

“Eco-cultural” Perspectives for Green Building Design and Built Heritage Conservation

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Introduction

The symbiosis between human settlements and landscapes reflects the harmony between man and nature. Under the impact of “modernity”, entire peoples are losing their traditional culture at an unprecedented rate. This worldwide phenomenon is particularly obvious in rural areas. Thousands of peasants give up their land and move to the cities to work as labourers. The depopulation of the countryside and the tremendous increase of the size of urban areas are threatening the ecological balance at local, regional and global levels. While sustainable development has been presented as the great hope and absolute necessity for preserving our environment and our biodiversity, two underlying issues are: What can we learn from the built heritage if we want to develop a true “green building” design? How to protect and improve this priceless built heritage which is disappearing fast before our very eyes? In China, a valuable experience argues for an innovative **eco-cultural** approach. Let’s go to the largest botanical garden of China: the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences (CAS) which is located in Menglun at the very south of Yunnan province. The design and building of its new scientific research center and the conservation issue of its unique natural and cultural environment, the native rain forest and the Dai and Hani/Akha built heritage, will help us to better understand what this new “eco-cultural” concept means in practice.

Eco-cultural vision

“**Eco-culture**” is not the same as “traditional culture”, although in many parts of the world, the cultural built heritage, as bearer of traditions, provides countless examples of cultures of living in harmony with nature. For us, “Eco-culture” is timeless; it means any form of human culture that may demonstrate a strong ability to protect nature. Eco-culture invites us to preserve its material as well as immaterial legacy — in particular its environmentally friendly built heritage — what contributes to ecosystem conservation efforts. Taking the most of tradition and modernity, eco-culture suggests the following focuses:

- **Eco-cultural tradition for eco-cultural modernity:** To take into account the importance of local human cultures in the nature preservation. To promote their architectural inheritances which show us useful patterns and features for new design, especially for making “green building” a reality.
- **Eco-cultural modernity for new eco-cultural traditions:** To develop ecology and nature awareness, taking time to carry out holistic field studies and local climatic data analysis for

designing true bioclimatic and “green building” projects and in this way participating in the creation of new forms of “modern” eco-cultural traditions.

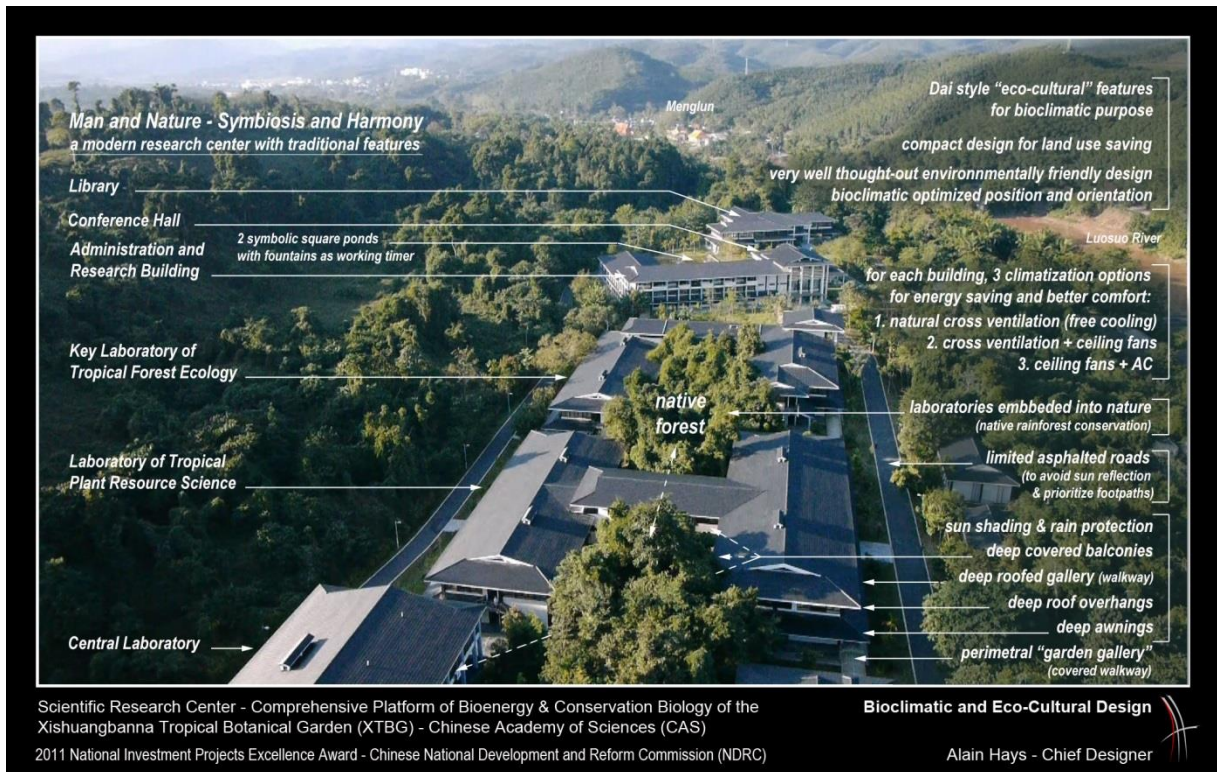
Eco-cultural action

The UNESCO Universal Declaration on Cultural Diversity states: *“Human Habitat is a main reflection of lifestyle and cultures diversity [...] As a source of exchange, innovation and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature”*. The notions of nature and culture are complex (see bibliog.: Descola, 2005) ; they are “scientifically” differentiated in our modern societies but deeply embedded in traditional communities, in particular rural societies and indigenous peoples.

As an example, taking the Dai people, the main ethnic minority of Xishuangbanna, as Prof. Zhu Liangwen pointed out: *“The Dai, as rural folk through millennia, are extremely knowledgeable about the qualities of all the innumerable plants that surround them”*. In other words, “nature is their culture”. Their wooden architecture is a unique tropical ethnobotanical building heritage which deserves to be preserved as a valuable example of vernacular bioclimatic housing design, energy saving and natural resources management. This indigenous built heritage could give us a great ecology lesson, as was the case for designing the XTBG research center project.



Taking nature into account for the design of a scientific research center is not so common. Generally, more importance should be given only to its technical functions and conventional appearance of laboratories. But taking local culture into account for designing a modern research center, moreover, the traditional culture of indigenous people, is a revolutionary idea! Without the clear vision and decided support of Prof. Chen Jin, director of XTBG-CAS, this exceptional project would never have been realized. The captioned aerial photograph of the XTBG research center project (see below), better than a lengthy speech, summarizes different useful bioclimatic features inspired by the Dai built heritage, the previous study of which was completely part of the architectural design process.



The new XTBG scientific research center design is the result of an "eco-cultural" concept which respects the native forest on the building site and expresses local cultural values in a modern friendly and functional way. During the design process, landscaping (especially plants and trees) was not considered as a final embellishment, a simple decor as it is usual, but also was entirely part of the architectural and bioclimatic design. It did not follow the usual Chinese construction pattern: "remove all and level down, then construct the buildings and rebuild the landscape". On the contrary, the project made the most of the natural shape and slopes of the terrain and the original plants were preserved all around the buildings during the construction work. The building process was a little more complicated but the result was worth it. Surrounded by the preserved forest, the new buildings, including the laboratories, were "instantly" integrated into nature and the environment, giving a soul to the research center and promoting a sense of having always existed in this outstanding place.

Natural and Cultural World Heritage

Around the Xishuangbanna Tropical Botanical Garden, the local Dai and Hani wooden villages and the rainforest environment are not only an attraction for domestic and foreign visitors. Firstly they are part of the Dai and Hani ways of life, cultures and knowledge systems; secondly this rich tropical environment is an outstanding **open-air laboratory** for scientific research on tropical plants and biodiversity preservation.

Indeed, the Dai and Hani villages, which surround the town of Menglun and the botanical garden should be recognized as a **unique building heritage**, expressed through **five "eco-cultural" topics**:

1. Strong cultural values. ("Nature-Culture" thinking and heritage)
2. Deep indigenous knowledge in natural resources management (especially in wood carpentry).

3. Original and exemplary bioclimatic traditional design.
4. Perfect integration into nature.
5. Appropriate scale development for nature preservation.

Reciprocally, XTBG is not a classic botanical garden, but an extraordinary buffer zone between the indigenous knowledge of plants (ethnobotany) and botanical science. What's more, the Garden is a unique place making a bridge between the native tropical rain forest environment (which is representative of tropical South-East Asia) and worldwide richness of plants diversity.

Numerous and unique plants collections from many parts of the World constitute a botanical treasure available to the national and international public, not only to everyone's delight but also for science and education: a real **"Nature-Culture" patrimony** which contributes to biodiversity raising awareness and learning, creating and preserving at the same time its own "eco-cultural heritage" for local people and humanity benefit. Therefore, XTBG would deserved to be recognized as **Natural and Cultural World Heritage**.

In short: "XTBG is a great opportunity for Menglun and Menglun is a great opportunity for XTBG"



Eco-culture in danger

While the XTBG research center was in the process of being built, at the same time, the Dai and Hani built heritage, so significant not only as unique vernacular architecture but also for nature conservation, was seriously threatened in the face of rapid urbanization of the small city of Menglun. Many authentic wooden villages with their typical windowless houses on stilts are fast being lost to urban development.



Dai wooden carpentry built with art. Strong indigenous knowledge of local resources management. Cheng Zi Village, Menglun, 2006.



Photos by Li Defei, (Alain Hays archive).

Could this Dai and Hani amazing built heritage disappear in the short term? Unfortunately, the answer is yes. There is a high probability of the disappearance of the architectural inheritance and corresponding indigenous knowledge if one or several of the **five “eco-cultural” topics** are affected by urban pressure. Is it the price to pay for “modernity” and better living conditions? The answer is much more complex.

If “modernity” is considered as a synonym of “urban way of life”, everything that comes from rural knowledge and patterns will be depreciated by the inhabitants and their local authorities. This phenomenon is not only in China. It exists in any part of the world, especially when the urban growth is very fast. This is an unprecedented phenomenon of the XX^e and XXI^e century: in a few years, huge century-old or thousand-year-old building heritages (and lands, pieces of nature...) were lost forever or threatened with imminent destruction. In Europe, after the World-War II reconstruction, it has taken some decades for peoples and authorities to realize the importance of the building heritage preservation, not only for keeping an historic record of the past, but also for economic reasons, not only for tourism development but also for territorial attractiveness for different purposes: especially for business, commercial, for all uses and housing attractiveness (in particular in the old well-preserved urban center). In Europe, banks, offices, shopkeepers, investors for retail property, and so on, have been quick to grasp the advantages of the building heritage preservation, and not only in the cities but also in rural areas. The lesson: “Building heritage” is good for a friendly, smart and sustainable “modernity” and good for business too!

But would it be fair some people are obliged to live in their traditional houses or ancient buildings while others enjoy more comfort in modern buildings? The answer is obviously: No! But often, restoration, well-done improvement or modification of traditional houses (*Pict.: Dai house a.*) or ancient building could be much more convenient, also for more comfort and economy. Generally, affordable modern buildings or houses have smaller living areas, and they are often not so comfortable as they seem, especially in rural or semi-rural areas. The new buildings layouts try to simulate urban patterns, mainly for a question of status and do not pay so much attention to the climatic differences between regions. Orientation, window sizes and locations, roof types and so on are too often completely wrong (*Pict.: Dai house b.*). Following the regions, it is not rare to find new “modern” houses that are like fridges in cold areas or like overheated greenhouse in tropical areas.



a. Good improved Dai traditional house - b. Bad “pseudo-modern” Dai house

The five dangers of new “pseudo-modern” buildings



The impacts of these new “pseudo-modern” buildings in a traditional rural or peri-urban sector are various and have in most cases irreversible effects we could name the five dangers:

1. **Disaster mitigation issue:** The worst thing could be a reduced resistance to natural disasters (especially earthquakes and flooding). Xishuangbanna is a seismic region. Although wooden buildings could be damaged by strong earthquakes or floodings, traditional Dai or Hani wooden structures were optimized over time according to local people long experience and knowledge, which can prevent major damages. The same is not true with “new” reinforced concrete and bricks or concrete blocks technology imported recently in the region. In an attempt to imitate patterns and layouts of foreign urban design, local people are not always careful with building codes and adequate seismic codes and many times standards are not respected.

2. **Energy wastage :** Another worrying and serious problem is ecological, because the use of more energy resources for heating or cooling the buildings when they are badly designed (by simple copy of layouts and patterns which are not corresponding to the local climate).

3. **Land wastage:** The bad or excessive use of the land, when the new building projects are not “on local scale” and not taking into account the unspoiled landscape, natural slopes, vegetation, biodiversity, water resource management and so on, can affect seriously the natural resources, agricultural capacity and appropriate forestry management.

4. **Loss of natural and cultural heritage:** The quick loss of ancestral indigenous knowledge and technologies (especially carpentry, timber harvesting, and forestry ecological management) can be a loss not only for construction but also for ecology and nature management.

5. **Loss of identity and harmony:** The loss of identity and harmony not only of some individual buildings but also of the local communities (villages, towns, landscapes), can affect seriously the attractiveness for foreign or domestic visitors and future investors.

Guidelines for Green Building Design and Built Heritage Conservation

In France for example, a “classified sites” politic at national level was established for natural and cultural heritage protection: “The aim of site policy is to preserve sites whose exceptional character justifies protection at national level and whose conservation or preservation is of general artistic, historical, scientific, legendary or scenic interest. Over the decades, this policy has shifted from single sites to large landscapes, from a pure conservation policy to dynamic site management. France has 2,700 **classified** sites and 4,000 **registered** sites, i.e. 4% of the national territory.

- In a **classified site**, any modification of the state or aspect of the site is subject to a special authorization.
- On a **registered site**, applications for the authorization of works likely to affect the space need a simple notice except for the demolition works which are subject to an assent.”

Furthermore, two main systems for environmental protected areas could be interesting fields to explore: **Nature Reserves** and **Regional Nature Parks**.

- **Nature Reserves** make it a priority to protect nature and wilderness while banning local human activities and human settlements, the latter remains a major obstacle in indigenous areas where native people have legitimately property rights on their land.
- **Regional Nature Parks** are territories with a **voluntary** environmental development model for the benefit of all stakeholders in particular the local inhabitants.

For the environmental preservation and cultural heritage conservation of the Menglun region and the Xishuangbanna Tropical Botanical Garden, it is important to have clear views and strategic visions which can be put into practice through a well-done “**eco-cultural**” master plan. Two strategic visions could be highlighted: a “Nature Reserve” Vision and an “Eco-Cultural” Vision.



“Nature Reserve” Vision: This nature priority preservation vision could be useful for establishing or expanding “nature reserves” as buffer zones or protected areas for tropical plants and scientific research (**open-air laboratory**) in the immediate neighborhood or in the medium distance surroundings of XTBG.

“Eco-Cultural” Vision: This eco-cultural vision, could be important especially for the socio-economic development of Menglun town and the traditional Dai and Hani villages of the region which deserve to be protected, “classified” or at least “registered”.

Some arguments for a “Regional Eco-Cultural Park”

By suitably combining these two strategic visions, it could be possible to establish a “**Regional Eco-Cultural Park**” which would have the following benefits:

- This Regional Eco-Cultural Park should be more flexible and not so restrictive than a *National park (Nature reserve)* and should give more empowerment and opportunities for local authorities and inhabitants.
- This Regional Eco-Cultural Park would be a territory with a **voluntary** environmental development model for the benefit of all stakeholders in particular the local inhabitants.
- This Regional Eco-Cultural Park could include some “nature reserves” or “protected areas”, which could fit well with the ancestral concept of “Holy forest” and untouched nature as an **“open-air laboratory”** for science and education.
- Such a Regional Eco-Cultural Park would not convert local people into a folkloric zoo for tourists. (This is important!)
- It should not be a human museum but has to participate in nature and culture heritage transmission and public education

- It should not only be tourism oriented. Many other activities could be developed providing the cultural and natural heritage is respected.
- It may allow and promote human activities that respect deeply the Natural and Cultural Heritage.
- This Regional Eco-Cultural Park would participate greatly to the local, regional and national economy, in a **modern but responsible and sustainable development**.

Conclusion

Nowadays, people from all over the world have a right to expect a better life, more comfort, better housing and services as they can see it in the best parts of major cities. The past is the past, and there is no lost paradise. But the built heritage is, very often, the expression of strong folk art, part of genuine cultures which have demonstrated deep knowledges in local resources: treasures of skills, experiences and know-hows that have been passed down through the generations and run the risk of disappearing in the short term. So, it is important to develop new strategic visions and actions for protecting this irreplaceable heritage: not only to keep alive the memory of the past but also to make the most of its ecology lessons for a true “Green building” design in any project, thus to create new modern traditions which should be more friendly to nature and the environment and could provide more humane living and working conditions for everyone.

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