

再定住集落における住宅の増改築に関する調査研究

～台湾南部・Rinari 再定住地を事例として～

Housing Extension of Post-Disaster Relocation Settlement in Taiwan — The Case Study of Rinari Settlement, Pingtung County —

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2009 年のモーラコット台風により、台湾の多くの少数民族の居住地が深刻な被害を受けた。その後台湾政府は、被災地域を含めた、災害リスクの高い山間部区域での居住を制限し、住民たちを移住させた。災害後住宅再建の空間変化を明らかにするため、本研究では Rinari 集落へ移住した好茶(ハオチャ)部族について、住宅の増改築部分の実態、用途、面積、居住人数を聞き取り調査及び実測調査し、居住人数と増改築面積の関連を確認した。また、調査結果、住宅の増改築に至る理由を明らかにした。

Keywords: Relocation, Housing extension, Indigenous people, Post-disaster recovery
再定住、増改築、少数民族、災害後復興

1. Introduction

Hao-Cha is one of the indigenous tribe in the South of Taiwan from the 'Old' Hao-Cha settlement. In 1977, the government implemented the policy which resulted in the relocation for the community to New Hao-Cha. In 2009, Taiwan was hit by Typhoon Morakot and this brought about 3,000 mm rainfall in a single day. This typhoon had caused serious landslide damage to New Hao-Cha settlement. In 2010, the community was relocated to Rinari settlement. The relocation caused certain changes in the community dynamics including the housing designs and extension. This study was to understand the housing situation with a focus on of the housing extension in Rinari settlement. the study will also understand why the households carried out the extensions.

“Build back better” is a concept that had been promoted in post-disaster recovery which focused on increasing the resilience of communities through strengthening society systems, discussions of the community issues, revitalization of livelihoods, etc. Housing is an important aspect of recovery after a disaster and this is the same for the Hao-cha people living in Rinari settlement (World Bank 2010). The Rinari settlement is the third village site, it is important to understand the layout changes after the completion and to investigate what influenced these modifications.

These modifications can be understood by carrying out measurement survey of houses in the settlement. Sample targets were selected based on random selection and interviews were also conducted within the sample households. Results and lessons learnt from this research can contribute to better understanding changes of the post-disaster housing and become a reference case study for similar reconstruction project in Taiwan in the future. The adaptation of the community's post disaster housing to their new environment is highlighted in this study. Some of the adaptation factors include; 1) The housing extension type of the individual household 2) The reasons why the residents in Rinari settlement wanted to build housing extnsions 3) Case study of the housing extension in the Rinari settlement

The table 1 shows the methodology, date, and the sample size of each research activities. Regarding the selection of the sample, the interview research was acquired by 12 key persons, while measurement research targeted on 11 rando household.

Table 1. Outline of methodology and sample size

Date	Methodology	Sample size
2018.8-9	Interview survey	12 people
2018.8-9	Measurement survey	11 Households
2017.10	Aerial photographs analysis	Front yard extension of the 177 households (Refer to Figure 2)

2. Overview of the Hao-Cha village and Resettlements processes

2-1. Migration History of Hao-Cha people

Hao-Cha tribe belonged to the indigenous ethnic group of “Rukai*.” The total population of Rukai is 12,785 people (National Council for Aborigines, 2014) and Hao-Cha tribe is one (3.7% of the total population) of the Rukai group originally located on the North Dawu Mountain, and on the west side of Wutou Mountain. It is 600m away from the South Ai-Liao River*2. This was known as the Old Hao-Cha settlement. From 1975-1977, to improve the living condition of Hao-Cha people, the government relocated the Hao-Cha tribe from Old Hao-Cha to the South Ai-Liao river terrace, 200m from the South Ai-Liao River. This new site was called New Hao-Cha settlement. The old site (Old Hao-cha) was recently recognized and preserved by the WMF (World Monument Found) through the Ministry of Culture as National heritage.

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The beginning of the second relocation project could be traced back to the Typhoon Sepat in August 2007, which caused some damages to the New Hao-Cha settlement. Soon after that, on August 8, 2009, Typhoon Morakot brought about rainstorm and caused landslide in New Hao-Cha settlement. Eventually, the whole New Hao-Cha settlement was buried under the earth. Therefore, the government immediately demarcated the residential area and asked the Hao-Cha tribe to evacuated to Ai-Liao military camp as the temporary shelter. In the temporary shelter, they made an agreement with government that they would move to Rinari settlement, where was totally safely in terms of disasters risks. In September 2009, the government had invited NGOs and local community committee for the planning discussion. In December 2009, under the escort of the reconstruction regulation, Rinari settlement started to be constructed. In December 2010, 483 households were completed and handed over to the households. (Refer to Figure 1)



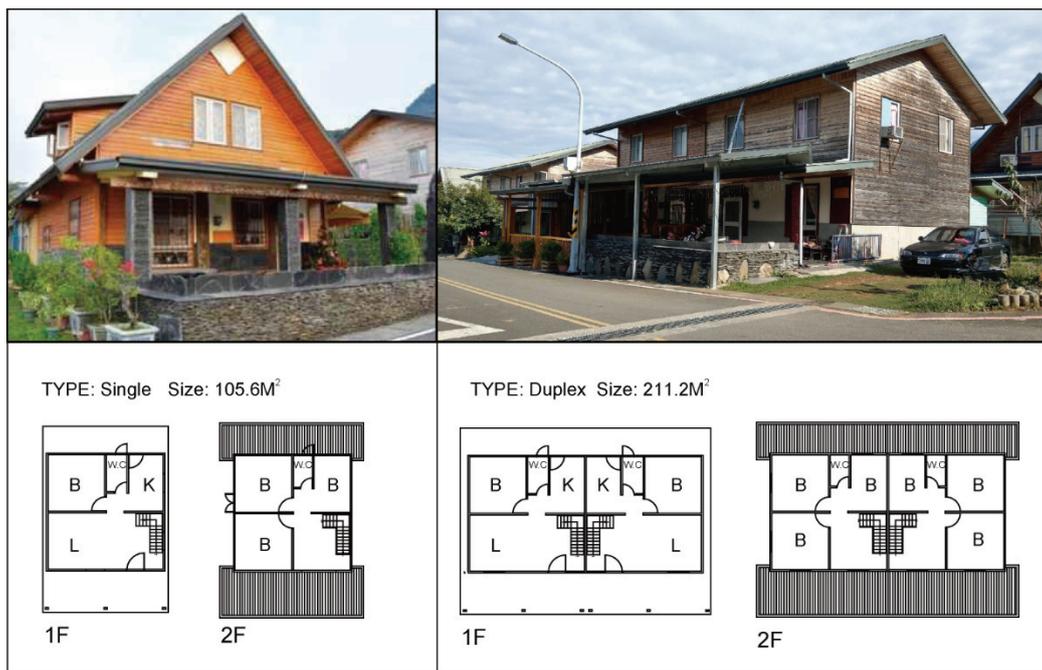
Figure 1. Front yard extension of Rinari settlement (extension part marked in Red color)

Table 2. Migration history of Hao-Cha people

Period	Settlement
Pre historical era-1977	Old Hao-Cha (resettled based on the government policy)
1977-2009	New Hao-Cha (affected by the landslide)
2009-2010	Ai-Liao Military Camp (temporary shelter)
2010-Now	Rinari

2-2. Housing of Hao-Cha people

The housing layout and size in New Hao-Cha settlement are very different from Old Hao-Cha settlement. The housing in Old Hao-Cha is only about 48 m², the interior space is for the activities like hand crafting, sleeping and dining. However, in New Hao-Cha settlement, the housing is about 264 m² which is the largest amongst the three settlement. In Rinari settlement, the housing is about 105.6 m². The housing had been designed to three types, which is Single (Steep incline), Single (Moderate incline) and Duplex. (Refer to Figure 2) The housing design was discussed and decided by the Hao-Cha people and NGO together. At the beginning of the discussion, Hao-Cha people wanted to use the traditional design which as same as the one in Old Hao-Cha settlement, however, due to the budget and time restriction. Hao-Cha people accepted the design proposed by the NGO, which use the light steel as the main structure and wooden material as the partitions. The structure system provided by the NGO can accelerate the construction speed and lower the cost of the construction. Moreover, because of the light steel system, it gave the housing some opportunity for the modification and extension in the following years after the completion of the buildings. It is very interesting to see that all of the housing in this three settlements have relatively huge front yard space, which allow people to chat with each other.



Note: B-bedroom, K-kitchen, L-Living room, W.C-Bathroom

Figure 3. The standard size and design of housing in Rinari settlement

3. Individual housing measurement and findings

There has been two field visits (August 2018 and September 2018,) to measure 11 individual houses in Rinari settlement. The extension construction range, extension part, area and the extension reasons had been recorded through the measurement survey and the interview. The table 2 documents the extension area, purpose of extension, interior renovation situation and the family member in the interviewed household. (Refer to Table 3)

Table 3. The measurement and interview result of the households

Housing Code	Gender	Occupation	Extension part	Extension reason	Interior renovation	Permanent Family member	Not permanent member	Extension area(m ²)
1	M	Retired(Teacher)	KDSL	1,2,3,5	No	2	5	55.5
2	M	Priest	SL	1,2,5	No	N/A	N/A	21.86
3	M	Free time	WG	1,3,5	No	2	1	49.29
4	F	Retired(Teacher)	KLWBG	1,2,3,5	No	3	1	152.62
5	F	Restaurant Owner	KSWG	1,3,5	No	3	7	27.12
6(S)	M	Restaurant Owner	SG	1,3,4,5	No	6	0	76.5
7	M	Government related	KDSLWG	1,3,4,5	Yes	2	3	127.37
8	M	Carpenter	KDLWG	1,2,3,4,5	Yes	8	0	128.12
9	M	Retired(Government related)	KDSTL	1,2,4,5	Yes	9	0	85.17
J	M	Office worker	SL	3,5	No	4	0	44.06
K(S)	M	Office worker	SL	1,3,5	No	0	2	27.42

Note	
Housing Code	M: male F: female
Gender	The housing code with (S) means single type of the housing
Extension part	K: Kitchen extension, D: Dining Room, S: Storage, T: Toilet, L: Laundry, W: Work Space, B: Bedroom G: garage
Extension reason	1: Living space scarcity or accommodate to the old living style 2: Need income source 3: Cultural identity preservation 4: Housing material protection 5: Policy
Not permanent member	The housing member who living in the Rinari settlement less than once a week N/A: No data (Which was not showed in the Figure 5)
Permanent member	The housing member who living in the Rinari settlement more than once a week to everyday N/A: No data (Which was not showed in the Figure 5) 0: The household still own the house but no longer live in Rinari settlement

Figure 3 shows that the most often seen extension type was storage and laundry space, which eight out of eleven households had extension in their house. Seven household had extension in the garage space. Follow by garage space extension, the kitchen had the quantity of six. Those were the top 4 extension type of the 11 interviewed households. Therefore, it could be interpreted that those space type in the originate housing design did not be satisfied and were not well considered or planned. Regarding the relationship of the extension area and the family member, according to the Figure 4 it shows that the bigger the extension area, the larger the family member, therefore, it could be interpreted that the extension area were highly related to the requirement of the space and, living activities of the number of the family member in the households

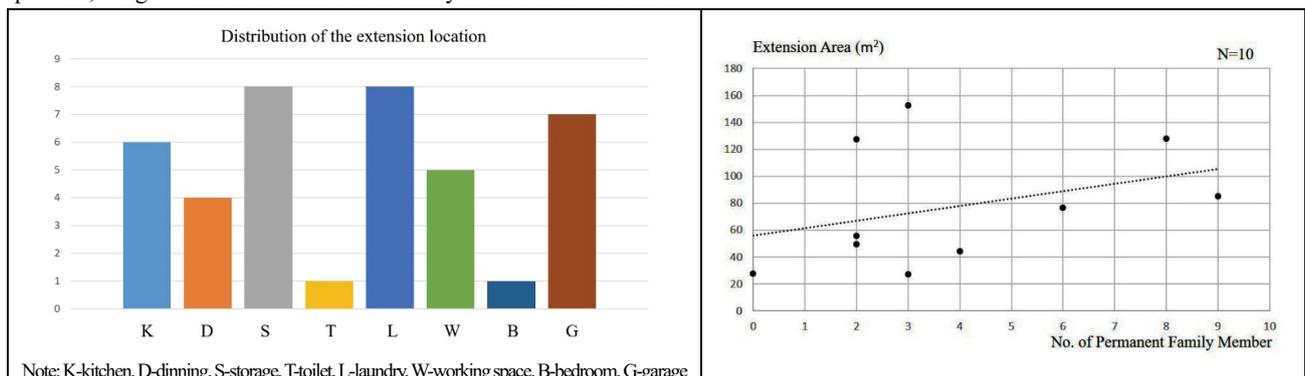


Figure 3. Distribution of the extension type in 11 households

Figure 4. Relationship of the extension area and the family member

4. Case study of the housing extension

Figure 5 shows two of the representative measured household record example, one is the duplex type, and another is single type. The red line shows the originally constructed area.

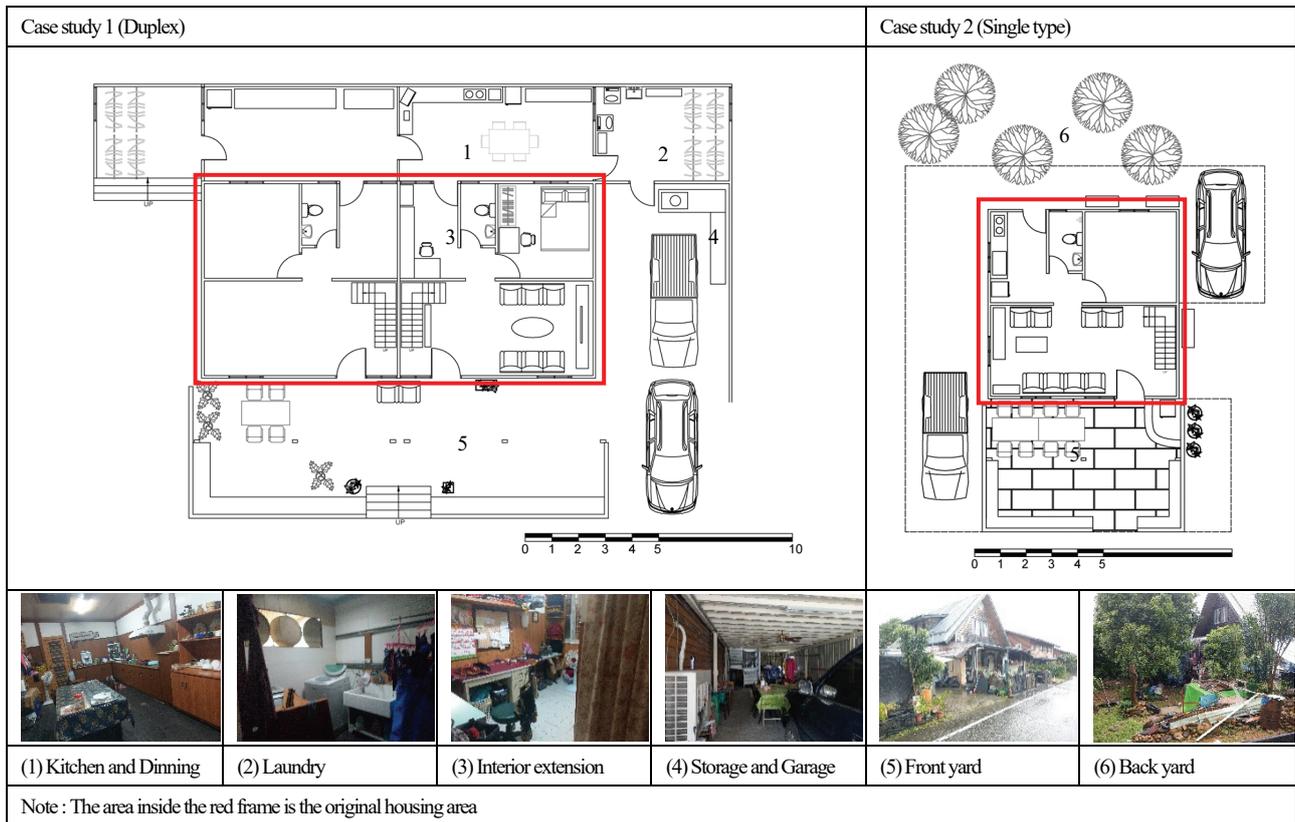


Figure 5. Case study of the housing extension

Observation Point (Refer to Figure 5):

- (1) **Kitchen space and Dining space:** The Hao-Cha people extended the kitchen on the backside of the house, which combine with the dining space together. Moreover, the kitchen can also serve as the backside connection between two duplex households.
- (2) **Laundry space:** Laundry space usually located on the backside or right/left side of the housing. The laundry space usually including a basin, a washing machine and some clotheshorses. It could be indoor or semi-indoor.
- (3) **Interior extension:** The original kitchen had been renovated into the working room for making the handcrafts.
- (4) **Storage space& Garage space:** The storage space was mainly for the agriculture tools and the refrigerator for the indigenous traditional foods. While the garage space had more than two cars and several motorcycles.
- (5) **Front yard:** The front yard serves as the business area and the communication area with other residents.
- (6) **Back yard:** The house owner did not extend any permanent structure on the back yard, the back yard space is the storage for the household but not fully utilized.

5. Discussion: Reason of housing extension

In this section, the reasons of why the resident in Rinari want to build the housing extension had been listed and discussed. Which could be classified as passive reason (Policy) and Self-motivated reason (Living space scarcity, Need income source, and life style preservation)

5-1. Passive reason

1) Receiving the subsidy from the government

One year after the completion of the Rinari settlement, Council of Indigenous Peoples conducted the “Indigenous Tribal House Building Culture and Renovation Project”. The plan is mainly to strengthen the cultural characteristics of the permanent housing with a subsidy of NTS\$100,000 (USD \$3,334) per household to renovate the front yard of the house. Because the Council believed that the front yard was the place could be seen easily and fully represent the culture of indigenous culture. Not only the housing in Rinari settlement, the subsidy also went to other affect indigenous reconstruction settlement. In total, about 1,280 houses received the subsidy. The implementation period was from mid of 2011 to mid of 2012. Refer to Figure 2, most of the Hao-Cha households in Rinari settlement had renovated their front yard with the subsidy from the government. The front yard extension and renovation could be considered as the first stage of the housing extension occurred in Rinari settlement. Without doubt, the subsidy stimulated the households to renovate their house. The example can refer to point (5) in Figure 5.

5-2. Self-motivated reason

1) *Living space scarcity or accommodate to the old living style*

Comparing with the previous housing layout in New Hao-cha village, the permanent houses in Rinari were relatively small and narrow. Although designer and architect had designed the maximum layout for the villager, the living spaces are still very small³ for the household and very inconvenient for living. Hence, the different type of spaces had been expended because of the scarcity of the space or the mismatch of the living style. For example, Hao cha people use larger space for cooking because of indigenous steam cake need to be cooked in large steam cases. The example can refer to the point (1) (2) (4) and (6) in Figure 5.

2) *Need a space for income source/generation*

The need of income sources was related to the feasibility to find livelihood opportunities, especially in a new environment and in the early stage after the resettlement. The most common extension cases with the reason of income source were seen in the renovation of the original kitchen spaces and back side of the houses. Hao-Cha people preferred to renovated them as the working spaces for example making indigenous handcrafts. The handcraft would be sold on the local market or internet. The example can refer to the point (5) in Figure 5.

3) *Cultural identity preservation*

Some of the residents were not willing to use the permanent material for the housing extension, because they wanted to respect the traditional living style or renovate their front yard as the one in Old Hao-Cha settlement. For example, refer to point (5) and (6) in Figure 5, the household only use canvas to extend his house, including the front and back side, because he did not want to renovated his house with the non-indigenous materials like other households. However, he did not had enough money to buy slates materials (Traditional housing material of Hao-Cha tribe) but still need the extra space for storage. Therefore, he added the temporary extension material on the surrounding of the house. Moreover, some residents stated that they even further renovated their houses exceeded the budget of the government subsidy on the front yard, which represented that they really regarded front yard as an important space in their culture. For example, the chief of the Hao-Cha tribe erected the stone pillar on the front yard to represent his society status while some of the household further added the slate big table and slate chair for chatting.

4) *Housing material protection*

The permanent houses had been built by wooden material as the facades. Some of the residents said that because of rain and wind, the wooden material deteriorated very quickly. Therefore, they had no choice but to add the iron corrugated material surrounding the house to protect the wooden material from deterioration. The example can refer to the point (4) in Figure 5, which the storage place had been built by the steel structure to protect the wall of the house.

6. Conclusion

From the analysis, it was found that people in Hao-Cha had a large variation of the housing extension after moved into the Rinari settlement, the extension type reflected the living habitation and the space requirement of the house. Moreover, the relationship of the extension area and the family member had been confirmed that the more family member in the house, the larger the housing extension be constructed.

Second, there are several reasons such as policy, living space scarcity, living style, income source, culture identity preservation and housing material protection reason which were found in this research. By the interview and the measurement survey of the households, it showed that single household had several reasons for extension and the extension is still on going at several households after 8 years of the completion.

Note

*1 Rukai is the seventh-largest of the 14 officially recognized indigenous groups in Taiwan. The Rukai means "people living in the mountain".

*2 South Ai-Liao river is a tributary of the Gaoping River in Taiwan. It flows through Kaohsiung City and Pingtung County for 68.5 km. The South Ai-Liao river had been regarded as the holy river in Hao-Cha traditional culture.

*3 The average house size in New Hao-Cha settlement is 264m², while in Rinari is about 105.6m² per households.

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