

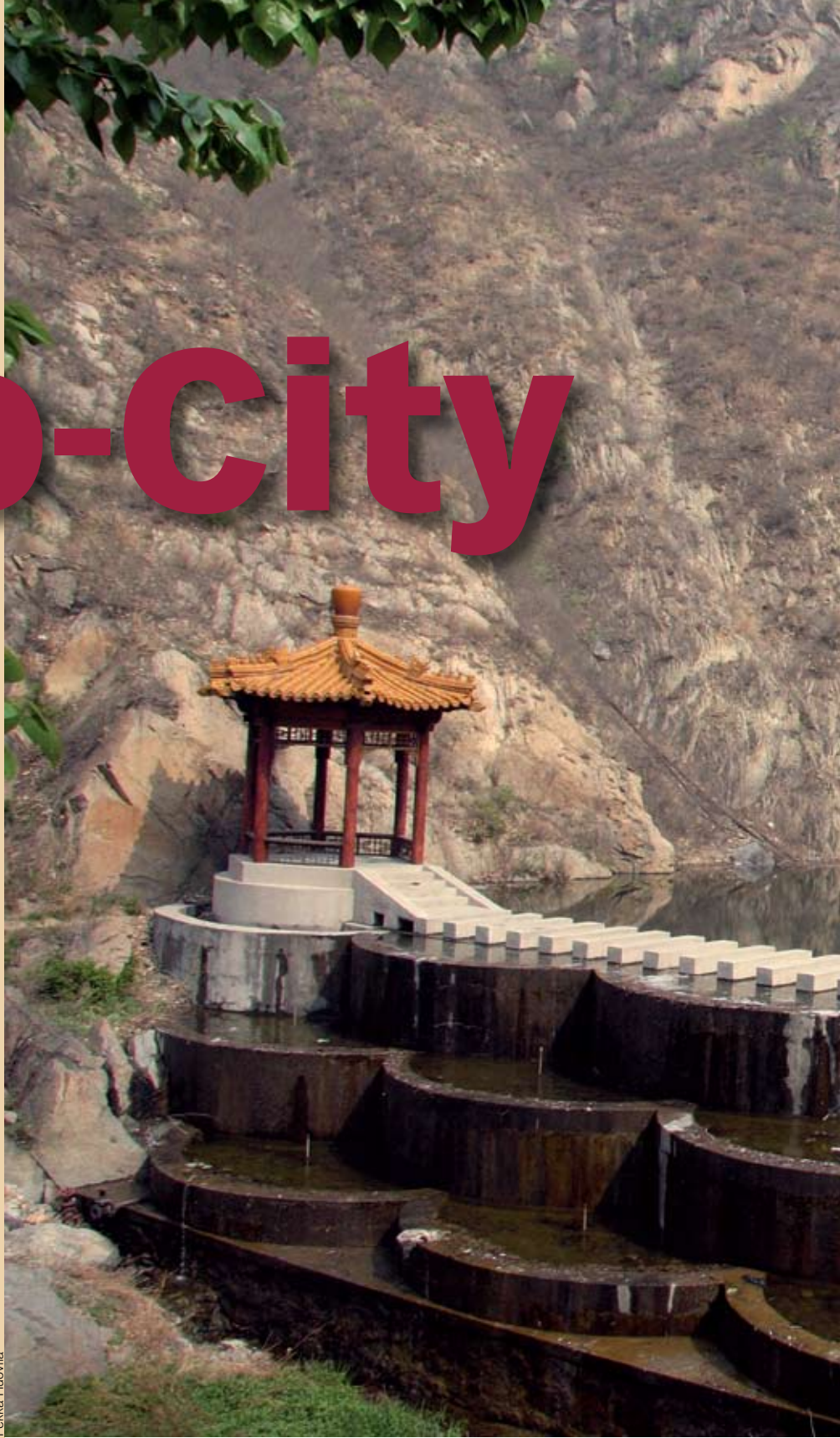
From Finland to China

Eco-City

“The first real eco-city will not change the world, but it will provide a seed of change. This is why we need one eco-city that is radically different from existing ones. It would demonstrate that environmental problems can be solved with the help of modern technology,” says Professor Eero Paloheimo.

Lauri Kinnunen

Peikka Huovila



Professor **Eero Paloheimo** originally proposed the idea of establishing an eco-city in China in his book entitled *The Way Towards a New Europe*.

Currently, VTT Technical Research Centre of Finland is drawing up a feasibility study on planning and building an eco-city for the Mentougou District of Beijing. Professor Paloheimo is member of the project's advisory board.

Today, the world is undergoing an

environmental crisis, which manifests itself in various ways. Natural resources are being exhausted, excessive amounts of greenhouse gases are being released into the atmosphere, the climate is warming, oceans are being polluted and there is less and less virgin land available.

“The core of the problem is that the industrialised world is constrained by interests that are too short-sighted and the rigidity of the existing infrastructure,” Paloheimo stresses.



The Mentougou District is historically significant and has abundant tourism resources. This water reservoir is located at a height of 800 metres. The most common local products are pear, persimmon, big cherry, and walnut.

“This includes both technical and administrative structures. For example, for decades the structure of our towns and cities and the nature of city plans have

been shaped by the passenger car.”

“Those fortresses must be torn down, in order to save the earth from an environmental catastrophe, the underlying cause of which is these incorrect structures.”

First real eco-city

There already are a number of cities which have been called “eco-cities”, according to

Paloheimo.

The buildings may differ from traditional designs, they may have more parks than other cities and they may be more pleasant than other cities. These represent an aesthete’s idea of an eco-city, but they are not eco-cities.

“A few of these may have some elements of an eco-city, and they are good steps in the right direction, but we need one eco-





city that is radically different from existing ones. No such city has yet been built anywhere,” Paloheimo says.

“Although the first radical eco-city will not change the world, it will provide a seed of change,” he emphasises.

“Construction of a prototype eco-city will be more expensive than an ordinary city. But it provides significant advantages, for instance, the builder will learn what improvements the prototype needs, and he will be ahead of others.”

“By taking radical action China could still avoid the worst environmental problems that already affect all countries in Europe. The country could—at least partly—jump over the industrial stage, which has proven itself to be a mistake,” Paloheimo continues.

The next few decades could see the construction of radical eco-cities all over the world, and China could become the

first and most important producer of eco-cities.

Two absolute indicators

Professor Paloheimo lists two important aspects which may be considered as absolute indicators of ecological integrity. Firstly, an eco-city does not pollute its surroundings. Secondly, it uses a minimum amount of all natural resources.

“These two aspects can be considered the basic features of an eco-city. They must be taken into consideration in planning and implementing food and energy production, water management, and transport systems,” Paloheimo stresses.

With the exception of cars, the residents of an eco-city use the same products as other people: refrigerators, televisions, mobile phones and bicycles. The majority

of these will be produced elsewhere and imported into the city, and any waste will be returned to the producers. That is a wider issue for national consideration.

An attractive eco-city is a mixture of pleasant ambience and absolute ecological integrity.

“Instead of being clones of each other, they would have significant differences due to the climate, terrain and local culture.”

“Some would be large, some small. But they would all share certain characteristics,” Paloheimo says.

Self-sufficient in food, water, and energy

Paloheimo gives some examples of an eco-city’s technical features.

Most of the food the residents consume will be produced in the city itself. Thus it is much less densely built-up than an ordinary city.

An eco-city generates the energy it needs with solar panels, wind generators,

“The first eco-city will pave the way for further development.”

Sakari Sohlberg



“We need a real eco-city to show that environmental problems can be solved with the help of modern technology,” say Professor Eero Paloheimo (left) and Professor Kari Larjava. They are the Finnish Members of the advisory board of the Mentougou eco-city project.

Finnish-Chinese Cooperation

VTT Technical Research Centre of Finland is drawing up a feasibility study on planning and building the Mentougou eco-city. In addition to VTT's experts, representatives of the district's administration and experts from Tsinghua and Nankai Universities will take part in the study.

According to Professor **Kari Larjava**, Vice President of VTT, the study will include creating an eco-city concept suitable for the Mentougou District, an implementation plan and a list of required technological development actions.

"One of the first tasks is to develop and apply eco-city indicators into the rating system for eco-city development. In this work we are cooperating closely with local people and Chinese professionals," Larjava describes.

"Thus, we ensure that the city can be built in such a way that this area, with its significant environmental value, can be conserved when building new houses and renovating old ones."

The results will be exploited in developing environmentally sustainable building standards in China.

Other key development themes

include energy-efficient buildings and built environments, sustainable energy production, water and waste management, infrastructure, ICT, jobs and services, resource management and restoration of damaged green environments.

Part of the current village structure

Mentougou District, located about 50 kilometres from Beijing, consists of a network of 17 villages.

The eco-city feasibility study concerns six of them, and the eco-city will be part of their structure.

"Planning, materials and structures in the renovation and infilling will conform to the principles of sustainable development," Larjava says.

The site also acts as a significant showcase to the world since the district is a popular tourist attraction in China. The eco-city was also one of the themes to be displayed during the Beijing Olympic Games.

The eco-city will be a pleasant place to live, and it will offer excellent services in a clean and natural environment. The goal is to create people-friendly

surroundings that suit all types of residents.

"Currently there are about 10,000 inhabitants in six villages. The number could be larger, but it is restricted by fresh water resources which depend on rainfall," Larjava notes.

Joint venture for construction

A Finnish-Chinese joint venture will be established for the construction of the eco-city. It will participate in the building and locally produce some of the building materials needed in the construction.

VTT has already established a spin-off company, Global EcoSolutions Oy, to implement eco-city projects. Professor **Reijo Kohonen** has been appointed as the company's Managing Director.

The business idea of Global EcoSolutions Oy is to integrate and implement sustainable technologies in housing development projects worldwide. The company will work together with its local partner companies.

geothermal heat pumps and bioenergy production—without polluting the air, water or soil.

In addition to food and energy, the third commodity needed daily is water. An eco-city will have a closed water circulation system. This means that water is not imported from outside the city, nor is wastewater transported to outside the city.

Waste management and materials recycling are seamlessly integrated with all other operations of an eco-city.

"Utilising organic waste in energy production and the fertilisation of fields is one aspect of these operations. In this way waste management, energy production and food production are mutually connected and form an integrated system," Paloheimo says.

No cars, state of the art ICT

The eco-city's design principle is to avoid wasting energy and minimise waste generation. This is particularly true for

transport and construction.

Bicycles are also allowed, while passenger cars are not. Cars will be replaced with vehicles that are electrically operated and controlled via a city-wide navigation system. They work like lifts, but move horizontally. There is no noise from traffic, which is safe and non-polluting.

This transport system makes urban planning easier in many ways.

Streets may be narrow, pleasant and winding.

The eco-city will have a modern, versatile data communications system, which enables efficient communications between different sectors and allows for less compact development in land use.

There are rentable facilities for information distribution here and there in the city, with large panels covering the walls.

The panels can be used for virtual meetings with experts around the world, finding information on the Internet, contacting hospitals or universities, trading and taking care of any number of daily matters.

"By taking radical action, China could still avoid the worst environmental problems that already affect Europe."

Paving the way

Paloheimo notes that the first eco-city will pave the way for further development.

For this reason it is evident that the city will attract a large number of residents from among those who will design the next eco-cities and later participate in their construction.

"To support this development, the first eco-city could even house an international research institute concerned with the development of ecological housing and communities in cooperation with various universities," Paloheimo describes.

Otherwise, the residents will pursue different lines of work like the residents of any other city: there would be doctors, farmers, carpenters, teachers, and so on.

An eco-city could also house a small factory for the assembly and maintenance of the special vehicles used in the city, and a maintenance centre for energy production equipment, for instance.

"It is clear that designing the first eco-city is much more than a purely technical task. This requires cooperation involving countless professions," Paloheimo concludes. □

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