

# Sustainability-based Study on the Development of Human Settlement in Traditional Villages

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**Abstract:** The purpose of this study is to investigate and analyze the status quo of the living environment in traditional villages, and to identify current issues and developing strategies based on data analysis. It is proposed that comprehensive sustainable strategies for land use should be designed, defined and used as guidelines for the constructions of traditional villages in the process of rapid urbanization. Such sustainable strategies should be applicable for remediation and development of traditional villages. This will promote the coordinated development in society, economy and environment in traditional villages.

## 1. Introduction

### 1.1 Research Background

The protection of living environment in traditional villages is a long-term dynamic process, which requires dynamic monitoring and adjustment throughout the entire process. The effectiveness of village protection measures, which is manifested in the quality of achievements, depends on the research methods of management relating to sustainable development. Therefore, sustainable development strategies for living environment must be established first, including living environment design with local villagers' involvement, hierarchical and phase-by-phase continuous management system, and a instructive and achievable sustainable development model.

Langtou Village, locating in Huadu District, Guangzhou, a traditional village with characteristic traditional Academy of classical learning and ancestral hall, was chosen as a representative example in this study.

## 2. Literature Review

Currently, domestic research on living environment in traditional villages mainly focuses on improvement and optimization, through adjustments of land and business structures, from a business planning, ecological planning and tourism planning point of view. Back in 2001, Wu Liangyong [1] made scientific research on human settlement, and ten years later, in 2011, he published a book titled Scientific Research Progress on Human Settlement (2002-2010), which showed that human settlement should employ different adaptive criteria and methods to keep up with the times. Shan Jixiang [2] (2010), the Director of State Administration of Cultural Heritage, emphasized the importance of village human settlement protection and expounded on its classification and renovation targets. He proposed that village human settlement protection should stick to the principles of strengthening



community functions, hold on to traditional culture and boost regional economy. In House Form and Culture, Amos Rapoport [3] probed into the design process of vernacular architecture and maintained that the process should be the one during which architects and users perfectly understand each other, because local architecture is closely related to the real life and geography of villages, which also embodies the relation between space form and lifestyle. The basic requirements and function of traditional rural settlements include producing and servicing function, Eco-environmental function, and social function. [4] Sustainable human settlements are organic, dynamic and growing. Thus, it should be considered carefully in the design of land use and eco-environment. [5]

### 3. Research Method

With Langtou Village in Guangzhou as a sample, the researcher undertook a questionnaire survey that covered the planning and design of new villages, with a view to obtaining data concerning basic information and current housing condition of individual villagers and their families, their satisfaction with life, their suggestions for future village construction, etc. All respondents are native villagers. Altogether 50 questionnaires were handed out, and 43 were retrieved. Data analysis based on public participation is adopted in this research. Then, statistical analysis was performed to obtain the result.

### 4. Data collection and analysis

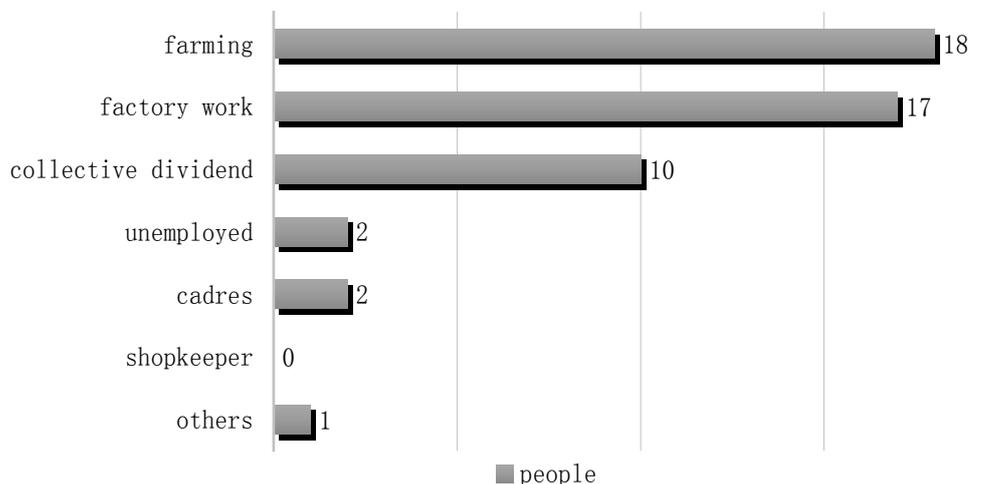
#### 4.1 Basic personal and family situations

The main sources of income for respondents' families and the types of work in which respondents are currently engaged.

Figure 1 shows that income source is mainly divided into three parts including agricultural income (36%), wage income (34%) and collective dividend (20%).

Figure 2 shows that 40% of the villagers mainly work in agriculture, and 38% of the villagers work in factories. The data analysis was proceeded from the main income source of villagers and types of work they are currently engaged in.

Respondents' age is between 14 to 61 years old, a relatively balanced residential structure.



**Figure.1** Respondents' major income source



**Figure.2** Respondents' current work category

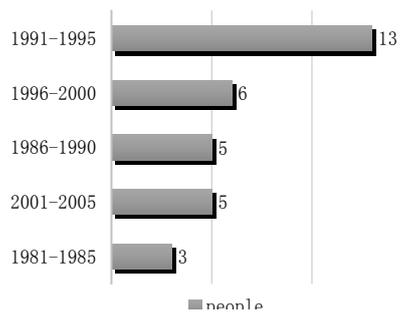
#### 4.2 The housing situation

It includes the building time and size of the house.

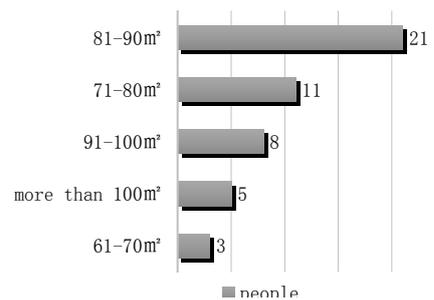
As shown in Figure 3, 100% of villagers own a house. Most of the houses were built between 1991 and 1995 with one floor.

As shown in Figure 4, 55% of villagers own a house measuring 80-90 square meters.

The desire of the villagers for the residential housing for the future planning years is related to the housing improvement type.



**Figure.3** The Building time of the respondents



**Figure.4** Housing area of the respondents

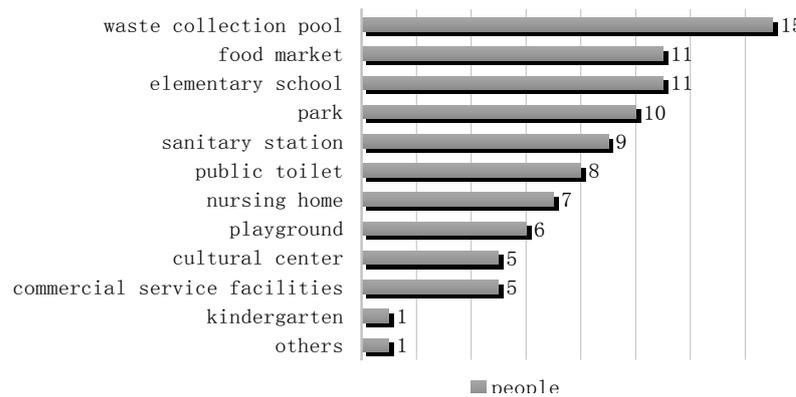
#### 4.3 Satisfaction on rural infrastructure

It includes respondents' satisfaction on rural infrastructure and environmental remediation.

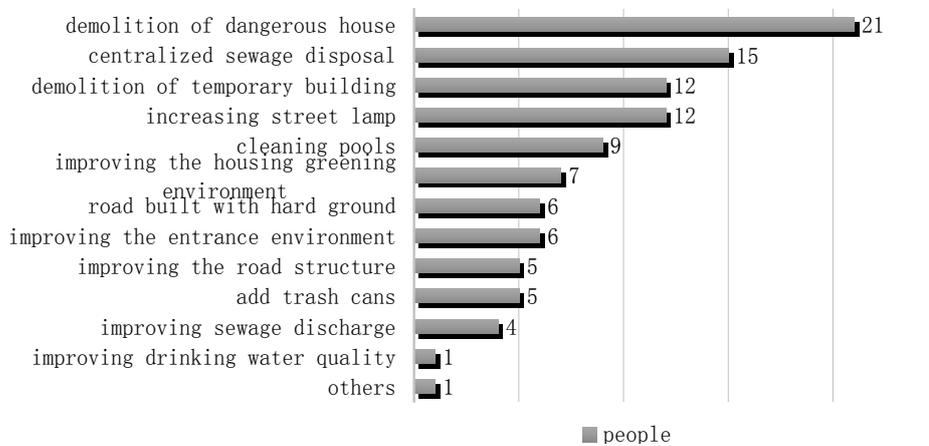
Fig.5 data states that 60% of villagers are satisfied with the greening, just at an average level.

Figure 6 expounds that 60% of the villagers are dissatisfied with the construction leisure sites and facilities in the village, and look forward to the improvement of the living environment of the public facilities in the village. Among the problems for environmental renovation listed in the recycling questionnaire, 20% of the villagers think that it is most urgent to dismantle the dilapidated houses, and 15% of the villagers believe that the most urgent problem is centralized sewage disposal.

Based on the proportion of villagers' demands for public service facilities, the call for improvement on existing environment is intensively reflected in sustainable strategies.



**Figure. 5** Respondents' satisfaction on rural infrastructure



**Figure.6** Respondents' satisfaction on the current environmental remediation

#### 4.4 Proposals for new rural development

Concerns by respondents include several aspects, (I) the primary problem that needs to be addressed in constructing a new countryside, (II) the landmarks to represent village, (III) the respondents' willingness to devote a certain amount of funds for reinvention living environment, (IV) the respondents' willingness to accept the demolition of their own houses.

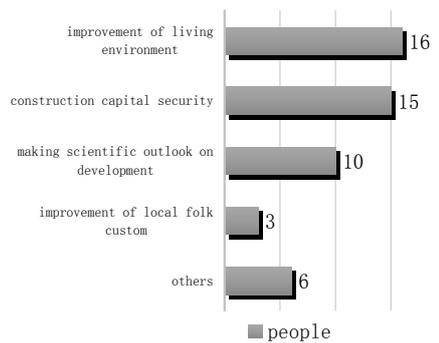
As shown in Figure 7, 32% of the villagers think that the improvement of the living environment is the primary issue needed to be solved in the process of new rural construction. 30% of the villagers consider construction capital security as the most primary thing, 20% of the villagers believe that making scientific planning is most important.

Figure 8 shows the local identity data of villagers. 38% of the villagers think the landmarks most likely to represent their village are the ancestral temple, memorial arch. 30% of the villagers give priority to the hometown of historic celebrities, and 18% of the villagers prefer to local-style dwellings.

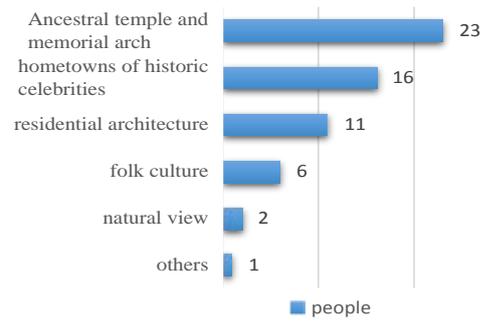
Figure 9 shows that 44% of percent of villagers are not very motivated to invest some money for the improvement of their living environment. 34% of the villagers feel hard to accept the burden of self-financing in the new countryside, and 33% think they could not accept it.

Figure 10 shows that 28% of the villagers refuse to accept the demolition of their houses, and 35% of the villagers are not sure. 38% of the villagers are under the obligation to build the new countryside, and 27% of the villagers are not sure.

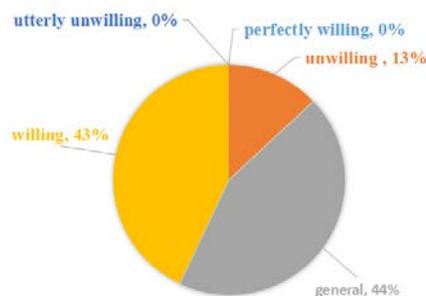
It can be learned that the sustainable strategies for the improvement of the living environment in traditional villages lies in the scientific measure of multi-cooperation and multi-party construction.



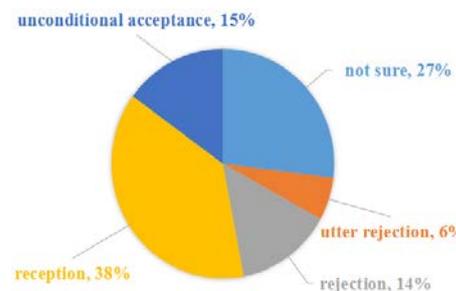
**Figure.7** respondents' suggestions for the primary issue that needs to be addressed in new rural construction



**Figure.8** respondents' suggestion for the symbol most likely to represent village in new rural construction



**Figure.9** The willingness of respondents to invest a certain amount of money in improving the living environment



**Figure.10** interviewees' reception of duty in the new rural construction

## 5. Discussion

### 5.1 The sustainability of traditional village human settlements

Local economic development should be coordinated with fund raising capacity according to the principle of land economy, energy conservation, water and material saving. Importance should be attached to regional characteristics, protection of the ecological environment, natural landscape, traditional architecture, historical and cultural relics, with respect for local folk customs and the protection of the natural texture of the village. Improvement of the production and living conditions of the villagers should be conducted by intensive construction of agricultural housing renovation, village infrastructure and public service facilities. The core is to increase the villagers' income and to enhance the life quality of the villagers.

### 5.2 Control of the population size of the planned years

The population predication is carried out through time series to obtain scientific statistics for future village capacity. Prediction of the future population growth is based on the historical and present-day change. The purpose of population capacity prediction is to achieve an appropriate balance between the native population quantity and alien population quantity, and to control the capacity of the village scientifically.

$$\text{Formula: } Q=Q1(1+K)^a+ P$$

In formula: Q - population prediction (human);

Q1 -- the current number of registered population (people);

K - natural growth rate of agricultural population during the planning period (%);

a- planning term (year);

P- mechanical growth of agricultural population during the planning period

### 5.3 Improvement of living and landscape habitat

*Planning villagers' residential land.* It mainly relies on the adjustment and renovation of the existing village residential land: focusing on the remediation of qualified residential land; adding new village land at reasonable location; arranging and utilizing public facilities and infrastructure in a centralized manner.

*Improving the quality of land used for public facilities.* Land should be reserved for village-level facilities for the needs of the villagers to make a reasonable complement for rural life. Such facilities include administrative facilities, commercial and financial facilities, cultural and recreational facilities, sports facilities, health care facilities and educational facilities.

*Multi-cooperation and guidelines for sustainable development of traditional villages.* The government guidance and coordination should be strengthened to provide organizational guarantee for planning execution, including the system protection of the public; the democratic management to provide human resources support for planning implement; the fund raising through various channels to provide financial security.

## 6. Conclusion

A standard of sustainability in this study is the residents' satisfaction to living conditions. Langtou Village was chosen as a representative example in this study. The data and results obtained from Langtou Village can be used as important standards in sustainable development of traditional villages.

The goal of rectification should be according to local conditions, with targeted and optional construction standard for each phase. Also, it is necessary to give an overall consideration of housing by villagers and the construction of public facilities and infrastructure. The smooth implementation of democracy between the government and the village can contribute to the equal cooperation for villagers, grassroots government and diversified cooperative groups. On the whole, a sustainable development of human settlement in traditional villages can make a reality through multi-cooperation and coordination. Consequently, the balance between nature and social ecological system in rural areas can be maintained through taking into consideration the balance of multiple parties' interests and finding the resonance point in the law of market economy.

Base on the data analysis, the research in this study confirmed again that the sustainable development of traditional villages should be efficiently design according to organic, dynamic and growing model.

## 7. Acknowledgement

Acknowledgement: Project supported by the National Nature Science Foundation of China, Project No. 51278194

## 8. References

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