban neighbourhoods. In Europe these include Vauban in Freiburg, Sudstadt in Tuebingen, Culemborg in Holland, Malmo in Sweden, Kronsberg in Hannover (and, rather feebly, Millennium Village in London). As well as the unique regeneration of the Fairfield area in Perth, for which my colleagues in GAIA Scotland won a World Habitat Award.

All of these are characterised by attention to the whole, ecology, economy and community. As well as good degrees of citizen participation for, as stated in Agenda 21, there is no sustainability without user involvement. Solutions are integrated, with a strong focus on people, not a one sided preoccupation with ecotechnology as "the saviour". Most of these to date are at a scale of several thousand people. Vauban is my favourite; a diverse, ecological, low rise green neighbourhood, socially vibrant, with 15 years experience.

Another very positive vision is the ecovillages movement. This is now worldwide; some of these are very ideological and most are rural, but others are urban and comprise pretty "normal" people with a modern lifestyle. They have renewable energy, quite a lot of organic food production, local workplaces and a strong sense of community; and a generally far lower level of consumption. They give very significant results. Ecocommunities such as Hjortshoj in Denmark (illustrated here) as well as Findhorn in Scotland have been shown to have an ecological footprint that is only about one third of the national average! This despite having all modern facilities. They are thus a real pointer to a sustainable future. But these too are at a small scale.

What about the big picture?

In addition to these good examples, organizations such as ICLEI and Transition Towns are taking useful steps. But our major sustainability challenge by far is not green neighbourhoods; it is to fundamentally restructure thousands of existing cities. Will we ever be able to do this – let alone at the rate that the climate agenda may require? Unlikely without dictators or ecofascist governments? One of the biggest obstacles to urban sustainability is the car. This is not just about fuel use but to enable compact cities



"Most American cities are planned on the basis of cheap gasoline forever"

Clark Bullar

without vast areas given over to traffic, with liveable, child friendly streets and healthy, noise free spaces. Only very few cities (Freiburg, Stockholm, Hasselt) have succeeded in reversing the trend and reducing car traffic. In Vauban it is not that people own fewer cars; it is that they use them much less, thanks to excellent pedestrian facilities and public transport and the proximity of the workplaces and shops.

Sustainability is also about choosing the *appropriate* scale for solutions. For example, urban planning has not been integrated with energy planning. Renewables-based district heating (or cooling) makes more sense than trying to make each building self sufficient in energy. The same applies to ecological waste water management. This again is about seeing system and subsystem boundaries in a holistic way.

The primary scale of action must be regional, roughly speaking, to include cities and their hinterland. As well as synergies with neighbouring cities. This applies not only to the ecotechnology, but equally to economic resilience and to community. An example – fairly unique I think – is the Master Plan for an Ecocity we in GAIA International developed in Taiwan. Though as suggested above, I would prefer to avoid the spatially limiting word "city" and use the term "sustainable habitat".

Perhaps sustainability is too much by city people, for city people? The rural world is still our basis for food, water and energy as well as natural resources, biodiversity, waste treatment, fresh air, and recreation. Sustainable development can offer new life and economic opportunities to the rural world. Partly because all these activities connected to resource flows – in particular energy, water, wastes and materials flows – are becoming increasingly important, and hence revalorized economically.

In 2004-2007 GAIA International was commissioned to develop a master plan for a new Ecocity in southern Taiwan. The proposals give a new dimension to the idea of sustainable cities, being perhaps the first concept for integration of a city and its rural surroundings. This offers fascinating synergy effects. It also addresses the rural poor – the source of migration to city slums. Synergy between rural and urban



subsystems includes design of compact mixed space, sustainable water and waste cycles, biodiversity, food production and renewable energy.

We redefined the boundaries for the new city, broadening the whole project so as to include the surrounding areas. In this way many of the resource flows could be both optimised and integrated – think large scale permaculture. The approach is first of all passive: the layout is based on bioclimatic principles. High priority is placed on energy efficiency, reduced traffic, water recycling features and green corridors. These passive design strategies address the demand side first, reducing resource needs, before the stage of selecting supply side technologies.

For example green corridors reaching into the city are not only for recreational or aesthetic reasons but fulfil specific microclimatic functions. Similarly, the orientation and geometry of streets and buildings is not aesthetic design but relates to solar orientation, shade, local wind directions and the need (in that hot climate) for an urban ventilation strategy – thus providing an improved microclimate and reducing energy needs. In this way climate and ecology take their rightful place as key generators of urban form.

The city is zoned into four mixed use areas of different character and density in order to integrate workplaces as well as to illustrate that there is no single answer regarding sustainable typologies, which here range from dense urban blocks to low density garden suburbs, and rural villages.

The energy dimension is important. Tainan county comprises intensively farmed land plus large areas of less productive land devoted to a struggling sugar cane industry. These latter are ideal for growing biofuels since this will hardly

ABOVE: Ecocity Tainan:
Integration of city and countryside:
Master Plan project by GAIA International including Joachim Eble, Dr Varis Bokalders and Chris Butters, with EDS Design Services, Archlife Foundation and Tainan County government.

LEFT: Vauban, Germany

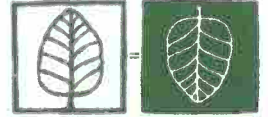
Courtesy: Chris Butters

displace food production. They could quite literally become the city's petrol station. With solar, wind energy and biofuels, as well as waste recycling, farmers can also obtain vital new sources of income. Our conceptual models for Ecocity Tainan build not least on the pioneering ideas of Scotland's famous biologist and planner Patrick Geddes, whose holistic planning predated today's mantra of Ecology-Economy-Community by 100 years.

The master plan was developed in workshops and multidisciplinary design sessions. It was developed further in cooperation with Joachim Eble's office in Tübingen, Germany. True to the Asian Tiger spirit, the city has been taking shape at breakneck speed. Many of our proposals are being implemented, others not.

The Tainan concept, even if only partly implemented, puts discussion about compact cities in a broader perspective. Above all it offers a vision where the countryside – neglected and often dying – regains status as an essential part of human settlements. The GAIA International Master Plan thus underscores the positive synergies that can be achieved only through urban-rural integration – suggesting a broader approach to sustainable human habitat.

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Are cities green?

