The Integrative Design in Assemble Habitation and Its Circumstance in Mountainous Region

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Abstract. This paper researches the integrative design in assemble habitation and its circumstance in mountainous region, taking example for Xinhua mountainous region of Hunan province. First, the paper analyses the actuality of the mountainous assemble habitation according as the state policy and criterion which can ensure the boongs building to adapting the change along with development in mountainous region. Furthermore, the research expatiates on three basic theories -- the geomantic theory of China, the Paolo Soleri’s theory—arcology, and the mountainous bioclimatology theory. The geomantic theory of China is a simple environment concept in Chinese antiquity. It guides people who can carefully seeing about the nature surroundings to create the all right environment of mountainous resident. Arcology is consistent with the geomantic theory of china about the ecological environment of residential buildings. In nature, as an organism evolves it increases in complexity and it also becomes a more compact or miniaturized system. The mountainous bioclimatology architecture should inoculate area, visual sensation and vitality of scenery together to cause a sensibility resonance. Then, the paper brings forward for integrative design in four patterns of assemble habitation with its circumstance in mountainous region. Such as the pattern of protection, the pattern of renovation, the pattern of derivation and the pattern of restoration. This part is the most important one which will set up a suit of the pattern truss for mountainous boongs. Through these four patterns researches, we can see a new phenomenon of settlements in mountainous region. The settlements in mountainous region will become suitable, geomantic, arcological and bioclimatological. In the end, the research will approve the new integrative design pattern which is feasible and continuable in development foreground. So, we should utilize the intelligent system to construct a integrative and an ecological residence follow a new mountainous architecture culture.

1. The Background

Through these years rapid development, the construction in our country has also progressed everywhere. The mountainous region is one important part of our country. So the research on the change of assemble habitation in mountainous region is also very significant. Currently, in the mountainous region, the glebe is changed to belongs with industry, commerce, inhabitation and some
other function. It brings on immingle inhabitancy not only in boongs, but also in immigrations[1]. The mountainous assemble is an intergradation between city and village, and it is the village which has to be provided with some city’s characters. In this area, the assemble habitation forms strong contrast and coexistence all round, such as different occupation, different life style, different belief, different conception, different demand and different civilization diathesis. Therefore, the paper will according as the state policy and criterion, based on normal theories, analyse the actuality of the mountainous assemble habitation, adapt the mountainous circumstance. Accordingly we researches the plan and technique which is the integrative design to improve the assemble habitation and its circumstance of the boongs in mountainous region.

2. The Actuality of The Mountainous Assemble Habitation

On account of the unique mountainous terrain, the mountainous assemble habitation is belongs to close, laggard and original. But, during the development with the city construction, the mountainous area has to be empoldered out of order. The village government can not manage availably. The mountain soil is exploited cosmically ,not according as the state policy and criterion. In the mountainous region today, so much soil forms dispersedly. More and more soil is hired to the developer. But the developer can not open out the hired soil in time, so it forms a popular phenomenon that the mountainous area is left unused[2]. Whereas the boongs lose the soil, their habitation circumstance occurs strictness problem. So the circumstance in the mountainous assemble is destroyed by city’s expanding.

2.1. The Traditional Mountain Circumstance Havoced

Through almost 30 years development, the mountainous region has been faced with a breakthrough period. Much more soil resource has been appropriated. And most of them has been wasted. For example, in Xinhua area of Hunan province the actuality of the assemble circumstance presents confusedly in many aspects, such as:

- The soil resource: the plowland has degenerated and has been wasted badly.
- The habitation circumstance: the chaotic sky, the disafforestation, the mountainous region has been pushed planely, and the water has been polluted strictly.
- The mountainous assemble crowds, the path lacked, the building out of order.
- The boong’s estate: lowness efficiency, lowness return, highness energy sources consume.
- The management of government: segmentation, short-term and not the holistic plan.

The figure 1 is a true portrayal of the circumstance.

2.2. The Pattern of Mountainous Boong Has Been Broken

![Figure 1. The Xinhua Zhenglong traditional circumstance confused.](image)
As the life style changed, the pattern of mountainous boong has been broken. In the course of city’s expanding, the traditional assemble habitation is reducing step by step. More and more mountainous boongs have lost the soil for national purchase. Then they have to hire self-house to make a living. They build more house in unit of doors on their remained soil. These house layout dispersedly, construct random, establishment behindhand. For example, the boongs in Xinhua mountainous area still use traditional brick skill to build their house more than 70%: clay brick for wall, handwork for building, few prefabrication, modulus lowly, modernize poor. And it must be changed that the assemble intensivism has to develop the living level of boongs.

It is the other reason that the family configuration has been transformed. For example in hunan’s mountainous area: Ten years ago, there is 54% three era in one family and 12% more era in one family. Untill 2008, these proportion descended to 27% and 8%. It is indicated that the traditional family configuration has not adapt in today like a fish out of water. Some new configurations appear, such as young couple family, young bachelordom family, aged couple family, old bachelordom family ets. Now we can see the principle of opening an account in police department which also takes the change place gradually. The singleton all serves as one family without any era. If there are more than tow children with agro-residence and the children reach marriage age, the family can dispart. Currently, many hunan’s mountainous tenement has three or four fellows. Also it is the norm tenement that their residence building can not occupy over 80 centiare. Then the abruption from old big family has induced the traditional pattern of mountainous assemble residence broken, as the figure 2 displayed.

![Figure 2](image)

**Figure 2.** The Xinhua Shangmei traditional assemble habitation is reducing step by step.

3. Integrative Design in Assemble Habitation And Its Circumstance in Mountainous Region

Human being’s activity have conflicted with entironment. It leads to the deterioration between entironment and residence. Also the assemble habitation and its circumstance deteriorate day by day through the expanding from city to mountain. So we must scan renewedly the connection with hunan and nature, buildings and entironment. In our country academician Wuliangyong bring forward “the sciences of human settlements in china”. Mr wu said the human settlements include all the assenble form as villages, towns,and cities. It is emphasized that the research of human settlements is intergrative, roundly, systemic and compositive. And it aims to control the impersonality rule of development in human settlements[3]. Then we can design appropriate settlement for human. This paper based on Wu’s theory. On emphases, we combine other theories ---- Geomantic Theory of China, Arcology, Intergrated Bioclimatic Architecture theory. We research the integrative design in
the assemble habitation and its circumstance in mountainous region. The figure 3 is an example of the integrative design.

Figure 3. The Xinhua new assemble settlements with integrative design.

3.1. The Basic Theories
This paper provides an all-round new ecological concept of residential buildings which is the integrative design in the assemble habitation and its circumstance in mountainous region. According as these three theories, which are the most popular in the field of modern architecture, the research on residential greening may hold the accurate direction to develop. In addition, the paper researches the structural support to ensure the integrative design in the assemble habitation and its circumstance in mountainous region achieved. By way of testing, the quality of air, the temperature and the humidity of the residential buildings are improved evidently. The integrative design will truly become an important part of the mountainous residence.

- Geomantic Theory of China
The geomantic theory of China is a simple environment concept in Chinese antiquity. It guides people who can carefully seeing about the nature surroundings to create the all right environment of resident. From the theory of modern science, the geomantic theory is an all-around science, involving the Geophysics, the Hydrology, the Euthenics, the Arcology, the Cosmoplastism and the Somatology. The hard core of the geomantic theory of china has close connection with residential environment probably in three aspects which are the physiognomic theory, the landscape theory and the storing wind and assembling climate theory. This is the originally ecological theory on architecture in archaic china, and is the reference to choose appropriate method for mountainous design[4].

- Arcology
Arcology, the concept of ecological human habitats was introduced by Paolo Soleri in late 1960's, exploring an alternative urban development in the age of environmental crisis .In nature, as an organism evolves it increases in complexity and it also becomes a more compact or miniaturized system. Arcology, architecture and ecology as one integral process, is capable of demonstrating positive response to the many problems of urban civilization, population, pollution, energy and natural resource depletion, food scarcity and quality of life. Overall, arcology seeks to embody a “Lean Alternative” to hyper consumption and wastefulness through more frugal, efficient and intelligent design, especially in terms of heating, lighting and cooling[1]. Therefore, arcology is consistent with the geomantic theory of china about the ecological environment of mountainous residential buildings[5].

- Intergrated Bioclimatic Architecture theory
Because of the different region climate, the bioclimatology theory is used differently and widely in modern architecture. The famous Spaish architect--J.Barebar founded the theory of Intergrated Bioclimatic Architecture, which also is called as continuable architecture. J.Barebar considers that the
Integrated Bioclimatic Architecture profits from the landscape. “The bioclimatic architecture” incarnates that the buildings have ability of applicability, adjustment and perfection by itself. Accordingly, the mountainous design will combine with nature, obey the bionics principle and hold the continuable principia[2]. In addition, the bioclimatic architecture also makes deep attention with healthiness of residential condition. Anyway, the Integrated Bioclimatic Architecture should inosculate area, visual sensation and vitality of scenery together to cause a sensibility resonance[6].

3.2. Integrative Design Tactic in Four Patterns of The Assemble Mountainous Habitation
How will we bring planning of the mountainous habitation into city planning. So we can have criterion to manage as a whole, design as integer. This is the core of the research on the integrative design in the assemble habitation and its circumstance in mountainous region[7]. Concretely, we research four new patterns of the assemble mountainous habitation as follows.

- The Pattern of Protection
Based on the integrative design, we will protect the original patterns of the assemble mountainous habitation which have national characteristic or belong to history style and features, as the figure 5 showed. Also we must revert the history appearance to retain local color, as the figure 4 showed. Therefore, we don’t move the basic assemble room. We only maintain, amend and revert the characteristic room. On this way, the intrinsic mountainous habitation will have renew life.

Figure 4. The protection patterns retain local color.  
Figure 5. The protection patterns belong to history style.

- The Pattern of Renovation
Along with the change in boogns family, we bring forward the pattern of renovation especially for old residerter who will not adapt more movement for their life. Also it can debase efficiently the society cost to reconstruct the assemble residence. Furthermore, based on integrative design we can renovate
the quality of original residence. And we can combine the original residence with the mountainous circumstance perfectly. Figure 6 showed how the renovation patterns adapt mountainous circumstance.

Figure 6. The renovation patterns adapt mountainous circumstance.

- The Pattern of Derivation
In the course of the assemble development, the boogns improve their independence consciousness more and more. The structure of original family has been changed within. Then a new pattern of residence derivates inside the original assemble room. This pattern of derivation will be based on village group, as the figure 7 showed. Besides it has associated and coherence in the extreme. On the principle of integrative design, we will build the residence with conjunction each other. Also the pattern of derivation will be more appetent in big old family. The boogn’s relation will be more harmonious than before.

Figure 7. The derivation patterns base on village group.

- The Pattern of Restoration
During the mountainous householder juvenscence, the youngling of the boogn pursues new pattern of residence. So the pattern of restoration will satisfy with different aims of different person. And this pattern can keep stabilization of assemble together with development benign. When we design the pattern of restoration, we must follow the mountainous characteristic, as the figure 8 displayed. We also must adjust measures to local conditions, as the figure 9 displayed. We will obey the nature rule to rebuild new assemble residence. Of course, the new pattern will be seasoned with standardization development.
Figure 8. The restoration patterns follow the mountainous characteristic.

Figure 9. The restoration patterns adjust to local conditions.
4. Conclusion

Today, all kinds of residence have developed rapidly. The mountainous assemble is also one important kind of human settlement. The mountainous boogn has changed their life style unprecedentedly. We research the integrative design in the assemble habitation and its circumstance of the boongs in mountainous region to solve some problem of this especial assemble habitation. This paper provides an all-round new integrative design concept of residential buildings. According as the theories, which are the most popular in the field of modern architecture, the research on mountainous residence may hold the accurate direction to develop. In addition, the paper researches the structural support to ensure the integrative design achieved. By way of testing, the quality of air, the temperature and the humidity of the residential buildings are improved evidently.

In future, if just as been hoped for the framework and maintenance system can regulate itself according to the weather and comfort, the buildings get intelligence[8]. Furthermore, due to the rapid developing of the technology of computer, communications, and automatic control, we can intelligentize the futural assemble habitation and its circumstance of the boongs in mountainous region to meet the integrative idea. In the future, mountainous residential subzone would be an architecture complex with the self-adjusting function commanded by high-tech, and the mountainous settlement would be a intelligent and a tri-dimensional one. The intelligent assemble should integrate the inside environment and outside by an intelligented design, which may introduce the using of self-control device, intelligent management system ,CATV, Intrernet, and the intelligent household, etc, to realize the dust prevention, germ destroyed, noise control, climate conditioning and environment prettified[9].

So, it is concluded that to build genuine mountainous architecture, we should utilize the intelligent system to construct an integrative and an ecological residence follow a new mountainous architecture culture[10]

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