

## **THE GENES OF TULO: A STUDY ON PRESERVATION AND SUSTAINABLE DEVELOPMENT OF TULO**

Shaosen Wang, Suyu Li, and Shijie Liao  
School of Architecture and Civil Engineering, Xiamen University, Xiamen 361005, P.R. China  
[w3m@vip.sina.com](mailto:w3m@vip.sina.com)

**Abstract:** This paper analyzes the formation of Tulou villages and the characteristics of Tulou building. The genes of Tulou are examined within the unique physical forms and the significant social culture background. It's concerned with how to apply the valuable genes in the preservation and sustainable development of Tulou.

**Keywords:** Tulou, genes, preservation, sustainable development

### **1 INTRODUCTION**

Tulou is a unique type of Chinese rural dwelling which carries its social background, history and the local culture contexts. It's an important architecture GenBank, in which a lot of valuable genes can be abstracted for our contemporary architecture design. There are two groups of genes. One group is genes of social culture, which note the history of society. A Tulou village reflects the order of consanguinity habitation, the environment-concerned treatment, the respect of nature, the concept of fully using local resources etc. The other group is genes of physical morphology, such as varied styles, self-contained system, natural color, cohesive space, feasible techniques and so on. All these genes deserve in-depth understanding for suitable preservation and sustainable development of Tulou.

### **2 GENES OF SOCIAL CULTURE**

From the beginning, Tulou was recording the society, the history and the culture of the time. It's a good interpretation of the relationship between Chinese and Nature. It also embodies the typical oriental philosophy.

#### *2.1 Record of Society, History and Culture*

Tulou evolves with the development of society. It's the evidence of the migration to seek refuge from the central plains to south China. As the footprint of the history, Tulou is of great worth for anthrop sociology. From the aspect of sociology, a Tulou is usually occupied by one large family clan of several generations. Families band together for risk and defense, living in the Tulou building which is the effective stronghold. It exhibits its unique characteristic as a model of community housing of equals. A vertical set from ground floor to "penthouse" floor serves as a living cell. Each family can not only enjoy its privacy but also has social communication with other families. Nowadays, the community dependence is weakening while emphasis on private property is strengthening. Both the community and the privacy should be fully satisfied. The many inscribed tablets, the couplets on pillar and the ancestral hall are the location of the cultural life in Tulou. There are 'Fengshui conception', farming-learning culture, Confucian ideology of order in the active scenes of life in Tulou. The overall harmonious is the essence of traditional culture and we should promote it greatly.

#### *2.2 Adaptable to Conditions, Respect of Nature*

Chinese classic philosophy insists on the harmonious between the building and the nature. When selecting site

of the settlement, natural environment is deeply considered and respected, such as site with water in front and a hill at the back. Thus, Fengshui becomes a pattern language. There is a kind of interdependent relation between the Tulou village and the natural environment. The mountains provide richful sources for living and production. The rivers give the convenient come-and-go. Tulou forms the ecological connection with the nature for a long time. On the contrary, in the expansion of the cities, people are the first in line and natural ecology is ignored to some extent. It's more and more difficult to keep the ability of the city to deal with disaster under extreme weather situation. We should learn from Tulou to improve the relationship between the nature and the cities.

### *2.3 Local Material, Adaptable Technology*

The construction of Tulou is conditioned by the level of technology, economy etc. The Hakka made the most use of local resources. They choose adaptable technology to build houses comfortable to live in. The rammed earth wall building technology is efficient. It saves labor and is easy to get all the necessary local materials. The adaptable technology applied in Tulou provides many significant examples of energy conservation. Tulou has the artistic, technical and ecological values in architecture.

## **3 GENES OF PHYSICAL MORPHOLOGY**

Genes of physical forms can be absorbed and applied in a flexible way for architecture preservation. There are free styles of overall layout of Tulou villages, and also the strict round or square planned in every Tulou building. Characteristic expression in form, space, construction and material comes into a vital Genbank for the regional architecture design of today.

### *3.1 Systemic Genes of Tulou Clusters*

Tulou clusters follow the Chinese architecture tradition of overall balance and order of building groups. The axis hold in a Tulou cluster is based on physical geography instead of on social hierarchy. The layout of the building group adjusts the relation between natural and society in a topology method without an architect. Collective consciousness and public participant promote the adjustment. Paying close attention to the overall environment is vital in the preservation and sustainable development of Tulou.

### *3.2 Refined Principle of Order in Tulou*

Ground floor plan of Tulou includes circle, square, rectangle, or combination of some. It follows a precise composing principle. The fine order of a Tulou is worth to be inherited to improve today's architect design language. The exterior color of Tulou matches the earth around, with the vivid color of window frame, door head, spring festival scrolls, etc.

The bottom two storeys of Tulu are solid with no window for the reason of defense. Windows are open only from the third to fifth storey with their size changing. Extended eaves are to prevent rain from dampening the walls. The shine shadow of the windows and eaves make rich layers and stereoscopic feeling.

The concept that the form follows the function is well embodied in Tulou building which is full of vitality until now. Poetic architecture space is made by appropriate techniques, such as regional construction method and use of local material. The earth-wood-structured Tulou focuses on the ecological factures of material, which just mirrors some sustainable design concepts.

The layout of Tulou followed the 'closed outside, open inside' concept: an enclosure wall with living quarters around the peripheral and a common courtyard at the centre. The space in-between the Tulous provides variety of living scenes and is the 'spirit of space' of Tulou. Nowadays, some new elements intervention in the self-enclosed Tulou will help to adapt it to new situation. The mix may bring the genetical modification in its form, space, material and concept. The in-between space does have potential value for the preservation and sustainable development of Tulou.

## 4 CONCLUSIONS

The study on the genes of Tulou is an essential part of preservation and renovation of Tulou. The two gene groups have different applying methods, different function in the preservation and development of Tulou. Genes of social culture value on the preservation of the harmonious spirit of Tulou. Genes of physical forms value on both the overall system and the genetical modification by new intervention in Tulou building. Through this genetical modification, Tulou will keep on sustainable development in the new era.

## REFERENCES

- Shi Yilong. (1996). *Applied Anthropology*, Xiamen University Press, Xiamen, China  
Shi Yilong. (2005). *Tu Wei Lou*, China Travel and Tourism Press, Beijing, China  
Wang Shaosen. (2000). *Introduction to Architecture*, Science Press, Beijing, China  
Wang Zhengzhang. (2010). *Introduction to Architecture design*, Southeast University Press, Nanjing, China