The Color Image of Linpan in Western Sichuan, China

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Abstract: Linpan, in western Sichuan (hereafter Linpan) is a traditional settlement on the Chengdu Plain and an important part of the cultural heritage of Sichuan Province. China's rapid urbanization is accelerating the destruction of Linpan, making it essential to plan ways of protecting and restoring the area. To date, many serious problems have arisen, including the use of mixed and improperly designed colors in constructed and restored buildings. This study uses the Color Information Analysis method to identify the traditional color characteristics of Linpan and to design an appropriate color image for the settlement. By researching and analyzing the color rhythm, graphics-background, and color elements present in Linpan, this study has identified three main color-image characteristics: the integral color image, the architectural color image, and the plant color image. These are used to provide recommendations for future construction.

1. Introduction

Linpan, in western Sichuan (Linpan), is an example of one of China's typical rural settlement groups and historical geographical units, featuring the organic textural composition, ecological background, and landscape recognition factors that characterize Chengdu Plain settlements. The main elements of Linpan are fields, forests, water, and houses; these integrate the functions of production, daily life, and ecology. Linpan simultaneously embodies the richness and leisure of Tianfu, the accumulation and development of farming civilization, and the survival and extension of Shu civilization. During the past ten years, against a backdrop of rural revitalization, Linpan has greatly improved the quality of its space, ecological environment, and industrial structure through government-sponsored restoration and renovation projects. However, problems have emerged, including a single planning perspective, weakened aesthetic perception, and lack of landscape images. These issues have introduced ambiguity into the meaning of this rural landscape.

Currently, most countryside-construction problems in Linpan are essentially caused by the absence of traditional rural image. As builders and designers lack awareness of Linpan's traditional color images, they frequently use color in inappropriate ways, mixing colors and creating inappropriate color designs for new and restored buildings (Fig.1). This paper aims to fill this gap by studying and analyzing color images of Linpan objectively, in response to current problems.

Figure 1: The improper use of colors in Linpan

2. Background and Methods of Research

The term "color" usually refers to a visual and psychological feeling caused by light reflected from objects, as perceived by the human eye. A "color image" is the way that color makes people feel both physically and psychologically; it forms an overall color cognition of an observed object, at a subjective level. Scholars have developed a way of understanding the color of urban settlements. First, urban color design does not exist in isolation; rather, is closely related to geography, history, and the surrounding environment. Second, color saturation and brightness are often the first spatial factors in a landscape to attract the eye. The emotion and implied information expressed by color is formed through human association. Third, as a medium for transmitting aesthetic information, different colors can stimulate different emotions, triggering different artistic conceptions and reactions. Few studies have explored the color of traditional settlements in China or analyzed the origins of such colors and other regional characteristics. By filling this gap, the present study aims to provide a significant resource for academic researchers, architects, and designers with an interest in Sichuan Province.

The process of extracting the color image of Linpan proceeded in three steps. Firstly, the color data were recorded, using Chinese Building Color Cards (a visual color-measurement method) for the visual comparison. Next, various methods of analyzing color information were used to process and analyze the color data. Finally, the results were collated, revealing subjective color harmonies and contrast. Although relatively scientific and accurate technical means of analyzing and researching color exist, people's subjective feelings and perception of the environment are also important. In a study of this type, it is essential to combine subjective and objective, as well as qualitative and quantitative, methods of analysis.

3. The Process of Analyzing Color Information

3.1 Constructing the color image: an overview

From the perspective of environmental perception, the color of Linpan includes all elements in the physical environment that can be recognized and identified. It incorporates a comprehensive understanding of Linpan's color appearance, as well as basic color units and sequences that are drawn from the objective environment and formed in the human brain.

Color experiments have shown that when people observe things in normal conditions, the distribution of color occupies 80% of their attention, while the shape of object occupies 20%. This selective attention mechanism in human vision reflects the limited processing capacity of the brain. To carry out effective processing in a short period of time, our visual senses can only absorb specific and limited information. Thus, in the overall landscape effect of Linpan, the color image is the most intuitive and indispensable content; the main tone of the visual image plays an important role in constructing the color image. At the same time, according to the Visual Organization Principle in Gestalt Psychology, during the process of perceiving visual information, the varying influence of visual stimuli on psychology causes the image to be perceived as two parts: figure and background. Although figure and background are relative concepts, they cannot complement each other if the figure leaves the background. The visual organization principle

of Gestalt psychology states that vision tends to distinguish them as "graph" and "bottom", reflecting the different degree of psychological influence caused by these visual stimuli. Although graphics and background are relative, they are inseparable. If the graphic element leaves the background, it can't be called a "graph", while the same is true of the background. In addition, most color elements in the environment can be transformed into each other through their graphic and background properties. For example, a bamboo forest that forms the base of a map in the Linpan can become a graph in a larger, plain environment (Fig.2). However, graphics always occupy the dominant position in vision, while the background provides the visual edge. In the physical environment of Linpan, the color of "graphic" elements is therefore an important component of the overall color image.

The following two steps must be carried out to extract the color image of traditional Linpan. First, we must recognize the relationship between the image and the environment, summarizing and sorting the visual content of these "figures" and "backgrounds". Second, we must grasp the overall law of the color, rhythm, and color information of the main elements, using micro-content to form a macro-color style. This will guide the formation of an overall color image of Linpan. Using the theoretical methods of the above research and the relevant literature, this paper proposes three categories of traditional forest-plate color information in Western Sichuan: color rhythm, color elements, and a comparison of figure and background color.

Figure 2: The Linpan Figure-Ground Relationship

3.2 Analysis of Color Rhythm

Rhythm is a musical term, used to describe priorities. Different color combinations and compositions also produce different rhythms. Across the whole of southern China, including Jiangsu and Zhejiang, Anhui, Yunnan, and Sichuan, black tiles and white walls are a commonly used architectural style [1]. However, even when the same or similar colors are used, the application proportion, segmentation form, texture of materials, and environment will produce completely different perceptions and images (fig.3). Even within Sichuan, the prevailing architectural style can be subdivided into four regions: northern, southern, eastern, and western Sichuan. Residential buildings in Linpan, located in western Sichuan, must therefore reflect the western color rhythm (segmentation form, color proportion, and colored area) [2].

Figure 3: The Same Colors used in Different Styles of Residential Buildings

The famous Japanese color planner Yoshida Shenwu believed that "the color of architecture does not matter good or bad, nor does it produce contrast or beauty. The real aesthetic feeling comes from the

harmonious relationship between color and architectural form." [3] The aesthetic feeling of color in traditional residential buildings in western Sichuan originates from the new rhythm formed by the coordinated collocation of the area, position, shape and texture of colors, which together create a beautiful rhythm. It is difficult to preserve ancient residential buildings completely, because the main building materials used in traditional folk houses in western Sichuan were clay, bamboo, and wood; these have been damaged by the wars and banditry of various dynasties, as well as the relatively high air humidity in Sichuan. Most of the houses we see today were built in the late Qing Dynasty; few date from the Ming Dynasty. However, the literature review and an on-site inspection of many traditional residential forms show that the architectural styles of traditional residential buildings in western Sichuan are basically similar. Most of the photographs used to analyze architectural colors in this paper were taken during the on-site investigation (Fig.4) [4].

Figure 4: The Residential buildings of Linpan

From the color usage area, we know that when the ratio of two adjacent color areas is close or equal, the conflict between them is very strong. When one side decreases, the other area increases, causing the tone to shift; this rhythm is enhanced and gradually coordinated. (Fig.5). The first time we see a building, the main tone color (the largest area of color) is perceived first, followed by the auxiliary color and decorative colors found in smaller areas.
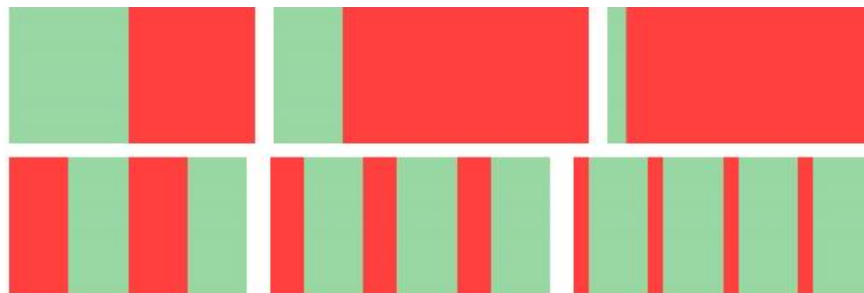
Figure 5: The Rhythm of Colors

In the Ancient Shu Period, the typical residences of western Sichuan were "wood-bone-mud wall & straw top", based on natural resources, farming technology, and environmental conditions, given the region's superior rice culture, straw and other crops were often added to the mud to increase the tensile strength of walls, which thus presented the nature of soil at that time. Later, with new technological developments and the integration of central plains culture, the traditional roofs of Linpan were largely converted to clay, with embryos baked into green and grey tiles. However, the humid air of the western Sichuan plain turned the tiles green and black, after long periods of dampness. Meanwhile, bamboo weaving and wall clipping began to appear in some areas, as bamboo production and weaving technology developed in the Shu area. Western Sichuan has abundant rainfall and foggy weather. As it lacks sunlight, white ash has traditionally been used to protect the walls of residential buildings. Large areas of white-toned wall reflect sunlight, solving the problem of insufficient light on slightly darker walls. A brown wooden structure intersects the white wall. The shade of brown differs from building to building, sometimes becoming a dark jujube red; this reflects the different cuts of wood used, methods of cutting, and the age of the woodwork. Overall, the main architectural form, which combines a wooden frame,

green tiles, and white walls, evolved from the languid thatched house and continues to be used today, forming a simple, natural, and unique style of residential color (Fig.6).
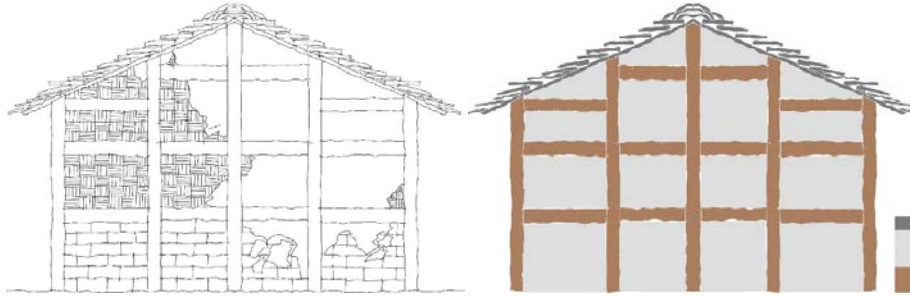

Figure 6: The Evolution of Residential Buildings in Linpan

A survey of several traditional residential buildings in Linpan has revealed the following points. On the one hand, from the point of view of residents, building facades generally feature large areas of gray-white or beige-white wall (when the outer white layer peels or falls into disrepair, the yellow is exposed), combined with small areas of blue-black tiles. These two colors account for the largest proportion of space and represent the main colors of these buildings. For the details, the wood used for the posts, doors, and windows generally retains its original brown color, sometimes with the addition of jujube red. In this way, the colors of gray-white and cyan-black, which occupy a large area, create distinctive black-white tones, enhanced by the unique rhythmic and aesthetic color image of brown and jujube red. This architectural style is both simple and elegant. The shape of the building facades where the color is located and the size of segmented sections alter the contrastive nature of these colors and produce different effects. The traditional folk-house form in western Sichuan includes a sloping roof and large eaves. The white walls are rhythmically divided into several small squares, some of which open as windows to enrich the form of elevation (Figures 7 and 8).

Figures 7: The Color Rhythm of Residential Buildings in Linpan

Figures 8: Facade color segmentation of Residential Buildings in Linpan

3.3 Graphic-Background Analysis
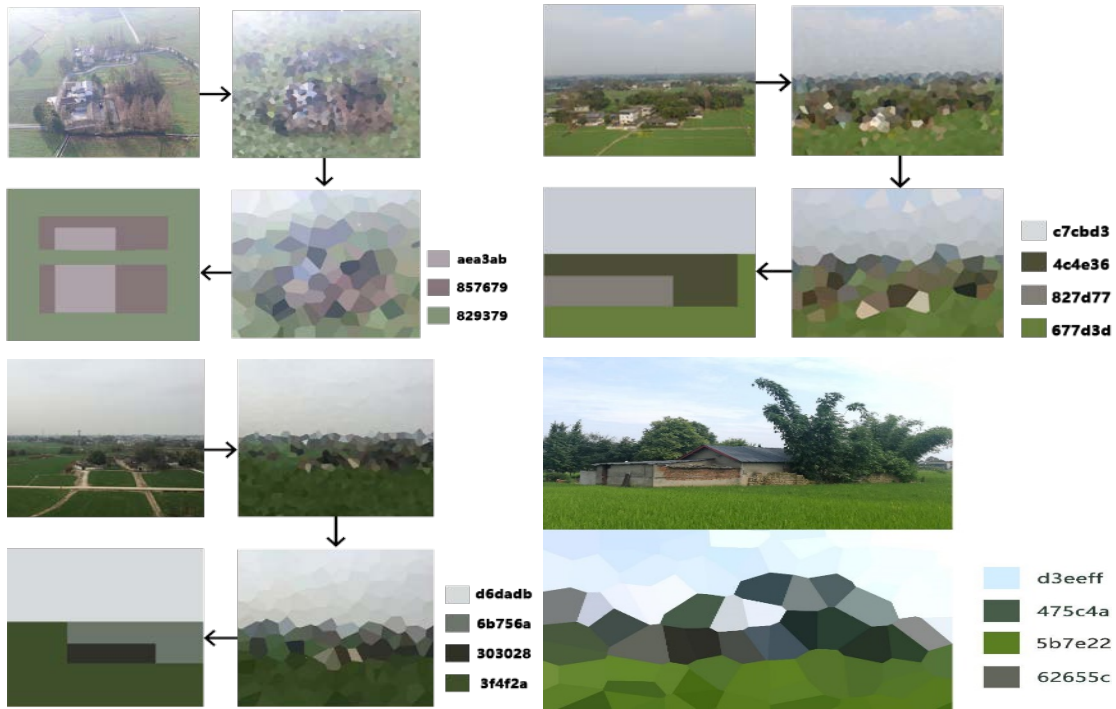
Figures 9: The Relationship between Picture and Background in Linpan

Gestalt psychology has made an outstanding contribution to the identification of forms. Its most important idea is to be concise: the perception of any figure should be as simple, clear, and easy to understand as possible. When people are in a particular environment, they always categorize and order the elements of objective objects. In other words, people grasp the information conveyed by the surrounding environment in accordance with a set of "organizational principles", which deepen their understanding and memory of the environment. During the process of visual perception, people tend to interpret objects as graphic forms against a background. In perceiving objective objects, people cannot accept them all, but must perceive parts of them selectively. At the same time, human vision divides the elements in a perceived object into two categories: graphics and background. The elements that provide greater visual stimulation or dominate the scene for psychological and emotional reasons are called "graphics," while elements pushed to the visual edge are called the "background." Given that graphics and background interact and support each other [5], a Graphic-Background Analysis is based on both dimensions. This method of analysis uses one perspective on a certain area as the basis for analyzing the color background

of a two-dimensional picture. To conduct an analysis of Linpan, we began by simplifying the environmental color into color blocks, using Photoshop software. We then analyzed the color relations and color matches between the graphic and background elements. The main colors, which accounted for the largest proportion of space, were extracted and presented as representative colors. This analysis retained both representative colors and a clear color-planning image relationship, while also enhancing non-prominent colors. The images below present background analyses of four representative scenes of traditional Linpan (Fig.9).

The results of these analyses are as follows. First, the four samples all present artificial colors as graphics and natural color as the background. Second, the first aerial view reveals that the distribution of plants in Linpan evokes the spatial characteristics of a "field-forest-house," with the color block formed from the first two elements accounting for the largest proportion of space. The second and third overlook views have, as their background, a large area of white sky. This produces the effect of Liubai, a traditional Chinese artistic technique in which part of a picture is left blank to make the focal image more thought-provoking. The ground in the picture is mainly green, with a coordinated combination of black, white, and grey hidden within the building. Although the color-block area is small, it still forms a strong color contrast and rhythm. The last image is a close-range human view, which shows that the overall outline of Linpan is composed of emerald bamboo forests and vegetable fields. The residential buildings hide their coordinated combinations of black, white, and grey. The upper half of the picture takes a large area of light-toned sky as its background; this forms a strong color contrast with the dark tone of the lower part of the image. In this way, graphic-background analyses excavate the main tone and representative color, as well as the comparative overall color relationship, providing a basis for creating the overall color image.

3.4 The Extraction of Color Elements

To construct a color image of Linpan, scientific and reasonable methods were used to extract information about various color elements and to grasp the inherent rules and relations of color. To combine the existing research on color with features of the actual situation, we chose to adopt the On-Site Color Card Visual Comparison Method and the Photo Color Extraction Method to extract the colors precisely. Our research data are in two parts: 1) the color extracted on-site, using color cards at an early stage of research; and 2) a later computer analysis of photos, conducted to ensure that no colors were missed. We used the "Chinese Architectural Color Card" system compiled by the Chinese Academy of Architectural Sciences as a comparative tool.

Figures 10: The Color Cards used for sampling

As the collected color data show, we divided the hue values of all elements into four categories: common green leaves (Group A), common vegetables (Group B), colorful leaves and flowers (Group C), and buildings and their details (Group D). The categories were then tabulated (Table 1). The values in the table are the mean values of samples taken from each color phase; elements of each color phase are then grouped together. The numbers of elements in each color phase are also labeled (Table 2).

Table 1: Color Survey of Various Elements in Linpan
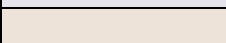
Category	Name	Hue	RGB Value	Color
Green-leaved plants	Phoebe zhennan	5GY 5/5	R:107 G:129 B:18	
	Grapefruit	7.5GY 7/6	R:156 G:177 B:110	
	Camphor	5GY 4/4	R:82 G:94 B:48	
	Camellia	7.5GY 4/4	R:70 G:96 B:57	
	Loquat	10GY 4/4	R:77 G:105 B:57	
	Ligustrum lucidum	10GY 3/4	R:66 G:91 B:59	
	Metasequoia (Green)	10GY 8/8	R:162 G:229 B:126	
	Ligustrum quihoui	7.5GY 5/6	R:108 G:139 B:71	
	Fragrans	7.5GY 4/6	R:68 G:95 B:42	
	Ginkgo (Green)	2.5G 5/6	R:100 G:143 B:97	
	Nerium oleander (Leaf)	5G 5/4	R:90 G:125 B:101	
	Cherry blossoms (Green)	7.5GY 5/5	R:98 G:147 B:39	
	Bamboo (Leaf)	7.5GY 5/6	R:99 G:125 B:54	
	Bamboo (Pole)	7.5GY 5/6	R:94 G:114 B:53	
Common vegetables	Scallion	10GY 6/6	R:123 G:170 B:102	
	Malva verticillata	10GY 5/4	R:96 G:123 B:88	
	Brassica chinensis	10GY 5/4	R:96 G:123 B:88	
	Rape (Leaf)	10GY 7/4	R:145 G:188 B:134	
	Kidney bean (Leaf)	7.5GY 6/4	R:130 G:149 B:104	
	Lettuce	5GY 7/6	R:154 G:176 B:94	
Colorful leaves and flowers	Nerium oleander (Flower)	2.5RP 5/12	R:198 G:96 B:162	
	Red plum (Flower)	10RP 5/10	R:180 G:89 B:106	
	Acer palmatum	5R 5/12	R:217 G:77 B:86	
	Ginkgo (Yellow)	7.5Y 8/10	R:229 G:201 B:45	
	Cherry blossoms (Yellow)	10YR 7/10	R:252 G:192 B:70	
	Nerium oleander (Yellow)	5Y 8/10	R:238 G:195 B:56	
	Wintersweet	10Y 9/6	R:244 G:228 B:115	
	Metasequoia (Yellow)	7.5YR 4/6	R:142 G:84 B:44	
	Rape (Flower)	7.5Y 5/12	R:232 G:210 B:2	
Buildings and their details	Tile (tends to Black)	10YR 4/1	R:100 G:97 B:92	
	Tile (tends to Grey)	5BG 7/1	R:162 G:171 B:170	
	Pillar (Brown)	7.5R 5/8	R:191 G:103 B:99	
	Pillar (Maroon)	7.5YR 6/4	R:161 G:134 B:104	
	window and door (Red)	5R 4/8	R:158 G:80 B:80	
	window and door (Maroon)	7.5YR 6/4	R:161 G:134 B:104	
	Pavement	5YR 6/1	R:152 G:149 B:144	
	Red brick wall	2.5YR 5/8	R:181 G:107 B:68	
	Grey brick wall	5PB 7/1	R:170 G:170 B:172	
	Mud wall	10YR 7/4	R:196 G:162 B:127	
	White wall 1	10PB 9/2	R:229 G:228 B:236	
	White wall 2	5YR 9/1	R:238 G:227 B:217	

Table 2: Hue Survey of Various Elements in Linpan

	G	GY	RP	R	Y	YR	BG	BP
All Data	3.75 (2)	8.06 (18)	6.25 (2)	5.83 (3)	7.5 (4)	7.22 (9)	5 (1)	7.5 (2)
Green-leaved Plants (A)	3.75 (2)	7.71 (12)						
Common Vegetables (B)		8.75 (6)						
Colorful Leaves and Flowers (C)			6.25 (2)	5 (1)	7.5 (4)	8.75 (2)		
Buildings and their Details (D)				6.25 (2)		6.79 (7)	5 (1)	7.5 (2)

We found that the color phase of common green-leaved plants in Linpan was mainly concentrated in the green (G) and yellow-green (YG) series. This confirms that Linpan's most common plants are evergreens, including bamboo, camphor trees, sweet-scented osmanthus, and glossy privet. The common local vegetables are basically yellow-green. Although some produce, such as carrots, peppers, and eggplants, have red and purple colors, yellow-green colors can be observed in a large area of the field, with a small area of vision. In focusing on the main colors, we left out fruit colors, which occupied only a small area, and took colors mainly from leaves. Bright colors could be observed in flowers and buildings, with most flowers red-purple (RP), red (R), yellow (Y), or yellow-red (YR) and most buildings red, blue-gray (BG), yellow-red, and blue-purple (BP). Although bamboo clip walls, a traditional residential building structure in Linpan, are known as "white walls," rainwater, air humidity, and poor maintenance have resulted in various degrees of discoloration and fading. As a result, we found no pure white in the color card comparison, just yellow-red and blue-purple. Similarly, none of the tiles were pure black. Instead, they were blue-grey and grey (G).
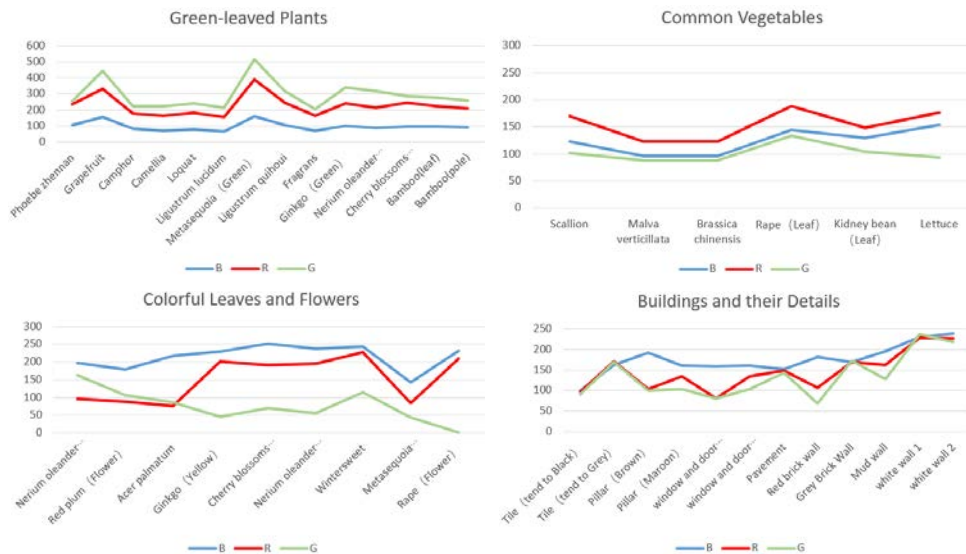

Figure 11: RGB Values of the Four Types of Elements

Figure 12: Scenery from the four seasons of Linpan

The pictures above (Fig.11) are broken-line graphs of RGB values from the four elements. After comparing the RGB values of Groups A and B with those of Group C (both mean values), we obtained six ratios: 0.56 (RA /RC), 0.88 (GA/GC), 0.51 (BA/BC), 0.71 (RB/RC), 1.05 (GB/GC), and 0.76 (BB/BC). In terms of the overall visual effect of Linpan, all four seasons have green as their main color. The G-value ratio between Groups A and B and Group C are close to 1. Therefore, in terms of the overall color performance, the visual effect of traditional Linpan is harmonious, without much conflict (Fig.12).

4. Results of the color image analysis

4.1 Integral Color Image

The overall color of Linpan is mainly composed of fields and woodlands. In the early stage of settlement formation, the conditions were restrictive, allowing only a small area to be planted. Single crops were grown, mainly on dry land, so farmland had a single main color, embedded in a large area of green woodland. Subsequently, with the development of traditional agriculture and growing settlements, the farmland cultivation area and field space also expanded. As the forest pan continued to expand around the settlement, the original woodland began to decrease and farmland gradually fused. In addition, the Dujiangyan Water Conservancy Project continuously built and improved the dense water network; canals gradually began to intersect the field texture of the Chengdu Plain. At the beginning of this period, larger paddy fields began to replace dry land, crop varieties increased, and different colors appeared in the fields. By the time of the Ming and Qing dynasties, the pattern of Linpan was completely formed. In different seasons, the colors of the fields became more diversified, turning the western Sichuan plain into a giant, irregular color palette.

The premise of Graphic Base Theory is that separating a figure from its background is the only way to grasp a figure completely. People's understanding of a figure is highly related to its background. The advantages and disadvantages of the background will affect our understanding of the form of the main figure. Only the organic combination of figure and background can produce a real sense of "visual gestalt." [6] The overall color of Linpan has an outline composed of emerald bamboo forests and vegetable fields. This hides the black-white-grey coordinated combination of residential buildings. From the perspective of human beings, the visual field takes the large area of light-toned sky as the background and forms a color contrast with deep-toned vegetable fields, paddy fields, and woodlands at the bottom. Overlooking the Chengdu Plain, the water network is spread across the landscape; patches of fields are interlaced, making Linpan look as if green gemstones were scattered across its vast fields. This produces a poetic and picturesque beauty and strong visual stimulation. The present study recommends preserving the integral color image of Linpan. To achieve this, we should make the overall picture sense mainly incline to the yellow-green and yellow-red systems, with low saturation and medium brightness; this basic scheme can be adorned with a few bright colors when structures are built or restored in future.

Figure 13: The integral color image of Linpan

4.2 The Architectural Color Image

The aesthetic of architecture comes from the expression of order, which is the result of the coordination of form, material, color, and natural environment. From the visual perspective, color is a very

direct and influential architectural language. To some extent, color can compensate for architectural shortcomings, making form look fuller. A beautiful building combines good form and color matching. As an important part of the environment, architectural color plays an important role in constructing a color image. Generally speaking, the basic tone of a building will involve lower purity colors; the auxiliary colors will have higher purity. These colored, very bright details embellish the main color, ensuring that the color rhythm of buildings provides an aesthetic visual design. Alongside the complex terrain, climate, and plant species of western Sichuan, the traditional building materials retain the natural colors of earth, wood, bamboo, stone, and straw, creating a simple and elegant architectural style. The roofs of historic Linpan are made of small, green baked clay tiles that appear blue-black, as a consequence of long-term humidity and dampness. The western Sichuan area is rich in rainfall and foggy weather. The walls of traditional dwellings are generally painted with white ash. Large areas of white wall reflect sunshine, solving the problem of insufficient sunshine and slightly darker walls. Brown wooden structures are partially interspersed between segments of white wall. Given the different types and ages of wood, and the methods used to cut it, the wood in some structures can be dark or jujube red, giving the buildings a simple, natural, and unique color style (Fig.14).

Figure 14: The Color of Residential Buildings in Linpan

Figure 15: The Color Image of Residential Buildings in Linpan

The dwellings of Linpan in western Sichuan represent the farming culture of Sichuan Province. They are naturally integrated into the local environment, retaining the color and grace of nature. Their main colors consist of white walls and blue-black tiles; auxiliary colors appear in the brown wood structures, jujube-red doors, and dark-red windows. The treatment of these colors enables residential buildings in Linpan to blend harmoniously into the pastoral, giving the area an ancient and simple atmosphere. A

simple building structure dominates, with most decorative features subordinated—hidden under eaves, or carved into stone and wood. In dwellings that feature more elaborate workmanship, the textures carved into doors, windows, panes, hangings, imitations, arch supports, pillars, and other features typically use traditional historical and cultural elements, such as Fulushouxi (blessing, prosperous, longevity, happiness), Qinqishuhua (musical instruments, chess, calligraphy, painting), Jixiangruyi (auspicious), and vivid, natural themes (Fig.15).

4.3 The Plant Color Image

As discussed above, plant colors in Linpan have strong regional characteristics and attributes that vary with time. In visual perceptions of the overall color, the main characteristics (green tone, mid-brightness, and low saturation) are constant. Due to the history of farming technology on the Chengdu Plain, only rice was grown in Linpan's peripheral fields in ancient times. Nowadays, economic crops such as rice and oilseed rape predominate, sometimes accompanied by wheat, peas, corn, and seasonal vegetables. Thus, the color of Linpan is increasing, with richer crop varieties. In spring, the rice sprouts and the rape blossoms, creating a light green and golden image. In summer, everything grows, edible fruits mature—some colorful under the green leaves, but most just light and dark green. In autumn, some leaves turn yellow and fall; the leaves of the metasequoia and ginkgo trees fall completely, leaving bare branches. Linpan becomes an image of brown and yellow, interspersed with yellow-green at this time. In winter, lettuce, radishes, and other vegetables are planted, but most of the farmland is plowed to prepare for the next spring sowing. The Shu land (ancient Sichuan Province) is rainy and foggy. For this reason, the image of Linpan mainly features low brightness, low color, and dark color.

Figure 16: The Color of Plants in Linpan

Changing times, economic development, accelerating urbanization, and many other factors have greatly impacted the landscape of Linpan in western Sichuan. Crops have changed, different types of plantings have increased, and various fruit bases, vegetable bases, breeding bases, and nursery gardens have emerged endlessly. The use of modern agricultural facilities has had a profound impact on the farmland landscape. Given the combined effect of these factors, the space and color of Linpan's fields are constantly changing, day by day. However, the color image of Linpan must continue to maintain an organic combination of various architectural elements with the environment. For this reason, making the effort to harmonize colors in future design and restoration projects is the key recommendation of this study (Fig.17).

Figure 17: Plant Colors in Harmony with Linpan's Environment

5. Conclusion

In the field of color geography, researchers believe that urban color designs are not isolated, but closely related to geography, history, and the surrounding environment. The color image of Linpan must continue to clearly present the geography, environmental resources, and cultural and historical connotations of the Chengdu Plain. At the same time, the most important task in constructing a color image is to clarify the color relationship between the landscape and environment. A well-defined color image can guide the design of future structures, avoiding those based on an insufficient understanding of Linpan. This approach will avoid the risk of "color pollution" or "visual confusion" by replacing subjective color preferences with a deeper understanding of the regional landscape environment. The present research results can provide a reference for future color design applications and construction in Linpan, western Sichuan.

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