

SE SHUI COMMUNITY LANDSCAPE PLANNING AND C2C DESIGN

Wen-Ting Chang¹, Shwu-Ting Lee¹

¹Department of architecture, Feng Chia University, Taiwan, stlee@fcu.edu.tw

ABSTRACT:

In recent years, nature's counterattacks force people to be aware of the importance of environment and ecology. The tendency of architectures is no longer to focus on shape or form. "Strong environment, weak architecture" is the current issue and expectation. Using the Seshui community in Taiwan for a design study, research methods are "Heuristic Structure" (H.S.) which is applied as design framework, and "cradle to cradle" (C2C) as design principles. Design as a research result is integrated by production and living with ecology. And the fireflies' restoration is the indicator of the environment. This research also provides designers with more objective judgments and operations in design application and process.

Keywords: Heuristic Structure, C2C design, Fireflies restoration, the Se shui community

1. INTRODUCTION

In recent years, Mother Nature's counterattack makes people be aware of the importance of saving the environment and ecology protection. Expectation of modern architectures no longer focus on shape or form under this manifestation, "strong environment, weak architectures" is becoming an issue (Sim Van Der Ryn, Stuart Cowan, 2009). The concept of C2C (Cradle to Cradle: Remaking the way we making things, William McDonough, Michael Braungart, 2008) emphasizes that people have to think how to coexist friendly with environment before design, instead of the results from cradle to grave. This research takes the Se shui community in Nantou, Taiwan as a study model. After the severe damaged of the 921 earth quake happened at 1997, this community has been trying to re-construct and to transform themselves into a "clay pottery/art, health and leisure/ lifestyle, and ecological community" from

emphasis on activities of traditional pottery, Assam black tea and fireflies restoration, (Hshieh, 2001). Because of the natural ecological environment and clean water in its neighborhood, The Se shui community owns varieties of fireflies(Ho and Chiang, 2002 ; Feng Chia architecture design center, 2008). Living fireflies is one of the most important indicators of clean environment. Therefore, the community attempts to make the fireflies restoration as a primary factor to develop their tourist business(Ho and Chiang · 2002). Beside, Rural Regeneration plan launched in 2009 with government assistance and self-reliance of local residents, it hope to balance the economy, equity, and ecology of the community .However, after being named in the finalist among top ten rural villages in Taiwan, B & B business is booming. With a large population of tourists coming to the community force the community to be urbanized. Too much emphasis on economic growth, it causes fireflies restoration plan and fireflies habitat abandoned. These are all the critical conditions for the Se shui community to reconsider how to make the idea of balance among economy, equity, and ecology to be true.

2. METHOD

2. 1. HEURISTIC STRUCTURE AND INVERSE INSIGHT

Heuristic idea was from Lonergan Bernard J.F.'s book "Insight. In1999, Tsai structured Heuristic into an architecture design theory (Tsai, 2010). Heuristic Structure (H.S.) is based on a logical thinking process of reorganization of the thinking procedures driven by the operator. Heuristic Structure (H.S.) has to rely on extensive literal study. According to the study, it can be classified into seven steps of design concept (Tsai, 2010).

- a. define the domain: Focus on the main research issues and viewpoint to study the issues whether the "problem" is.
- b. Problem breakdown: Single issue can be discussed to include multi-dimensional aspects. These can increase the credibility of theory in academic research.
- c. Significance extraction: Against an issue, if there are many description and interpretation, it must be all fully integrated into significance extraction.
- d. Induction: Phase of "knowing" data collection.
- e. Deduction: Deduction is an interpretation. Beyond the information, then format the inferences.
- f. Goal situation: Situation is a mental image, it will be generated after fully internalize the main information.
- g. Definition: Logical result. It is the most rational answer in the context of defined the domain.

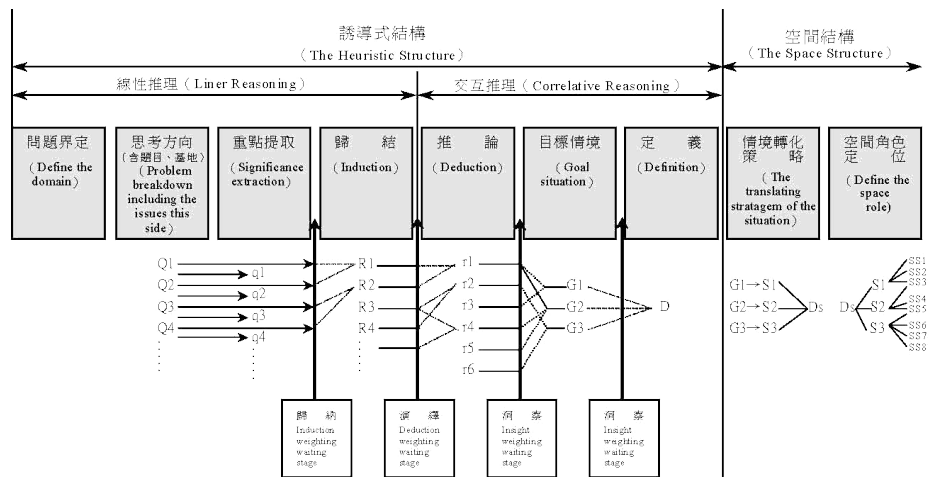


Figure 1: Step of Heuristic Structure .

However, when science and knowledge got error in the interpretation and is not compatible with each other. We must be fundamentally re-examined which is called "inverse insight". It is the similar concept of "Paradigm Shift" which was written in the book of "The Structure of Scientific Revolutions" by Thomas Kuhn in 1962. Insight can be apart to direct insight and inverse insight, direct insight can help to identify intelligibility, but inverse insight can help to find out the lack of intelligibility (Chen, 2006). After making direct insight into the Heuristic Structure, then re-examine the correctness and objectivity of design by using inverse insight.

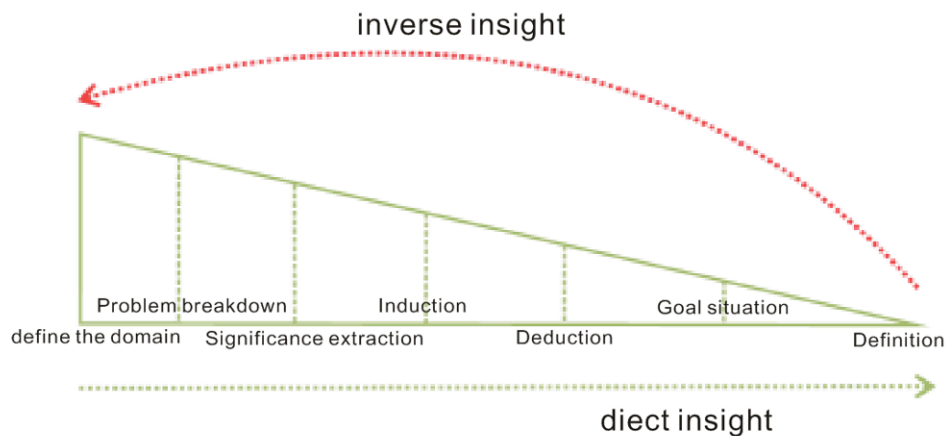


Figure 2: Deduction order of direct insight and inverse insight .

2. 2. C2C DESIGN PRINCIPLE

The concept of C2C is from "Cradle to Cradle: Remaking the way we making things", written by William McDonough and Michael Braungart in 2002. It argues the industrial revolution one-way manufacturing production leads us from "cradle to grave". Instead of less damage of reduce, recycled of low-grade materials and uses, and reuse to increase its life cycle from urge environmentalists, cradle to cradle suggest waste equals food, respect diversity and eco-effectiveness replaced eco-efficiency. Respect this spirit and principle, C2C in architectural design can be divided into systems as "system of establishment within ecological cycle" and "system to support ecological network". Further, in architecture these two systems could be developed by C2C technology, C2C materials and C2C design (Cheng , 2010).

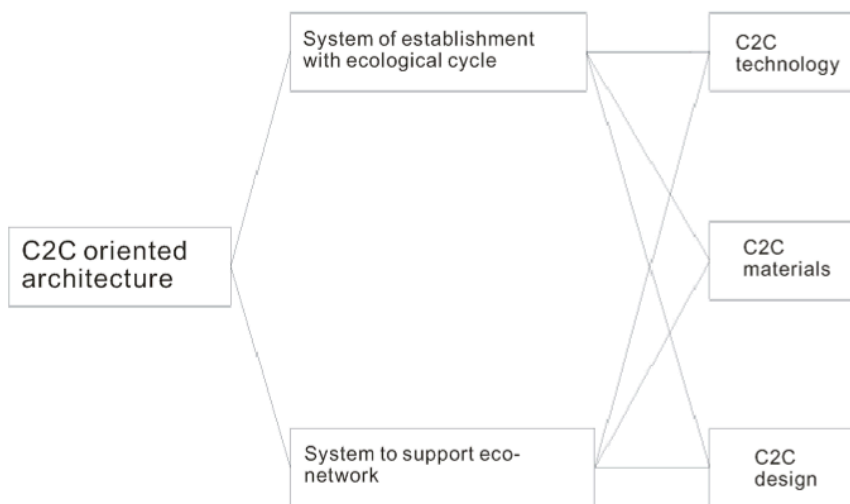


Figure 3:C2C design principle.

a. C2C technology: Development of technology can use natural resources. It could be passive way of control and balance. The result of the waste could be furthered used by upgraded recycling technology.

b. C2C materials: According to the composition of materials used for architecture, it can be classified as "biological materials" and "industrial materials ". Try to use and establish a C2C material database to provide a system of "cradle to cradle certification".

c. C2C design: Design to satisfy the principles of "Eco-Effectiveness to replace Eco-Efficiency", "Waste equals food supply" and "Respect diversity".

3. PROCEDURE

3. 1. HEURISTIC STRUCTURE OF SE SHUI COMMUNITY

TO find the problem of Se Shui community, the "Problem breakdown" can be apart into five issue: 1.C2C issue 2. Rural transformation issue 3. Ecological community issue 4. Firefly conservation issue 5.base issue. Then, the "Significance extraction" and "Induction" can be generalize into six "deduction": 1. Repositioning economy, equity ,ecology 2. Combine the natural elements as architecture landscape 3. Festival of local Community 4. Architecture that friendly co-exist with environment 5. Eco-space combined with Humanities 6. Eco-Friendly materials, construction methods and design. After these six "deduction", the "Goal situation" and "Definition" can be delimit as Friendly coexistence between Human and firefly.

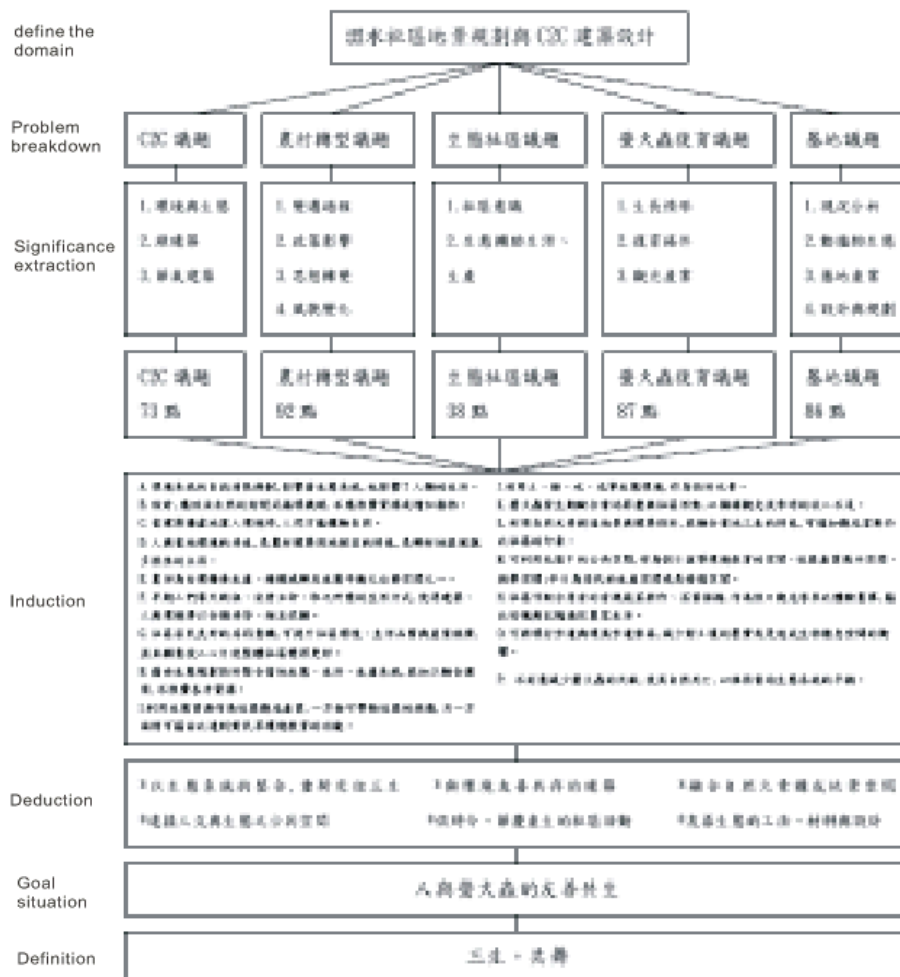


Figure 4: Heuristic Structure OF Se shui community.

3. 2. C2C DESIGN OF SE SHUI COMMUNITY

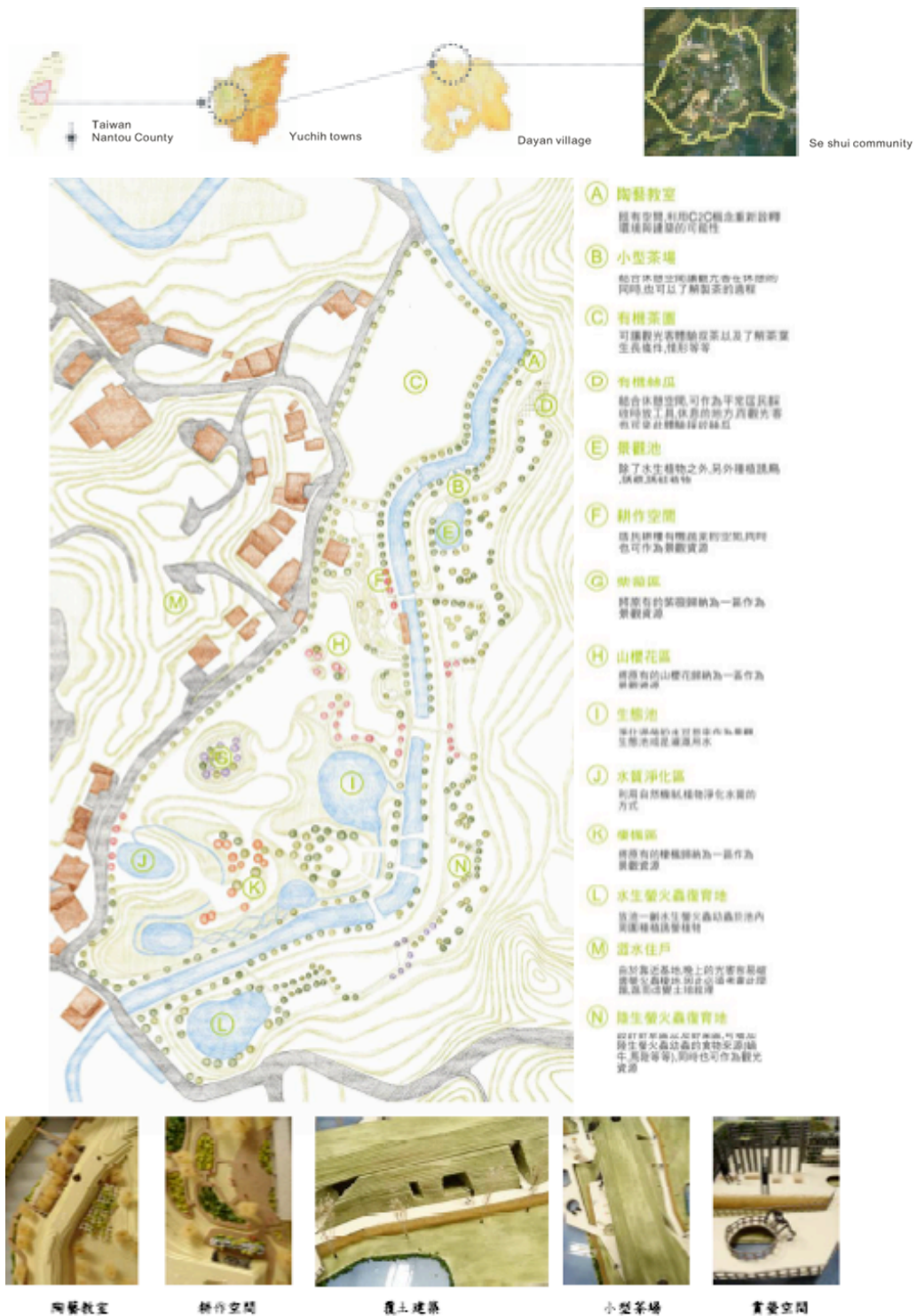


Figure 5: c2c design of Se shui community.

3. 3. INVERSE INSIGHT

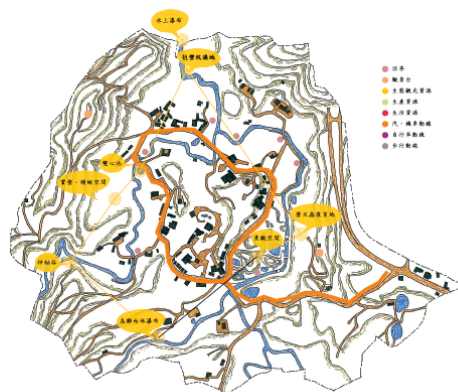
The original design proposal only operates a portion of the Se shui community. After inverse insight taking into account of ecological conservation, environment around the chosen site should similarly enables the biology to continue. The ecological conservation in its planning should be expanded to the entire community or even the adjacent communities.

The framework of planning can be followed as (1) Reposition equity, economy, and ecology, (2) Transportation, (3) Architecture design in respect of locality, (4) Identity in respect of node and variety of districts, (5) In respect of Chinese wisdom Solar Terms, (6) Landscape.

Repositioning economy, equity and ecology: (1) local ecological resources as tourism resources are less likely to damage the environment, (2) encourage organic farming of tea and vegetables, ceramics waste recycling, (3) To improve the quality of community life, emphasis on local ecological landscape design, architectural design.

Transportation: (1) vehicle control starts from the community gateway, (2) primary circular circulation is restricted to be bicycle and electric vehicles only to reduce traffic pollution, (3) primitive ecology environment area should be restricted to trails of footpath.

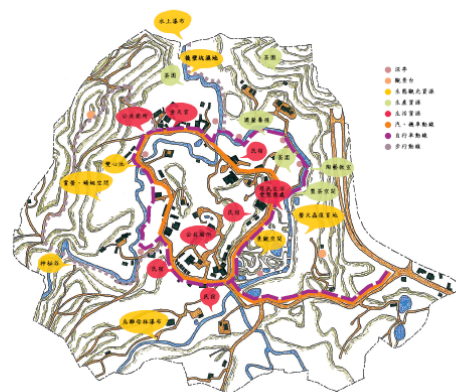
重新定位三生



1. 以當地生態資源作為主要觀光資源，可減低大量產業對環境造成之破壞
2. 以生態輔助生產，鼓勵種植有機茶葉、蔬菜等；廢棄陶製品的升級回收作為透水鋪面材料
3. 強調當地生態環境之地景設計、景觀設計、建築設計，藉此提升整體社區生活品質

生態保育區周遭應有相同物種與類似棲地，方能使保育物種長期駐留此地。

交通規劃

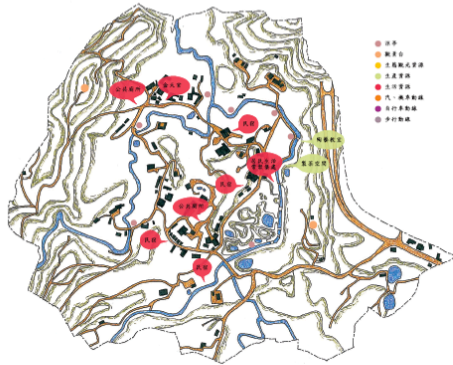


1. 社區內外來車輛的管控
 2. 環村步道以自行車、電動車為主，並規劃自行車停車節點、充電轉運站
 3. 自然度高之地區以步行為主
- 汽、機車道路 --- 當地居民為主，方便居民生活
 ● 自行車道 --- 配合上坪計畫與社區減炭的概念，劃設自行車道與自行車停車節點
 ● 步道 --- 自然度較高之地區以步道為主，減少交通設施對環境的干擾

Figure 6: Repositioning economy, equity ,ecology and Transportation Planning.

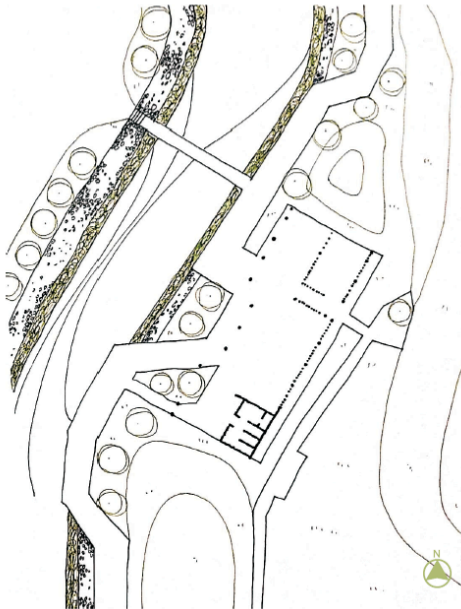
Architecture design in respect of locality: (1) use local materials for building, for example, lifted architecture by using woods or ceramic tiles floor can increase the permeability and drain. Local bamboo as structure and trunks of Areca can be structure and partition that could replace the convention material of concrete. (2) combining nature resources and no pollution industry to create the local characteristics, (3) Local ecological principles as an inevitable condition, in addition for the convenience of users and not to affect the firefly conservation areas, public architecture near the conservation areas could be structured by bamboo and covered with greenery. This could be part of ecological support system.

建築在地性特色之原則



1. 建村以當地材料為主
2. 結合當地生態與產業創造出自然性高的公共空間
3. 以當地生態條件為設計原則
4. 融合過去至現在當地建築之優點要項

陶藝教室平面圖



結合社區內建築內涵與C2C的思維模式，可發展成為生物承載體的建築形式

土角厝、三合院 --- 人與環境關係密切



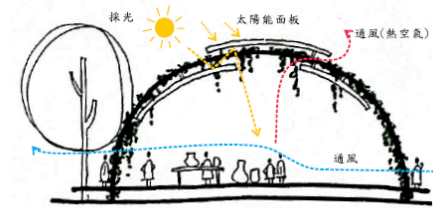
藍瓦白牆的新式住宅 --- 以生活為優先考量



風格多樣的民房 --- 材質變化豐富



生物承載體的建築概念



1. 採光---間接照明
2. 通風
3. 攀藤植栽---隔熱、隱藏建築
4. 屋頂---太陽能面板
5. 聚高樓板

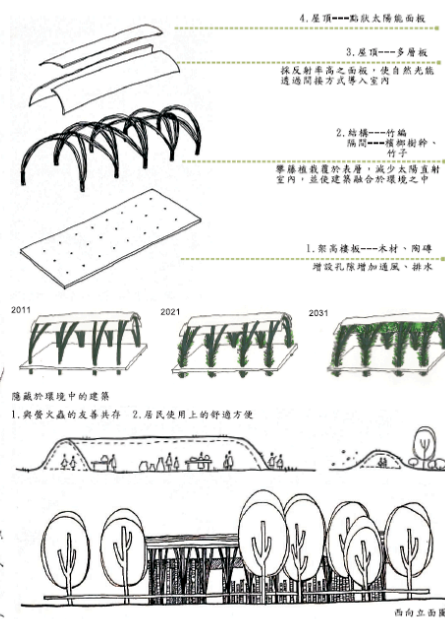
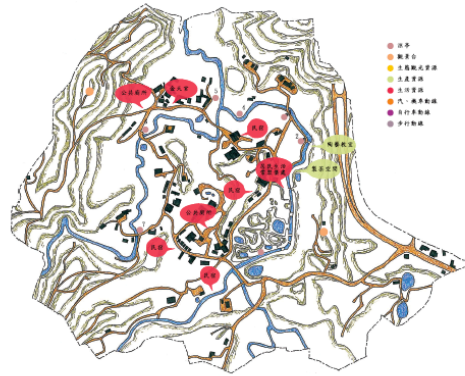


Figure 7: Architectural principles of local conditions

Identity in respect of node and variety of districts: (1) create bicycle rest areas for node, (2) create an eco-educational function district, arbors and surrounding landscape can be the nodes that tourists recognize the ecology of Seshui community, these nodes also have the function of ecological education and practical experience (3) establish electric vehicle charging stations for node.

7.10 反向洞察後之節點與場域規劃檢討

節點與場域規劃



1. 為社區未來自行車停車、休憩節點
2. 建築為其生態教育功能的空間
3. 電動車充電轉運站



涼亭設計概念

結合在地性與人文的生物乘載體

1. 就地取材、節省經費
2. 易操作施工
3. 鼓勵當地居民共同參與

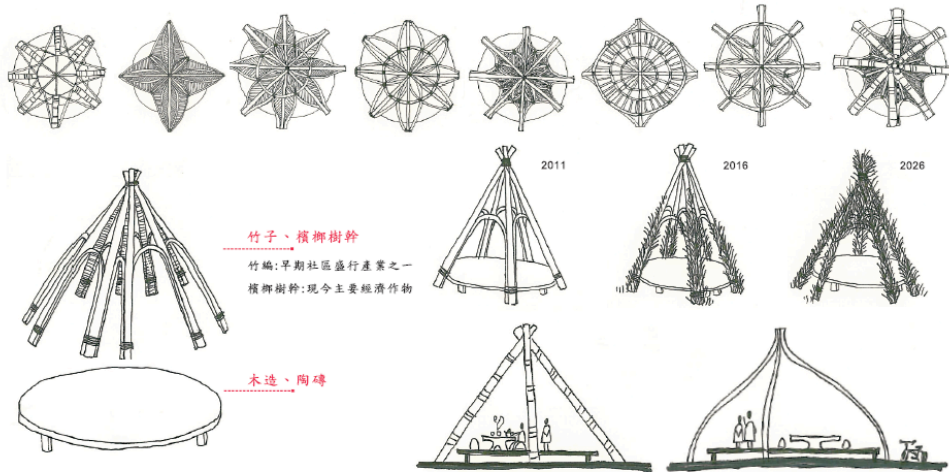


Figure 8: Planning of Node and district

In respect of Chinese wisdom Solar Terms: (1) public space to create seasons experience and observation, (2) Enhance the public assembly space for community festivals, (3) create the new landscape according to the solar terms.

Landscape planning principles: (1) use the local native plants for landscape, (2) create a neighborhood for biological diversity, (3) habitat areas to maintain primitive weeds and woods.

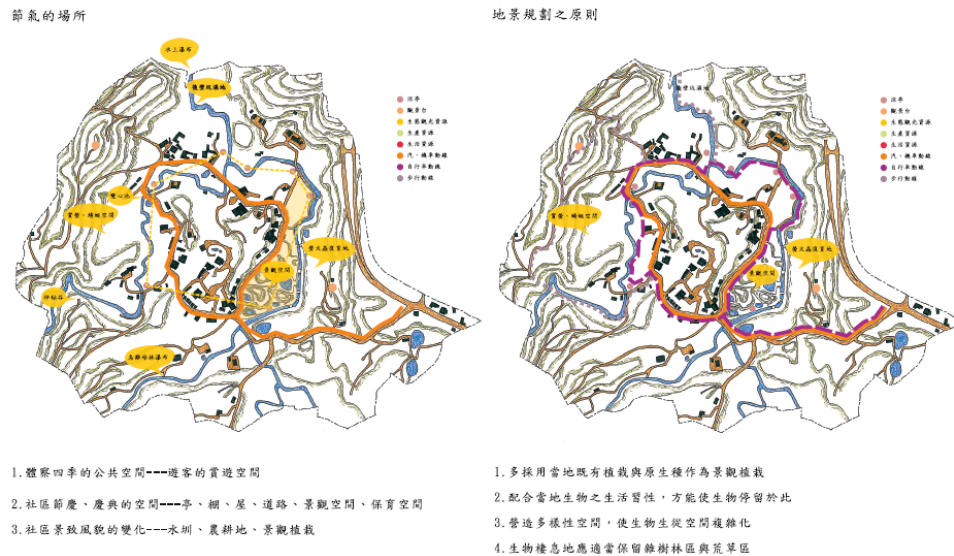


Figure 9: site of Solar Terms and Landscape planning principles .

4. CONCLUSION

Investigate the Rural Regeneration planning by using the Se shui community, a real site as a practice study model in architecture design followed the traditional design and thinking process was conducted in the first year. This research applied design methodology of Heuristic Structure, inverse insight and C2C for the second year experiment. It argues the architecture design with theoretical structures support an outcome which is more objective and rational. The Se shui community after theoretical methods initiated finds a more complete rural planning for itself. Conclusions can be summarized in the followings:

Rural planning should focus on the balance of local ecology, economy and equity. Rural site likes the Se shui community while increase its economy and assisted its living for equity has to rely on ecology. Restoration of fireflies as one of the local ecological resources can improve the quality of living and production.

Planning strategy: (1) Transportation: low carbon transport, (2) Architecture: characteristics of the place, local materials and local

tectonic, (3) the sense of place generated by nodes and variety of public assembly districts, (4) Solar Terms sites: evoke the memory of environment-friendly coexistence with agriculture, (5) Landscape Planning: shaped the biodiversity space with multi-level planting and topography.

The Se shui community's C2C design principle

Followed the C2C design principles of eco-Effectiveness replaced Eco-Efficiency, waste equals food and respect diversity proposed by William McDonough & Michael Braungart, and C2C materials, construction, design and management proposed by Chen, these can be summarized in the following:

(1) Waste equals food: recycle the local production of waste (such as ceramics, areca palm, bamboo, and timber), (2) Respect diversity: Respect the diversity of planting in conservation areas, planting those plants can lure fireflies, butterflies and deliberately. Encourage the primitive forest area to facilitate biodiversity, (3) Eco-Effectiveness replaced Eco-Efficiency: considerations for the ecological public buildings, it must consider the function that human use and creature's living space, so we can ensure this biological long-term presence in here, (4) Other management measures: to ensure biological survival, conservation space no need to clean up too often, beside, it needs to make limits of the number of vehicles, and number of visitors in and out of the community.

3. Fireflies conservation planning principles of the Se shui community:

(1) Because of the site of fireflies conservation is near tea plantation and residential area, so to change tea planting to organic way, then to use landscape and planting as a buffer space between residential and conservation area, (2) Using dark curtains in every house to deduce the impact of light pollution at night in the conservation area, and (3) Limited the number of visitors to ensure the quality of the conservation area.

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